

Computerised Switching

Introduction

The Switcher program generates switching moves for a model railroad based on the information supplied about freight cars, loads carried and locations visited. The moves can be printed out in switchlist format or in a simplified car card/waybill style.

| Trip | Loco | Location | Car | Type | Load | Direction | Remarks |
|------|---------|---------------------|-------------|--------|------------------|-----------|------------------------|
| | | Can-Freeze Food Co. | UTLX White | Tank | Empty | Held | |
| | | Will's Print Shop | SP 40ft 3 | Box | Printed matter | Held | |
| | | Sorrento Eng | ATSF 40ft | Box | Empty | Held | |
| | | Napoli Distrib | UTLX Black | Tank | Fuel oil | Held | |
| | | Big Baddy Scrap | CR Black | Gon | Scrap metal | Held | |
| | | Team Track | CN Brown | Hopper | Empty | Held | |
| 1 | SP 5602 | Can-Freeze Food Co. | UTLX White | Tank | Empty | Out | To Corny Produce |
| | | Will's Print Shop | SP 40ft 3 | Box | Printed matter | Out | To Pulpny Publishing |
| | | Sorrento Eng | ATSF 40ft | Box | Empty | Out | To Interchange |
| | | Napoli Distrib | SP 40ft 2 | Box | Consumer goods | In | From Sparks Electrical |
| | | | UTLX Black | Tank | Fuel oil | Out | To Slick Oil |
| | | Big Baddy Scrap | ATSF Blk/ye | Gon | Empty | In | From Interchange |
| | | | CR Black | Gon | Scrap metal | Out | To Irons Metalworks |
| | | Team Track | UTLX Blue | Tank | Sodium Hydroxide | In | From Stinky Chemicals |
| | | | CN Brown | Hopper | Empty | Out | To Interchange |
| 2 | SOO 322 | Will's Print Shop | SP 40ft 3 | Box | Empty | In | From Interchange |
| | | Sorrento Eng | ATSF 40ft | Box | Eng components | In | From Metallic Co |
| | | Napoli Distrib | UTLX Black | Tank | Fuel oil | In | From Slick Oil |
| | | | SP 40ft 2 | Box | Empty | Out | To Interchange |
| | | Team Track | CP Black | Hopper | Gravel | In | From Stony Merchants |
| | | | UTLX Blue | Tank | Empty | Out | To Stinky Chemicals |

| | |
|-----------------------------|--------------------------|
| Car ATSF 40ft | Type Box |
| Trip 1 | |
| From Sorrento Eng | To Interchange |
| Load Empty | |

| | |
|----------------------------------|-----------------------------|
| Car SP 40ft 2 | Type Box |
| Trip 1 | |
| From Sparks Electrical | To Napoli Distrib |
| Load Consumer goods | |

The individual columns can be resized, or in some cases hidden, and printed out in landscape or portrait format. There is also a wide format where pickup and set down details are shown in separate columns:

| Trip | Loco | Location | Set Down | Type | Load | From | Pick Up | Type | Load | To |
|------|---------|---------------------|-------------|--------|------------------|-------------------|-------------|--------|----------------|------------------|
| | | Can-Freeze Food Co. | UTLX White | Tank | Empty | Held | | | | |
| | | Will's Print Shop | SP 40ft 3 | Box | Printed matter | Held | | | | |
| | | Sorrento Eng | ATSF 40ft | Box | Empty | Held | | | | |
| | | Napoli Distrib | UTLX Black | Tank | Fuel oil | Held | | | | |
| | | Big Baddy Scrap | CR Black | Gon | Scrap metal | Held | | | | |
| | | Team Track | CN Brown | Hopper | Empty | Held | | | | |
| 1 | SP 5602 | Can-Freeze Food Co. | | | | | UTLX White | Tank | Empty | Corny Produce |
| | | Will's Print Shop | | | | | SP 40ft 3 | Box | Printed matter | Pulpy Publishing |
| | | Sorrento Eng | | | | | ATSF 40ft | Box | Empty | Interchange |
| | | Napoli Distrib | SP 40ft 2 | Box | Consumer goods | Sparks Electrical | UTLX Black | Tank | Fuel oil | Slick Oil |
| | | Big Baddy Scrap | ATSF Blk/ye | Gon | Empty | Interchange | CR Black | Gon | Scrap metal | Irons Metalworks |
| | | Team Track | UTLX Blue | Tank | Sodium Hydroxide | Stinky Chemicals | CN Brown | Hopper | Empty | Interchange |
| 2 | SOO 322 | Will's Print Shop | SP 40ft 3 | Box | Empty | Interchange | | | | |
| | | Sorrento Eng | ATSF 40ft | Box | Eng components | Metallic Co | | | | |
| | | Napoli Distrib | UTLX Black | Tank | Fuel oil | Slick Oil | SP 40ft 2 | Box | Empty | Interchange |
| | | Team Track | CP Black | Hopper | Gravel | Stony Merchants | UTLX Blue | Tank | Empty | Stinky Chemicals |
| 3 | SP 5602 | Can-Freeze Food Co. | UTLX White | Tank | Corn syrup | Corny Produce | | | | |
| | | Will's Print Shop | SRY 50ft | Box | Ink & chemicals | Inky Products | SP 40ft 3 | Box | Printed matter | Pulpy Publishing |
| | | Sorrento Eng | CR Brown | Flat | Steel | Irons Metalworks | ATSF 40ft | Box | Empty | Interchange |
| | | Big Baddy Scrap | CR Black | Gon | Empty | Interchange | ATSF Blk/ye | Gon | Scrap metal | Irons Metalworks |

A Quick Start

To generate a quick switchlist based on the sample data provided, select Dataset 3 from the Options screen then click the New Sequence button.

