

# *Understanding and Using Railroad Signal Aspects*

*By Michael J. Burgett*



# *Summary of Clinic*

**1: Definitions**

**2: Signal Aspects and Indications**

*(Speed Signaling)*

**3: Signal Aspects and Indications**

*(Route Signaling)*

***WHAT SYSTEM***

***DO I USE***

***???***

# *Speed Signaled Railroads*

- 1: NYC
- 2: C&O
- 3: FEC
- 4: GTW
- 5: NKP
- 6: L&N
- 7: N&W
- 8: PRR
- 9: B&O
- 10: CONRAIL / NORAC
- 11: DT&I
- 12: CN / Canada
- 13: Erie
- 14: WM

# *Route Signaled Railroads*

- 1: UP
- 2: SP
- 3: C&NW
- 4: AT&SF
- 5: IC
- 6: WP
- 7: SOO
- 8: WC
- 9: EJ&E
- 10: BNSF
- 11: MILW
- 12: SP&S

# Part 1 - Definitions

• Fixed Signal

• Signal Aspect

• Signal Indication



# *Fixed Signal*

A signal of permanent location indicating a condition affecting the movement of a train.

# *Signal Aspect*

The appearance of a fixed signal conveying an indication by one or more of the following methods.

- 1: The color of lights.
- 2: The flashing of lights.
- 3: The position of lights.
- 4: The position of semaphore arms.
- 5: The shape, color or lettering of signs.



# *Signal Indication*

The required action to be taken by a crew in the operation of there train as conveyed by an aspect of a fixed signal.



# Part 2

Signal Aspects  
and Indications  
“Speed Signaling”

# AREMA SPEED CLASSES

AREMA SPEED CLASS	SPEED IN M.P.H. FREIGHT	SPEED IN M.P.H. PASSENGER
Maximum Authorized Speed	50/60	79
Limited Speed	40	45
Medium Speed	30	30
Slow Speed	15	15
Restricted Speed	15 or less	15 or less

**NOTE:** Restricted speed requires that the engineer proceed prepared to stop one half the range of vision and to be looking out for a train, obstruction, switch improperly lined, broken rail or anything that may require the speed to be reduced, but never to exceed 15 MPH.

# AREMA TRUNOUT SPEED CHART

## AREMA SECTION 3.4

No. 5	12 MPH	11'-0" Switch Points
No. 6	14 MPH	
No. 7	16 MPH	16'-6" Switch Points
No. 8	19 MPH	
No. 9	21 MPH	
No. 10	21 MPH	
No. 11	27 MPH	22'-0" Switch Points
No. 12	28 MPH	
No. 14	28 MPH	
No. 15	37 MPH	30'-0" Switch Points
No. 16	38 MPH	
No. 18	38 MPH	
No. 20	46 MPH	39'-0" Switch Points

**NOTE:** Passenger trains completely equipped with cars that have a roll angle of less than 1 degree 30 minutes, trains may operate comfortably through at 12% higher speeds than those indicated.

# SIMPLIFIED TURNOUT SPEED CHART & USES

TYPICAL AREMA  
TURNOUT SIZE

HO SCALE TURNOUT  
SIZE I LIKE TO USE

TYPICAL  
PROTOTYPE USES

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No. 8

No. 10

No. 12

No. 16

No. 20

No. 4

No. 5

No. 6

No. 8

No. 10

Yards and Industrial Tracks

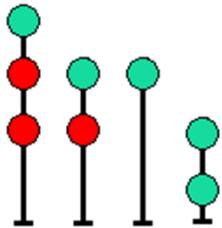
Yards and Branch lines

Main track, Slow Speed Turnout

Main track, Medium Speed Turnout

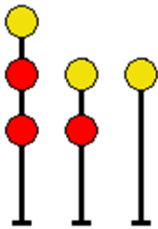
Main track, Limited Speed Turnout

# Speed type Aspects and Indications Page #1



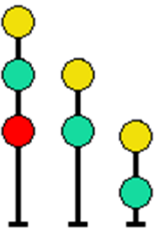
**Name:** Clear

**Indication:** Proceed at authorized speed.



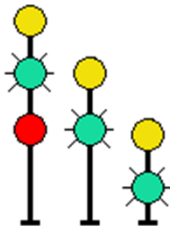
**Name:** Approach

**Indication:** Proceed, preparing to stop at the next signal.



**Name:** Approach Medium

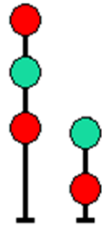
**Indication:** Proceed, approaching next signal at Medium Speed (30 MPH).



**Name:** Approach Limited

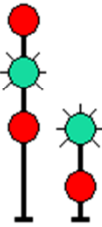
**Indication:** Proceed, approaching next signal at Limited speed (40 MPH).

# Speed type Aspects and Indications Page #2



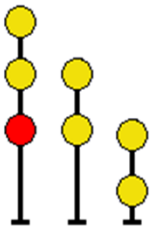
**Name:** Medium Clear

**Indication:** Proceed, at Medium speed (30 MPH) within interlocking limits or through turnouts.



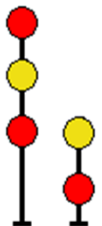
**Name:** Limited Clear

**Indication:** Proceed, at Limited speed (40 MPH) within interlocking limits or through turnouts.



**Name:** Approach Slow

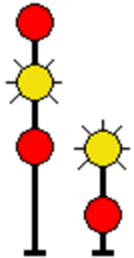
**Indication:** Proceed, approaching the next signal at Slow speed (15 MPH).



