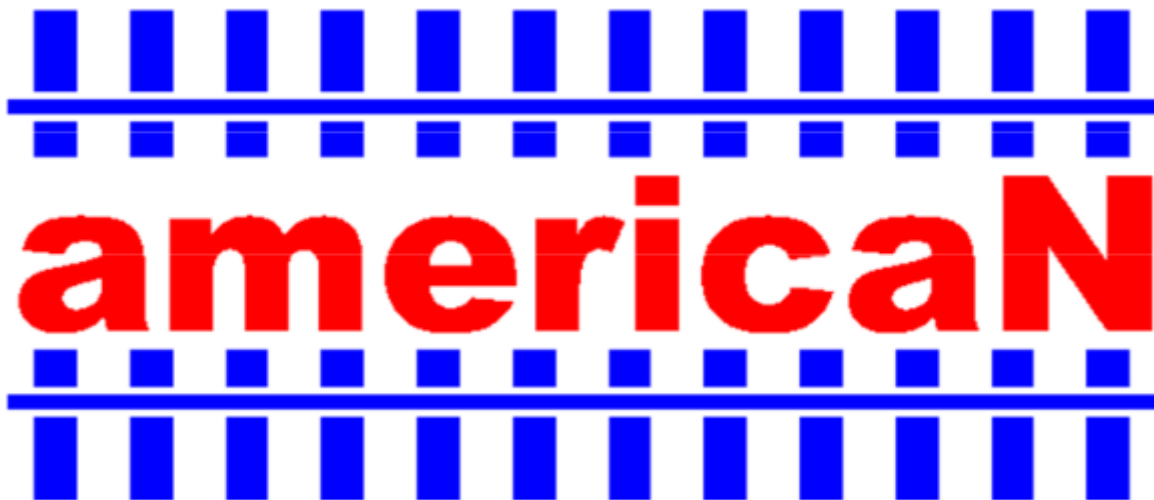




## Timetable and Trainorder TT&TO

An Overview and **american** Adaptation



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# 1. Overview of TT&TO Operation

The goal of every railroad used to move traffic over the line efficiently and safely. There are several ways to control train movement, but the most basic is to have a fixed schedule of trains. A **timetable** containing this schedule is published, and train crews are required to follow the schedule exactly. This works well, with two exceptions: A fixed schedule doesn't allow for unusual occurrences such as breakdowns or bad weather; and certain freight patterns simply aren't compatible with regularly-scheduled trains (e.g., seasonal merchandise, or locals with a lot of switching that is difficult to time beforehand)

To accommodate these situations, railroads developed **train orders**. A train order contains direct instructions from the railroad dispatcher to a train crew. It might grant the crew authority to run an **extra train** (not listed in the schedule), direct the crew to meet another train at a designated station, or cancel (annul) a scheduled train entirely.

In addition, train crews need a **clearance** when leaving their initial station. A clearance is a verification that the crew has received all the orders it is supposed to receive.

So how does this all work?

Each crew member is required to carry a copy of the timetable and the rule book. Crews of "regular" trains (those listed in the timetable) run the train according to the published schedule. Crews of "extra" trains (not listed in the schedule) run their trains according to train orders they receive. When any train passes a station, its crew looks at the train order signal (the "order board"), and stops the train to pick up orders and clearance if the signal is red.

The **dispatcher** controls the railroad. If a situation arises that can't be safely handled by following the timetable schedule, the dispatcher dictates a train order to an **operator** at a station. The station operator pulls a lever to set the train order signal to Stop, then writes the order onto a form. When the train arrives, the station operator gives copies of the train order and a clearance to the appropriate crew members.

## 2. FREMO **americaN** TT&TO guide

### FREMO **americaN** Modeling TT&TO Operations

During TT&TO Operations crews carry a rule book and timetable, and regular trains run according to the printed schedule.

#### 2.1 Timetable

A timetable will be prepared for each meeting to reflect the specific layout. It lists the stations and all trains, showing departure times and meets.

