Hornby Elite Digital Controller

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You have now learnt to select a locomotive for control and how to programme further locomotives as you add them to your layout.

Now read on to learn how to explore the Elite’s full features and capabilities. You will find the Elite’s menu system and procedures are quite intuitive.

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Hornby Elite Digital Controller

Introduction: DCC

On a traditional DC (analogue) layout, to control a locomotive the power feed applied to the rails is controlled, therefore normally only a single locomotive is placed on the track at any one time. DCC however, allows the user to control many locomotives on the same track at the same time on an individual basis. This is achieved by controlling the motor in each locomotive directly via track born digital signals that are sent from a DCC controller. Each loco has a small DCC decoder fitted which listens to the track born signals, decodes them and feeds power to the locomotive motor at the level commanded by the DCC controller for that particular locomotive. The decoder can also control direction and other functions on board the locomotive, e.g. lighting, etc.

The Hornby Elite Digital Controller offers many advanced features and is yet very simple to use. This instruction manual clearly explains all of the Elite’s capabilities. We will start with a basic ‘get you going’ guide explaining how to connect your Elite to the track, etc. We then move on to the ‘Quick Start’ section explaining how to quickly select and control a locomotive and then how to programme a new address to a locomotive.

Once you have mastered the above, we move on to examine the full capabilities of the Elite. Each section of the manual follows the Menu System Guide. This guide shows the menu structure of the Elite in a simple flow diagram format (see pages 8-9).
Introducing the Elite

Keyboard
The 17 button keyboard includes not only keys 0 - 9 which are alpha numeric, but other keys marked LOCO, ACC (accessory), FUNCTION, ON/OFF, MENU, ESCAPE and of course STOP! These multi-function keys provide the basis for the programming and functioning of up to 254 locomotives and 255 accessories including points.

The keyboard has the capability of entering into the Elite’s memory the names and numbers of locomotives and accessories as well as inputting the various functions that the Elite offers. Using the keypad locomotives can be addressed from 0 to 9999 and points or solenoid operated accessories from 1 - 252 if assigned to a Hornby R8247 Accessory/Points Decoder.

Rotary Controller
The Hornby Elite Digital Controller incorporates two rotary controllers which not only control the assigned locomotives but also assist in registering each model and accessory to the Elite. The controllers are able to do this by a simple click and rotate procedure.

This method is also employed to add names and locomotive numbers to the Elite display so that in place of locomotives being identified with just their coded number, abbreviated names and/or running numbers can be used. The pressing of the Rotary Controllers can also determine which knob has control, the direction of the locomotive's travel plus point motor activation.

These are just a few of the functions that are associated with the Rotary Controllers, however they do go some way to illustrate the technical advances that the Hornby Elite Digital Controller boasts.

LCD Display
The liquid crystal display centred on the Elite has from top to bottom - 3 mode indicators, 2 rows of 8 characters, train direction indicators, a speed indicator, and a set of numbers 0 - 9 which show the functions that are switched on in respect of locomotives under direct control.

The Elite supports up to 29 decoder functions which are accessed through 5 display modes.

A clock is also included on the display which can be set to real time or can be set up to 10X faster. Working with the rotary controllers the display is able to keep the operator fully up to date with the functions of the Elite.

Power
The Elite is supplied with a 4 amp transformer. This provides the Elite with the possible capability of running up to 10 locomotives at any one time. However this quantity may vary depending on the current draw of each locomotive.

Please note, if the AUX OUTPUT connection is used, less power will be available for driving locomotives.

For more information visit: www.hornby.com
You can access the menu options by pressing the Menu key on the Elite.

Rotate Controller 1 to cycle through menu options (shown in RED).

Press Controller 1 to select a menu option.

Rotate Controller 1 to display any sub-menu item (shown in GREY).

Press Controller 1 to select a sub-menu item.

Rotate and/or press Controller 1 to scroll through the headings (shown in BLACK).

For more information visit: www.hornby.com
The Elite has the ability to have the screen instructions shown in four alternative languages other than English. The languages concerned are French, Italian, Spanish and German.

To change from the factory set English screen use the following procedure.

1. Press **Menu**. Screen shows "Loco".
2. Rotate **Controller 1**. Screen shows "Unit".
3. Press **Controller 1** to confirm. If necessary rotate **Controller 1** until "Language" is shown. Press **Controller 1**.
4. Screen shows "Language English". Rotate **Controller 1** until the language you require is shown. Press **Controller 1** to confirm. All instructions will then be shown in the chosen language.
5. Press **Menu** to return to the main screen.

Please Note: Always use Hornby Point Motors with Hornby points.

The Elite supplies a digital control (DCC) signal to the track. This DCC signal is received and decoded by the decoders giving control of the locomotive's speed and direction, etc. For DCC to operate at its full potential it is important that the locomotives receive a strong and consistent DCC signal from the Elite. Please ensure the track and connecting fishplates are clean and are firmly connected.

It is important that the entire layout is live. On a normal 8' x 4' type layout one power input may be adequate, however on larger layouts e.g. with more than one loop of track, additional power connections are recommended to guarantee equal signal and power distribution. This can be easily achieved by adding further power connections to various parts of the layout.

Should you feel that you may need such additional feeds please contact the Hornby Customer Care for basic information regarding power distribution. Other useful articles may be found on the Hornby website.

Please Note: Hornby points are self-isolating and it is recommended that power is fed to all 'exits'. To de-isolate these points it is recommended that you install 2 x R8232 Hornby Digital Electric Point Clips in between the point 'frogs' (see below).

In most circumstances these point clips will be quite adequate but it may in certain circumstances be necessary to add additional feeds. Again for further information please contact Hornby Customer Care.

Please Note: The Elite operates most efficiently when the whole of the layout is 'live'. Hornby points are self isolating therefore it is necessary to fit each point with 2 x R8232 Hornby Digital Electric Point Clips. Some of these clips are included in the Hornby DCC sets, further clips are available from Hornby stockists.

For more information visit: [www.hornby.com](http://www.hornby.com)
Connecting the Elite to the Main Track

1. Locate the terminals at the back of the Elite labelled TRACK. See Fig. 1.
2. Locate the Track to the Controller Link Wire and insert the black lead into Socket A and the black and white lead into Socket B. (These wires must NOT be inserted into mains socket outlets.)
3. If fitted, locate the R8241 Hornby Digital Power Track section on the track circuit.
4. Press down on the left hand button on the Digital Power Track section and insert the black and white lead of the Link Wire into the socket and release the button.
5. Repeat the process inserting the black lead into the right socket of the Digital Power Track.

Connecting to the Power Supply

1. Locate the Power Transformer with integral cable.
2. Locate the Power Input socket on the rear of the Elite (POWER +15V DC).
3. Take the Power Supply cable and insert the plug into the Power Input socket situated at the rear of the Elite.
4. Plug the Power Transformer into the mains socket and switch on the power. The LCD display shows the start-up sequence shown below.

Please Note: There is no On/Off switch on the Elite. Always ensure that the power supply is unplugged from the Mains when not in use.

Setting up a Programming Track

Before any programming can commence a Programming Track must be attached to the Elite. A Programming Track will allow for both locomotive decoders and accessory/point decoders to be programmed simply and easily.

Connect the Elite to the Programming Track as shown in Fig. 2.

Please Note: The majority of programming of locomotives and accessory/point decoders must be done using the Programming Track and not on the Main Track.

For more information visit: www.hornby.com
Quick Start

Basic Locomotive Control

Note: Either Controller 1 or Controller 2 may be used to either control or programme the selected locomotives or accessories, however for ease of understanding Controller 1 will be used in the majority of examples shown throughout these instructions.

The Elite is now ready to control a locomotive. At the end of the start-up sequence of the Elite the LCD will show the Time Display mode as shown in Fig. 1.

Note: All new factory fitted digital locomotives are programmed No.3 as standard (default).

Using a locomotive programmed as No. 3 please follow these instructions.

1. Place the locomotive on the track.
2. Note that “0003” is shown on the LCD (Liquid Crystal Display). At this stage locomotive address 0003 is assigned to both controls. Press Controller 1 to take control of the locomotive.
3. Rotate Controller 1 clockwise until the locomotive has reached the desired speed.
4. To slow down and stop the locomotive, rotate Controller 1 anti-clockwise.
5. Direction of travel is controlled by pressing down and releasing Controller 1.

IT IS IMPORTANT THAT YOU STOP THE LOCOMOTIVE BEFORE CHANGING DIRECTION. DO NOT REMOVE THE LOCOMOTIVE FROM THE TRACK WHILE IT IS STILL RUNNING. FAILURE TO DO THIS MAY DAMAGE THE LOCOMOTIVE DECODER.

Basic Locomotive Address Programming

1. Connect the Elite to the Programming Track as shown in Fig. 1 on page 12.
2. Place the locomotive that you require to programme on the track.
3. Press Menu key on the Elite. Screen shows “Loco”.
4. Press Controller 1 to confirm. Screen shows “Direct”.
5. Press Controller 1 to confirm. Screen shows “Address”.
6. Press Controller 1 to confirm. Screen shows “Address Write”.
7. Press Controller 1 to confirm. Screen shows “Adr:0003” (default address).
8. Rotate the controller or use the keypad to select the desired address number.
9. Press Controller 1 to confirm. For this example choose No. 1.
10. The locomotive is now addressed as No. 1.
11. To operate the locomotive press Menu. Screen shows “00:00 1 0001”. The clock may vary from 00:00.
12. Place the locomotive on the main track and control as described on page 14.

You have now learnt to select a locomotive for control and how to programme further locomotives as you add them to your layout.

Now read on to learn how to explore the Elite’s full features and capabilities. You will find the Elite’s menu system and procedures are quite intuitive.

For more information visit: www.hornby.com
The operation and control of locomotives is carried out using the 5 main Elite display modes. These display modes support throttle setting, directional control, and function control / switching.

**Function Control:** The Elite can support the operation of up to 29 decoder functions. All of the functions can be switched or controlled in a push button manner, i.e. momentarily or toggled on and off. For example momentary switching is ideal for the operation of a horn, whistle, etc.

**Hornby Sapphire Decoder:** The Elite also supports the Hornby Sapphire decoder’s Fuel Simulation capability by providing a simple and easy way of displaying fuel levels within a dedicated display mode. Any locomotive fitted with a Sapphire decoder that is running Fuel Simulation can be accessed and fuel levels monitored.

To ‘cycle’ through the Elite’s different display modes press the Function key on the left of the Elite display.

