

Milepost Simulations



Clear Creek Narrow Gauge Golden-Silver Plume & Central City



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Introduction

The route is set in the 1930s when the route was operated by the Colorado and Southern. The route features that portion of the 3 foot gauge line starting in Golden, Colorado around 15 miles west of Denver and heads west through Clear Creek Canyon. About 12 miles west of Golden the line splits at Forks Creek. The branch to the mining towns of Black Hawk and Central City goes off to the north and the mainline continues west. On the branch, the line has a double 'switch back' to gain elevation between Black Hawk and Central City. The mainline passes through Idaho Springs about 8 miles west of Forks Creek where there are many rail served mines. West of Idaho Springs the line continues to follow Clear Creek to Georgetown. At Georgetown the steep ascent on 3.5% grades starts to Silver Plume around the famous Georgetown Loop where the line does a loop over the top of itself and a double horseshoe before arriving at Silver Plume.

The line was closed in the early 1940s but the Georgetown Loop has since reopened as a tourist railway between Georgetown and Silver Plume.

Best efforts have been made to try to make the route as historically accurate as possible. However creating a route set in a historic period over 70 years ago means there are likely to be some inaccuracies due to limited material to work from.

History

The Colorado Central first built a standard gauge line east from Golden to connect with the Kansas Pacific in 1870. This gave Golden a route to Denver and the east. Once this connection was complete the Colorado Central started construction of a narrow gauge line heading west from Golden to reach the mining towns up Clear Creek. By the end of 1872 the railroad was complete through Forks Creek to Black Hawk. Construction then turned to the line towards Georgetown. However the financial Panic of 1873 caused an economic depression and construction was stopped at Floyd Hill. It was not until 1877 that the railway from Floyd Hill through Idaho Springs to Georgetown was completed. In 1878 the Colorado Central completed the line from Black Hawk to Central City which required a double switch back in order to gain the required elevation in a heavily built up area.

In 1879 the Union Pacific entered an agreement in which it leased the Colorado Central for a period of 50 years. The Union Pacific wanted a route to the mining boom city of Leadville and they saw the Colorado Central as a means to get there. This would have involved crossing the Rockies over Loveland Pass west of Georgetown. The Union Pacific incorporated the Georgetown, Breckenridge and Leadville in 1881 in order to build west from Georgetown. In order to overcome the elevation rise of 638 feet between Georgetown and Silver Plume 2 miles to the west, the railway was required to loop back over itself on the 'Georgetown Loop' as well as a double horseshoe curve. This meant the grade could be reduced to around 3.5% from what would otherwise have been an average grade of over 6%. The railway to Silver Plume was completed in March 1882. The line over the loop became a popular destination with tourists from the time it opened. Many excursions were run to Silver Plume over the Georgetown Loop.

Soon after the railway reached Silver Plume it was extended west to Bakerville at the foot of Loveland Pass. A route over Loveland Pass towards Leadville was surveyed with a tunnel to cross the top of the pass. However by this time the Union Pacific had control of the Denver South Park and Pacific which was in the process of completing its own line to Leadville via Como and Boreas Pass. The UP was hesitant to fund an expensive tunnel despite the fact

that a route to Leadville via Silver Plume would have been significantly shorter than the other proposed route. Work on the tunnel was paused in 1882 never to restart. The Denver South Park and Pacific completed its own line to Leadville in 1894. The Bakerville extension was not used much and the tracks were removed from just west of Silver Plume before the turn of the century.

In 1890 the Union Pacific Denver and Gulf Railway (UPD&G) was organized to absorb many Union Pacific subsidiaries including the Colorado Central, Georgetown Breckenridge and Leadville and many other lines including the Denver and Fort Worth which gave the UPD&G a route to Texas and Gulf of Mexico. At the same time the Denver South Park and Pacific was reorganized as the Denver Leadville and Gunnison still under UP control.

The Silver Panic of 1893 bankrupted the Union Pacific placing all the UP's holdings in receivership. The UPD&G was sold by the receiver in 1898 along with the Denver Leadville and Gunnison Railway and was renamed the Colorado and Southern Railway. The Chicago Burlington and Quincy (CB&Q) acquired the Colorado and Southern and operated it as a subsidiary of the CB&Q.

In 1905 the Argentine Central Railway started construction climbing up the mountainside from Silver Plume to the mining town of Waldorf with a double switch back on 6% grades. The railway later extended to the top of Mount McClellan at an elevation of over 13,000 feet as a tourist attraction. Due to the steep grades the line was worked by Shay locomotives. At one time the Argentine Central Railway planned another tunnel to connect Silver Plume with Leadville however this was incomplete by the time the railway went bankrupt in 1911. It operated as a tourist railway for a few years before being closed completely in 1918. During the Argentine Central's short life it did provide extra freight traffic for the C&S as well as through excursion trains from Denver combining the Georgetown Loop with a trip up to Mount McClellan.

The former Colorado Central portion of the C&S began losing money in 1917. Soon after the C&S started to look at abandonment of the entire narrow gauge network. In 1925 the line from Black Hawk to Central City was abandoned although the track was not lifted until 1931. In 1927 passenger service was discontinued and replaced by a mixed train a couple of times a week until 1931. In 1936 the C&S applied to abandon the entire former Colorado Central. This was rejected by the Interstate Commerce Commission (ICC) due to a slight increase in mining traffic during the mid-1930s compared to the early 1930s at the height of the Great Depression. The C&S was allowed to abandon the line between Idaho Springs and Silver Plume over the costly to maintain Georgetown Loop.

