贵广高速铁路（桂林–贺州段）

Guilin–Hezhou High-Speed Railway

·友聯工作室·
UNION WORKSHOP

A DLC route for Train Simulator

Table of content

1. Due to the nature of the simulation, it is often not possible to reproduce a completely accurate soundscape for a variety of reasons such as limitations with our current technology and occasional inability to gain meaningful access to the locomotives being created. You should therefore regard the audio reproduction for our locomotives as authentic interpretations rather than perfect recreations.

2. Due to local laws and regulations, and the national conditions, we did some modification to the alignment of track, elevation of the route, gradient, bridge and tunnel position.

3. Please make sure your PC meet the minimum requirement of the game. For better game experience, you might need a higher configuration PC. For older PCs, you can lower your game graphics setting for better performance. If you wish to create your own scenarios, less AI trains will ensure your game running at higher FPS.

1. Route information

1.1 Background information

Guiguang HSR, or Guiyang-guangzhou Highspeed railway, is a highspeed railway line link Guiyang and Guangzhou, he provincial capitals, respectively of Guizhou and Guangdong. Construction began in 2008 and was completed in 2014, the line was built to accommodate train speeds of up to 250 km/h (155 mph), with the capacity to be remodeled to allow train speeds of up to 300 km/h (186 mph).

It is designed to serve as a rapid rail link between the southwest China and the Pearl River Delta. The travel time by train between Guiyang and Guangzhou was reduced from 20 hours to 4 hours, and Chongqing to Guangzhou was reduce from 24 hours to 7 hours.

In this game, you can drive Guilin to Hezhou section, total route lenght is around 200km.

1.2 Technical Data

Number of Stations:	22 (6 was included in this DLC)
Type of route:	Passenger dedicated line
Route length:	857km (in this DLC, 200km of them included)
Operating speed:	250km/h
Track gauge:	Ballastless track
distance between centers of tracks:	4.8m
Type of block:	Automatic block
Rail vehicles:	CRH2A Unification version (CRH2ATX) include in this DLC

1.3 Route Map

1.4 Route Signal

The Chinese Train Control System is a train control system used on railway lines in People's Republic of China. CTCS is similar to the European Train Control System (ETCS). It has two subsystems: ground subsystem and onboard subsystem. The ground subsystem may based on balise, track circuit, radio communication network (GSM-R), and Radio Block Center (RBC). The onboard subsystem includes onboard computer and communication module.

In this DLC, CTCS2 is applied. Track Circuit + Balise + ATP, the track circuit is used both for block occupation detection and movement authorization, its architecture is similar to TVM-300. Below table is signal and signs in use in this route.

	CTCS signal sign, use in CTCS mainline section, mark between each block.
	Station enter signal (Home signal) Green: Allow train to pass this signal and enter station, there are at least 3 free blocks ahead of this signal. A single yellow: Allow train to pass this signal and prepare to stop at the mainline. Double yellow: Allow train to pass this signal and prepare to stop at siding. Red: Not allow train to pass this signal.
	Station exit signal Green: Allow train to pass this signal and enter the mainline, there are at least 3 free blocks ahead. Green and yellow: Allow train to pass this signal and enter the mainline, there are at least 2 free blocks ahead. Yellow: Allow train to pass this signal, there are at least 1 free block ahead. Red: Not allow train to pass this signal.
	Yard signal Yellow: Allow the train to pass this signal. Red: Not allow train to pass this signal.

2. CRH2A Unification EMU

2.1 Brief Introduction to CRH2 Unification (CRH2ATX) EMU

The China Railways CRH2A EMU high-speed train was originally developed from the Shinkansen E2-1000 Series, although the newer versions of the CRH2 are not related to the E2-1000 Series despite having the same exterior styling.

The CRH2A is in widespread use and is one of the most popular high-speed EMUs in China, with over 200 sets currently in service and more planned.
CRH2A can be used in single 8-cars consist, or coupled 16-cars consist. Detailed formations

Unification: In 2013 as requested by China National Railway Administration, manufactory redesigned the CRH2A' s both exterior and its interior, as well as the entire system in order to meet the operational requirements and new standards of China railway.

CRH2ATX Formation (single unit, unified consists, 2013 onwards)

1	2	3	4	5	6	7	8
T1sc	M2	M1	T1p	T2k	M2p	M1	T2c
1U				2U			

The green part represents the First-Class coach.

2.2 Train data:

Consist length:	201.4m
Width:	3380mm
Height:	3700mm
Maximum operation speed:	250km/h
Power output:	4800kW
Electric system:	25 kV 50 Hz AC overhead catenary
Braking system:	Regenerative, electronically controlled pneumatic brakes

2.3 About this Add-On

For better driving experience, this CRH2ATX EMU embedded with ATP function and breaking curve.