1. **Time Display Mode** (default starting point)
2. **Function Page 0** F0-F9
3. **Function Page 1** F10-F19
4. **Function Page 2** F20-F28
5. **Sapphire Fuel Display**

**NOTE:** Sapphire Fuel Display is only applicable to Sapphire decoders and has no function with other decoders.

We suggest that you methodically go through this sequence for each locomotive in turn. Once you are more experienced with the Elite you will find it is intuitive to operate and will be able to effortlessly switch between locomotives when making control adjustments... have fun!
Controlling Two Locomotives (continued)

‘Quick select’ of assigned locomotives

If the locomotive address you wish to control is not shown on the Elite’s display you can cycle through the 10 most recent locomotives that have been assigned to that controller by repeatedly pressing the Escape key. The current speed and direction will be displayed for each locomotive in turn. When ‘quick selecting’ a previously used locomotive for assignment to a controller, the Elite’s display will revert to Time Display mode.

Note: Once a locomotive has been selected use the current active controller to operate the locomotive’s speed and direction. The other controller will remain inactive. Any locomotive previously controlled with the inactive controller will continue in its last set state for speed, direction and function status.

Note: It is possible to control speed and direction with the active controller while the Elite is in any of the 5 display modes. If you forget which locomotive address you are controlling simply press the Escape key to return to the Time Display mode. You can then read the locomotive address that is under control and then later return to any other display mode required by pressing the Function key.

Note: Only the active controller can be used at any one time. The other controller will remain inactive until it is selected for locomotive control.

Assigning Locomotives to a Controller

The following procedure illustrates how to assign specific locomotives to each of the Elite’s Controllers.

1. From any display mode press the Loco key. Screen shows “Contr 1 Aadr:0003”.
2. Rotate Controller 1 until the locomotive required is shown or alternatively enter the locomotive address via the keypad. For this example 10 has been selected.
3. Press Controller 1. Screen returns to the previous display mode, e.g., Time Mode as shown on the left.
4. Rotate Controller 1 to move the locomotive.
5. To control a second locomotive with Controller 2 press Controller 2. Screen shows “00:00 2 0003”.

Note: the display will show the last display mode used for the last locomotive controlled by Controller 2. In this example Time Mode with locomotive address 3.
7. Rotate Controller 2 until the locomotive required is shown or alternatively enter the locomotive address via the keypad. For this example 20 has been selected.
8. Press Controller 2. Screen shows “00:00 2 0020”.

For more information visit: www.hornby.com

Fig. 1
Function Control

Function Introduction

Once the desired locomotive address is displayed you may immediately control speed and direction. If you wish to access any of the available functions you will need to access the appropriate Function control displays. Press the Function button to cycle through the 5 display modes - Function Page 0, Function Page 1, Function Page 2 and Fuel Simulation (Fuel Simulation is only applicable to Sapphire decoders and has no function with other decoders). See page 16.

Selecting Functions for Control

The examples below describe the procedure for accessing a variety of function numbers in all three Function display pages.

1. For Function 0 select Function Page 0 by pressing the Function key until the screen display is as shown.
2. Press the 0 key on the key pad and the small Function number 0 will illuminate on the lower left of the display.
3. For Function 6 - if not already selected, select Function Page 0 as described above. Press the 6 key on the keypad. Function number 6 will illuminate on the display.
4. For Function 10 select Function Page 1 by pressing the Function key until the screen display is as shown.
5. Press the 0 key on the keypad. Function number 0 will illuminate on the lower left of the display.
6. For Function 15 - if not already selected, select Function Page 1 by pressing the Function key as described above and press the 5 key on the keypad. Function number 5 will illuminate on the display.
7. For Function 21 - if not already selected, select Function Page 2 by pressing the Function key as shown.
8. Press the 1 key on the keypad. Function number 1 will illuminate on the display.
9. For Function 28 - if not already selected, select Function Page 2 by pressing the Function key as described above and press the 8 key on the keypad. Function number 8 will illuminate on the display.

Note: Each time a function is activated its corresponding icon will be illuminated within the appropriate Function Page to indicate that this function is now activated.

See examples below. For On/Off or Momentary action of functions see page 22.

Multiple function control examples

Function Page 0 (F00-F09)  Function numbers 0, 1 and 6 are active
Function Page 1 (F10-F19)  Function numbers 10, 13 and 15 are active
Function Page 2 (F20-F28)  Function numbers 22, 26 and 28 are active

For more information visit: www.hornby.com
Selecting Functions for Control (continued)

Toggle ON/OFF and Momentary action

**Toggle ON/OFF**
To toggle a function **On** or **Off** press and release the appropriate numbered key on the key pad, please do not hold the key down. This operation works the same way you would switch on a domestic light in your house.

**Momentary action**
To momentarily activate a **Function** press and hold the appropriate numbered key down for as long as you wish. The **Function** will now activate for as long as you continue to keep the key pressed. The **Function** will cease as soon as you release the key.

Function Control in practice
If you are controlling many locomotives, it is good practice when you select a locomotive that you cycle through the different **Elite** function displays to check which **Functions** have been activated for that particular locomotive. Also, if the locomotive is running **Fuel Simulation**, you can check the current fuel level by examining the **Sapphire Fuel Display**. See page 16.

Emergency Stop

If not properly managed running multiple locomotives on one layout can create the potential for accidents and collisions to occur. To help avoid such incidents the **Hornby Elite Digital Controller** features an Emergency Stop key. Pressing this key causes all activity on the layout to cease.

**Emergency Stop Procedure**

1. Press the **STOP** key located on the **Elite**. See Fig. 1.
2. The screen will show “E. Stop” (Emergency Stop).
3. All activity on the layout will cease. (All power is removed.)
4. Allow at least 5 seconds to pass before restoring the power. Press **STOP** again to restore power to the layout.

**Note:** The locomotive that was last under direct control before the **STOP** key was pressed will be displayed after the Emergency Stop is reset.

Double Heading

**Creating a Double Headed Group (Consist)**
For this example Locomotives 1 and 2 will be consisted as No. 10. Double Head programming can be done while both locomotives are on the main circuit. Either controller can be used in this procedure to confirm a setting. Controller 1 is used in this example.

1. Press **Menu** key. Screen shows “Loco”.
2. Rotate **Controller 1** until “Dbl Hdr” is displayed on the screen.
3. Press **Controller 1** to confirm. The Screen will show either “Dissolve Gp” or “Create Gp”. Rotate **Controller 1** until “Create Gp” is displayed.
4. Press **Controller 1**. Screen shows “Create Adr: 01” as a default setting.
5. Decide on an Address / Number that you wish to have as the Double Heading number up to a maximum of 99. For this example 10 has been chosen.
6. Rotate **Controller 1** until 10 is displayed. Alternatively you can, using the keyboard type in 10.
7. Press **Controller 1** to confirm. Screen shows “Loco 1 Adr: 0010”.
8. Rotate **Controller 1** or type in the number of the first locomotive that you wish to add to the Consist. For this example No. 1 has been chosen.
9. Press **Controller 1** to confirm. Screen shows “Loco2 Adr: 0001”.
10. Rotate **Controller 1** until the screen shows “Loco2 Adr: 0002”.
11. Press **Controller 1** to confirm. Screen shows the last locomotive that was operated.
12. To control the Consist press the **Loco** key and rotate **Controller 1** until Screen shows “Contr 1 Adr:0010”.
13. Press **Controller 1** to confirm. Screen shows “00:00 I 0010”. Rotate **Controller 1** both locomotives will now move.

**Please Note:** For both locomotives to operate in unison it is important that they each have the same acceleration and deceleration levels.
Dissolving a Double Headed Group (Consist)

1. Press the Menu key. Screen shows “Loco”. Rotate Controller 1 until screen shows “Dbl Hdr”.

2. Press Controller 1 and rotate until screen shows “Dissolve Gp”.

3. Press Controller 1. The screen shows “Dissolve Adr: 01”.

4. Rotate Controller 1 to show the Consist you wish to dissolve and press Controller 1 to confirm.

5. Screen will then show in sequence “Dissolve Adr: 0010”, “Adr: 0001”, “Adr: 0002”, “Gp Removed” (Fig. 1), and finally the address of the dissolved group “00:00 | 0010”.

6. The locomotive address displayed is the address of the Consist previously dissolved. To select another locomotive for control use the Loco button etc, or press repeatedly the Escape button to cycle through previously assigned locomotive addresses.

Note: If an attempt is made to dissolve a Consist which does not exist the screen will display “No Member”.

Introduction: 4 Programming Modes

Reg, Paged and Direct modes

The development of DCC control can be traced back to the mid to late 1970s and over the years has advanced from having basic capabilities to today’s multi-functioning units. Early decoders had 8 ‘Registers’ for storing basic configuration information, e.g. locomotive address, acceleration / deceleration, etc. Programming these early decoders was carried out in Reg mode.

For decoders to become more sophisticated it was necessary to expand the number of Registers supported. This led to the development of the concept of CVs and Paged mode programming. 1024 CVs could now be supported, however read-back of a decoder’s CVs in Paged mode was a complex process and slow in practice. Further advancements were made resulting in Direct mode.

Modern decoders using Direct mode programming which supports faster read-back response, etc. This is now the preferred mode for decoder programming.

The Elite supports all three programming modes described above, consequently the Elite will support a wide range of decoder types.

All the above 3 programming modes are carried out with the locomotive placed on a dedicated Programming Track.

Operate mode

It is also possible to programme CVs while a locomotive is on the Main Track. To do this a special programming mode is used. This 4th mode is called Operate mode.

Locomotives on the Main Track may be programmed using Operate mode, however most decoders cannot be ‘read back’ unless they support RailCom®.

Note: If a decoder supports RailCom® it must be enabled in the decoder, see CV29 on page 29.

RailCom® is a technology supporting bi-directional communication between a decoder and the controller and has been developed by Lenz Elektronik GmbH.

RailCom® allows a Sapphire decoder to report back to the Elite fuel levels when Fuel Simulation is operational.

Operate mode is typically used for adjusting a locomotives acceleration/deceleration and setting default direction, etc. while the locomotive is under control on the Main Track and is stationary.

RailCom® is a registered trade mark of Lenz Systems.
Programmed Overview

The following sections will take you through the procedure of programming decoders. We will follow the logical flow of the 'Programming' area of the Elite's menu.

Once you have elected to programme a locomotive you will be first asked what programming mode you wish to use. In most cases you will select Direct mode. From there on you have the following 'quick access' options.

1. Programme the Locomotive Address.
2. Change the decoder operational characteristics using the Config menu. This is a very easy way of making changes to CV29. See the full explanation of CV29 on page 29.
4. Set Deceleration.
5. Set the decoder Start Up Voltage.
6. Access CV programming - Detailed programming capability with Read Back.
7. Read Back decoder version number.
8. Read Back decoder Manufacturer ID number.

A special note re Programming 'Dummy' Cars

The Elite, version 1.4 and later allows address programming of 'dummy' cars. The Pendolino, HST, etc. locomotives carry decoders in their 'dummy' cars for the purpose of controlling directional lights. These decoders have to be programmed with the same address as the 'power' car's decoder for directional lighting to work correctly under Function control from the controller.

