

# Class 456

## Electric Multiple Unit



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## How to install

- 1) Locate where you have downloaded this pack and unzip it. Information on how to do this can be found [here](#).
- 2) Go to the location where you have extracted the files from the .zip file.
- 3) Now find the .exe file called 'Class 456 EMU Pack'. Double-click this file.
- 4) Follow the steps and by the end of the process, the main part of this pack will have installed.
- 5) If you intend to use any of the included scenarios, make sure you have the freely available extra stock pack and relevant payware add-on packs listed on the product page installed so the scenarios function as intended.

## Technical information

|                        |  |
|------------------------|--|
| <b>Manufacturer</b>    | BREL (British Rail Engineering Limited) York |
| <b>Years built</b>     | 1990 - 1991                                  |
| <b>Number built</b>    | 24 (456001 - 456024)                         |
| <b>Traction motors</b> | x2 GEC507-20J / 250hp (186kw) each           |
| <b>Maximum speed</b>   | 75mph (121km/h)                              |
| <b>Coupling type</b>   | Tightlock                                    |
| <b>Length</b>          | 20.18m per car                               |
| <b>Height</b>          | 3.77m  |
| <b>Width</b>           | 2.82m  |
| <b>Weight</b>          | 72.5 tonnes per 2 car unit                   |

# Liveries

Connex South Central - *Connex*



Connex Unbranded - *Connex UB*



Network SouthEast - *NSE*



Network SouthEast Faded & Unbranded - *NSE Faded*



Southern



Southern Unbranded - *Southern UB*



Southern CCTV - CCTV



Southern White

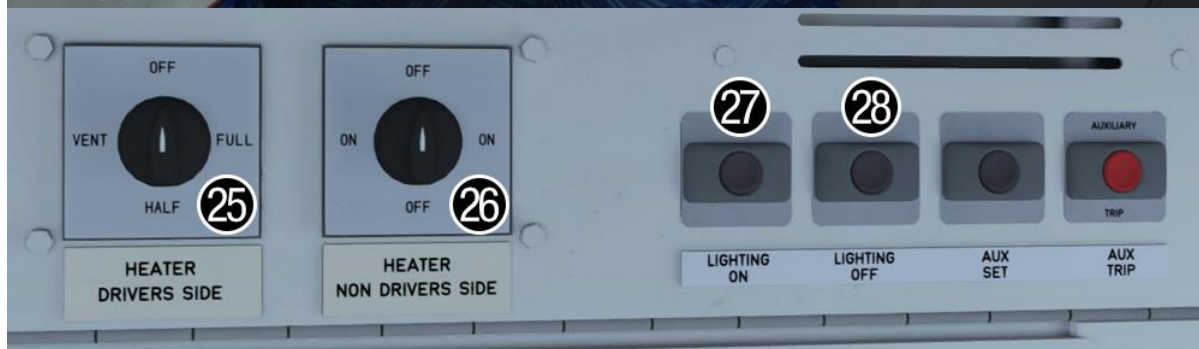
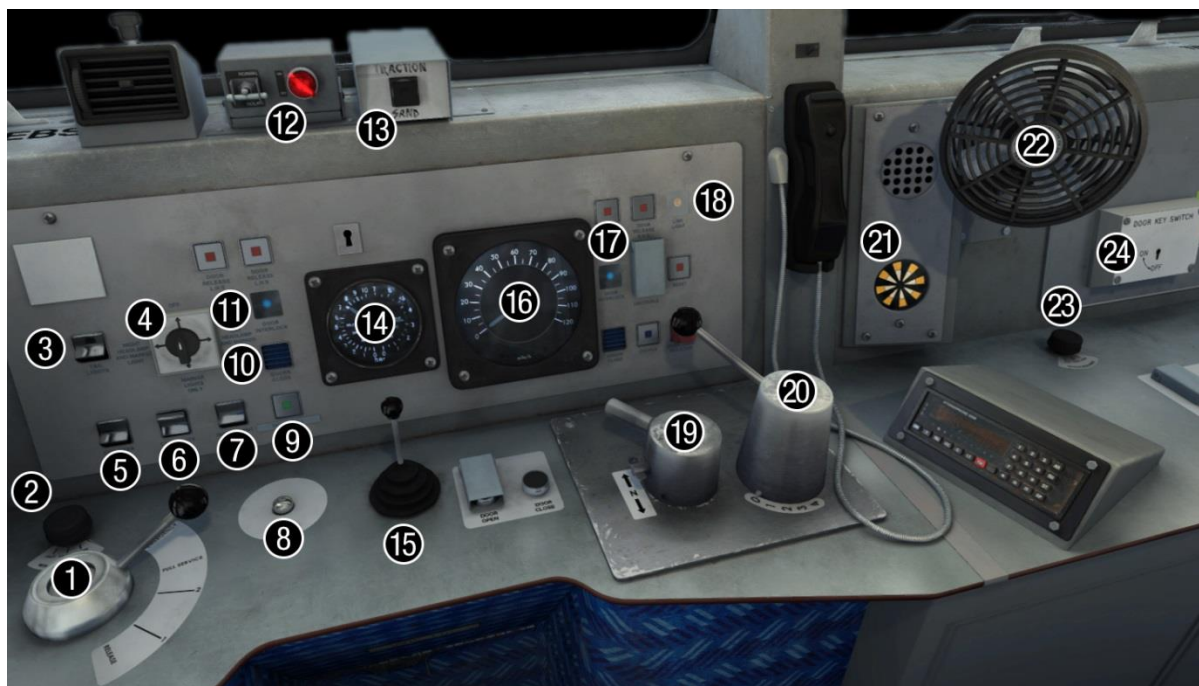


