

Advanced Train Control System (ATCSMon)

Authors Note

This document is intended to assist people new to the ATCS monitor and the associated Yahoo Group to get started using ATCSMon. A great deal of what is presented below exists on the Yahoo Group but may be a bit confusing for new people. Much of what is below is not original with me but rather is a collection of other peoples work. Where possible I have included their names. My apologies to anyone who feels that they did not receive appropriate credit.

ATCS

ATCS is an acronym for Advanced Train Control System. It is my belief that the various railroad operating control systems such as CTC, PTC, and so on will ultimately be one system that monitors rail traffic and will provide the ability to control the locomotive as well as providing a dispatcher a view of how the railroad is operating. How far this goes and when it will happen are beyond the scope of this document as is any sort of technical discussion as to how ATCS works beyond what follows below.

The following was written by Jon Roma:

“Please don't equate ATCS and CTC. The map shows method of train control.

CTC, like ABS and TWC, are train control methods – in other words, they are operating protocols (collections of rules) that provide a safe structure for controlling train movement.

CTC (also known as Traffic Control System or TCS) is also a collection of technical principles and practices that ensure fail-safe operation of signals in a way that those signals can convey movement authority to trains. This behavior works in conjunction with the operating rules that establish the operating protocols.

ATCS is simply a communication protocol that establishes the details of how data is transmitted to and from a CTC system. There are other methods of doing this, including direct wire, leased line, microwave, and satellite, and there are other protocols like ARES and Genesis that are alternate protocols of radio communication.”

ATCS is comprised of line-side radio-based devices called MCP's. MCP is Mobile Control Package. MCP's may present indications of the state of a device (block occupied, signal is red, etc) and MCP's may receive commands (throw a switch, set a signal, etc). MCP's communicate with BCP's which are Base Control Package. The communication between MCP's and BCP's is accomplished by radio transmission over bands assigned to the railroads. With a properly configured radio it is possible to monitor MCP traffic directly into ATCS but that is also beyond the scope of this document.

ATCS Monitor (ATCSMon)

Many very generous railfans throughout the United States and Canada have collected enough computer and radio equipment together to build a system that monitors specific railroad signaling radio traffic. This data is then passed to the internet via servers. The ATCS monitor can then access the railroads data via the internet and displays the activity of the railroad on your display. So I can sit in Arizona and watch CN traffic in Toronto. In real-time. It's important to understand that our fellow railfans who provide us with this ability do so at their own cost in time as well as in dollars and for this we are very grateful.

In order to use ATCSMon and watch your favorite railroads activity you will need to do the following:

- (1). You must be a member of the ATCS User Group in Yahoo.
- (2). You will need to download “ATCSMon”. This is the software that, when running on your computer, displays the dispatcher –view panels. Please note that it is called a monitor for a reason: you may read

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railroad data only but you can't transmit data and interfere with railroad operations. By itself it has little use because it is dependent upon railroad-specific data to perform.

- (3). You will need to locate and make available to ATCSMon, the railroad specific data that is pertinent to the section of railroad that you wish to monitor:
- The MCP data for your railroad segment. MCP data is the detailed list of each control point along the portion of the railroad you are planning to monitor.
 - The layout file for your railroad segment. The layout file is the graphic representation of your railroad segment and looks like a dispatchers panel when running.
 - The server data for your railroad segment. This will tell ATCSMon where it can get the current data for you to view.
 - The profile for your railroad segment. The ATCSMon software has many options and controls that are required for the section of the railroad that you want to view. The options must be loaded with each section of the railroad you want to view. These control files are in text format and may be changed as needed. These controlling option files are called profiles and have a file extension of ".ini".
- (4). After all of the above is located and properly setup, you are ready to monitor.

Browser Note

This handout was developed based on Windows 7 and Internet Explorer. If you are using a different system then some of the details on how what follows may differ. The functions (downloading ATCSMon, locating and accessing railroad-specific data, etc.) that you must perform, however, remain the same.

1. ATCS Yahoo Group

In order to monitor ATCS traffic, you must be a member of the ATCS Yahoo Users Group.

To accomplish this, go to the following:

http://groups.yahoo.com/group/ATCS_Monitor

Near the bottom of the page you will find:

ATCS_Monitor-subscribe@yahoogroups.com

Once accepted by the Yahoo Group you will receive proper notification that you may go to the next step..

