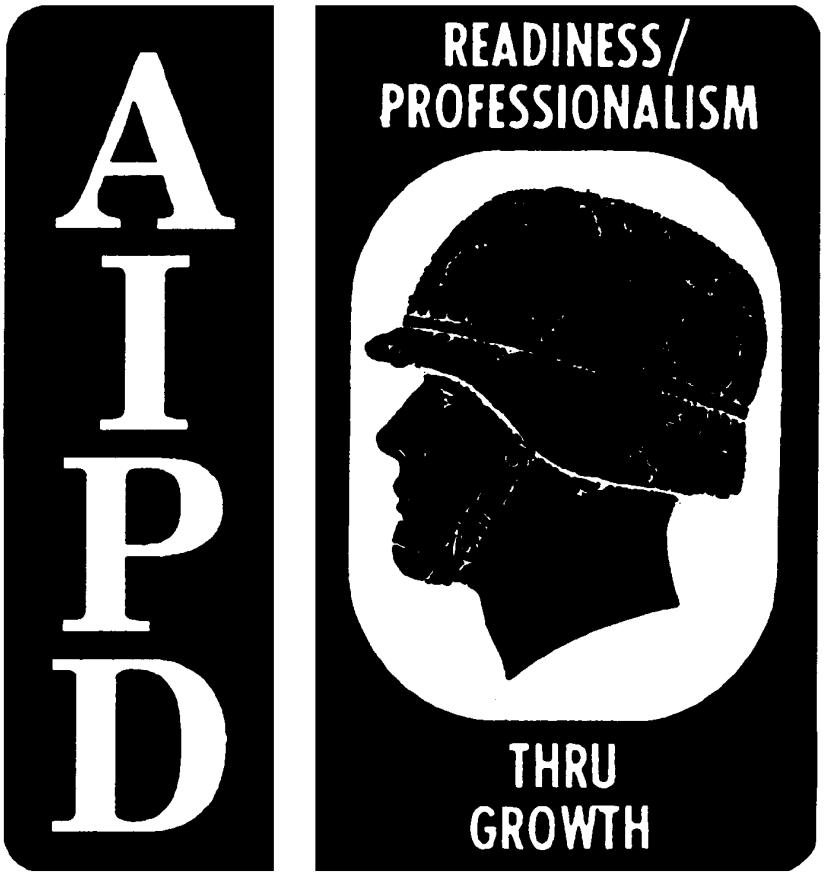
SUBCOURSE
TR0635

EDITION
8

# MILITARY TRAIN OPERATIONS




THE ARMY INSTITUTE FOR PROFESSIONAL DEVELOPMENT

ARMY CORRESPONDENCE COURSE PROGRAM

TRANS SUBCOURSE 635

MILITARY TRAIN OPERATIONS

INTRODUCTION

The transportation railway service (TRS) operates railroads in theaters of operations to support combat forces. To insure that trains operate safely and efficiently, the TRS requires its personnel not only to know but to obey the rules set forth in TM 55-200, Railway Operating Rules. All assigned to the TRS should be familiar with the rules in this manual.

After studying the reference text of this subcourse, you are expected to be able to list some of the rules, define some of the technical terms, and describe the methods of operation and types of trains used in military train operations; to explain train superiority; to describe the kinds of railway signals used in military train operations; and to outline methods and procedures used for operating trains in radioactive areas. The subcourse consists of two lessons and an examination as follows:

| | Credit hours |
|---|---|
| Lesson 1, Railway Rules, Terms, and Types of Trains | 1 |
| 2, Train Movement Control | 2 |
| Examination | 1 |
| Total | 4 |

You are not limited as to the time you may spend on the solution of either lesson or the examination.

Text and materials furnished: Reference Text 635, Military Train Operations, November 1972., with annex A.

Upon completion of this subcourse, you keep the reference text and lesson assignment sheets; do not return them with your answer sheets.

LESSON.....Rules and Types of Trains.

CREDIT HOURS.....1.

TEXT ASSIGNMENT.....Reference Text 635, pars. 1.1-1.9.

MATERIALS REQUIRED .....None.

LESSON OBJECTIVE.....To enable you to list some general rules, define some of the technical terms, and describe the types of trains operated by the TRS and to define train superiority.

SUGGESTIONS. .....None.

---

Weight | True-False

4 1. On single track, an extra train may be given superiority by right over a first-class train traveling in the superior direction specified by the timetable.

4 2. Passenger extra trains are authorized by timetable schedule.

4 3. An engine displaying markers without cars is a train.

Cluster True-False

(Each of the following groups of questions is related to the stem that immediately precedes the group.

indicate which questions are true and which false with respect to the stem

FIRST GROUP

To insure safety and efficiency of operations, a standard code of railway operating rules is provided for personnel engaged in operating Department of the Army railways. As a member of the transportation railway service, you know that:

4 4. Every person whose duties are regulated by the rules in TM 55-200 must possess a copy of this manual and also be able to pass any required examinations on the rules.

Weight

4 5. If you are working near the right-of-way and see a smoking journal on a car in a passing train, you should immediately notify the division superintendent.

4 6. In a train accident, the engineman is responsible for notifying the chief dispatcher and insuring that first aid and medical assistance are provided for injured persons.

4 7. If your duties are affected by train movements controlled by a timetable, you must have a copy of the timetable on your person while on duty.

4 8. You are required to know only those rules that pertain to you and your duties.

4 9. When you see a coworker violating a rule, you must report the violation to the proper authority.

4 10. An individual must request explanation of a rule or rules he does not understand.

SECOND GROUP

A system of train superiority is established for the efficient operation of railroads. As a TRS railway dispatcher you realize that:

4 11. Train superiority is actually a matter of which train will take the siding and which train will hold the main line.

4 12. A second-class train has departed station X for stations Y and Z; if it continues at scheduled speed, a first-class train will overtake it between stations Y and Z. The second-class train will take a siding at Y and wait for the first-class train to pass it before continuing to station Z.

4 13. If the superior direction for a rail line is east and two first-class trains are opposing each other, the eastbound train must take a siding and wait for the westbound train to pass.

4 14. Extra trains usually have superiority by class.

Weight

4 15. A train may be superior to another by right only if a timetable is issued that establishes this superiority.

4 16. Superiority by direction and class is established by the timetable.

4 17. When train A is given superiority over train B by train order, train A is said to be superior by class.

THIRD GROUP

In a theater of operations, the TRS may operate several types of trains. If you were a military dispatcher, you should be able to evaluate the following statements. If the statements are valid ones, mark them true; if not, mark them false.

4 18. Passenger trains carry baggage and mail as well as people.

4 19. The four types of military trains are freight, extra, regular, and passenger.

4 20. The ambulance train is sometimes operated as a passenger extra.

4 21. The time limits in which a work train is authorized to occupy track cannot be extended unless permission is given by superintendent's bulletin.

4 22. A wreck train is a special kind of freight train.

4 23. Work trains are normally used in track maintenance and are authorized by train order.

4 24. A car marked with a red cross may be used, in an emergency, to carry freight.

4 25. Freight trains normally have priority over all other trains except ambulance trains.

# LESSON ASSIGNMENT SHEET

TRANS SUBCOURSE 635 .....Military Train Operations.

LESSON 2.....Train Movement Control.

CREDIT HOURS.....2.

TEXT ASSIGNMENT.....Reference Text 635, pars. 2.1-2.18.

MATERIALS REQUIRED.....None.

LESSON OBJECTIVE.....To enable you to identify and explain the rules tat govern train order and timetable operations in a theater; the kinds of railway signals used in military train operations; and the procedures used for operating trains in radioactive areas.

SUGGESTIONS.....None.

EXERCISES

---

Weight — True-False

1 1. On a timetable's classified schedule page, you read north-bound train times from top to bottom and westbound train times from bottom to top.

1 2. A timetable takes effect at 0001 hours on the date listed on it.

1 3. The last section of an extra train always displays green classification signals.

Weight | Cluster True-False

(Each of the following groups of questions is related to the stem that immediately precedes the group. On the answer sheet, indicate which questions are true and which false with respect to the stem

FIRST GROUP

Railway signals are necessary for the safe and efficient operation of trains. All train operating personnel of the transportation railway service should know that:

3 4. Green flags or lights on the front of a locomotive indicate that a regular train is being run in sections.

3 5. A workman finding a blue signal on a track may remove it only if he replaces the signal himself before he leaves the area.

3 6. A train may proceed with caution past a position light signal with three lights in the horizontal position.

3 7. The flags or lamps on the front of a locomotive are classification signals.

3 8. On a color light signal, red, yellow, and green lights are arranged in a circular pattern.

3 9. Two red lights on the rear of a train mean that the main line is obstructed.

SECOND GROUP

From the classified schedule page shown on page 7, you know that:

2 10. The passing time of train No. 412 by Seton is 1232 hours.

2 11. Fuel and water facilities are available at Green station.

2 12. Train No. 8 is scheduled to meet train No. 209 at Braxton station.

Weight

2 13. Unless flagged, train No. 3 stops only once after leaving Lyon station and before arriving at Lane.

2 14. Only one train, No. 412, is authorized to run as an extra.

2 15. The passing track capacity at Seton is 42 cars.

2 16. There are two wyes on the line.

2 17. Trains can receive train orders at six stations on the line.

| | WESTWARD | | | | EASTWARD | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | SECOND CLASS | FIRST CLASS | | TIMETABLE No. 9 Eff. 30 Sep 72 | FIRST CLASS | | SECOND CLASS | THIRD CLASS | Distance From Lyon (Kilometers) | Station Symbol | Passing Track Cap. In Cars (44') |
| | 209 Lv. Daily | 7 Lv. Daily | 3 Lv. Daily | STATIONS | 4 Lv Daily | 8 Lv. Daily | 210 Lv. Daily | 412 Lv. Daily | | | |
| BW OP | L 0845 | | L 0650 | R Lyon | | A 0945 | A 0800 | A 1300 | -- | LY | Yd. |
| IY P | 0850 | | 0755 | TO R Ellis | | 0938 | 0752 | 1255 | 1.6 | EL | 24 |
| P | 0854 | | 0701 | TO Braxton | | 0934 | 0745 | 1236 | 3 | BR | 30 |
| P | ---- | | ---- | Lexton | | ---- | ---- | ---- | 6.3 | LE | -- |
| P | 0858 | | f 0706 | Seton | | f 0930 | 0740 | 1232 | 7.9 | SE | 42 |
| P | s 0925 8 | | s 0713 | TO Green | | f 0925 209 | 0735 | 1225 | 9.9 | GR | 37 |
| P | 0937 | L 0803 | A 0723 | TO Lane | A 0837 | L 0917 | 0723 | 1159 | 11. | LA | 27 |
| IY P | 0942 | 0808 | | Wye Tower | 0832 | | 0717 | 1152 | 13.5 | WY | -- |
| BW OP | A 0945 | A 0810 | | TO R Andrews | L 0830 | | L 0715 | L 1150 | 15. | AN | Yd. |

THIRD GROUP

As a member of a train crew, tell which of the following statements are true or not true of military train operation in a theater.

3 18. The special instructions in a timetable list the times that trains arrive and depart each station on the line.

Weight

3 19. Trains may be operated by a combination of the timetable and train order methods.

3 20. One function of the train-order signal and Clearance Form "A" is the spacing of trains.

3 21. The initials TO preceding a station listed in the timetable mean that the station is a train order station.

3 22. The authority to move a train not listed in the timetable from one point on a rail line to another is given in a train order.

3 23. The timetable indicates train speeds for main line movements only.

3 24. The special instructions of a timetable may be changed by a timetable bulletin.

FOURTH GROUP

You are the chief train dispatcher for a division of railroad using a combination of the timetable and train order methods. From your experience, evaluate the following statements, If the statements are valid, mark them true; if not, mark them false.

3 25. Except for doing station work or entering a siding, a train stopped at a train order station to receive a train order must also receive a Clearance Form "A" before it can proceed.

3 26. The clearances between rail equipment and structures are listed in the classified schedule page of the timetable.

3 27. No train should pass a semaphore arm signal pointing straight up.

3 28. A train can leave a station up to 5 seconds ahead of its scheduled time.

3 29. The car capacity of the sidings at each station are given on both the classified schedule page and the Dispatchers' Record of Train Movements.

Weight

3 30. You must issue a train order when two opposing extra trains are to meet.

3 31. Your initials must appear on every train order issued on your division.

3 32. The train crews on trains running through areas contaminated by radiation should be alternated often to prevent overexposure.

3 33. Once a train order has been issued, it cannot be annulled.

3 34. A train order for a train is addressed to the station agent at the station receiving it.

Matching

(In questions 35 through 40, match the terms listed in column H with the descriptive remarks in column I

Choices in column II may be used once, more than once, or not at all.)

| | Column I | Column II |
|---|---|---|
| 2 | 35. Authority for an unscheduled train to move from one point to another in a railway division. | A. "X" response.<br>B. Timetable.<br>C. Train order. |
| 2 | 36. Method of acknowledging receipt of a train order before repeating it. | D. Clearance Form "A". |
| 2 | 37. Form used to make a change in the scheduled movement of a train. | |
| 2 | 38. Authority for regularly scheduled train to move over a division of railroad. | |

(contd)

| Weight | Column I (cont'd) | Column II |
|---|---|---|
| 2 | 39. Instruction for meets between opposing extra trains. | |
| 2 | 40. Permission for a train stopped at a TO station to proceed. | |

# REFERENCE TEXT
# 635

# MILITARY TRAIN OPERATIONS

The information contained herein is provided for instructional purposes only. It reflects the current thought of this school and conforms to printed Department of the Army doctrine as closely as possible. Development and progress render such doctrine continuously subject to change.


## U. S. ARMY TRANSPORTATION SCHOOL
## Fort Eustis, Virginia

CONTENTS


| | | Page |
|---|---|---|
| INTRODUCTION | | 1 |
| CHAPTER 1. | RULES AND TYPES OF TRAINS | 3 |
| Paragraph 1.1. | Introduction | 3 |
| 1.2. | General Rules | 3 |
| 1.3. | Added Rules | 6 |
| 1.4. | Importance of Rules | 6 |
| 1.5. | Railway Terms | 7 |
| 1.6. | Rules Governing Superiority of Trains | 9 |
| 1.7. | Examples of Train Superiority | 10 |
| 1.8. | Types of Trains | 11 |
| 1.9. | Summary | 13 |
| CHAPTER 2. | TRAIN MOVEMENT CONTROL | 15 |
| Paragraph 2.1. | General | 15 |
| 2.2. | Fleet and Manual Block Operations | 15 |
| 2.3. | Train Order Operation | 17 |
| 2.4. | Train Order | 17 |
| 2.5. | Rules for Movement by Train Orders | 20 |
| 2.6. | Forms of Train Orders | 27 |
| 2.7. | Clearance Form "A" | 28 |
| 2.8. | Dispatchers' Record of Train Movements | 29 |

Page

Paragraph 2.9. Timetable Operation..... 31

2.10. Timetable Rules ..... 33

2.11. Authorized Timetable Abbreviations..... 35

2.12. Classified Schedule..... 36

2.13. Special Instructions..... 38

2.14. Railway Signals..... 39

2.15. Classification Signals and Markers..... 40

2.16. Fixed Signals..... 41

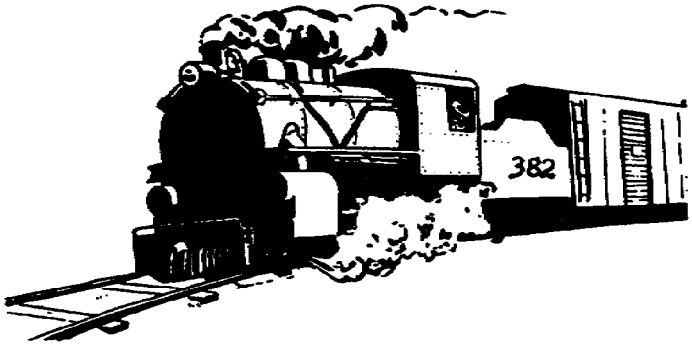
2.17. Operations in Radioactive Areas..... 44

2.18. Summary..... 46

APPENDIX I. REFERENCES..... 48

II. GLOSSARY..... 49

INDEX..... 51




INTRODUCTION

The Illinois Central passenger train No. 1, the Cannonball, ran in the fog and darkness of the early morning hours of April 30, 1900. Having what was then the speediest schedule in the road's history, the Cannonball, or Chicago-New Orleans Express, was Illinois Central's choicest run. With the distinctive record he had established during his 10 years at the throttle, Casey Jones was given this run. Among dispatchers, Casey was regarded as a "fast roller, " an engineman who could be depended on to get his train over the road on schedule, to take advantage of every break he could be given at passing points. He never dawdled at coal and water stations or cinder-pit tracks; never wasted time along the road. Casey was the man to keep the Cannonball Express "on the advertised."

