Advanced Ops for the Layout Designer

INTRODUCTION TO ADVANCED OPS DESIGN

Designing an Advanced Ops scenario for your layout starts with planning your railroad commerce system, placing and labeling your industries, yards and staging tracks, and positioning the appropriate car types at the various industries and yards.

The next step is to open "Ops Central" and provide the details of all the locations on your layout, followed by information about the products to be shipped and/or received by your industries. You will also need to plan an effective operating sequence for the trains which will be needed to complete these tasks.
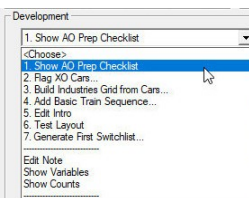

The initial data entry process has been automated and can be actioned from a short menu on the Advanced Tab of Ops Central. After this basic data has been created you will need to fine tune the information to achieve the desired result.

When you are satisfied with the stored data you can "Generate the first Switchlist" and save the Ops Ready version of the layout.

Ops Central also includes additional tools to assist with the task of upgrading earlier style TrainPlayer Ops layouts to the AO system.

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ADDING AN OPS LAYER TO EASTON-WESTON
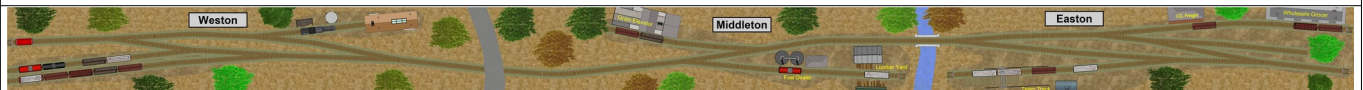
Easton-Weston is a Tutorial Layout specifically designed for this Step by Step Guide to preparing a layout for Advanced Operations.

Start by loading the layout:

Easton-Weston.rrw

which can be found in your chooser here:

Trainplayer/Layouts/Advanced Ops Layouts/Tutorials/

There may be several versions of Easton-Weston available and you should take care **not to load** a copy which includes the **_ao** suffix in its filename. We need the raw original copy.

Easton-Weston is a short line which connects the small town of Easton with a Class 1 railroad at Weston. The period is the mid 1940's and the railroad is suffering from the growth of road traffic. Rail Traffic to and from Easton and Middleton originates from a Staging Area close to the main line at Weston. Traffic is extremely light as the railroad is in decline and we will only be handling about five inbound and five outbound cars each day.
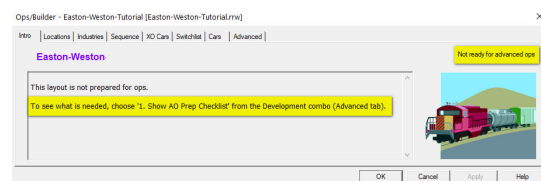
OK that's enough waffle for now. Eyes down, look in and let's get started.

Click the OC button on the Ops Toolbar to launch Ops Central.
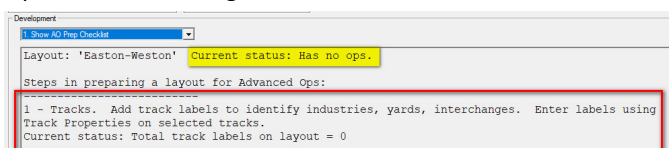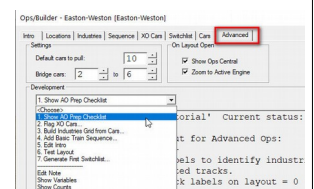
As this layout is not yet Ops ready you will see instructions on the OC Introduction Page on how to proceed.
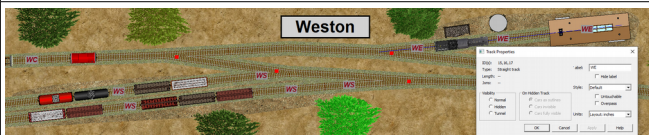

Select the Advanced tab and use the Development Menu to select **Show AO Prep Checklist**.

