UK AWS Script

The UK AWS script for OpenRails, provides a representation of the operation of the British AWS systems as in use from 1908 until the present day. There are some compromises, which can not be avoided for the present time in OpenRails. The main limitation being that if AWS is specified in an eng file, that it will operate in the same way on all routes and sections of the route where the train is used. In other words in is not currently possible to specify that certain signals or certain sections of route are fitted with a particular version of AWS where other signals or sections of route may not be.

The required script and sound files are contained in a AWS folder that can be installed into the trainset folder for any route where trains were fitted with AWS. This is a common folder and avoids the need to include copies of these files with every locomotive.

Fitting of working AWS to a locomotive requires adding three lines to OpenRails eng file, these are *ORTSTrainControlSystem*, *ORTSTrainControlSystemSound* and *ORTSTrainControlSystemParameters*.

ORTSTrainControlSystem is a common file used for all versions of AWS, this is a script file that interacts with the OR simulation code to give the required behaviour. The OR script for this was written by Carlo Santucci.

ORTSTrainControlSystemSound is an sms file that specifies the sounds to be used. There are three versions included TCS_AWS_UK_GWR.sms which gives the original GWR bell and siren sounds. TCS_AWS_UK_old.sms which gives the earlier bell and horn sounds and TCS_AWS_UK_new.sms which gives the more modern electronic sounds. Alternative sound files could be added using the standard MSTS / OR format.

ORTSTrainControlSystemParameters specifies the particular version of AWS in use on a given train. There have been several changes to AWS and to other train control systems over more than 100 years of use. A summary of important changes is listed below and details of the 12 different ini files provided are given on the following pages.

Example eng file entry for vacuum braked locomotive with BR AWS before 1970:

```
Comment ( ** Train Control Systems - Monitoring of Overspeed, Emergency Braking, Vigilance, etc ** )

ORTSTrainControlSystem( "..\\..\\AWS\\SCRIPT\\TCS_AWS_UK" )
ORTSTrainControlSystemSound( "..\\..\\AWS\\SOUND\\TCS_AWS_UK_old.sms" )
ORTSTrainControlSystemParameters( "..\\..\\AWS\\SCRIPT\\TCS_AWS_1956_VB.ini" )
```

The major developments of the AWS system are as follows:

1908 – GWR AWS introduced, electro-mechanical, sound indication only at distant signals.
1956 – BR AWS introduced, electro-magnetic, sound and visual indications.
1971 – Addition of warning for permanent speed restrictions.
2000 – TPWS giving emergency stop at danger signals and other enhancements.

Variations of AWS are now being progressively replaced by ERTMS.

Sound files:

(i) For trains fitted with GWR AWS

ORTSTrainControlSystemSound("..\\..\\AWS\\SOUND\\TCS_AWS_UK_GWR.sms")

(ii) For trains fitted with BR AWS up to c.1975

ORTSTrainControlSystemSound("..\\..\\AWS\\SOUND\\TCS_AWS_UK_old.sms")

(iii) For trains built from 1976 onwards, or more recently fitted with TPWS

ORTSTrainControlSystemSound("..\\..\\AWS\\SOUND\\TCS_AWS_UK_new.sms")

Ini files:

1908 -1973 GWR AWS

(a) GWR and BR locomotives and railcars operating over routes with GWR AWS

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_GWR.ini")

Note: **GWR AWS did not include a visual (***Sunflower***) indication**.

Note: *prior to 1916 the bell for clear signals needed to be manually cancelled.*

1956 -1970 BR AWS

(b) Trains with vacuum brake only. Steam locomotives, diesel and electric locomotives with vacuum brakes only and first generation diesel multiple units.

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_1956_VB.ini")

(c) Trains with air brakes. (Dual braked diesel and electric locomotives, Blue Pullman sets.)

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_1956_AB.ini")

(d) Trains with EP brakes. (Electric and diesel electric multiple units.)

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_1956_EP.ini")

1971 -2000 BR_AWS

(e) Trains with vacuum brake only. Steam locomotives, diesel and electric locomotives with vacuum brakes only and first generation diesel multiple units.

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_1971_VB.ini")

(f) Trains with air brakes.

Dual braked locomotives and Blue Pullman sets built without vigilance alarm

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_1971_AB.ini")

(g) Air braked locomotives built 1974 onwards – with vigilance alarm

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_1971_ABv.ini")

(h) Trains with EP brakes.

Electric and diesel electric multiple units built without vigilance alarm

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_1971_EP.ini")

(i) Multiple units built after 1974 - with vigilance alarm

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_1971_EPv.ini")

2000 onwards TPWS

(j) Trains with air brakes (except those fitted with ATP or TASS)

Air braked locomotives and driving trailers, including HST, Inter City 225, Voyager sets, Adelante sets and Heritage locomotives with Main Line certification.