Soon after midnight on April 30, 1900, Casey's famed last trip began at Memphis, Tennessee. His engine, No. 382, had plenty of steam pressure and was ready to go.

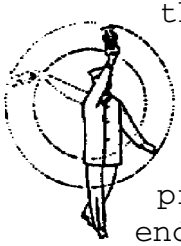
Because No. 1 was late arriving at Memphis, Casey held a late order to run Memphis to Sardis, Mississippi--a point about 50 miles ahead. A freight train coming north on the single-track line was the only thing headed toward him. For two weeks previously, rainy, foggy weather had prevailed, and the clouds were now low and dark. After about an hour's traveling time the Cannonball reached Sardis; on south she steamed. Soon she made Grenada, then came Winona, then Durant. The lost time was being whittled to nothing. I all went well, the Cannonball would pass Way, 6 miles north of Canton, at the scheduled time. No more orders had been received, and down the track roared the Cannonball, soon approaching Vaughan, Mississippi, 12 miles above Canton. Vaughan was at the lower end of a double S curve. The north switch was about the middle of the

first S, and as the Cannonball boomed down on it, two red lights flared in front of her. This meant a train not in the clear.

A freight train had sawed by another southbound train shortly before and, in doing so, had pulled out some drawheads. Failing to get in the clear, the caboose and two other cars were out on the main line. The resulting crash of the Cannonball into these cars and death of the engineman, Casey Jones, are well-known history.

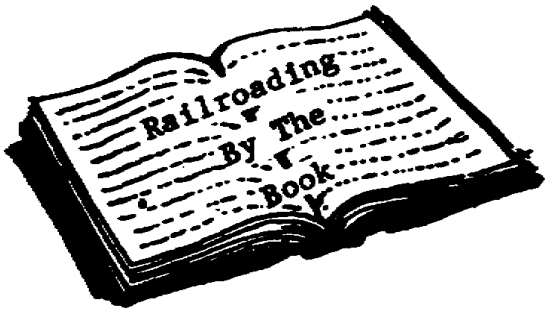
At Vaughan, the northbound freight was waiting at the south switch. The crash occurred at 3:52 A.M. and the Cannonball was due in Vaughan at 3:50. It would have passed Way on the dot.

Whether the disabled train was protected by torpedo and flagman with red lantern, as it should have been, remains a matter of conjecture. Each one connected with the wreck told his story, but the one person who could have given the best explanation could not testify. However, the fact remains that the train did wreck, track and equipment were damaged, and rail traffic was delayed. Today automatic block signals warn enginemen beforehand about things like freight trains projecting out of sidings onto the main line. At the north end of the Vaughan siding above the spot where Casey wrecked, two semaphores stand guard blinking yellow, red, and green through all kinds of weather night after night.



The story of Casey Jones has been retold here to emphasize the importance of railway operating rules and signals for safe and efficient rail operations. All persons involved with train operation on a U. S. Army military railroad must perform their duties according to rules set forth in Technical Manual (TM) 55-200, Railway Operating Rules. These rules are adapted from the Standard Code of Operating Rules of the Association of American Railroads (AAR), which governs the operation of commercial railroads, in the United States. Both civilian and military railroaders must not only know these rules but also obey them.

This reference text, consisting of two chapters and an annex, discusses railway operating rules governing military railway operations, methods of train operation in a theater, rules for movement by train order and by timetable, and some of the railway signals that affect movements of trains.




# Chapter 1

# RULES AND TYPES OF TRAINS

## 1.1. INTRODUCTION

Discussions in this chapter begin with a presentation of that portion of the railway operating rules called general rules. Following this discussion are definitions of pertinent terms used in railroading, and an explanation of the operating rules that determine train superiority. Finally, the different types of military trains generally found in a theater of operations are explained.

## 1.2. GENERAL RULES

The general rules apply to all personnel in the transportation railway service (TRS). As stated earlier, the operating rules in TM 55-200 are adapted from the Association of American Railroads (AAR) Standard Code of Operating Rules. Because military rail operations may differ from civilian operations, some of the rules have been modified or worded differently from the way they are given in the Standard Code to better cover operations peculiar to Department of the Army (DA) railroads. The rule lettering and numbering in this text correspond to that in TM 55-200. The following general rules are self-explanatory and are quoted directly from TM 55-200, Railway Operating Rules.

a. Rule A. Possession of Manual and Timetable.

(1) Commanding officers of personnel whose duties are regulated by the rules of this manual will provide each individual with a copy of this manual and will be responsible for the observance of such rules.

(2) Personnel whose duties are in any way affected by the timetable will be provided with a copy of the current timetable and will carry it while on duty.

b. Rule B. Knowledge of Rules.

(1) Personnel will be conversant with and obey the rules and special instructions. Request will be made of proper authority for an explanation of any rule or instruction which is not understood.

(2) All personnel whose duties are concerned with the movement of trains will become familiar with the rules governing other personnel as well as the rules which govern them. They will be prepared to perform any duty to insure safety in an emergency.

c. Rule C. Examinations.

Personnel whose duties are affected by these rules must pass the required examinations.

d. Rule D. Personnel Affected by Rules.

All personnel engaged in any service on trains are subject to the rules and special instructions.

e. Rule E. Violations of Rules.

Personnel must render all assistance possible in carrying out the rules and special instructions, and must report any violations to the proper authority.

f. Rule F. Reporting Hazards.

(1) Accidents; failure in the supply of water or fuel; defects in track, bridges, or signals; or any unusual conditions which may affect the movement of trains must be reported to the proper authority by the quickest and most reliable means available.

(2) Personnel will be alert at all times to detect defective or unserviceable equipment or track. They will, when practicable, observe passing trains for any defect, such as sticking brakes, brake rigging down, hot journals, or protruding objects, and will signal to the train crews to call attention to the defects. If it is not possible to communicate with the train or engine crew, the train dispatcher will be notified as quickly as possible.

(3) Defective or unserviceable track or equipment will be protected properly if facilities or material for repairs are not available.

g. Rule G. Intoxicants; Narcotics.

The use of intoxicants or narcotics while on duty is prohibited. Personnel reporting for duty under the influence of intoxicants or narcotics will be subject to disciplinary action.

h. Rule H. Smoking Restriction.

Smoking will be restricted as required. Such restrictions will be issued by the division superintendent or transportation officer and will conform to instructions issued by higher authority.

i. Rule J. Identification Badges and Uniform.

Personnel, when so required, will wear prescribed identification badges. For military personnel the uniform will be fatigue clothes unless otherwise ordered.

j. Rule K. Courtesy; Discipline.

(1) Personnel must be courteous, orderly, and quiet while on duty in or about stations, and in or about trains.

(2) Personnel who reflect discredit upon the Department of the Army will be subject to disciplinary action.

k. Rule L. Protection of Property.

Personnel will unite to protect Government property in case of danger.

l. Rule M. Safety.

(1) Personnel will exercise care to avoid injury to themselves or others by observing the condition of equipment and tools used in performing their duties. Equipment or tools found defective will, if practicable, be put in safe condition or the necessary protection will be afforded. All defects will be reported to the proper authority.

(2) Personnel must inform themselves as to the locations of structures or obstructions where clearances are close.

(3) Personnel must expect the movement of trains, engines, or cars at any time, on any track, in either direction.

(4) Personnel must not stand on the track in front of an approaching engine or car for the purpose of boarding it.

(5) Personnel will observe the railway safety rules listed in DA Pamphlet 55-1.

1.3. ADDED RULES

The rules given in this paragraph, and designated as added rules in TM 55-200, apply only to military train operations.

a. Discharge of Duty. Personnel will not absent themselves from their duties, exchange duties, or substitute other personnel in their places without proper authority.

b. Ambulance Trains, Cars. Extra precautions will be taken in the movement of equipment designed or used as ambulance trains or cars.

c. Accidents, Personal Injuries. In train accidents involving injury to train personnel or passengers, first aid must be administered when necessary, the chief dispatcher must be notified promptly, and the required reports must be submitted. Necessary medical assistance will be called as quickly as possible. It will be the responsibility of the conductor to comply with the provisions of this rule. If the conductor is incapacitated, the next senior crew member will act in his place. In making narrative reports, names of witnesses, if any, must be secured and reported.

1.4. IMPORTANCE OF RULES

None of these rules is more or less important than the others, but particular emphasis should be placed on the first three, Rules A, B, and C. If you are involved in a railway operation, you should have the rules in your possession, know them thoroughly, and be able to interpret them accurately. If you do not fully understand them, ask some qualified person who does know to explain them to you. You should also be prepared to take and satisfactorily complete an examination on the rules at any time. And, most important of all, you must obey the rules.

Before continuing with further discussions of railway operating rules, you should have some understanding of railroad terminology. The following paragraph defines some common railway terms; you should be familiar with them because they are used extensively throughout the remainder of the text.

## 1.5. RAILWAY TERMS

The definitions of railway terms used by TRS personnel are sometimes different from those used by the AAR, commercial railroaders, and most laymen. The following terms and definitions are pertinent to a clear understanding of this text.

Current of traffic--movement of trains on a main track, in one direction, specified by the rules. On a single-track line where as many trains must run one way as the other, the current of traffic is in both directions. On a double-or multiple-track line, the direction of each track is designated and has a current of traffic established for it according to the direction of train movements on it. For example, suppose you have a double-track line connecting Pittsburgh with Philadelphia, Pennsylvania. One track would be for eastbound traffic and the other for westbound.

Division--portion of railroad assigned to the supervision of a superintendent. In the TRS, the transportation railway battalion (TRB) commander is the railway superintendent, and the battalion under his command is normally assigned a rail division from 145 to 241 kilometers (90 to 150 miles) in length.

Engine (as used in TM 55-200 means railway locomotive) --(1) a unit propelled by any form of energy, or (2) a combination of such units, other than steam, operated from a single control, used in train or yard service. The TRS normally uses diesel-electric locomotives; however, it uses any railroads and any equipment found in a theater including steam and electric locomotives and electrified rail lines.

Extra train--train not authorized by a timetable schedule. It may be designated: (1) extra, for any extra train except passenger extra or work extra; (2) passenger extra, for passenger train extra; (3) work extra, for work train extra. Extra trains carry white classification signals on the front of the locomotive and are always authorized by train order.

Fixed signal--signal with a fixed location for regulating railroad traffic.

Main track--track extending through yards and between stations, upon which trains are operated by timetable or train order, or both, or the use of which is governed by block signals.

Pilot--qualified person assigned to a train when the engineman or conductor, or both, are not fully familiar with the physical characteristics of or the rules covering any portion of railroad over which the train is to be moved.

Regular train--train authorized by a timetable schedule.

Schedule--that part of a timetable which prescribes class, direction, number, and movement for a regular train.

Section--one of two or more trains running on the same schedule displaying signals, or for which signals are displayed.

Siding--track auxiliary to the main track, connected by switches at both ends, that permits trains to clear the main line and to meet and pass other trains. It should be long enough to contain the longest train permitted to operate over the division.

Single track--main track upon which trains are operated in both directions.

Station--place designated on the timetable by name.

Superior train--train having precedence over another train.

Timetable--authority for the movement of regular trains subject to the rules. It contains classified schedules with special instructions relating to the movement of trains.

Train--engine, or more than one engine coupled, with or without cars, displaying markers. Markers are attached to the rear of a train. They are discussed in more detail in paragraph 2. 14. Most laymen think of a train as cars and a caboose puled by an engine. This is not always true. It must display markers before it constitutes a train. A train must have an engine, and it must have markers.

Train of superior class--train given precedence by timetable over opposing trains of an inferior class.

Train of superior direction--train given precedence in the direction specified by a timetable between opposing trains of the same class.

Train of superior right--train given precedence by train order.

Yard--system of tracks within defined limits provided for making up trains, storing of cars, and other purposes, over which movements not authorized by timetable or by train order may be made, subject to prescribed signals and rules or special instructions.

## 1.6. RULES GOVERNING SUPERIORITY OF TRAINS

The preceding definitions of rail terms should help you to understand the following explanations on train superiority, as well as the information in the remainder of the text.

When trains are operated over a rail net, one train may have to stop and yield the track to another; the train that stays on the main track is said to be superior to the other. This is particularly common when the operation is over a single-track line, but one train may have superiority over another even in a double-track operation. Train superiority is simply a matter of which train takes the siding and which train continues on the main line. A train is superior to another by right, class, or direction. Right is a superiority conferred by a train order issued by the authority and over the signature of the chief train dispatcher. The class and direction of trains are conferred by timetable, with one direction being superior to the other for trains of the same class. Right is superior to class or direction. Because a clear understanding of train superiority is imperative, the rules specifying how it is determined on single or double track are quoted from TM 55-200. Rules with a prefix S are for single track, and those with a prefix D are for two or more tracks; rules without a prefix are for both single and multiple tracks.

a. Rule S-71. General. A train is superior to another train by right, class, or direction.

(1) Right is conferred by train order; class and direction by timetable.

(2) Right is superior to class or direction.

(3) Direction is superior between trains of the same class.

b. Rule D-71. General. A train is sup;. or to another train by right or class.

(1) Right is conferred by train order; class by timetable.

(2) Right is superior to class.

c. Rule 72. Class and Direction. Trains of the first class are superior to those of the second; trains of the second class are superior to those of the third; and so on. Trains in the direction specified by the timetable are superior to trains of the same class in the opposite direction.

d. Rule 73. Extra Trains. Extra trains are inferior to regular trains.

## 1.7. EXAMPLES OF TRAIN SUPERIORITY

The following examples explain how train superiority by class or direction is established by the timetable, and illustrate how right can be conferred on any train. For our purposes, assume that the railroad shown in figure 1.1 is a single-track, standard-gage division in a theater of operations extending from a port to a railhead (RH) through stations A, B, C, and D. The only sidings on the division are located at these stations. The timetable for this division has two classes of regular trains scheduled, and the superior direction is east from the port to the railhead. The three hypothetical operations presented in this figure are separate situations happening at three different times. They could not happen concurrently.

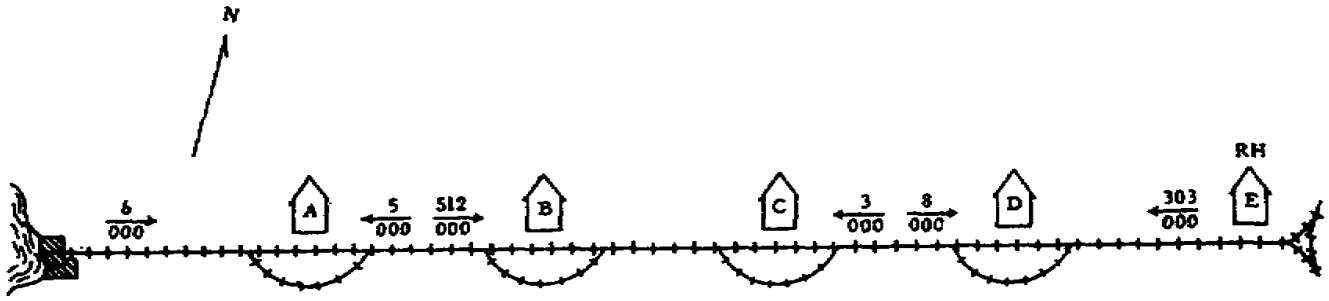



Figure 1.1. Hypothetical Railway Division.