To see how the sample data is set up, click Edit Data and use the tabbed screens to view the car types, cars, loads, locations and locos in the sample dataset.

To start entering data of your own, select Dataset 1 or Dataset 2 from the Options screen, then click Edit Data and used the tabbed screens as described below.

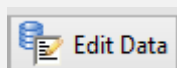
Main Screen

| Trip | Loco | Location | Set Down | Type | Load | From | Pick Up | Type | Load | To |
|------|---------|---------------------|-------------|--------|------------------|-------------------|------------|--------|----------------|---------------------|
| | | Can-Freeze Food Co. | SP 40ft 1 | Box | Empty | Held | | | | |
| | | Will's Print Shop | SRY 50ft | Box | Empty | Held | | | | |
| | | Napoli Distrib | UTLX Black | Tank | Fuel oil | Held | | | | |
| | | Big Baddy Scrap | ATSF Blk/ye | Gon | Scrap metal | Held | | | | |
| | | Team Track | CP Black | Hopper | Empty | Held | | | | |
| 1 | SOO 322 | Can-Freeze Food Co. | PC 40ft | Reefer | Chilled foods | Cool Comestibles | SP 40ft 1 | Box | Empty | Interchange |
| | | Will's Print Shop | CR 50ft | Box | Newsprint | Rolly Paper Co. | SRY 50ft | Box | Empty | Interchange |
| | | Sorrento Eng | UTLX Black | Tank | Fuel oil | Napoli Distrib | | | | |
| | | Napoli Distrib | | | | | UTLX Black | Tank | Fuel oil | Sorrento Eng |
| | | Team Track | UTLX Blue | Tank | Sodium Hydroxide | Stinky Chemicals | CP Black | Hopper | Empty | Interchange |
| 2 | SOO 322 | Will's Print Shop | SP 40ft 3 | Box | Empty | Interchange | CR 50ft | Box | Empty | Rolly Paper Co. |
| | | Sorrento Eng | | | | | UTLX Black | Tank | Fuel oil | Napoli Distrib |
| | | Napoli Distrib | UTLX Black | Tank | Fuel oil | Sorrento Eng | | | | |
| | | Team Track | CP Black | Hopper | Gravel | Stony Merchants | UTLX Blue | Tank | Empty | Stinky Chemicals |
| 3 | CR 9359 | Can-Freeze Food Co. | SP 40ft 1 | Box | Cans & packaging | Packan Products | PC 40ft | Reefer | Empty | Interchange |
| | | Will's Print Shop | SRY 50ft | Box | Ink & chemicals | Inky Products | SP 40ft 3 | Box | Printed matter | Pulpy Publishing |
| | | Sorrento Eng | CR Brown | Flat | Steel | Irons Metalworks | | | | |
| | | Off-spot | CN Brown | Hopper | Sand | Stony Merchants | CP Black | Hopper | Gravel | Hold - unloading |
| 4 | BO 6575 | Sorrento Eng | CR Black | Gon | Empty | Interchange | CR Brown | Flat | Empty | Irons Metalworks |
| | | Napoli Distrib | SP 40ft 2 | Box | Consumer goods | Sparks Electrical | UTLX Black | Tank | Fuel oil | Slick Oil |
| | | Team Track | CN Brown | Hopper | Sand | Stony Merchants | CP Black | Hopper | Empty | Interchange |
| 5 | BO 6575 | Sorrento Eng | | | | | CR Black | Gon | Engineering FG | Crafty Construction |
| | | Team Track | UTLX White | Tank | Corn syrup | Corny Produce | CN Brown | Hopper | Empty | Interchange |
| 6 | SP 5602 | Off-spot | CSXT 60ft | Box | Dry goods | Feedall Co. | SP 40ft 2 | Box | Consumer goods | Hold - unloading |
| | | Team Track | CN Brown | Hopper | Gravel | Stony Merchants | UTLX White | Tank | Emotv | Corny Produce |

The main screen shows the most recently generated switchlist underneath a set of options. Initially, of course, this screen will be blank.

All options are also available via the menu or, in some cases, via function keys.

The first thing to do is to set up some data.