The Prep Checklist explains the eleven steps needed to set up an Ops scenario, starting with:

We will discuss the other steps as we come to them.

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Step 1. ADD TRACK LABELS - Add Labels to the Industries, Yards and Staging Tracks (using the Track Properties dialog).


Here we have already labeled the Staging tracks at WS and the Caboose Track at WC (this isn't the Water Closet) and we have just added our labels to the three Engine Tracks at WE.

Use the track selection tool to highlight one or more tracks to represent a single location, then right click on any one of the highlighted tracks and select Properties from the Context Menu. Then add a simple two or three character alphabetic or alpha numeric code to the 'Label' field in the top right corner of the Track Properties dialog.

Track Labels can be alphabetic, alpha-numeric or numeric-alpha, but not solely numeric.

Each code used should be short enough to also be displayed on the top of a car as a destination label.
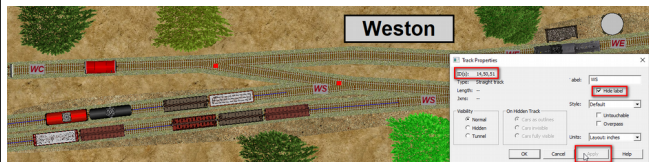

The label entered in the Track Properties dialog will be applied to all the highlighted tracks when you click the Apply button.

Each track which forms part of the same location must have the same label code but it is acceptable to tick the "Hide label" box for some tracks to reduce the number of track labels displayed.

The WS Staging at Weston was displaying labels for five tracks. We only need to see a label at the entry point onto the track so in the image above we have highlighted three of the Staging tracks, placed a check mark in the "Hide Label" box of Track Properties and clicked the Apply button to leave only the labels at the entry point to the tracks on display.

Note that you can also make use of the Split Track option on the Track Context menu to provide a short section of labeled track close to the entry point into a siding or spur. There are five tracks labeled WS but only two are displaying the label.

TrainPlayer 7.2 introduced an even easier way to control the display of these track labels. Just right click on the relevant track segment and either remove or add a check mark to the Show Label line.
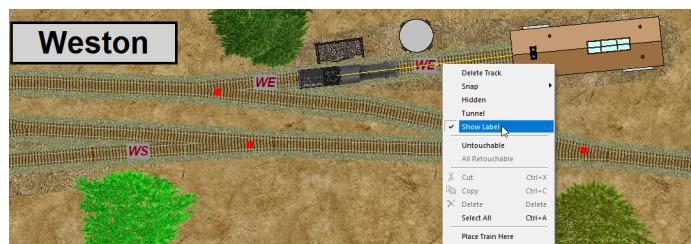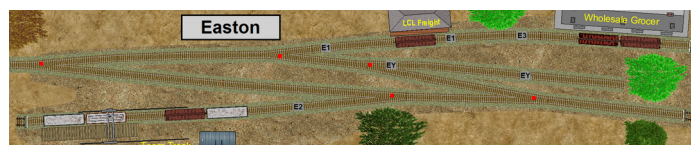
Here we have already hidden the WE label on the hidden track in the engine shed and we are about to hide the label in front of the Water Tank. This still leaves us with one label visible which is enough to identify this track during Ops.

Repeat this same procedure for every industry, yard and staging area on your layout.
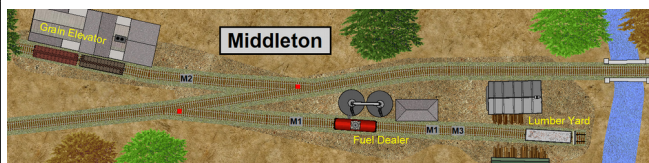
There is no run round loop at Middleton so the Industries have been labeled with an Alpha-numeric label to identify whether they should be serviced by an Eastbound train (Even number) or a Westbound train (Odd number). This is not an essential convention but it just suited our purpose to do it this way.