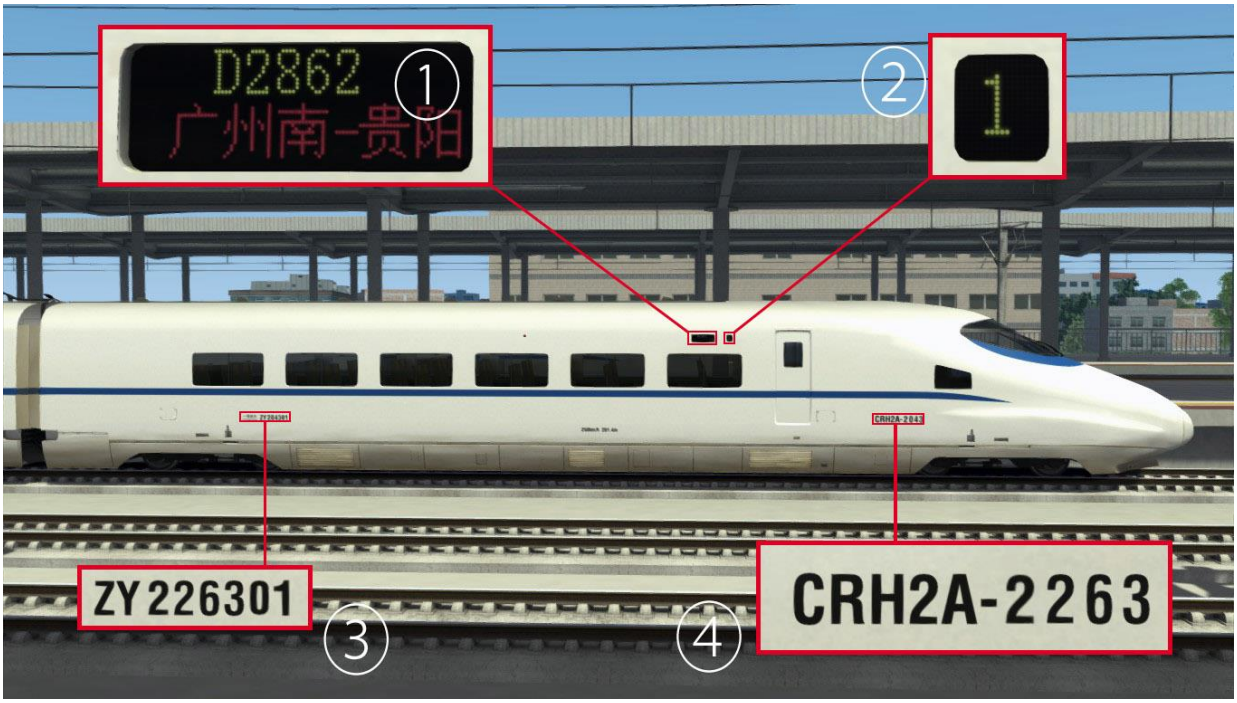
Interactive MON screen: It’ s a real touch screen! You can click on the screen button to see the next page or to set the train service number.

Fully workable ATP system: Introducing for the first time ever the "target & distance" ATP system in Train Simulator with a continuous braking curve, the CRH2A will let you drive more smoothly from station A to station B. It also comes with the constant speed control; this function will free you from the regulator lever and you will just need to monitor the system.

Train number and auto destination display. When you use the touch screen to input the train number, the route name and destination will also appear on your ATP and MON screen automatically, as they do on the exterior LED board. This system will also check the train's direction based on the number you entered. For example, D5103 will show Chongqing bei-Chengdu dong, while D5102 will show Chengdu dong-Chongqing bei.

Please see **Appendix 3** for detailed database information.

2.4 Functions on External Model



This Add-on allows you to set the train number, as detailed below:

① LED Direction broad. Enter this information in the Cab with MON screen.

② Coach number: indicate which car this is. Enter this in Scenario editor.

③ Train car number: Enter this in Scenario editor.

④ Consist number: Enter this in Scenario editor.

You need to open the Scenario editor to change the coach number, car number and consist number. You will only need to enter the car number and coach number, consist number will be changed according to what you entered.

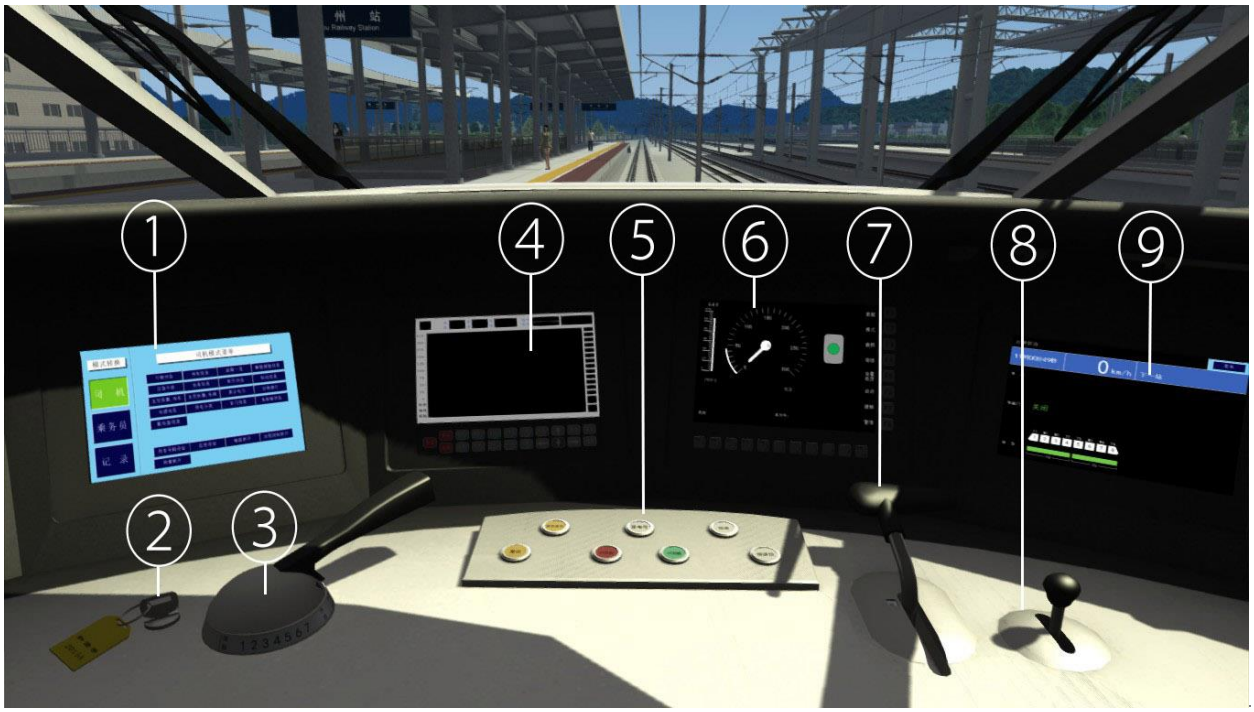
You need to enter 4 numbers to change the car and coach numbers. The first three are for car numbers and can only use numbers. The fourth is for the coach number, and can only use capital letters B through P. The meaning of these letters are as follows:

