

EVENING STAR

SOUTHERN BELLE

92220

EVENING STAR



# EVENING STAR

## INTRODUCTION

Welcome to the "Evening Star", the second steam locomotive simulation from Hewson. The "Evening Star" was one of the most powerful steam locomotives of the British Railways fleet, one of the legendary BR9F Class, pulling it's passenger train over the undulating countryside of the old Somerset and Dorset line between Bath and Bournemouth. You must take the roles of both Fireman and Driver. There are many levels of simulation. We suggest you read the instructions carefully then watch the computer demonstration for a few minutes. Study the control settings and then attempt the Training Run. Gradually you will improve your skill and will eventually be able to take the "Evening Star" to Bournemouth in accordance with the timetable, using the coal and water available to the optimum efficiency.

To load the game follow the instructions below for your make of computer and wait until the main menu appears on the screen. Note that after about one minute the computer will automatically select high speed run showing the whole of the line. To return to the main menu press X.



# LOADING

## **Spectrum Cassette**

48K ZX Spectrum, ZX Spectrum Plus or ZX Spectrum 128 with cassette player, ZX Spectrum +2.

You are advised to disconnect all hardware from the rear edge connector. Unless using a ZX Spectrum +2 connect a cassette player to the computer in the usual manner. ZX Spectrum +2 and 128 users should select 48K mode. Rewind the cassette if necessary, enter LOAD "" on the computer keyboard and press the ENTER key. Press the Play key on the cassette player. The game takes a few minutes to load.

## **Amstrad Cassette**

Amstrad CPC 464

Amstrad CPC 664 or Amstrad CPC 6128 with cassette player and suitable leads.

Amstrad CPC 664 and CPC 6128 users should connect a cassette player to the computer and enter / tape and press the ENTER key. Place the cassette in the player, rewind if necessary and press CTRL and ENTER keys. Press the Play key on the cassette player and then any key on the computer keyboard. The game takes a few minutes to load.

## **Amstrad Disc**

Amstrad CPC 6128 or Amstrad CPC 664

Amstrad CPC 464 with disc drive.

Amstrad CPC 464 users should connect a disc drive to the computer and enter / disc and press the ENTER key. Place the disc in the drive and enter run "disc and press ENTER or RETURN key. The game takes a few seconds to load.

## **Commodore Cassette**

Commodore 64 or Commodore 128 with suitable cassette player.

connect the cassette player to the computer, place the cassette in the player and rewind if necessary. Press the SHIFT and RUN/STOP keys on the computer keyboard and press the Play key on the cassette player. The game takes a few minutes to load.

## **Commodore Disc**

Commodore 64 or Commodore 128 with Disc Drive.

You are advised to disconnect all hardware from your computer. Connect the disc drive to the computer and place the disc in the drive. Enter LOAD "\*",8 1 and press the RETURN key. The game takes a few seconds to load.

## **BBC and Electron Cassette**

Connect the cassette player to the computer, place the cassette in the player and rewind if necessary. Enter CH. "" and press the RETURN key. Press the Play key on the cassette player. The game takes a few minutes to load.

## **BBC Disc**

Connect the disc drive to the computer and place the disc in the drive. Press the SHIFT and BREAK keys together. The game takes a few seconds to load.

# **GETTING STARTED**

## **Selecting the Demonstration**

Load the program in the usual way and press key 0 when the main menu appears and then press the RETURN key when the timetable is displayed. The locomotive will pull slowly away from Bath, accelerating down the line on a local non-stop train to Evercreech Junction. Observe the various controls and study the readings on the gauges. Press CTRL + X to return to the main menu (on the Spectrum press CAPS SHIFT + X).

## **HIGH SPEED RUN**

If RETURN is pressed when the main menu appears the program executes a High Speed Run along the entire line. You will be able to see all features along the way pass in quick succession. To exit press X.

## **STARTING A TRAINING RUN**

Press 1 when the main menu appears and 1 again for the locomotive control menu. This will give you control of the regulator, Cut Off and Brake only. The remainder of the controls will be adjusted by the computer. Read the Schedule displayed and then press RETURN.

With the locomotive standing at Bath Station open the Cut Off fully by pressing C four times. Half open the Regulator by pressing R twice. After 15 seconds or so the locomotive will pull slowly along the platform and out of the station.

Observe your speed display and when you are travelling at four miles per hour or faster press R twice more to open the regulator fully. The locomotive will then accelerate more rapidly as it moves past the Gasometer and up the steep incline of Devonshire Bank. If you open the regulator too soon the locomotive driving wheels will spin on the running rails leading to a loss of speed and wasting steam (this is indicated by a sudden increase in the sound speed).

You may have noticed that when the computer has total control on the Demonstration run that it reduces the Cut Off when the train is moving. This uses steam more efficiently and you should do the same to conserve as much steam as possible to enhance your Economy rating at the end of the run.

To exit from the Training Run (or any other run except the high speed) press CTRL + X (on the Spectrum use CAPS SHIFT + X).

## SCREEN LAYOUT

The main part of the screen is the view of the cab, the controls and the line ahead. Above this is a sign naming the next station or line feature that you will encounter. Below is the message area to relay important information to you, the driver. To the side of the view screen is various control information including your speed, the amount of coal and water remaining, the status of the next signal, the current gradient and the profile for the next 1 1/2 miles, the actual time and the position of the locomotive relative to Bournemouth and to Bath Junction which is 1/2 mile from Bath Station. Historically, it is from this position that all mileages are measured on the Somerset and Dorset line.