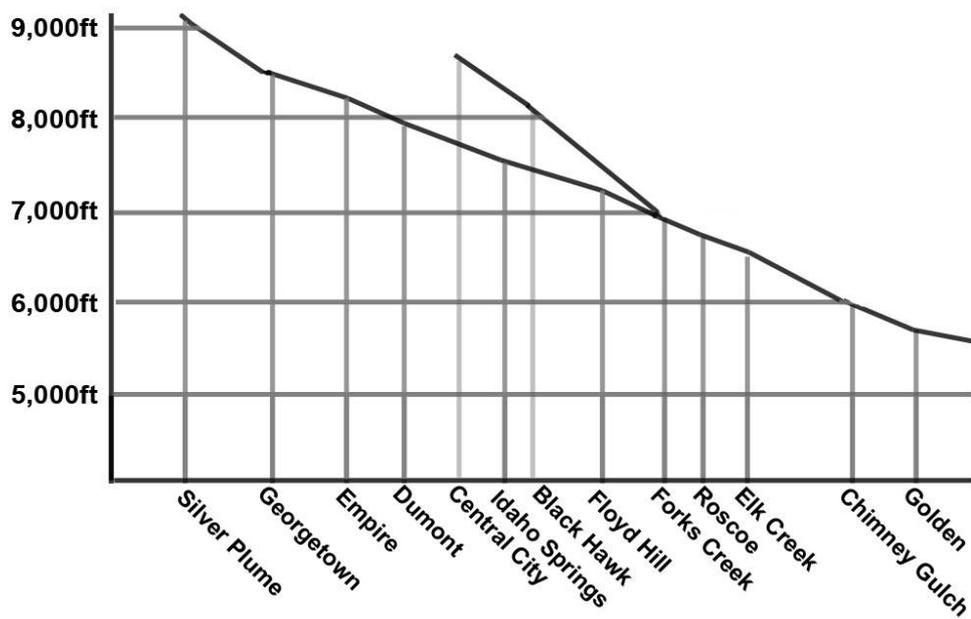
In 1940 the C&S applied to the ICC again to abandon what was left of the former Colorado Central and this time due to declining traffic with increased competition from highway trucking the C&S was allowed to abandon all of the narrow gauge Colorado Central. The last train for Idaho Springs ran in May 1941. The Colorado Central between Golden and Denver, which was dual gauge, had the narrow gauge rail removed and is still open to this day as a branch of the BNSF. The last C&S narrow gauge train operated on a section of the former DSP&P between Leadville and Climax in 1943 as that section was converted to standard gauge.

Although the Colorado Central Railroad never made it west of the Rockies, its route was chosen as the best route to build the main East-West Interstate Highway, I-70, through

Colorado. The Interstate tunnelled through the Rockies just west of Silver Plume in the Eisenhower Tunnel which fully opened in 1979. The construction of the Interstate in places is on the same grade as the old Railroad.

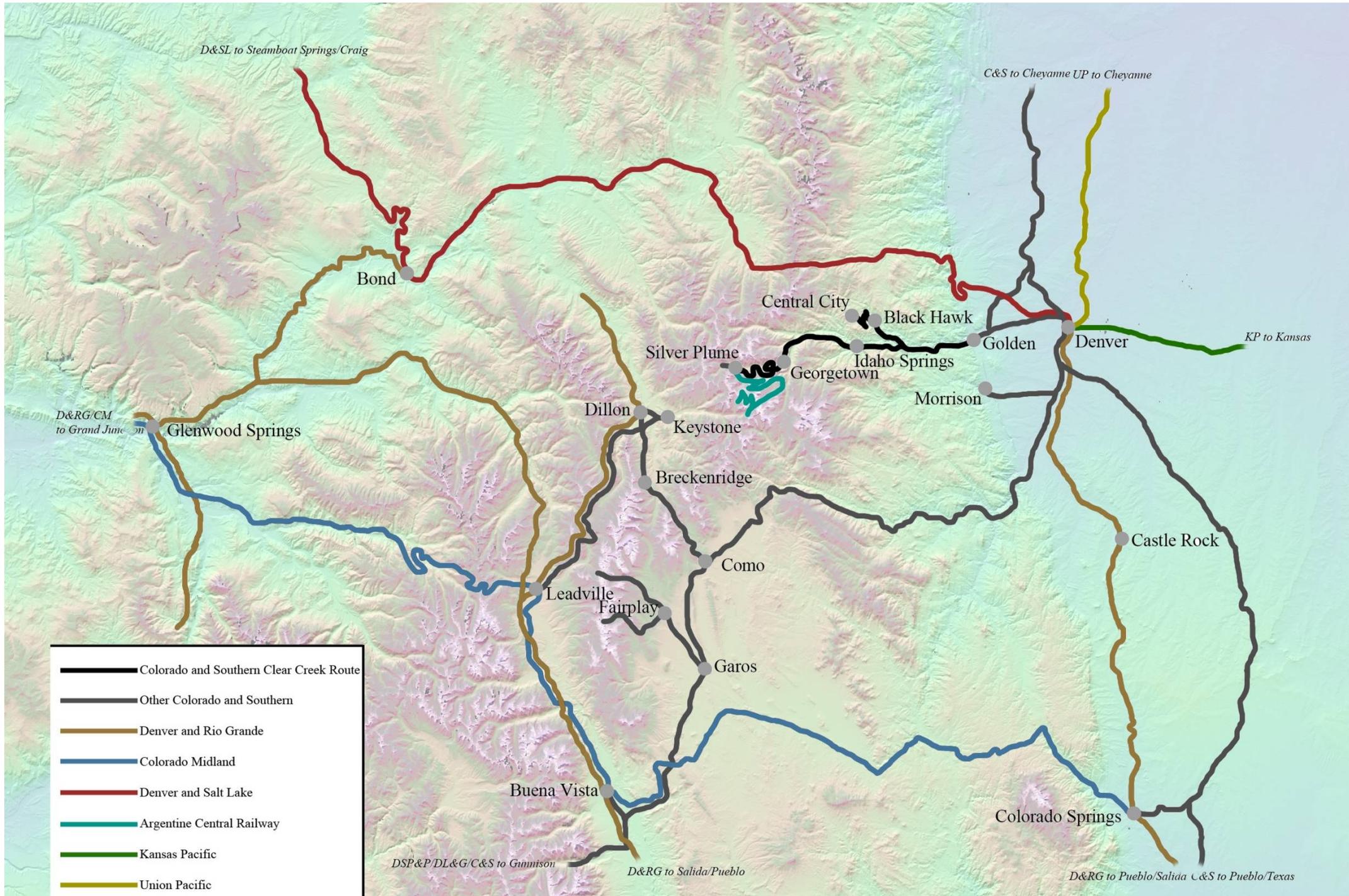
In 1973 efforts to recreate the Georgetown Loop as a tourist attraction got underway in Silver Plume. The 3 mile section between Silver Plume and the bottom level of the Georgetown Loop just west of Georgetown reopened in 1984 and today it is a popular tourist railroad on a section of the former Colorado Central. The Silver Plume terminal is on a slightly different alignment than the historic depot site as the Interstate now has cut off the railroad from the town.