Note: It is not possible to read back a decoder without a load connected (i.e. no motor).

Alternative Programming Modes

As well as supporting the more common Direct programming mode, the Elite also supports Register programming mode, Paged programming mode and Operate programming mode. The following describes how each mode can be accessed with the Elite. (See page 25 for details of each mode.)

Register Programming Mode

1. Press Menu. Screen shows "Loco". Press Controller 1 to confirm. Screen shows "Direct".
2. Rotate Controller 1 until screen shows "Reg" and press Controller 1 to confirm.
3. Screen shows "Address". Press Controller 1 to confirm.
4. Screen shows "Address Write".
5. Press Controller 1 to confirm. Screen shows "Address Adr:0003" or the last locomotive selected. Enter the locomotive number you wish to programme.
6. Press Controller 1 to confirm. Red LED flashes for a few seconds. Screen shows "Address".
7. Return the loco to the main track. To operate the locomotive press Menu. Screen shows "00:00 1 0003" or the locomotive that was programmed.

Note: Use on Programming Track only.

Note: In the above example we have described the procedure for using Register mode programming of the locomotive's address.

When at step 3 in the above procedure it is possible to cycle through the other quick access programming options if you wish to change the locomotive's acceleration etc. However, you will note that there is no 'CV' programming option in the selectable options. The CV option, while in Register programming mode is replaced by "Reg" programming. When Reg programming is selected there are only 8 registers available for programming unlike the 1024 CVs usually available.
Alternative Programming Modes

Paged Programming Mode

1. Press Menu. Screen shows “Loco”. Press Controller 1 to confirm. Screen shows “Direct”.
2. Rotate Controller 1 until screen shows “Paged” and press Controller 1 to confirm.
3. Screen shows “Address”. Press Controller 1 to confirm.
4. Screen shows “Address Write”.
5. Press Controller 1 to confirm. Screen shows “Address Adr:0003” or the last locomotive selected. Enter the locomotive number you wish to programme.
6. Press Controller 1 to confirm. Red LED flashes for a few seconds. Screen shows “Address”.
7. Return the loco to the main track. To operate the locomotive press Menu. Screen shows “00:00 1 0003” or the locomotive that was programmed.

Note: Use on Programming Track only.
Note: In the above example we have described the procedure for using Paged mode programming of the locomotive’s address.
When at step 3 in the above procedure it is possible to cycle through the other quick access programming options if you wish to change the locomotive’s acceleration etc.

Operate Programming Mode

The Operate mode can be used to change a locomotive’s CVs, i.e. Acceleration/Deceleration, etc. while the locomotive is on the main line, i.e. not on the Programming Track, however the Operate mode will not allow you to change the locomotive’s address (CV 1). See writing and reading CVs in Operate mode on pages 40-42.

For more information visit: www.hornby.com
Config Menu (CV29) (continued)

What is CV29? (continued)

**SPEED TABLE – CV29 bit 4**
By default the way a locomotive responds to the throttle is governed by CV2, 5 and 6. These CVs govern \textit{Vstart}, \textit{Vhigh}, and \textit{Vmid}, which sets a basic ‘speed curve’. However, advanced decoders allow you to build a custom speed curve by programming values into CVs 67-94. This parameter in CV29 allows you to choose which speed curve to apply. The Sapphire supports advanced ‘speed curves’.

**ADDRESS LENGTH – CV29 bit 5**
Most decoders can be programmed with either “Short” or “Extended” address, e.g. Short addresses 1-127, long addresses 1-9999, where each type of address stored is different. This parameter is usually handled automatically when programming a decoder.

**DECODER FUNCTION TYPE – CV29 bit 7** (bit 6 is reserved for future use)
Some decoders can operate in either \textit{Loco} or \textit{Accessory} modes. The ‘type’ can be set with this parameter.

\textbf{Note:} If a feature is not supported within CV29 on a particular decoder you will not be able to programme it, however nothing will change if you do attempt to change it with the \textit{Elite}.

\textbf{Note:} R8249 Hornby DCC Locomotive Decoder CV29 only supports \textit{Direction}, \textit{Function Lighting}, \textit{Power Conversion} and \textit{Address Length}.

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CV29 Config Programming

Programming CV29 with the \textit{Config} menu

1. Press \textit{Menu} and then either controller and if necessary rotate until screen shows “\textit{Direct}” and press the controller.
2. Rotate until screen shows “\textit{Config}” and press the controller to confirm.
3. The screen now shows the first of seven parameters “\textit{Dir Normal}”. Rotate the controller to the desired setting “\textit{Dir Normal}” or “\textit{Dir Reversed}” and press the controller to move to the next parameter.
4. Repeat step 3 for all seven parameters.
5. After the seventh parameter has been set press the controller and the \textit{Elite} will write CV29 (the red LED will flash). When the Write sequence has finished the display will show “\textit{Config}”.
6. Press the \textit{Menu} key to return to Time Display mode.

\textbf{Note:} When you run through the procedure outlined in the flow diagram on page 32 you must complete the entire sequence by selecting the desired value for each parameter as you progress.

\textbf{Note:} After completion of the CV programming procedure the \textit{Elite} remembers the last CV number programmed, thus making access to CVs quicker during the programming procedure.
Programming CV29 with the Config menu (continued)

1. Press Menu key on the Elite. Screen shows “Loco”.
2. Press Controller 1 to confirm. Screen shows “Direct”.
3. Press Controller 1 to confirm. Screen shows “Address”.
4. Rotate Controller 1 until screen shows “Accel”.
5. Press Controller 1. Screen shows “Accel 000”.

6. Rotate Controller 1 until the desired acceleration level is displayed. Alternatively, you can type in the level using the keypad. The lower the numbers entered the faster the acceleration; the higher the number (maximum 255), the slower the acceleration.
7. Press Controller 1 and the red LED will flash for a few seconds. Screen shows “Accel”. See Fig. 1.
8. Press Menu to return to the main screen.

Please Note:
The speed of acceleration and deceleration will depend largely on the levels chosen. As a general rule of thumb an acceleration / deceleration level of 50 will take approximately 40 seconds to reach either maximum speed or stop. This is assuming that the Speed Step setting of the decoder is 128.
Deceleration Control (CV4)

Before programming the deceleration level ensure the locomotive is on the Programming Track.

1. Press Menu key on the Elite. Screen shows “Loco”.
2. Press Controller 1 to confirm. Screen shows “Direct”.
3. Press Controller 1. Screen shows “Address”.
4. Rotate Controller 1 until screen shows “Decel”. See Fig. 1.
5. Press Controller 1 to confirm. Screen shows “Decel 000”.
6. Rotate Controller 1 until the desired deceleration level is displayed. Alternatively, you can type in the deceleration level using the keypad. The lower the number entered the faster the deceleration; the higher the number, (maximum 255) the slower the deceleration.
7. Press Controller 1, red LED will flash for a few seconds. Screen shows “Decel”. See Fig. 1.
8. Press Menu to return to the main screen.

Please Note:
1 second per acceleration level (e.g. An acceleration level of 10 equals 10 seconds approximately).

Start Up Voltage (CV2)

Not all electric motors have the same start up voltage requirements. This means that some Digital locomotives may require their decoders to be adjusted to compensate for the type of motor used. The Hornby Elite has therefore been designed to provide the facility for the adjustment of the start up voltage which can be programmed into the decoder in up to 255 steps. The lower the number, the lower the start up voltage, however several attempts to find the optimum start up voltage may be required. Locomotive 1 will be used in this example. Place the locomotive on the Programming Track. Always check the decoder documentation re maximum value supported for any CV.

1. Press Menu. Screen shows “Loco”.
2. Press Controller 1. Screen shows “Direct”.
3. Press Controller 1. Screen shows “Address”.
4. Rotate Controller 1 until “Start V” is shown.
5. Press Controller 1. Screen shows “Start V 000”.
6. Either rotate Controller 1 until the required number is displayed or using the keypad type in the required level, e.g. 10. Screen shows “Start V 010”.
7. Press Controller 1. Red LED will flash for a few seconds. Screen shows “Start V”.
8. Press Menu to return to the main screen.

Alternatively the Start Up Voltage may be adjusted using the Operate mode while the locomotive is on the main line. It must be noted that once the Start Up figure has been input and Controller 1 is pressed to confirm the red LED will not flash.
Changing and Reading CVs

There may be occasions when a decoder CVs may need to be altered. This can be achieved by following the directions below.

**Please Note:** The range of CVs a decoder supports can vary between different decoders. Also, the maximum value that can be set for any given specific CV may be different from one decoder to another. Please check the decoder’s documentation before attempting to programme a CV value.

**Programming CVs on Programming Track**

In the following example Direct mode is used for programming CV4 (Deceleration) and must be executed with the locomotive on a Programming Track.

1. Press **Menu**. Screen shows “Loco”.
2. Press **Controller 1**. Screen shows “Direct”.
3. Press **Controller 1**. Screen shows “Address”.
4. Rotate **Controller 1** until screen shows “CV”.
5. Press **Controller 1**. Screen shows “CV Write”.
6. Press **Controller 1**. Screen shows “CV 0001 W”.
7. Rotate **Controller 1** until screen shows “CV 0004 W”.
8. Press **Controller 1** to confirm. Screen shows “CV 0004 W 000”.
9. Rotate **Controller 1** to adjust the setting of your choice 1 - 255. Press **Controller 1** to confirm. Red LED flashes six times. Screen returns to show “CV”.
10. Press **Menu** to return to the main screen.

**Reading CVs on Programming Track**

The following example in Direct mode is for the reading of CV3 (Acceleration) and must be executed with the locomotive on a Programming Track.

1. Press **Menu**. Screen shows “Loco”.
2. Press **Controller 1**. Screen shows “Direct”.
3. Press **Controller 1**. Screen shows “Address”.
4. Rotate **Controller 1** until screen shows “CV”.
5. Press **Controller 1**. Screen shows “CV Write”.
6. Rotate **Controller 1** until screen shows “CV Read”.
7. Press **Controller 1**. Screen shows “CV 0001 R”.
8. Rotate **Controller 1** until the screen shows “CV 0003 R”.
9. Press **Controller 1**. The red LED will light while the decoder is being read. Screen shows “CV 0003 R” and the number that CV3 was programmed as. Should the screen show “CV 0003 R XXX” this will denote that the CV could not be read. If this occurs refer to the decoder’s specification sheet.

**Please Note:** Not all decoders are capable of having their CVs read. Please refer to the specification sheet supplied with the decoder.
Adjusting the Speed Curve

A decoder is sent ‘speed step’ control information from the DCC controller (Elite). The physical speed the motor runs for any given ‘speed step’ command is governed by one of two possible ‘speed curves’. One being ‘simple’ while the other ‘complex’. The ‘simple speed step’ curve is made up of 3 points and offers basic ‘linear’ speed response. The other ‘complex’ curve offers more detailed control and is made up of 27 different points.