**Name:** Medium Approach

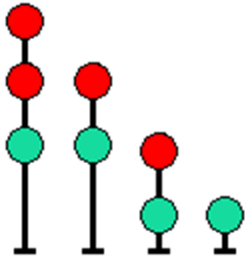
**Indication:** Proceed, at Medium speed (30 MPH) within interlocking limits or through turnouts; then proceed prepared to stop at next signal.

# Speed type Aspects and Indications Page #3



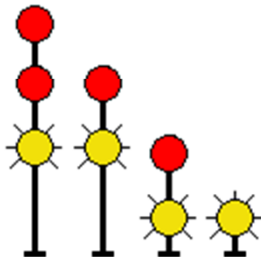
**Name:** Limited Approach

**Indication:** Proceed, at Limited speed (40 MPH) within interlocking limits or through turnouts; then proceed prepared to stop at the next signal.



**Name:** Slow Clear

**Indication:** Proceed, at Slow speed (15 MPH) within interlocking limits or through turnouts.

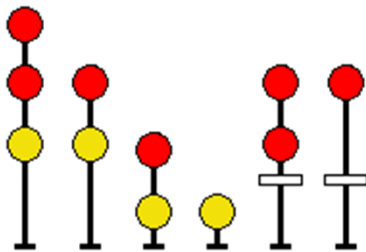


**Name:** Slow Approach

**Indication:** Proceed, at Slow speed (15 MPH) within interlocking limits or through turnouts; then proceed prepared to stop at the next signal.

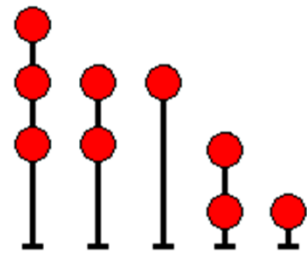


# Speed type Aspects and Indications Page #4



**Name:** Restricting

**Indication:** Proceed at restricted speed.



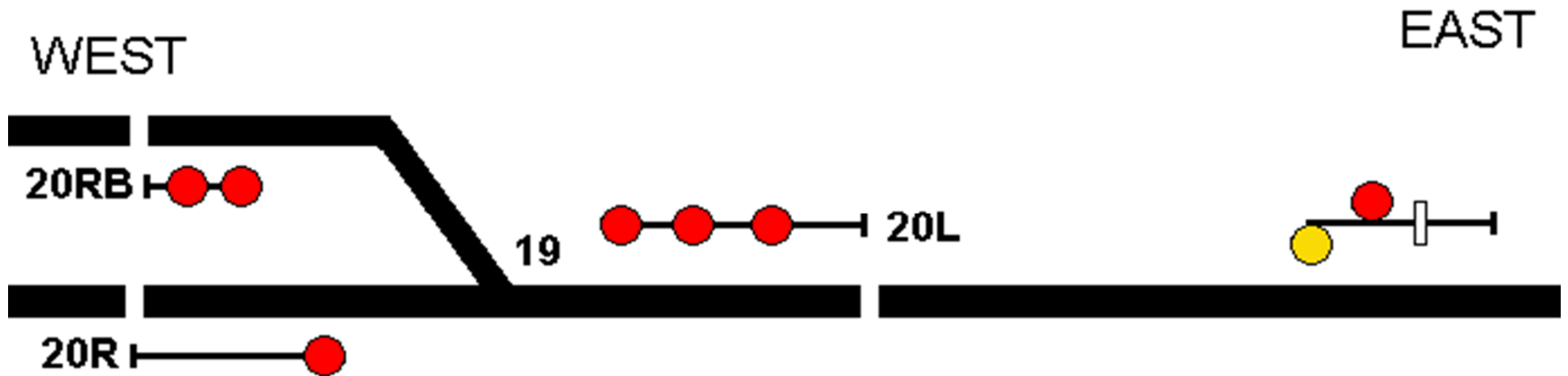
**Name:** Stop

**Indication:** Stop before any part of train or engine passes signal.

# Typical End of Siding Location

(Speed Signaling with # 16 Turnout)