Elevation Profile



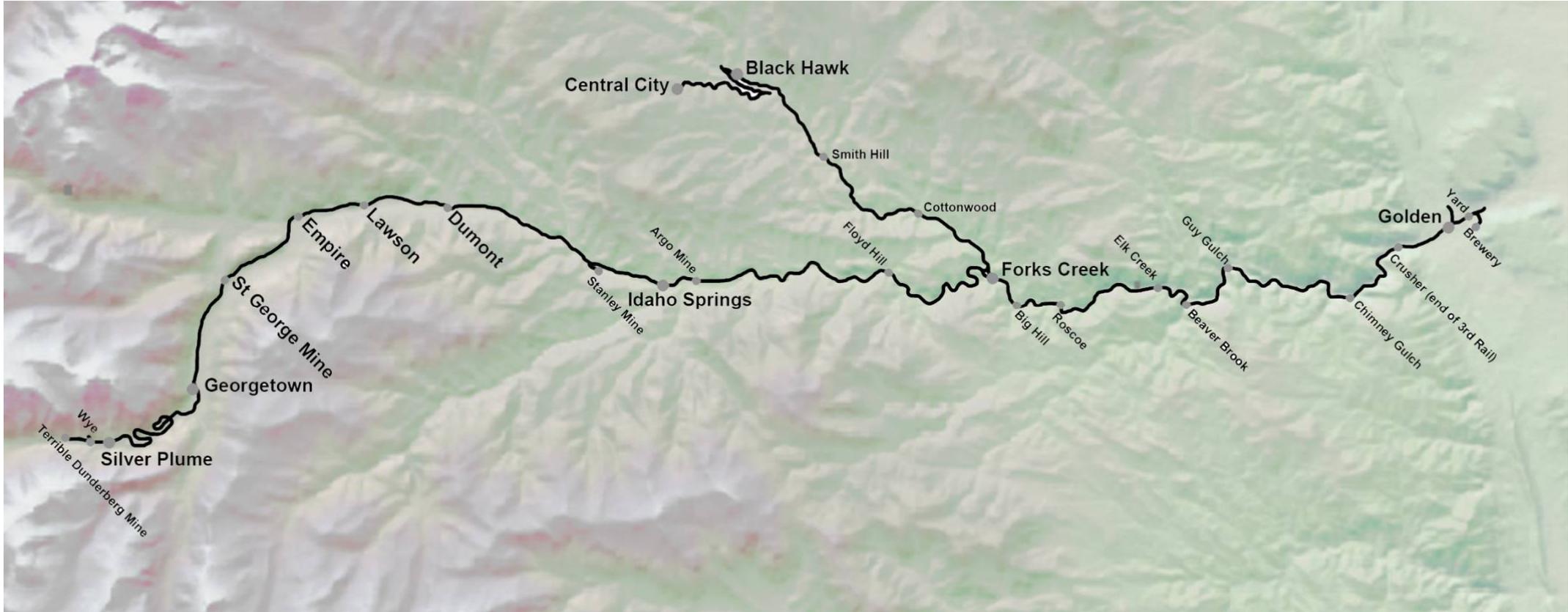
Area Map

The next page shows a map of all the main railways in the area. It can be seen from the map that a through route west of Silver Plume over the Rockies to Dillon and onto Leadville would have been significantly shorter than any other line. It should be noted that not all lines are shown only those with relevance to the history of the Clear Creek lines and some others to put the map into perspective.



Route Map

This map shows the included route with all sidings marked. It should be noted that not all mining sidings and spurs are marked, only those that are outside towns are shown.