The “basic” curve corresponds to CV values CV2, CV5 and CV6 i.e. Start Voltage, Maximum Speed and Medium speed of the locomotive. The ‘complex speed curve’ has 27 definable values in the CV range, CV67 to CV94.

Selecting which of the two speed curves (basic ‘3 point’ or the complex ‘27 point’ curve) to be used by the decoder is controlled by CV29 bit 4. Please refer to the full description of CV29 and the programming procedure on pages 30 to 32 for further information. Before adjusting any of the Speed Curve CVs it is advisable to produce a graph particular to the locomotive you wish to programme showing how you see the speed curve progressing.

This can be achieved by using graph paper and breaking each CV value into 255 segments. Once this has been drawn plot the speed curve making a note of each of the revised CV settings. Once you have drawn on the graph the speed curve you require you can then start to install the CVs onto the locomotive decoder via the “CV Write” facility on the Elite. It is worth noting that there are several third party ‘software’ packages which can help plot a Speed Curve which may be more preferable than using graph paper.

Example of programming a Speed Curve CV value

Once a decision has been made as to which of the two speed curves suit your needs for a particular locomotive you will need to programme the CV values for the speed curve selected.

In the following example you have elected to use the ‘complex’ speed curve. The example shows the procedure for programming CV67. CV67 is the first value in the ‘complex’ speed curve, all other values in the ‘complex’ speed curve may be programmed in the same way. i.e. CV67-CV94.

If you have elected to use the ‘basic’ speed curve the CVs to be programmed with the described procedure will be CV2, CV5 and CV6 i.e. Start Voltage, Maximum Speed and Medium speed of the locomotive.

1. Press Menu. Screen shows “Loco”.
2. Press Controller 1. Screen shows “Direct”.
3. Press Controller 1. Screen shows “Address”.
4. Rotate Controller 1 until screen shows “CV”.
5. Press Controller 1. Screen shows “CV Write”.
6. Press Controller 1. Screen shows “CV 0001 W”.
7. Rotate Controller 1 until screen shows “CV 0067 W”. Press Controller 1 to confirm.
8. Screen shows “CV 0067 W 000”. Rotate Controller 1 to choose the value of the CV setting (0 - 255) and press to confirm.
9. The red LED will flash confirming that the change has been accepted. Should the LED flash eight times this will denote that the programming has not been accepted. Try again.
10. Follow the above procedure working gradually through the CV settings.

Please Note:
It is advisable that before changing the factory settings that you plot the speed curve you require on graph paper or a suitable computer programme to avoid uncharacteristic acceleration / deceleration levels.

For more information visit: www.hornby.com
Operate Mode

Introduction
Operate mode allows the change of most CV values while the locomotive is placed on the main track. For operational reasons CV1 (short address) is not accessible.

In general, the Operate programming procedure follows the same steps as the previous programming procedure described using Direct mode. However, Operate mode allows programming of a locomotive on the main track.

After selecting Operate mode you will be asked which locomotive you want to programme. i.e. you could have many locomotives on the main track and the controller needs to know which locomotive to target during the programme procedure.

Once the ‘target’ locomotive has been selected various locomotive parameters can be programmed or read back. Select the menu option by rotating the controller (see opposite).

In practice the usual parameters accessed while a locomotive is on the main track are Acceleration or Deceleration. On occasion you may wish to change the default direction of the locomotive, but this is less common.

Summary
Under Operate mode it is possible to carry out the following tasks while the locomotive is placed on the main track. Each option is selected by rotating and pressing the control knob in the same way described on page 25 regarding Direct mode programming.

5. CV programming - Detailed programming capability with Read Back (RailCom® required for read-back.)
   Note: Decoders may be reset to default values. See Point 7.
6. Read Back decoder version number.
7. Read Back decoder Manufacturer ID number. (CV8) Writing the value “8” to this CV will reset a Hornby decoder.

Please refer to the following example opposite regarding the use of Operate mode. In this example we will access and change CV3 (Acceleration.)

Example of changing a CV value on the main track
In the example below we will change CV3 (Acceleration) of a locomotive while it is placed on the Main track.

1. Press Menu. Screen shows “Loco”.
2. Press Controller I. Screen shows “Direct”.
3. Rotate Controller I until screen shows “Operate”.
4. Press Controller I to confirm. Screen shows “Operate Adr:0003” or the last locomotive number operated.
5. Rotate Controller I until screen shows the number of the locomotive whose CV you wish to adjust. In this example number 10 has been chosen. Press Controller I to confirm.
6. Screen shows “Config”. Rotate Controller I until “CV” is shown and press Controller I to confirm.
7. Screen shows “CV Write”. Press Controller I to confirm. Screen shows “CV 0001 W”.
8. Rotate Controller I until “CV 0003” is shown.
9. Press Controller I to confirm. Screen shows “CV 0003 W 000”.
10. Rotate Controller I to adjust the setting of your choice 1 - 255.
11. Press Controller I to confirm. Screen shows “CV”.
12. Press Menu to return to the main screen.

Please Note:
The red LED will not flash.

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Operate Mode (continued)

Example of reading a CV on the main track

Please Note: Read back of a decoder under Operate mode while the locomotive is on the main track requires the RailCom® feature to be enabled in both the controller and the decoder.

Not all decoders support RailCom® and thus will not support read back while the locomotive is on the main track.

The Elite automatically turns on RailCom® support when a read back request is executed in ‘Operational’ mode. However, for read back to work, please ensure that RailCom® is enabled in CV29 in the decoder.

To enable RailCom® within CV29, please see pages 29 to 32 for more information. Enabling RailCom® in CV29 will need to be carried out under Direct mode with the locomotive on the programming track before any read backs can be attempted under Operate mode.

The following example is for the reading of CV4 (Deceleration) using Operate mode, i.e. on the main line.

1. Press Menu key. Screen shows “Loco”.
2. Press Controller 1. Screen shows “Direct”.
3. Rotate Controller 1 until screen shows “Operate”.
4. Press Controller 1 to confirm. Screen shows “Operate Adr:0003” or the last locomotive operated.
5. Rotate Controller 1 until screen shows the number of the locomotive whose CV you wish to adjust. In this example number 20 has been chosen. Press Controller 1 to confirm.
6. Screen shows “Config”. Rotate Controller 1 until “CV” is shown and press Controller 1 to confirm.
7. Screen shows “CV Write”.
8. Rotate Controller 1 until “CV Read” is shown and press Controller 1 to confirm.
9. Screen shows “CV 0001 R”.
10. Rotate Controller 1 until screen shows “CV 0004 R” and press Controller 1 to confirm.
11. The red LED will light while the decoder is being read. Screen shows “CV 0004 R” and the number that CV4 was programmed as. Should the screen show “CV 0004 R XXX” this will denote that the CV could not be read. If this occurs refer to the decoder’s specification sheet.
12. Press Menu to return to the main screen.

Operate Mode (continued)

Loinnifer Direction setting

The default direction of the locomotive can be altered using the Elite without taking it off the Main Track and to do this the following procedure will need to be used.

1. Press Menu key. Screen shows “Loco”.
2. Press Controller 1 to confirm. Screen shows “Direct”.
3. Rotate Controller 1 until “Operate” is displayed.
4. Press Controller 1. Screen shows “Operate Adr:0003” or the last locomotive operated.
5. Press Controller 1. Screen shows “Config”. See Fig. 1.
6. Press Controller 1. Screen shows “Dir Normal”.
7. Rotate Controller 1 to show “Normal” or “Reversed”. Select the preferred direction.
8. Press Controller 1 to confirm.
9. Press Controller 1 six more times to skip further options. Screen shows “Config”. See Fig. 1.
10. Press Menu to return to the main menu.

For more information visit: www.hornby.com

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**Elite Features**

The *Elite* controller has several built-in features that can assist you in controlling your layout. Please read on for more information on how to use these features.

---

### To Name a Locomotive

Using the *Elite* alphanumeric keyboard locomotives can not only be given their own unique number but also named. For this example the name ‘Mallard’ will be used.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Press Menu</td>
<td>Screen shows “Loco”.</td>
</tr>
<tr>
<td>2.</td>
<td>Press Controller 1</td>
<td>Screen shows “Direct”.</td>
</tr>
<tr>
<td>3.</td>
<td>Rotate Controller 1</td>
<td>Until screen shows “Features”.</td>
</tr>
<tr>
<td>4.</td>
<td>Press Controller 1</td>
<td>Screen shows “Features Adr:0001” or the last locomotive operated. Rotate Controller 1 until loco desired is displayed.</td>
</tr>
<tr>
<td>5.</td>
<td>Press Controller 1</td>
<td>Screen shows “Name”.</td>
</tr>
<tr>
<td>6.</td>
<td>Press Controller 1</td>
<td>Press 6 twice. Screen shows “M”.</td>
</tr>
<tr>
<td>7.</td>
<td>Press 2 twice</td>
<td>Screen shows “MA”.</td>
</tr>
<tr>
<td>8.</td>
<td>Press 5 four times</td>
<td>Screen shows “MAL”.</td>
</tr>
<tr>
<td>9.</td>
<td>Press 5 four times</td>
<td>Screen shows “MALL”.</td>
</tr>
<tr>
<td>10.</td>
<td>Press 2 twice</td>
<td>Screen shows “MALLA”.</td>
</tr>
<tr>
<td>11.</td>
<td>Press 7 four times</td>
<td>Screen shows “MALLARD”.</td>
</tr>
<tr>
<td>12.</td>
<td>Press 3 twice</td>
<td>Screen shows “MALLARD”.</td>
</tr>
<tr>
<td>13.</td>
<td>Should a mistake be made or you wish to remove the name rotate Controller 1 anti-clockwise so that the cursor is underneath the incorrect letter. Press 0 twice and the letter will disappear then continue as above.</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Press Controller 1</td>
<td>To confirm. “Name” is displayed. Press Menu to return to the main screen.</td>
</tr>
</tbody>
</table>

---

### Changing the number of speed steps transmitted to a locomotive

There may be occasions when locomotives fitted with older generation decoders/motors may be required to be controlled by the *Elite*. To get optimum control with these locomotives, it may be necessary to change the speed step range sent from the controller.

The *Elite* by default divides the full speed range for a locomotive decoder into 128 discrete speed steps. This suits most modern decoders etc. However, in addition to the default 128 speed steps the *Elite* can be set to transmit 14 or 28 speed steps to control the full speed range. This is set on a per locomotive basis thus allowing varying speed step capability for all locomotives on the layout.

**Note:** fewer speed steps will give a courser control of the locomotive when compared to the full default 128 speed steps.

**Note:** All Hornby decoders are optimised for 128 speed steps.

**Note:** Changing speed steps is a controller function. Nothing will be changed in the decoder, i.e. you do not have to have the locomotive on the main or programming tracks when carrying out this procedure.