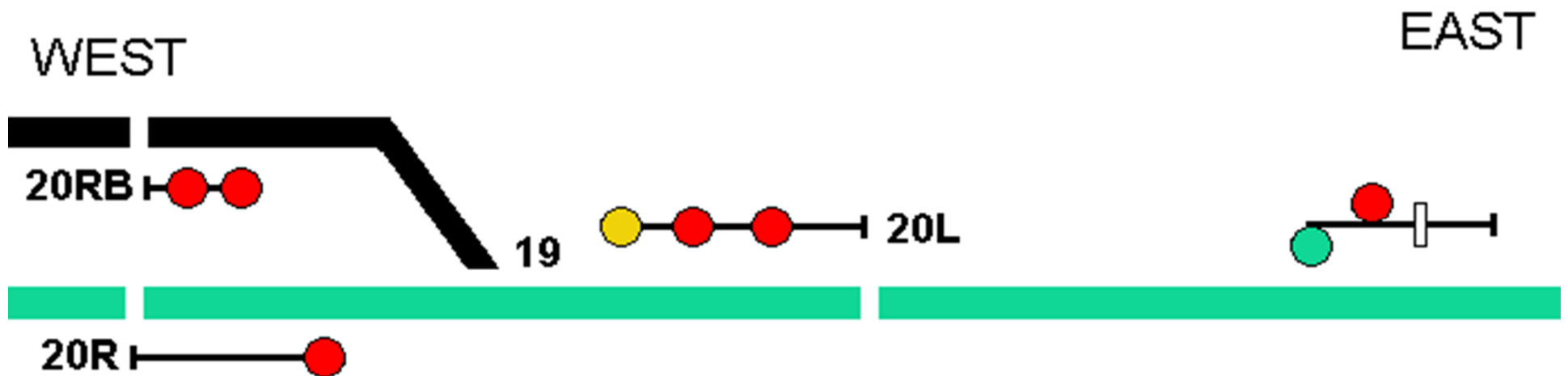
System in its normal state



# Typical End of Siding Location

(Speed Signaling with # 16 Turnout)

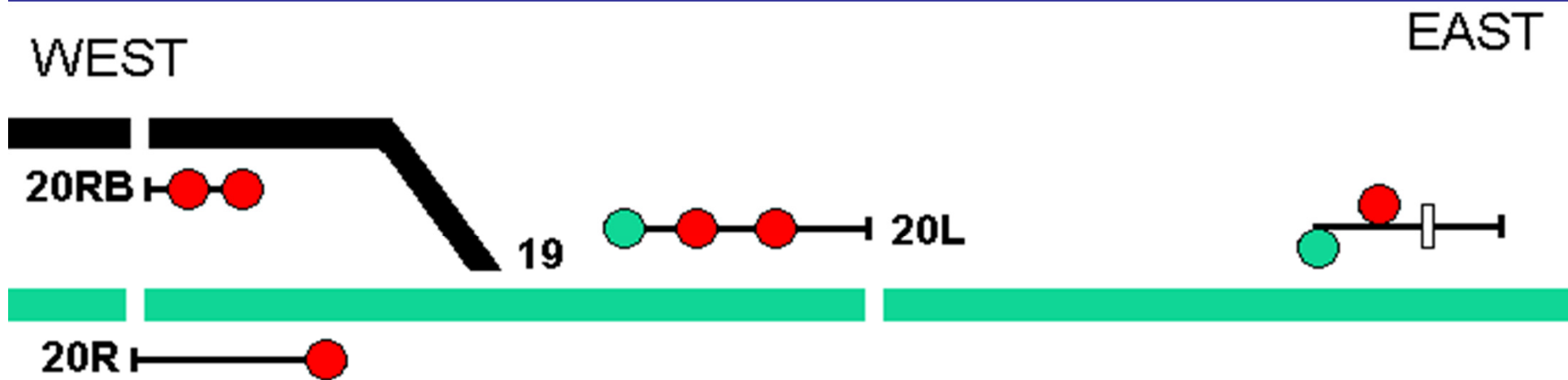
A westbound route is established at the East End only!



# Typical End of Siding Location

(Speed Signaling with # 16 Turnout)

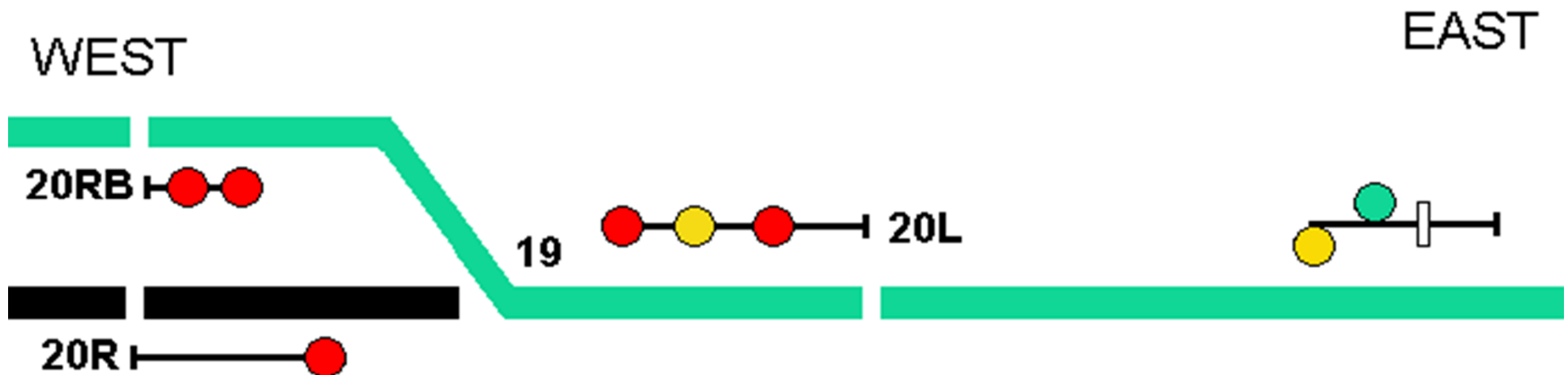
A westbound route is established at both East and West Ends of the siding!



# Typical End of Siding Location

(Speed Signaling with # 16 Turnout)

A westbound route is established into the siding at the East End!

