

mac

Metropolis Atlantic Commercial Railway *n-scale*



**VISITOR'S HANDBOOK
FOR GUESTS AND
OPERATORS**

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Please do use whatever inspires you or is useful on ***your*** model railroad.

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VISITORS WELCOME

Visitors are invited to visit the layout by appointment.

Your Guidebook

This handbook is a primer for visitors and provides basic information about the layout and operations.

No visitors permitted without a certified Supervisor present.

Visitors to the layout are classified as guests or operators. Guests watch. Operators run trains.

Trains are usually available to be run for or by visitors. Formal operation sessions that simulate a full shift on the railroad are scheduled in advance.

No beverages or food in the layout room. No smoking anywhere.

Please refrain from leaning on the layout.

Layout room occupancy is limited to six adults.

No touching of equipment, scenery or controls by guests. Guests may be offered a throttle by the Supervisor in charge only.

Operators may handle equipment minimally as provided for herein. All visitors are subject to a beating for any damage they may cause through carelessness.

Questions are welcome. Suggestions are welcome. Relevant prototypical information is most welcome. Nitpicking not so much.

The Vision and the Reality

Note that this handbook is a draft written to help the owner project the experience that he is hoping to provide for guests and operators.

The layout is a work in progress. Do not expect that the layout you visit will actually reflect all of the features mentioned in this handbook at the time of your visit.

Enjoy your visit to the layout!

(Just kidding about the beatings.)

ABOUT THE LAYOUT

Scale

The layout is modeled in n-scale (1/160). A scale mile is 33 actual feet.

Time and Place

We are in a fictitious urban to suburban area located west of Metropolis and north of Gotham, somewhere in the Northeast, USA.

Facing the layout, you are looking South. East is always to your left and West is to the right.

The time is early 21st century.

Size

The layout room is just over 225 square feet. The visible railroad is about 5 scale miles long, but we pretend it is more like 50 miles. When the layout is complete, there will be over 1000 linear feet of track on 3 levels with nearly 500 feet of the track in hidden staging areas.

See the website MetropolisAtlantic.com for details about the rationale for the layout, maps, mileposts, industries serviced, modeled facilities, operating schematics, construction details and standards, automation, staging, photos, and a tour of the layout.

RAILROADS MODELED

Six separate railroad entities operate on the layout.

MAC - Metropolis Atlantic Commercial Railway

This freelanced shortline and the primary focus for operation is a bridge between CSX and NS, services intermodal docks, and switches industries on several branch lines.

STA - Suburban Transit Authority

This is a busy and fictitious commuter railroad.

CSX - CSX Transportation

Interchanges with MAC off of the CSX mainline.

NS - Norfolk Southern

Interchanges with MAC at Jarius Yard, the main yard on the layout.

AMT - Amtrak

Runs intercity passenger trains over CSX trackage.

YTBD - Yet to be Determined

Another regional short line that interchanges with MAC at Fort St. Francis.

PHYSICAL PLANT

Under the Hood

The layout is controlled by **Digitrax DCC** (Digital Command Control) hardware and **JMRI** (Java Model Railroad Interface) software running in Linux OS on an old MacBook laptop.

Any locomotive equipped with a **NMRA** (National Model Railroad Association) compatible DCC decoder will work on the layout. The Digitrax Analog Option is disabled. No locomotive without a decoder will run on the layout.

Programming of the many locomotive options is done with **Decoder Pro** (a part of JMRI) in *Service Mode* on a dedicated programming track or in *Ops Mode* while a train is running.

What is a Locomotive Address?

Each locomotive has a decoder that is controlled by a throttle via a DCC system address that corresponds to the locomotive's number.

Throttles

The master throttle on the layout is a **DT400**. This encases two throttle knobs and is ideal for making and breaking consists and is assigned to the engine facility, tethered in close

proximity to the programming track and layout computer.

Two **UT1** Utility throttles are assigned to yard work. Practically, these are limited to 2 digit addresses. This limitation is not significant because these throttles are normally used with MAC locomotives, which are all 2 digit addresses. (These throttles can control 4 digit addresses using address 99 and the dispatch / acquire procedure outlined in the UT1 throttle manual.)

Running trains is best with wireless throttles. It didn't take long to get hopelessly tangled cords the first time running multiple trains with the grandchildren. (Their parameters for what is fun is different than that of "serious" operators.) Wireless operation is provided over WiFi with the **WiThrottle** app running on an iPhone or iPod - or with **Engine Driver** on Android devices. These are free apps that run through JMRI.

Visiting operators are encouraged to bring their own devices with the appropriate app installed. A few old phones have been donated to the layout for visiting operators and have been configured exclusively as throttles.

On your iPhone, an incoming call will stop your train (not necessarily a bad thing).