# THE CONTROL KEYS

## Locomotive Control Keys

| CONTROL       | INCREASE<br>SETTING | DECREASE<br>SETTING |
|---------------|---------------------|---------------------|
| Regulator     | R                   | SHIFT+R             |
| Vacuum Brake  | V                   | SHIFT+V             |
| Cut Off       | C                   | SHIFT+C             |
| Blower        | B                   | SHIFT+B             |
| Injector      | I                   | SHIFT+I             |
| Firedoor      | F                   | SHIFT+F             |
| Damper        | D                   | SHIFT+D             |
| Sound Whistle | W                   |                     |
| Stoke Fire    | RETURN/ENTER        |                     |

*Spectrum users note that SHIFT refers to Symbol Shift*

## Program Control Keys

| FUNCTION                                 | KEY                         |
|------------------------------------------|-----------------------------|
| Toggle between accelerated and real time | A                           |
| Toggle between smoke on and off          | S                           |
| Return to main menu                      | CTRL+X (or<br>CAPS SHIFT+X) |
| Hold, wait for RETURN/ENTER to restart   | H                           |
| Display timetable                        | T                           |
| Acknowledge message                      | SPACE BAR                   |
| Increase engine noise                    | N                           |
| Decrease engine noise                    | SHIFT+N                     |

*N.B. Noise controls are only on computers without external volume controls.*

To enable you to judge whether or not you are burning your coal efficiently the following keys may be pressed to simulate the various states of combustion.

## **SMOKE LEVEL**

Very light smoke - far too much air

Light smoke - too much air

Correct smoke level

Dark smoke - insufficient air

## **KEY**

1

2

3

4

## **MENUS, MESSAGES AND SPEED LIMITS**

### **The Main Menu**

#### **LEVEL**

#### **RETURN**

0

1

2

3

4

5

6

7

#### **SUMMARY**

High Speed Run - Selected automatically after 1 minute  
Computer Demonstration - Computer controlled non-stop  
run to Evercreech Junction.

Train Run - Identical run and schedule to level 0 with you  
in control.

Local non-stop run with added complication of speed  
limits.

Local stopping train with speed limits and signals to  
contend with.

Full line stopping train to Bournemouth with speed limits  
and signaling.

Try to break the record for the fastest non-stop run to  
Bournemouth.

Drive the prestige "Pines Express" to Bournemouth time  
errors are marked severely

Any schedule with extra problems.

### **Speed Limits**

#### **HAZARD**

Permanent Way Working

Passing from single to double track  
or visa versa

Passing or near Siding, Junction  
or Loop

Overall line limit speed

#### **LIMIT**

30 mph

40 mph

40 mph

70 mph

*Note that excessive violation of the 40 mph or 70 mph limits will result in derailling the Train.*

# Error Messages

## ERROR MESSAGE FATAL ERRORS

## MEANING

|                     |                                                                           |
|---------------------|---------------------------------------------------------------------------|
| Fusible plugs gone  | Water level in the boiler too low                                         |
| Boiler overfill     | Water level in the boiler too high                                        |
| Overran stop signal | Passing a stop signal in the down position                                |
| Unsafe reversing    | Allowing the train to run backwards                                       |
| Blowback            | Failure to open the Blower in a tunnel or when regulator is shut          |
| Derailed            | Excessive violation of speed limit                                        |
| Crashed at B' mouth | Hit buffers at too high a speed                                           |
| Collision           | Colliding with oncoming train in single line section due to lack of token |

## Non Fatal Errors

|               |                                                                                    |
|---------------|------------------------------------------------------------------------------------|
| Poor stop at  | Failing to stop close enough to the far end of the platform                        |
| Stop short at | Failing to stop for the full 60 seconds minimum at a Station                       |
| Rough stop at | Using vacuum brake setting 3 or above when coming to a halt at a scheduled station |
| No stop at    | Failing to stop at a scheduled stopping station                                    |

## Non Fatal Errors (cont)

|                            |                                                                                              |
|----------------------------|----------------------------------------------------------------------------------------------|
| No whistle at              | Failing to blow whistle before starting off, or before a tunnel or permanent way <b>work</b> |
| Hit buffers at arriving at | Failing to come to a halt before the buffers when<br>Bournemouth                             |
| Em brakes at               | Using vacuum brake setting 4 (maximum)                                                       |
| Speeding near              | Failure to observe speed limit                                                               |
| No token at line section,  | Failure to pick up token upon entering a single<br>because of excessive speed                |

## RUN OPTIONS IN DETAIL

### Option 0 Computer Demonstration Run

This run demonstrates the various techniques required to drive the locomotive with the computer running all controls on a local non-stop run to Evercreech Junction. You are advised to study the various settings used to help you learn correct driving methods. Should you wish to hold the run at any stage you can do so by pressing "H" which will stop the run and await the press of RETURN (or ENTER if that is the key on your computer). Also you can accelerate the run so that the time passes four or five times quicker than normal by pressing "A" (note the rapid movement of the clock display). Press "A" again to return to normal. This is useful during some of the longer stretches of the run. You have control over whether or not the smoke is displayed by pressing "S".

### Option 1 Training Run

A practice session for the novice driver / fireman with the same schedule as the computer demonstration. You are expected to adhere to the timetable exactly. Any deviation from the times shown will be penalised at the end of the run in the time score. You can halt the program to consult the timetable at any time by pressing "T". The timetable with any

completed times will be displayed. From this part of the program you can also check for any errors by pressing “E” or save the position of the run to date by pressing “S” (see the section on Saving and Loading a run). A short beep is sounded to assist you when the computer records a time for the timetable. Note that the times shown on the timetable are minutes only. It should be apparent from the time displayed to which hour each refers. When arriving at Evercreech Junction you must bring the train to a halt near to the end of the platform so that all your passengers may alight safely. You must also bring the train to a halt without the use of heavy braking. Emergency braking (maximum braking) should not be used at any time due to the risk to your passengers and will result in a loss of safety score.

You will be penalised for any mismanagement of locomotive controls that you have elected to control yourself. Correct methods of use are detailed in the accompanying notes “How a Steam Locomotive Works” and all such methods are practised by the computer when it has control.

At the end of the run your performance is assessed with regard to economy, safety and timekeeping. A result of 70% overall is considered acceptable. The economy assessment is based upon the stocks of coal and water remaining. The page of errors and events can, once again, be displayed in place of the timetable by pressing “E”.