In the procedure described below we will change the number of speed steps transmitted to locomotive 1.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Press Menu</td>
<td>Screen shows “Loco”.</td>
</tr>
<tr>
<td>2.</td>
<td>Press Controller 1</td>
<td>Screen shows “Direct”.</td>
</tr>
<tr>
<td>4.</td>
<td>Screen shows “Features Adr:0003” or the number of the last locomotive ‘called up’. Rotate Controller 1 to the locomotive number required.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Press Controller 1</td>
<td>to confirm. Screen shows the steps selected.</td>
</tr>
<tr>
<td>6.</td>
<td>Press Controller 1</td>
<td>Screen shows “Name”.</td>
</tr>
<tr>
<td>8.</td>
<td>Rotate Controller 1 until</td>
<td>the desired setting is displayed.</td>
</tr>
<tr>
<td>9.</td>
<td>Press Controller 1</td>
<td>to confirm. Screen shows the steps selected.</td>
</tr>
<tr>
<td>10.</td>
<td>Press Menu</td>
<td>to return to the main screen.</td>
</tr>
</tbody>
</table>

---

For more information visit: [www.hornby.com](http://www.hornby.com)
Elite Features (continued)

**Locomotive Favourite Settings**

The Favourites setting on the Elite is an extremely useful function for those who have a large stable of locomotives or who use an array of 4 digit ID numbers. Most modellers have special locomotives that they always use (Favourites) and these can be 'marked' accordingly. It is then possible for the Elite to only allow access to these favourite locomotives. i.e. you will only be able to scroll through a specific list of locomotive addresses or locomotive names thus, speeding up access to your locomotives.

There can be up to 254 locomotives in the 'Favourites' list.

Setting up the 'Favourites' list is carried out in two stages. i.e. For the Elite to show just those locomotives that are on the Favourites list the "Fav" setting should be set to "On". To do this follow the procedure below. Once the Favourites list has been turned on, you must then add locomotives to the list. See procedure on the next page.

**Please Note:** Any locomotive addresses not included in the Favourites list will not be accessible for control. To access these locomotive address either add the locomotive address to the Favourites list or turn off the Favourites function of the Elite in the Unit menu.

**Enabling and Disabling the Favourites List**

1. Press Menu. Screen shows "Loco".
2. Rotate Controller 1 until screen shows "Unit".
3. Press Controller 1 and rotate until screen shows "Fav".
4. Press Controller 1. Screen shows "Fav Off" or "Fav On".
5. Rotate Controller 1 to either "Fav Off" or "Fav On".
6. Press Controller 1 to confirm. Screen shows "Fav".
7. Press Menu to return to the main screen.

**Please Note:**
"Fav On" means that only those locomotives that are on your favourites list will be able to be called up and operated.
"Fav Off" means that all locomotives are available for operation.

For more information visit: [www.hornby.com](http://www.hornby.com)

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**Adding a locomotive address to the Favourites list**

Now that the Favourite (Fav) function has been enabled locomotives required to be placed on the Favourite List can be programmed as follows using Locomotive 1 as an example:

1. Press Menu. Screen shows "Loco".
2. Press Controller 1. Screen shows "Direct".
3. Rotate Controller 1 until screen shows "Features".
4. Press Controller 1. Screen shows "Features Addr: 0003" or the last used locomotive address.
5. Enter the locomotive address you wish to add as a favourite using Controller 1 or the keypad.
6. Press Controller 1. Screen shows "Name".
7. Rotate Controller 1 until screen shows "Fav".
8. Press Controller 1. Screen shows "Fav No". See Fig. 1.
9. If you wish the locomotive to be added to your Favourite list rotate Controller 1 until "Fav Yes" is shown. Press Controller 1 to confirm. Screen shows "Fav".
10. Press Menu to return to the main screen.

**Please Note:**
To call up locomotives that are not on the Favourite list the Favourite setting must be switched off. See page 46.

---

Fig. 1
Programming the Sapphire

Simple programming of the Sapphire decoder’s unique features

The Hornby Sapphire decoder has two unique features that can be controlled and programmed via dedicated menus and displays of the Elite version 1.4 or later.

Fuel Simulation

The locomotive will stop when the fuel has been completely depleted. The term ‘fuel’ is used to describe both coal and diesel oil. See page 49.

Automatic Control Cycle

The Sapphire decoder can be programmed to carry out a sequence of events under fully automatic control without any user intervention. The control cycle can be set to run once or repeat from the start. See page 51.

Once the display shows “Sapphire” (see below) press the controller and you will then be shown either the “Auto Control” or “Fuel Simulate”. You may toggle between these sections by rotating either controller. Once the desired section is shown, press either controller to enter the desired section.

How to access the Sapphire programming menus

The flow diagram below shows how to enter the Elite’s Sapphire programming menus. First press the Menu key.

For more information visit: www.hornby.com

Fuel Simulation

An initial fuel quantity has to be set before you can run Fuel Simulation. The initial fuel quantity is used every time you refuel the locomotive.

Choosing initial fuel quantities

Generally a locomotive running at maximum throttle setting will stop after a few minutes if the fuel quantity is set to 10, however this is a very rough guide. It is best to start at a value of 5 and work upwards until you find the optimum quantity for your needs. The maximum quantity you can set is 254.

Setting the Initial Fuel Quantity

1. To set the initial fuel quantity follow the steps of the flow chart on page 48 until screen shows “Features Adr:0003”. Select the desired locomotive and continue with the steps of the flow chart on page 48 until the screen shows “Fuel Simulate”.
2. Press either controller. Screen shows “Fuel 000”. Enter the initial fuel quantity with the keypad or by rotating the controller (fuel value of 15 in this example). Screen shows “Fuel 015”.
3. Press either controller to confirm. A red LED illuminates for approx. 4 seconds while the fuel quantity is programmed into the decoder. Screen shows “Sapphire”.
4. Press the Menu key to return to Loco control, the Fuel Simulation is now ready to run.

Running the Fuel Simulation

1. Press the Loco key, select the desired locomotive and press the controller. Cycle through the display modes by pressing the Function key until you get to the Fuel Simulation display (see page 16). Screen shows “Off F 0003”.
2. Press the On/Off key to turn on the simulation. Screen shows “On Fxxx 0003”. The fuel quantity will then be read back from the decoder (in this example 15). Screen shows “On F015 0003”.
3. Rotate the controller to take control of the locomotive. After a while the screen will show the fuel quantity deplete at a rate dependent on the throttle setting.

Note: When a locomotive runs out of fuel it stops and requires refuelling. The headlights / rear lights on locomotives so equipped will flash when the fuel is fully depleted.

Note: The Sapphire decoder calculates the rate of fuel consumption based on the speed set on the Elite. A higher speed value will be required for a locomotive under a heavy load in order to maintain speed as opposed to a lightly loaded locomotive running at equivalent speed. Fuel will be consumed faster the higher the speed. The actual speed of the locomotive is not the governing factor regarding fuel consumption but the throttle setting.
Fuel Simulation (continued)

Refuelling

When a locomotive runs out of fuel it stops and requires refuelling. The headlights / rear lights on locomotives so equipped, will flash when the fuel is fully depleted. However, you can refuel a locomotive at any point.

1. Select the address of the locomotive you wish to refuel.
2. Cycle through the display modes by pressing the Function key until you get to the Fuel Simulation display (see page 16).
3. The display will now show the fuel remaining.
4. Press the On/Off key to turn the simulation off. This will cause the throttle for the locomotive to be set to minimum (stationary).

Screen shows “Off F”.
5. Press the On/Off key once more to refuel and restart the simulation, i.e. the fuel level will be reset to the amount previously set as the ‘Initial’ value. (page 49.) You now have to set a new throttle setting. This process can be repeated as many times as desired.

How many locomotives can run at the same time with Fuel Simulation?

During the simulation the Elite only reads back the fuel level of the locomotive address that is shown in the Fuel Simulation display. The Elite can run up to 64 Sapphire-fitted locomotives with fuel simulation.

You can control other locomotives while the simulation is running - returning to the locomotive running the Fuel Simulation to check fuel status as desired. The Fuel Simulation function is a Sapphire based function, once it is turned on the Sapphire will continuously calculate fuel values whether it is being monitored by the Elite or not.

The Elite will always revert to the previously set display mode when the desired controller is pressed. It is possible to set the Elite up so that pressing either controller will immediately show the current fuel status for the last locomotive assigned to each controller making it easy to monitor two locomotives with a single controller press.

Advanced Simulation

The Elite Fuel Simulation display only offers support for Fuel only, however the Sapphire decoder is actually capable of Water and Fuel simulation.

This involves the setting of two independent quantities which will be used in the consumption calculation. Using the CV read back capabilities of the Sapphire and utilising RailCom® it is possible to monitor both water and fuel levels as they are calculated. Carrying out this type of simulation involves some experience in dealing with CV values, etc. Please refer to the Sapphire instruction leaflet for the full set of CVs involved in the simulation. The Elite Fuel Consumption display feature sets Water to maximum automatically so that even though the water quantity is being depleted, it will not run out before the Fuel therefore Water is ignored.

For more information visit: www.hornby.com

Automatic Control Cycle (ACC)

The Elite has a dedicated menu that simplifies the process of setting up the Sapphire’s Automatic Control Cycle therefore no specialist knowledge of CVs is required.

An ACC is made up of a series of Events and Controls which are selected within the ACC. Setting up the ACC is executed in two parts i.e. Event and Control.

In the Event part of the menu, actions can be set up for the desired locomotive to carry out. For example an optional initial delay and then speed, direction and time parameters. See page 52.

In the Control part of the menu Events may be selected which can run and if needed stop the ACC from running. See pages 54-55.

ACC Event Parameters Description

There are 4 possible locomotive Delay time / Speed / Direction / Duration Events that can be set to run consecutively. There is also an optional Event Delay parameter that allows the operator to set a delay before the 4 Events start running. The ACC starts as soon as the locomotive is placed on the track and powered. Using the Event Delay parameter will prevent the locomotive trying to run while being placed on the track.

Note: An ACC can be set to automatically repeat or to run once. When an ACC is set to ‘repeat’ the cycle will return to the first locomotive Delay time / Speed / Direction / Duration Event set after the initial delay time that has been set in the “Event Delay” parameter. The Initial Delay time will not be used on subsequent cycles. When the track is powered down or up in the case of an emergency stop or the locomotive is removed or replaced on the track the ACC will commence using the “Event Delay” time.

Note: When planning an ACC it is worth making a note of exactly what you are intending to do. This will help you keep track of the parameter values that have been set. The Elite does not have the ability to read back the parameter values set when using the ACC programming feature.