Route Guide

The route starts on the dual gauge trackage at Golden roughly 15 miles from Denver. Golden at one time had a large roundhouse for the Colorado Central but in early C&S days all the locomotive facilities for the Clear Creek division moved to Denver. Golden once had a large brick works but is more famous for the location of the Coors brewery.

Leaving Golden, the line enters Clear Creek Canyon and starts climbing on grades of up to 4.2% (1in23) passing through Crusher where the dual gauge ends then on to Magpie, Chimney Gulch and Huntsman. Then it crosses Clear Creek for the first time just before the siding of Guy Gulch. The line then passes through a narrow canyon at Inspiration Point and comes to Beaver Brook. Here a pavilion was built on the canyon side for passengers to stretch their legs and admire the view. In the early days of the railroad Beaver Brook was a water stop, however this was moved to Elk Creek by the era the route is set in. Beaver Brook had a siding for loading lumber and a depot which also served refreshments to passengers. From Beaver Brook the railroad follows Clear Creek through many bends in the twisting canyon and crosses back to the north side of Clear Creek just before coming to Elk Creek.

Elk Creek is the first water stop out of Golden. Elk Creek has a long passing siding and the grade flattens out here but some sections still have a maximum grade of 3.5% (1in28). From Elk Creek the railroad passes the sidings of Roscoe and Big Hill before coming to Forks Creek.

Forks Creek has a depot and passenger trains stopped here for passengers to get refreshments. Forks Creek has both a coaling dock and a water tower as well as a Wye to turn locomotives. At Forks Creek the line splits with the mainline going to Georgetown and a branch line heading to Black Hawk and Cripple Creek.

West of Forks Creek the mainline continues westwards in the bottom of Clear Creek Canyon coming to Floyd Hill where the road US6 starts to follow the railroad again for the first time since Golden. Now from Floyd Hill Interstate 70 also follows Clear Creek which has dramatically changed the area.

On the approach to Idaho Springs the line passes the distinctive and unusual Argo Mine. The mine tunnel here as well as being a mine also connected with mining tunnels in the Black Hawk and Central City area and helped to drain those mines. The large red Argo Mill Building still stands today and is a museum. The large wooden railway loadout was not so fortunate and collapsed a few decades after the railway was closed.

Idaho Springs is the biggest town west of Golden on the railway and had many rail served industries with sidings or spurs as well as a depot and a small yard. On the western edge of Idaho Springs there is a water tank, the last before Georgetown. Idaho Springs never had a wye or turntable so it was never possible to turn a loco at Idaho Springs. From 1938, when the line west of Idaho Springs was abandoned, to 1941 tender first running was required in one direction between Idaho Springs and Forks Creek.

West of Idaho Springs the Clear Creek valley becomes more open and there were many mines and mills with rail access. The first is the Maud Monroe. The line then crosses Clear Creek on a wooden girder bridge where a spur from the Stanley Mine joins the mainline. The distinctive yellow building is still there today although long abandoned.

Continuing westwards the line comes to the small town of Dumont and then crosses Clear Creek again before coming to the small town of Lawson.

Continuing west, the railway comes to the town of Empire Junction. The town of Empire was a mile and a half away by road. Empire Junction was simply just known as Empire to the railway. From

Empire Junction the railway turns to head south to Georgetown. Around half way between Empire and Georgetown the railway passes a siding for St Georges mine.

Arriving in the Georgetown area, the railway passes Georgetown Lake before crossing Clear Creek a couple more times and before reaching the Georgetown Wye. The line splits just beyond the Georgetown water tank. The line straight ahead goes to the main depot and some warehouses while the main line curves off to the east and starts the climb up to Silver Plume.

Above the town of Georgetown the grades increase to 3.8% (1in26) at several points. There are spurs for several mines and one to the Georgetown Power Station. The railroad now enters the famous Georgetown Loop. The line then completes a circle by over itself 100 feet higher on the Devils Gate High Bridge.

The line continues to gain elevation using 180 degree horseshoe curves to finally reach Silver Plume.

Silver Plume has a small yard and depot in the town. Beyond the Silver Plume depot the line comes to a wye where a clock tower and pavilion built for tourist excursion trains to the Georgetown Loop. The line finally terminates at Terrible Dunderburg Mine. At the one time the line went on to Bakerville.

The Black Hawk branch leaves the mainline at Forks Creek and climbs on grades of up to 4% (1in25) up the North Clear Creek Valley to Black Hawk passing sidings at Cottonwood before coming to Smith Hill where there is a water tank for the thirsty locos climbing the steep grade.

The town of Black Hawk is situated in the bottom of the North Clear Creek Valley. Arriving in Black Hawk the line passes the Iron City Mill and the very large Penn Mill at the lower end of town. As well as being served by the C&S at one time all the mills and mines in the area were also served by the 2 foot gauge Gilpin Tramway which was abandoned by 1920. The railway then crosses the North Clear Creek and passes the Randolph Mill and a few smaller mills or mines before coming to a turntable near the Black Hawk water tank.

After passing the water tank, the line crosses the North Clear Creek again and climbs to the main depot and yard in Black Hawk. The line continues past the large Bob Tail Mill which has rail access at both the lower and upper sides of the complex.

The railway reaches the lower switchback where all trains have to reverse to continue the climb up to Central City. On the switchback, the line passes the Bob Tail Mill where it can service the mine's upper spurs. It then crosses the main street in Black Hawk on a high overbridge. The line comes to the Running Lode Mine siding before crossing a large wooden trestle on the final climb up to the upper switch back.