If by some misfortune you have committed a fatal error and the run has been terminated before the end of the timetabled run, you may resume the run from the point of catastrophe by pressing “R”. Timekeeping and economy assessments are unaffected by the premature end, but safety will be zero. Upon resumption of a run, the computer will have taken some action to prevent an immediate recurrence of whatever problem you have encountered. However, you may have to take some more permanent action to prevent further mishap.

## **Option 2 Short non-stop with Speed Limits**

A train on a non-stop local run, where speed limits are in force at many places down the line. Each one is associated with a line feature, and can be identified visually. The position of each is shown on the gradient profile by the letter S or by the change in track type. The major speed limits are of 40 mph and they are associated with positions where the track splits from single to double or visa versa, near junctions where another track can be seen joining the main line or where there is a siding beside the track or a passing loop (characteristic of some single line stations). Failure to observe these limits will result in a loss of safety marks and in extreme cases derailment.

There is another form of speed limit also of 40 mph in that you must enter each section

of single track at or below that speed. This is so that a “token transfer” may take place, the “token” being an object which is held by a particular train to ensure that only one train at a time may use a single track section. Failure to achieve token transfer is dangerous as you run the risk of collision with an oncoming train. When successfully held the token is shown at the top right of the cab.

Whilst passing near permanent way work you are expected not to exceed 30 mph. Passing at speeds in excess of this will result in a loss of safety marks but there is no derailment risk. Permanent way working affecting the line will be notified at the start of the run. There is an overall limit of 70 mph for the entire line.

### **Option 3 Short Stopper and Signalling**

In addition to the speed limits of option 2 you must also obey all signals and make the stops demanded by the timetable.

Signals divide the line into sections so that trains on the same line run at an adequate distance from each other. There are two types of signals used on this line, stop (with a square end) and distant (with a notched end). Each has two positions; up for clear and down (horizontal) for stop or caution. Stop signal may come singly or in groups.

You must not pass a stop signal in the down (stop) position. To give warning of the condition of the stop signal a distant signal is placed a suitable distance before it. It will be down (caution) if the stop signal to which it refers is down i.e. at the stop position.

In order for you to have the maximum time to react the state of the next signal to be passed is reproduced separately in the signal section of the screen.

The stations at which you are scheduled to stop are shown in capital letters on the timetable. You must attempt to stop close to the far end of the platform once again without excessive braking. Should you pass the end of the platform before the train has come to a halt a beep will sound and you will be assessed as not stopping at a required station and you will be penalised as such.

You must arrive at the station in good time to allow at least one minute for your passengers to embark and disembark. If the computer is controlling the whistle, it will sound exactly one minute after arrival. Should you be in control of the whistle you must ensure that it is blown before setting off. The timetable gives the required departure time.

### **Option 4 Long Stopper**

A train which runs the entire length of the line from Bath to Bournemouth with intermediate stops. All the constraints of a previous options apply.

### Option 5 Record Run

This is a full line non-stop train with a timetable that will allow you to complete the journey to Bournemouth in record time. Any run which arrives at Bournemouth on time can be considered good. Arriving early is outstanding.

### Option 6 Pines Express

This is the premier train to run the line. You are expected to maintain the prestige of the Railway company and adhere to the timetable scrupulously. Any errors in this area will be more severely punished than usual.

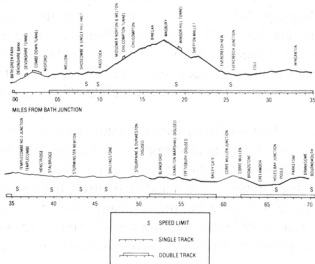
### Option 7 Problem Run

You will be presented with any timetable, all constraints apply. However, you will also have another serious problem to contend with to make your task a little more difficult. You may be passed a message below the main screen. Once read it can be acknowledged (and therefore wiped) by pressing the space bar.

## SAVING AND LOADING A RUN

Because a complete run can take in excess of 2 hours in real time we have given you the facility to save the current position to reload later. This is done from within a run by pressing "T" then "S" when prompted.

Disc users are further prompted to type in a file letter (A to Z) by which this particular run can be identified.



# EVENING STAR HISTORICAL NOTES

On the 8th September 1962 the locomotive "Evening Star" pulled the "Pines Express" from Bournemouth to Bath and back. This was the last time this train took the route over the Somerset and Dorset line to Bath, it being subsequently diverted via Reading and Basingstoke. This diversion of traffic from the Somerset and Dorset line sealed the demise of the line which was closed in 1966. This was the end of the picturesque and much loved railway with a long and glorious past.

The Somerset and Dorset line's history starts in 1852 when the then Somerset Central Railway was building its line from Burnham-on-Sea to Glastonbury. They built a pier at Highbridge on the Bristol Channel and so had steamboat connections for both passengers and freight to the industries of Southern Wales. Meanwhile the Dorset Central Railway was building a line from Wimborne, north-west to Blandford.

In 1862 the two companies merged to form the Somerset and Dorset Railway, extending the existing lines to meet at Cole. The company thus achieved its primary objective of having a coast to coast route from Highbridge on the Bristol Channel to Poole on the English Channel. At one time the company offered services from South Wales and Bristol to Cherbourg, via its line to the English Channel and thence by steamship. Traffic, although adequate, was not sufficient to financially secure the line so the company looked at other areas from which to attract traffic.

This led to the building of what was then called the "Bath Extension", a branch off the then mainline over the Mendip Hills to Bath connecting with the recently built Midland Railway station there. The S&D, although already financially hard pressed, managed to complete the line in only 2 years but because of cost it was built as single line only. The new line involved many tunnels, viaducts and earthworks in contrast to the existing line. It did however run through the North Somerset Coalfield, thus giving the company access to mineral traffic.

On the 20th July 1874 the first S & D train used Bath station and the company's new North-South route was complete. It was at this time that the company first acquired the label Slow and Dirty (for S&D) which stuck with it to the end and is still familiar today (although it had also been dubbed "Swift and Delightful" but never so often).