2. ATCSMon.exe

Now that you have been accepted by the ATCS Yahoo group, you will need to download the monitor program. This is provided free of charge by going to the following:

http://finance.groups.yahoo.com/group/ATCS_Monitor/

On the upper left side of the screen is a list of options for data.

Click on "**Files**"

When that screen loads, click on "**Applications**"

When that screen loads, click on "**ATCS Monitor Downloads**"

When the screen loads click on "**ATCSMonxxx.exe**" ("**xxx**" is the release).

The most current version is "**ATCSMon410.exe**"

Note: don't load any version with the word "Beta" – that is a test version.

Click on the current release.

Internet Explorer will ask if you want to "**Run**", "**Save**", or "**Cancel**" the download.

Click on "**Run**"

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Windows 7 will ask if you want to permit the making of changes to your computer by an unknown program. The answer is yes.

The ATCSMon Setup Wizard starts and will ask a number of questions. Accept all default values unless you really are knowledgeable and understand the consequences of not accepting the default values. The next to last question is if you want to install or not. Of course you do, so click on “**Install**”

Lastly the Setup Wizard will ask if you want to view the release notes – leave it checked and do you want to launch ATCSMon – uncheck it.

This is where I have made several mistakes – read the release notes. Most of it may not make sense but I have missed some very important notes about Installation Kits that has caused me some anguish.

At this point, the ATCS logo icon should be on the desktop and ATCSMon.exe should be in the ATCSMon folder located in the “Program Files” folder (C:\Program Files\ATCS Monitor).

3. Railroad Specific Data

In order for ATCSMon to properly display the railroad that you are interested in, you will need the following data:

1. The format of the display that the dispatcher sees can be thought of as a “model board” or track layout which shows the layout of the railroad segment in a graphic form. The layout files have a file extension of “.lay”
2. The MCP codes for the railroad that you are interested in are also needed. Your ATCSMon maintains a database of the MCP’s that you have expressed interest in. Once loaded they can remain unchanged unless the creator has made changes and you do an update. MCP’s have a file extension of “.mdb”. Sometimes it might be “mcp” instead. It’s important to know that MCP data goes into a database that records every MCP you have expressed interest, not just the railroad section that you are currently interested in.
3. Each railroad that ATCS can monitor will have a server that monitors ATCS traffic over a given area. The server has a URL and a port number.
4. Associated with each railroad is a profile or configuration file. This is a text file that contains all the options that you may set for the railroad you are watching. This is a large file and should not be modified unless you are knowledgeable enough to understand the consequences of screwing it up. ATCSMon provides the means to change some of those parameters that may be of interest to you.
5. All of the data needed to run ATCSMon is sent to you via a compressed (.zip) file. The .zip file is the installation kit. The zip file contains the profile (.ini); layout file(s) (.lay), a MCP file (.mdb) and generally a ReadMe file for your chosen railroad segment.

To obtain the data for the railroad you want to watch, do the following:

- a. Go to the following: http://finance.groups.yahoo.com/group/ATCS_Monitor/
- b. On the left side of the screen, click on “**Files**”
- c. Click on “**Data Files**” to get you to the railroad-specific files.
- d. Click on the railroad you want to monitor. In this example select “**BNSF**”
- e. Once you have the list of available BNSF divisions, click on the division that you are interested in. In this example, click on “**Southwest Division**”.
- f. Next click on the sub-division or terminal that you are interested in. In this example. In this example click on “**Seligman Sub**”.
- g. What is available to you at this time is a zipped (compressed) file “**BNSF_Seligman.zip**” which is the monitoring installation kit for the sub-division used in this example.

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4. Downloading Your Railroad-Specific Data

In step 3.5.g above, you have located the zip file containing the data you need to start monitoring. The next step is to pass that file to ATCSMon for subsequent installation. The trick here is find the zipped file that describes the railroad segment that you wish to monitor and to place it in the Downloads folder located in the ATCSMon folder. I altered the “Send To” command to send the downloaded zip file directly to the ATCSMon/Downloads folder. You may have your own way of accomplishing this goal: get the zipped file and place it in the ATCSMon/Downloads folder because that is where ATCSMon expects the data to be.