At the upper switch back all trains reverse again and continue in the direction of Central City. After passing back past Black Hawk (now 300 feet below) the line goes over the Mountain City trestle and reaches Central City. Central City has several sidings and spurs as well as a depot and small yard.

B4D Locomotive

The loco included is a Baldwin 1890 built 2-8-0 Consolidation for the Denver Leadville and Gunnison Railway (a C&S Narrow Gauge predecessor). When the locomotives were built they were the most powerful locos on DL&G and well suited to the mountain grades and tight curves of the Colorado narrow gauge.

In 1902-1903 the class were heavily rebuilt by the C&S at Denver with new boilers. When air brakes were introduced they had air tanks placed on top of the boiler between the domes as was standard on narrow gauge C&S locomotives. They were renumbered 63-70 by the C&S and classified as B4D. In the late 1910s all C&S narrow gauge locomotives were given the distinctive Ridgeway Spark arrestor which caught burning cinders leaving the chimney while not affecting the flow of the exhaust. It was introduced to solve the problem of forest fires caused by steam locomotives. The cinders could be emptied from the pipe down the side of the smoke box once they had cooled down. The Ridgeway Spark arrestor was often known to railfans as a Bear Trap Spark Arrestor.

The distinctive air tanks and spark arrestors were a unique feature of the C&S narrow gauge from the late 1910s until its closure.

The B4Ds worked the Clear Creek lines up until they closed as well as the former South Park lines. In the early 1930s Locomotive #70 was converted to an oil burner and therefore had its Ridgeway Spark Arrestor removed as it was no longer required. As Denver was the only locomotives facility to be able to service an oil burning locomotive, after its conversion #70 was restricted in its use and so become a very regular locomotive on the Clear Creek lines.

Some of the specifications of the B4D are shown in the table below.

Boiler Pressure	150psi
Traffic Effort	17,643lbs
Driver Diameter	37 inches
Cylinder Size	16x20 inches
Tender Coal Capacity	6 tons
Tender Water Capacity	2,200 gallons
Weight of Locomotive	38 tons
Weight of Loaded Tender	23.5 tons
Combined Loco and Tender Weight	61.5 tons

Unfortunately all the B4Ds were scrapped once the C&S closed their narrow gauge system apart from #69 and #70 which were acquired by the US army during WWII to work on the White Pass and Yukon. Sadly they too were also scrapped after the war in 1946. Some similar C&S Consolidation Locomotives are preserved including #60 a B4C displayed at Idaho Springs and #71 a B4E at Central City.

The B4D were given the following maximum trailing tonnage ratings on the route. If you are created a scenario it is recommended you keep the total tonnage of a train at least 15% lower than these figures. The weight of rolling stock is given in the rolling stock section

Line Section	Maximum Tonnage Rating
Golden to Forks Creek	160
Forks Creek to Idaho Springs	150
Idaho Springs to Georgetown	210
Georgetown to Silver Plume	150
Forks Creek to Central City	120