Suppose that a second-class train, No. 512, has departed station A for the railhead, and that a first-class train, No. 3, has left station D for the port. Train No. 3 would ordinarily meet No. 512 between C and B. However, you do not want No. 3 stopped or held to a slower speed, and since it has superiority by class over No. 512, the second-class train, No. 512, will take a siding (clear the main track) at B and wait for No. 3 to pass before it proceeds. Superiority of trains, then, is determined by <u>class</u> established in the timetable.

Now, look at figure 1.1 and you find a conflict between trains of the same class. In this example, direction determines which train is superior. Remember that the superior direction given on the timetable is east from the port to the railhead. Two first-class trains are involved. Train No. 6 is headed to station A from the port, and train No. 5 is approaching A from B. Number 5 will take a siding at A and wait for No. 6 to pass before it continues to the port because No. 6 is superior by <u>direction</u>.

Again, in figure 1.1 the dispatcher wishes to overrule the timetable authority by issuing a train order. Number 8 is a first-class train approaching station D in the superior direction; however, an ambulance train, Extra 303 West, is ready to depart the railhead, or station E, for a hospital located near the port, Because ambulance trains are normally given priority, the dispatcher issues the train orders shown in figure 1.2. They give Extra 303 West <u>right</u> over No. 8, and the first-class train will not go beyond station D before the extra train has arrived. When superiority is taken away from No. 8 and right conferred on Extra 303 West, orders must be issued to No. 8 first and then to Extra 303 West. As each operator receives his order he writes it as received and repeats it back to the sender for a check of accuracy.

The preceding paragraphs explain that trains have superiority by <u>right</u>, by <u>class</u>, or by <u>direction</u>. The next discussion presents the types of military trains used in a theater.

## 1.8. TYPES OF TRAINS

The four basic types of trains generally found in a theater are freight, passenger, ambulance, and work trains. Unlike commercial railroads in the United States, the transportation railway service does not normally give passenger trains superiority over freight trains. Moving supplies to support the combat forces in a theater is the primary mission of the TRS. However, when troop movements

| TRAIN ORDER (TM 55-200) | TRAIN ORDER NO. | FROM Port |
|---|---|---|
| | 1 | 30 Nov 19 72 |

TO C & E

No 8 Eng 817

| AT (Station) | X | OPERATOR | TIME |
|---|---|---|---|
| Echo | | | |

TRAIN ORDER

Extra 303 West has right over No 8 Eng 817

Echo to Delta

SAMPLE

| REPEATED | CHIEF DISPATCHER |
|---|---|
| 1015 | MHB |

| MADE | TIME | OPERATOR |
|---|---|---|
| Com | 1016 | Adams |

DA FORM 1 AUG 53 55-203 REPLACES WD AGO FORMS 55-203, 1 MAY 45 AND 55-204, 1 MAY 45, WHICH ARE OBSOLETE. 16—68801-2 U. S. GOVERNMENT PRINTING OFFICE

Train Order for Train No. 8

| TRAIN ORDER (TM 55-200) | TRAIN ORDER NO. | FROM Port |
|---|---|---|
| | 2 | 30 Nov 19 72 |

TO C & E

Extra 303 West

| AT (Station) | X | OPERATOR | TIME |
|---|---|---|---|
| Delta | | | |

TRAIN ORDER

Extra 303 West has right over No 8 Eng 817

Echo to Delta

SAMPLE

| REPEATED | CHIEF DISPATCHER |
|---|---|
| 1018 | MHB |

| MADE | TIME | OPERATOR |
|---|---|---|
| Com | 1017 | Adams |

DA FORM 1 AUG 53 55-203 REPLACES WD AGO FORMS 55-203, 1 MAY 45 AND 55-204, 1 MAY 45, WHICH ARE OBSOLETE. 16—68801-2 U. S. GOVERNMENT PRINTING OFFICE

Train Order for Extra 303 West

Figure 1.2. Train Orders for Hypothetical Division.

take priority over freight movements, a passenger train may be given superiority over freight trains by train order. Also, when the track must be cleared of obstructions or when the line must be repaired, a work train may be given priority over all other trains. The types of trains are discussed in the following subparagraphs.

a. Freight trains are discussed first because of their importance. They carry the bulk of supplies and equipment to support military activities in a theater, and they normally have priority over other rail traffic, except ambulance trains. The two kinds of freight trains are through and local. Through trains carry priority freight and generally go from one terminal to the next without changing consist from origin to destination. Local trains pick up and set off freight and cars at stations along the division.

b. Passenger trains transport personnel, baggage, and mail. The coaches and cars used are those already in the theater. Although passenger or baggage cars are preferred, boxcars, gondolas, and flatcars may be used if necessary.

c. Ambulance or hospital trains, used exclusively for moving the sick and wounded, are usually given first priority in a theater. They are operated as passenger extras when required by the medical command. Each car in the train is conspicuously marked with a red cross and, when so marked, should not be used for anything not connected with the ambulance service.

d. Work trains carry maintenance personnel and equipment, and are used in such operations as laying new track, spreading ballast, and moving wreck crews to the site of derailments. They are authorized by train order to occupy track where their services are required. The time limits are given in the train order and cannot be extended unless a new train order is issued canceling the original one and establishing new limits. When a train accident occurs or the track is blocked, a special type of work train, a wreck train, is sent with equipment to clear the track. This train is authorized by train order and has superior rights.

## 1.9. SUMMARY

The general rules that govern persons involved with the operation of U. S. Army railroads are presented in TM 55-200, Railway Operating Rules. They are an adaptation of the Standard Code of Operating Rules of the Association of American Railroads. Each person whose duties are regulated by the rules in the manual

must be provided a copy of it. He is required to know, obey, and be able to pass an examination on the rules in the manual.

The purpose of all the rules in TM 55-200 is to insure the safe and efficient operation of trains over military railroads. Trains have superiority by right, by class, or by direction established by either train order or timetable. Remember that any train having superiority by class or direction established by a timetable may have that superiority changed by a train order. When one train is given superiority over another by train order, its superiority is by right conferred by the train order.

The four types of trains normally found in a theater are freight, passenger, ambulance, and work trains.



# Chapter 2

# TRAIN MOVEMENT CONTROL

## 2.1. GENERAL

Control of train movements over main lines is a function of headquarters and headquarters company (Hq and Hq Co) of the transportation railway battalion (TRB). Located in battalion headquarters and chief of the train movement section of Hq and Hq Co, the chief dispatcher is directly responsible for the movement of all trains over a division. Because he cannot be on duty constantly, he is assisted by the assistant chief dispatcher and a number of train dispatchers, who, under the chief's direction, issue the train orders.

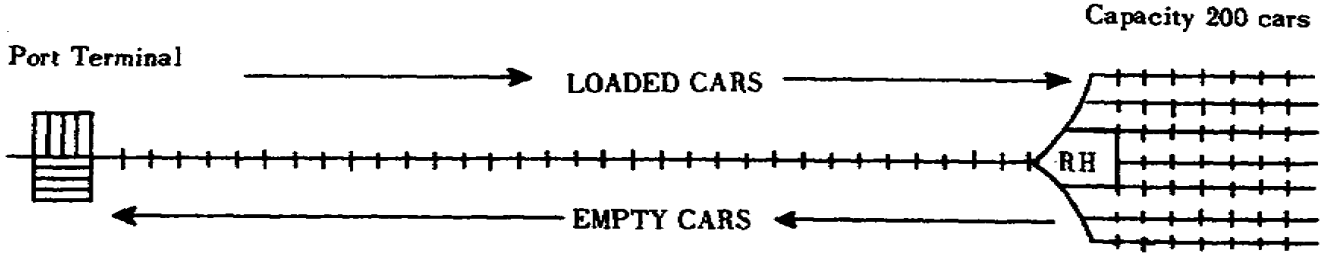
These orders are the tools of the dispatchers' trade in operating a division efficiently. This chapter discusses the four methods of military train operation in a theater: fleet, manual block (hereafter referred to as block), train order, and timetable. Particular emphasis is placed on the rules governing train order and timetable operations. A discussion on the hinds of railway signals and how they are used is also included in the chapter. Finally, an explanation is given on how trains should operate through areas contaminated by radioactivity.

## 2.2. FLEET AND MANUAL BLOCK OPERATIONS

Of the four methods of train operation used by the TRS in a theater--fleet, block, train order, and timetable--the first two are the least flexible. The four methods are generally used in the order mentioned, beginning with fleet operation when theater areas immediately behind the combat zone are unsettled, and progressing to the more flexible and precise timetable operation in stabilized rear areas. The following subparagraphs further discuss the fleet and block methods.

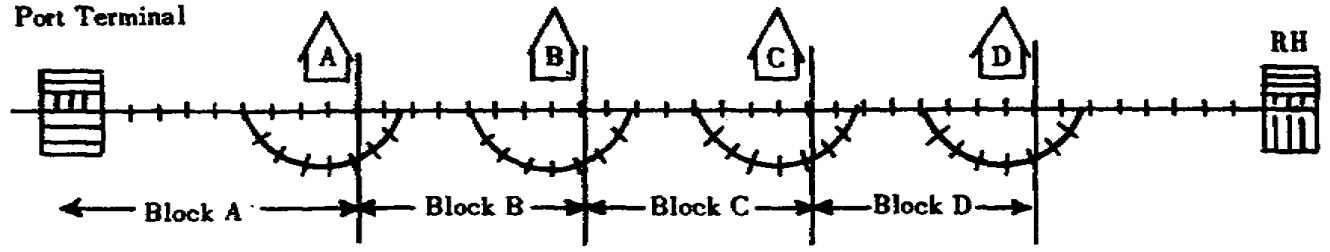
a. Fleet operation. Immediately upon entry into a theater, where there are usually little or no communications and quite often only a single stretch of track with no sidings or passing tracks, fleet operation is used. In military railroading, passing tracks

and sidings are the same. As the inserted sketch shows, in this method, you run loaded trains forward until the tracks at the railhead are full, unload the trains, and return them empty to the port or point of origin. Fleet operation is an emergency measure and should be discontinued as soon as possible. It is limited by the capacity of the railhead, and the grouped trains present a good target for the enemy.




Fleet Operation

b. Block operation. Once sidings or passing tracks are provided but before communications become dependable, block operation is used. In this method, the railroad is divided into blocks with a station at the end of each block, as shown in the inserted sketch. The TRS train-movement operator, or station agent, authorizes each train to enter the block of track under his control. A passing track must be located at each station so that the waiting




Block Operation

train can clear the main line and permit the train occupying the block to meet and pass. Two types of block methods are used: positive and permissive. In positive block, the use of the block is limited to one train at a time. Permissive block operation permits more than one train moving in the same direction to occupy one block of track at one time. The second method is more efficient than the first, but the positive block method has definite security advantages. A train operating under positive block control can stop if it is attacked or the line is obstructed and, if necessary, back up to the last station it passed or to a safe place and wait until the track is

secure before proceeding. With only one train permitted in any one block at a time, it would not be in danger of backing into another train moving up behind it. The positive block method would generally be used in radioactive areas. Train operation in such areas is discussed in paragraph 2.17.

## 2.3. TRAIN ORDER OPERATION

When a reliable communications system is established, and an adequate number of passing tracks and facilities are operational, train order operation is begun. If communications are adequate, it is possible that all train movements in a theater will be made by train order. This method is flexible and efficient; however, in a single-track operation, passing tracks or sidings must be available. Paragraphs 2.4-2.8 discuss the train order in terms of who originates it, how and to whom it is issued, and what it contains; train order rules and forms; clearance form "A"; and the dispatchers' record of all trains moving on the division.

## 2.4. TRAIN ORDER

A train order is the authority for trains not provided for in timetables to move from one point to another on a railway division. It is written on DA Form 55-203, shown in figure 1.2 in paragraph 1. 6 and again in figure 2.1. The order is issued by a train dispatcher by the authority and over the signature of the chief dispatcher, orally, by radio, or by telephone, through a station agent who writes it as received and repeats it back to the sender for a check of accuracy. The written order is handed to passing train crews. Train orders are numbered consecutively each day beginning at 0001 hours; they are in effect until fulfilled, superseded, or annulled. Figure 2.1 shows one issued by a train dispatcher to run an extra train from station Alfa to station Delta on the rail line shown in figure 2.2.

With the train order in figure 2.1 and a Clearance Form "A," explained in paragraph 2.7, Engine 411 is authorized to run as Extra 411 East from Alfa to Delta. It must clear all opposing regular trains and all regular trains moving in the same direction but it may pass second-, third-, and any other inferior-class trains. Additional orders must be issued if it is to meet another extra train. Remember that a train order is in effect until it has been <u>fulfilled</u>, <u>superseded</u>, or <u>annulled</u>. It is always addressed to those who are to execute it: conductors, enginemen, station agents, or anyone who is acting as a pilot; its body must be in the same words to everyone.

| TRAIN ORDER (TM 55-200) | TRAIN ORDER NO. | FROM Quincy 30 Nov 19 72 | |
|---|---|---|---|
| TO C & E<br>Eng 411 | | | |
| AT (Station)<br>Alfa | X | OPERATOR | TIME |
| TRAIN ORDER<br>Eng 411 run Extra Alfa to Delta<br>SAMPLE | | | |
| REPEATED<br>1204 | | CHIEF DISPATCHER<br>MHB | |
| MADE<br>Com | TIME<br>1205 | OPERATOR<br>Simmons | |

DA 1 AUG 53 55-203 REPLACES WD AGO FORMS 55-203, 1 MAY 45 AND 55-204, 1 MAY 45, WHICH ARE OBSOLETE.

Figure 2.1. Train Order No. 1 from Quincy.