A	B	C	D	E	F
--	Car No.1	Car No.2	Car No.3	Car No.4	Car No.5
G	H	I	J	K	L
Car No.6	Car No.7	Car No.8	Car No.9	Car No.10	Car No.11
M	N	O	P	Q	
Car No.12	Car No.13	Car No.14	Car No.15	Car No.16	

2.5 Get to Know the Cab

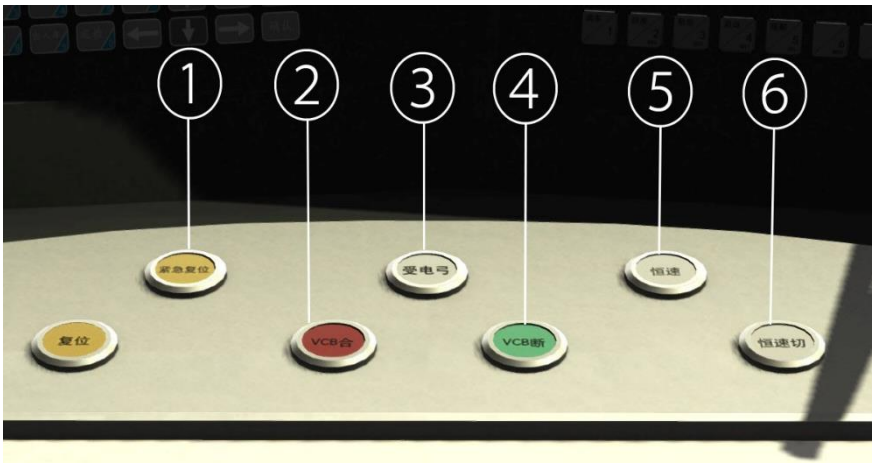
2.5.1 The Main Area

This DLC provides a highly detailed and fully functional cab, now let's look at it.



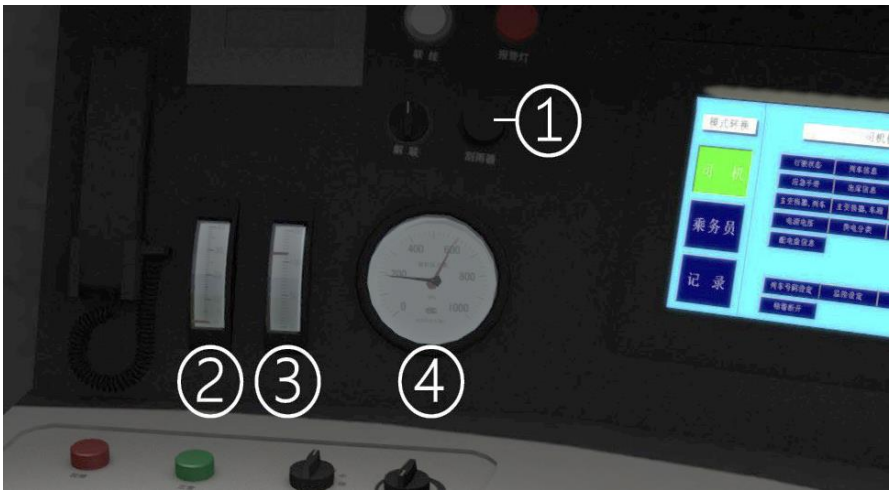
1	Right MON screen	**2**	Master key	**3**	Brake handle
4	LKJ screen	**5**	Main control panel	**6**	CTCS screen
7	Regulator handle	**8**	Reserve handle	**9**	Left MON screen