Locomotive Variants



Coal fired B4D

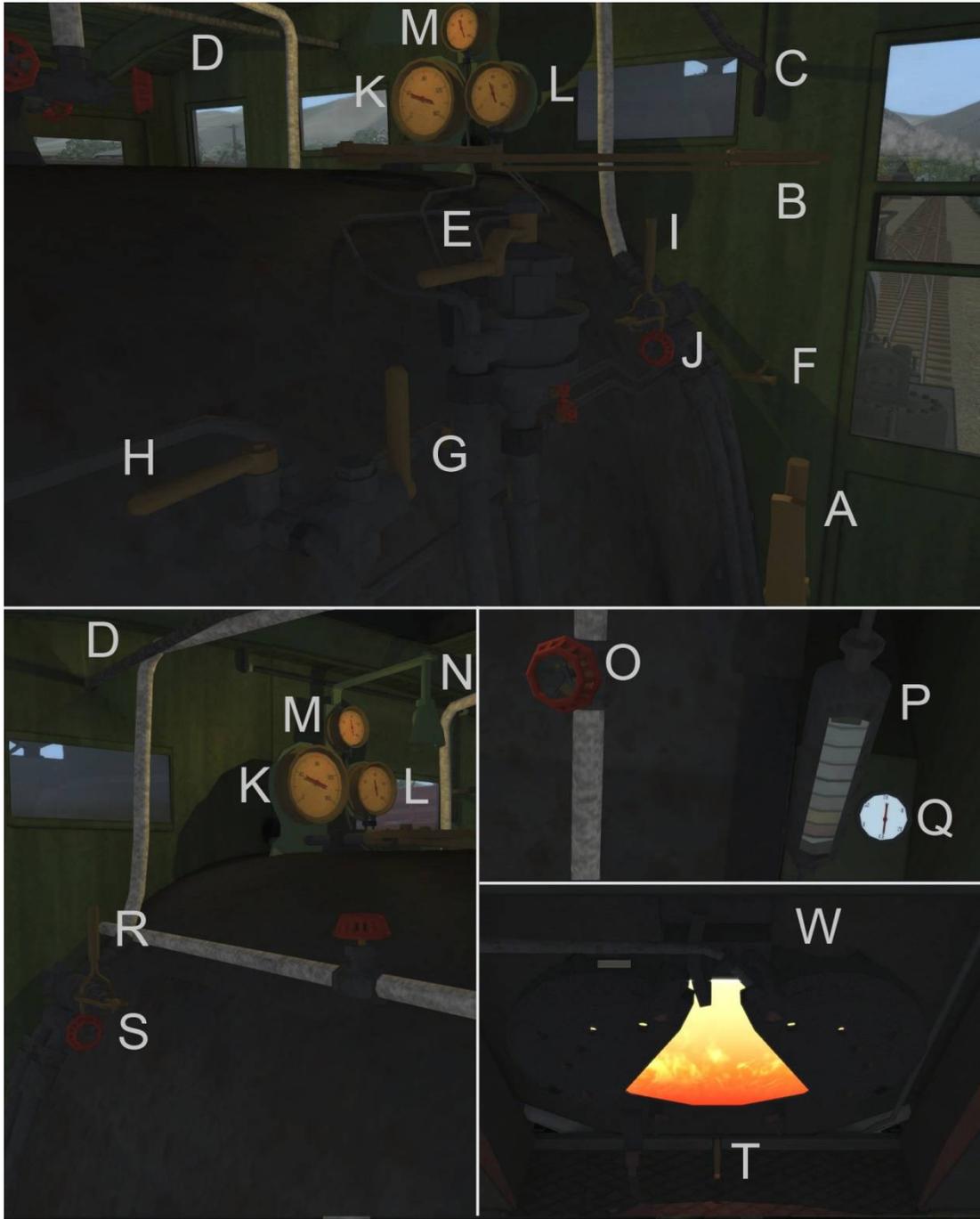


Coal fired B4D with snow plough



Oil Fired B4D

Locomotive Controls



	Control	Key		Control	Key
A	Reverser	W & S	M	Brake Pipe Pressure	-
B	Regulator	A & D	N	Cab Light	click
C	Whistle	Space	O	Blower	N
D	Bell	B	P	Water Gauge	n/a
E	Train Brake	; & `	Q	Fire Rate Dial for auto fireman only	E
F	Cylinder Cocks	C	R	Steam Lever For Injector	I
G	Sander	X	S	Water Lever for Injector	O
H	Locomotive Brake	[&]	T	Damper	M
I	Steam Lever for Injector	O	W	Firebox Door	S
J	Water Valve for Injector I	L	-	Stoking	R
K	Boiler Pressure	-	-	Flags	Y
L	Air Reservoir Pressure	-	-	Spark Arrester	Ctrl + C

Oil Fired Cab Controls

The Oil burner has the same cab controls apart from an additional control for the oil regulator that controls the flow of oil into the firebox.



The control labelled **X** is the oil regulator. As the oil burner has a very small fire mass the regulator will need almost constant adjustment when working up a grade so it is recommended you use the built in auto fireman. The absence of a significant fire mass means that the fireman must attempt to adjust the firing rate to meet steam usage rates. Since the burn rate is controlled by the exhaust rate, if the exhaust steam gets too high, the fire mass will drop and even go out.

Driving the B4D Locomotive

Controls are conventional Rail Sim Controls with two exceptions:

1. Both injectors are set up to function as live steam injectors;
2. The Firing Rate Control has been added to allow a scripted auto fireman to take over firing duties with restrictions discussed in a separate section below.
3. The ideal fire mass is 750lbs; the maximum fire mass is 1,000lbs. The fire mass may safely vary from 600lbs-800lbs depending upon the steam demands of the locomotive.

While the water level will start at 100%, it is good practice to keep it in the range from 40% to 75%. Keeping the volume lower than the max allows for use of the injectors to keep the boiler from wasting steam when the steam usage is low.

Engineers Controls

The B4D was not designed for great speed but is more than satisfactory for the Clear Creek line where uneven grades of up to 4% can be encountered. Essential to good performance is anticipating changes in grade so the fireman will not be caught with too much or too little steam.

The B4D can generate a maximum of 10,500lbs/hr steam with about 1,000lbs/hr needed for appliances such as the injectors, generator, and air compressor. If using the F5HUD it is possible to monitor the generation vs use rate for steam. This is not cheating for the simulation cannot supply all the sensory data that one gets in a real locomotive. Using the F4 HUD presents less information and also impacts the way the engine is fired if fired manually.

When the engine has been sitting for some time, the cylinder cocks should be open when steam is first admitted to the cylinders and should remain open for several rotations of the drivers. To start, the Reverser should be fully open and the regulator applied with care until the locomotive begins to move. As speed picks up, the reverser should be pulled back towards the center and the regulator valve opened more. For most operating conditions on this route, the reverser should not be dropped below about 35% and the throttle should be kept as fully open as needed to maintain speed.

Heavy grades will require the reverser to be in the 65 – 75% range in order to keep the train from losing speed. The regulator should always be fully open when climbing steep grades. The

reverser should be advanced gradually as speed decreases and advanced no further than is needed to maintain a workable speed (say 5 – 9 mph) so that steam usage is kept at a minimum. Once the train begins to accelerate, the reverser should be cut back.

Braking

The B4D has both engine brakes and train brakes. The engine brakes should not be used to brake a long train. Using the engine brake will cause the other cars to buck the engine – not a good thing.

The **train brake** stand is a Westinghouse A-series that has only Release, SelfLapped, Apply, and Emergency positions.

Release - This is the position used when running. If brakes have been applied, moving even briefly to Release will cause the brakes to fully release. To achieve a partial release you can go briefly to Release then quickly back to Apply until a satisfactory pressure is achieved.