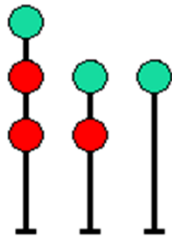




# ***Part 3***

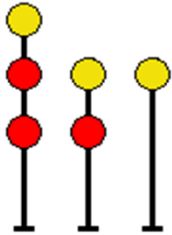
## **Signal Aspects and Indications** ***“Route Signaling”***

# Route type Aspects and Indications Page #1



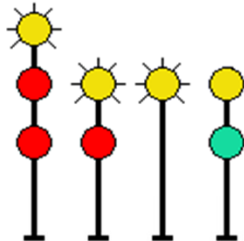
**Name:** Clear

**Indication:** Proceed at authorized speed.



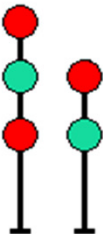
**Name:** Approach

**Indication:** Proceed, preparing to stop at the next signal.



**Name:** Approach Diverging

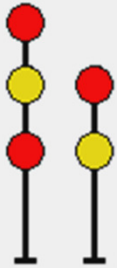
**Indication:** Proceed approaching next signal prepared to enter diverging route at prescribed speed.



**Name:** Diverging Clear

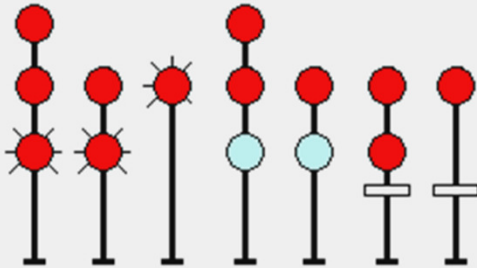
**Indication:** Proceed on diverging route, not exceeding prescribed speed through turnouts.

## Route type Aspects and Indications Page #2



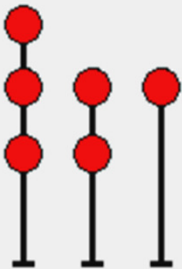
**Name:** Diverging Approach

**Indication:** Proceed on diverging route through turnouts at prescribed speed, preparing to stop at the next signal.



**Name:** Restricting

**Indication:** Proceed at restricted speed.



**Name:** Stop

**Indication:** Stop before any part of train or engine passes stop signal.



# Example of turnout speed, listed in Employees Timetable for Route type Signaling System

## 72 SOUTH BEND SUBDIVISION SPECIAL INSTRUCTIONS

	Intermodal MPH	Freight MPH
<b>1. MAXIMUM SPEED</b> .....	60	55
<b>2. SPEED RESTRICTIONS</b> .....		
Battle Creek - Extension .....		15
MP 178.6 to MP 175.3 (Main 1) .....		35
MP 178.6 to MP 174.7 (Main 2) .....		30
MP 178.2 to MP 177.3 - Pick-up Tracks 1, 2, 3 .....		15
<b>Baron - East Crossover</b> .....		<b>10</b>
MP 152.3 to MP 152.1 - Vicksburg curve .....		40
MP 146.8 - NS Crossing .....		30
<b>Jefferson - through Crossovers</b> .....		<b>45</b>
MP 105 to MP 102.4 .....		40
MP 102.4 to MP 99.4 .....		30
MP 95.7 to MP 97.4 (Ewd movement on Main 1) .....		30
<b>Mill Creek - through Crossovers</b> .....		<b>30</b>
MP 80.2 - CSSSB Crossing .....		30
MP 71.1 - CSX Crossing .....		40
MP 57 to MP 54.8 .....		35
MP 52.8 to MP 52.6 - Interlocking limits .....		40
MP 36.1 - EJ&E Crossing .....		40

Trains or engines using any Track other than Main Track or sidings on the South Bend Sub must proceed at REDUCED SPEED not to exceed 10 MPH unless otherwise specified.

<b>SIDING SPEEDS-</b>	MPH
Rose - Gord .....	15
Marcellus .....	40

### 3. OPERATING CHARACTERISTICS

#### DOB LIMITS -

Battle Creek DOB South Bend Sub between MP 178.6 and MP 160.1  
 Flint Sub between MP 189.2 and MP 178.6  
 Chicago Terminal DOB South Bend Sub between MP 43 and MP 36.1  
 Elsdon Sub between MP 36.1 and MP 8.7

#### MULTIPLE MAIN TRACKS

Emmett Street to Schoolcraft  
 Penn to Valpo  
 Sedley to Griffith

#### ABS - in effect

Gord to Schoolcraft  
 Penn to Valpo

Main 1 is signalled for westward movement. Main 2 is signalled for eastward movement.