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_TPWS_AB.ini")

(k) Trains with EP brakes.

Most diesel or electric multiple units

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_TPWS_EP.ini")

1990/2000 onwards ATP or TASS – GWR Main Line, Chiltern Line, West Coast Main Line

Note: ATP fitted trains have LED inication of speed limits at 5 mph intervals on speedometer.

(l) Trains with air brakes

Air braked locomotives, HST and Adelante sets operating on GWML.
Tilting trains on WCML – Pendolino and Super Voyager.

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_ATP_AB.ini")

(m) Trains with EP brakes.

Diesel and Electric Multiple Units operating on GWML

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_ATP_EP.ini")

Ini file details:

1908 -1970+ GWR AWS

(a) GWR AWS

[General]
AWSMonitor=true
EmergencyStopMonitor=false
VigilanceMonitor=false
OverspeedMonitor=false
[AWS]
Inhibited=false
WarningTimerDelayS=0
BrakeImmediately=true
TrainStopBeforeRelease=false
ActivationOnSpeedLimitReduction=false
SpeedLimitReductionForActivationMpS=11.176
BeaconDistanceToPostM=1368
AppliesCutsPower=false
AppliesTCSBrake=true
AppliesEmergencyBrake=false

1956 -1970 BR AWS

(b) BR vacuum braked AWS

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_1956_VB.ini")

[General]
AWSMonitor=true
EmergencyStopMonitor=false
VigilanceMonitor=false
OverspeedMonitor=false
[AWS]
Inhibited=false
WarningTimerDelayS=0
BrakeImmediately=true
TrainStopBeforeRelease=false
ActivationOnSpeedLimitReduction=false
SpeedLimitReductionForActivationMpS=11.176
BeaconDistanceToPostM=1186
AppliesCutsPower=false
AppliesTCSBrake=true
AppliesEmergencyBrake=false

(c) Trains with air brakes.

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_1956_AB.ini")

[General]
AWSMonitor=true
EmergencyStopMonitor=false
VigilanceMonitor=false
OverspeedMonitor=false
[AWS]
Inhibited=false
WarningTimerDelayS=3
BrakeImmediately=false
TrainStopBeforeRelease=false
ActivationOnSpeedLimitReduction=false
SpeedLimitReductionForActivationMpS=11.176
BeaconDistanceToPostM=1186
AppliesCutsPower=false
AppliesTCSBrake=true
AppliesEmergencyBrake=false

(d) Trains with EP brakes.

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_1956_EP.ini")

[General]
AWSMonitor=true
EmergencyStopMonitor=false
VigilanceMonitor=false
OverspeedMonitor=false
[AWS]
Inhibited=false
WarningTimerDelayS=3
BrakeImmediately=false
TrainStopBeforeRelease=true
ActivationOnSpeedLimitReduction=false
SpeedLimitReductionForActivationMpS=11.176
BeaconDistanceToPostM=1186
AppliesCutsPower=true
AppliesTCSBrake=false
AppliesEmergencyBrake=true

1971 -2000 BR AWS

(e) Vacuum braked only AWS

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_1971_VB.ini")

[General]
AWSMonitor=true
EmergencyStopMonitor=false
VigilanceMonitor=false
OverspeedMonitor=false
[AWS]

Inhibited=false
WarningTimerDelayS=0
BrakeImmediately=true
TrainStopBeforeRelease=false
ActivationOnSpeedLimitReduction=true
SpeedLimitReductionForActivationMpS=11.176
BeaconDistanceToPostM=1186
AppliesCutsPower=false
AppliesTCSBrake=true
AppliesEmergencyBrake=false

(f) Air braked and Dual braked AWS (no vigilance alarm)

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_1971_AB.ini")

[General]
AWSMonitor=true
EmergencyStopMonitor=false
VigilanceMonitor=false
OverspeedMonitor=false
[AWS]
Inhibited=false
WarningTimerDelayS=3
BrakeImmediately=false
TrainStopBeforeRelease=false
ActivationOnSpeedLimitReduction=true
SpeedLimitReductionForActivationMpS=11.176
BeaconDistanceToPostM=1186
AppliesCutsPower=false
AppliesTCSBrake=true
AppliesEmergencyBrake=false

(g) Air braked AWS (with vigilance alarm)

[General]
AWSMonitor=true
EmergencyStopMonitor=false
VigilanceMonitor=true
OverspeedMonitor=false
[AWS]
Inhibited=false
WarningTimerDelayS=3
BrakeImmediately=false
TrainStopBeforeRelease=true
ActivationOnSpeedLimitReduction=true
SpeedLimitReductionForActivationMpS=11.176
BeaconDistanceToPostM=1186
AppliesCutsPower=false
AppliesTCSBrake=true
AppliesEmergencyBrake=false