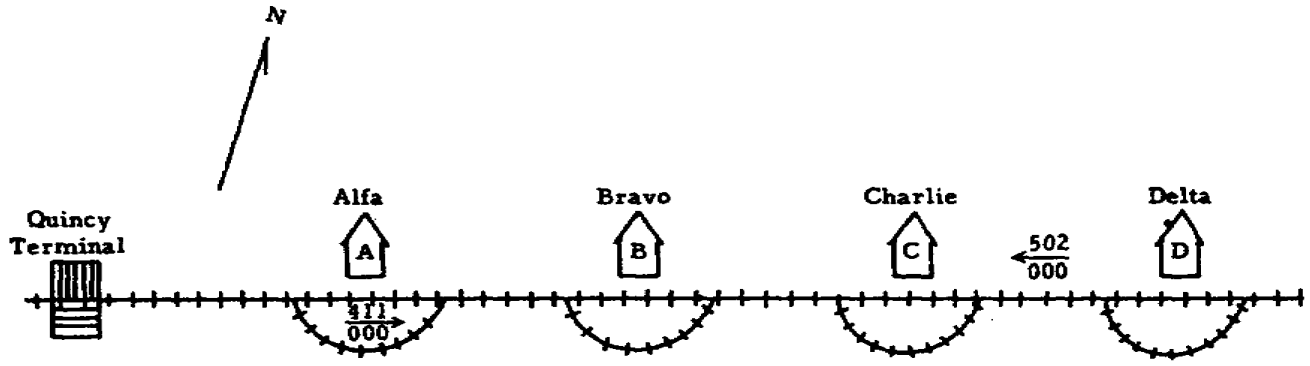
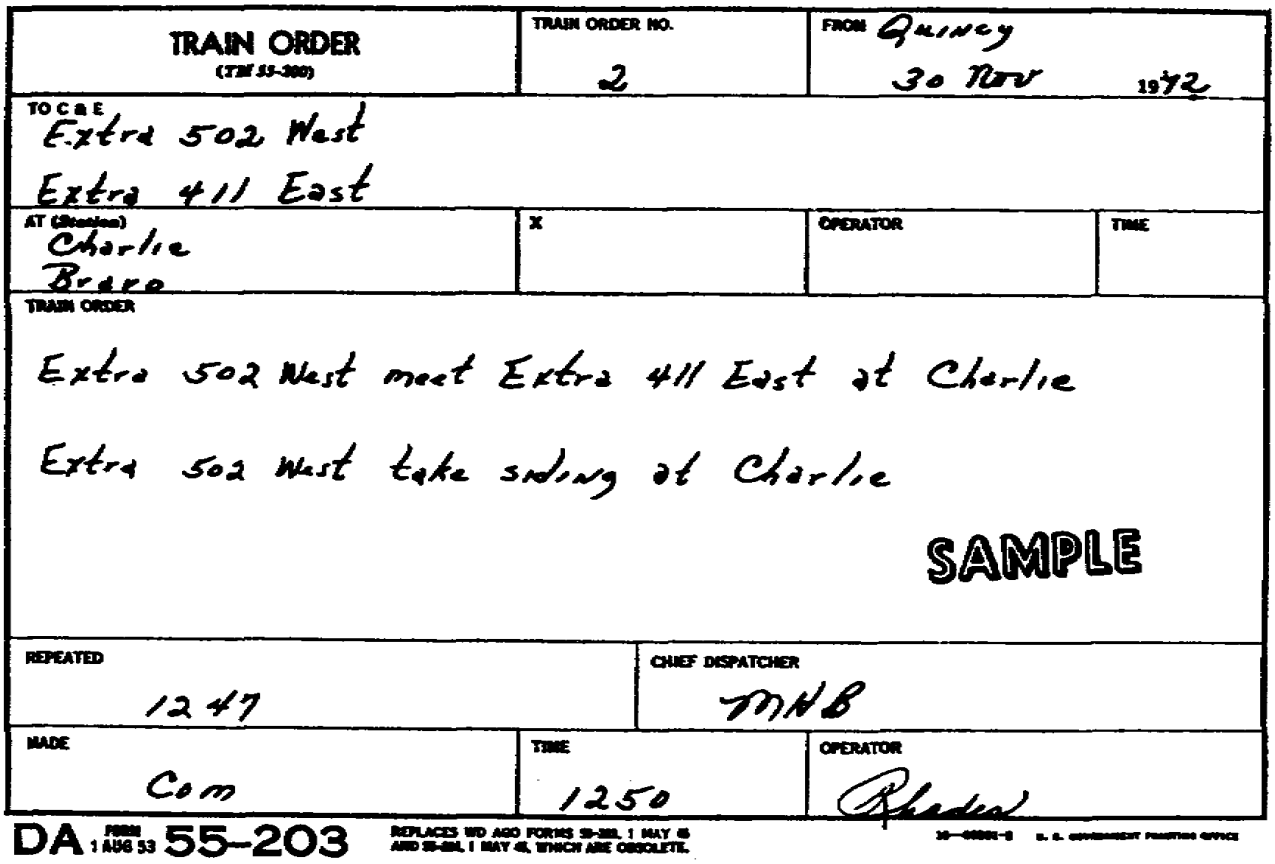



Figure 2.2. Rail Line from Quincy Terminal to Station Delta.

A train order is not effective until it has been repeated and the completed time given by the train dispatcher; it contains only information or instructions essential to the train movements involved; and it must always be clear and concise. To prevent mistakes or misunderstandings, no erasures, alterations, or interlineations are made on a train order, and figures must not be surrounded by brackets, circles, or other characters. Notice that no punctuation is used in the body of the train order.

Train orders not only authorize a train to run as an extra, but they also establish meets between opposing extra trains or change a timetable meet, and they can also give an inferior train right over a superior train. Figure 2.3 is an example establishing a meet between two extra trains on the rail division shown in figure 2.2.



TRAIN ORDER (TM 55-300)

TRAIN ORDER NO. 2

FROM Quincy 30 Nov 1942

TO C & E
Extra 502 West
Extra 411 East

AT (Station) Charlie Bravo | X | OPERATOR | TIME

TRAIN ORDER

Extra 502 West meet Extra 411 East at Charlie

Extra 502 West take siding at Charlie

SAMPLE

REPEATED 1247 | CHIEF DISPATCHER MNB

MADE Com | TIME 1250 | OPERATOR Rhodes

DA FORM 1 AUG 53 55-203 REPLACES WD AGO FORMS 39-38L, 1 MAY 45 AND 39-68L, 1 MAY 45, WHICH ARE OBSOLETE.

Figure 2.3. Train Order No. 2 from Quincy.

When one train has superiority over another, the inferior train must protect itself from the superior one; it must also clear an opposing superior train at any station by at least 5 minutes. Assume that over the same railroad shown in figure 2.2, you want to run an extra train from Alfa to Delta and give it superiority over a regular train listed on the timetable to run from Delta to Quincy. You can issue a train order to both trains, -stating that the extra will not leave Bravo until 0830 hours and will not leave Charlie before 0900 hours. In this instance, the regular train can leave Delta only if it can be in the siding at Charlie by 0855. If it can get into the siding at Bravo before 0825, it can continue to Bravo. Without the train order giving it right over the superior train, the extra train would have the same restrictions placed upon it. It would then have to clear the superior train's schedule at each station by at least 5 minutes.

## 2.5. RULES FOR MOVEMENT BY TRAIN ORDER

The technical manual on railway operating rules specifies rules to be followed in the wording and use of train orders. The following list is not all inclusive, but it does contain those rules pertaining to rail movements by train order directly related to this text. Because the rules are self explanatory, they are quoted directly from TM 55-200.

Rule 200. Delivery of Train Orders. The quickest and most reliable means available will be used for delivering train orders to train crews in the absence of telephone or telegraph communication. Orders delivered in such manner will have the same authority as those delivered by telephone or telegraph.

Rule 201. Procedure.

(1) For movements not provided for by timetable, train orders will be issued by authority and over the signature of the chief dispatcher and will contain only information or instructions essential to such movements.

(2) Train orders must be brief and clear; <u>in the prescribed format when applicable</u>; and without erasure, alteration, or interlineation.

(3) Figures in train orders must not be surrounded by brackets, circles, or other characters.

Rule 202. Identical Wording. Each train order must be given in the same words to all personnel or trains addressed.

Rule 203. Numbering. Train orders will be numbered consecutively each day beginning at 0001 hours. When more than one dispatching subdivision is operated from one office, train order numbers on each subdivision will differ. For example, one subdivision may begin with No. 1 and another subdivision with No. 201.

Rule 204. Addressing.

(1) Train orders must be addressed to those who are to execute them, naming the places at which they are to receive their copies. Those for a train must be addressed to the conductor and engineman and also to anyone who acts as its pilot. A copy for each person addressed must be supplied by the station agent.

(2) Orders restricting the movement of trains which are addressed to station agents must be respected by conductors and enginemen just as if addressed to them.

(3) Train orders, clearances, and check of train register must be shown by the conductor to at least one brakeman and to others, when practicable. They must be shown by the engineman to the fireman and, when practicable, to the forward brakeman. Brakemen and firemen must read and return them; compare their understanding of the orders with the conductor or engineman, calling attention to errors or omissions; and should there be occasion to do so, remind the conductor or engineman of the contents.

(4) When more than one engine is attached to a train, each engineman must be supplied with copies of all orders affecting the movement of the train.

Rule 205. Recording. Each train order will be written in full in a book provided for that purpose at the office of the train dispatcher. With the train order, there will be recorded the time and signals which show when, from what offices, and by whom the order was repeated, and the responses transmitted. The train dispatcher's initials will also be recorded. The records must be made at once and never from memory or memorandums. Additions to train orders must not be made after they have been repeated.

Rule 206. Writing, Transmitting.

(1) In train orders, regular trains will be designated by number, as "No. 2," and sections, as "Second 2," adding the engine number. Extra trains will be designated by engine number and the direction, as "Extra 605 East." Work extras will be designated by engine number, as "Work Extra 611." The initials, as well as the engine number, will be used for the movement of an engine of another railroad. The number of the leading engine will be used when two or more engines are coupled and a designation is made by engine number.

(2) Even numbers such as "1500" hours must not be used in stating time in train orders.

(3) In transmitting and repeating train orders by telegraph, time may be stated only in figures.

(4) In transmitting train orders by telephone, names of stations, sections, and direction of extra trains must be plainly pronounced and then spelled, letter by letter, thus: Dallas, D-a-l-l-a-s; Second, S-e-c-o-n-d; East, E-a-s-t. Order numbers and train, engine and other numbers must first be pronounced and then followed by pronouncing each figure; thus: one hundred five, 1-0-5; twenty-seven fifty-six, 2-7-5-6; except where the number is but one figure when it must first be pronounced and then spelled, thus: one, figure 1, o-n-e. Time must first be pronounced, thus: ten twenty, then spelled, letter by letter, thus: t-e-n t-w-e-n-t-y, followed by plainly pronouncing each figure, thus: 1-0-2-0. The letters duplicating names of stations and numerals will not be written in the order book nor upon train orders.

(5) When train orders are transmitted by telephone, the train dispatcher must write the train order in the train order book as he transmits it and underscore each word and number as repeated by each office. When transmitted by telegraph, the order must be written in the train order book as repeated by the first office and each word and

number underscored as repeated by each succeeding office.

(6) To relay a train order, it must be transmitted in the usual manner to the relaying office. The station agent at the relaying office must transmit the order to destination. The person receiving the order at destination must repeat the order to the station agent at the relaying office, who must underscore on his copy each word and number as repeated. He must then repeat the order to the train dispatcher, by whom "complete" will be given to the relaying operator, who will transmit it to destination. If the order also is addressed to a superior train at the relaying office, the "X" response* must be given before it is transmitted to the inferior train.

(7) Before transmitting an order to a conductor or engineman over a telephone circuit, the person who is about to receive the order must first give his name, train identification, and location.

(8) The "X" response must not be used when handling train orders directly with the conductor or the engineman.

Rule 207. Transmitting Train Orders. To transmit a train order, the dispatcher will state "train order, " and give the direction, to each office called. He will also specify the number of copies required, such as "train order West, copy 5."

Rule 210. Train Order. When a train order has been transmitted, station agents must, unless otherwise directed, repeat it at once from the manifold copy in the succession in which the several offices have been addressed. Each station agent receiving the order must observe whether the others repeat

---

*The "X" response holds a superior train to allow an order for an inferior train to be repeated and completed. This is to avoid unnecessary delay to the inferior train when there is no rush on the order for the superior train. See rule 212.

correctly. When the order has been repeated correctly by the station agent, the response "complete," and the time, with the initials of the chief dispatcher will be given by the train dispatcher. The station agent receiving this response will then write in the space provided on the order the abbreviation "corn," the time, and his last name in full. He will personally deliver a copy to each person addressed without taking his signature. When delivery to an engineman will take the station agent from the immediate vicinity of his office, the engineman's copy may be delivered by a member of the crew or the fireman.

Rule 212. "X" Response. When so directed by the train dispatcher, a train order may be acknowledged before repeating, by the station agent's responding: "(number of train order) to (train number), X," with the station agent's initials and office signal. The station agent then must write his initials on the order and the time in the space provided.

Rule 221. Train Order Signals and Clearance Form "A," DA Form 55-200.

(1) Unless otherwise provided, a fixed signal must be used at each train order office. The signal will indicate "stop" where there is a station agent on duty, except when changed to "proceed" to allow a train for which there are no train orders to pass. If the station agent does not hold an order for an approaching train, unless otherwise directed he must clear the signal after the train has reached a point from which the signal can be seen plainly by the engineman. After having been cleared for a train the signal must be restored to "stop" position as soon as practicable after the rear of the train has passed.

(2) When the signal indicates "stop," the train will not proceed without a Clearance Form "A," DA Form 55-200, except to do station work or enter a siding after proper understanding with the station agent. Until it has been ascertained that the train is not to receive a train order which restricts the train

at that point, it must not pass the fouling point of the switch at which an opposing train lay enter the siding.

(3) Station agents will have the proper appliances for hand signaling ready for immediate use if a fixed signal should fail to work properly. If a signal is not displayed at a night office, trains which have not been notified will stop and ascertain the cause and prepare a narrative report of the facts to the train dispatcher from the first available point of communication.

(4) Before delivering train orders, station agents must carefully read the address of each order and fill out Clearance Form "A, " DA Form 55-20 entering thereon, without alteration or erasure, the number of orders for the train and the number of each order. The station agent will transmit the address and order numbers from the clearance form to the train dispatcher, who will check the correctness thereof against his record in the train order book. The dispatcher will give OK, time, and initials of the chief dispatcher, and make proper record. The station agent will enter this information on Clearance Form "A," DA Form 55-200, after which the clearance, together with all train orders will be delivered to the train.

(5) When means of communication have failed, Clearance Form "A," DA Form 55-200, may be issued by the station agent without the dispatcher's OK, provided he has no train orders for the train which have not been made "complete."

(6) When a clearance is received by a train, the conductor and engineman must know before leaving that the numbers shown correspond with the orders received and that all information required on the clearance form is properly shown.

(7) Outside of automatic block system limits, station agents must space trains moving in the same direction 10 minutes apart. The train order signal and clearance will be used for this purpose.

When necessary to space trains in this manner the time the following train win be permitted to proceed must be shown on the clearance form in the space provided for that purpose. The conductor and engineman must respect that time.

Rule 223. Signal; Abbreviations. The following signals and abbreviations may be used in train orders:

(1) Initials for the signature of the chief train dispatcher.

(2) Such office and other signals as are authorized.

(3) The usual abbreviations for the names of the months and stations.

(4) C&E--Conductor and engineman.

(5) Con--Complete.

(6) Condr--Conductor.

(7) Dispr--Dispatcher.

(8) Dist--District

(9) Div--Division.

(10) Eng--Engine.

(11) Engmn--Engineman.

(12) Frt--Freight.

(13) Jct--Junction.

(14) Mins--Minutes.

(15) MP--Milepost

(16) MPH--Miles per hour.

(17) No--Number.

(18) Opr--Operator.

(19) OS--Train report.

(20) Psgr--Passenger.

(21) SD--"Stop displayed."

(22) Sec--Section.

(23) Subdiv--Subdivision.

(24) X--Train will be held until train order is made "complete."

2.6. FORMS OF TRAIN ORDERS

The following two forms of train orders illustrate their use in fixing meeting points for opposing trains and in the operation of extra trains. In the Form S-A order, the prefix S stands for single track.

a. Form S-A. Fixing Meeting Points for Opposing Trains.

(1) The following examples illustrate Form S-A train orders.

(a) No 1 Eng 904 meet No 2 Eng 900 at B

(b) No 3 Eng 701 meet Second 4 Eng 712 at B

(c) No 7 Eng 901 meet Extra 611 East at B

(d) Extra 709 East meet Extra 397 West at B

(e) No 2 Eng 900 and Second 4 Eng 712 meet No 1 Eng 904 and No 3 Eng 701 at C and Extra 612 West at D

(f) No 1 Eng 908 meet No 2 Eng 909 at B Second 4 Eng 905 at C and Extra 624 East at D

(2) These examples may be modified by adding:

(a) No 1 hold main track at B

(b) Extra 624 East hold main track at D

or

(c) No 2 take siding at B

(d) No 1 take siding at D

(3) When a train is designated to hold the main track or to take siding at a meeting point, such provision applies only to that order and to trains designated.