Note: Each parameter value of the ACC is stored in specific CV locations - Delay time / Speed / Direction / Duration for each event. It is therefore possible to read back and verify all ACC parameters via the appropriate CVs using the standard programming functions of the Elite. Consult the Sapphire instruction leaflet for the list of ACC CV locations and follow the usual CV programming and read back procedures of the Elite.
Setting the Event Parameters

The Sapphire's Automatic Control Cycle (ACC) example

Example: To set the Sapphire ACC so that a locomotive can carry out the following actions.
1. After an initial delay of 20 seconds.
2. The locomotive runs forwards at speed 50 for 10 seconds.
3. The locomotive stops for 5 seconds.
4. The locomotive runs in the opposite direction at speed setting 25 for 30 seconds.
5. The locomotive stops for 7 seconds before restarting the cycle from step 2.

Part 1 – Setting the Event parameters

With the display showing "Event" (see flow diagram on page 51) press the chosen controller. The screen is now set for the Event sub-headings.

1. Rotate the controller
2. Rotate the controller
3. Rotate the controller
4. Rotate the controller
5. Rotate the controller

Part 1 continued – Setting the Event Delay

1. With the Elite display showing “Event Delay” press the chosen controller. Screen shows “HH:mm:ss 00:00:00”.
2. Press the controller to move from hours to minutes to seconds. Note the relevant letters change case which signifies the relevant input section.
3. Use the keypad or rotate the controller to set the time parameter. For this example input 10 in the 'seconds' section.
4. Press the controller to set the desired value. Screen shows “Event Delay”.

Note: If no initial delay is required set the Event Delay parameter to zero seconds.
Note: The Event Delay parameter is only used once in the ACC. When the initial delay has been completed the ACC will continue to run, cycling through each speed / direction / duration Event in sequence.

For more information visit: www.hornby.com

Part 1 continued - Setting the Events (EV1, EV2, EV3, EV4)

In this example the 4 Events are set as follows:

EV 1 - Speed (050) / Direction (Normal) / Duration (00:00:10).
EV 2 - Stop (speed = 000) for 5 seconds (00:00:05). If desired, you can control the locomotive directional lighting by changing the locomotive direction parameter. e.g. the locomotive directional lighting is set to correspond with the next Event.
EV 3 - Run in the opposite direction at speed setting 025 for 00:00:30 seconds.
EV 4 - Stop for 00:00:07 seconds, you can set the direction parameter if you wish.

1. Rotate the selected controller until screen shows the first sub-menu “EV 1”. Press the controller.
2. Screen shows “Speed 000” Use the keypad or rotate a controller to set the speed parameter. Press the controller when the desired value has been set (50 in this example).
3. You will then move to the next sub-menu. Screen shows “Dir Normal”. Rotate a controller to set the desired direction “Dir Normal” or “Dir Reversed”. Press the controller when the desired direction has been set and move to the next sub-menu.
4. Screen shows “HH:mm:ss 00:00:00”. Use the keypad or rotate a controller to set the time parameters. Press the controller to move between hours, minutes and seconds. Press the controller when the desired value has been set which in this instance is 10 seconds. Screen shows “Event EV 1”. EV 1 (Loco Speed / Direction / Duration) has now been set.
5. To set the other Events (EV2, EV3, EV4) repeat steps 1 to 4 inputting the appropriate values for this example.
6. When you have finished configuring Events press the Escape key to return to “Event”. Go to page 54.
Part - 2 Setting the Event Control parameters

Follow the flow diagram on page 54 to access each Event Control option.

The “Control Disable” option will be used later to disable the ACC. See Turning Off ACC on page 56.

The first 4 displays are ‘run once’ options (Control EV 1, EV 1-2, EV 1-3, EV 1-4). The following 3 displays allow you to select a ‘run continuously’ option (Control EV 1-2R, EV 1-3R, EV 1-4R).

In our example we will run all 4 Event EVs programmed on a continuous basis.

1. To set our ACC running, step through each display option until the screen shows “Control EV 1-4 R”.

2. Press and release either controller. The ACC will start to run as soon as the controller is pressed. The display will now show “Control”.

3. Press the Menu key to return to ‘normal’ locomotive control (i.e. to manually control non-ACC locomotives).

Note: While the ACC is running, it is not possible to control the locomotive manually. However, locomotive functions e.g. lighting may be manually controlled.

Note: The Emergency Stop key will halt all locomotives on the layout including those under ACC operation. When power is restored to the track all locomotives under ACC will restart and commence running their full ACC cycles, including any “Initial Delay” times if set.
For more information visit: www.hornby.com
Accessory Programming (Acc)

The Hornby R8247 Accessory/Point Decoder may be programmed and read back in Direct mode. The older R8216 Point Decoder must be programmed in Reg mode. Read back is not supported.

Note: The R8216 requires pre-charging for 20 seconds by connecting it to the Elite ‘Track’ output before disconnecting and connecting to the ‘Programme’ output for programming.

For third party Accessory/Point Decoders alternative programming mode and methods may be required. Please refer to the programming information supplied with the third party Accessory/Point Decoder.

R8247: Programming the addresses

In the example below we describe the procedure for programming the address of an R8247. Other parameters, e.g. the setting of the pulse duration for each output port may be programmed by accessing CV mode programming. Please see the instructions supplied with the decoder. However, for most operations regarding solenoid type point motors the decoder’s address only needs to be set.

1. Press Menu and rotate Controller 1 until “Acc” is displayed.
2. Press Controller 1 to confirm. Screen shows “Direct”.
3. Press Controller 1 to confirm. Screen shows “Address”.
4. Press Controller 1 to confirm. Screen shows “Address Write”.
5. Press Controller 1 to confirm. Screen shows “Address Write”.
6. Rotate Controller 1 until the desired address is displayed. If you are setting up your layout it is best to start with “1”.
7. Press Controller 1 to confirm. The red LED will flash several times to denote acceptance. (If the LED flashes eight times or more the number has not been accepted.) Screen shows “Address”.
8. Should you wish not to name the point/accessory press Menu to return the main screen, however if you do, follow instructions as shown in Step 2 on page 61.

Please Note: If using a Hornby Points/Accessory Decoder it is advisable for consistency that the first point motor/accessory is addressed as number 1. Once addressed the other three outlets will be automatically programmed 2, 3, 4. Thereafter all further Hornby accessory/point decoders will be programmed in consecutive blocks of 4.

2nd Accessory/Point Decoder Nos. (5, 6, 7, 8)
3rd Accessory/Point Decoder Nos. (9, 10, 11, 12)
4th Accessory/Point Decoder Nos. (13, 14, 15, 16) etc.

Reading back R8247 point and accessory addresses

It is possible to read back the address set up of the R8247 by selecting “Read” after the “Address” option in the procedure described on page 58. However, since the R8247 actually is supporting 4 address the “address” read back will not at first make sense.

All Point and Accessory addresses follow a group of 4 rule, i.e. if you programme the R8247 with any of the following numbers e.g. 1, 2, 3, 4 the R8247 will then programme/allocate each of those numbers to its 4 ports consecutively. The numbers 1, 2, 3, and 4 make up what is referred to as Group 1.

Each group of 4 numbers has its own unique group number. The next group (2) will consist of the numbers 5, 6, 7, and 8. Group 3 will consist of 9, 10, 11, and 12 and so on.

When reading back an R8247 the appropriate “Group number” will be displayed, e.g. the value “2” would mean the R8247 is programmed 5, 6, 7 and 8.

Note: When the Elite is programming an R8247 (or R8216) it works out the appropriate group number for the address you have selected and actually programmes the R8247 with the “Group” number. The R8247/R8216 does the rest by recognising the “Group” number and allocating the appropriate numbers to each of its ports.

The following table shows the relationship between group numbers and address/port allocations.

<table>
<thead>
<tr>
<th>Group Number</th>
<th>Allocated # Range</th>
<th>Group Number</th>
<th>Allocated # Range</th>
<th>Group Number</th>
<th>Allocated # Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1-4</td>
<td>22</td>
<td>85-88</td>
<td>43</td>
<td>169-172</td>
</tr>
<tr>
<td>2</td>
<td>5-8</td>
<td>23</td>
<td>89-92</td>
<td>44</td>
<td>173-176</td>
</tr>
<tr>
<td>3</td>
<td>9-12</td>
<td>24</td>
<td>93-96</td>
<td>45</td>
<td>177-180</td>
</tr>
<tr>
<td>4</td>
<td>13-16</td>
<td>25</td>
<td>97-100</td>
<td>46</td>
<td>181-184</td>
</tr>
<tr>
<td>5</td>
<td>17-20</td>
<td>26</td>
<td>101-104</td>
<td>47</td>
<td>185-188</td>
</tr>
<tr>
<td>6</td>
<td>21-24</td>
<td>27</td>
<td>105-108</td>
<td>48</td>
<td>189-192</td>
</tr>
<tr>
<td>7</td>
<td>25-28</td>
<td>28</td>
<td>109-112</td>
<td>49</td>
<td>193-196</td>
</tr>
<tr>
<td>8</td>
<td>29-32</td>
<td>29</td>
<td>113-116</td>
<td>50</td>
<td>197-200</td>
</tr>
<tr>
<td>9</td>
<td>33-36</td>
<td>30</td>
<td>117-120</td>
<td>51</td>
<td>201-204</td>
</tr>
<tr>
<td>10</td>
<td>37-40</td>
<td>31</td>
<td>121-124</td>
<td>52</td>
<td>205-208</td>
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<tr>
<td>11</td>
<td>41-44</td>
<td>32</td>
<td>125-128</td>
<td>53</td>
<td>209-212</td>
</tr>
<tr>
<td>12</td>
<td>45-48</td>
<td>33</td>
<td>129-132</td>
<td>54</td>
<td>213-216</td>
</tr>
<tr>
<td>13</td>
<td>49-52</td>
<td>34</td>
<td>133-136</td>
<td>55</td>
<td>217-220</td>
</tr>
<tr>
<td>14</td>
<td>53-56</td>
<td>35</td>
<td>137-140</td>
<td>56</td>
<td>221-224</td>
</tr>
<tr>
<td>15</td>
<td>57-60</td>
<td>36</td>
<td>141-144</td>
<td>57</td>
<td>225-228</td>
</tr>
<tr>
<td>16</td>
<td>61-64</td>
<td>37</td>
<td>145-148</td>
<td>58</td>
<td>229-232</td>
</tr>
<tr>
<td>17</td>
<td>65-68</td>
<td>38</td>
<td>149-152</td>
<td>59</td>
<td>233-236</td>
</tr>
<tr>
<td>18</td>
<td>69-72</td>
<td>39</td>
<td>153-156</td>
<td>60</td>
<td>237-240</td>
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<tr>
<td>19</td>
<td>73-76</td>
<td>40</td>
<td>157-160</td>
<td>61</td>
<td>241-244</td>
</tr>
<tr>
<td>20</td>
<td>77-80</td>
<td>41</td>
<td>161-164</td>
<td>62</td>
<td>245-248</td>
</tr>
<tr>
<td>21</td>
<td>81-84</td>
<td>42</td>
<td>165-168</td>
<td>63</td>
<td>249-252</td>
</tr>
</tbody>
</table>
R8247: Programming and Reading CVs

1. Press Menu. Screen shows “Loco”.
2. Rotate Controller 1 until screen shows “Acc”.
3. Press Controller 1. Screen shows “Direct”.
4. Press Controller 1 to confirm. Screen shows “Address”.
5. Rotate Controller 1 until screen shows “CV”. Press Controller 1. Screen shows “CV Write”. If you wish to read back a CV rotate the controller until “CV Read” is displayed.
6. Press Controller 1 to confirm the desired action. i.e. read or write. Screen shows “CV 0001” or “CV 0001 R”. 0001 is the default setting.
7. Rotate controller to select the CV you wish read/write. When the CV number is displayed press Controller 1.
   Reading: If reading back a CV, read back will commence. After a few seconds the result of the read back will be shown. e.g. “CV 0001 R 001”. The read back procedure is now complete.
   Writing: If writing a CV, rotate Controller 1 until the new value for the CV you wish to change is shown.
8. Press Controller 1 to commence writing the CV. The red LED flashes several times and screen shows “Address”.
9. Press Menu to return to the main screen.