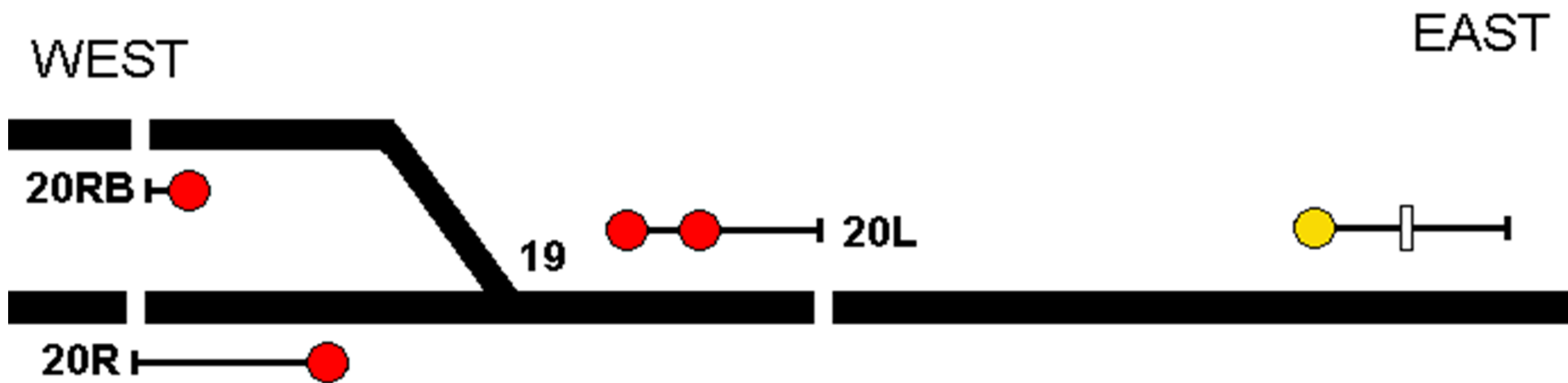
#### CTC - in effect

Emmett Street to Gord .....	Controlled by
Schoolcraft to Penn .....	CN/IC Train Dispatcher
Valpo to Griffith .....	CN/IC Train Dispatcher

# Typical End of Siding Location

(Route Signaling with # 16 Turnout)

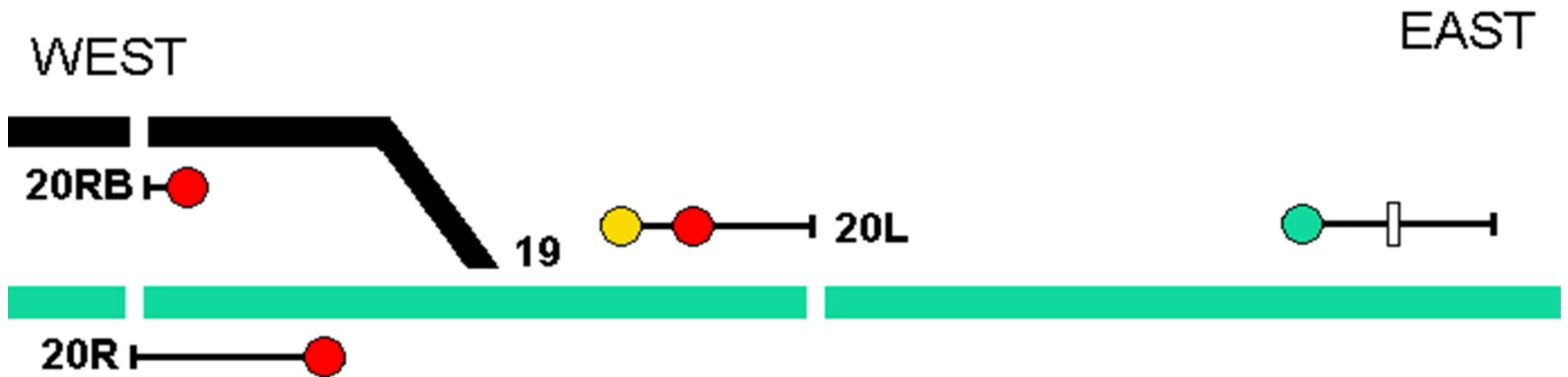
System in its normal state



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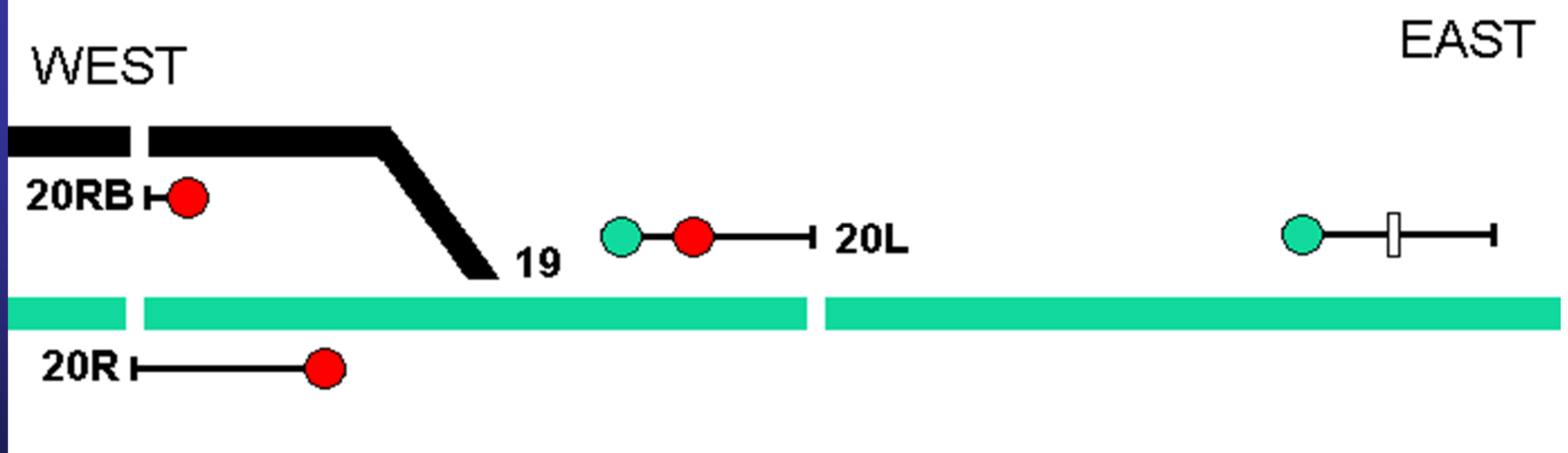
A westbound route is established at the East End only!