2.5.2 Main control panel



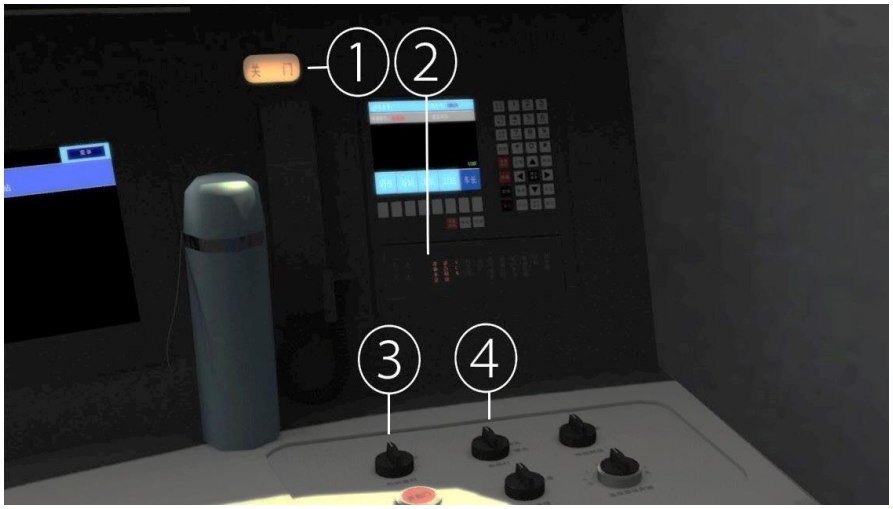
1	Emergency brake reset	**2**	VCB on button	**3**	Pantograph On/Off
4	VCB off	**5**	Cruise control on	**6**	Cruise control off

2.5.3 Left control panel



1	Wiper control	**2**	Traction voltage	**3**	Control system voltage	**4**	Pressure gage

2.5.4 Right control panel

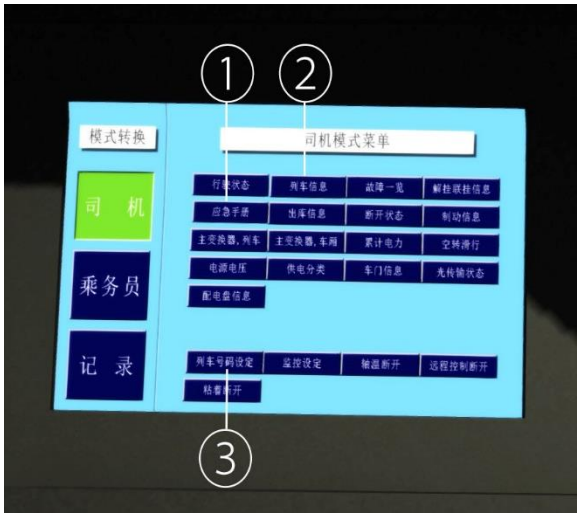


1	Doors indicator	**2**	Error information	**3**	Cab light	**4**	Headlamp light

2.5.5 Upper area

1	Desk light	**2**	Sun visor

2.5.6 Left MON Screen

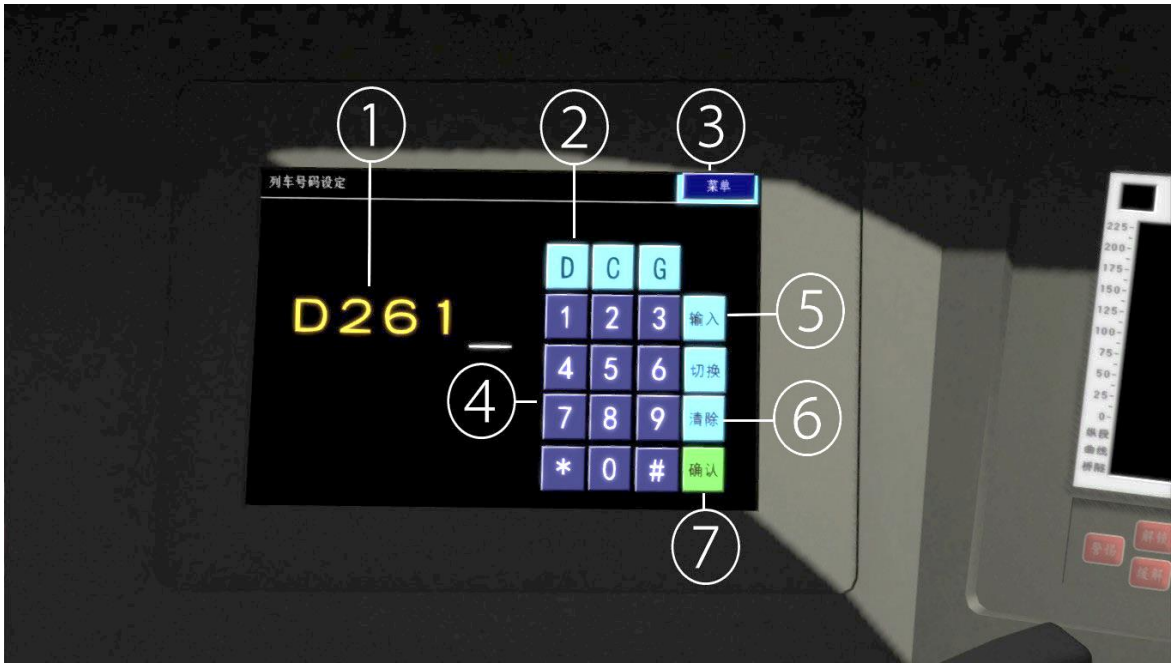


1. Hotkey screen

2. Train information screen

3. Train service number input screen

2.5.7 Train service number input screen



1	Train service number	**2**	Train class input area	**3**	Back to top screen
4	Digital input area	**5**	Keyboard activation button	**6**	Clear button
7	Confirm button				