The Industries at Easton have used the same naming convention as those at Middleton. This is not essential but we like to be consistent. There is also a single Classification Yard track at Easton which we have labeled as EY.

If we reopen Ops Central and take a peek at the Locations Tab we will see that this has already started to be filled with data based on the edits we have made to the Track Properties.

It's good to see that something is happening but we are getting ahead of ourselves here. Editing the Locations Grid data is our next task which comes in Step 2.

ID	Locale	Track	Class	VacantSpots
1	E1	E1	industry	1
2	E2	E2	industry	1
3	E3	E3	industry	1
4	EY	EY	industry	1
5	M1	M1	industry	1
6	M2	M2	industry	1
7	M3	M3	industry	1
8	WC	WC	industry	1
9	WE	WE	industry	1
10	WS	WS	industry	1

This might be a good time to Save the layout so that we can carry on from this point in a later session. In case you are reading this without following the steps in TrainPlayer we have already placed a copy of the layout with the progress so far in the **TrainPlayer/Layouts/Advanced Ops Layouts/Tutorials/** folder with the filename **Easton-Weston_ao1.rrw**.

We will explain the meaning of this grid information and what you need to do to edit it in Step 2.

This will enable you to load this file and follow on with the Tutorial in the next session.

Step 2. EDIT LOCATIONS GRID - Provide names and types for all the labeled tracks.

AO Waybills are only generated in Staging or Interchanges. All car movements must therefore start and end in either Staging or Interchange areas. So to function effectively an AO layout <u>must have</u> at least one Staging or Interchange area plus several industries. As the program is unable to identify which of the track labels were intended to be Staging the Locations Tab will initially classify all your labeled tracks as Industries. You will therefore need to reclassify at least one of these Industry tracks as Staging (or Interchange). Tracks can also be marked as Classification Yards or XO reserved tracks, these are optional and are only added at the discretion of the designer, these track classes will be referred to separately later in this Tutorial.

If you are working through this Tutorial with us, open the saved file **Easton-Weston_ao1** which you will find in the **Advanced Ops Layouts/Tutorials/** folder.

[OC] Open Ops Central, go to the Advanced Tab and take another look at **Show AO Prep Checklist**.
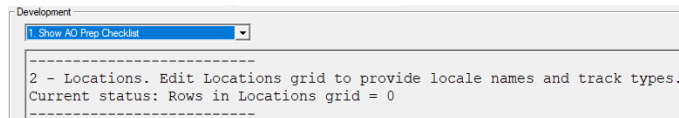
Select the Locations Tab to edit the generated data.
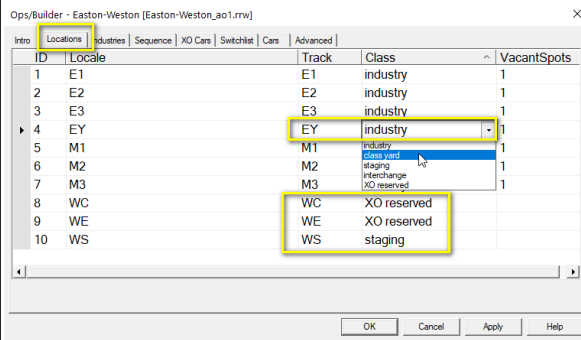
Edit the Class Column to Identify tracks which are <u>not</u> Industries.

Identify the track label(s) which will be used as Staging, select the cell in the Class column and use the combo menu to change the track class to Staging. Repeat this for any tracks that are intended for use as Interchanges, Class Yards or XO reserved tracks.