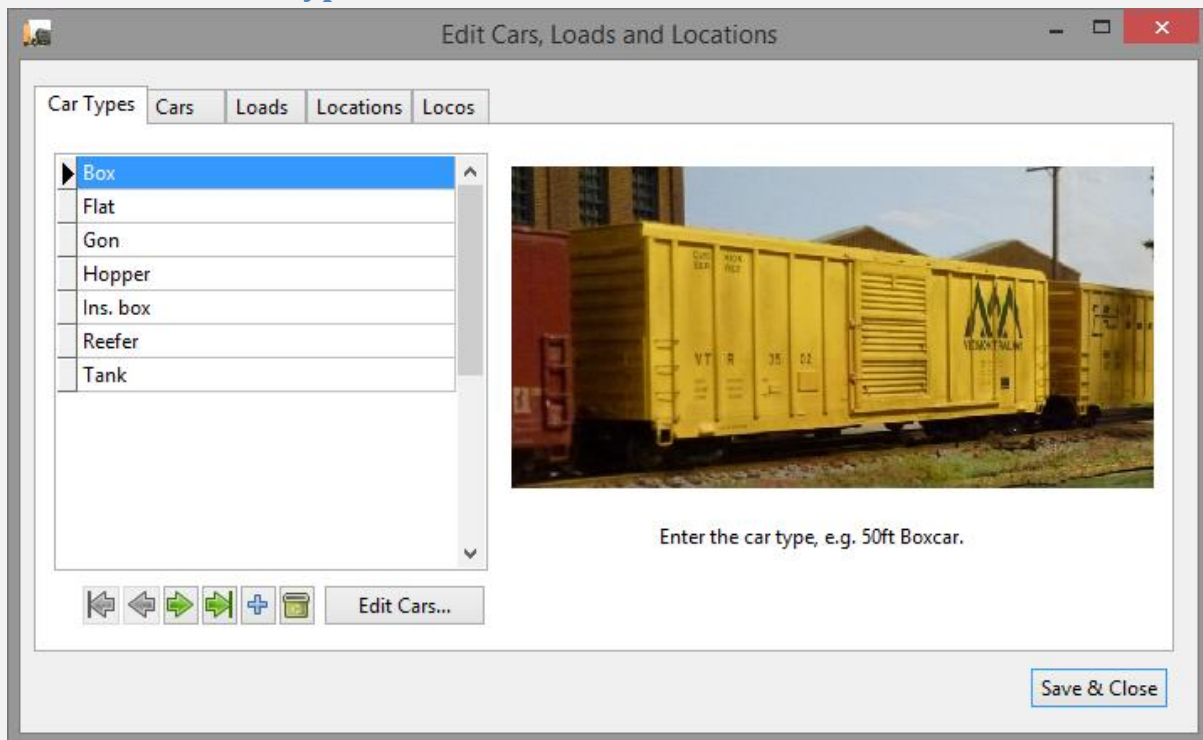


The edit screen is accessed via the Edit Data button, via the Edit menu or by pressing F2. It allows you to specify cars, car types, loads, locations and optional locos using a series of tabs. There are limits to the lengths of the data but subject to this, entries can be as descriptive or as concise as you like.

On each tabbed display, use the + button to insert a new record, the button with the bin icon to delete a record, and the arrow buttons, mouse or keyboard to navigate up and down.

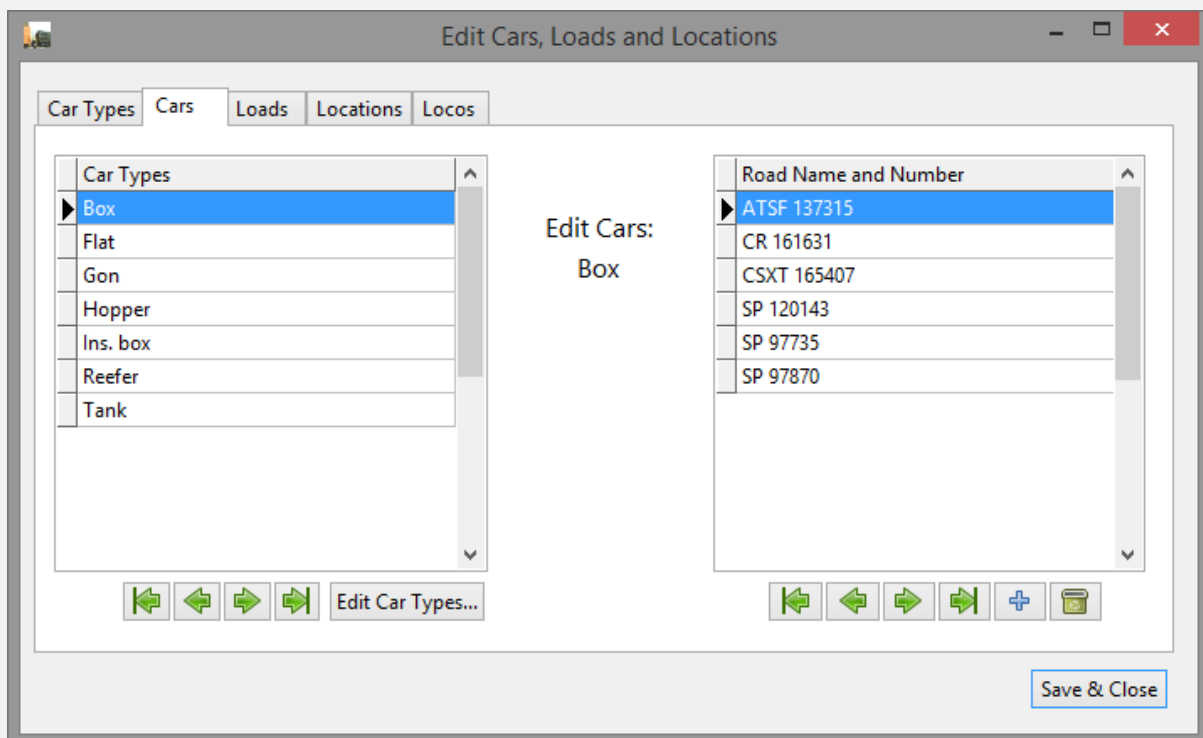
Linked screens enable you to allocate cars to loads, and loads to locations. (Note that there is no direct link between cars and locations – they are linked to each other via the loads).