To modify your “Send To” command, do the following.

1. Go to **C:\Users\username\AppData\Roaming\Microsoft\Windows\SendTo**
2. Click on **“Files”, “New”, “Shortcut”**
3. Windows will ask you what item you would like to create a shortcut for.
4. Browse to **C:\Program Files\ATCSMon\Downloads**.
5. Click **“Next”**
6. Enter **“ATCSMon”** as the shortcut name.
7. Click on **“Finish”**

5. Installing Your Railroad Segment Data

At this point you should be looking at a link to your zipped installation file (**“BNSF_Seligman.zip”** in the example above). Here is how to install it and get it running:

1. Double click the link pointing to the zipped railroad data file..
2. Windows will ask if you want to **“Open”, “Save”, or “Save As”**
3. Click on **“Save”**
4. When finished downloading, Windows will ask if you want to do.
5. Click on **“View Downloads”**
6. Right click the entry in the downloads file that you want to install
7. Click on **“Send To”**
8. Click on **“ATCSMon”**
9. Get out of windows and return to your desktop.
10. Start ATCS by double clicking the green over red signal icon on your desktop.
11. Click on **“Actions”**
12. Click on **“Install Monitoring Kit”**
13. Look for the installation file that you just loaded in the ATCSMon\Downloads folder.
14. Click on the installation kit you want to install.
15. Click on **“Open”**.
16. Click on **“Install”**

ATCSMon will start running and you should see MCP data on your screen. If you do not see the model board then:

1. Click on **“View”** on the top tool bar.
2. Click on **“Dispatcher Display”**

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6. Running ATCS

The main screen has three main sections. Across the top are the MCP communications. On the lower left are the active MCPs in the MCP database and on the lower right are packet displays.

Under File, click on “Load Profile” and select the profile (*.ini” file) that you wish to monitor.

Now you can watch the Dispatcher Display that you have worked so hard to see:

Click on “**View**”

Click on “**Dispatcher Display**”.

If ATCSMon does not start running, see “Configuring ATCSMon” below.

7. Watching The Dispatcher Display

The dispatcher screen is color coded and it’s important to understand what the various colors mean.

Track segments and turnouts are identified by straight lines. Look carefully at a turnout and you can see which way it’s thrown. Actually you can change a turnout’s position on your screen by yourself. It does NOT actually throw the real switch. Using ATCS, you read only and have no control over actual railroad operations.

Note that all icons are not used by all railroads – expect some not to be used.

Track Segments

White	Unoccupied.
Grey	Dead track – not covered by ATCS
Red	Occupied
Green	Unoccupied but cleared for movement
Purple	Out of service and occupied
Blue	Out of service and not occupied

Switches

Red square	switch is locked and will not throw
Blue square	switch points are out of position or stuck

Signals

Green	Route has been set, proceed. This is not a “clear” signal.
Blinking Green	Route requested but the plant has not yet acknowledged and set it.
Red	Stop

Blinking green may be set for one direction while a train is moving against it – that is what you see when the dispatcher has pre-set the next move.

Stations

Stations are locations on the railroad. They may be a depot but most likely they are control points. The colors of station names can be:

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Dark Gray	The station is not listed in the MCP database.
Blue	Control messages from the dispatcher to the station have been received.
Yellow/White	No radio traffic has been recently received.
Red	Indications have been received from the station

Symbols:

Lightning bolt	Indicates that the site has lost power.
Crossed hammer and wrench	Signal maintainer working at this location.
Arrow	Request from dispatcher for a proceed signal across interlocking.
Snow flake	Snow melter is in operation at this location.

Note that you can configure ATCSMon to use different colors if you wish.

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8. Configuring ATCSMon

Most of the time, you will need only to start ATCSMon and select the profile (.ini file) that you wish to monitor. If however, you are having difficulties getting the monitor to work with the railroad segment that you are interested in, it's best to check how the profile for that railroad is setup. Perhaps some changes need to be made.

The process of establishing the various options begins. It's important to click on "**Apply**" before leaving a window if you want to use the settings you established.