(4) Trains receiving these orders will run with respect to each other to the designated points and there meet in the manner prescribed by the rules.

b. Form G. Extra Trains. The following examples illustrate train orders for extra trains.

(1) Eng 99 run Extra A to F

(2) Eng 99 run Psgr Extra A to X

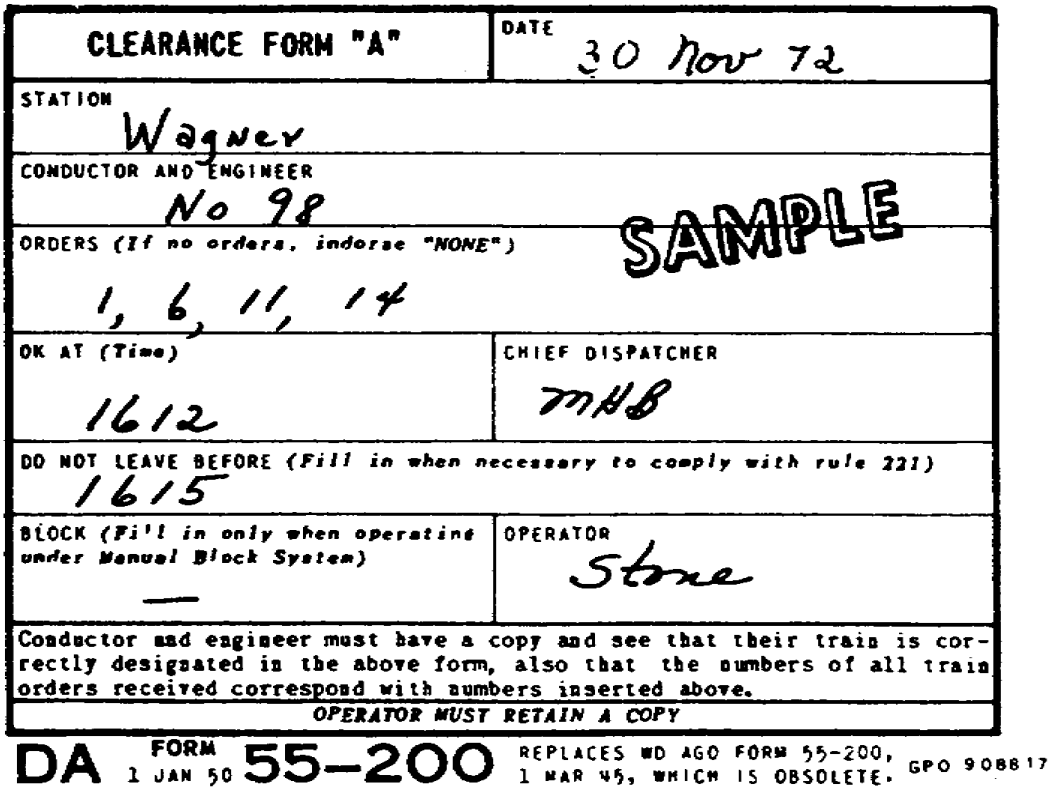
(3) Eng 99 run Extra A to F and return to C (The extra must go to F before returning to C)

2.7. CLEARANCE FORM "A"

When a train has been stopped at a train order station to receive a train order, it must not proceed without a Clearance Form "A," DA Form 55-200, except to do station work or enter a siding, after a proper understanding is obtained with the station agent. The information entered on the form, illustrated in figure 2.4, must be without erasures or alterations. The number of orders for the train and the number of each order must be entered on the form and checked with the train dispatcher to see if they are identical with those entered in his record in the train order book. The dispatcher gives the station agent the OK, time (time that the clearance form was checked for accuracy), and initials of the chief train dispatcher. He then makes a record of the clearance in his book. The station agent enters the information received on the Clearance Form "A" and then the clearance along with all train orders are given to those who are to execute them.

The conductor and engineman must know before leaving that the numbers shown on the clearance correspond with the orders received and that all information required on the clearance form is

properly shown. Notice in figure 2.4 that a space headed "do not leave before" is provided on the form. This space can serve many purposes, but probably the most important one is the spacing of trains. By designating the time the train should leave, the dispatcher controls the distance and time between trains.


CLEARANCE FORM "A"

DATE 30 Nov 72

STATION Wagner

CONDUCTOR AND ENGINEER No 98

SAMPLE

ORDERS (If no orders, indorse "NONE")

1, 6, 11, 14

OK AT (Time) 1612

CHIEF DISPATCHER MHB

DO NOT LEAVE BEFORE (Fill in when necessary to comply with rule 221) 1615

BLOCK (Fill in only when operating under Manual Block System) —

OPERATOR Stone

Conductor and engineer must have a copy and see that their train is correctly designated in the above form, also that the numbers of all train orders received correspond with numbers inserted above.

OPERATOR MUST RETAIN A COPY

DA FORM 1 JAN 50 55-200 REPLACES WD AGO FORM 55-200, 1 MAR 45, WHICH IS OBSOLETE. GPO 908817

Figure 2.4. Clearance Form "A."

Throughout this text the dispatcher is mentioned. In fact, he is the key to the success and efficiency of train operations on his division. There is only one chief train dispatcher and he cannot be on duty constantly; therefore, he is assisted by a number of train dispatchers who report on and off duty throughout the day and have the same authority over train movements as the chief dispatcher while they are on duty. To insure that a clear picture of what is actually taking place on the railroad can be given at any time, an up-to-the-minute record is kept of all train movements on the main line of the division. The following paragraph discusses this record.

## 2.8. DISPATCHERS' RECORD OF TRAIN MOVEMENTS

All trains move either east and west or north and south. The Dispatchers' Record of Train Movements, also called the train sheet, lists trains moving west or south on the left and those moving east or north on the right. A copy of the dispatchers' record is shown as

annex A. This record is used for a 24-hour period, beginning with a new sheet at 0001 hours and terminating at 2400 hours each day. It is kept in the dispatcher's office. Each train dispatcher signs his name at the upper left corner, and makes note of the time he works as dispatcher. As this portion of annex A shows, R. M. Muske was the dispatcher on duty from 0001 hours to 0800 hours; he was followed by B. K. Kanoles from 0800 hours to 1600 hours and by L. Cosgrove from 1600 hours to 2359 hours. Tie transportation railway battalion number, the place, and the date are entered near the top of the sheet in the space provided. In the upper right corner are entered the name of the battalion commander and the chief dispatcher. This sheet gives an up-to-the-minute picture of what train movements are taking place on the main line of the entire rail division at any given time.

Immediately above the list of stations are squares to record the time the crew reported for duty and the time they were relieved. Look at annex A and observe that the crew for Extra 2020 East reported for duty at 0100 hours, leaving Nitsu at 0130 hours and arriving at Uozu at 0615 hours. The double diagonal line in the time relieved square means that the crew did not get off duty at the end of that run. Now look at the westward section; this same crew made the return trip on passenger Extra 2032 West. They arrived at Nitsu at 1032 hours and were relieved from duty at 1100 hours.

A record of the weather along the division is kept in the lower right corner if the sheet. This information is gathered and recorded four times each day by the dispatcher. Cold weather accompanied by ice, snow, or high winds reduces the tonnage a locomotive can pull over a division; if the weather is severe, the tonnage of trains must be reduced to maintain speed.

Notice in annex A that the names of the stations on the rail line are listed in the center column. On the left of it, the distance is listed and numbered from the point of division origin to the end of the division, given in the superior direction. To the right of the station column, the siding capacity of each station is listed. This information is particularly important on a single-track line where trains must meet and pass, because trains should not contain more cars than the sidings can hold if they are to clear the main line and allow other trains to pass. The top line running horizontally across the sheet is headed "train symbol." The number or symbol is given of each train running during the period covered by the record. Regular trains are listed in the blank columns beginning nearest the three center columns and extending outward in the order of their departure times. In military train operations, however, regular trains

are seldom run. Extra trains are listed outside the regular trains in their departure-time sequence. To the immediate right of the reporting time of a train at a station is listed the amount of tonnage of a freight train, and also the number of loaded and empty cars in a train. On the train sheet in annex A, these figures are listed at the train's initial station and at other stations where changes take place.

The contents and destination of loaded cars must also be shown. In annex A, this information is given in the lower section of the sheet. Extra 2065 West, for example, contains 28 cars loaded with empty 55-gallon drums destined for supply point (SP) 7 at Nitsu. Extra 2020 East contains 28 loaded cars, 15 of which are loaded with class I (C-I) supplies destined for SP 10 at Odate and the other 13 with class V supplies for SP 22 at Akita.

Entered to the left of the station column, arrival and departure times of trains moving west or south are read down (from top to bottom); those moving east or north, entered to the right of the station column, are read up (from bottom to top). For trains moving west or south, the arrival time at each station is shown in the upper square and the departure time in the lower square. The reverse is true for trains moving in the opposite direction. If a train does not stop at a station, only one time is shown; it is recorded by writing the time in large figures over both the arrival and departure squares.

Delays are recorded on the back of the train sheet; however, they are shown on the front in annex A for convenience.

## 2.9. TIMETABLE OPERATION

When traffic in the theater is fully stabilized, the timetable method of operation may be used. As with the train order operation, a reliable communications system must be established and an adequate number of passing tracks and facilities must be operational. While the timetable operation is the most desirable of the four methods, it must be used in conjunction with the train order method. The majority of military train operations normally consist of extra trains not shown in timetables; however, military railway personnel must be familiar with the timetable operation.

A timetable is the operating authority for the movement of regularly scheduled trains. Any member of the TRS whose duties are affected by the timetable must possess a copy of the current one and carry it while on duty. Its two principal parts are the classified schedule and the special instructions. Paragraphs 2.10 through 2.13

discuss these two parts, some of the rules governing makeup and use of the timetable, and the authorized abbreviations that may appear on it. First, however, the following subparagraphs explain some of the important aspects of the application of timetable rules.

a. When timetables take effect. The effective date of a timetable is listed on it, and at 0001 hours on that date that timetable supersedes the previous timetable. All trains operating on schedules not provided for in the new timetable will secure valid authorization from the dispatcher to continue their runs and go as extra trains.

b. Schedules. If a train running late will tie up the railroad or create a safety hazard, a train order is issued to each train affected by the running of the late train, designating how late it will be at each station on the line. The rules of train superiority will be in effect throughout the run of the late train. It will keep its same class unless a train order is issued annulling its schedule. When a train is running so late that it affects the entire rail line, its schedule may be annulled by train order. After a schedule is annulled, the train can then move to its destination as an extra.

c. Times. The timetable schedule lists all regular trains by number, class, and direction, gives the leaving time for each at the original station, and gives the arrival time for each at its final destination. When a train leaves a station, the schedule for that train is in effect.

d. Train meeting and passing. On a single-track division, most trains meet and pass at designated stations. These stations are shown on the timetable in full-faced type (darker and heavier type than that used elsewhere in the body of the timetable). When one or more trains are to meet or pass another train at a station, their numbers are shown in small type beside the meeting or passing time.

e. Timetable changes. Changes to the timetable are made by issuing a new timetable, by timetable bulletin, or by train order. When minor or temporary changes to the timetable are necessary, a timetable bulletin is issued or a train order is given. Generally, a bulletin makes changes in the special instructions; train orders make changes in the scheduled movement of trains. If, for example, the speed limit over a certain section of the division needs to be reduced for safety from 55 kph to 30 kph, this change to the special instructions of the timetable is made by a timetable bulletin. On the other hand, if the schedule of one regular train needs to be annulled

for one day and an extra train authorized to run instead, this change to the timetable is made by train order. If there are many permanent changes, a new timetable is usually issued.

## 2.10. TIMETABLE RULES

The rules discussed in this paragraph are taken from the technical manual on railway operating rules. The numbers correspond to the rule numbers in TM 55-200. Only the rules that directly pertain to the timetable and its application are included; this accounts for the seemingly odd appearance of the second-order subparagraph numbers.

a. Rule 4. Timetable.

(1) Each timetable, from the moment it takes effect, supersedes the previous timetable. All trains operating on schedules not provided for in the new timetable will secure valid authorization from the dispatcher to continue their runs and do so as extra trains.

(2) Schedules on each division or subdivision date from their initial stations on such division or subdivision.

(3) Not more than one schedule of the same number and day shall be in effect on any division or subdivision.

(4) Notice of a new timetable or supplement will be bulletined at least 24 hours before the time it is to take effect. During a period commencing at least 24 hours before and continuing until 6 days after a new timetable or supplement becomes effective, notice by train order must be delivered to all trains at their initial stations.

(5) Receipts of a new timetable or supplement must be secured from all personnel in train, engine, or yard service.

(6) Bulletin boards or books will be provided at stations designated by timetable. Timetable bulletins will contain only information or instructions relating to the rules or the movement of trains. They supersede special instructions in the timetable or any rule or regulations in this manual with which they conflict.

(10) Timetable bulletins will be issued by authority and over the signature of the superintendent and will be numbered consecutively during the effectiveness of each timetable. In addition to the bulletin number, they will bear the number of the current timetable.

b. Rule 5. Train Time.

(1) Not more than two times are given for a train at any station: where one is given it is, unless otherwise indicated, the leaving time; where two are given they are the arriving and the leaving time.

(2) Unless otherwise indicated, the time applies at the switch where an opposing train enters the siding. Where there is no siding, it applies at the place from which the train-order signal is operated; where there is neither siding nor train-order signal, it applies at the location of the station sign.

(3) Schedule meeting or passing stations are indicated by figures in full-faced type.

(4) Both the arriving and leaving time of a train are in full-faced type when both are meeting or passing times, or when one or more trains are to meet or to pass the train between those times.

(5) Where one or more trains are to meet or pass a train at any station, their numbers are shown in small type beside the meeting-or passing time.

c. Rule 82. Schedule Duration. Timetable schedules, unless fulfilled, are in effect for 12 hours after their time at each station. Regular trains more than 12 hours behind either their scheduled arriving or leaving time at any station lose both right and schedule, and thereafter can proceed only as authorized by train order.

d. Rule 92. Leaving Time. A train must not leave a station in advance of its scheduled leaving time.

## 2.11. AUTHORIZED TIMETABLE ABBREVIATIONS

Symbols just before a train's time on the classified schedule page indicate the following:

L - Leave.

A - Arrive.

s - Regular stop.

f - Flag stop to receive or discharge traffic. (Train stops at flag stations listed on its schedule only if flagged.)

The following symbols appearing at the left of the station names indicate:

TO- Train-order office. (Train orders are given to crews at these stations.)

R - Train-register station. (All trains must stop, and the conductor of each train must sign the train register and also indicate that he has read the bulletin board and checked the signals or markers on his train. The superintendent's bulletins are posted at these stations, and all train operating personnel are required to read them. This insures that they are aware of any new information that might affect the operation of their trains.)

When the following symbols are placed at the far left of the timetable classified schedule page, they indicate:

W - Water station.

C - Coal station.

O - Fuel oil station.

I - Interlocking.

T - Turntable.

Y - Wye, or turning track. (A place where trains may reverse direction.)

P - Telephone.

## 2.12. CLASSIFIED SCHEDULE

The classified schedule page of a timetable, illustrated in figure 2.5, gives the time schedules for all regular trains for a rail line by class, direction, and number. Notice that the schedule is divided by a column headed Timetable No. 7 effective 30 Sep 1972. Immediately below this heading, the names of all the stations on the line are listed.

The classified schedule page shown in figure 2.5 is for a very small hypothetical railroad (15 kilometers). It is used in this text for explanatory purposes because it contains all the items that require explanation. Normally, a classified schedule would include all items for an entire railway division.