Edit Screen – Car Types and Cars

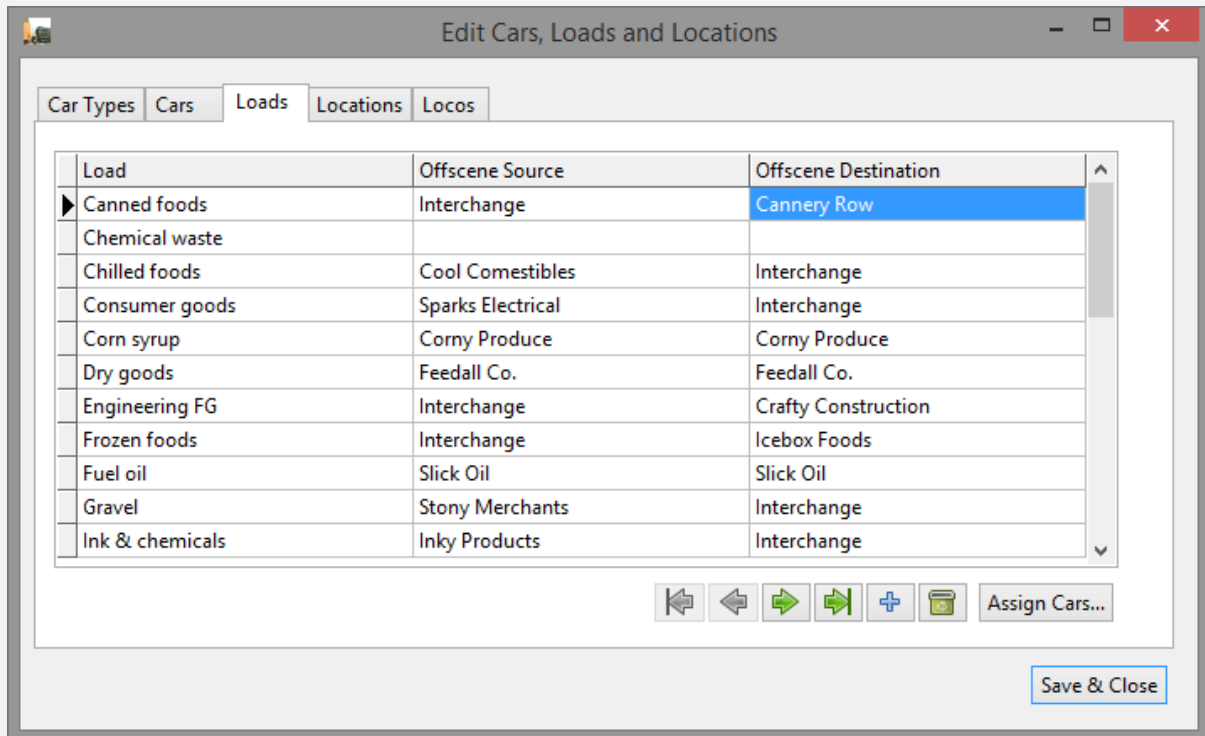


The first tab on the edit screen allows you to enter car types.

Having entered the car types, switch to the second tab or click Edit Cars... to enter individual road names and numbers for each car type.

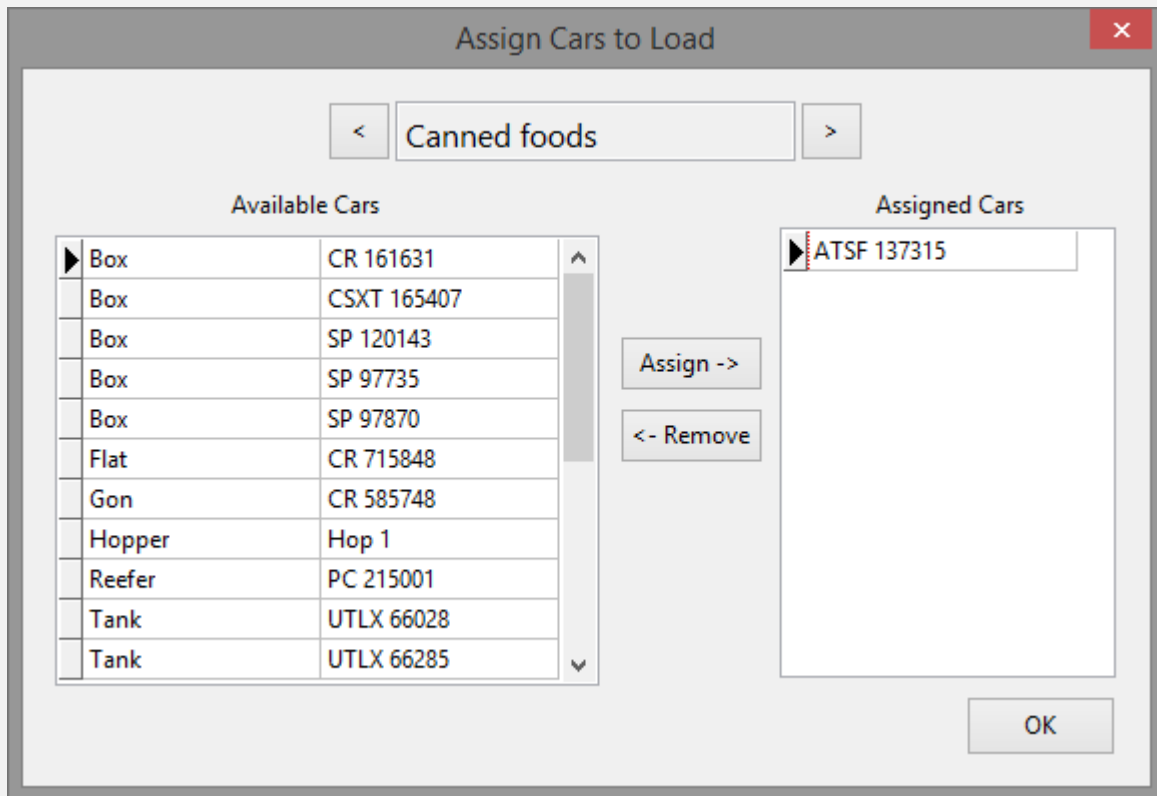


Edit Screen - Loads



The third tab on the edit screen allows you to enter loads and, optionally, their offscene source and destination. These offscene locations are notional, representing a nominal supplier and customer, and will typically be represented by a storage or fiddle yard.

