

# **Class 465/466**

## **Enhancement Pack**

### **Volume 2**



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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 465-466 Enhancement Pack Vol 2'. 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 requirements installed, as listed on the product page.
- 6) To ensure the cab environment sounds as intended in this pack, please make sure that 'EFX' is ticked within your in-game Audio settings.

# Liveries

## Class 465/0 & 465/1 (BREL/ABB/Hitachi)

South Eastern 1:

with new destination display - *APEP 465 SE1(2) (Hit)*

with original destination display - *APEP 465 SE1(2) (Hit/OD)*



South Eastern 3 - *APEP 465 SE3*



South Eastern 4:

with original door alarms - *APEP 465 SE4*

with new/PRM door alarms - *APEP 465 SE4 (PRM)*



## **Class 465/2 & /9 (Metro-Cammell)**

South Eastern 1 - *APEP 465/2 SE1(2)* & *APEP 465/9 SE1(2)*





South Eastern 2 - APEP 465/9 SE2



South Eastern 3 - APEP 465/2 SE3 & APEP 465/9 SE3



South Eastern 4:

with original door alarms - *APEP 465/2 SE4 & APEP 465/9 SE4*

with new/PRM door alarms - *APEP 465/2 SE4 (PRM) & APEP 465/9 SE4 (PRM)*



## **Class 466 (Metro-Cammell)**

South Eastern 1 - *APEP 466 SE1(2)*





### South Eastern 3 - *APEP 466 SE3*



### South Eastern 4:

with original door alarms - *APEP 466 SE4*

with new/PRM door alarms - *APEP 466 SE4 (PRM)*



# Keyboard Controls

Non-standard keyboard controls are listed below:

|                     |  |
|---------------------|--|
| Numpad Plus -       | Brake hold button                      |
| L -                 | Cab light ON/OFF                       |
| E -                 | Deadman's pedal (DVD reset)            |
| F7 -                | Destination display DOWN               |
| F8 -                | Destination display UP                 |
| Shift+F7 -          | Destination display (via) DOWN         |
| Shift+F8 -          | Destination display (via) UP           |
| R -                 | Door close button                      |
| U -                 | Door release buttons (left)            |
| O -                 | Door release buttons (right)           |
| Y -                 | Driver reminder appliance (DRA) ON/OFF |
| C -                 | Driver to guard bell                   |
| Ctrl+D -            | Driver vigilance device (DVD) ON/OFF   |
| H -                 | Headlight switch CLOCKWISE             |
| Shift+H -           | Headlight switch ANTI-CLOCKWISE        |
| I -                 | Instrument lights switch ON/OFF        |
| Shift+W -           | Master key IN/OUT                      |
| Shift+M -           | Motor factor UP                        |
| Ctrl+M -            | Motor factor DOWN                      |
| Ctrl+R -            | Passenger door operation toggle DOO/GO |
| M -                 | Saloon lights ON/OFF                   |
| . -                 | Speed set control CLOCKWISE            |
| , -                 | Speed set control ANTI-CLOCKWISE       |
| K -                 | Tail lights switch ON/OFF              |
| Ctrl+Numpad Enter - | Visual aids ON/OFF                     |
| V -                 | Wiper switch CLOCKWISE                 |
| Shift+V -           | Wiper switch ANTI-CLOCKWISE            |



# Features

## Variations

Many of the detail differences between the BREL/ABB & Metro-Cammell units have been simulated in this pack.

### *Visual*

BREL/ABB specific anti-climb steps



Newly modelled window surrounds. BREL/ABB on the right and Metro-Cammell on the left. Also, pressure ventilator grilles on BREL/ABB variant.



Revised Hitachi BREL/ABB DMSO underframe



BREL/ABB TSO/TSOL underframe



## **Audio**

The following sounds have BREL/ABB & Metro-Cammell specific versions:

- Traction motors
- Dynamic brake/traction motor cooling fan
- Clunk when applying/disengaging power on Metro-Cammell variant only
- External and internal DMSO 'run' sounds
- Brakes
- Doors
- Compressor
- Auxiliary converter
- Pressure ventilator on BREL/ABB variant only

## **Driver Only Operation (DOO)**

Full door control is featured in this pack to simulate 'DOO'. Please see below for what the relevant procedure is and how to change the type of operation whilst in-game:

### ***Driver Only Operation (DOO)***

- 1) Open the doors by pressing **T+U** (left-hand side) or **T+O** (right-hand side). Alternatively, you can click the corresponding red buttons in the cab.
- 2) If at a platform, wait for the 'Platform Duties Complete' message to appear in the top-right corner and press **R** to close the doors. If not at a platform, press **R** whenever you wish.
- 3) Once the door interlock light illuminates, you may depart.