Step 2: Naming Points and Accessories

Using the Elite it is possible to name all accessories / points that are digitally operated.

1. Press Menu and rotate Controller 1 until screen shows “Acc”.
2. Press Controller 1 to confirm. Screen shows “Direct”.
3. Rotate Controller 1 until screen shows “Features” and press Controller 1 to confirm.
4. Screen shows “Features Adr:0001” and the number of the last accessory used. Rotate Controller 1 to the accessory number you wish to name and press Controller 1 to confirm.
5. Screen shows “Name _”. For this example the name “POINT_” will be used.
6. Press 7 twice. Screen shows “P_”.
7. Press 6 four times. Screen shows “PO _”.
8. Press 4 four times. Screen shows “POI_”.
9. Press 6 three times. Screen shows “POIN_”.
10. Press 8 twice. Screen shows “POINT_”.
11. Press 8 twice. Screen shows “POINT_”.
12. Press 5 once. Screen shows “POINT_”.
13. Press Controller 1 to confirm. Screen shows “Direct”.
14. Press Menu to return to the main screen.

Please Note:
Should a mistake be made rotate Controller 1 anti-clockwise so that the cursor moves back one position below the incorrect letter. Press 0 twice and the letter will disappear then continue as above.
Additional Elite Features

Having now experienced the initial control and programming abilities of the Hornby Elite the next section of this instruction manual explains the many additional features that the Elite has to offer.

Analog Locomotive Control

It is possible (but not recommended) that a locomotive that is not fitted with a decoder (analogue) can be operated on a digital layout. This locomotive is given the address “0”.

1. Make sure that analogue mode is enabled (see page 63). Press the Loco key and either rotate the chosen controller or type in 0. Screen shows “Contr A dr:0000”.

2. Press and release the selected controller. Screen shows “00:00 1 0000”. Loco 0 can now be controlled.

4. Rotate the selected controller. Loco 0 will move forward. Press and release the selected controller and the locomotive will reverse.

5. Note that the control of a locomotive which is not fitted with a decoder is noisy and does not support smooth control.

Please Note: If a digital locomotive is called up the analogue locomotive will continue to run at the speed set prior to the digital locomotive being operated.

It is not possible to program acceleration or deceleration levels into an analogue locomotive. When an analogue locomotive is placed on the tracks it will emit a high pitched noise when stationary which will become louder when running - this is normal!

Only one analogue locomotive (0) can be run on a digital layout at any one time.

Analogue Locomotive Enable / Disable

1. Press Menu. Screen shows “Loco”. Rotate Controller 1 until “Unit” is displayed.

2. Press Controller 1. Screen shows “Train 0”. This setting is to enable / disable the use of an analogue locomotive.

3. Press Controller 1. Screen shows “Train 0 Off”.

4. If desired rotate Controller 1. Screen shows “Train 0 On”.

5. Press Controller 1 to set the desired analogue function - On or Off. Screen reverts back to “Train 0”.

6. Press Menu to return to the main screen.
Using the Elite’s Clock

Please note that the clock will immediately start functioning as soon as the Elite is powered up, therefore some of the clock times that you see on the main screen may not correspond with the diagrams of the main screen shown throughout these instructions.

Clock Enable / Disable

1. Press Menu. Screen shows “Loco”. Rotate Controller 1 until screen shows “Unit”.
2. Press Controller 1 and rotate Controller 1 until screen shows “Clock”.
3. Press Controller 1. Screen shows “Clock On”. See Fig. 1.
4. Rotate Controller 1 to alternate between “Clock On” or “Clock Off”. Select the desired setting.
5. Press Controller 1 to confirm. Screen shows “Clock”.
6. Press Menu to return to the main screen.

Additional Elite Features (continued)

Setting the Clock in Scale Time

1. Press Menu. Screen shows “Loco”. Rotate Controller 1 until “Unit” is displayed.
2. Press Controller 1 and, if necessary, rotate until screen shows “Set Clk”. Screen shows “Clock X 00:00”.
4. Press Controller 1. “Set Clk 00:00” is displayed.
5. To set the hours rotate Controller 1 clockwise until the desired hour has been reached.
6. Rotate Controller 2 clockwise to select minutes. The hour is now set and the minutes will flash.
7. Rotate Controller 1 to the minutes required. If the hour setting is incorrect, rotate Controller 2 anti-clockwise until the hours flash and reset.
8. Press to confirm. Screen shows “Set Clk”.
9. Press Menu to return to the main screen.

Setting the Clock in Real Time

1. Press Menu. Screen shows “Loco”. Rotate Controller 1 until “Unit” is displayed.
2. Press Controller 1 and, if necessary, rotate until screen shows “Set Clk”. Screen shows “Set Clk 00:00”.
4. Press Controller 1. “Set Clk 00:00” is displayed.
5. To set the hours rotate Controller 1 clockwise until the desired hour has been reached.
6. Rotate Controller 2 clockwise to select minutes. The hour is now set and the minutes will flash.
7. Rotate Controller 1 to the minutes required. If the hour setting is incorrect, rotate Controller 2 anti-clockwise until the hours flash and reset.
8. Press to confirm. Screen shows “Set Clk”.
9. Press Menu to return to the main screen.

Using the Elite’s Clock

Setting the Clock in Real Time

Additional Elite Features (continued)

Please note that the clock will immediately start functioning as soon as the Elite is powered up, therefore some of the clock times that you see on the main screen may not correspond with the diagrams of the main screen shown throughout these instructions.

Clock Enable / Disable

1. Press Menu. Screen shows “Loco”. Rotate Controller 1 until screen shows “Unit”.
2. Press Controller 1 and rotate Controller 1 until screen shows “Clock”.
3. Press Controller 1. Screen shows “Clock On”. See Fig. 1.
4. Rotate Controller 1 to alternate between “Clock On” or “Clock Off”. Select the desired setting.
5. Press Controller 1 to confirm. Screen shows “Clock”.
6. Press Menu to return to the main screen.

Additional Elite Features (continued)

Setting the Clock in Scale Time

1. Press Menu. Screen shows “Loco”. Rotate Controller 1 until “Unit” is displayed.
2. Press Controller 1 and, if necessary, rotate until screen shows “Set Clk”. Screen shows “Clock X 00:00”.
4. Press Controller 1. “Set Clk 00:00” is displayed.
5. To set the hours rotate Controller 1 clockwise until the desired hour has been reached.
6. Rotate Controller 2 clockwise to select minutes. The hour is now set and the minutes will flash.
7. Rotate Controller 1 to the minutes required. If the hour setting is incorrect, rotate Controller 2 anti-clockwise until the hours flash and reset.
8. Press to confirm. Screen shows “Set Clk”.
9. Press Menu to return to the main screen.

Setting the Clock in Real Time

1. Press Menu. Screen shows “Loco”. Rotate Controller 1 until “Unit” is displayed.
2. Press Controller 1 and, if necessary, rotate until screen shows “Set Clk”. Screen shows “Set Clk 00:00”.
4. Press Controller 1. “Set Clk 00:00” is displayed.
5. To set the hours rotate Controller 1 clockwise until the desired hour has been reached.
6. Rotate Controller 2 clockwise to select minutes. The hour is now set and the minutes will flash.
7. Rotate Controller 1 to the minutes required. If the hour setting is incorrect, rotate Controller 2 anti-clockwise until the hours flash and reset.
8. Press to confirm. Screen shows “Set Clk”.
9. Press Menu to return to the main screen.

For more information visit: www.hornby.com
Additional Elite Features (continued)

Using the Elite’s Loco Log and search function

When there are numerous stationary locomotives on the same track at the same time it is quite easy to become confused as to the numbers of the locomotives on the track. The following Loco Search or Log Function is a very useful application should this happen. The following is the procedure to allow you to do this using Locomotive 1 as an example.

1. Press Menu. Screen shows “Loco”.
2. Rotate Controller 1. Screen shows “Unit”. Press Controller 1 to confirm.
3. Rotate Controller 1 until screen shows “Loco Log”. Press Controller 1 to confirm.
4. Screen shows “Loco Log Address” or “Loco Log Name”. Rotate Controller 1 to show “Loco Log Address”.
5. Press Controller 1 and type in the locomotive number you are looking for and press Controller 1 to confirm.
6. Watch for movement on your layout. The locomotive that you are searching for will move slightly forwards and/or backwards. See Fig. 1.
7. Once you have located the locomotive press Menu to return to the main screen.

Please Note: Should you have named the locomotive then use the procedure above to locate the locomotive only typing in the name rather than the locomotive’s address. To do this select “Loco Log Name” at this stage. Enter the name of the locomotive and press Controller 1. The address number of the locomotive will now be displayed. Make a note of the address and select “Loco Log Address” and continue with the procedure described above.

Fig. 1

Additional Elite Features (continued)

Introduction - Elite Operating Modes

Standard operating mode

This is the default mode of the Elite and will be briefly seen on the LCD screen during the start up sequence.

In this mode the Elite fully supports the Hornby RailMaster model railway control application. For more information regarding the PC application please see the Hornby website www.hornby.com for further information.

Classic operating mode

Under certain circumstances it may be necessary to switch to the Classic mode in order for the Elite to operate effectively with older versions of the Hornby R8215 decoder.

The Classic mode incorporates features that have been built into the firmware to accommodate possible factors that may lead to decoder resets when powering up the Elite.

The Classic mode also amends the Point address mapping incompatibility when the Select v1.1 is connected and used as a ‘Walkabout’. This only applies to the v1.1 or later. Note: Select v1.0 does not exhibit any Point address mapping issues when used as a “walkabout.”