Traffic on the new route was good but the company, after its extension to Bath, was financially exhausted and in 1875 they had no alternative but to ask wealthier neighbours to buy it out. The Great Western Railway (who controlled many of the adjacent areas to

the North and West) was approached as was the London and South Western Railway (who controlled the areas to the South and East, most importantly where the S&D crossed the L&SWR at Templecombe and at Wimborne where they connected for the last miles to Poole and Bournemouth).

The L&SWR saw the Midland Railway as a better partner with which to run the line, having the line North from Bath from the S&D's line. The L&SWR and the MR thus jointly leased the S&D line, leaving the GWR somewhat aggrieved at being left out, and the S&D became the S&D Joint Railway.

In 1923 the railway companies of Britain merged into four large companies. The MR became part of the London Midland and Scottish Railways and the L&SWR became part of the Southern Railway. Thus the line was still jointly run, the LMS taking responsibility for the locomotives and stock and the SR for the track and signalling. By this time Bath to Bournemouth had become the main line, with doubling of track where possible, and the Highbridge line was reduced to a branch. Trains from the North to the South would route via Bath then over the S&D to the South coast and Bournemouth as the town and resort grew in importance. The "Pines Express" originated in Manchester and took its name from the Pine trees of the Bournemouth area.

The section from Bath to Bournemouth over the S&D started with a climb up and over the Mendip hills to Evercreech. The trains often had many coaches (especially in summer) and needed two locomotives to get them up and over. At Bath this could be a helper or "Banker" at the rear of the train to help with the climb up Devonshire bank. It would drop off at the top and return to Bath. More commonly with passenger trains two locos would be coupled at the front for the trip to Evercreech Junction where one would be uncoupled and used to assist trains over the Mendips in the other direction. "Double heading" was very expensive in terms of locos and men but unavoidable because of the steep gradient in that section of line.

Another factor affecting the line in the latter years was the seasonal nature of its traffic. In winter the line was adequate for its task and coped with its local and freight traffic, the various single line sections not providing a problem. However, during the summer season (at weekend in particular) trains from all over Northern England would be using the line requiring "double heading" over the Mendips and every available loco was pressed into service. This high loading inevitably caused delays on the single line sections and so perpetuated the reputation of the line for being "Slow and Dirty".

In 1960 a class of locomotive new to the line was tested. This was one of the 9F British Rail standard types, one of a range of BR locomotives designed and built after nationali-

sation in 1948. The new locos were aimed at improving operating efficiency and ease of maintenance, and were to be used throughout BRs network. The 9F was designed and built as a heavy freight locomotive and first ran in 1954. They were arguably the most successful of BRs standard types with over 200 examples being built. The 9F was to be tried on the S&D not as a freight loco but as a passenger locomotive to see if it could pull, "single headed", the heavy passenger trains of the summer thereby eliminating, "double heading". The trial took place in March 1960 and was a great success, four 9Fs then being allocated to Bath for the summer.

In this class of locomotive many saw the saviour of the line but 9Fs could never be fully utilised for several reasons. Firstly its size. Such a powerful locomotive was too big for the turntables of the S&D and so was not useful for the freight trains to Evercreech. Secondly, because of its freight train origins it had no facility to provide heating for the coaches it pulled and was therefore limited to summer use only. In the final summers of through train operation on the S&D the 9F made light work of the "Pines Express" single handed. It is worth noting that it was no easy task for the firemen on such a locomotive to keep the fire's appetite for coal satisfied.

In 1962 the last 9F of the class was sent to Bath shed to haul the last "Pines Express" over the S&D. This was 92220 Evening Star built in the Swindon works and delivered to BR in 1960. After the summer of 1962 the "Pines Express" although still run was routed away from the S&D, as were many other through trains. Local services survived but the line was being groomed for closure. In 1965 its terminus at Bournemouth West was closed and later demolished. In 1966 after much acrimony the entire line was closed completely. No part of the original S&D line now exists but its spirit is kept alive by a preservation group now based on the West Somerset Railway at Washford - The Somerset & Dorset Railway Trust. 1987 is the 125th anniversary of the S&D. "Evening Star" has been preserved and still pulls enthusiasts' trains but not, sadly the S&D. The station at Bath - Green Park has also survived and has been preserved, the track bed now being used as a car park for a supermarket.

# HOW A STEAM LOCOMOTIVE WORKS

These notes describe the operation of a steam locomotive with particular reference to the screen display and controls of Evening Star. Understanding how a steam locomotive works will help you to master the controls more quickly. The driving force of the locomotive comes from the cylinders where a piston is pushed back and forth by the steam pressure raised in the boiler. Hot gasses from the firebox are drawn through the boiler by a system of tubes, which heat the water to boiling point, converting it into steam. The hot gasses drawn through the boiler then enter the smokebox and escape through the chimney. The performance of the locomotive depends upon the pressure in the boiler, which can be controlled by manipulating the fire.

## WATER GAUGES

These two are vertical tubes in the centre of the cab. They are very important as they give a visual indication of the level of water in the boiler. The bottom of the gauge is one inch above the firebox top, which must be kept covered at all times otherwise the fire will heat the firebox top beyond limits causing special plugs (called fusible plugs) to melt allowing steam into the firebox. This action cools the fire and alerts the train crew.

If too much water is carried in the boiler and the gauge reaches the top, water instead of steam will enter the cylinders causing permanent damage.

Ideally you should attempt to maintain a water level in the top half of the gauge. Should a failure occur, the run will be terminated with the consequential loss of marks.

## STEAM PRESSURE GAUGE

A round dial with a needle pointer, situated in the centre of the cab, graduated from minimum on the left to a maximum (200 psi) on the right. The more steam pressure maintained the higher the potential power of the locomotive. However too much pressure will lift the safety valves and release steam thereby reducing pressure to below maximum (shown by two jets of steam issuing from the boiler top). This represents a waste of coal and water and should be avoided to achieve maximum efficiency.