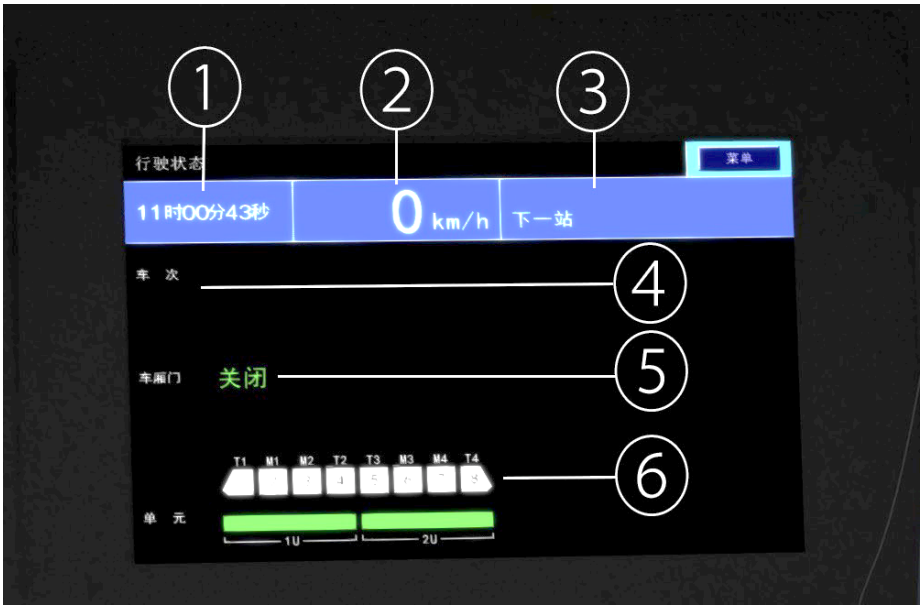
You can click on the train service number input button on the top menu to enter the new train service number input screen, then click on the button (4) to activate the keyboard (you will see a flashing cursor). To input the numbers, you need to press D/C/G first and then input the numbers. You can click the menu button to return to the main screen, or the clear button to clear up what you have just entered.

2.5.8 ATP Screen

1	Distance to next speed limit.
2	Signal mode.
3	Cruise control display.
4	Speedometer and speed limit. See ATP section for details.
5	Control mode.
6	Train service number, route name and station name.
7	Signal aspects. See ATP section for details.
8	Shunting mode button.
9	On sight mode button.
10	Isolate mode button.

Please consult the ATP function section for full details.

2.5.9 Right MON Screen



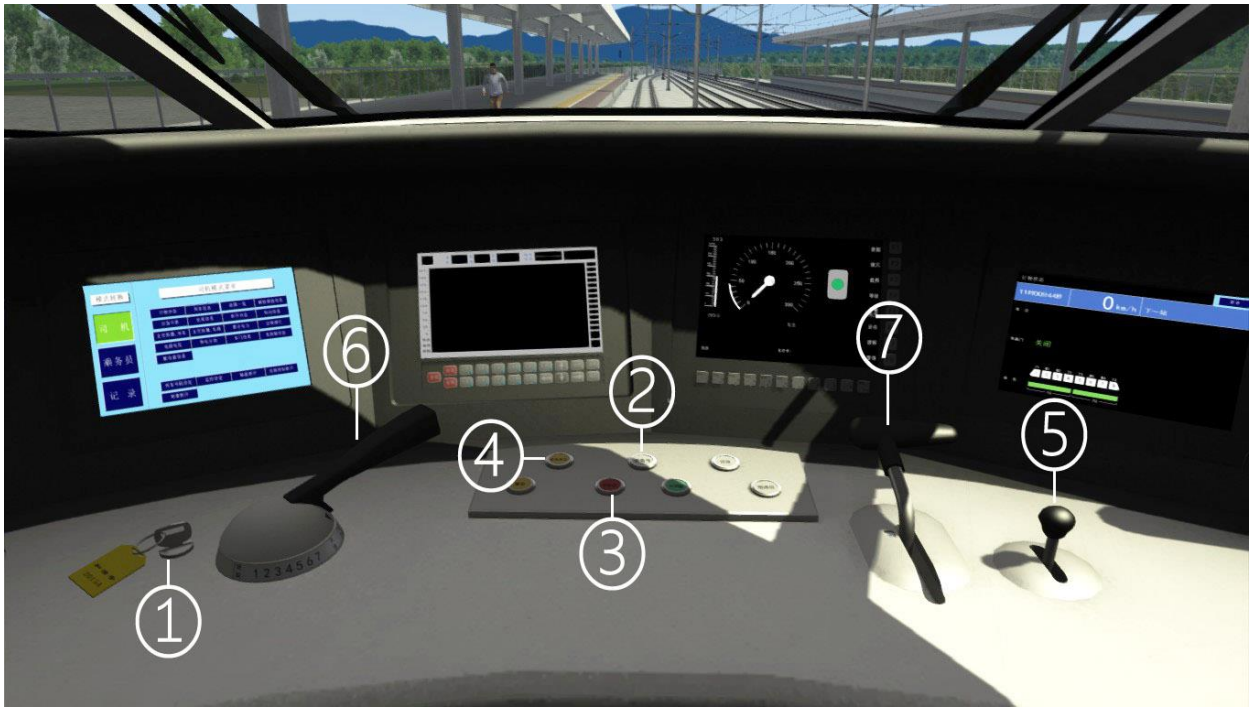
1	Time in game world	**2**	Digital speedometer	**3**	Next station
4	Train service number	**5**	Door state display	**6**	Consist information*

* When coupled with another CRH2A train, this will display 2 consists and 16 cars.