SelfLapped - If brakes have been applied through the Apply position, this position will maintain the cylinder pressure reached. It will not stop an Emergency application.

Apply - The rate of application of brakes depends on how far into the position the handle is moved. Maximum benefit is reached at 45psi; slowing trains on the route's grades usually requires no more than 18 lbs while stopping on a grade may require above 30psi.

Emergency - The meaning of this is clear. Once this position is touched, the brakes will go to maximum cylinder pressure. Avoid unless absolutely necessary.

Firing the B4D

There are 4 distinct ways to fire the B4D:

1. Manually firing using the F5HUD;
2. Manually firing using the F4HUD;
3. Using the built-in automatic fireman;
4. Using the scripted automatic fireman.

These are separately enumerated because each has different implications for the firing process.

1. Manually firing with the F5HUD (or no HUD) is the best way to learn about how steam locomotives behave. The recommended ranges for the fire mass and water levels are given above. The most important thing to keep in mind is that the fireman must *anticipate* the demands for steam and have the boiler ready before reaching a grade or beginning to descend the grade. It is not possible on this route to play catch-up once boiler pressure begins to seriously drop. When preparing for a change in steam demand, first get the fire and water levels to the desired levels and then try to replace both fuel and water at as close to use rates as possible, keeping levels fairly even.
2. The F4HUD forces both the stoking and injectors to function at either fully on or fully off. While it is possible to anticipate changes in demand this way, it is difficult to match use rates for replacement of fuel and water.
3. The built-in automatic fireman is a terrible fireman, doing things whenever it suits him. He is always responding after the fact and will make it difficult to maintain steam pressure under conditions of heavy use.
4. The scripted fireman is discussed in detail below.

The Scripted Automatic Fireman

This is available to users with certain limitations:

1. The built-in auto fireman must be off.
2. The F4 HUD must not be used.
3. F3 Display can be used without impact.

The scripted fireman has 5 levels of firing to simulate different rates of firing for different running conditions.

The E Key increases the rate; key shift-E decreases the rate. There is a gauge on the fireman's side of the cab that will show the level.

Level 0 - The script does nothing allowing for one of the other firing options to control. If the built-in auto fireman or the use of the F5HUD is detected, the script will shut down if it has not already been set to zero.

Level 1 - Used if the locomotive is using steam mainly for appliances but not for moving.

Level 2 - Light movement in switching and other yard movement or drifting downgrade.

Level 3 - Light work on the mainline where upgrades are slight.

Level 4 - For running at speeds near the route limits or climbing shorter grades.

Level 5 - For climbing steep grades with tonnage trains.

For each level the auto fireman can be set to control just the fire (red) as well as the fire and water levels in the boiler (blue). You can go between red default setting and the blue setting by continuing to press the E key once you get to level 5 red will take you to level 1 blue. The colour of the needle on the fire rate dial changes colour.

The key to getting the best from this option is to anticipate what level of demands will be required. For most of the route going upgrade from Golden, levels 4 and 5 will be the best options. When descending that same grade, levels 1 or 2 will be satisfactory.

Rolling Stock

The route includes a selection of both passenger and freight narrow gauge rolling stock that would have worked on the route. In addition to the narrow gauge stock listed below a selection of standard gauge rolling stock is included for the yards in Golden.

Passenger Car Weight: 20 tons



The included coaches were built by St Charles in 1896 for the Union Pacific Denver & Gulf and were inherited by the Colorado & Southern upon its creation in 1899. They were in service until the final end of passenger operations on the C&S in 1937. Coach #70 is preserved today on display in Idaho Springs.

Baggage Car Weight: 20 tons



The included baggage cars were built by the Union Pacific for the Denver South Park & Pacific in 1879. They later became Denver Leadville and Gunnison and were inherited by C&S upon its creation. They were in service until the final end of passenger operations on the C&S in 1937.

Caboose

Weight: 8 tons



The C&S narrow gauge Caboose were originally built between 1879 and 1887 for various Union Pacific narrow gauge subsidiaries eventually all ending up working on the Union Pacific Denver & Gulf or Denver Leadville and Gunnison. When built they had no Cupola on the roof. When the C&S inherited the cabooses they were fitted with air brakes and a cupola was added. There were some of the last 4 wheeled cabooses in service in the USA lasting until the final end of C&S narrow gauge operations in 1943.

Box Car

Weight Empty: 10 tons

Weight Loaded: 37 tons



The boxcars included were built for the C&S between 1903 and 1910 and were used to transport a huge variety of freight including ore which was too valuable to be placed in open gondola cars.

Reefer

Weight Empty: 12 tons

Weight Loaded: 35 tons



These refrigerator cars were built for the C&S in 1909. They keep food products refrigerated by having ice blocks in each end of the car.

Gondola

Weight Empty: 10 tons

Weight Loaded: 30 tons



The Gondola cars were built for the C&S between 1907 and 1908. They were mainly used to transport coal as well as less valuable ores.

Tank Car Weight Empty: 11 tons Weight Loaded: 30 tons



Tank cars were rarely owned by the Railroad companies and were operated and owned by the oil companies. The car included is typical of those built between 1915 and 1925.

Flat Car Weight Empty: 8 tons Weight Loaded: 20-30 tons



Flat Cars were used for a wide variety of freight including lumber and machinery.