## **WHISTLE**

The whistle is part of the safety equipment and must always be used before starting away, entering tunnels or approaching sections where permanent way gangs (railway maintenance teams) are working. To conserve steam the whistle should not be used indiscriminately.

As a guide to correct whistle usage, when the computer is controlling the whistle it is blown at the earliest time in each of the circumstances detailed above.

## **REGULATOR**

A lever situated on the top left of the cab which controls the flow of steam to the cylinders. It has five positions, closed on the right, progressing to fully open on the left. Opening the regulator applies power to the wheels and it must be adjusted when running to suit requirements. Always close the regulator when braking. Open the regulator cautiously when starting away as too much power will cause the wheels to slip (especially in adverse weather conditions). Wheel slip will be apparent from the increase in the speed of the steam exhaust.

## **CUT OFF**

A wheel control on the bottom left (marked C) which controls the time during each cylinder cycle that steam is allowed into the cylinder. It has five positions, 0% (straight up), 20%, 35%, 55% and 75% (straight down). For example when the cut off is set at 20%, steam is allowed to enter for just 20% of the cycle. This has the effect that the expansive properties of steam are used more efficiently, by reducing the steam usage significantly for only a small loss of power. You will need to use this control to obtain high efficiency. When starting away it is normal practice to use 75% cut off.

## **VACUUM BRAKE**

A wheel control situated between the regulator and the cut off (marked V) which has five positions; off (straight up), light braking, medium braking, heavy braking and emergency braking (straight down). The brakes act upon all the carriages and are held off by maintaining a vacuum in a pipe connecting the carriages, braking being achieved by progressive release of the vacuum via the vacuum brake control.

In the event that the communication cord of the train is pulled, emergency braking is automatically applied and will be released as appropriate. Emergency braking must not be used by the driver except in extreme circumstances, as a poor safety rating will result. Avoid using harsh braking to bring the train to a halt at a station for the comfort of your passengers.

## **BLOWER**

A wheel control situated centre right of the cab (marked B) which is off when pointing straight up. It is essential that at all times gasflow is maintained drawing the gasses from the firebox out through the chimney ensuring that no flames or gasses are allowed to escape into the cab via the firehole doors. Normally this gasflow is supplied by the exhaust of used steam up the chimney when the regulator is open. This gasflow will be interrupted by closing the regulator or by the confines of a tunnel. In these circumstances normal gasflow must be maintained by opening the blower which sends a jet of live steam up the chimney. Failure to use the blower when necessary is dangerous and can lead to an "explosive blowback" into the cab. Use of the blower should be limited to only when necessary due to its cost in the loss of steam.

## **INJECTORS**

A wheel situated top right of the cab (marked I), which controls the device by which water from the tender is forced into the boiler. It has five positions, off (straight up), progressing to full on (straight down). This is the means by which the level of water in the boiler is maintained.

## **DAMPERS**

A wheel is situated on the bottom right of the cab (marked D) which controls the amount of air provided through the base of the fire (called primary air). It has five positions, closed (straight up) progressing to fully open (straight down). By control of the amount of primary air it is possible to vary the temperature of the fire and thereby the amount of water evaporated into steam. To achieve a hot fire a large amount of primary air is required for combustion. Conversely for a cool fire only a small amount of primary air is required. To help you judge the temperature of your fire a thermometer style temperature gauge is presented in the cab centre. The indication of correct combustion is the colour of your smoke such that black smoke would indicate insufficient air for the temperature of the

fire, grey smoke indicates correct air and lighter shades indicate too much air. If too little air is supplied coal combustion will not provide the maximum heat value. If too much air is supplied, heat will be wasted in heating the excess air. To be efficient you must aim to maintain the correct air supply as far as possible. (Whilst manipulating the fire temperature correct combustion is unlikely). The rate at which coal is consumed increased with the temperature of the fire.

## **FIREHOLE DOORS**

A pair of steel doors used to confine the fire and to control the flow of air over the fire (secondary air). To achieve optimum temperatures of the fire, the level of coal must be maintained in the middle third of the firebox. Coal levels outside these parameters cannot achieve maximum temperatures. You must fully open the firedoors whilst coal is being added (indicated by a shovel at the right hand corner of the display). Failure to do so will waste coal. In all but the highest level of control the computer will do this for you. For perfect combustion a small amount of secondary air may be required.

The firedoors can also be used to assist in the manipulation of the fire temperature. for example to raise the temperature of the fire "quickly" keep the firedoors shut, and to lower the temperature "quickly" open wide.

## **GRADIENTS**

Railway lines are not level and steam railway locomotives are affected by the gradient of the track. The gradient is indicated in the same manner as road gradients, e.g. 1 in 100. This would indicate a slope up or down of one foot for every 100 feet travelled. A cross section of the gradient of the line together with the positions of the stations and tunnels is shown in the gradient profile included. The exact gradient of the track at any particular time may be displayed in the signalling area.

Vacuum brakes must be used to ensure that the train is never allowed to run backwards on an up gradient.

# **SOUTHERN BELLE**

Welcome to the Southern Belle - a realistic simulation of the King Arthur class steam locomotive hauling a passenger train from London to Brighton during the early 1930's. The task before you is to take a steam locomotive and its train from London (Victoria) to Brighton. You must take the roles of both Fireman and Driver. There are many levels of play and we suggest you read the instructions carefully, then watch the computer demonstration for a few minutes. Study the control settings and then attempt the Training Run. Gradually you will improve your skills and eventually you will be able to take the Southern Belle to Brighton in accordance with the timetable using the coal and water available to the optimum efficiency.

## **GETTING STARTED**

### **Selecting The Demonstration**

Load the program in the usual way. Press key 0 when the main menu appears and then press the RETURN / ENTER key when the timetable is displayed. The locomotive will pull slowly away from Victoria Station and then accelerate past Battersea Power Station. Observe the use of the various controls and study the readings on the gauges. Press F1 (C64), or COPY (Amstrad) to return to the main menu.