It also conveys authority to trains:

By Class: First class trains are superior to second class trains

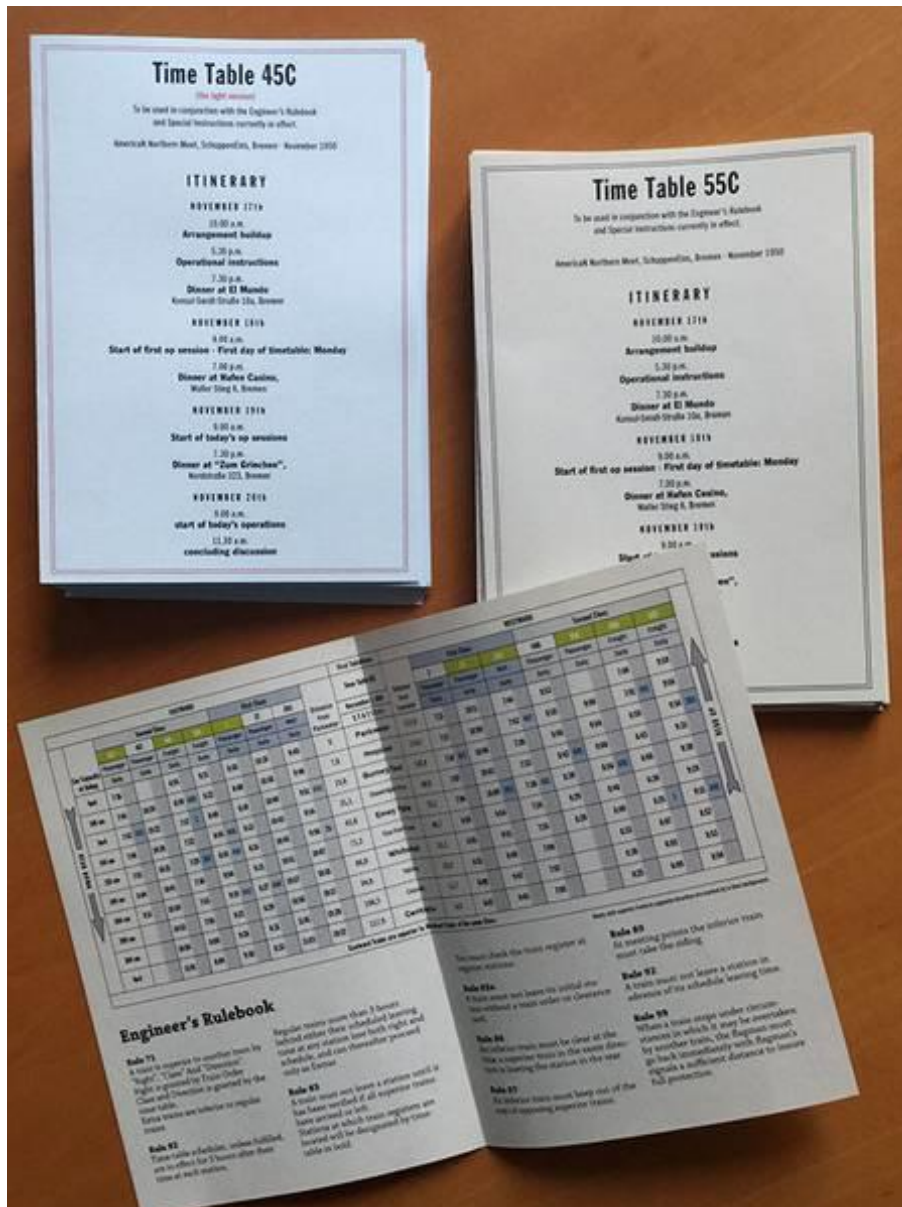
By Direction: The timetable establishes which direction is superior for trains of the same class

Station names in bold font require an "On Sheet" ("OS") call to the dispatcher to inform him that the train is leaving the station. Radios are provided at these stations.