For scheduling, all trains run in four directions only: north, south, east, and west. Any single rail line is designated either east-west or north-south. This particular schedule is for an east-west line with all regular trains going west listed on the left of the column of station names, and all regular trains going east listed on the right of it. If the schedule were for a north-south line, all southbound trains would be on the left and all northbound trains on the right. Always read the left side of a timetable classified schedule page from top to bottom and the right side from bottom to top.

To further explain the classified schedule in figure 2.5, examine the horizontal line containing Lane station from left to right. The symbols in the extreme left column show that at this station there are water and fuel oil facilities, and also a telephone. Two westbound trains leave Lane each day: No. 207 at 0945 and No. 1 at 0750. Lane is a train-order and train-register station, and three eastbound trains arrive there daily: No. 6 at 1045, No. 208 at 0900, and No. 410 at 1400. The station symbol is LA, and a rail yard is located there.

Look again at figure 2.5. Notice that there are two first-class trains and one second-class train scheduled to run west each day. Four trains are scheduled eastbound each day: two first-class, one second-class, and one third-class. The time schedule for each train is listed in a separate column. Look at the horizontal line

| WESTWARD | | | | | | | | EASTWARD | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SECOND CLASS | | FIRST CLASS | | TIMETABLE No. 7 Eff 30 Sep 72 | FIRST CLASS | | SECOND CLASS | THIRD CLASS | Distance From Lane (Kilometers) | Station Symbol | Passing Track Capacity In Cars (44-foot) | |
| 207 Lv. Daily | | 5 Lv. Daily | 1 Lv. Daily | STATIONS | 2 Lv. Daily | 6 Lv. Daily | 208 Lv. Daily | 410 Lv. Daily | | | | |
| WO P | L 0945 | | L 0750 | TO R Lane | | A 1045 | A 0900 | A 1400 | -- | LA | Yd. | |
| P | 0950 | | f 0755 | TO Lewis | | f 1038 | 0852 | s 1355 | 1.6 | LE | 24 | |
| P | 0945 | | f 0801 | TO Howard | | f 1034 | 0845 | 1336 | 3. | HO | 30 | |
| P | - - - - | | - - - - | Sunbrook | | - - - - | - - - - | - - - - | 6.3 | -- | -- | |
| P | 0958 | | f 0806 | Hubbard | | f 1030 | 0840 | 1332 | 7.9 | HU | 42 | |
| YP | s 1025 6 | | s 0813 | TO Queen | | f 1025 207 | 0835 | s 1335 | 9.9 | QN | 37 | |
| P | 1037 | L 0903 | A 0823 208 | TO Ramsey | A 0937 | L 1017 | 0823 1 | 1259 | 11. | RM | 27 | |
| IY P | 1042 | 0908 | | Wye Tower | 0932 | | 0817 | 1252 | 13.5 | WY | -- | |
| BW OP | A 1045 | A 0910 | | TO R Franklin | L 0930 | | L 0815 | L 1250 | 15. | FR | Yd. | |

Figure 2.5. Classified Schedule Page.

containing Queen station, and note that trains number 6 and 207 are scheduled to meet at 1025 hours. Just to the right of the schedule for eastbound train No. 410, columns list the distance in kilometers from Lane station, station symbols used for easier communications, and passing track capacities at each station given in the number of 44-foot cars the tracks will hold. The letters above the station names and those in the extreme left column of the timetable are authorized timetable abbreviations. They are explained in paragraph 2.11.

2.13. SPECIAL INSTRUCTIONS

Now that you are familiar with the classified schedule and some of the rules that govern timetables, we are ready to discuss the special instructions part of a timetable.

In addition to the classified schedule, the timetable also contains special instructions to operating personnel for the particular division affected by the timetable. The special instructions supersede the railway operating rules in TM 55-200 if they conflict. The following subparagraphs give and explain some examples of special instructions.

a. Speed restrictions. The maximum authorized speeds for train movements over main lines; on sidings, spurs, and turnouts; and on all tracks within yard limits are given in the special instructions.

b. Direction superiority. In explaining the superiority of trains, chapter 1 states that trains are superior by right, class, or direction. The superior direction for any division is established by and stated in the special instructions of the timetable.

c. Location of standard clock. The traditional gold watch carried by railroad men and the pride they take in its accuracy is no joke. In no other mode of transportation is time more important than in railroading. Because of the efficiency with which railroads operate, they have established a record of dependability that is unmatched by other modes. With standard clocks located at key points on rail lines, and their locations noted in the special instructions, all railway personnel can check and set their watches; this gives a standard time for the entire railroad.

d. Signal indications. Not all railroads have the same type of signal systems nor are they used in the same way. The special

instructions state what the signals mean and how they are to be used; this contributes to the TRS capability of operating any railroad anywhere in the world.

e. Interchange operations. At the beginning and end of a rail division, cars must be interchanged with other divisions. The special instructions give specific information governing interchange operations.

f. Close clearances. An important limitation on any road is the amount of clearance between rail equipment and such structures as loading platforms, bridge rigging, and tunnel walls and ceilings. Not only are these clearance instructions important for safety, but they determine the type of equipment that can be used and how the equipment is loaded.

g. Special safety instructions. The operating rules are specially designed and worded to insure safety of both personnel and equipment. However, a particular rail division may have hazards not normally present in railroading, and instructions to insure the safety of operations must be issued. These are also shown in the special instructions.

h. Speed table. The speed table gives traveling time in minutes and seconds per kilometer, in terms of kilometers per hour. For example, a train moving at 25 kilometers per hour takes 2 minutes and 24 seconds to travel 1 kilometer. The speed table is for information only and does not authorize exceeding the speed restrictions discussed in the preceding subparagraph a.

## 2.14. RAILWAY SIGNALS

Train movements cannot be made safely without a thorough knowledge and understanding of adequate railway signal systems. Since automatic block signals are highly vulnerable to continued damage and sabotage in a theater of operations, this discussion is limited to the basic color fixed signals that could possibly be used in a stabilized rear area operation.

The next two main paragraphs discuss some of the more important signals that affect train movements. First, the classification signals and markers are explained. Even though markers are not signals as such, they do convey information about the train to operating personnel. Then a discussion of fixed signals is presented explaining their positions and colors, and also certain devices used by operating personnel to signal other personnel.

## 2.15. CLASSIFICATION SIGNALS AND MARKERS

When flags by day and in addition lights by night are placed on the front of the engine, they are called classification signals, and are used to show what type of train it is. When flags by day and in addition lights by night are placed on the rear of a train, they are called markers. Every type of train must display markers to qualify as a train and to show that the train is complete.

a. Train classification signals. A regular train displays no classification signals in front unless it is being run in sections. The first section of a regular train displays green flags by day and, in addition, green lights by night on the front of the locomotive as shown on the right in figure 2. 6. Each section carries these same classification signals except the last section, which carries none. For example, if a train is being run in three sections, the first two sections display the appropriate green classification signals, and the last section runs as a regular train showing no classification signals in front. If there are only two sections, the first displays the green classification signals, and the second does not. Extra trains are not run in sections.

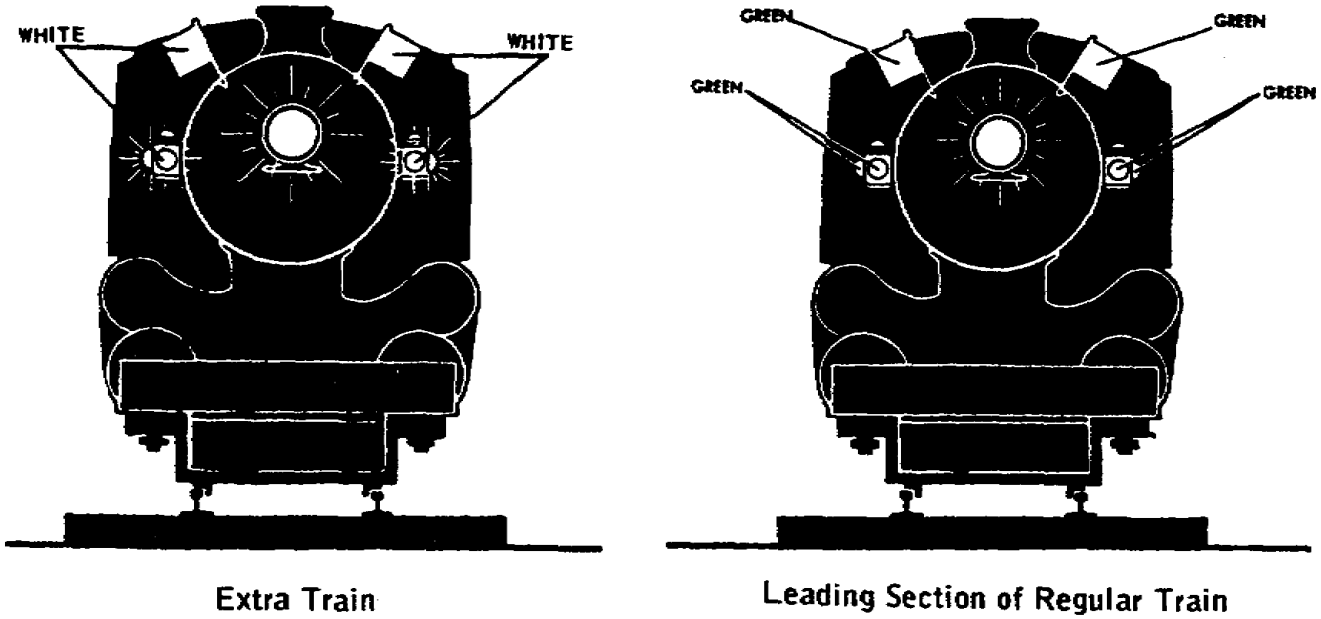



Figure 2.6. Train Classification Signals.

An extra train always displays white classification signals on the front of the locomotive as shown on the left in figure 2.6. White flags are used during daylight in addition, two white lights are used by night.

b. Markers on the rear of trains. Markers are displayed on the rear of all trains. Because train operation in a theater usually takes place on single-track main lines, the discussion of train markers is confined to single-track operation. The markers, shown in figure 2. 7, are red and green flags used by day and red and green lights by night. When red lights are displayed on the rear, it means that the main track is obstructed. A following train must approach at reduced speed. When a train is in the siding clear of the main track with the switch lined for a through main line movement, it displays green flags by day and, in addition, green lights by night on the last car of the train. A single engine authorized by train order to run as an extra train must display white classification signals on the front of the engine and markers on the rear.

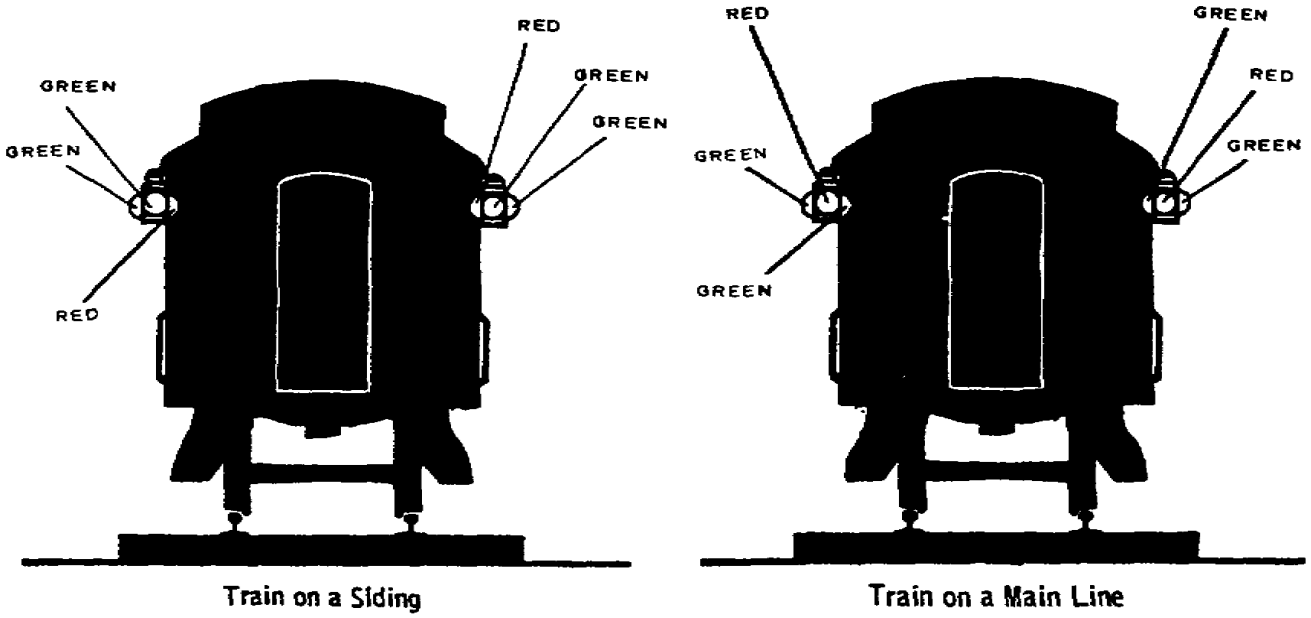



Figure 2.7. Rear Markers for Trains.

2.16. FIXED SIGNALS

In chapter 1, fixed signals are defined as any signals of fixed location that affect the movement of a train or engine. They may be many sizes and shapes, but three basic fixed signals are commonly found: semaphore, color light, and position light. Aspects of fixed signals are shown by the position of semaphore arms, color of lights, position of lights, or a combination of color and position of lights.

a. The semaphore, shown in figure 2.8, consists of an arm or Made, secured by a movable mechanism to a vertical pole or mast. When the arm is straight up, in a vertical position, a train

may proceed. When it is straight out from the post horizontally, the train must stop. The position of the signal between straight up and straight out, approximately a 45° angle, means that the train may proceed with caution and at a reduced speed. If the signal is in any other than the three named positions, the train must stop. A signal imperfectly displayed or the absence of a signal at a place where a signal is usually shown must be reported promptly to the train dispatcher. This measure protects against defective signals endangering the movement of trains. During nighttime operations, the semaphore also has lights that can be seen as the arm is raised or lowered. The appearance of these lights at night is also shown in figure 2.8.

b. The color light signal has three lights of different colors: red, yellow, and green. It is similar to traffic-control lights at street intersections. An example of this signal is shown in figure 2.8 also. When the light is red, the train must stop. A green light means that the train may proceed; the yellow light permits it to proceed at a reduced speed and with caution. As a safety precaution, two or more lights burning at the same time or all lights out mean stop.

c. The position light signal is used rather extensively throughout the world today. This type of fixed signal is likely to be present in a theater of operations. Yellow lights arranged in a circular pattern around a central light burn in rows representing semaphore-arm aspects. Thus, as shown in figure 2.8, a vertical row means proceed; a horizontal row, stop; and a diagonal row, proceed with caution and at reduced speed. With this signal, it is the position of the lights rather than the color that denotes the indication. Again, any combination of lights in positions other than those stated above means stop.