### ***Guard Operation (GO)***

- 1) Open the doors by pressing **T**.
- 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 acknowledge by also giving two bells. This can be carried out by pressing **C** twice.

### ***How to Change Operation***

This can be changed in-game by pressing **Ctrl+R** which will produce a visual message in the top-right hand corner of the screen to let you know which option you have selected.



## **Adhesion**

Adhesion between a train's wheels and the rails plays a big part in allowing a train to accelerate or brake. Too little of it and the train will slip or slide. There are a myriad of factors that control the level of adhesion and we have attempted to simulate the most important of these to give a varied and realistic driving experience:

### ***Season***

Adhesion is generally good in dry conditions during summer and spring. Slightly decreased adhesion during winter to take account of the increased amount of moisture and possible ice on the rails due to cooler temperatures. Much decreased adhesion during autumn due to leaf mulch.

### ***Weather***

Adhesion decreases in wet weather, especially so when rain first starts falling before it has had a chance to clean the railhead. If rain is light, it will take longer for the railhead to be cleaned whereas heavy rain will clean it quicker, resulting in adhesion recovering sooner.

When using the drizzle weather pattern in our Sky & Weather Enhancement Pack, adhesion is particularly poor as the rain hasn't enough force to clean the railhead but still makes it sufficiently wet to worsen adhesion.

### ***Time of Day***

Adhesion will decrease somewhat after dusk as the air cools and dew is more likely to form on the railhead. This persists throughout the night until around an hour after sunrise when higher temperatures or the sun dry it out. In our simulation, this factor is reduced during summer to account for warmer temperatures, which on average result in less dew.

### ***Tunnels***

When adhesion is poor due to external factors such as weather or season, adhesion will generally improve upon entering a tunnel, which is not as susceptible to these factors. When adhesion is good during dry weather and outside of autumn, adhesion may decrease a little upon entering a tunnel due to their damp nature.

## ***Wheelslip***

Wheelslip protection aids the driver when powering or braking during times of poor adhesion.

When wheelslip is encountered during acceleration, a two-stage process takes place:

- 1) The motors can be heard rising rapidly in pitch and power cuts violently to control the slip.
- 2) Once grip is regained, power is reapplied at the notch selected on the power brake controller.

As a driver, you must assess which power notch is most suitable for the conditions and balance the occurrence of wheelslip with the maximum possible rate of acceleration.

## ***Wheelslide***

When wheelslide is encountered during braking, a multi-stage process takes place:

- 1) If the dynamic brake is active, the unit automatically switches to use the air brake only.
- 2) Brake pressure is automatically reduced to try and control the slide.
- 3) Sand is automatically applied if in step 2, step 3 or emergency brake.
- 4) Once the slide stops, brake pressure is returned to the notch selected on the power brake controller. If wheelslide reoccurs, the process starts again.

As a driver, you must resist the temptation to reduce the brake yourself as the wheelslip protection will offer the best braking performance.

## Speed Set

The speed set speed selector control is located below the AWS sunflower. The first position on the switch is 3 mph, the next is 5 mph, and the settings then increase in 5 mph intervals up to 75 mph. The speed selected is indicated by the white pointer on the outer edge of the speedometer

When in speed set mode with a power notch selected, the speed set system will automatically control the train speed to hold a speed approximately 2mph below the target speed selected. If the speed drops too far below the target speed, the unit will automatically apply traction power in order to get back to the selected speed. If the target speed starts to be exceeded, such as when the train is on a falling gradient, the speed set will automatically apply the dynamic brake in order to control the speed.

The only form of braking available whilst using speed set is dynamic braking, so the speed set will not brake the train if the dynamic brake is isolated.

It is recommended that you only use speed set to hold your speed or change your speed by small increments such as 5 or 10 mph. Acceleration rate is reduced when using speed set so using it to accelerate to a certain speed will take longer compared to when it is inactive.

## Accelerometer, Decelerometer & Clock

Acceleration and deceleration meters have been modelled next to the speedometer as per reality. As well as those, a clock has been added which also displays the unit's lifetime mileage (since last reset by a fitter) if you press the 'Select' button below it. This is a random figure automatically set at the start of a scenario.