This is a sample timetable from Bremen 2016:

Car Capacity of Siding	EASTWARD						Distance from Parkwater	First Subdivision	Distance from Centralia	WESTWARD						
	Second Class				First Class					Time Table 45C	STATIONS					
	407	457	681	691	1											
	Passenger Daily	Passenger Daily	Freight Daily	Freight Daily	Passenger Daily						2	408	45C	690	692	
Yard	7:36		6:55	8:15	6:05		0	Parkwater	117,9	7:15	8:53		7:04	9:59		
395 cm	7:44	10:20	6:59	680	8:22	6:08	7,8	Hoquiam	110,2	7:13	8:50	9:08	7:01	681	9:56	
Yard	7:42	10:22	7:12	2	8:40	6:10	15,6	Burney Yard	102,4	7:10	681	8:46	9:04	6:59	9:54	203
140 cm	7:46	10:26	7:17		8:45	408	6:13	Shawigan/ Erro	86,8	7:07	8:42	691	9:00	6:43	9:33	
210 cm	7:51	10:31	7:21		8:55	456	6:15	Emey Falls	75,2	7:04	8:39	8:56	691	6:40	9:30	
180 cm	8:04	10:41	7:30		9:04	6:21	71,3	Five Feet Creek	46,7	6:58	8:29	8:46	6:30	9:20		
500 cm	8:31	10:50	7:45		9:19	692	6:27	680	86,8	6:55	8:20	8:40	6:25	1	9:15	691
200 cm		10:53	7:48		9:22	6:28	94,6	Yakima	23,3	6:51		8:33	6:07	8:57		
300 cm		10:58	7:52		9:26	6:31	106,3	Cascade	11,7	6:49		8:30	6:03	8:53		
Yard		11:01	7:56		9:30	6:33	117,9	Centralia	0,0	6:47		8:25	6:00	8:50		

Eastward Trains are superior to Westward Trains of the same Class



## 2.2 Extra Trains

Extras are authorized by the dispatcher and receive orders to safely perform their tasks. They do not have any authority by class or direction. Unless they have received an order by the dispatcher they need to ensure that they stay out of the way of scheduled trains.

## 2.3 Rule Book

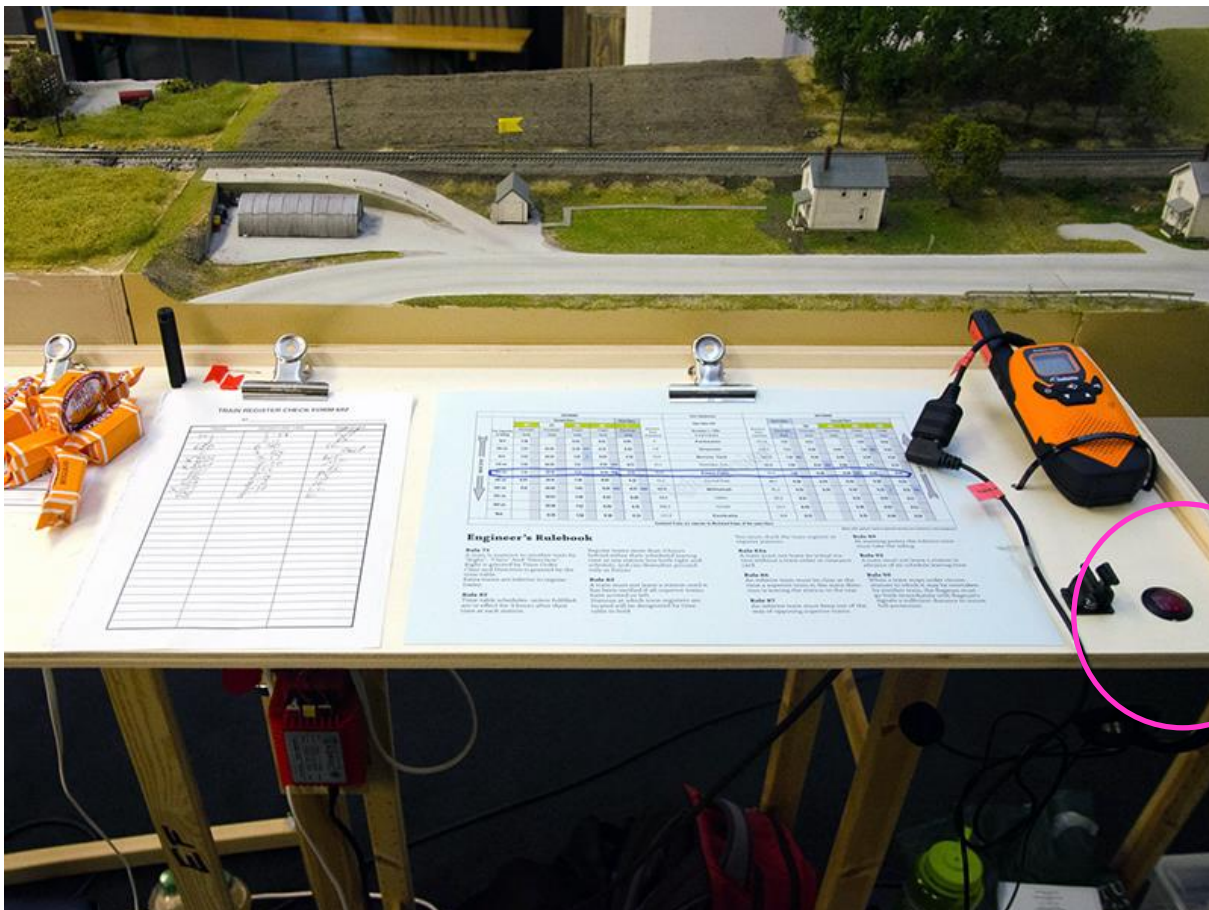
To instruct all crews on the safe handling of trains there are rules that a crew should be familiar with.