Alternatively, operators may bring their own Digitrax throttles. However, these need to be the corded plug-in variety. There is no provision on the layout for Digitrax radio or infrared throttles. There are strategically placed plug-in locations.

Consists

Locomotive lash-ups of multiple units are made up and broken at the engine servicing facility by the engine Hostler. Engines are pre-matched for similar operating characteristics. For simplicity and consistency (pun tolerated), the preferred method of handling consist operation utilizes the *Universal Consisting* procedure of the DT400 (refer to the DT400 manual) and consist information is stored in the DCS100 command station memory. The consist feature of JMRI is not used. Hence, consist information neither shows up on smart phone throttles nor is modified by road crews.

Consists shall be controlled by the lead locomotive and addressed by the lead locomotive's road number. Functions of locomotives within the consist are controlled by addressing each locomotive individually and using the normal function control keystrokes.

Visitor Equipment

Operators may bring their own equipment to run on the layout with pre-authorization by the layout owner. An inventory list should be presented and checked at the beginning and end of a session. Guests bringing their own locomotives should determine with the Supervisor that their locomotive is assigned a unique address and operate them at realistic speeds.

Rolling stock must conform to NMRA standards of weight, coupler height and wheel gauge. Couplers shall be of the operating knuckle variety unless the cars are to be operated as a block. Wheels flanges must be NMRA compliant and not the problematic deep flange Micro-Trains brand variety.

OPERATION

PERSONNEL

Owner/Superintendent

The ultimate authority responsible for the rationale, design, building, maintenance and care of the layout.

Operator

Anyone that assumes a role in the running of the railroad.

Supervisor

Specifically designated as the person in charge of an operating session by the owner.

Dispatcher

Because of the small size of the layout, there is usually no assigned dispatcher. Prototypical duties of the dispatcher are assumed by the Conductor and Supervisor (and the computer).

Yard Master

The authority in a yard. The Yard Master also dispatches trains for local switching duties.

Hostler

Chief authority of the Engine Facility,

the hostler assigns motive power and is responsible for Locomotive maintenance (real and imagined). The role of Hostler is most often assumed by the Yardmaster.

Conductor

The boss of a particular train. Handles the paperwork and makes the decisions on how to best get the job done. The conductor directs the engineer and brakeman, coordinates train movements; complies with timetable, rule book, and prototypical practices.

Brakeman

Assists with setting out cars, throwing turnouts, inspecting the train - primarily as an assistant to the conductor.

Engineer

The driver of the train who operates the throttle.

Crew

Collectively, the conductor, engineer and the brakeman. Because of cramped quarters and short trains this is often one person.

Guest

An observer.

RUNNING TRAINS

Speed Limits

Train speeds should never be excessive. Upper limit of model locomotive speed on the layout is set at or below the prototype locomotive's top speed using DCC decoder **CVs** (configuration variables) when this option is available. Normal top running speed would be at about 90% of the programmed upper limit. Model trains look better - like they are actually doing work - when moving at slower speeds.

On locomotives so configured, operators may choose to activate F6 on their throttles to cut the top speed and extend the sensitivity range of the speed controls while switching.

Starting and Stopping

Please start heavy trains slowly and, likewise, bring them to a slow, smooth stop. Engines are programmed to ease acceleration and deceleration and to prevent sudden starts and stops. This may not be sufficient to properly simulate prototypical inertia, however.

To stop a train in an emergency, press the emergency stop button on the throttle. (The stop button on the layout's master DT400 throttle is set to stop ALL locomotives running on the layout.)

Safety First

Follow prototype practices when you know them, learn them if you don't. Operate trains as though YOU are on board! Pay attention to the track in front of the train, taking care not to run into an open turnout. Do not exceed speed restrictions. Follow the rules.

Turnouts

Switch points (the moving parts on a turnout) are controlled by push-pull rods on the layout facia at the turnout location.

Where helpful, a nearby track schematic on the facia will indicate via **LEDs** (light emitting diodes) the route for which the turnouts are aligned. Green indicates *proceed at normal speed*. Yellow means *proceed with caution at restricted speed*. Red or no lit LED means *stop because the turnout is set against the train's motion*.

Where these indicators are not present, operators must rely upon visual inspection to confirm switch point position (a good practice in all circumstances).

Train Limits

Passing siding capacity, industrial trackage, and grades correspondingly limit train size.

The Yard Master will ensure that departing trains are of appropriate length. That doesn't mean a train could not pick up too many cars en route and become too long for passing tracks or too heavy for grades.

Look for train limits on your *Job Brief*.

Can't Make the Grade?

