

Metro-North

M2 / M4



SIMULATION MANUAL
TRAIN SIMULATOR 2020

HISTORY

M2

The M2 "Cosmopolitan" series (numbers 8400-8849) replaced EMU cars dating from the early 1920s to 1954, including the Pullman 4400-series, which were originally manufactured for (and inherited from) the New York, New Haven & Hartford Railroad. As with the cousin M1 series, the M2s accompanied an overhaul of the long-neglected main line and the New Canaan Branch in which longer, high level platforms were introduced along with other infrastructure improvements. The first M2s were accepted for service on April 16, 1973. 144 base order cars were built in 1972-1974, followed by a 100-car option in 1975. These cars had been scheduled for delivery in spring 1971, but were delayed due to technical problems. Aside from the technical differences of the New Haven Line (electrification via overhead catenary instead of third rail), the cars are similar to the sister M1A order and, in times of equipment shortages or severe weather, the M2s have run on the Hudson and Harlem lines. Most of the other differences are in the interior and exterior appearance of the cars, such as red striping on the exterior rather than blue, the interior wallpaper having both the New York and Connecticut state seals and the obvious pantograph and mechanical apparatus on the roof. Both the MTA and ConnDOT

purchased bar cars, but complaints from riders from stations in New York, coupled with arrival of new equipment on the Hudson and Harlem lines, led to the conversion of the ten MTA-owned bar cars to standard coaches. The ten ConnDOT-owned bar cars, which ran on express trains to New Haven, Stamford, South Norwalk and New Canaan, remained in service during weekdays until May 2014. 48 M2s were overhauled starting in 1994, with 24 returning to service in 1995.

M4

After the LIRR and Hudson/Harlem lines received an updated version of the original Metropolitan series of cars in 1984-86 (the LIRR M3 and Metro-North M3A series), plans were announced for a similar undertaking on the New Haven Line. It sought additional cars to increase service on the line after projections indicated an increase in ridership. Metro-North originally planned to purchase 44 additional M2s, but decided to award a contract for 54 M4 cars (8900-series) in 1987-1988 to Tokyu Car. The change was made due to the need to accommodate additional ridership, and because of perceived improvements the M4 model. The MTA Board approved the \$77.3 million contract on December 20, 1984. These cars were built in the Brooklyn

Navy Yard. Nemko assembled and finished the cars for Mitsui, which shipped the parts made by Tokyu. In October 1986, these cars had been expected to enter service the following year. The first cars were expected to arrive in early 1987. Identical to the M2s, Tokyu Car initially gave the "Triplex" brand name to the M4 cars to highlight their being a three-car set, as opposed to the married pairs of the M2s. These cars came to be known as "triplets" by railroad personnel. During the development of the order, Metro–North's operation and planning groups sought increased flexibility in the utilization of cars on the New Haven Line, and thus, decided on the triplets.

DESCRIPTION

The M-2 cars are multiple unit electric (EMU) commuter railcars that operate as two car units (referred to as married pairs) and the M-4 cars are multiple unit electric commuter railcars that operate as three car units (referred to as triplets).

The M-2 and M-4 cars are electrically powered from either of two sources: 650 VDC nominal from a third rail or 13,200 VAC nominal from an overhead catenary system. This

power is supplied to the train propulsion system and to inverters which output 230 VAC to power HVAC, the 37.5 VDC low voltage supply, and other equipment. The M2s and M4s are completely equipped for independent, bi-directional operation. The M-4 triplets may be combined with M-2 pairs in a consist.

The multiple unit railcar concept provides functional efficiency and cost effectiveness by increasing seating capacity and decreasing individual car weight. This is accomplished on the M-2 by sharing equipment between cars of a married pair. M-2s could be used only as pairs. An M-2 consist always had an even number of cars. The M-4 cars are furnished as triplets with redundant equipment. Consists can now have an odd or even number of cars, depending on the number of triplets used and how they are combined with M-2s. Each triplet has two of each piece of critical equipment (e.g., pantographs).