2.6 Driving the CRH2A

2.6.1 Start-Up Procedure

In most circumstances, you need to start up the train manually, following these steps:



1. Turn the key to get the power on, so that the screen turns on and the control voltage shows 120 V.
2. Raise the pantograph.
3. Press the VCB ON button until "unprepared" and "VCB" lights on the error screen turn off. The traction voltage should now be 25 kV.
4. Press and hold the emergency reset button until the "Emergency" light on the error screen turns off.
5. Move the reverser handle to its front position.
6. Move train brake handle from the remove position to release position to release the brake.
7. Pull the regulator handle towards you, and train should start moving.

Warning: Please use Expert mode to drive this train.

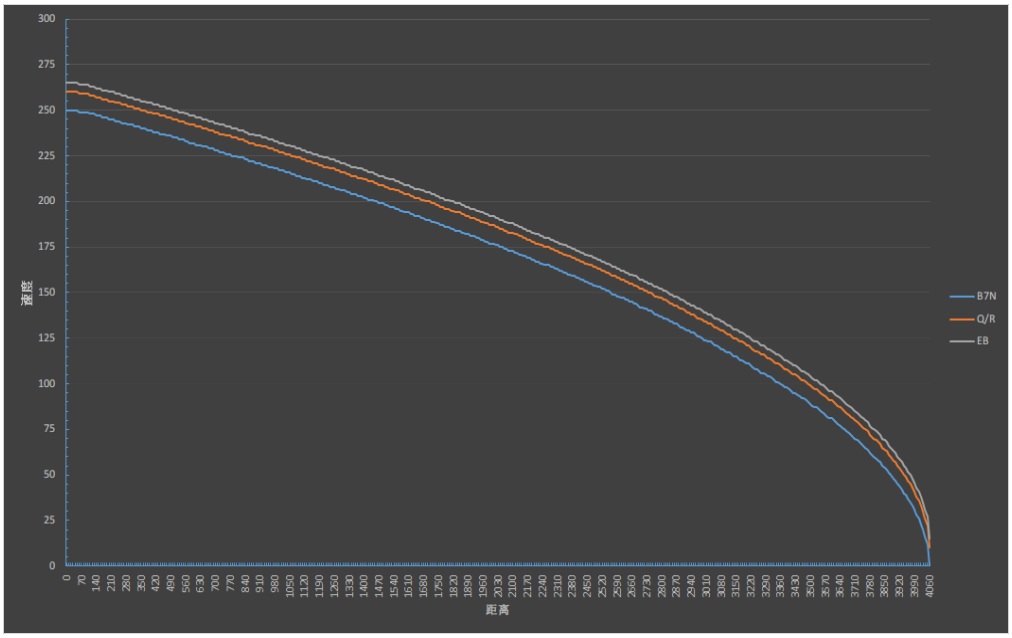
2.6.2 ATP function in Details

2.6.2.1 Introduction

Automatic Train Protection (ATP) is a system preventing the train from speeding or passing a red signal. This system uses a target speed indication and audible warnings to warn the train driver if they are likely to exceed a speed that would cause the train to pass a red (danger) signal or exceed a speed restriction. The system will apply the brakes if the driver fails to respond to these warnings. The system takes into account the speed and position of the train relative until it stops moving in terms of issuing the warnings and applying the brakes.

2.6.2.2 ATP in This Add-On

In full control mode, all signaling systems and functions are activated. The systems will get the line speed limit as well as the next speed limit and signal aspect. When approaching the next speed limit (lower than the current speed limit) or when the next signal is red, the system will calculate the distance between the current position and the next speed limit (or next red signal) and apply the appropriate brake force to slow down the train. Unlike the TVM3 or ATC-1 systems' interval speed curve, the braking curve on our ATP system will be a continuous speed curve from your current speed to the target speed.



Braking performance of the CRH2A EMU (in this DLC)

2.6.2.3 The Information Provided by ATP Screen

1. **Distance to the next speed limit.** This displays up to a distance of 9900 m away from your train. If the distance to the next speed limit is less than 1000m then the white bar will also change.
2. **Signal mode.** This shows the signal mode, which will be set to either CTCS-0, CTCS-1, CTCS-2 or CTCS-3. The ATP braking curve will only work on settings CTCS 1 through 3.
3. **Speedometer and speed limit bar.** When the bar shows as only white it means that is the current speed limit; When it shows as a white and yellow bar, the yellow part represents the current speed limit while the white part represents the next speed limit; When it shows yellow bar only, it means that the next speed limit is 0, or next signal is red. When the speed limit ahead changes (and is lower than the current one), the system will calculate the braking distance and curve required based on your current speed and the distance to the next speed limit. When approaching the next speed limit and entering the braking zone, the speed limit bar (yellow parts) will change dynamically to guide you slowing down to the next speed limit. This is the continuous braking curve which displays on the ATP screen. If you fail to slow down to within the yellow bar part, the auto system will kick in to apply the brake. This system will help you apply the brakes in time and catch up with the timetable.
4. **Digital speedometer and needle.**
5. **Control mode.** Displays the control mode:

   Full: All signal systems and functions are active including the ATP continuous braking curve.

