WMATA – Automatic Train Control System

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Signal & Train Control Investigation
Automatic Train Control System

- Maintain safe train separation
  - Speed commands provided to trains
  - Speed commands from signal on the rails
- Designed to control scheduling
  - Algorithm determines if schedule adjustment is needed
  - Acceleration profile transmitted to train
- Trains not allowed to accelerate past speed command
Automatic Train Control System

<table>
<thead>
<tr>
<th>336</th>
<th>328</th>
<th>322</th>
<th>312</th>
<th>304</th>
</tr>
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<tbody>
<tr>
<td>803 ft</td>
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<td>654 ft</td>
<td>991 ft</td>
<td>738 ft</td>
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Track Circuit Signal

• Detect the presence of a train within an associated track circuit
• Transmit speed commands based on this information through the rails to maintain safe separation between trains
Automatic Train Control System

- Speed Command = 0 mph
- Unoccupied Track Circuit

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Automatic Train Control System

Speed Command = 35 mph

Unoccupied Track Circuits

336  328  322  312  304
803 ft  802 ft  654 ft  991 ft  738 ft
Automatic Train Control System

Speed Command = 55 mph

Unoccupied Track Circuits
Unoccupied Track Circuit

Train Control Room

304 Track Relay

Energized

Circuit Module Rack

304 Receiver

304 Transmitter

Impedance Bond

Track Circuit 301

Track Circuit 304

Track Circuit 312
Occupied Track Circuit

Train Control Room

304 Track Relay
De-energized

Circuit Module Rack

304 Receiver

304 Transmitter

Impedance Bond

Track Circuit 301
Track Circuit 304
Track Circuit 312