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(Route Signaling with # 16 Turnout)

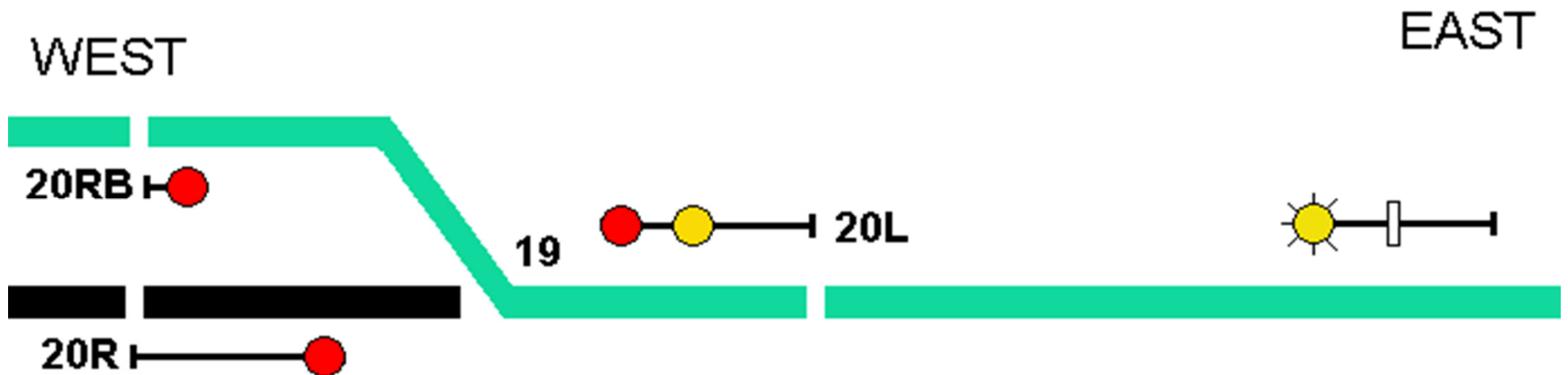
A westbound route is established at both East and West Ends of the siding!



# Typical End of Siding Location

(Route Signaling with # 16 Turnout)

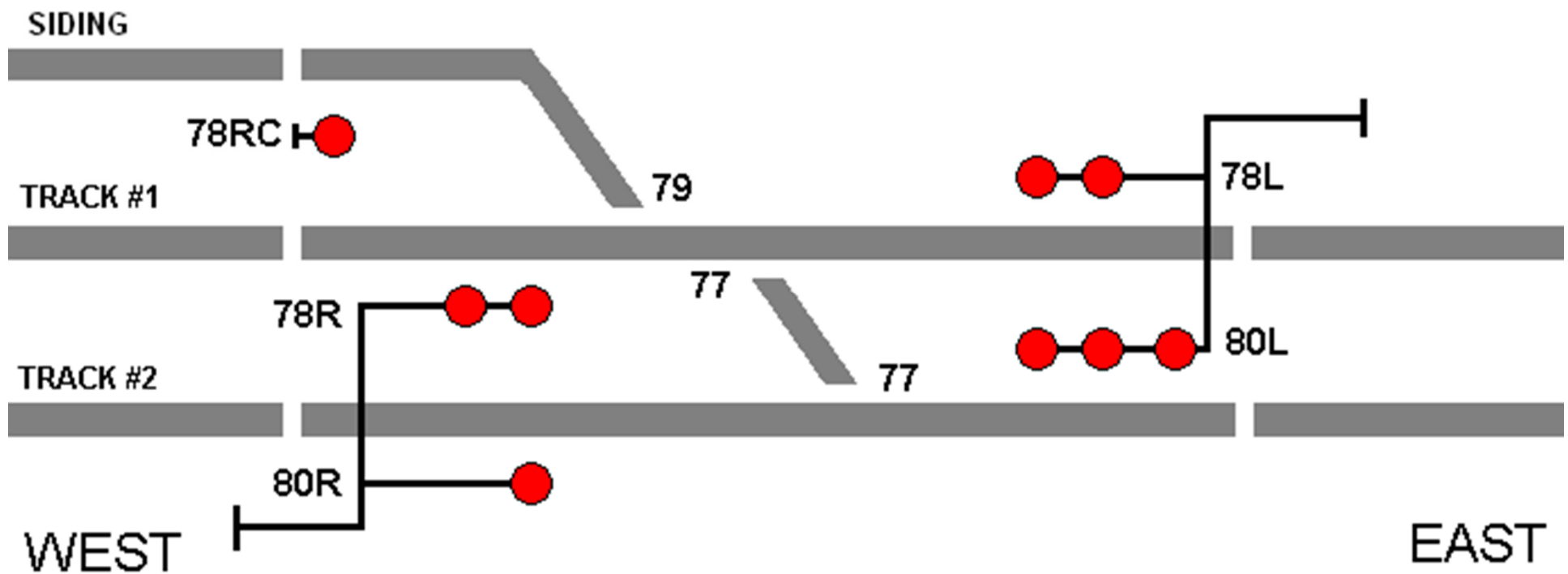
A westbound route is established into the siding at the East End!