[VigilanceMonitor]
MonitorTimeLimitS=25
AlarmTimeLimitS=17
PenaltyTimeLimitS=0
CriticalLevelMpS=0
ResetLevelMpS=0
AppliesTCSBrake=true
AppliesEmergencyBrake=false
ResetOnZeroSpeed=false
AppliesCutsPower=false
RestartOnControlsMoved=true
AppliesShutsDownEngine=true
ResetOnResetButton=true

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_1971_ABv.ini")

(h) EP braked AWS (no vigilance alarm)

[General]
AWSMonitor=true
EmergencyStopMonitor=false
VigilanceMonitor=false
OverspeedMonitor=false
[AWS]
Inhibited=false
WarningTimerDelayS=3
BrakeImmediately=false
TrainStopBeforeRelease=true
ActivationOnSpeedLimitReduction=true
SpeedLimitReductionForActivationMpS=11.176
BeaconDistanceToPostM=1186
AppliesCutsPower=true
AppliesTCSBrake=false
AppliesEmergencyBrake=true

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_1971_EP.ini")

(i) EP braked AWS (with vigilance alarm)

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_1971_EPv.ini")

[General]
AWSMonitor=true
EmergencyStopMonitor=false
VigilanceMonitor=true
OverspeedMonitor=false
[AWS]
Inhibited=false
WarningTimerDelayS=3
BrakeImmediately=false
TrainStopBeforeRelease=true

ActivationOnSpeedLimitReduction=true
SpeedLimitReductionForActivationMpS=11.176
BeaconDistanceToPostM=1186
AppliesCutsPower=true
AppliesTCSBrake=false
AppliesEmergencyBrake=true
[VigilanceMonitor]
MonitorTimeLimitS=25
AlarmTimeLimitS=17
PenaltyTimeLimitS=0
CriticalLevelMpS=0
ResetLevelMpS=0
AppliesTCSBrake=false
AppliesEmergencyBrake=true
ResetOnZeroSpeed=true
AppliesCutsPower=false
RestartOnControlsMoved=true
AppliesShutsDownEngine=true
ResetOnResetButton=true

2000 onwards TPWS

(j) Air braked TPWS (except trains fitted with ATP or TASS)

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_TPWS_AB.ini")

[General]
AWSMonitor=true
EmergencyStopMonitor=true
VigilanceMonitor=true
OverspeedMonitor=false
[AWS]
Inhibited=false
WarningTimerDelayS=3
BrakeImmediately=false
TrainStopBeforeRelease=true
ActivationOnSpeedLimitReduction=true
SpeedLimitReductionForActivationMpS=11.176
BeaconDistanceToPostM=1186
AppliesCutsPower=false
AppliesTCSBrake=true
AppliesEmergencyBrake=false
[EmergencyStopMonitor]
MonitorTimeLimitS=0
AlarmTimeLimitS=0
PenaltyTimeLimitS=0
CriticalLevelMpS=0
ResetLevelMpS=0
AppliesFullBrake=false
AppliesEmergencyBrake=true
AppliesCutsPower=false
AppliesShutsDownEngine=false

[VigilanceMonitor]
MonitorTimeLimitS=25
AlarmTimeLimitS=17
PenaltyTimeLimitS=0
CriticalLevelMpS=0
ResetLevelMpS=0
AppliesTCSBrake=true
AppliesEmergencyBrake=false
ResetOnZeroSpeed=false
AppliesCutsPower=false
RestartOnControlsMoved=true
AppliesShutsDownEngine=true
ResetOnResetButton=true

(k) EP braked TPWS (except trains fitted with ATP or TASS)

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_TPWS_EP.ini")

[General]
AWSMonitor=true
EmergencyStopMonitor=true
VigilanceMonitor=true
OverspeedMonitor=false
[AWS]
Inhibited=false
WarningTimerDelayS=3
BrakeImmediately=false
TrainStopBeforeRelease=true
ActivationOnSpeedLimitReduction=true
SpeedLimitReductionForActivationMpS=11.176
BeaconDistanceToPostM=1186
AppliesCutsPower=true
AppliesTCSBrake=false
AppliesEmergencyBrake=true
[EmergencyStopMonitor]
MonitorTimeLimitS=0
AlarmTimeLimitS=0
PenaltyTimeLimitS=0
CriticalLevelMpS=0
ResetLevelMpS=0
AppliesFullBrake=true
AppliesEmergencyBrake=false
AppliesCutsPower=true
AppliesShutsDownEngine=false
[VigilanceMonitor]
MonitorTimeLimitS=25
AlarmTimeLimitS=17
PenaltyTimeLimitS=0
CriticalLevelMpS=0
ResetLevelMpS=0
AppliesTCSBrake=false

AppliesEmergencyBrake=true
ResetOnZeroSpeed=true
AppliesCutsPower=false
RestartOnControlsMoved=true
AppliesShutsDownEngine=true
ResetOnResetButton=true