## South West Trains - SWT





# Cab guide



## Desk

- 1 - Brake handle
- 2 - Driver's windscreen wiper switch (fast/park/slow)
- 3 - Tail light switch (off/on)
- 4 - Headlight switch (off/day/marker/night)
- 5 - Demister switch
- 6 - Cab lights switch (off/on)
- 7 - Instrument dimmer switch
- 8 - AWS reset button
- 9 - Driver to guard bell button
- 10 - Door close button
- 11 - Door interlock light
- 12 - DRA (Driver Reminder Appliance)
- 13 - Sander
- 14 - Brake gauge
- 15 - Horn (high/low)
- 16 - Speedometer
- 17 - Door interlock light
- 18 - Line light



- 19 - Reverser (off/forward/neutral/reverse)
- 20 - Power controller (0/1/2/3/4)
- 21 - AWS sunflower
- 22 - Fan (fast/off/slow)
- 23 - Second man's windscreen wiper switch (fast/park/slow)
- 24 - Door key switch (off/on)

**Back wall**

- 25 - Heater switch driver side (off/vent only/half/full)
- 26 - Heater switch non-driver side (off/on/off/on)
- 27 - Saloon lighting on button
- 28 - Saloon lighting off button

**Back wall door control panel**

- 29 - Door close button
- 30 - Driver to guard bell button

# Keyboard controls

Non-standard keyboard controls are listed below:

|                     |  |
|---------------------|--|
| L -                 | Cab light ON/OFF                       |
| E -                 | Deadman's pedal (DSD vigilance reset)  |
| F7 -                | Destination (manual) blind DOWN        |
| F8 -                | Destination (manual) blind UP          |
| R -                 | Door close button                      |
| F -                 | DRA (Driver Reminder Appliance) ON/OFF |
| C -                 | Driver to guard bell                   |
| Ctrl+shift+E -      | DSD vigilance ON/OFF                   |
| Space -             | Horn (low tone)                        |
| B -                 | Horn (high tone)                       |
| O -                 | Passenger saloon lighting ON           |
| Shift+O -           | Passenger saloon lighting OFF          |
| K -                 | Tail lights ON/OFF                     |
| Ctrl+Numpad Enter - | Visual aids ON/OFF                     |
| V -                 | Wiper (driver) RIGHT                   |
| Shift+V -           | Wiper (driver) LEFT                    |
| Ctrl+V -            | Wiper (guard) RIGHT                    |
| Ctrl+Shift+V -      | Wiper (guard) LEFT                     |

## Features

- High definition textures
- Detailed internal & external audio
- Accurate, driver-approved acceleration & braking physics
- [Driver only/guard operation option](#)
- [Manual and electronic destination displays](#)
- Prototypical 3 step brake and [power controller](#)
- Accurate reverser function
- Traction interlock - power can't be applied with doors open
- Fully functioning AWS with accurate delay between passing over the magnet and hearing the warning sound
- AWS & TPWS self-test
- DRA (Driver Reminder Appliance)
- DVD (Driver Vigilance Device) (optional)
- [AWS/DSD visual aids](#) (optional)
- Guard/driver signal button
- Independent driver and guard wipers
- Opening cab windows
- Cab instrument lighting
- Cab light
- User-operable passenger saloon lights
- Prototypical day and night headlights with AI functionality
- TSX headlight and rain effects
- [Class 455 compatibility](#)