In our Easton-Weston example on the left the WS tracks at Weston have already been marked as Staging to service the Industries on our layout. The WE engine track and the WC caboose track have both been marked as XO reserved and we are just in the process of marking the EY track at Easton as a Class Yard. All other locations remain as Industries. There are no Interchanges used on this layout.
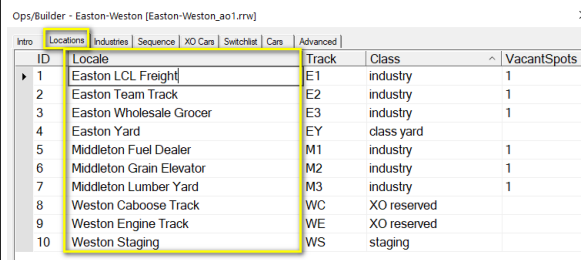
Edit the Locale Column to provide Names for your locations.

You should edit the Locale column to give meaningful names to all your industries, yards and staging etc.
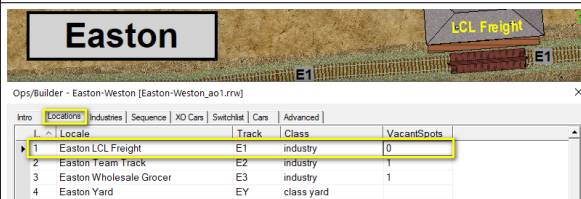
Here we have applied names to all our locations, these names will be used whenever a name is needed to match a specific track label; for example in the Industries tab or on a Waybill. If you subsequently need to adjust a Locale Name you must return to the Locations tab and edit the name here.
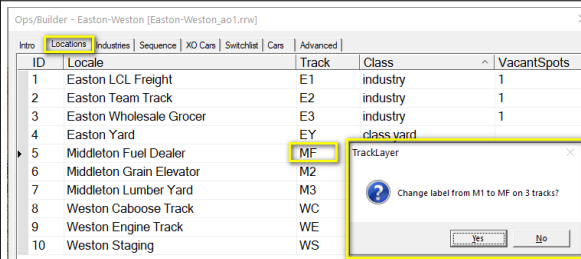
Editing track labels and applying changes to the track Properties.

You can't add new track labels directly to the grid, for that you have to apply a label directly to a track on the layout. You can however change a label simply by editing it in this grid. You will then be asked if you wish to apply the new label to all the tracks which originally used the previous label. A very cool way to relabel tracks on a layout if you change your mind.

Click Yes to relabel the three M1 tracks as MF, but here we click No.

Editing the Vacant Spots Value.

The vacant spots value only applies to Track Labels which are defined as Industries. This will always default to a value of 1 and you will only need to change this in special circumstances. The default value of 1 assumes that when you placed your cars at the various industries you left sufficient space at each location to enable it to accept at least one more car. If you didn't leave enough extra space for another car you will need to edit this VacantSpots value to 0.

The LCL Freight Shed at Easton has ample space for up to three cars but we want to restrict this to only ever allow servicing of a single car at any one time.

We achieve this by setting the Vacant Spots value to 0 so that this location can only ever handle one car (the same as we placed there at the start). If the value was 1 it would take 2 cars, or if the value were 2 it would accept up to 3 cars (i.e. 2 + the car currently present).

Occasionally you may need to increase the VacantSpots value for some of your industries to 2 or more. This should only be necessary if the layout has fewer industries than the number of "Cars to pull".
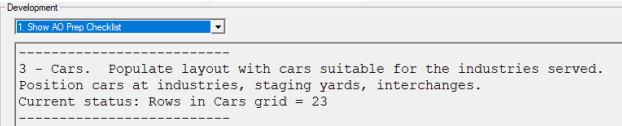
An upward adjustment could also be needed if one of your Staging areas is defined as an Interchange, perhaps a car float, and you want to be sure of finding enough empty spots to unload the boat.

Now might be a good time to save a copy of your progress.

Step 3. PROVIDE CARS TO SERVICE THE INDUSTRIES - Populate the layout with cars suitable for the needs of the Industries.

The needs of the Industries generate the traffic flow for the layout. So the Switchlist Generator works on the assumption that Industries dispatching their loads or returning their unloaded cars to Staging will be repeating these actions on a regular basis. The assumption is that all cars already standing at an industry will require pulling and moving on. After a car has been pulled then at some point that same industry will require a replacement load from Staging (or another empty car to load).

