

# Frequently Asked Questions (FAQ)

*Q: Technically speaking, how does this work?*

A: The devices in the field (referred to as an "MCP") communicate with a base station (referred to as a "BCP") via two-way radios by sending and receiving short bursts of computer data. The data transmitted from an MCP to a BCP is called an indication, because it is indicating something happening in the field such block occupancy, switch alignment, etc. The data sent from a BCP to an MCP is called a control, because it is requesting (controlling) something in the field, such as a signal or switch alignment. For an example of what this data burst sounds like, you can listen to the BNSF ARES system on 161.325Mhz (AAR Channel 81).

*Q: If it's possible to decode the information, is it also possible to affect movements?*

A: No. ATCS Monitor is a read-only application. It receives an audio signal from the output of a high-quality radio receiver that is able to tune the appropriate frequencies, digitizes the audio waveform at 44.1 kHz, and derives the data by analyzing the digitized stream. The program intentionally contains no code to create any control information, and no code for audio signal modulation. Since it contains NO encoding algorithms and cannot produce any audio output, it absolutely CANNOT be used to perform or assist in the performance of any kind of radio transmission. No version of the program has ever been produced with the capability to produce a signal suitable for transmission, nor will one ever be produced. Even if it could, the railroad wayside equipment would not allow conflicting routes to be set.

*Q: Why don't I see any other signals except for green on the display? What about Approach indications?*

A: The dispatcher only has the ability to request a proceed indication from the devices in the field. A proceed indication is distinctly different from a clear signal. A proceed indication is really any other signal at a control point except for a stop. It's important to note that the dispatcher requests a signal, he doesn't actually control it directly. In reality it is up to the logic in the field at the various control points to determine what the appropriate signal to display is. It will make this decision based on block occupancy, switch alignment, etc. The same logic applies with any other controls a dispatcher can send to a control point. A dispatcher can request that a control point line a switch into the siding, however, if it is not safe to do so (for example, a train moving over the switch) the control point will not act on that request. So, when the dispatcher requests a proceed indication at a control point, the signal system may in reality display a stop signal because the next block is occupied. Or an approach, because the next signal is Stop, etc. Further, the MCPs in the field will only ever report back a proceed indication, so that is all that can be shown on the display. From the point of view of the dispatcher, all he or she really cares about is if the trains he controls can move forward or not.

*Q: Why do trains disappear into sidings, only to reappear on the other side?*

A: Many sidings on the BNSF Aurora Subdivision are "Non-Bonded", meaning that they are not connected to the signal system to provide block occupancy. Currently, the sidings at Mored and Oregon are the only sidings in range that show occupancy. When radio conditions are good, you may also see Fenton and Ebner on the Barstow Subdivision which are setup to display siding occupancy.

*Q: Why do station names light up Red and Blue?*

A: A station name in Red indicates that an indication was sent by the remote control point to the base station. Indications contain status information about the control point, such as block occupancy, switch alignment, signal indication (proceed or stop), etc. A station will light up blue when a control is sent to it. Controls contain the requests from the dispatcher, such as creating a route, lining a switch, or to turn on a snow melter. When the dispatcher is lining a route for a train, it's not unusual to see a series of stations turn blue from the control message, then have them turn red as the stations send back status information. You may also see other station colors, such as Orange which indicates that some other type of radio traffic was sent to or from the station. You will also see White or Yellow, which indicates that we are unable to receive any information about that station.

*Q: How come I see stations in blue for very long distances, but only the nearby stations light up red?*

A: Controls (which make the station show blue) are transmitted from a tall, powerful, and centrally located base station that can easily transmit to a large number of control points. The indication information (which makes the station show red) comes from lower-powered radios located at each control point. Since these are radio signals, atmospheric conditions can affect how well they propagate, meaning that at times (particularly at night) you will receive data for a much larger section of railroad than at other times.

*Q: Can train symbols and other information available to the dispatcher be displayed?*

A: That type of logistical information isn't gathered or distributed to the devices in the field. ATCS Monitor only had the ability to monitor information that is broadcast over-the-air to and from the devices in the field. Since an electric switch doesn't care about train symbols and such, it is not broadcast, and thus not available for us to display.

*Q: Why is there sometimes a train, but no occupancy shown, or vice versa?*

A: This is an imperfect, amateur monitoring system. The hundreds-of-dollars in equipment spent to bring this display to you is no match for the tens-of-thousands-of-dollars (or more!) spent by the railroads on radio towers, high-end receivers, transmitters, cabling, etc. If we miss a message telling

us that a train is there, or is not, then we miss it and cannot update the display until the next valid message is received.

*Q: Why does it seem that UP Trains never get a signal to cross the diamonds, but yet they do anyway?*

A: Although you won't see it on the display, chances are they did get a proceed signal. Since this automatic interlocking operates on a first come, first served basis, a proceed indication on the UP is never sent back to the BNSF dispatching system. However, BNSF fully monitors their half of the crossing, but only sees a single proceed covering all directions for the UP. After all, the BNSF dispatcher really only cares if traffic can be sent across the diamonds or not. On this display, a bit of green text is used to indicate that the UP has control.

*Q: Can I access this from home? Where can I find out more information about ATCS Monitor?*

A: Yes, you can visit the ATCS Monitor web site at [www.atcsmon.com](http://www.atcsmon.com) to learn more about ATCS Monitor, and also find out how to download the application.

*Q: I live within a few miles of these or other high-traffic railroad lines. Can I fill some gaps in the coverage?*

A: Possibly! Please provide your contact information to the Railroad Park shop staff and introduce yourself once you've joined the ATCS\_Monitor group at: [http://groups.yahoo.com/ATCS\\_Monitor](http://groups.yahoo.com/ATCS_Monitor)

*Q: What do the railroads think of this?*

A: There's varying response. Not much of it has been terribly negative, and in fact, many signal system maintainers utilize the software to monitor and troubleshoot their own systems.

*Q: Couldn't this technology be misused dangerously in the wrong hands?*

A: No more so than a variety of other means. All we can really do is see when a train is coming. You could think of dozens of simpler ways to achieve that: field observers, webcams, and defect detectors calling out train passage over the voice radio are among them. No useful detail about the train location, speed, or content is obtained. Did you know you can go to any of a dozen websites to see the exact position of any commercial airliner in the US? Do a Google search on "flight tracking".