# Interlocking with multiple size turnouts in a route type signal system

Turnout #79 is a #12 and crossover #77 is a #20

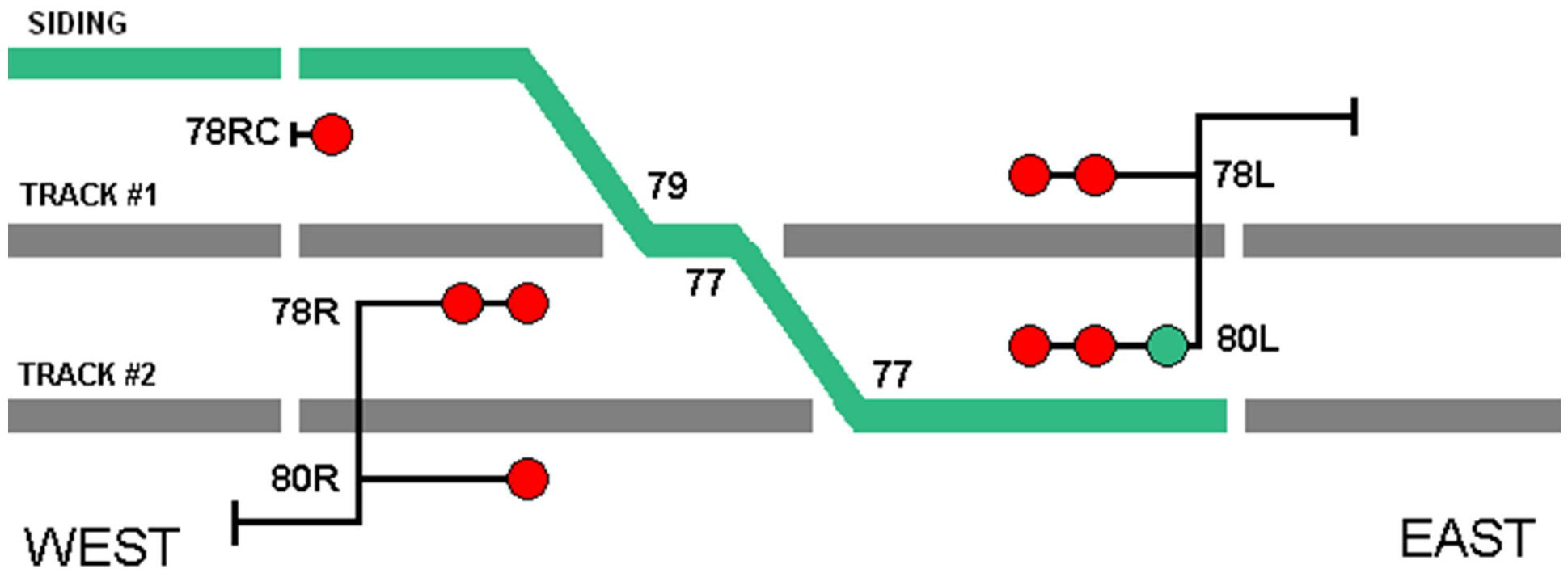
## System in its normal state



# Interlocking with multiple size turnouts in a route type signal system

Turnout #79 is a #12 and crossover #77 is a #20

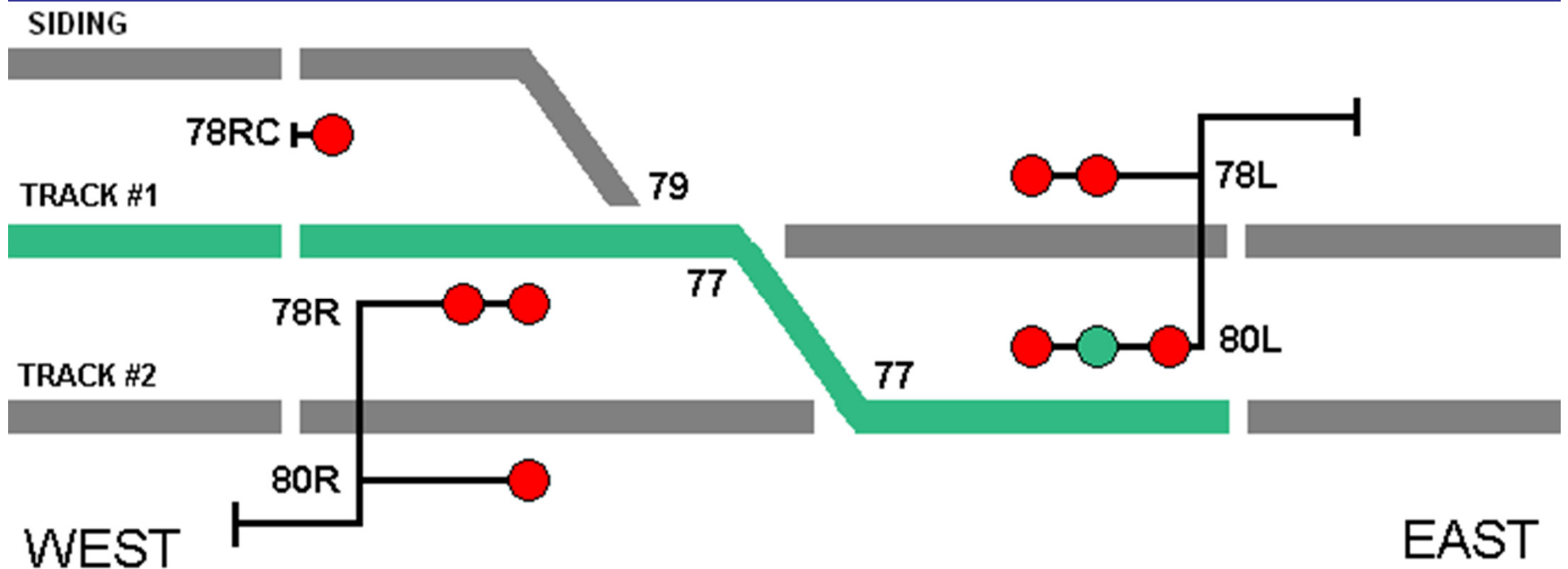
A westbound route is established into the siding through crossover #77!



