

Signal Training Bulletin

**Committee G: Education & Training
Communication & Signal Division, AAR**

**F-3 Traffic Control System
(Centralized Traffic Control)**

Approved December 1981

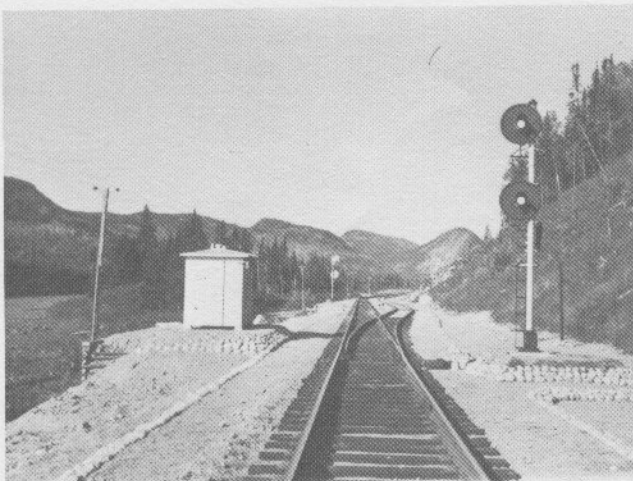
Definition: A block signal system under which train movements are authorized by block signals whose indications supersede the superiority of trains for opposing and following movements on the same track.

Symbol: None

Description: A centralized traffic control (CTC) system is made up of a succession of manual interlockings, all controlled from a single control machine. Automatic block signals are usually provided on the intervening trackage. Such a system may be adapted to any existing signal installation and may be applied to a single or multiple track. Train movements for normal operation are authorized and directed by signal indication only, without requiring the establishment of time table superiority, and without requiring train orders. Because CTC is a method of train operation whereby trains are operated by signal indication only, the protection afforded by the signal system must be complete and absolute.

Purpose and Application: CTC is used to direct, control and expedite train movements within a specified territory. Train movement is directed at crossover points, turnouts, crossings and at points where diverting switches are involved, by signal indication under the control of an operator (dispatcher).

CTC may be used at only one interlocking plant over a short section of track or over a long territory comprising many interlocking plants and many miles of railroad.



End of a siding in centralized traffic control territory.

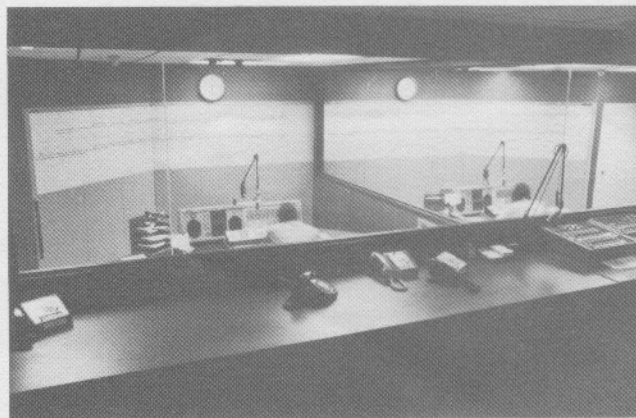
General Information: A CTC signal system is comprised of three essential parts:

1- A control machine at a location which can be within, adjacent to, or remote from the actual signal territory being controlled.

2- Equipment at each controlled location (station), such as power operated switch machines, signals, switch heaters, etc. complete with the full protection of local circuit interlocking.

3- A transmission medium or communications system (i.e., open line, cable, microwave, etc.).

Detailed Operation: A typical control machine would contain, among other things, a control and indication panel, a supplementary track diagram which shows car capacities of sidings and lengths of intermediate track between sidings. Other information helpful to operation such as names of stations, power off indication, power operated switch machine and electric lock locations would also be displayed on the control machine.



Computer aided dispatching system has large track diagrams combined with small keyboard for control of switches, signals, etc.

The actual track diagram is normally laid out in geographic representation of the territory controlled. Contained on this track diagram would be signal symbols with identifying numbers. The number/name of the switches and crossovers or other controlled facility would also be designated. Track occupancy lights would be located within the track line as would lights which indicate switch positions.

An employee-call switch for each station is placed in an appropriate position on the control machine. The operating device at the field station may be a horn, bell, buzzer or light or combination thereof.

Levers or switches for control of signals and power operated switch machines would be positioned on the control machine at a convenient location for the operator or dispatcher. Variations as to the layout of the control machine panel are made according to the preference of the individual railroad.

The overriding goal in the design, installation and maintenance of a CTC system is that no field function can be performed unless it is safe to do so at the appropriate location in the field. Therefore, the control machine, however modern and sophisticated, sends only requests, not commands, to the field stations. The requests are coded so that only one station can respond to each code. Unless the request can be safely executed, the interlocking circuits at the field station selected will ignore or disregard the request and the field function will not be performed. For example, if a dispatcher inadvertently tries to position a power switch reverse when a train is making a main line move over that switch, the field interlocking circuits will prevent the switch machine from moving until it is safe to do so.

By proper manipulation of the control machine, a dispatcher can initiate a request to a field station. This request is carried to the field station via the communications medium. If the Station accepts the request as safe to perform, the actual field function (i.e., power operated switch machine reverse) will be executed.

When the field function has been executed, the field station receiver acts as a transmitter. The transmitter sends this information (indication) back to the control location where it is displayed on the control panel for the observation of the dispatcher. Indications of important track circuit occupancy or malfunctions are also displayed on the control panel.



Another type of computer aided CTC uses pushbutton controls and cathode ray tube (TV screens) for display of the track diagram panels.

As trains move through a territory under the responsibility of a dispatcher, the dispatcher selects functions to be performed at the various stations which coordinates and expedites train moves, meets and passes.

An automatic train recorder is often added to machines controlling extensive territories. Train movements are automatically recorded on a constantly moving chart, which is marked with time graduations. The train recorder provides a permanent record of train operation which can be checked at any later date to insure consistent ease and efficient movement of trains.

Many railroads have instructions outlining installation, maintenance and inspection procedures with regard to CTC. It is most important that you become familiar with the requirements of your company.

Note: This Bulletin is for general information only. For specific applications consult the rules, standards and instructions published by your railroad.

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