The rules we had used in Bremen 2016 are in Appendix 1

## 2.4 Train Orders

Train Orders are either handed by the dispatcher to the crew when they receive their clearance to leave a yard. Once they are on the road the dispatcher can no longer directly communicate with them as they do not carry a radio and we typically do not have station operators or "Agents".

To simulate a Train Order Signal the dispatcher can alert the train crew by using a red light ("Call Light") on dedicated "Operator Boards" that can be mounted to any module; the call lights are remote controlled. A red light alerts the crew that they need to stop and contact the dispatcher.



## 2.5 Train Register

On every major station the operator board includes a "Train register": The train register records which trains have passed a station. Train crews need to check the register to learn if superior trains that they are concerned with have passed the station, so they know what

action to take. Likewise, every crew must enter its train information in the register, so other crews will know about the train.

## **2.6 Clearance Card**

To start its run every train must have a clearance card that lists all orders the train should have. This ensures that all orders are handed to the crew. Without a clearance card a train must not leave its originating station or yard.

## **2.7 Protecting / Flagging the Train**

Any time a train must stop unexpectedly or it fouls the track while stopped normally (e.g., for a meet), send out the flagmen!

We use red plastic flags that are kept at each Operation Board. Stick one of these flags into the roadbed while your train is stopped, and remove it before you proceed.

# Appendix 1: Rule Book

## Rule 71

A train is superior to another train by “Right”, “Class” And “Direction”.

- Right is granted by Train Order
- Class and Direction is granted by the time-table.
- Extra trains are inferior to regular trains.

## Rule 82

Time-table schedules, unless fulfilled, are in effect for 3 hours after their time at each station. Regular trains more than 3 hours behind either their scheduled leaving time at any station loose both right and schedule, and can thereafter proceed only as Extras

## Rule 83

A train must not leave a station until it has been verified if all superior trains have arrived or left.

Stations at which train registers are located will be designated by time-table in bold

You must check the train register at register stations.

## Rule 83A

A train must not leave its initial station without a train order or clearance card.

## Rule 86

An inferior train must be clear at the time a superior train in the same direction is leaving the station in the rear

## Rule 87

An inferior train must keep out of the way of opposing superior trains.

## Rule 89

At meeting points the inferior train must take the siding

## Rule 92

A train must not leave a station in advance of its schedule leaving time.

## Rule 99

When a train stops under circumstances in which it may be overtaken by another train, the flagman must go back immediately with flagman's signals a sufficient distance to insure full protection