# Interlocking with multiple size turnouts in a route type signal system

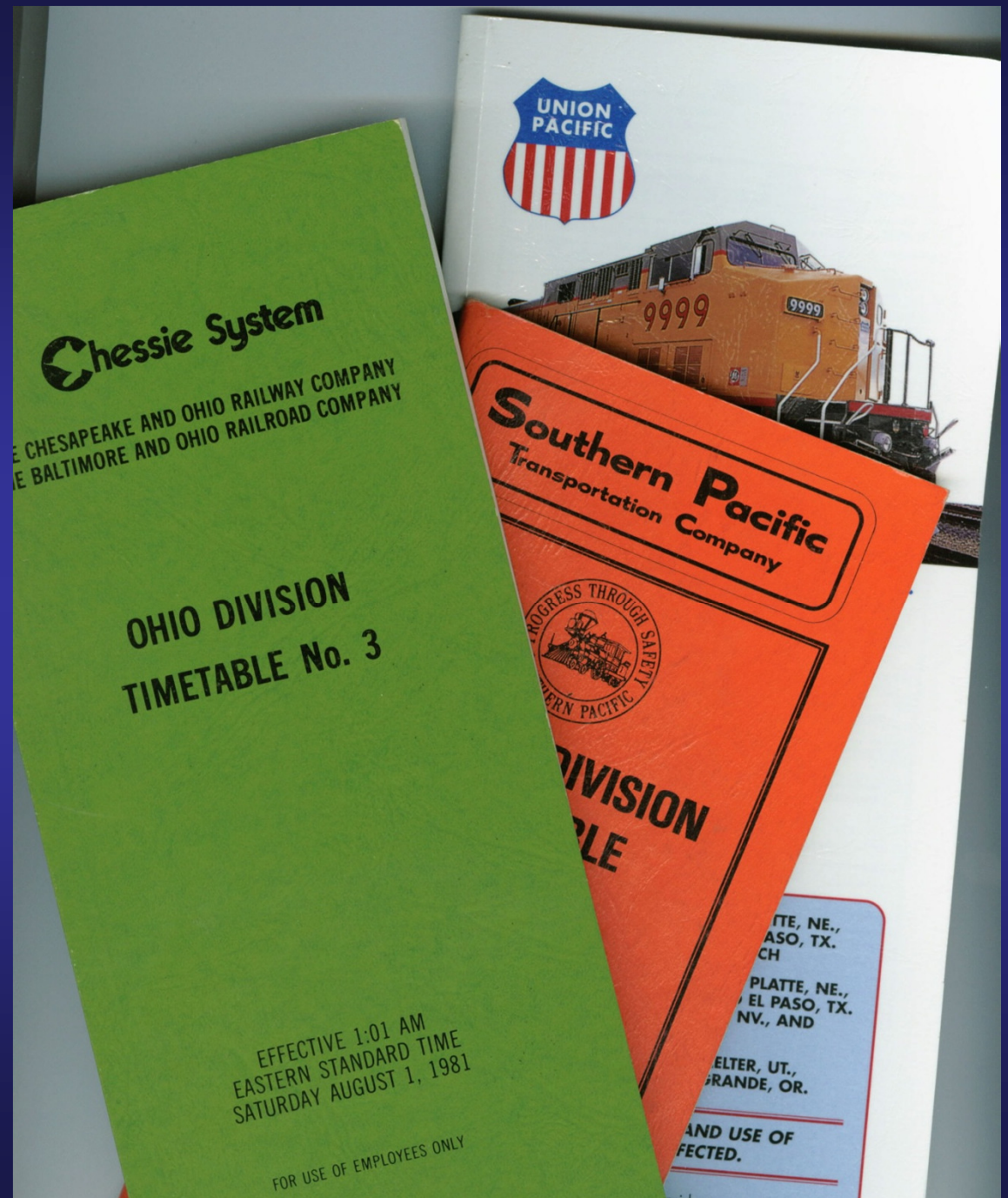
Turnout #79 is a #12 and crossover #77 is a #20

A westbound route is established through crossover #77 only!





Refer to  
your  
prototype's  
Employees  
Timetable!



**[www.CTCTParts.com](http://www.CTCTParts.com)**

Go to the “All About CTC”

Tab, click on “Signal Aspects and Indications”

**The End!**