A. Collecting Required Data

If you have been using installation kits, the data that you need are not individually available to you in the respective folders under the ATCSMon folder. You will have to obtain the data and physically store it in their correct folders. The .lay files have to go to the Layouts folder and the .mdb files have to go to the MCP folder. One additional wrinkle is that you will need the server data too. This is information that you must find and write down for subsequent use (it's not in a data file). Here is how you do that:

Return to: http://finance.groups.yahoo.com/group/ATCS_Monitor/

Click on "**Databases**".

Once there, click on "**ATCS Servers**" to get you to the list of available servers.

From the list available, find the server that is related to the railroad/division/sub-division that you are interested in. In this example, locate "**Seligman**". "Search This Table" works well. Typing in "Seligman in" will take you directly to the listing. In the column marked "MCP Address: Port" you will see "**bnsf-southwest.dyndns.org:4891**". "bnsf-southwest.dyndns.org" is the URL pointer to the server and "4891" is the port number. Write this down on a piece of paper or copy/paste the URL into Notepad.

Follow steps 1 thru 9 in "**5. Installing Your Railroad Segment Data**" to get to the zipped data files and place them in the ATCSMon Downloads folder.

Unzip the files.

Put the .lay file(s) into the "**Layouts**" folder.

Put the .mdb file into the MCP folder.

B. Starting The Configuration Feature

1. Start ATCSMon by double clicking the green over red signal icon on your desktop.
2. Load the profile of the railroad segment that you are interested in. ("**File**" > "**Load Profile**" > **List**)
3. At the top of the screen, click on "**Configure**"
4. The Configure drop-down box will open.

C. Configuring MCP Data

If you need to modify or install the MCP database then:

1. Click on "**MCP Information**"
2. At the bottom of the screen you should see a button Marked "**Import**"

If you do not see the "**Import**" button then it is possible that the window to be displayed is larger than your computer screen and you need to "roll it up". This is one of the maddening things about ATCSMon – you click on "Import" and it appears that nothing has happened. It really has responded. Here is how you correct that problem:

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1. Windows 7: place the mouse pointer over the program name in the task bar at the bottom of the screen
2. Press “**Shift**” + right click
3. Click on “**Show windows stacked**”. Note: this is “Cascade windows” in Windows XP.
4. The control buttons should be visible.
5. Click “**Import**”.
6. ATCSMon will then ask you to select the MCP file you wish to import to your database. It should be the MCP file you just downloaded.

Note: if you have to move windows around, you may want to restore their original position.

D. Configuring Servers

1. At the top of the ATCSMon screen, click on “**Configure**”
2. Click on “**Options**”.
3. The options window will open.
4. Click on the “**Data Source**” tab.
5. Near the middle of the window will be “**Network Settings**”.
Check to see what ATCSMon has as your server. If the server URL and port number are correct you need go no further. If its not, here is how to correct it:
6. Click on the server you wish to change. Do not change “**Server Mode Listener**”.
7. Click on “**Delete**”
8. Click on the “**Add**” button..
9. The window presented will enable you to enter the server URL and port number that you located earlier.
10. Click on “**Enabled**” to set it.
11. Click on “**Apply**”
12. Click on “**OK**”

E. Configuring Layouts

1. At the top of the ATCSMon screen, click on “**Configure**”
2. Click on “**Options**”.
3. The options window will open.
4. Click on the “**Display**” tab.
Look for the wording “**Layout File:**” The box to the right contains the current layout file. If it is correct then click on “**OK**” and exit.
6. Click on the “**Browse**” button. This will present you with the contents of the layout folder. If the layout you want is not there, follow then instructions above to obtain the data.
7. Click on the layout you want.
8. Click on the “**Open**” button..
9. Your new layout should be in the box described in 5 above.
10. Click on “**Apply**”
11. Click on “**OK**”

F. Configuring Other Options

Using more or less that same procedures outlined above, its possible to make quite a few changes to ATCSMon. Remember that these changes, for the most part, are global in that they effect all profiles that you use. The following are a few to check in the Configuration window.

On the Configure Window:

“**General**” tab: “**Save Setting On Exit**” – you might want to set that.

“**Windows**” tab: sets colors

“**Data Source**” tab: “**Network Connection**” should be set
“**Network Settings**” was discussed earlier

“**Display**” tab: pretty much self-explanatory

“**Protocol**” tab: don’t make any changes here.

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“**DSP/GPSI**” tab: don’t make any changes here.

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