The busiest industries will handle the most cars so the designer only has to select and place his cars at the Industries in the proportions that reflect the ratio of movement required. If industry A has one car at the start of the first switchlist, industry B has two cars and industry C has four cars; then C will generate four times the traffic of A, and twice the traffic of B.

```
Development
1. Show AO Prep Checklist          ▼

---------------------------
3 - Cars.  Populate layout with cars suitable for the industries served.
Position cars at industries, staging yards, interchanges.
Current status: Rows in Cars grid = 23
---------------------------
```

Open your saved file and select **Show AO Prep Checklist** from the Advanced Tab of Ops Central to see what comes next.

If you didn't save your work you can use the prepared layout

Easton-Weston_ao2

which is in your **Advanced Ops Layouts/Tutorials/** folder.

Start by working through all your industries, placing appropriate car types for receiving and shipping the goods handled by the industry.

Once you have populated all your industries with cars you should place additional cars in your Classification Yards, and in the Staging and Interchange areas. Cars in Staging and Interchanges are considered to be elsewhere on the Railroad and available for inbound traffic. **Don't forget to provide at least one engine.**
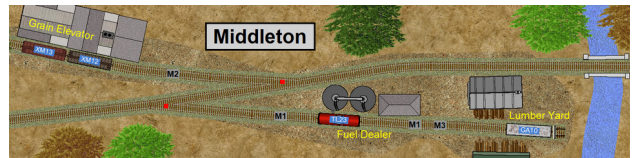
The cars at Easton-Weston are already in position but you should take care when placing cars on your own layouts to ensure that they are only positioned on labeled tracks.

Cars at Industries will be allocated valid waybills or empty car orders when you Generate the First Switchlist (Step 9). You should only place cars at each industry with the AAR types that are appropriate for the anticipated traffic.

Cars in Staging should be a mix of the AAR types used by all your Industries, we would recommend the total number of cars for a Staging area should be around one and a half times the defined "Cars to pull" value but this is not a hard and fast rule. If the first train to visit a Staging area terminates there it is OK to place no cars because the tracks will be populated by cars from the inbound train.

Staging yards can also be used for Divisional Yards or for Interchanges with other railroads. An "on stage" yard with TrainPlayer scenery can also be defined as Staging if you so wish (as per the Staging tracks at Easton Weston).

Cars in Class Yards are initially considered to be on the homeward leg of their journey. These cars will be pulled and returned to Staging. On a layout with only one Staging yard the number of cars should be kept low, but where a layout has several Staging areas these cars will be shared evenly between them over a sequence of several trains.

Cars in Interchanges should be a mix of the same types used by your industries. The number of cars placed in an Interchange should not exceed the "Cars to pull" value.

Cars on XO reserved tracks are considered to be Dedicated Service cars and must have the XO (Exclude Ops) flag set. These cars move under the "Card Order" system without reference to the Waybill Database. XO cars are used for engines, block trains, passenger services etc.(See Step 6).

Once you have placed your cars you can examine the Cars Grid. Sort this by the AAR column and check for any anomalies in the AAR codes of similar but not identical car types.

In our Easton-Weston example one of our six Gondolas has a different AAR code to the other five and our three tank cars each use a different AAR code to the others.

Often it can be advantageous to use different AAR codes to service different industries but this is not helpful here. It would be better to use only one type of Gondola and one type of Tank Car on this layout and AO provides us with a way to do this without needing to search for alternative car images and change the actual cars we have chosen to use.

We can reclassify the GBH Gondola as a GA Gondola (for this layout only) by applying an AarOverride code of GA, this will take effect when we click the Apply button. The TL and TM Tank cars can be converted to type TG to match the other car in the same way.

When we Generate our First Switchlist in Step 9 these new AAR override codes will be automatically applied to the Car ID label.