Occasionally, a train may be too heavy to make it up a grade. What to do? Please don't pointlessly spin the wheels on the locomotive. Notify the Supervisor of the problem. The Supervisor will either have you double the hill (split the train) or call out a helper locomotive.

Headlights

Headlights of the lead locomotive must be ON whenever the train is moving. Headlights must be kept on HIGH except should be dimmed when approaching other trains, stations, junctions and terminals, or when standing at a meeting point.

Consult the locomotive card or throttle for functions that control the lights.

Headlights are configured to be directional and will automatically change with the direction of movement. This is convenient as a practical indication of what direction a standing

locomotive will move when the throttle is advanced.

Ring Them Bells, Blow Your Own Horn

The following guidelines govern operation of the horn and bell on locomotives (when available). There is a lot of opportunity - don't overdo it.

Horn:

When approaching a public grade crossing sound 2 long blasts, 1 short blast, 1 long blast - holding last blast of the horn until the crossing is occupied.

As an alarm for persons or animals on the track, sound repeated short blasts.

To indicate another train is immediately following, sound 1 long and 2 short blasts.

As a request for manual signals from a crewman on the ground, sound 4 short blasts.

Bell:

It is appropriate to sound the bell: When passing over bridges and in tunnels; When approaching and passing over road crossings; When approaching station stops; When passing standing trains or cars on adjacent tracks; While passing maintenance personnel.

MAKING IT REAL

Your Paperwork

Every train will have an associated pack of cards that correspond to the locomotive(s), the rolling stock in the train, waybills that determine set outs and pick ups, and the Job Brief that tells the crew what to do.

It is recommended that operators wear shirts with chest pockets or shop aprons as a good place to hold card packs while running trains.

Conductors are not required to do any paperwork other than keep the cards organized.

Job Briefs

These guide train crews on tasks and locations, as well as to introduce elements of prototype railroading into the operating session.

Being prototypically correct is fun and slows down movements on the railroad in realistic ways.

Locomotive Cards

Every locomotive has a corresponding card that travels with it at all times. On this card find the locomotive's DCC address and basic function information. Function

keys are standardized as much as possible, but may vary, so these should be checked before operating the locomotive. Consists of locomotives are clipped together with the "top" locomotive card on top - see how that works?

Car Cards and Waybills

Every car has a corresponding card that travels with it at all times. **Car cards stay with and follow the car.** Car Cards have a pocket to store waybills that indicate the car's load and destination. Do not place car cards/waybills on the layout. Use the racks provided at interchange, yard, and industrial locations to hold and sort the car cards/waybills.

Waybills use a four cycle system to simulate loading and unloading and set up the car for forwarding at the next operating session. Waybills and car spotting locations are color coded to simplify delivery and car sorting in yards.

Before taking a train over the road, the crew should check for correct waybills and to see if any cars require special handling or placement in the train.

When you set out cars, leave those cars' cards in the appropriate *set out* box at that location. When you pick up cars, take those cars' cards from the *pick up* box at that location and insert

them into the train's car card pack in proper order. That is, insert the car cards within the packet in the position corresponding to the picked up cars positions within the train, with the card for the front car on top of the car card stack.

Waybills are turned between sessions by the layout owner. **Operators do not turn waybills** unless specific instructions on the card tell them to.

When Your Work Is Done

When a train terminates, place the car card packet, in proper order, into the appropriate yard track car card box. Uncouple and run the motive power to the Engine Facility. Return the Locomotive Card(s) to the Hostler. Return the Job Brief to the Supervisor.

Yards

Yards are locations with defined limits for storage and classification of freight cars. Trains within Yard Limits move at restricted speed.

Only Jarius Yard is under the authority of a Yard Master. Here trains are assembled for departure and upon arrival are broken apart. Before a train moves on any track that is controlled by the Yard Master, it must first receive permission to occupy that track.

Schedules and Superiority

CSX freights, Amtrak intercity and some STA commuter trains operate in the background and are on a JMRI programed schedule and dispatched automatically by computer. These trains are superior to all other trains on the layout.

STA commuter trains on the Lilly Springs Line and Bohdi Extension are operated on a published schedule. These trains run in push-pull fashion; Eastbound to Metropolis in the AM and return Westward at night.

MAC freight operations are all extras and not on a schedule. Work on the line begins after the last commuter train makes its run in the morning and the line must be clear for the first commuter train of the evening.

For grade considerations, Westbound trains are superior to Eastbound trains.

CSX Dispatcher

When a MAC or operator controlled STA train needs to use the CSX mainline, the Conductor must first get permission from the CSX Dispatcher. Unfortunately we don't have one.

So this is simulated by first visually checking

for oncoming trains. Wait for any train already visible on the desired mainline to pass. Then throw the toggle switch on the facia to "Stop and Hold" oncoming traffic. This is "talking" to the computer dispatcher and is your clearance to occupy the main. When your work is finished on the mainline, realign turnouts for the main and notify the dispatcher (set the toggle switch on the facia to "Proceed").