2000 onwards ATP or TASS – GWR Main Line, Chiltern Line, West Coast Main Line

(l) Air braked trains fitted with ATP or TASS

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_ATP_AB.ini")

[General]
AWSMonitor=true
EmergencyStopMonitor=true
VigilanceMonitor=true
OverspeedMonitor=true
[AWS]
Inhibited=false
WarningTimerDelayS=3
BrakeImmediately=false
TrainStopBeforeRelease=true
ActivationOnSpeedLimitReduction=true
SpeedLimitReductionForActivationMpS=11.176
BeaconDistanceToPostM=1186
AppliesCutsPower=false
AppliesTCSBrake=true
AppliesEmergencyBrake=false
[EmergencyStopMonitor]
MonitorTimeLimitS=0
AlarmTimeLimitS=0
PenaltyTimeLimitS=0
CriticalLevelMpS=0
ResetLevelMpS=0
AppliesFullBrake=true
AppliesEmergencyBrake=false
AppliesCutsPower=true
AppliesShutsDownEngine=false
[VigilanceMonitor]
MonitorTimeLimitS=25
AlarmTimeLimitS=17
PenaltyTimeLimitS=0
CriticalLevelMpS=0
ResetLevelMpS=0
AppliesTCSBrake=true
AppliesEmergencyBrake=false
ResetOnZeroSpeed=false
AppliesCutsPower=false
RestartOnControlsMoved=true
AppliesShutsDownEngine=true
ResetOnResetButton=true
[OverspeedMonitor]
MonitorTimeLimitS=10
AlarmTimeLimitS=5
PenaltyTimeLimitS=0
CriticalLevelMpS=55.88
ResetLevelMpS=0.1
AppliesFullBrake=true

AppliesEmergencyBrake=false
AppliesCutsPower=true
AppliesShutsDownEngine=false
AlarmTimeBeforeOverSpeedS=5
DoesSuppressionReset=false
TriggerOnOverspeedMpS=57.22
ResetOnZeroSpeed=true
ResetOnResetButton=false
TriggerOnTrackOverspeed=true
TriggerOnTrackOverspeedMarginMpS=1.34

(m) EP braked trains fitted with ATP or TASS

ORTSTrainControlSystemParameters("..\\..\\AWS\\SCRIPT\\TCS_AWS_UK_ATP_EP.ini")

[General]
AWSMonitor=true
EmergencyStopMonitor=true
VigilanceMonitor=true
OverspeedMonitor=true
[AWS]
Inhibited=false
WarningTimerDelayS=3
BrakeImmediately=false
TrainStopBeforeRelease=true
ActivationOnSpeedLimitReduction=true
SpeedLimitReductionForActivationMpS=11.176
BeaconDistanceToPostM=1186
AppliesCutsPower=true
AppliesTCSBrake=false
AppliesEmergencyBrake=true
[EmergencyStopMonitor]
MonitorTimeLimitS=0
AlarmTimeLimitS=0
PenaltyTimeLimitS=0
CriticalLevelMpS=0
ResetLevelMpS=0
AppliesFullBrake=false
AppliesEmergencyBrake=true
AppliesCutsPower=true
AppliesShutsDownEngine=false
[VigilanceMonitor]
MonitorTimeLimitS=25
AlarmTimeLimitS=17
PenaltyTimeLimitS=0
CriticalLevelMpS=0
ResetLevelMpS=0
AppliesTCSBrake=false
AppliesEmergencyBrake=true
ResetOnZeroSpeed=true

AppliesCutsPower=true
RestartOnControlsMoved=true
AppliesShutsDownEngine=true
ResetOnResetButton=true
[OverspeedMonitor]
MonitorTimeLimitS=10
AlarmTimeLimitS=5
PenaltyTimeLimitS=0
CriticalLevelMpS=55.88
ResetLevelMpS=0.1
AppliesFullBrake=true
AppliesEmergencyBrake=false
AppliesCutsPower=true
AppliesShutsDownEngine=false
AlarmTimeBeforeOverSpeedS=5
DoesSuppressionReset=false
TriggerOnOverspeedMpS=57.22
ResetOnZeroSpeed=true
ResetOnResetButton=false
TriggerOnTrackOverspeed=true
TriggerOnTrackOverspeedMarginMpS=1.34

AWS sounds
==========

aws_bell_old.wav and buzz.wav are MSTS freeware sounds copyright Rebecca Sky
(snowey_white2003@yahoo.co.uk)

AWS.wav, AWSBell2.wav, AWS_Bing.wav and AWSnew.wav are files created by Martin Corbett for BVE and are distributed under a creative commons license.

The GWR AWS Siren is pitch shifted from the Warning Siren recorded by snottyboy.