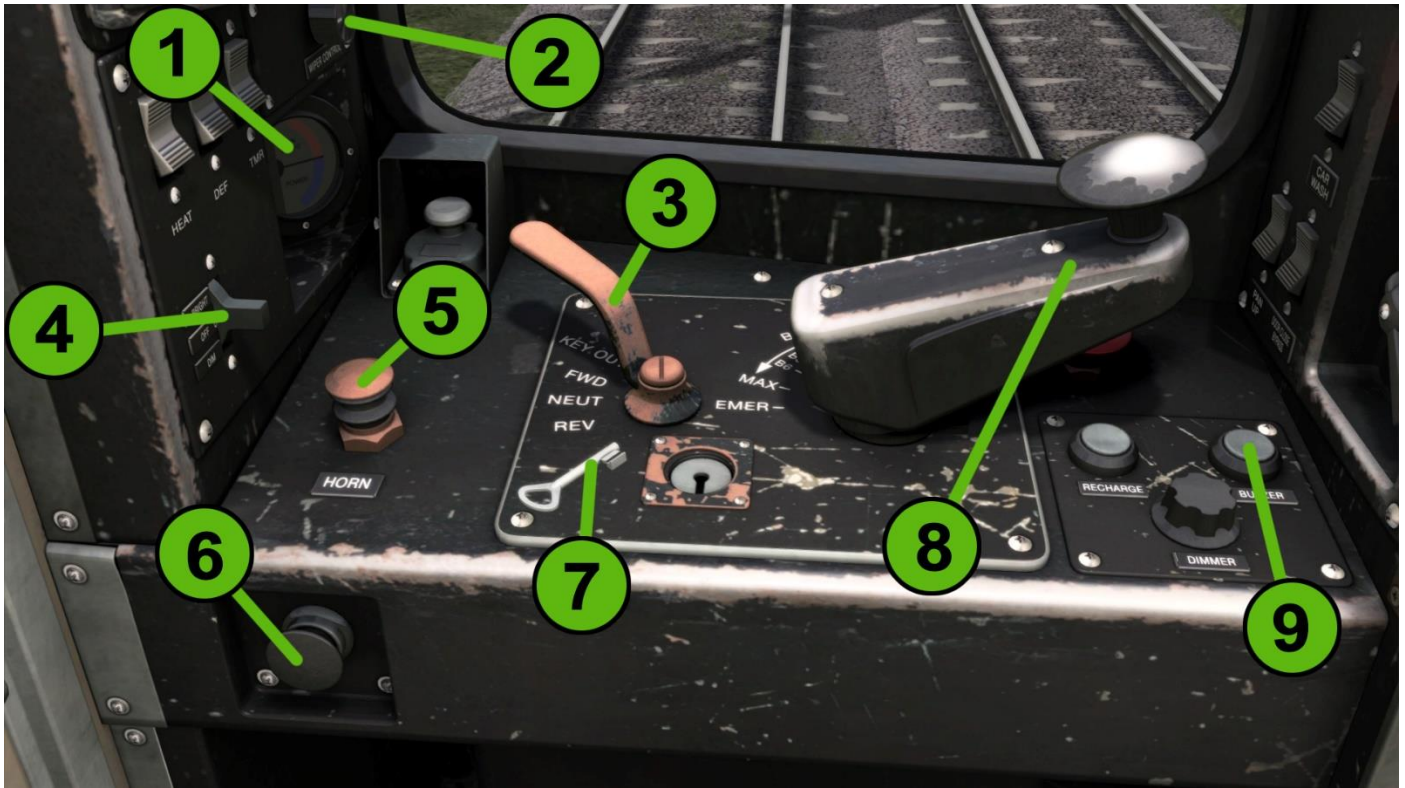
Metro-North M2



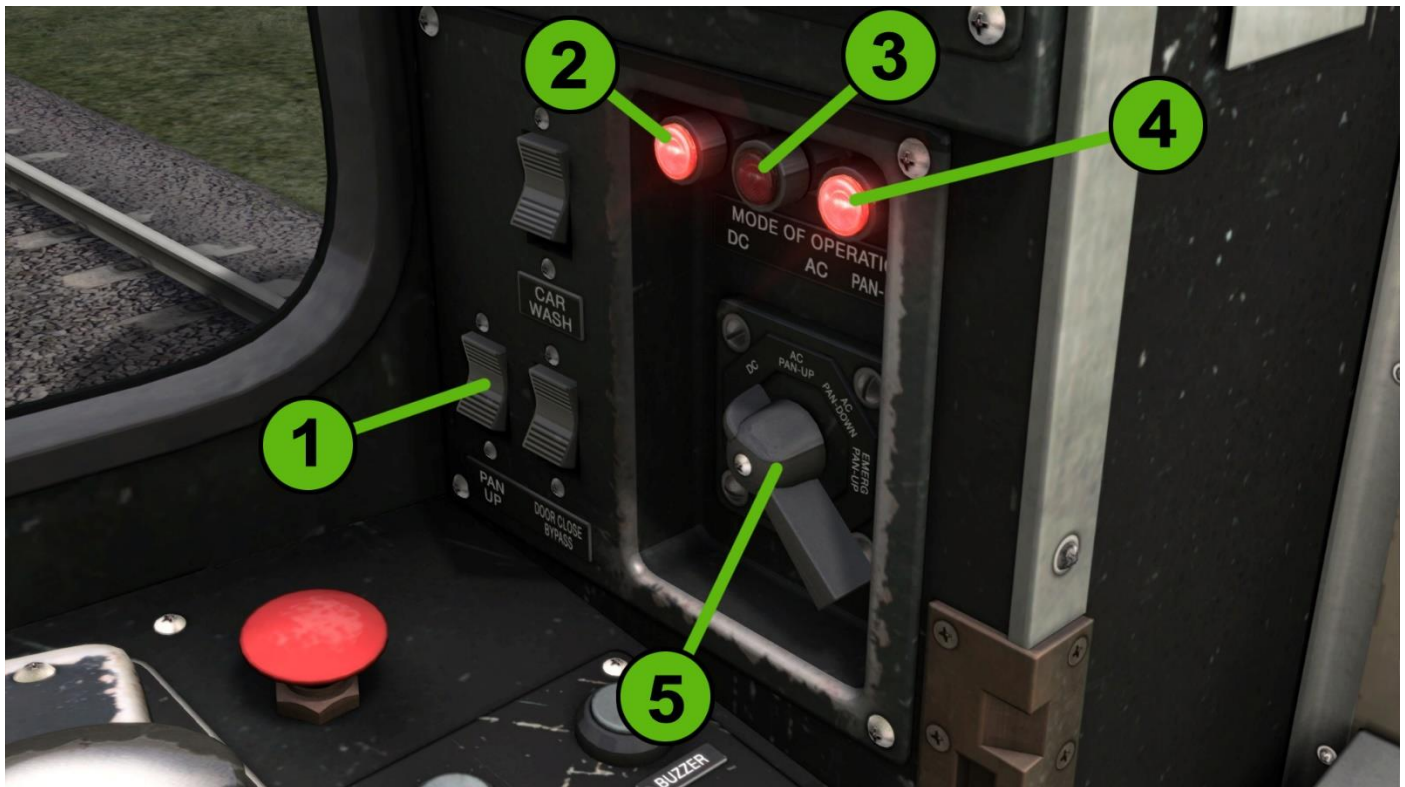
Metro-North M4



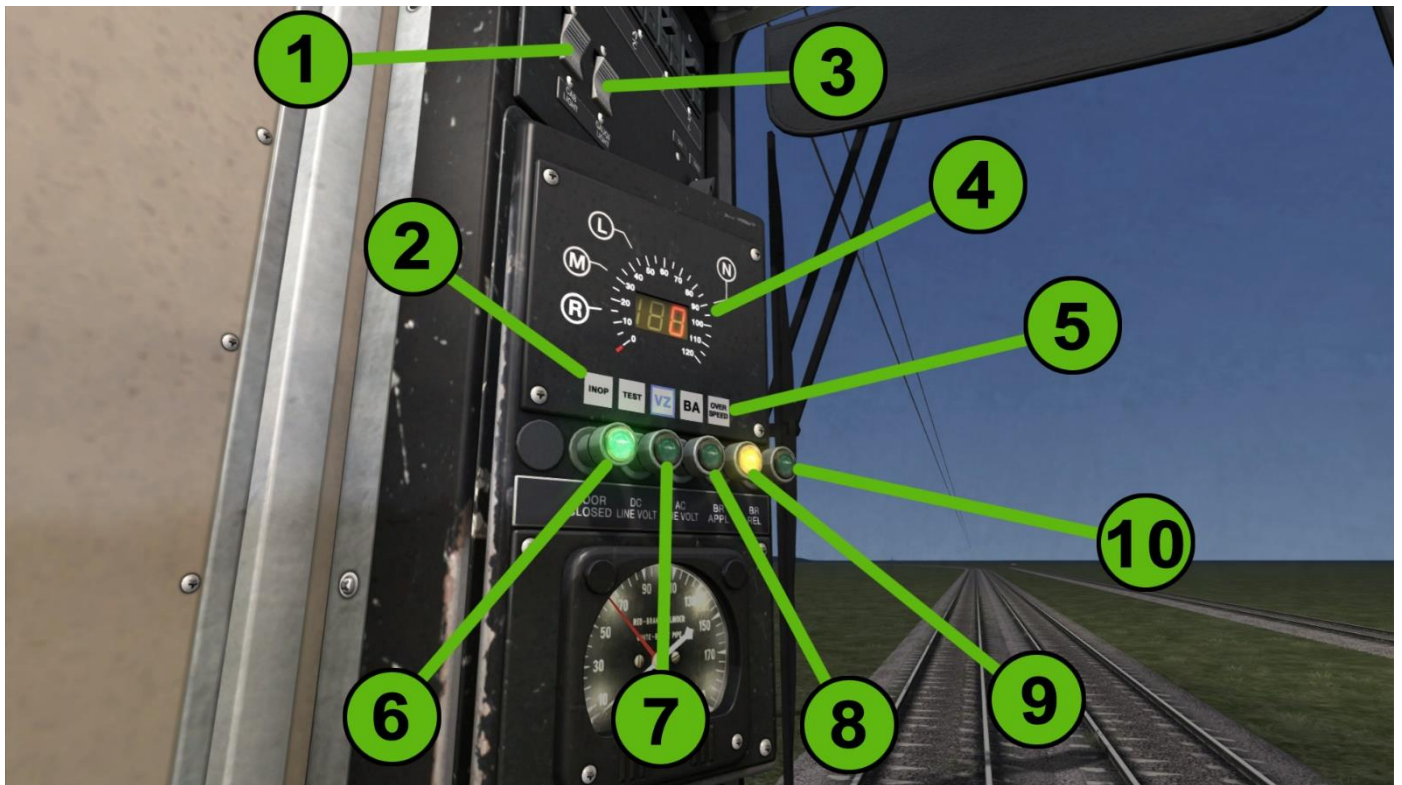
CAB CONTROLS LOCATION



1. Ammeter
2. Wiper Control
3. Reverser
4. Headlights
5. Horn
6. Alerter Reset Button
7. Master Key
8. Master Lever
9. Buzzer



1. Pan Up Button
2. Mode DC Indicator
3. Mode AC Indicator
4. Mode AC with Panto down Indicator
5. Power Mode Selector



1. Cab Light
2. ATC Disabled Indicator
3. Instrument Light
4. Speedometer
5. Overspeed Indicator
6. Door Closed Indicator
7. DC Power Available Indicator
8. AC Power Available Indicator
9. Air Brake Applied
10. Air Brake Released

CREATING A CONSIST

Since trains can not "know" the type of electrification until it passes a signal with the proper message, when you create a consist for an scenario, you must pay attention to the type of electrification present in the territory where the consist will start the scenario. If overhead line is present only the vehicles with the OH suffix in its name will work, if the line is with third rail then you should use vehicles with the TR suffix. Do not mix different types of vehicles in the same train and always use units with the "nd" (no driver) suffix for the whole train, except for the vehicle which has the driver.

DRIVING THE TRAIN

For A Third Rail Line

1. Click on the Master Key to put it in place. This will unlock the Master Lever.
2. The Master Lever is in Emergency position by default, move it to Max position, this unlocks the Reverser.
3. Move the Reverser to forward or reverse position.
4. Move the Master Lever to Coast and allow the brake pressure to drop.
5. Now add power by moving the Master Lever to Position 4 to initially gain speed, decrease to 3, 2, and 1 when needed.