Using fewer AAR codes reduces the number of entries we will need later in the Industries grid which is helpful for this Tutorial.

AAR Override codes are a powerful tool for controlling traffic. If you have two industries which accept Tank cars, Ind-1 dispatches chemicals and Ind-2 receives fuel; then you can override the original AAR codes on your cars to ensure that a new car type T1 handles the chemicals and T2 handles the fuel. This prevents AO from using a "Mobilgas" car to carry chemicals.

If you are working through this Tutorial you should save your progress so far.

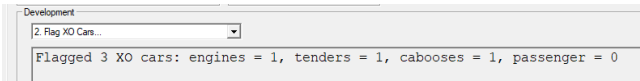| Step 4.	SET UP ROUTING DATA FOR XO CARS - Flag the Dedicated Service Cars and edit the XO cars grid.

Open your saved file and select **Show AO Prep Checklist** from the Advanced Tab of Ops Central. Alternatively you can use the prepared layout **Easton-Weston_ao3** which is in your **Advanced Ops Layouts/Tutorials/** folder.


```
Development
1. Show AO Prep Checklist                    ▾

4 - XO Cars. Flag cars to be used for dedicated service. Use 'Flag XO Cars'
to flag all engines and passenger cars; to flag a freight car, right-click and
check 'Excluded from Ops' under Car Data.
Current status: Rows in XO Cars grid = 0
```
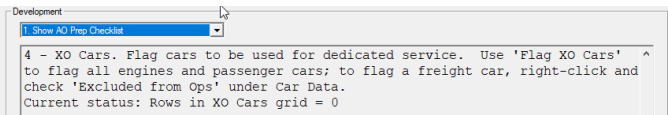
Open the Ops Central Advanced Tab and select option 2 on the Development menu to **Flag XO Cars**.


```
Development
2. Flag XO Cars...                          ▾

Flagged 3 XO cars: engines = 1, tenders = 1, cabooses = 1, passenger = 0
```

This automatically applies an XO (Excluded from Ops) flag to all engines, tenders, cabooses and passenger service cars on your layout. This flag prevents these cars from accessing the Industries database. Instead of "Card Waybill" these cars are controlled by "Card Order" using data from the XO cars tab.

You may need to control some freight cars independently of the Card Waybill system to run MOW cars, block trains, idler cars for loading a ferry, and routed cars that change destination during the progress of a single switchlist.

To flag a single car for "Dedicated Service" right click on the car and select "Exclude from Ops" from the context menu.

To flag a cut of several cars, right click on the cut, highlight "Train" and select "Exclude from Ops" on the submenu.

All cars with an XO flag will appear on the XO cars tab and this is where we will enter the details of our engine moves.

If we were to run a single peddler turn between Weston and Easton we wouldn't need to provide any route data for the engine, tender and caboose because they would finish the run on their original spots. But as we want to run Eastbound and Westbound Trains we do need to supply route data.

Unfortunately we omitted to provide a track for the engine to layover at Easton so we must fix this now. We can label a suitable track as EE (Easton Engine Track), edit the Locations tab to show the name and set the track class as XO reserved.
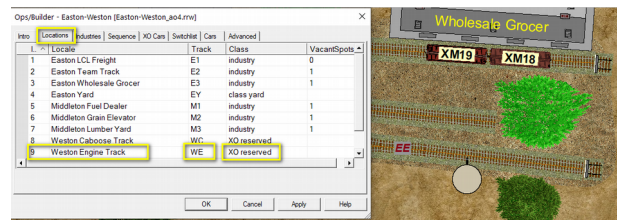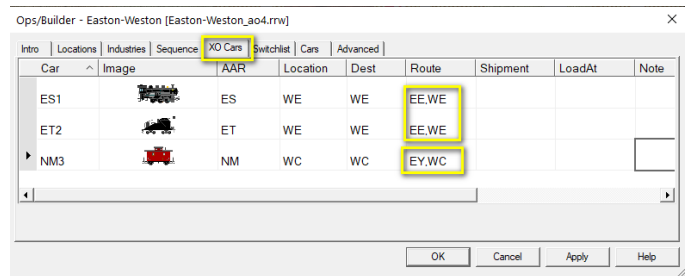

Now we are ready to open the XO cars tab and edit the route for the engine, tender and caboose for a layover at Easton.