## Player Changeable Destination Display

The destination display can be changed during a scenario by pressing either the F7 or 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:

|                                  |                           |                                    |
|----------------------------------|---------------------------|------------------------------------|
| <b>a - Blank</b>                 | <b>r - Faversham</b>      | <b>I - Paddock Wood</b>            |
| <b>b - Broadstairs</b>           | <b>s - Gillingham</b>     | <b>J - Plumstead</b>               |
| <b>c - Ashford International</b> | <b>t - Gravesend</b>      | <b>K - Ramsgate</b>                |
| <b>d - Barnehurst</b>            | <b>u - Grove Park</b>     | <b>L - Rochester</b>               |
| <b>e - Beckenham Jn</b>          | <b>v - Hastings</b>       | <b>M - Sevenoaks</b>               |
| <b>f - Blackfriars</b>           | <b>w - Hayes</b>          | <b>N - Sheerness</b>               |
| <b>g - Bromley North</b>         | <b>x - Higham</b>         | <b>O - Sidcup</b>                  |
| <b>h - Bromley South</b>         | <b>y - Hither Green</b>   | <b>P - Sittingbourne</b>           |
| <b>i - Cannon St</b>             | <b>z - Kent House</b>     | <b>Q - Slade Green</b>             |
| <b>j - Canterbury East</b>       | <b>A - London Bridge</b>  | <b>R - Strood</b>                  |
| <b>k - Canterbury West</b>       | <b>B - Maidstone East</b> | <b>S - Swanley</b>                 |
| <b>l - Charing X</b>             | <b>C - Maidstone West</b> | <b>T - Tonbridge</b>               |
| <b>m - City Thameslink</b>       | <b>D - Margate</b>        | <b>U - Tunbridge Wells</b>         |
| <b>n - Crayford</b>              | <b>E - New Beckenham</b>  | <b>V - Victoria</b>                |
| <b>o - Dartford</b>              | <b>F - New Cross</b>      | <b>W - Listen to Announcements</b> |
| <b>p - Dover Priory</b>          | <b>G - Ore</b>            | <b>X - Out of Service</b>          |
| <b>q - Lewisham</b>              | <b>H - Orpington</b>      | <b>Y - Special</b>                 |

## Via

There are additional 'via' options for the second line of the destination display. These can be controlled by pressing **Shift+F7** or **Shift+F8**. Please see below for a list of the options and their relevant code if you wish to use them on an AI service by adding **;D2=x** to the DMSOA's vehicle number. Options in italics are not available on the new destination display:

|                               |                                |                              |
|-------------------------------|--------------------------------|------------------------------|
| <b>1 - via Beckenham Jn</b>   | <b>10 - via Bromley South</b>  | <b>19 - via W A Lewisham</b> |
| <b>2 - via Bexleyheath</b>    | <b>11 - via Canterbury E</b>   | <b>20 - and Ashford Intl</b> |
| <b>3 - via Catford</b>        | <b>12 - via Canterbury W</b>   | <b>21 - and Canterbury E</b> |
| <b>4 - via Greenwich</b>      | <b>13 - via Catford Bridge</b> | <b>22 - and Canterbury W</b> |
| <b>5 - via Herne Hill</b>     | <b>14 - via Chatham</b>        | <b>23 - and Dover Priory</b> |
| <b>6 - via Lewisham</b>       | <b>15 - via Lewisham W A</b>   | <b>24 - and Margate</b>      |
| <b>7 - via Sidcup</b>         | <b>16 - via Orpington</b>      | <b>25 - and Ramsgate</b>     |
| <b>8 - via Maidstone East</b> | <b>17 - via Otford</b>         |                              |
| <b>9 - via Blackheath W A</b> | <b>18 - via W A Blackheath</b> |                              |

## Variable Traction Motor Volume

In reality, some traction motors are louder than others. To simulate this, we have implemented a random 'Motor Factor' to each motor bogie which ranges from 1 to 6; 1 being the quietest and 6 being the loudest. 'Motor Factor' can also be changed on the player train's leading motor bogie by pressing **Shift+M** or **Ctrl+M**. Please note that this only applies to the Class 465/0 & /1 sub-classes, which in reality, have the most noticeable difference.

## Automatic Unit Numbering

When placing a unit in the scenario editor or using one in Quick Drive, all vehicles will automatically be given correct unit and coach numbers, instead of you having to select each vehicle and changing their number manually so they match. The unit number is controlled via the DMSOA vehicle if you wish to change it.