For An Overhead Line

1. Click on the Mater Key to put it in place. This will unlock the Master Lever.

2. The Master lever is in Emergency position by default, move it to the Max position, this unlocks the reverser.
3. Change the power from DC to AC by moving the Power Mode Selector to AC Pan-Up, this is the centre option.
4. Wait for the Mode AC Indicator light to turn on, this is the centre red light above the Power Mode Selector
5. Push and hold the Pan-Up Switch for 5 seconds until the Mode AC with Panto down Indicator turns off, this is the red light furthest on the right of the three red lights above the Power Mode Selector.
6. Verify that the power has changed to AC by observing the AC Power Available Indicator is on, this is the green light in the middle of the fight lights below the speed indicator.
7. Move the reverser into the forward position.
8. Move the Master Lever into Coast and wait for the brake pressure to release
9. Now apply power using the Master Lever.

Changing from AC to DC

1. Place the Master Lever in the coast position.
2. Move the Power Mode Selector to the DC position.
3. Verify the change of the power supply by observing that the DC Power Available Indicator is green.

The Vigilance Alerter System

1. The Vigilance Alerter (Dead Man) is off by default since handling this system can be hard at the beginning and needs some previous training. You can toggle this feature using Ctrl + F.
2. The Vigilance Alerter works using the Master lever, the Master lever's handle must be pressed down to avoid an alert, this behaviour is independent of the rotatory function of the Master Lever and does not have an effect on its brake and throttle function.

3. To keep this handle down you can use the 'Enter and '+' keys on the Num Pad, the 'Z' key and the middle mouse button (The wheel). This arrangement of keys is intended to make it easier than using both hands while driving.
4. If the handle is released for 1 second, a sound alert will play, if this alert is ignored for 8 seconds a penalty application will happen and the train will stop.
5. To reset the controls after a penalty application, place the Master Lever in Max position and push the Alerter Reset Button twice.

KEYBOARD CONTROLS



Increase Master Lever Position



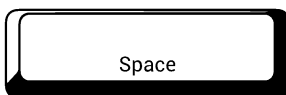
Decrease Master Lever Position



Increase Reverser Position



Decrease Reverser Position



Horn



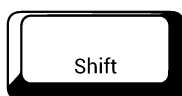
Buzzer



Alerter Reset



Increase the Power Mode Selector



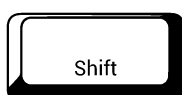
Decrease the Power Mode Selector



Panto Up



Increase the Headlight Selector



Decrease the Headlight Selector



Activate the in cab Signalling System.



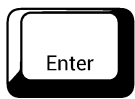
Activate the Driver Safety Alerter.



Keeps the Master Lever Handle down.



Keeps the Master Lever Handle down. (Num Pad)



Keeps the Master Lever Handle down. (Num Pad)



Keeps the Master Lever Handle down. (Center Button)

INCLUDED SCENARIOS

[MNCR M2] NEW CANAAN BRANCH SHUTTLE

One of the most unique, and captivating, portions of the Metro-North system is the 8.2-mile New Canaan Branch between Stamford and New Canaan, Connecticut, which in form recalls an American Interurban line. You are the engineer of the New Canaan shuttle and, with a set of MNCR M2 EMUs, will be making a wintry roundtrip from New Canaan to Stamford and return.

Scenario duration: ~45 minutes.

[MNCR M2] MIDDAY STAMFORD LOCAL

An institution on the Metro-North New Haven Line, indeed dating back to NYNH&H days, is the “Stamford Local” operating between Stamford, Connecticut and New York City. You are the engineer of a midday Stamford Local on a rainy spring day, ready to depart Stamford with an M2A consist and with 14 intermediate stops scheduled en route to Grand Central Terminal.

Scenario duration: ~65 minutes.

[MNCR M4] NEW HAVEN SEMI-EXPRESS, PT. 1

You are the engineer of a Metro-North semi-express morning commuter run that will travel from New York’s famed Grand Central Terminal over the length of the MNCR New Haven Line to New Haven, Connecticut. For the run, you have a consist of Metro-North M4As. This is the first of a two-part scenario.

Scenario duration: ~60 minutes.

[MNCR M4] NEW HAVEN SEMI-EXPRESS, PT. 2

You are the engineer of a Metro-North semi-express morning commuter run that will travel from New York's Grand Central Terminal over the length of the MNCR New Haven Line to New Haven, Connecticut. For the run, you have a consist of Metro-North M4As. In Part 1 of this two-part scenario, you reached Darien, and you're now ready to proceed east to New Haven.

Scenario duration: ~60 minutes.

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