   Part: The signal aspect present and the continuous speed curve control aren't available, this is used when you are using the CRH2A on another route without the CTCS signal.

   Shunting: For doing shunting work in a yard. You need to switch to this mode manually while stopped. In shunting mode, you cannot pass a red signal either, and the top speed is 45 km/h.

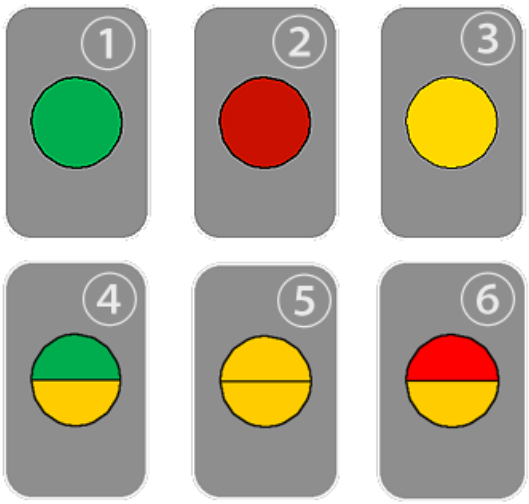
On Sight: In some circumstances, you may be required to pass a red signal. This time you will need use this mode. In order to switch to this mode, you first of all need to stop before the red signal, then switch to it, and then you can pass the signal with a speed of no more than 15 km/h.

Isolate: Isolates all systems, you can ignore any signals or speed limits. Using this mode in a normal scenario may cause the scenario to fail.

1 You can only switch to a different mode when the train is stopped. Clicking on a mode button will switch to a different mode, clicking on it again will return to Full/Part mode.

2 Using the Isolate mode in a normal scenario may cause the scenario to fail.

2.6.2.4 Signal aspects



1 Green. The track is clear and allows you to proceed following the line's speed limitations.

2 Red. This signal indicates a stop. If the dispatcher allows you to pass a red, please stop the train and switch to Override mode first.

3 Yellow. Allow to pass signal, one free block ahead.

4 Green and yellow. Allow to pass signal, two free blocks ahead.

5 Double yellow. Allow to pass signal and enter station from siding.

6 Red-Yellow. Not used in this DLC.

2.5.2.5 Cruise control

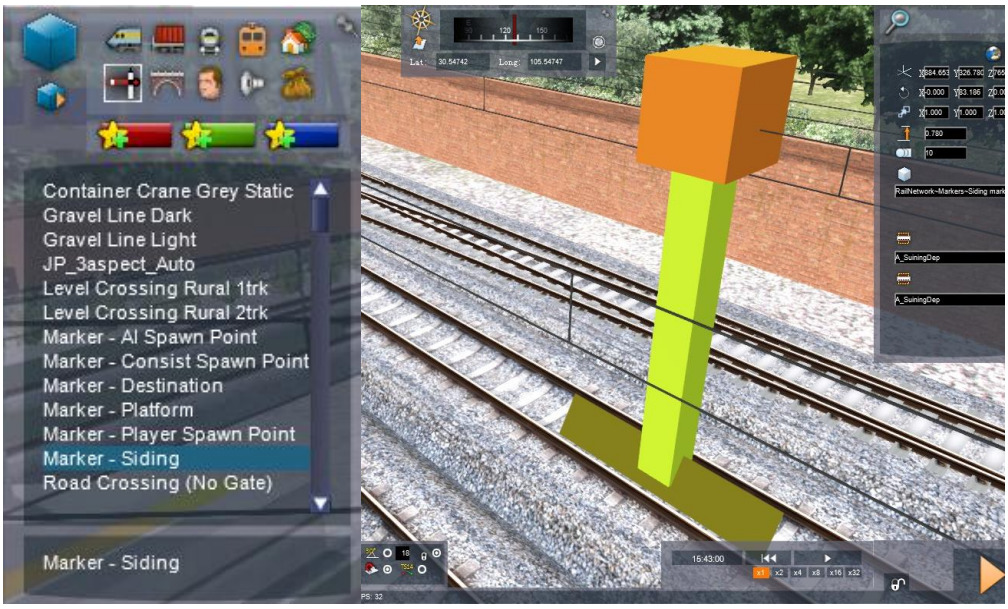
The CRH2A has a constant speed function, this will allow hands-free control of the cab. Once you press the constant speed button the train will hold its current speed automatically. If speed limit changes or if you push or pull the regulator or brake handle, the constant speed function will disengage automatically. To use the constant speed function, you will need to not be speeding and to be in Full control mode.