As an additional safety precaution, the engineman and the head brakeman observe the signals as they are approached, and both state the meaning they convey. For example, as a train approaches a signal indicating proceed, the engineman says "signal up" or "green board, " and the head brakeman looks at the signal and repeats what the engineman has said. This is a double-check for safety. Also, if for any reason the engineman should become disabled, the brakeman knows the status of the last signal the train passed.

d. Color signal indications are standard for all railroads. The results that can occur from failure to comply with signals are so bad that railroaders learn the signals early and unfailingly comply

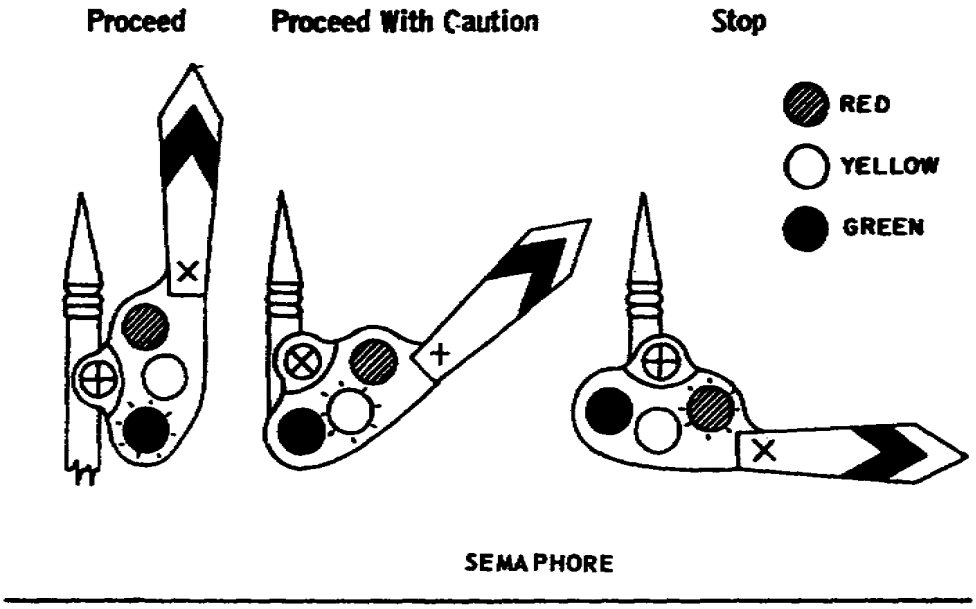



Figure 2.8. Fixed Signals.

with them. Not only does the position of a signal give information to a railroader, but the color of the signal also has specific meaning. The following list gives standard color indications for all railroads:

red.....stop.

yellow.....proceed at restricted speed, and other uses prescribed by the rules.

green.....proceed, and for other uses prescribed by the rules.

green and white.....flag stop.

blue.....protect workmen.

purple.....stop (indication for siding derails).

These colors may be displayed in different ways or by different devices. For example, a yellow disk denoting a zone of restricted speed may have the authorized speed printed on it in black numerals. A blue metal disk on a portable stand by day, or a blue lantern or blue light by night, is used as a signal by maintenance men. It is displayed at one end or at both ends of an engine, car, or train to show that workmen are under or about it. No one except the person placing the sign in position can remove it. A green and white signal near the right-of-way on an approach to a station means that the station is a flag stop. If no signal appears at the station, the train may continue without stopping.

## 2.17. OPERATIONS IN RADIOACTIVE AREAS

The discussions presented so far have covered the conduct of railway personnel and the operation of railroads that proved effective in such conventional warfare as that of World War H and the Korean War. However, should nuclear weapons be used in a theater of operations, large areas would be contaminated by radiation. This paragraph explains how railroads may be operated in areas where nuclear weapons have been used.

To the untrained, the thought of nuclear warfare may be overwhelming. The use of nuclear weapons to him is so awesome that he thinks no further than the initial blast--destruction is final and complete. Such thinking is unfortunate; many people would probably survive and definite plans should be made to enable them to recover and

to continue worthwhile living. In a theater of operations, combat forces undoubtedly will still be in action after a nuclear explosion, and the problem of their logistical support is even greater than before but it is not insurmountable.

Results of nuclear testing show that, although railroads and rail equipment are exceedingly vulnerable to the initial blast, operations in and near the blast area may be resumed surprisingly soon. Precautions must be taken to insure that transportation railway service personnel are able to continue their duties after nuclear explosions in a theater. The battalion commander specifies an operation exposure guide for nuclear radiation. The information needed by the unit monitor for operation through radioactive-contaminated areas is based on this guide, on individual unit history of cumulative past exposure, and on information in Field Manual (FM) 3-12. The general methods and procedures given in the following subparagraphs are usually sound for rail operations in areas where radiation is present.

a. Delaying trains. The movement of trains through a radioactive-contaminated area should be delayed as long as possible without jeopardizing the railway mission. The longer the delay after an area has become contaminated, the smaller the amount of radiation. When necessary to move trains through contaminated areas, they should proceed rapidly and avoid any stops, delays, or train meets whenever possible. The method of operation normally best suited for these requirements is the positive block method described in subparagraph 2.2b, but the fleet method explained in subparagraph 2.2a may be used. The former method is the more efficient.

b. Protecting men. Maximum effort must be made to protect passengers and operating personnel from radiation. Overexposure to radioactivity must be avoided. Unless absolutely necessary, no passengers should be moved through a contaminated area, but when it is necessary, both they and the operating crews must be protected from overexposure. The best and most reliable crews should be chosen, and a team to monitor radiation dose rates should make the trip. Decontamination teams should be trained in each of the railway operating platoons so that the decontamination process for personnel and equipment can take place as soon as possible after a run through a contaminated area. If platoons lack the capability for this process, additional assistance should be obtained through higher headquarters. The train crews should be alternated constantly to prevent overexposure to radioactivity from successive trips.

c. Using protective equipment. Rail equipment offers considerable protection from radiation because of its construction. Additional protection can be provided by adding sheet metal to the bottoms, sides, and tops of wooden railway cars. If this material is not on hand, a good field expedient such as sandbags can be used to cover the floors and sides of equipment. The thickness of one sandbag generally reduces the radiation count by one-third. By using both steel plates and sandbags, radiation can be reduced to a permissible level where personnel would normally receive lethal doses quickly.

## 2.18. SUMMARY

No railroad runs by itself. A safe and efficient operation demands definite methods and procedures of train control which must be completely understood by all personnel involved in the operation. For military railroads the four methods of operation are fleet, block (positive and permissive), train order, and timetable. Only one method is in effect at any one time on any one section of railroad except in a very stable operation when a combination of train order and timetable methods may be used for greater flexibility.

Train control is a function of headquarters and headquarters company of the transportation railway battalion. The tools for this job contain the authority to move trains over a division of railroad; control of these movements is the responsibility of the dispatchers. Two very important tools are the timetable and the train order.

The timetable is the operating authority for the movement of regular trains subject to the rules, and all operating personnel must carry it while on duty. It establishes train superiority by class and direction. Timetable schedules are not in effect until the train leaving time at the initial station, and, unless fulfilled, remain in effect for 12 hours after the scheduled train time at each station.

The train order is the authority for the movement of extra trains, and it can also change the established superiority of any train. It confers train superiority by right, and it is in effect until fulfilled, superseded, or annulled.

When a train is stopped at a train order station, a Clearance Form "A" must be issued to the crew authorizing them to depart that station. This form insures that the crew of the train has all the instructions affecting the train throughout its journey unless it receives another train order. It also authorizes the train to continue.

The chief dispatcher maintains an accurate, up-to-the -minute account of what movements are actually taking place on the division. For this purpose, the dispatchers' record of train movements is used.

Another requirement for the safe and orderly operation of trains over a railroad is an easily understood signal system. Fixed signals are along the railway right-of-way to give directions to train operating crews by either their position or their color. The three most common types of fixed signals are the semaphore, the position light, and the color light. Trains also have markers and classification signals recognized by all railway personnel involved in train movements.

When trains must run through radioactive-contaminated areas, the operation should be delayed as long after an explosion as possible, and every precaution must be taken to protect personnel from overexposure to radioactivity. Once started, trains must move rapidly and, when possible, avoid any stops, delays, or train meets. While the positive block method is usually best suited for these operations, the fleet method may be used.

# CORRESPONDENCE COURSE OF THE U.S. ARMY TRANSPORTATION SCHOOL SOLUTIONS

TRANS SUBCOURSE 635.....Military Train Operations

(All references are to Reference Text 635)

LESSON 1

| Weight | Exercise | | |
|---|---|---|---|
| 4 | 1. | A, true | (pars. 1.6a (2), 1.7) |
| 4 | 2. | B, false | (par. 1.5) |
| 4 | 3. | A, true | (par. 1.5) |
| 4 | 4. | A, true | (par. 1.2a (1), c) |
| 4 | 5. | B, false | (par. 1.2f(2)) |
| 4 | 6. | B, false | (par. 1.3c) |
| 4 | 7. | A, true | (par. 1.2a(2)) |
| 4 | 8. | B, false | (par. 1.2b(2)) |
| 4 | 9. | A, true | (par. 1.2e) |
| 4 | 10. | A, true | (pars. 1.2b, (1), 1.4) |
| 4 | 11. | A, true | (par. 1.6) |
| 4 | 12. | A, true | (pars. 1.6, 1.7) |
| 4 | 13. | B, false | (pars. 1.6, 1.7) |
| 4 | 14. | B, false | (pars. 1.6, 1.7) |
| 4 | 15. | B, false | (pars. 1.6, 1.7) |
| 4 | 16. | A, true | (par. 1.6, 1.6a(1)) |
| 4 | 17. | B, false | (pars. 1.6, 1.7) |
| 4 | 18. | A, true | (par. 1.8b) |
| 4 | 19. | B, false | (par. 1.8) |
| 4 | 20. | A, true | (par. 1.8c) |
| 4 | 21. | B, false | (par. 1.8d) |
| 4 | 22. | B, false | (par. 1.8a, d) |
| 4 | 23. | A, true | (par. 1.8d) |
| 4 | 24. | B, false | (par. 1.8c) |
| 4 | 25. | A, true | (par. 1.8, |

*All concerned will be careful that neither this solution nor information concerning the same comes into the possession of students who have not completed the work to which it pertains.*

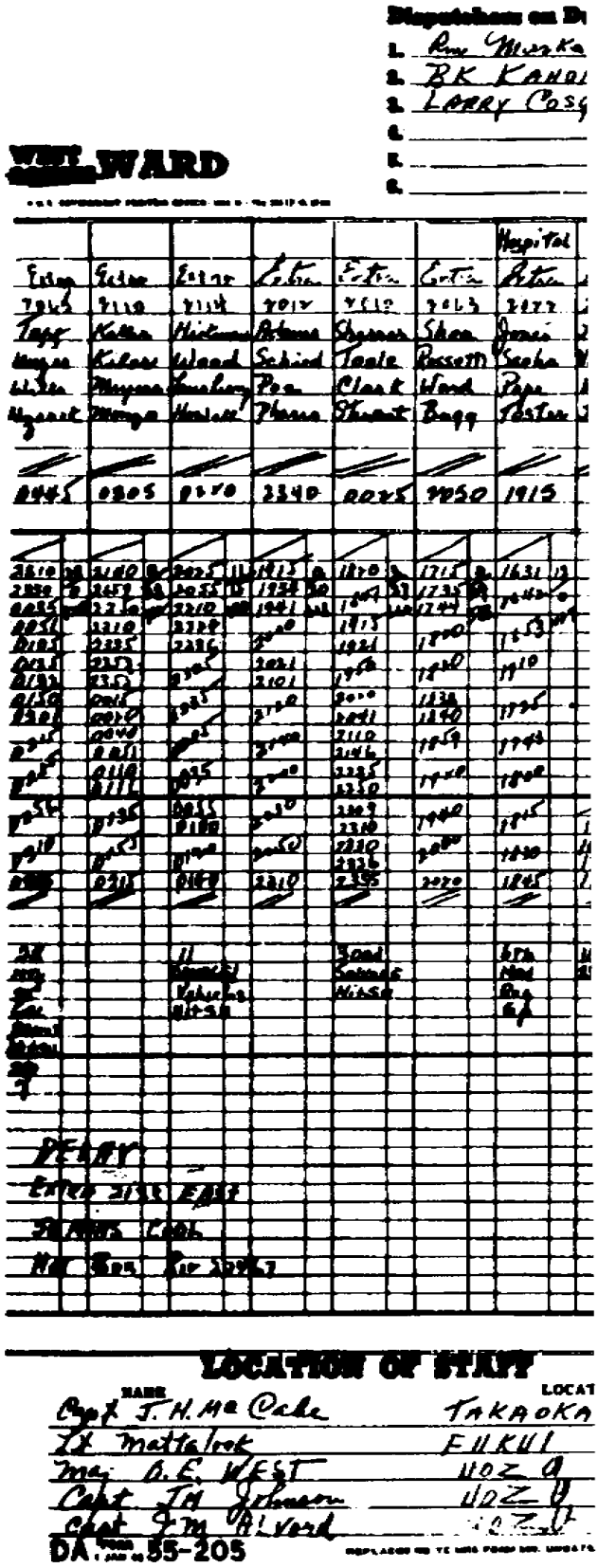
NOVEMBER 1972

Supersedes Trans 635, Military Train Operations, March 1970.

LESSON 2

| Weight | Exercise | | |
|---|---|---|---|
| 1 | 1. | B, false | (par. 2.2) |
| 1 | 2. | A, true | (par. 2.9a) |
| 1 | 3. | B, false | (par. 2.15a) |
| 3 | 4. | A, true | (par. 2.15a; fig. 2.6) |
| 3 | 5. | B, false | (par. 2.16d) |
| 3 | 6. | B, false | (par. 2.16c; fig 2.8) |
| 3 | 7. | A, true | (par. 2.15a) |
| 3 | 8. | B, false | (par. 2.16b) |
| 3 | 9. | A, true | (par. 2.15b) |
| 2 | 10. | A, true | (pars. 2.9c, 2.12; class. sch. page) |
| 2 | 11. | B, false | (pars. 2.11, 2.12; class. sch. page) |
| 2 | 12. | B, false | (pars. 2.9d, 2.12; class. sch. page) |
| 2 | 13. | A, true | (pars. 2.11, 2.12; class. sch. page) |
| 2 | 14. | B, false | (pars. 2.4, 2.12; class. sch. page) |
| 2 | 15. | A, true | (par. 2.12; class. sch. page) |
| 2 | 16. | A, true | (pars. 2.11, 2.12; class. sch. page) |
| 2 | 17. | B, false | (pars. 2.11, 2.12; class. sch. page) |
| 3 | 18. | B, false | (par. 2.13) |
| 3 | 19. | A, true | (par. 2.9) |
| 3 | 20. | A, true | (par. 2.7; rule 221(7)) |
| 3 | 21. | A, true | (pars. 2.11, 2.12; fig. 2.5) |
| 3 | 22. | A, true | (par. 2.4) |
| 3 | 23. | B, false | (par. 2.13a) |
| 3 | 24. | A, true | (par. 2.9e) |
| 3 | 25. | A, true | (par. 2.7; rule 221(2)) |
| 3 | 26. | B, false | (par. 2.13f) |
| 3 | 27. | B, false | (par. 2.16a; fig. 2.8) |
| 3 | 28. | B, false | (par. 2.10d; rule 92) |

| Weight | Exercise | | |
|---|---|---|---|
| 3 | 29. | A, true | (pars. 2.8, 2.12; fig. 2.5; annex A) |
| 3 | 30. | A, true | (par. 2.4) |
| 3 | 31. | A, true | (pars. 2.4, 2.5; rule 2.10; fig. 2.1) |
| 3 | 32. | A, true | (par. 2.17b) |
| 3 | 33. | B, false | (par. 2.4) |
| 3 | 34. | B, false | (par. 2.5; rule 204(1)) |
| 2 | 35. | C. | (par. 2.4) |
| 2 | 36. | A. | (par. 2.5; rule 212) |
| 2 | 37. | C. | (par. 2.9e) |
| 2 | 38. | B. | (par. 2.9) |
| 2 | 39. | C. | (par. 2.4) |
| 2 | 40. | D. | (par. 2.7) |



Dispositions on D
1. Pvt Mierka
2. BK KANOI
3. LARRY COSG
4.
5.
6.