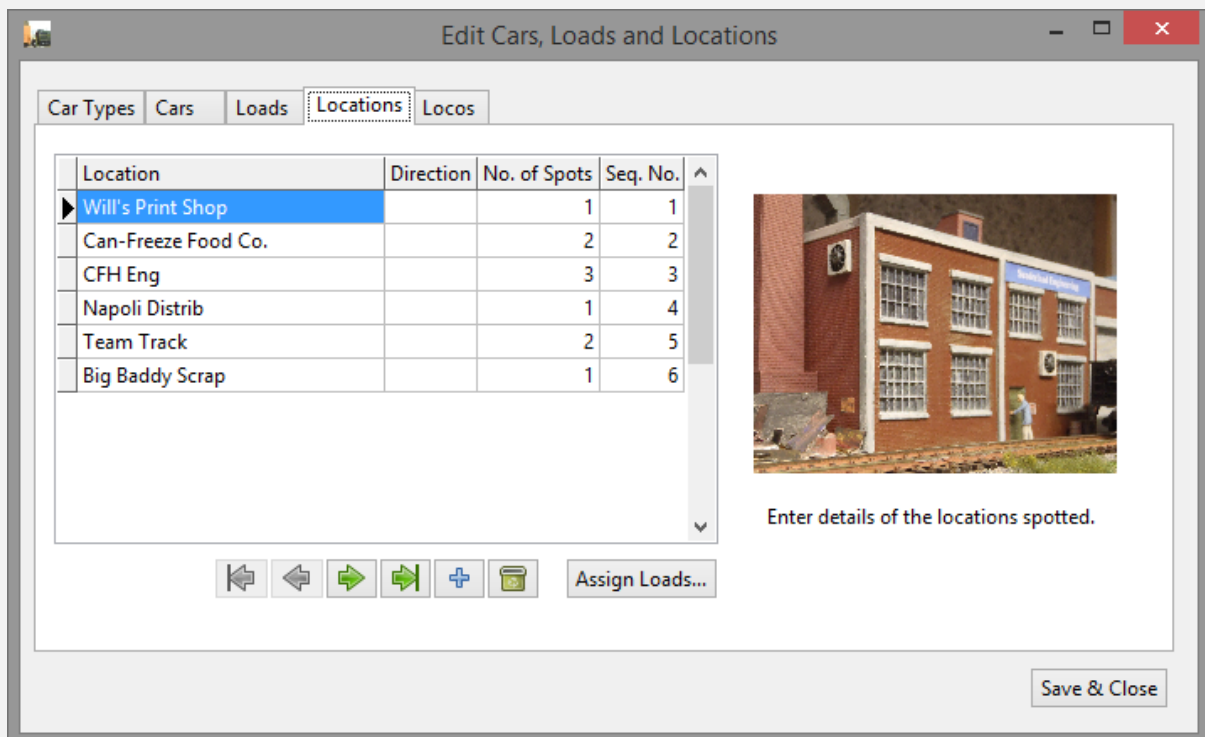
From this tab the Assign Cars... button brings up another screen to assign individual cars to each load. Use the left and right arrow buttons at the top to scroll through the loads, and the Assign and Remove buttons to allocate or deallocate cars as required.



You can assign the same car to more than one load.

All cars for a given load will be ordered randomly before the sequence starts, and if there is more than one trip or spot for that load the cars will be cycled through in the order generated.

Edit Screen – Locations



The fourth tab allows you to enter the spot locations. Typically, a location will equate to one of the industries on your layout or, in the case of a large industry, perhaps a part of the industry dealing with a particular type of car or load.

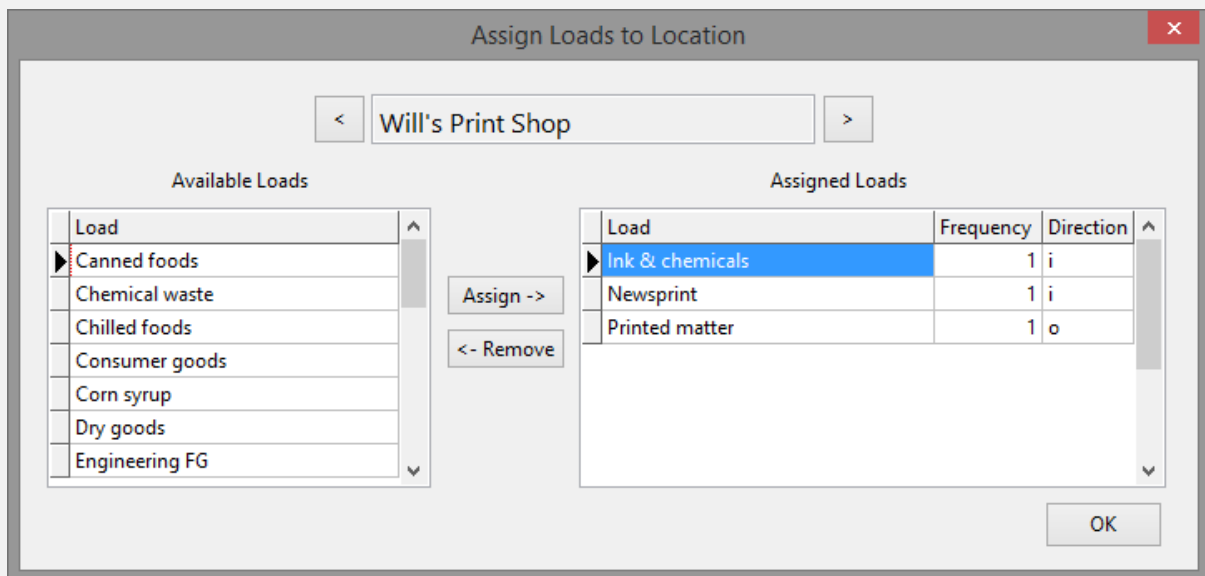
Optionally, a direction (1 or 0) for each location can be specified, for use with the “Split directions” option on the main screen. This specifies the direction of travel of the train relative to the location and, if used, each location is visited on alternate (same direction) trips only.