Appendix 1: Hotkey list

Light controls	
Headlamp shift up	H
Headlamp shift down	Shift+H
Main Cab light	L
Desk light left	Ctrl+N
Desk light right	Shift+N
Basic function	
Wiper	V
Horn	Space
Increase regulator	A
Decrease regulator	D
Reverser forward	W
Reverser backward	S
Increase train brake	Apostrophe
Decrease train brake	Semi Colon
Left sun visor	Ctrl+S
Right sun visor	Shift+S
Pantograph	P
Master Key	K
Doors	T
Advanced function	
VCB On	Y
VCB Off	Z
ATP Isolate Mode	I
ATP On-Sight Mode	O
ATP Shunting Mode	U
Emergency Brake	Backspace
EB Reset	E
Constant On	B
Constant Off	Ctrl+B

Appendix 2：How to Use Auto Broadcasting

1. This add-on provides an automatic broadcasting system for use during play time, if you wish to use it in your own scenario, please take the following steps:
2. Click Track Infrastructures in the scenario editor, then select the siding marker and put it on the track that the player's train will have to pass, then give it a relevant name.



3. In timetable view, create an event such as "Go Via" and give it a name, such as "DepSuining".。

```
if event == "DepSuining" then
```

Write the following script in your scenario script.

```
if event == "DepSuining" then
    SysCall ( "PlayerEngine:SetControlValue", "BroadCasting", 0, 2 );
    return TRUE;
end
```

Here the *DepSuining* is the name of event. We will need this to trigger the broadcasting.

You will also require resetting the broadcasting value to 0 when the player is at the platform:

```
if event == "Tongnan" then
    SysCall ( "PlayerEngine:SetControlValue", "BroadCasting", 0, 0 );
    return TRUE;
end
```

Tongnan is the station event. You can set up a pick-up passenger event here and enter this event name in Trigger Success section.

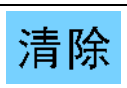
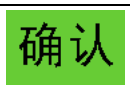
Broadcasting code and meanings:

Departure (bound for)		Next station		Arrival	
Code	Meaning	Code	Meaning	Code	Meaning
001	For Chengdudong	101	Chengdudong	201	Chengdudong
002	For Chongqingbei	102	Chongqingbei	202	Chongqingbei
003	For Emeishan	103	Emeishan	203	Emeishan
004	For Mianyang	104	Mianyang	204	Mianyang
005	For Nanchong	105	Nanchong	205	Nanchong
006	For Shanghai	106	Cangshanzhen	206	Cangshanzhen
007	For Wuchang	107	Dayingdong	207	Dayingdong
008	For Guiyangbei	108	===	208	===
009	For Guangzhounan	109	Hechuan	209	Hechuan
010	For Guilinbei	110	Huaikou	210	Huaikou
011	For Hezhou	111	Jijin	211	Jijin
012	For Nanningdong	112	Longsheng	212	Longsheng
013		113	Nanchong	213	Nanchong
014		114	Pengxi	214	Pengxi
015		115	Sanxing	215	Sanxing
016		116	Shizishan	216	Shizishan
017		117	Suining	217	Suining
018		118	Tongnan	218	Tongnan
019		119	Zitong	219	Zitong
		120	Mianyang	220	Guilinbei
		121	Guilinbei	221	Yangshuo
		122	Yangshuo	222	Zhongshanxi
		123	Zhongshanxi	223	Hezhou
		124	Hezhou	224	Gongcheng
		125	Gongcheng	225	
		126			

Appendix 3：Train Service Number Database

Train number range	Service section
C5003-C5020	Wuchang-Xianning nan
D401-D450 D5401-5510	Shanghai-Nanjing
D651-D680	Shanghai-Hangzhou
D5101-D5132	Chongqingbei-Chengdudong
D5133-D5142	Chongqingbei-Emeishan
D5143-D5152	Chongqingbei-Mianyang
D5161-D5194	Chengdudong-Nanchong
D8231-D8238 D8241-D8244	Nanningdong-Hezhou
D211/D212 D2801-D2820	Guiyangbei-Guangzhounan
D2831-D2844	Guilinbei-Guangzhounan
D1801-D1859	Chengdudong-Guangzhounan
D1861-D1899	Chongqingxi-Guangzhounan
D2911-D2939 D2961-D2989	Guilinbei-Guangzhounan
D2941-D2959	Liuzhou-Guangzhounan
D2991-D2999	Guilinbei-Guangzhou
D8261-D8279	Hezhou-Nanningdong

Appendix 4：Screen Chinese to English Translation

Chinese text	Meaning	Chinese text	Meaning
	Train information button		Next station
	Hot key information button		Train service number
	Train service number input button		Train doors
	Menu button		Unprepared
	Enter		Emergency brake
	Clear		Cruise speed control
	Confirm		On Sight
	Full		Isolate
	Shunting		Part
	Open		Closed

Appendix 5：Scenarios

This product provides following scenarios:

Academy Scenario:

Tutorial: CRH2ATX driver training course

Career Scenarios:

1. [CRH2ATX] Journey to the North
2. [CRH2ATX] Breeze from the Southland
3. [CRH2ATX] Typhoon aftermath
4. [CRH2ATX] Time to say goodnight
5. [CRH2ATX] A quick round trip to Hezhou Part1
6. [CRH2ATX] A quick round trip to Hezhou Part2
7. [CRH2ATX] Last train to Guangzhou

This DLC also features Quick Drive scenarios; you can create your own journey by clicking on the Quick Drive menu.

Credits

In no particular order

Developer: ***Union Workshop***

T9Express

CNAurora

Rainbow

Special thanks：节操酱(Jie Cao Jiang)

Liu Fei

Agasahiroshi (RISC)

Lrdcq

Beta testing team of Dovetail Games

3rd party team of Dovetail Games

Weibo.com/unionworkshop