WEST WARD

| Entry | Entry | Entry | Entry | Entry | Entry | Hospital Entry |
|---|---|---|---|---|---|---|
| 7845 | 7110 | 7114 | 7017 | 7512 | 7063 | 7272 |
| Tapp | Kelley | Hickman | Adams | Shannon | Shaw | Jones |
| Hayes | Kilcox | Wood | Schind | Teale | Prescott | Sachs |
| Wilson | Phipps | Hawkins | Poe | Clark | Ward | Pope |
| Hyatt | Mingo | Hamlett | Phipps | Thrust | Bagg | Foster |
| 0845 | 0905 | 0970 | 2340 | 0025 | 9050 | 1915 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2810 | 2140 | 2025 | 1915 | 1870 | 1715 | 1631 |
| 2830 | 2459 | 2055 | 1934 | 1941 | 1735 | 1642 |
| 0025 | 2210 | 2210 | 1941 | 1945 | 1744 | 1642 |
| 0054 | 2210 | 2209 | 1950 | 1915 | 1900 | 1653 |
| 0105 | 2235 | 2236 | 1950 | 1924 | 1900 | 1653 |
| 0054 | 2253 | 1950 | 2021 | 1950 | 1850 | 1910 |
| 0132 | 2310 | 1950 | 2101 | 1950 | 1850 | 1910 |
| 0150 | 0015 | 1950 | 2000 | 1838 | | |
| 0201 | 0010 | 2150 | 2041 | 1840 | 1750 | 1750 |
| 0250 | 0040 | 1950 | 2110 | 1959 | 1743 | |
| 0250 | 0111 | 1950 | 2146 | | | |
| 0250 | 0110 | 0025 | 2150 | 1950 | 1800 | |
| 0250 | 0111 | 0025 | 2150 | | | |
| 0250 | 0235 | 0045 | 2150 | 2309 | 1940 | 1915 |
| 0250 | 0250 | 0110 | 2150 | 2310 | | |
| 0250 | 0250 | 0110 | 2150 | 2310 | 1950 | 1930 |
| 0250 | 0250 | 0110 | 2150 | 2336 | | |
| 0250 | 0250 | 0110 | 2310 | 2335 | 2020 | 1841 |

| | | | | | | |
|---|---|---|---|---|---|---|
| SK | | | | Good | | 6Th |
| INJ | | | | Seizure | | Med |
| | | | | Nurse | | Reg |
| | | | | | | 6A |

DEATH
Entered 2155 EAST
[illegible] COL
No [illegible] Apr 1953

## LOCATION OF STAFF

| NAME | LOCAT |
|---|---|
| Capt J. H. McCabe | TAKAOKA |
| 1Lt Mattalook | FUKUI |
| Maj A. E. WEST | HQ 9 |
| Capt JA Johnson | HQ 9 |
| Capt JM Alvord | HQ 9 |

DA [illegible] 55-205

| | from | M. to | M. |
|---|---|---|---|
| [illegible] | 2001 | 0800 | M. |
| [illegible]es | 0800 | 1600 | M. |
| [illegible]Rove | 1600 | 2359 | M. |
| | | | M. |
| | | | M. |
| | | | M. |

# DISPATCHERS' RECORD OF TRAI

(TM 55-206)

723d RAILWAY OPERATING BAT[illegible]

Nitsu

| TRAIN SYMBOL | Extra | Extra | Extra | Extra | Extra | Bya Extra | Hospital Extra | Extra | Extra | Extra | Extra | Extra | Extra | KM | TRAIN SYMBOL | SIDING CAPACITY | Extra | Extra |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Train | 2025 | 2011 | 2073 | 2141 | 2019 | [illegible] | 2037 | 2107 | 2020 | 2116 | 2008 | 2115 | 2027 | | Train | | 2020 | 2011 |
| Engine, Conductor, Brakemen, Engineer & Fireman | [illegible] | Hector, Noble, Rucker, Suworel | Conner, Raymond, Monroe, Tallings | Roden, Salley, Plymer, Sukin | Ward, Mork, Fleck, Dunfee | Thrin, Tavares, [illegible], Gross | Kelp, [illegible], Kolstan, [illegible] | Buckham, McDowell, Adams, Hardman | Scabby, Sides, Wint, Horner | Fleck, Harda, Student, Pumphrey | McChesnell, Pushing, Funk, Holeman | Wilkins, Adams, Stephens, Turner | Smith, Jarnell, Kung, Bangbert | | Engine, Conductor, Brakemen, Engineer & Fireman | | [illegible] | Millberg, Mcrow, [illegible], Burke |
| Time Reported | | | | | | | | 06 [illegible] | 06 15 | 03 [illegible] | 02 [illegible] | 01 [illegible] | 24 15 | | Time Reported | | 01 15 | 01 35 |
| Time Relieved | 1830 | 1930 | 1800 | 1805 | 2055 | 1400 | 1100 | 1750 | 1445 | 0935 | 0705 | 0640 | 0570 | KM | Time Relieved | | | [illegible] |
| Stations | | | | | | | | | | | | | | | Stations | | | |
| | [illegible] | 1508 | 1315 | 1055 | 1010 | 2115 | 2100 | [illegible] | [illegible] | [illegible] | 0210 | 0150 | 0110 | 144 | UOZU | 872 | 0615 | 0515 |
| | [illegible] | 1500 | 1335 1341 | 1129 1134 | 1040 | 0051 | 0411 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 128 | TOYAMA | 81 | 0540 0530 | [illegible] |
| | [illegible] | 1534 1550 | 1400 1432 | 1250 1320 | 1110 1145 | 1001 | [illegible] | 0220 0250 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 112 | TAKAOKA | 61 | 0600 | [illegible] |
| | [illegible] | 1610 | 1445 | 1350 1356 | 1255 1405 | 1010 | [illegible] | [illegible] | 0105 0140 | [illegible] | [illegible] | [illegible] | [illegible] | 16 | KANAZAWA | 68 | [illegible] | 0415 0400 |
| | [illegible] | 1629 1630 | 1504 1516 | [illegible] | 1500 1510 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 0430 0450 | 0315 0410 | [illegible] | 30 | IBURIHASHI | 73 | [illegible] | [illegible] |
| | [illegible] | 1650 | 1535 | 1430 1504 | 1605 1615 | 1020 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 0310 0335 | 20 | DAISHOJI | 72 | [illegible] | [illegible] |
| | [illegible] | 1713 1740 | 1555 1601 | [illegible] | 1645 | 1041 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 24 | KANAZU | 74 | [illegible] | 0300 |
| | [illegible] | 1800 | [illegible] | 1545 1545 | 1718 1720 | 1050 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 0510 | [illegible] | 37 | FUKUI | 62 | [illegible] | [illegible] |
| | [illegible] | 1820 | [illegible] | 1605 1650 | 1815 2005 | 1101 1105 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 16 | TSURUGA | 65 | [illegible] | [illegible] |
| | [illegible] | 1840 | [illegible] | 1715 | 2035 | 1122 | [illegible] | [illegible] | 1415 | [illegible] | 1635 | [illegible] | 0440 | | NITSU | 450 | [illegible] | 0205 |
| | [illegible] | | | | 1 Coal Kanazawa | 10 [illegible] Bayle Dept | L [illegible] Med [illegible] | | 3 [illegible] [illegible] | 1 [illegible] [illegible] [illegible] Nitsu | | 2 [illegible] [illegible] Nitsu | | | | | 15 C [illegible] SP 10 C [illegible] 13 C SP [illegible] Akita | 25 C [illegible] SP 53 Niigata |

[illegible]ION

## INSTRUCTIONS

1. Weather conditions and temperatures shall be reported at least once in six hours by and recorded for at least one station in each dispatching district, and shall be recorded for such other stations as report weather conditions.
2. Each train dispatcher shall sign his name and record the time of going on and off duty in space provided.
3. The A.M. or P.M., as the case may be, shall be shown at the initial and final time of each movement.
4. The number of cars in each train shall be shown at least at one station, and at such other stations as may be required.
5. Time of trains passing reporting stations shall be recorded; where trains stop at reporting stations, both arriving and departing time shall be recorded.
6. Interruptions - delays - occurrences of military or historical interest will be shown on back of sheet.

ANNEX A-3
REFERENCE TEXT 635
MILITARY TRAIN OPERATIONS
November 1972

# N MOVEMENTS

**PALION**

30 nov. , 1972

Capt Vernon R Creel
C.O.

**EAST WARD**

**RECORD OF WEATHER**

| | 12AM A. M. | 6AM A. M. | 12AM P. M. | 6PM P. M. |
|---|---|---|---|---|
| UOZU | Clear 36° | Clear 42° | Cloudy 47° | Cloudy 40° |
| DAISHOJI | Clear 37° | Cloudy 40° | Cloudy 41° | Cloudy 39° |
| FUKUI | Cloudy 38° | Cloudy 44° | Lite Rain 42° | Lite Rain 40° |
| NITSU | Cloudy 40° | Cloudy 47° | Rain 43° | Rain 42° |

## Appendix I

## REFERENCES

### Army Regulations

| | |
|---|---|
| AR 55-650 | Military Railroads |
| AR 310-25 | Dictionary of United States Army Terms |
| AR 310-50 | Authorized Abbreviations and Brevity Codes |

### Field Manuals

| | |
|---|---|
| FM 3-12 | Operational Aspects of Radiological Defense |
| FM 55-20 | Army Rail Transport Operations |

### Technical Manuals

| | |
|---|---|
| TM 55-200 | Railway Operating Rules |
| TM 55-206 | Railway Train Operations |

## Appendix II

## GLOSSARY

Aspect--color or position of a roadway signal as it faces an approaching train; also, a cab signal as it appears to an observer in the cab.

Block section--section of track of defined length, the use of which is regulated by a fixed signal at the entering end of a double track and at each end of a single track.

Block signal system--method of governing the movement of trains into or within one or more blocks by block or cab signals, consisting of a series of consecutive block sections automatically or manually controlled.

Board--fixed signal that regulates railroad traffic, usually referred to as slow board, order board, clear board (for clear tracks), red board (stop), or green board (proceed).

Double-track main line--main line having two tracks, one for movement of trains in one direction and the other for trains in the opposing direction.

In the clear--car, locomotive, or train far enough in on a track so that passage through switches or on tracks on either side is possible; also, safe clearance past signal stands, station platforms, etc.

Markers--red or green flags by day and red or green lighted lamps by night which indicate the rear of a train.

Meet--passing of two trains traveling in opposite directions. (See also Pass.)

On the advertised--according to schedule; right on time.

Pass--overtaking of one train by another in the same direction. (See also Meet.)

Passing track--track auxiliary to the main track for passing or meeting trains.

Saw by--slow, complicated operation whereby one train passes another on a single-track line when the other is on a siding too short to hold the entire train. The term "saw by" is applied to any move through switches or through connecting switches that is necessitated by one train passing another.

Train order signal--signal used to indicate to the crew of a train if it will receive orders.

# INDEX


| | Paragraph | Page |
|---|---|---|
| Abbreviations | | |
| timetable | 2.11 | 35 |
| train order | 2.5 | 20 |
| Accidents, personal injuries | 1.3c | 6 |
| Added rules | 1.3 | 6 |
| Ambulance train | 1.3b, 1.8c | 6,13 |
| Authorized timetable abbreviations | 2.5 | 20 |
| Block operation | 2.2 | 15 |
| Chief dispatcher | 1.6, 2.1, 2.8 | 9,15, 29 |
| Class of trains | 1.6 | 9 |
| Classification signals | 2.15a | 40 |
| Classified schedule | 2.12 | 36 |
| Clearance Form "A" | 2.7 | 28 |
| Clearance instructions | 2.13f | 39 |
| Color light signal | 2.16b | 42 |
| Color signal indications | 2.16d | 42 |
| Current of traffic | 1.5 | 7 |
| Definitions of railway terms | 1.5 | 7 |
| Direction superiority | 1.6, 2.13b | 9,38 |
| Dispatchers' Record of Train Movements | 2.8 | 29 |
| Division of railroad | 1.5 | 7 |
| Engine | 1.5 | 7 |
| Examination on rules | 1.2c | 4 |
| Extra train, definition | 1.5 | 7 |
| Fixed signal | 1.5, 2.16 | 7,41 |
| Fleet operation | 2.2a | 15 |
| Forms of train orders | 2.6 | 27 |
| Freight train | 1.8a | 13 |
| General rules | 1.2 | 3 |
| Interchange instructions | 2.13e | 39 |
| Knowledge of rules | 1.2b | 4 |
| Location of standard clock | 2.13c | 38 |
| Main track, definition | 1.5 | 7 |
| Markers, train | 2.15b | 41 |
| Methods of operation | 2.1, 2.2 | 15,15 |
| fleet | 2.2a | 15 |
| manual block | 2.2b | 16 |
| timetable | 2.9 | 31 |
| train order | 2.3 | 17 |

| | Paragraph | Page |
|---|---|---|
| Operating rules | 1.1 | 3 |
| Passenger train | 1.8, 1.8b | 11, 13 |
| Permissive block operation | 2.2b | 16 |
| Pilot | 1.5 | 7 |
| Position light signal | 2.16c | 42 |
| Positive block operation | 2.2b | 16 |
| Possession of manual and timetable | 1.2a | 3 |
| Radiation | 2.17 | 44 |
| Radioactive areas | 2.17 | 44 |
| Railway signals | 2.14 | 39 |
| Railway terms | 1.5 | 7 |
| Regular train, definition | 1.5 | 7 |
| Reporting hazards | 1.2f | 4 |
| Right | 1.6 | 9 |
| Rules for movement by train order | 2.5 | 20 |
| Safety | 1.2l, 2.13g | 5, 39 |
| Schedule, definition | 1.5 | 7 |
| Section | 1.5, 2.15 | 7, 40 |
| Semaphore | 2.16a | 41 |
| Siding, definition | 1.5 | 7 |
| Signal indications in special instructions | 2.13d | 38 |
| Signals, fixed | 2.14, 2.16 | 39, 41 |
| Single track, definition | 1.5 | 7 |
| Special timetable instructions | 2.13 | 38 |
| Speed restrictions | 2.13a | 38 |
| Speed table | 2.13b | 38 |
| Station, definition | 1.5 | 7 |
| Superior train, definition | 1.5 | 7 |
| Superiority of trains | 1.6 | 9 |
| Terms, railway | 1.5 | 7 |
| Timetable | 2.9 | 31 |
| changes | 2.9e | 32 |
| definition | 1.5 | 7 |
| taking effect | 2.9a | 32 |
| times | 2.9c | 32 |
| train meeting and passing | 2.9d | 32 |
| Timetable operation | 2.9 | 31 |
| Timetable bulletin | 2.9e | 32 |
| Timetable rules | 2.10 | 33 |
| Train | | |
| classification signals | 2.15a | 40 |
| definition | 1.5 | 7 |
| markers | 2.15b | 41 |

| | Paragraph | Page |
|---|---|---|
| Train control | 2.10 | 33 |
| Train markers | 2.15b | 41 |
| Train movement in radioactive areas | 2.17 | 44 |
| Train order, example | 1.6, 2.4 | 9, 17 |
| Train order operation | 2.3 | 17 |
| Train order rules | 2.5 | 20 |
| Train order signals | 2.5 | 20 |
| Train superiority | 1.6 | 9 |
| Train time | 2.10b | 34 |
| Troop train | 1.8b | 13 |
| Types of trains | 1.8 | 11 |
| ambulance | 1.8c | 13 |
| freight | 1.8a | 13 |
| passenger | 1.8b | 13 |
| troop | 1.8b | 13 |
| work | 1.8d | 13 |
| wreck | 1.8d | 13 |
| Violation of rules | 1.2e | 4 |
| Work train | 1.8d | 13 |
| "X" response | 2.5 | 23 |
| Yard, definition | 1.5 | 7 |