The number of spots at each location can be entered. If no figure is entered, one spot is assumed.

Each location can be assigned a sequence number or spot order, and any such locations will be listed on the switchlist in that order for a given trip. Any locations not assigned a spot order will be listed after the sequenced ones in alphabetical order.

If “Reverse direction each trip” on the Options screen is selected, on alternate trips locations will be listed in reverse spot order or reverse alphabetical order as appropriate.

From the Locations tab, click Assign Loads... to allocate loads to each location. Use the Assign and Remove buttons to allocate or deallocate loads from the list on the left as required.



Each load can have a frequency and direction (not to be confused with the location’s direction, above) assigned to it.

Frequency is the number of times each load will be spotted at a particular location over the series of trips in the switching sequence. Loads cannot be allocated for delivery on specific days, but you can think of the frequency as days or trips, so if all loads at all locations have a frequency of 1, they will all be spotted once during the switching sequence. But by changing the frequency, you can stretch the sequence out to cover a number of days or trips.

Fractions are catered for to introduce variety to the number of times a load is spotted. For example, 0.5 means there will be a 50-50 chance the load will be dealt with, 0.8 will give the

load an 80 percent chance of being delivered, and 2.5 will mean there will be either two or three deliveries in the sequence. If a frequency is not specified, 1 will be assumed.

Direction specifies the direction of the load as seen from the perspective of the industry. Letter o (not number zero) means outbound, i.e. the car is spotted empty and returns loaded, and letter i (not number one) means inbound, i.e. the car is spotted loaded and returns from its spot location empty. If a direction is not specified the load will be assumed to be inbound.

As an alternative, x can be entered for the load direction. This means the car remains in an indeterminate state, e.g. in the case of a tank car delivering oil to more than one location and being considered neither full nor empty at any particular time.

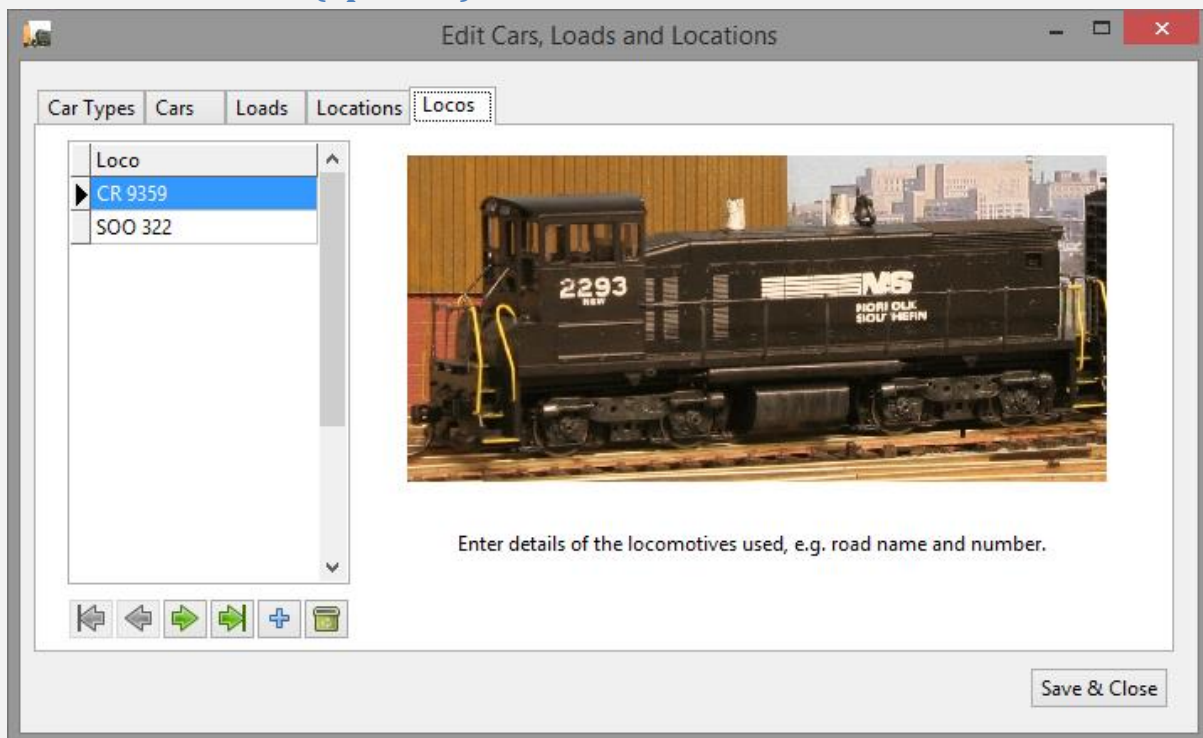
Direction can be entered in upper or lower case.

The same load can be assigned to more than one location.