Coupling and Uncoupling

The provided uncoupling sticks are used by inserting down between the couplers after coupler slack has been run in. A slight twist will uncouple the cars. Cars should couple automatically when gently shoved together. Sometimes (as with the prototype) couplers do not line up for coupling. When this happens, the uncoupling stick can be used to gently line up the errant coupler. Coupling or uncoupling by lifting equipment is discouraged.

The Red Rule

- A)** After train crews have completed work in an area, all turnouts should be returned to their normal position, i.e., aligned for the mainline.

- B)** Any red light *on the facia* (as distinguished from a signal on the layout) indicates a setting other than the default for critical turnouts and

certain other controls such as the computer dispatcher interface. **Do not leave an area without resetting the necessary control points such that ALL red lights on the fascia are out and the layout is at the default settings.** This is critical to safe operation, prevents accidents, and saves lives.

Derailments

If (when) a derailment occurs, the preferred method of re-railing is by lifting, holding, and aligning the trucks, not the sides of the equipment.

Any piece of rolling stock that derails three times during an operating session will be "bad-ordered" and removed by hand from the layout by the Supervisor. Any location where repeated derailments occur shall likewise be reported to the Supervisor.

Big Hand Movements

Disallowed: Pushing or pulling individual or strings of cars; Throwing turnouts; Carrying Locomotives or rail cars from place to place; Helping a train make a grade.

Allowed: Re-railing derailed equipment; Creating slack to facilitate uncoupling; Aligning stubborn couplers; Nudging a stalled locomotive; Freeing stuck turnout points.

When reaching into the layout, please do so carefully and mindful of just how big and terrorizing your hand is to the n-scale residents.

Signals

Most of the railroad is "dark", that is, unsignaled. There are a few signals at strategic locations, however.

With the exceptions following, a red signal is absolute, requiring a full stop until the signal clears.

The signals protecting the helix are "absolute permissive", which - when displaying red - provide absolute full signal protection for opposing trains but permit a train to follow another (at a safe distance) into the block.

Yard tracks have dwarf signals that show the alignment of turnouts. Green over Red indicates turnouts are aligned for that track: proceed with caution at reduced speed.

Report to the Supervisor

Any emergency situation. A train that cannot make the grade. Head to head meets. Car problems such as couplers, wheels, multiple derailments, broken details. Track problems

such as turnout issues, dirty track, multiple derailments, electrical problems. Unclear instructions. Misplaced car cards. Mismatched waybills. Any question of proper procedure.

Situations

At the start of an operation session the Supervisor may draw from a pack of **Situation Cards** that can impose unusual circumstances such as a snow storm.

The Situations Cards add variety and challenge to railroad operations and borrow a bit from role playing games to determine the severity of the situation, choices in actions to take, and time delays.

The situations have been selected assuming the railroad will generate plenty of derailments, misaligned turnouts, bad ordered cars, and crew inefficiency without artificial imposition.

The Fast Clock

Time on the railroad runs on a fast clock at 5 times normal speed. (Optimal Fast Time under study.) The clock on the wall displays the fast time.

Running operations with the fast clock means that a train takes more than a few seconds

on the clock to get from place to place. Actual scale distance from the terminal to the end of the line is only about 5 miles and the fast clock adds to the illusion of distance.

STA commuter trains run on a schedule coordinated to the fast clock. MAC freights are run as unscheduled extras and depart when ready and practical. The clock then is used to determine works shifts.

Take It Slow

Some necessary operations on the model railroad take almost as much time as they would on the prototype and crews need *real* time to do them. The number of trains under crew control is kept light so that they can be operated at a relaxed pace.

On the model when there is a car to set out at an industry, we typically might stop, make the cut, pull up, throw the switch, shove the car into the siding, return to the rest of the train, and continue onward.

That is efficient. But did the brakeman dismount the locomotive and walk over to the switch, unlock and throw the switch and then motion to the engineer to pull in? Is there a gate to unlock? Was time taken to walk up and assist with the cut with hand signals? Did

the conductor walk into the industry and ask the shipper at what door he wanted the car spotted? Did the Engineer do a set and release brake test before moving out? Don't forget to lock up that gate and turnout. How long would all that take? Too long on the fast clock most likely.

Model railroad operation tries to duplicate real railroad practices. As you operate, give some thought as to how the real crew would do the job at hand and how long it might take them.

Operators are encouraged to seek a balance between performing prototypical chores and getting over the road in a timely fashion. If you can't beat the clock, ask the Supervisor to pause time. (That's why he is called the **Super**visor.)