## Driver only/guard operation

Before being taken over by South West Trains, class 456s operated on routes where there was no guard on board the train and as a result, the driver had to close the doors himself. Please see below on what the relevant procedure is and how to change the type of operation whilst in-game:

### ***Driver only operation (DOO)***

- 1) Open doors by pressing 'T' on the keyboard.
- 2) Wait for passengers to finish boarding/alighting and when ready, press 'R' on the keyboard, or the 'Door Close' button on the cab desk, to close the doors. Please note that you can not close the doors when passengers are still boarding/alighting.
- 3) Once the door interlock light illuminates, you may depart.

### ***Guard operation***

- 1) Open doors by pressing 'T' on the keyboard
- 2) Doors will be closed by the guard once passengers have finished boarding/alighting.
- 3) Once the door interlock light illuminates, the guard will give you two bells which you must then acknowledge by also giving two bells. This can be carried out by either pressing 'C' on the keyboard or the green 'Signal Bell' button on either the cab desk or the back wall door control panel.

### ***How to change operation***

This can be changed in-game by inserting or removing the 'Door Key Switch' on the second man's side. This is carried out by clicking the panel below:



When the key is inserted, 'driver only operation' is activated.

## Destination display

### Manual blind

Network South East, Connex South Central & Southern White liveries all feature a manual destination blind which can be changed in-game by using the 'F7' & 'F8' keys. Please see below for a list of the available destinations and their relevant code if you wish to use them via the unit's number on an AI service:

|                       |  |                     |                                   |
|-----------------------|--|---------------------|-----------------------------------|
| 01 Not in Service     | 12 Dorking                             | 23 Preston Park     | 34 Sutton                         |
| 02 Depot              | 13 East Croydon                        | 24 Purley           | 35 Tattenham Corner               |
| 03 Balham             | 14 Epsom                               | 25 Purley Oaks      | 36 Thornton Heath                 |
| 04 Battersea Park     | 15 Epsom Downs                         | 26 Redhill          | 37 Three Bridges                  |
| 05 Beckenham Junction | 16 Gatwick Airport                     | 27 Reedham          | 38 Tonbridge                      |
| 06 Brighton           | 17 Haywards Heath                      | 28 Reigate          | 39 Victoria                       |
| 07 Cannon Street      | 18 Horsham                             | 29 Selhurst         | 40 Victoria<br>via Crystal Palace |
| 08 Caterham           | 19 Kensington Olympia                  | 30 Smitham          | 41 Victoria<br>via Peckham Rye    |
| 09 Charing Cross      | 20 London Bridge<br>via Crystal Palace | 31 South Croydon    | 42 Wandsworth Common              |
| 10 Clapham Junction   | 21 London Bridge<br>via Peckham Rye    | 32 Streatham Common | 43 West Croydon                   |
| 11 Coulsdon Town      | 22 London Bridge                       | 33 Streatham Hill   | 44 Wimbledon                      |

### Electronic dot matrix display

A fully functioning electronic dot matrix destination display is provided with the *Southern, Southern Unbranded, Southern CCTV & South West Trains* liveries. This display is operated via the internal computer found to the left of the driver on the Southern liveries and on the second man's side for the South West Trains livery.



To display a destination, simply input the relevant code and click 'SEND' on the Southern version or 'OK' on the South West Trains one. To remove a destination from the display, click 'CANC' on the Southern version or 'ESC' on the South West Trains one.



Please see the next page for a list of destination codes.