Paired Locations

The direction column can also be used to 'force' a car from one location to another, where a load needs to be transferred between them. If the sequence number of the second location is entered into this column, the car will be spotted empty at the first location, then 'loaded' and moved to the second location on a subsequent trip. This type of operation won't work for a chain of more than two spots.

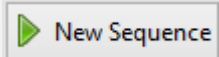
Edit Screen - Locos (optional)



The fifth tab allows you to specify optional locos. Each trip, a loco will be chosen at random from the list.

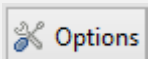
If you enter a loco list but choose not to use it, you can suppress the loco column on the switchlist (see below).

Main Screen

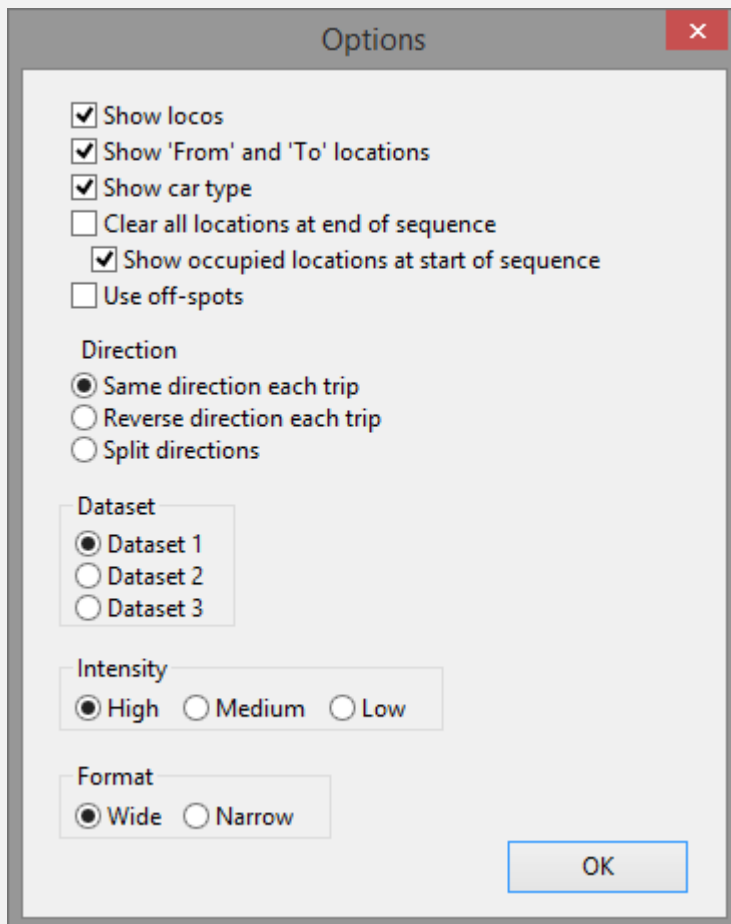


Once you are happy with your data, click the New Sequence button on the main screen to generate the switching moves. Each click of the New Sequence button will produce a new list of moves based on the current operating and display options. The moves will be spread over one or more trips depending on the number of loads and the frequency options chosen for each load/location combination.

The columns widths of the switchlist can be changed to suit the data, and will be saved on exit. Thus, if you have given your cars, loads or locations very short descriptions, you can narrow the columns right down, and vice versa.



Clicking the Options button, selecting Options from the File menu or pressing F11 will show the Options screen:

A screenshot of the "Options" dialog box. The dialog has a title bar with "Options" and a close button (X). The content area contains several sections of controls:

- Show locos**: Show locos
- Show 'From' and 'To' locations**: Show 'From' and 'To' locations
- Show car type**: Show car type
- Clear all locations at end of sequence**: Clear all locations at end of sequence
- Show occupied locations at start of sequence**: Show occupied locations at start of sequence
- Use off-spots**: Use off-spots
- Direction**:
 - Same direction each trip
 - Reverse direction each trip
 - Split directions
- Dataset**:
 - Dataset 1
 - Dataset 2
 - Dataset 3
- Intensity**: High Medium Low
- Format**: Wide Narrow

An "OK" button is located at the bottom right of the dialog.

Hiding Unwanted Columns

In addition to adjusting any of the column widths, the columns showing locos, 'From' and 'To' locations, and car type can all be hidden if desired, in which case they will not be shown or printed.

Continuity

Some cars may be left spotted at the end of a sequence and, if the checkbox entitled “Clear all locations at end of each sequence” is left unticked, they will start the next sequence from the same spots.

If the ‘Show occupied locations at start of sequence’ box is checked, cars left spotted at the end of the previous sequence will be listed on a cream background at the top of the next sequence before Trip 1.

Off-spots

If the “Use off-spots” box is checked, the switch list will randomly bring a car onto the layout before its destination spot has been vacated, and you will have to find a temporary spot for it. In this case the spot location will read “Off-spot” and the car at the final destination will show on the next line as being held. The move will be completed next trip.

Direction Options

There are three options for travel direction.

Same direction each trip: typically for single track layouts with one staging yard which the trains originate from and return to.

Reverse direction each trip: for use where all locations are visited both ways, e.g. on a layout with a fiddle yard at both ends.

Split directions: where some locations are spotted from one direction and others from the opposite direction, e.g. for industries on opposing spurs, or either side of a double track. This option uses the direction indicators on the Locations edit screen. If you find cars are being spotted in the wrong direction, simply flip the indicators round.

The direction indicators are ignored for the first two direction options.

Datasets

You can switch between up to three different datasets by clicking the appropriate option button.

The dataset currently in use will be shown in the title bar of the main screen.

All of the options specific to each dataset, including column widths set manually, will be saved on exit. The current switchlist will be saved too and re-loaded next time unless you switch datasets in the meantime.