## Bits and Bobs

This section is dedicated to aspects of this pack that don't warrant a dedicated section but are still of note:

- The class 365 cab from the DTG London - Peterborough route is used due to its better visuals and functionality.
- Higher resolution visuals for many of the various in-cab labels and buttons.
- Speedometer re-textured to signify the class 465/466's lower maximum speed of 75 mph.
- Clickable and functioning master key.
- Newly modelled reverser handle.
- 4-step reverser (off/forward/neutral/reverse).
- TPWS lights illuminate during AWS self-test.
- DVD isolation lights to the top-left of the driver, as well as 'Safety System Isolated' indicator on desk.
- Door interlock light moved from door close button to where it should actually be.
- In-cab unit/vehicle number labels.
- Selected destination displayed on the in-cab top-right computer unit.
- Functioning brake hold button which applies the equivalent of step 1 brake.
- Animated cab light & instrument (dash) light switches.
- Intermittent, slow & fast wiper speeds.
- Visual alarms outside of cab when AWS or DVD are active.
- The visible driver automatically moves to whichever cab you are in.
- Emergency brake pressure applied when reverser is in 'Off'.
- When the sander button is pressed, you must be in a power notch and it will only apply for 10 seconds maximum at a time. If you wish to continue to apply sand after 10 seconds, you must re-press the sander button.
- Due to reliability issues from around 2008 onwards, the dynamic brake was isolated on Metro-Cammell 465s/466s and this is implemented by default on all of these units.
- Driver to guard bell only active when reverser is away from 'Off'.



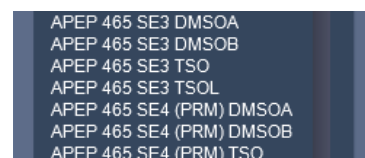
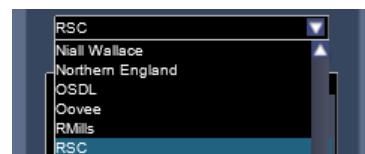
- 1 second delay between train passing over AWS magnet and AWS warning sound occurring. The F3/F4 HUD will show the warning immediately so you must wait 1 second before trying to cancel it.
- The headlights only provide illumination before sunrise and after sunset. This is to avoid the unrealistic appearance of projected light in broad daylight.
- High quality headlight/marker light & tail light visuals with LED variants.
- White & purple status lights above external destination display. White illuminates when the dynamic brake is active and purple illuminates when a safety system is isolated.
- Correct looking tightlock coupler applied.
- Extra passenger view camera angle.

# How to Use in the Scenario Editor

## *How to place*

To place 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 'RSC' from the drop-down menu.
- 3) Tick the second & third box beside 'Class465Pack01' & 'ECMLS'.
- 4) The liveries should now be visible in the left-hand rolling stock fly-out.



## Numbering

When placing in the scenario editor, you are able to control a number of features via the number of the unit. Please note that the only number you need to change is the DMSOA's, as other vehicles in the consist will automatically be numbered correctly using this number.

## *Dynamic brake*

The dynamic brake can be isolated by adding **;DB=1**.

## *Window frames*

On BREL/ABB South Eastern 1 livery, silver window frames are available by adding **;SW=1**.

## *Underframe*

On BREL/ABB South Eastern 4 livery, a white underframe is available by adding **;WU=1**.

Example number:

**465932****h**;**D2=c**;**DB=1**;**AC=1**

Key:

**465932** - Unit number

**h** - Destination

**;D2=c** - Destination (via)

**;DB=1** - Dynamic brake isolated

**;AC=1** - Air conditioning roof unit

## Setting up the Driver's Cab

Please follow these steps to set up the cab so you are ready to move:

- 1) Turn the master key in by pressing **Shift+W**.
- 2) Move the reverser to the 'Neutral' position by pressing **S**.
- 3) Cancel the DVD self-test alarm by pressing **E**.
- 4) Cancel the AWS self-test alarm by pressing **Q**.
- 5) Turn the tail lights off by pressing **K**.
- 6) Turn the headlights on by pressing **H**.
- 7) Turn the instrument lights on by pressing **I**.
- 8) Set your destination by pressing **F7** or **F8**.
- 9) Turn the Driver Reminder Appliance (DRA) off by pressing **Y**.

You should now be ready to move off.

# Scenarios

## **APC465EP: 2D90 08:22 Beckenham Junction - Victoria**

Route = Chatham Main & Medway Valley Lines

Track covered = Beckenham Junction - Victoria

Traction = South Eastern 466038 & 465042

Year = 2014

Duration = 25 minutes



## **APC465EP: 2K38 18:58 Victoria - Gillingham**

Route = Chatham Main & Medway Valley Lines

Track covered = Victoria - Gillingham - Gillingham Depot

Traction = South Eastern 465923

Year = 2012

Duration = 1 hour 20 minutes



## **APC465EP: 2M76 14:55 Victoria - Orpington**

Route = Chatham Main & Medway Valley Lines

Track covered = Victoria - Orpington

Traction = South Eastern 465007 & 465197

Year = 2016

Duration = 40 minutes



# Credits

**Nicolas Schichan** - Advanced scripting

**George Hartley** - Modelling of the external visual differences

**Chris Horsfield** - Destination display font

**Glenn Doig** - Internal wheelslip sound recordings