## ***Southern***

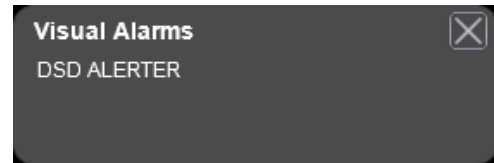
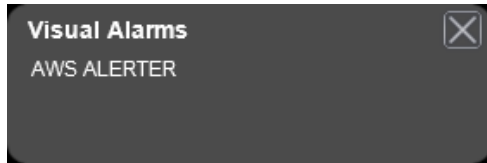
|                          |   |   |
|--------------------------|---|---|
| 00017 Balham             | 00295 Horsham                             | 00825 Streatham Common                      |
| 00018 Battersea Park     | 00811 Kensington Olympia                  | 00826 Streatham Hill                        |
| 00019 Beckenham Junction | 00812 London Bridge<br>via Crystal Palace | 00827 Sutton                                |
| 00023 Brighton           | 00813 London Bridge<br>via Peckham Rye    | 00828 Tattenham Corner                      |
| 00024 Cannon Street      | 00814 Norbury                             | 00829 Thornton Heath                        |
| 00052 Caterham           | 00815 Not in Service                      | 00830 Three Bridges                         |
| 00126 Charing Cross      | 00816 Preston Park                        | 00831 Tonbridge                             |
| 00199 Coulsdon Town      | 00817 Purley                              | 00832 London Victoria                       |
| 00176 Depot              | 00818 Purley Oaks                         | 00833 London Victoria<br>via Crystal Palace |
| 00191 Dorking            | 00819 Redhill                             | 00834 London Victoria<br>via Peckham Rye    |
| 00201 East Croydon       | 00820 Reedham                             | 00835 Wandsworth Common                     |
| 00234 Epsom              | 00821 Reigate                             | 00836 West Croydon                          |
| 00256 Epsom Downs        | 00822 Selhurst                            | 00837 Wimbledon                             |
| 00277 Gatwick Airport    | 00823 Smitham                             |   |
| 00294 Haywards Heath     | 00824 South Croydon                       |   |

## ***South West Trains***

|                          |                       |                        |
|--------------------------|-----------------------|------------------------|
| 00201 Not in Service     | 00223 Hampton Court   | 00245 Weybridge        |
| 00202 Aldershot          | 00224 Haslemere       | 00246 Wimbledon        |
| 00203 Ascot              | 00225 Horsham         | 00247 Windsor & Eton   |
| 00204 Basingstoke        | 00226 Hounslow        | 00248 Windsor & Eton R |
| 00205 Chessington        | 00227 Kensington      | 00249 Woking           |
| 00206 Chessington South  | 00228 Reading         | 00250 Special          |
| 00207 Clapham            | 00229 Shepperton      | 00251 Charter          |
| 00208 Clapham Junction   | 00230 Staines         | 00252 Empty to Depot   |
| 00209 Dorking            | 00231 Strawberry Hill | 00253 Race Special     |
| 00210 Effingham Junction | 00232 Twickenham      | 00254 Havant           |
| 00211 Epsom              | 00243 Waterloo        | 00255 Fratton          |
| 00222 Guildford          | 00244 West Croydon    |                        |

## AWS/DSD visual aids

For those who would like to make sure they don't miss an AWS alert or DSD vigilance alarm when in an external view or perhaps have trouble hearing high pitched sounds, visual aids can be activated and deactivated by pressing 'Ctrl+Numpad Enter'. These will appear in the top right-hand corner of your screen.



## Class 455 compatibility

This class 456 can be used in conjunction with the [Thomson Interactive Class 455](#). The only limitations when coupled to a class 455 are:

- Driver only operation can not be activated.
- If you switch from the class 455 to the 456 or vice versa whilst in-game, the keyboard will no longer be active and you will only be able to control the train using the F4 HUD.

## Setting up the driver's cab

Please follow the steps below to set up the cab of the class 456 so you are ready to move:

- 1) Move the reverser from 'Off' to 'Neutral' by pressing 'S' on the keyboard.
- 2) Cancel the AWS warning sound by pressing 'Q' on the keyboard.
- 3) Turn on the headlights by pressing 'H' on the keyboard until you reach your desired setting.
- 4) Switch to the rear cab and turn on the tail lights by pressing 'K' on the keyboard. Also, if required, move the destination blind to the relevant position.
- 5) Return to the front cab and again, if required, move the destination blind to the relevant position.
- 6) Turn off the Driver Reminder Appliance (DRA) by pressing 'F' on the keyboard.

You should now be ready to move off. For information on how to do so, please see the '[Driving guide](#)' section below.