### **The High Speed Run**

If RETURN / ENTER is pressed when the main menu appears the program executes a High Speed Run along the entire line. All the main features along the way including Battersea Power Station, Clapham Junction Station and Clayton Tunnel pass in quick succession. To exit press X.

### **Starting a Training Run**

Press 1 when the main menu appears and 1 again for the locomotive control menu. This will give you control of the Regulator, Cut Off and Brake only. The remainder of the controls will be worked by the computer. Read the schedule displayed and then press RETURN / ENTER.

With the locomotive standing at Victoria Station open the Cut Off fully by pressing C four times. Half Open the Regulator by pressing R twice. After a few moments the locomotive will pull slowly along the platform and out of the station.

Observe your speed display in the top left corner of the screen. When you are travelling faster than four miles per hour press R twice more to open the regulator fully. The locomotive will then accelerate more rapidly as it climbs the steep incline away from the station on its way over the River Thames and past Battersea Power Station. If you open the regulator too soon the locomotive driving wheels will slip on the running rails leading to a loss of traction.

To exit from the Training Run press F1 (C64) or COPY (Amstrad).

## **Screen Layout**

In the centre of the screen is the view of the cab, the controls and the line ahead. Above this is a sign naming the next station or feature that you encounter and at the bottom of the screen is the message area. To the left and right of the main display various control information is shown including your speed and the amount of coal and water remaining. The status of the next signal, the gradient profile for the next 1.25 miles and the present time are also shown.

## **SAVING AND RELOADING YOUR CURRENT POSITION (C64 ONLY)**

To save your position on to a cassette during a run select the timetable by pressing T and then press S. Place a blank cassette in your player and follow the instructions displayed on the screen. The screen goes blank for a few seconds whilst your position is saved.

To reload a position saved previously select the main menu, press L and follow the instructions displayed. The screen goes blank for a few seconds whilst the previous position is being reloaded.

# THE CONTROL KEYS

## Locomotive Control Keys

| CONTROL       | INCREASE<br>SETTING | DECREASE<br>SETTING |
|---------------|---------------------|---------------------|
| Sound Whistle | W                   |                     |
| Stoke Fire    | RETURN / ENTER      |                     |
| Regulator     | R                   | SHIFT + R           |
| Vacuum Brake  | V                   | SHIFT + V           |
| Cut Off       | C                   | SHIFT + C           |
| Blower        | B                   | SHIFT + B           |
| Injector      | I                   | SHIFT + I           |
| Firedoor      | F                   | SHIFT + F           |
| Damper        | D                   | SHIFT + D           |

## Program Control Keys

| FUNCTION                                       | KEY                         |
|------------------------------------------------|-----------------------------|
| Toggle between accelerated speed and real time | A                           |
| Toggle between smoke on and smoke off          | S                           |
| Return to main menu                            | F1 (C64), COPY<br>(Amstrad) |
| Hold, wait for ENTER / RETURN to restart       | H                           |
| Toggle between signal and gradient             | G (Amstrad only)            |
| Display position of train                      | P (Amstrad only)            |
| Display timetable                              | T                           |
| Acknowledge message                            | SPACE                       |

## Smoke Demonstration Keys

|               |                                                                                                      |
|---------------|------------------------------------------------------------------------------------------------------|
| NO STOP AT    | when the train comes to a halt at a station<br>Failure to stop at a scheduled stopping station.      |
| NO WHISTLE AT | Failure to sound the whistle before starting off, or before a tunnel or before permanent way working |
| EM BRAKE AT   | Using emergency brake                                                                                |
| SPEEDING NEAR | Failure to observe the speed limit                                                                   |

| SMOKE LEVEL | KEY |
|-------------|-----|
|-------------|-----|

|                                     |   |
|-------------------------------------|---|
| Very light smoke - far too much air | 1 |
| Light smoke - too much air          | 2 |
| Correct smoke level                 | 3 |
| Dark smoke - insufficient           | 4 |

## MENUS, MESSAGES AND SPEED LIMITS

### The Main Menu

#### LEVEL

#### RETURN

0

1

2

3

4

#### SUMMARY

High Speed Run - Selected automatically after 1 minute  
Computer Demonstration - Computer controlled non-stop run to Evercreech Junction.

Train Run - Identical run and schedule to level 0 with you in control.

Local non-stop run with added complication of speed limits.

Local stopping train with speed limits and signals to contend with.

Full line stopping train to **Brighton** with speed limits and signaling.

## MENUS, MESSAGES AND SPEED LIMITS (cont)

- |   |                                                                                                       |
|---|-------------------------------------------------------------------------------------------------------|
| 5 | Try to break the record for the fastest non-stop run to                                               |
| 6 | <u>1 Brighton</u><br>Drive the prestige "Southern Belle" to Brighton, time errors are marked severely |
| 7 | Any schedule with extra problems.                                                                     |

## SPEED LIMITS

| LIMIT | WHERE LIMIT APPLIES                               |
|-------|---------------------------------------------------|
| 40mph | Victoria to Clapham Junction                      |
| 45mph | Balham Junction (Curve after Balham)              |
| 60mph | Streatham Common for 1/2 mile                     |
| 45mph | Windmill Bridge Junction (1/4 mile past Selhurst) |
| 50mph | Far end Redhill Tunnel to Earlswood               |

## Error Messages

### ERROR MESSAGE FATAL ERRORS

### MEANING

|                               |                                                                  |
|-------------------------------|------------------------------------------------------------------|
| Fusible plugs gone            | Water level in the boiler too low                                |
| Boiler overflow               | Water level in the boiler too high                               |
| Overran stop signal           | Passing a stop signal in the down position                       |
| Unsafe reversing              | Allowing the train to run backwards                              |
| Blowback                      | Failure to open the Blower in a tunnel or when regulator is shut |
| Derailed                      | Excessive violation of speed limit                               |
| Crashed into Brighton Station | Hit buffers at too high a speed                                  |
| Poor Stop at                  | Failure to stop within 60ft of the end of the platform           |

## **Error Messages (cont)**

|               |                                                                                                      |
|---------------|------------------------------------------------------------------------------------------------------|
| Short Stop at | Failure to wait for one minute at a station                                                          |
| Rough Stop at | Using vacuum brake level three or above when the train comes to a halt at a station                  |
| No Stop at    | Failure to stop at a scheduled stopping station                                                      |
| No Whistle at | Failure to sound the whistle before starting off, or before a tunnel or before permanent way working |
| Em Brake at   | Using emergency brake                                                                                |
| Speeding Near | Failure to observe the speed limit                                                                   |

# **THE MAIN MENU IN DETAIL**

## **Option 0 - Computer Demonstration Run**

This run demonstrates the various techniques required to drive the locomotive with the computer running all controls on a non-stop run to Brighton. You are advised to study the various settings to help you learn correct driving methods.