Scenarios

The route includes career scenarios as well as being set up for Quick Drive starting at all significant places along the route. A selection of consists are available for quick drive. The route also includes Free Roam scenarios starting at all significant places along the line.

Career Scenarios

The following career scenarios are included with the route. The freight scenarios are set up slightly different from normal with a starting score of 1000 and you lose points for operational errors. Passenger scenarios are set up the normal way. In all scenarios you have a few mph leeway before you lose points for speeding. It is recommended you complete the scenarios in order so you get to know how to drive the B4D locomotive before putting your skills to the test on a heavy uphill freight.

[01] Introduction and Tutorial to the B4D

Duration: 10 minutes **Difficulty:** Easy **Route Travelled:** Georgetown

An Introduction and tutorial on how to drive the B4D Locomotive.

[02] Tutorial to the Oil Fired B4D

Duration: 15 minutes **Difficulty:** Easy **Route Travelled:** Clear Creek Canyon

Learn how to drive the oil fired B4D Locomotive in Clear Creek Canyon.

[03] Clear Creek Passenger Part I

Duration: 55 minutes **Difficulty:** Medium **Route Travelled:** Golden-Forks Creek

You are taking the afternoon passenger Train #53 from Golden to Forks Creek. Today you will be stopping at Beaver Brook and Forks Creek. You will be meeting train #54 at Chimney Gulch.

[04] Clear Creek Passenger Part II

Duration: 80 minutes **Difficulty:** Easy **Route Travelled:** Forks Creek-Georgetown

You are taking the afternoon passenger Train #53 from Forks Creek to Georgetown. Today you will be stopping at Idaho Springs, Dumont, Lawson, Empire and Georgetown. You will be passing a freight at Lawson.

[05] Over the Loop

Duration: 30 minutes **Difficulty:** Easy **Route Travelled:** Georgetown-Silver Plume

Take the morning Denver-Silver Plume Passenger #51 from Georgetown to Silver Plume on an autumn day.

[06] Central City Passenger

Duration: 60 minutes **Difficulty:** Easy **Route Travelled:** Forks Creek-Central City

Take the daily passenger train #151 from Forks Creek up the branch and switch backs to Central City.

[07] Down the Switch Backs

Duration: 40 minutes **Difficulty:** Medium **Route Travelled:** Central City-Black Hawk

Make up a freight at Central City and take it down to Black Hawk where you perform more switching.

[08] Down the Loop

Duration: 50 minutes **Difficulty:** Medium **Route Travelled:** Silver Plume-Empire

Take a freight from Silver Plume to Empire with oil burning #70 in the snow following behind a loco patrolling the line ahead with a plow fitted due to heavy snow.

[10] Clear Creek Freight Part II

Duration: 80 minutes **Difficulty:** Hard **Route Travelled:** Forks Creek-Dumont

Take a freight from Forks Creeks to Dumont performing switching in Idaho Springs on the way.

[11] Clear Creek Freight Part III

Duration: 85 minutes **Difficulty:** Hard **Route Travelled:** Dumont-Silver Plume

Take a freight from Dumont to Silver Plume performing along the way and make up the return train at Silver Plume.

[12] Black Hawk Freight

Duration: 55 minutes **Difficulty:** Hard **Route Travelled:** Forks Creek-Black Hawk

Take the oil burning #70 on a freight from Forks Creek to Black Hawk and switch at Black Hawk on a rainy Autumn day.

Signalling and Signage

The route was never signalled in the traditional sense and was operated under a train order system. A train order is written permission to proceed from one point to another along the line. A train order would be given on a 'Form 19' from the operator at a telegraph office along the line. The form will instruct the train crew where they are allowed to run. Permission may be subject to passing of another train at a set location. An example Form 19 is shown below.

FORM 19	FORM 19
Train Order No. <u>2</u>	Date <u>Nov 1st</u>
To <u>Eng 70</u>	
At <u>Forks Creek</u>	
<div style="border: 1px solid black; padding: 10px; margin: 10px 0;"><p>Engine #70 run Extra from Forks Creek to Black Hawk and switch at Black Hawk</p></div>	
Made <u>Complete</u>	Time <u>12:00</u> Mountain Time

The above train order gives permission for Engine #70 to run from Forks Creek to Black Hawk and permission to switch at Black Hawk. The train order number being 2 means it is the second train order issued on the Subdivision on that day. Running as an extra means it is not a scheduled train in the timetable. Most freight trains on the line always run as Extras as they were not in the timetable. If a train is running as an extra White Flags must be displayed (use the Y key). Made complete and the time mean the train order was officially made complete by the operator at that time. The form specifies the time zone as the Colorado and Southern parent company the Chicago Burlington and Quincy operated in multiple time zones.

Each Depot with an active telegraph office and operator has a semaphore indication. This can be either White or Red with a coloured light above. The semaphores are shown below.



A Red indication means that the train must stop for a new train order. Even if the train has a train order beyond the depot with the red indication it means it has been cancelled and the train must stop to pick up a new a train order. A white train order means the train is free to continue with its existing train order.

Signage



A slow signs means a reduction in the line speed. The speed can be checked by using the F3 or H4 HUD in most cases this would be 5mph.



Milepost Marker

Credits

Route and rolling stock created by Jonathan Lewis. Train physics and simulation by Bill Hobbs, Standard Gauge for Golden rolling stock provided by Michael Stephan. Some assets provided by Dove Tail Games. Thanks goes to Edward Gate and Simon Sauntson at Dove Tail Games for their help with project.