# Driving guide

The following steps should allow you to drive the class 456 in a realistic and safe manner:

- 1) Move the reverser to your desired direction of travel by pressing either 'W' on the keyboard for forward or 'S' for reverse.
- 2) Move the train brake handle to step 1 by pressing the ';' key.
- 3) Move the power handle to notch 2 by pressing the 'A' key on the keyboard. At the same time, move the train brake handle to the 'release' position which will ensure you depart without rolling back.
- 4) From then on, apply further power as you see fit. Please see the ['Power controller'](#) section below for further detail on the performance of each power notch.
- 5) To brake the train, you may make applications and releases by moving the handle between step 1 and full service. It is recommended you only use full service as a last resort so as to ensure you always have more brake force available if required.
- 6) Just before coming to a stop, aim to have the brakes in step 1 so as to provide a smooth stop.
- 7) In the event of an emergency brake application, you will need to wait for your train to come to a stop. You must then place the reverser in neutral, power handle in off, make sure the brake handle is in emergency and then release.

## Power controller

**0** - Traction power is OFF

**Notch 1** - 25% power

**Notch 2** - 50% power

**Notch 3** - 75% power

**Notch 4** - 100% power

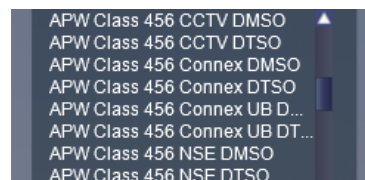
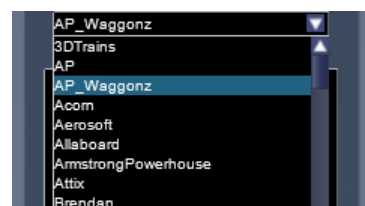
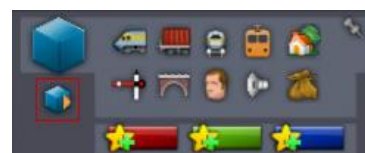
Please note that when accelerating at 28mph, power briefly cuts out as the motors switch from series to parallel.

# How to use in the scenario editor

## How to place

To place a class 456 in the scenario editor, please follow the instructions below:

- 1) In the left-hand rolling stock fly-out, click the object set filter which looks like a blue box with an orange arrow to the right of it.
- 2) Go to the right-hand fly-out which should have appeared. Select 'AP\_Waggonz' from the drop-down menu.
- 3) Tick the second & third box beside 'Class456Pack01'.
- 4) The class 456 liveries should now be visible in the left hand rolling stock fly-out.



## Formation

DMSO + DTSO

## Numbering

When placing a class 456 in the scenario editor, you are able to control the destination it displays via its number. This allows AI services to have a functioning destination display. As well as this, having a player service with a destination already entered means that the saloon lights will already be turned on to recreate when a driver picks up a unit that is already in service. So the player is still able to use the destination display, we recommend inputting what would have been that service's previous destination, the place you start the scenario.

Example number:

**0000045602464758**

Key:

**00000** - Destination code (only 2 digits when using manual destination blind)

**456024** - Unit number

**64758** - Coach number

# Scenarios

## **APC456: 17:42 London Bridge - London Victoria**

Route = South London Network  
Track covered = London Bridge - London Victoria  
Traction = Ex-Network SouthEast 456007  
Year = 2004  
Duration = 25 minutes



## **APC456: 21:04 London Victoria - West Croydon**

Route = South London Network  
Track covered = London Victoria - West Croydon  
Traction = Connex 456024 & Ex-Network SouthEast 456009  
Year = 1999  
Duration = 40 minutes



## **APC456: 2G60 15:39 Caterham - London Bridge**

Route = South London Network  
Track covered = East Croydon - London Bridge  
Traction = Southern 456018 & 456001  
Year = 2013  
Duration = 30 minutes



## **APC456: 2J06 07:01 West Croydon - London Bridge**

Route = South London Network  
Track covered = West Croydon - London Bridge  
Traction = CCTV 456006 & Southern 456010 & 456022  
Year = 2013  
Duration = 45 minutes



## **APC456: 5J95 10:30 London Bridge - Selhurst Depot**

Route = South London Network  
Track covered = London Bridge - Selhurst Depot  
Traction = Southern 456024, 456013 & 455804  
Year = 2013  
Duration = 45 minutes



# Credits

**Waggonz** - Modelling, texturing & scripting

**Jordi Blumberg** - Modelling & texturing

**Alan Hingston** - Assistance in researching of the cab and recording of sounds

**Gregg M. Erikson** - For the use of this [image](#) under the [Creative Commons license](#)