The datasets have a .db3 suffix. They are stored in your documents folder in a sub-folder called Switcher20.

Data in any of the datasets, including the sample data in Dataset 3, can be deleted by using the Clear All Data button.

Intensity

Intensity of operations can be set to high, medium or low. With high, all spots are made as early as possible. With medium and low, the spots are more spread out in random fashion over more trips.

Format

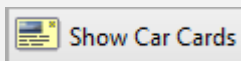
Wide format shows pickups to the right of spots, producing a wider screen. Narrow format shows pickups underneath spots, producing a narrower screen. These options are also available from the View menu or by pressing F6 or F7 respectively.

In wide format, rows are coloured grey and white alternatively. In narrow format, spots are in green and pickups are in grey.

Summary of Manoeuvres per Trip

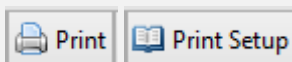
The program will generate some or all of the following types of manoeuvre depending on how you have set up your data.

1. To one spot location and back to storage. Loaded cars are unloaded at their destination and vice versa.
2. To one or more spot locations before returning. Load direction can be unspecified (x). If load direction is specified, loaded status will alternate, e.g. a car starting off loaded will be emptied at the first location, loaded at the second location etc. The car may be returned to storage in between. Locations can be paired such that a car will be sent empty to the first for 'loading' and then to the second for 'unloading' on the next trip.
3. Randomly, to off-spots where the destination is still occupied (if this option is chosen). The car will be moved to its destination next trip.



Clicking the Show Car Cards button will show the moves in a basic car card/waybill style for cutting out, six per A4 or Letter page. The car cards are colour-coded depending on whether the move is a spot or a pickup. The cards are taken directly from the switchlist, so the trip number is not car-specific, as it would be on a standard multi-cycle waybill.

The car cards can also be printed via this screen.



The switchlist and car cards will be printed pretty much as seen on-screen. For the switchlist, the user-selected column widths will be used.

The Print Setup button can be used to choose printer, paper size etc., and landscape or portrait format, but the car cards should be printed on A4 or Letter paper in portrait format.

If the switchlist is too wide for the selected page format, you will be given the option to cancel.

Show All Links

| Car type | Road name/number | Spot location | Spot Order | Load | Direction | Source | Destination | Frequency |
|----------|------------------|---------------------|------------|------------------|-----------|-------------------|---------------------|-----------|
| Box | ATSF 137315 | Can-Freeze Food Co. | 2 | Canned foods | o | Interchange | Cannery Row | 1 |
| Box | CR 161631 | Will's Print Shop | 1 | Newsprint | i | Rolly Paper Co. | Rolly Paper Co. | 1 |
| Box | CR 161631 | Will's Print Shop | 1 | Printed matter | o | Interchange | Pulpy Publishing | 1 |
| Box | CSXT 165407 | Team Track | 5 | Consumer goods | i | Sparks Electrical | Interchange | 1 |
| Box | SP 120143 | CFH Eng | 3 | Engineering FG | o | Interchange | Crafty Construction | 1 |
| Box | SP 120143 | Napoli Distrib | 4 | White goods | i | Sparks Electrical | Interchange | 1 |
| Box | SP 120143 | Will's Print Shop | 1 | Ink & chemicals | i | Inky Products | Interchange | 1 |
| Box | SP 97870 | Napoli Distrib | 4 | Dry goods | i | Feedall Co. | Feedall Co. | 2 |
| Flat | CR 715848 | CFH Eng | 3 | Sheet metal | i | Irons Metalworks | Irons Metalworks | 1 |
| Flat | CR 715848 | CFH Eng | 3 | Steel rods | i | Irons Metalworks | Irons Metalworks | 1 |
| Gon | CR 585748 | Big Baddy Scrap | 6 | Scrap metal | o | Interchange | Irons Metalworks | 4 |
| Gon | CR 585748 | CFH Eng | 3 | Engineering FG | o | Interchange | Crafty Construction | 1 |
| Hopper | Hop 1 | Team Track | 5 | Gravel | i | Stony Merchants | Interchange | 1 |
| Reefer | PC 215001 | Can-Freeze Food Co. | 2 | Chilled foods | i | Cool Comestibles | Interchange | 2 |
| Reefer | PC 215001 | Can-Freeze Food Co. | 2 | Frozen foods | o | Interchange | Icebox Foods | 1 |
| Tank | UTLX 66028 | CFH Eng | 3 | Fuel oil | i | Slick Oil | Slick Oil | 1 |
| Tank | UTLX 66028 | Napoli Distrib | 4 | Fuel oil | o | Slick Oil | Slick Oil | 1 |
| Tank | UTLX 66285 | Team Track | 5 | Sodium Hydroxide | i | Stinky Chemicals | Stinky Chemicals | 1 |
| Tank | UTLX 85709 | Team Track | 5 | Corn syrup | i | Corny Produce | Corny Produce | 1 |

This screen shows all possible combinations of cars, loads and locations allocated. Of course, not all of these will necessarily be used on a given run. The data can be sorted by any of the columns, ascending or descending, to facilitate checking that you have set up your data as desired.

Reset Column Widths

This button restores the default column widths if they have been changed manually.

Clear All Data

If you want to make a fresh start, or delete the sample data, this button will clear all data in the currently selected dataset. This is a pretty drastic thing to do so you are advised to make a backup copy beforehand of the data (.db3) files in the Switcher20 sub-folder of your Documents folder.

If you have any queries on operating the program, or would like to suggest improvements, feel free to contact me at showerydan@live.com

Rod Shaw, 2020