## **Option 1 - Training Run**

A practice session for the novice driver / fireman to the same schedule as the computer demonstration. You are expected to adhere to the timetable shown initially. You may halt the run at any time to refer to the timetable again. A short beep is sounded to assist you when the computer records a time for the final assessment.

When arriving at Brighton you must bring the train to a halt as near to the far end of the platform as possible. Hitting the buffers will result in a loss of safety marks and doing so at anything above walking pace will result in a crash.

At the end of the run your performance is assessed with regard to economy safety and timekeeping. A result of 70% overall is considered to be a pass. The economy assessment is based upon the stocks of coal (measured in hundreds of pounds) and water (measured in hundreds of gallons) left in the tender. The timetable is shown or it can be replaced by a page of significant events.

## **Option 2 - Easy timetable with speed limits**

A train on a non-stop schedule to Brighton. Speed limits, including an additional limit of 30 mph at the permanent way working, detailed under the timetable, must be observed otherwise safety marks will be lost or the train may derail.

## **Option 3 - Stopping train and signalling**

As option 2 but you must also obey all signals and make the stops required on your timetable.

Signals divide the line into sections so that trains on the same line run at an adequate distance from each other. There are two types of signal used on the line, stop (with a square end) and distant (with a notched end). Each has two positions, up for clear and down (horizontal) for stop or caution. Stop signals may come singly or in groups.

You must not pass a stop signal in the down (stop) position. To give warning of the condition of the stop signal a distant signal is placed a suitable distance before it. It will be down (caution) if the stop signal to which it refers is down i.e. at the stop position.

In order for you to have the maximum time to react the state of the next signal to be passed is reproduced separately in the signal section on the left of the screen.

The stations at which you are scheduled to stop are shown in capital letters on the timetable. You must attempt to stop within 60ft of the far end of the platform without excessive braking when coming to a halt. Should you pass the end of the platform before coming to a halt a beep will sound and a "no-stop" error will be recorded against your time.

You must arrive at the station in good time to allow at least one minute for your passengers to embark and disembark. The whistle will sound, if it is under computer control, one minute after your arrival or you may use the clock. The times recorded for the assessment are the times at which the train comes to a COMPLETE halt and the time it first moves thereafter. The time table gives the required departure time.

## **Option 4 - Heavy Stopping Train**

A heavily laden train with consequent loss of performance. All the constraints of option 3 apply.

## **Option 5 - Record Run**

On 26th July 1903 the record for a non-stop steam train from London to Brighton was set at 48 minutes 41 seconds. A schedule is supplied to enable you to equal or better that record. All normal speed limits apply.

## **Option 6 - Southern Belle**

This is the world famous pride of the Southern Railway Pullman non-stop train. Any deviations from the timetable are viewed with (distaste) by the railway management and made apparent in the assessment.

## **Option 7 - Problem Run**

You will be presented with any timetable. All constraints apply plus other problems which occur which will hinder your progress to Brighton.

# **SOUTHERN BELLE**

## **How a Steam Locomotive Works**

These notes describe the operation of a steam locomotive with particular reference to the screen display and controls of Southern Belle. Understanding how a steam locomotive works will help you to master the controls more quickly. The driving force of the locomotive comes from the cylinders where a piston is pushed back and forth by the steam pressure raised in the boiler. Hot gasses from the firebox are drawn through the boiler by a system of tubes, which heat the water to boiling point, converting it into steam. The hot gasses drawn through the boiler then enter the smokebox and escape through the chimney. The performance of the locomotive depends upon the pressure in the boiler, which can be controlled by manipulating the fire.

## **WATER GAUGES**

These are two vertical tubes in the centre of the cab. They are very important as they give a visual indication of the level of water in the boiler. The bottom of the gauge is one inch above the firebox top, which must be kept covered at all times otherwise the fire will heat the firebox top beyond limits causing special plugs (called fusible plugs) to melt allowing steam into the firebox. This action cools the fire and alerts the train crew.

If too much water is carried in the boiler and the gauge reaches the top, water instead of steam will enter the cylinders causing permanent damage.

Ideally you should attempt to maintain a water level in the top half of the gauge. Should a failure occur, the run will be terminated with the consequential loss of marks.

## **STEAM PRESSURE GAUGE**

A round dial with a needle pointer, situated in the centre of the cab, graduated from minimum on the left to maximum (200 psi) on the right. The more steam pressure maintained the higher the potential power of the locomotive. However too much pressure will lift the safety valves and release steam thereby reducing pressure to below maximum (shown by two jets of steam issuing from the boiler top). This represents a waste of coal and water and should be avoided to achieve maximum efficiency.

## **WHISTLE**

The whistle is part of the safety equipment and must always be used before starting away, entering tunnels or approaching sections where permanent way gangs (railway maintenance teams) are working. To conserve steam the whistle should not be used indiscriminately.

As a guide to correct whistle usage, when the computer is controlling the whistle it is blown at the earliest time in each of the circumstances detailed above.