This operating mode does not fully support PC layout control applications e.g. Hornby RailMaster.

Selecting the desired Operating Mode

1. Press the “Menu” key and rotate Controller 1 until the word “Unit” is displayed. Press Controller 1 to confirm.
2. Rotate Controller 1 until the word “Mode” is displayed and then press to confirm.
3. The current mode of operation is now shown. Rotating Controller 1 will toggle the display between “Mode Classic” and “Mode Standard.”
4. When the display shows the desired mode (“Mode Classic” or “Mode Standard”) press Controller 1 to confirm.
5. Press the “Menu” key to exit to normal operation.
Elite Reset

The Elite can be returned to its original factory settings by utilising the Reset function.

1. Press Menu. Screen shows "Loco".

2. Rotate Controller 1. Screen shows "Unit".

3. Press Controller 1 to confirm. Screen display may vary depending on the last action taken in this mode. However, rotate Controller 1 until "Reset" is displayed.

4. Press Controller 1 to confirm. Screen shows "Reset Confirm".

5. If you do not wish to reset the Elite press Menu to return to the main screen. However, if you wish to reset the Elite press Controller 1. The red LED will light and then start to flash for several seconds. The screen will then go blank while the Elite resets. The screen will return showing "00:00 1 0003". The Elite is now reset. All information previously stored has now been deleted.

Note: Any locomotives that were under control on the track will stop when the 'reset' is executed. They will not resume movement after the 'reset'.

Overload Safety Cut Off

Should there be a short circuit or an overload the Elite will immediately cut the power off to the track. The red LED will light and the screen will show "Error".

Should this occur locate the short circuit or the item that is causing the overload and remove. To reset / restart the Elite press the Escape key.

Note: Any locomotives that were running at the time of the 'overload' will resume running after the 'overload' condition/error message is cleared. i.e. pressing the Escape key.

XpressNet Connection

Eight Hornby Walkabout Select units may be connected to the Elite using the ExpressNet sockets which will allow for individual control of up to 10 locomotives. See page 72 for further information on connecting "walkabouts" to the Elite.

PC as Controller

Via XpressNet protocol and the USB connection the Elite can be controlled by software applications running on a PC. For complete control of your layout Hornby recommends the Hornby RailMaster application. RailMaster has been created specifically to support full layout control via the Elite.

A USB lead will be required (not included with the Elite) to connect the Elite to a computer.

Elite Firmware Update

The firmware of the Elite can be updated from the internet via a PC and the USB interface. Any updates will be available direct from the Hornby website: www.hornby.com
Glossary

Acceleration Delay
The delay between the locomotive being stationary and reaching the desired speed.

Accessory Decoder
An electronic decoder designed for use in track side accessories such as points or signals. An accessory decoder is not for use in a locomotive.

Address
A number used to identify a locomotive or accessory that is either equipped or linked to a Decoder.

Bus
Technical term for wires that carry electrical signals around a model layout.

Command Station
The Command Station is the ‘brains’ of a DCC system. A Command Station is in essence a micro-computer/controller that communicates with the decoders that are located either in a locomotive or connected to accessories. The computer transmits signals to the decoders instructing them what to do, such as accelerate, decelerate, brake or switch lights on or off.

Configuration Variable (CV)
A term referring to the operating information of the particular locomotive or accessory that is stored on the specific decoder. This information will remain ‘set’ until changed using the Command Station.

Consist / Consisting
Consist is an American term, but in the UK it is known by Double or Triple Heading. This is where two or more locomotives are brought together and function as one.

There are three types of Consisting (1) Basic consisting where the locomotive decoders in the Consist have the same address. (2) Universal Consisting where the Consist information is stored in the Command Station. (3) Advanced Consisting where the Consist information is stored inside the decoder.

DCC
Digital Command Control. The application of computer technology to control the movements of locomotives. Each locomotive is fitted with a decoder (or ‘chip’) which is uniquely programmed and recognises its own identity and responds only to those control signals which are addressed to it.

DCC also allows a wide range of extras including controllable lighting and on-board sound. The accepted standards have been laid down by the NMRA (National Model Railroad Association) an American Association.

For more information visit: www.hornby.com

Deceleration Delay
The delay of a locomotive slowing down to a standstill.

Feedback (Load Compensating)
This allows a locomotive to remain at a constant speed regardless of loads being pulled or incline being negotiated.

Locomotive Decoder
A small PC board which contains a ‘chip’ that stores control information; normally fitted in locomotives. The Command Station sends coded information to the decoder which can then control the locomotives speed, direction and any operating functions that the locomotive may have e.g. lights.

Locomotive Decoders can be also fitted to accessories that have a motor as a drive for example the R8131 Hornby Operating Conveyor or the R8132 Hornby Tipper set.

Occupancy Decoder
A unit that can detect the presence of a locomotive on a specific section of track and can provide the appropriate information as ‘return’ data.

Power Bus
Copper strip or wires that can relay/distribute power to the track via multiple track connections.

Power Booster/Power Station
A Power Booster or Power Station is as the name implies there to provide a boost of power to the track. This can occur if a larger than normal number of locomotives are required to be running on the layout at the same time. If the transformer already fitted cannot handle this number then it will be necessary to section the layout and fit a Power Booster.

This Booster will not only provide more amperage to drive locomotives but also boost the signals to the Decoders. All Boosters fitted must still be connected to the Power Station.

Programming
The process of assigning an address or changing a decoder parameter stored in a CV is referred to as ‘Programming’ the decoder.

Programming Track
A section of track isolated from the main layout purposely for programming locomotives. Programming on a Programming Track negates the requirement of removing other locomotives from the main layout.
Glossary (continued)

Speed Steps
A decoder fitted to a locomotive will from 'stationary' to full speed increment the locomotive's speed in discreet speed steps.
The number of steps commonly used in most DCC systems is 128. Some older decoders are designed to operate with 14 or 28 speed steps.
The number of speed steps to be used for a specific locomotive address is set in the controller on a per locomotive basis. i.e. the controller increments speed in a specific number of steps for that locomotive.
The more speed steps, the smoother the apparent control of the locomotive.

Stall Current
Stall Current is the maximum current draw in amperes that a locomotive is capable of when stalled. If the armature of a motor is prevented from turning and the maximum voltage is applied the current draw of the motor is known as the 'Stall Current'.

Throttle Notches
Determines whether a locomotive is controlled with 14, 28 or 128 speed steps. (See Speed Steps.)

XpressNet
A high-speed communication protocol used for connecting DCC equipment together. e.g., a 'walkabout' controller to a master control station as in a Select to an Elite.

XpressNet (XBUS) Input Devices
Devices using the XpressNet protocol to Control items on a digital layout.

For more information visit: www.hornby.com

Input and Output connections

All connections to the Elite are carried on the rear panel of the controller.

TRACK - This is the main DCC power output connected to the track. For troubleshooting purposes the output can usually be measured with an AC voltmeter. The reading should be approximately 15-16V AC.

PROG - This is the DCC programming output which connects to a dedicated programming track or siding arrangement. Unlike the TRACK output it is 'current limited' thus it will not 'blow up' a decoder if an error has been made in hard wiring/connection to the locomotive, etc. This output connection is only live during programming (pulses of 15-16V AC).

XpressNet - These two sockets are RJ12 types, and are used for the connection of 'Walkabout' units and other equipment that supports the XpressNet bus standard. Typically, you will connect Walkabout 'Select' controller/s to these sockets. Walkabout connection is provided on pins 2 to 5. The RJ12 connectors also provide 'boost' output data on pins 1 and 6.

Note: All Walkabouts must be connected with cable type R8266 RJ12 Connecting Leads (round cross section). Do not use R8236 RJ12 4-Wire 3M Lead (flat cross section). The R8236 RJ12 4-Wire 3M Lead cable may be used to connect the RJ12 sockets to R8239 Power and Signal Booster units. R8266 RJ12 Connecting Leads will not work with Booster units.

Note: When connecting Walkabouts do not connect them in a 'daisy chain'. When connecting two Walkabouts, connect one to each socket. If you wish to use more than two Walkabouts you will require 'wye adapters' R8237 Hornby Digital RJ12 Connecting Socket.

USB Port - This connection is for a standard USB cable, not miniature types as supplied with smart phones or cameras. The USB port is used to connect to a computer in order to install downloadable updates or for use with computer based DCC control software, e.g. Hornby RailMaster.

POWER - The power input socket is connected to the supplied P9300W (previously C7024) Hornby 15 Volt; 4 Amp power supply in the UK. In the USA the P9303 (previously C7033) - Digital 15 Volt 4 Amp power supply may be used (see Scalextric USA).

BOOST - This output connection is used to feed a low power version of the DCC track signal to drive one or more R8239 Hornby DCC Booster units. (The BOOST output must not be connected to the main track/power bus!) The BOOST output connection offers greater flexibility than the alternative RJ12 connection described above in that no special cables are required. For troubleshooting purposes the output can usually be measured with an AC voltmeter. The reading should be approximately 15-16V AC.

AUX OUTPUT - This is a DC output which is effectively a 'feed through' of the input DC power connected to the POWER input socket.

On small layouts the AUX OUTPUT can be used to power lighting, etc. However, any current drawn from this output will have a limiting effect on the maximum number of locomotives it is possible to run from the Elite. This is because locomotive power is shared with the AUX OUTPUT. Therefore, it is recommended to drive accessories, etc. from external power supplies.
Trouble shooting

Locomotive will not run
Check that all the wiring is correctly connected to the track and Controller and that the transformer is plugged into the wall socket and is switched on.
Ensure that the correct loco address is displayed on the LCD.
Check that the ‘STOP’ key has not been pressed accidentally.

The trains do not run smoothly
The locomotives require a clean track so that they can receive their information from the Elite, therefore ensure that the track is clean. Use an R8087 Track Rubber to remove dirt from the track and wheels of the locomotive.
Do not use any other abrasive material as this will permanently damage the track and/or wheels.

All locomotives move off together
Make sure that a locomotive has not been given a new address while other locomotives have been on the same track. To avoid this it is advisable to use a Programming Track to add new addresses to locomotives and Hornby Point/Accessory Decoders. See page 12.

System keeps cutting out
Check that there is no metal across the track that may be causing a short circuit. Also check that the system is not being overloaded by too many locomotives trying to run at the same time.
The 4amp transformer included with the Elite should within reason be capable of providing enough power to run nine locomotives. If in doubt consult your local dealer or the Hornby DCC Helpline.

Do not connect any other controller to the Hornby Elite other than a Hornby Walkabout Select. When using a Select with the Elite ensure that the Select is not connected directly to a mains transformer.
Do not run coreless motored locomotives on a DCC layout without them having a decoder fitted.
If in doubt please contact Hornby or your local dealer for advice.
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