## **REGULATOR**

A lever situated on the top left of the cab which controls the flow of steam to the cylinders. It has five positions; closed on the right, progressing to fully open on the left. Opening the regulator applies power to the wheels and it must be adjusted when running to suit requirements. Always close the regulator when braking. Open the regulator cautiously when starting away as too much power will cause the wheels to slip (especially in adverse weather conditions). Wheel slip will be apparent from the increase in the speed of the steam exhaust.

## **CUT OFF**

A wheel control on the bottom left (marked C) which controls the time during each cylinder cycle that steam is allowed into the cylinder. It has five positions, 0% (straight up), 20%, 35%, 55% and 75% (straight down). For example when cut off is set to 20%, steam is allowed to enter for just 20% of the cycle. This has the effect that the expansive properties of steam are used more efficiently, by reducing the steam usage significantly for only a small loss of power. You will need to use this control to obtain high efficiency. When starting away it is normal practice to use 75% cut off.

## **VACUUM BRAKE**

A wheel control situated between the regulator and the cut off (marked V) which has five positions; off (straight up), light braking, medium braking, heavy braking and emergency braking (straight down). The brakes act upon all the carriages and are held off by maintaining a vacuum in a pipe connecting the carriages, braking being achieved by progressive release of the vacuum via the vacuum brake control.

In the event that the communication cord of the train is pulled, emergency braking is automatically applied and will be released as appropriate. Emergency braking must not be used by the driver except in extreme circumstances, as a poor safety rating will result. Avoid using harsh braking to bring the train to a halt at a station for the comfort of your passengers.

## **BLOWER**

A wheel control situated centre right of the cab (marked B) which is off when pointing straight up. It is essential that at all times gas flow is maintained drawing the gasses from the firebox out through the chimney ensuring that no flames or gasses are allowed to escape into the cab via the firehole doors. Normally this gasflow is supplied by the exhaust of used steam up the chimney when the regulator is open. This gas flow will be interrupted by closing the regulator or by the confines of a tunnel. In these circumstances normal gas flow must be maintained by opening the blower which sends a jet of live steam up the chimney. Failure to use the blower when necessary is dangerous and can lead to an "explosive blowback" into the cab. Use of the blower should be limited to only when necessary due to its cost in the loss of steam.

## **INJECTORS**

A wheel situated top right of the cab (marked I), which controls the device by which water from the tender is forced into the boiler. It has five positions, off (straight up), progressing to full on (straight down). This is the means by which the level of water in the boiler is maintained.

## **DAMPERS**

A wheel situated on the bottom right of the cab (marked D) which controls the amount of air provided through the base of the fire (called primary air). It has five positions, closed (straight up) progressing to fully open (straight down). By control of the amount of

primary air it is possible to vary the temperature of the fire and thereby the amount of water evaporated into steam. To achieve a hot fire a large amount of primary air is required for combustion. Conversely for a cool fire only a small amount of primary air is required. To help you judge the temperature of your fire a thermometer style temperature gauge is presented in the cab centre. The indication of correct combustion is the colour of your smoke such that black smoke would indicate insufficient air for the temperature of the fire, grey smoke indicates correct air and lighter shades indicate too much air. If too little air is supplied coal combustion will not provide the maximum heat value. If too much air is supplied, heat will be wasted in heating the excess air. To be efficient you must aim to maintain the correct air supply as far as possible. (Whilst manipulating the fire temperature correct combustion is unlikely). The rate at which coal is consumed increased with the temperature of the fire.

## **FIREHOLE DOORS**

A pair of steel doors used to confine the fire and to control the flow of air over the fire (secondary air). To achieve optimum temperatures of the fire, the level of coal must be maintained in the middle third of the firebox. Coal levels outside these parameters cannot achieve maximum temperatures. You must fully open the firedoors whilst coal is being added (indicated by a shovel at the right hand corner of the display). Failure to do so will waste coal. In all but the highest level of control the computer will do this for you. For perfect combustion a small amount of secondary air may be required.

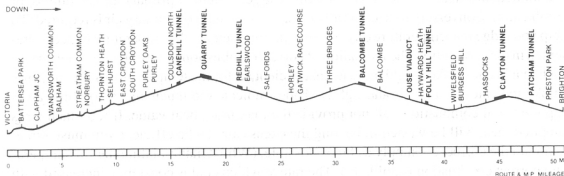
The firedoors can also be used to assist in the manipulation of the fire temperature. for example to raise the temperature of the fire “quickly” keep the firedoors shut, and to lower the temperature “quickly” open wide.

## **GRADIENTS**

Railway lines are not level and steam railway locomotives are affected by the gradient of the track. The gradient is indicated in the same manner as road gradients, e.g. 1 in 100. This would indicate a slope up or down of one foot for every 100 feet travelled. A cross section of the gradient of the line together with the positions of the stations and tunnels is shown in the gradient profile included. The exact gradient of the track at any particular time may be displayed in the signalling area.

Vacuum brakes must be used to ensure that the train is never allowed to run backwards on an up gradient.

## VICTORIA — BRIGHTON (VIA QUARRY)



## HISTORICAL NOTES

The London to Brighton Railway Company received permission to construct its line in 1837. The line was devised by Sir John Rennie and joined with the line of the London and Croydon Railway at Norwood. This gave a complete route from London Bridge Station to Brighton. In 1846 the two main route owners merged to form the London, Brighton and South Coast Railway (LB&SCR). The company's desire for its own West London Terminus was satisfied with the opening of Victoria Station in 1860, extending the line from a previous terminus at Pimlico.

In 1875 the first examples of "Pullman" luxury coaches were introduced by the company, culminating in Pullman non-stop London to Brighton a train called the "Southern Belle". It first ran in 1908 and continued until 1972 (running under the name "Brighton Belle" from 1934).

In 1923 the many railway companies of Britain were grouped together into four large ones, The LB&SCR becoming part of the Southern Railway. In 1926 the Southern Railway gave the job of pulling the "Southern Belle" to its powerful and imposing "King Arthur" class locomotives. These continued until the line was electrified in December 1932.

Today the elegance of the "Southern Belle" has disappeared but the many architectural and engineering feature of the line remain.