If an Engine (and Tender) operates from and returns to a fixed location in a single switchlist it doesn't need a route.

If an engine finishes a switchlist in a different location to the track it started out from then it does need a route.

The CarID, Location and AAR columns of the XO grid are set to read only and can't be edited. The Note and Dest columns don't require editing as these will be set up automatically from the route data when we Generate our First Switchlist.

This leaves three editable columns but as Shipment and LoadAt don't apply to engines, tenders or cabooses we are interested only in the Route column at the moment.

Data in the Route column should be a Comma Separated list starting with the car's first destination and ending with the current car position to enable the sequence to repeat itself.
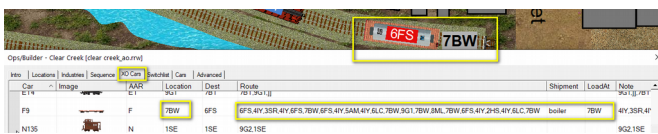
Loadable XO cars

Loadable XO cars should be provided with a loadname in the Shipment column in addition to the route data.

The location(s) at which they are to be loaded should appear in the LoadAt column which can be a single location or a comma separated list of locations from the Route column. The car will display its load at these locations and will be unloaded at any other industry location on its route.

An example from the Clear Creek layout

7BW at Clear Creek has very infrequent traffic and uses a single car to deliver new and refurbished boilers to numerous locations around the layout.

Each switchlist will only move the car one step along its route and it will therefore take this car at least 22 switchlists to cover the full route. During this time it will return to 7BW five times to pick up a new load.

The car will move in the current switchlist and its next destination is a yard track at 6FS where it will change trains. 7BW is also set as the final destination on its route so that the process can repeat itself through a further 22 switchlists.
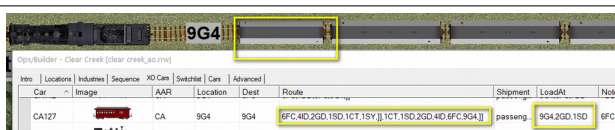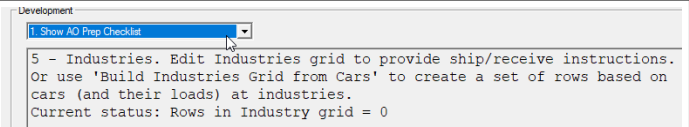

This car runs outbound on one switchlist to layover at 1SY when it encounters the]], it returns to 9G4 on a later train.

Routed XO cars which advance their routes each time they stop at an interim location should have the]] marker inserted into, or appended to, their route data after any stop at which they are intended to be set out to wait to be added to a later train. The car top label advances as the switchlist progresses and the car is set out when its route reaches the]] flag.


If you are ready to move on to the next step you should save a copy of your current progress now.

Step 5. EDIT THE INDUSTRIES GRID - Set up the Industries Database to provide Car Type and Shipment data for Waybill generation.

Open your saved file and select **Show AO Prep Checklist** from the Advanced Tab of Ops Central. Alternatively you can use the prepared layout **Easton-Weston_ao4** which is in your **Advanced Ops Layouts/Tutorials/** folder.


```
1. Show AO Prep Checklist

5 - Industries. Edit Industries grid to provide ship/receive instructions.
Or use 'Build Industries Grid from Cars' to create a set of rows based on
cars (and their loads) at industries.
Current status: Rows in Industry grid = 0
```

The first time you view the **Industries Tab** it is likely to be a blank page. Rows can be added to the blank grid from the context menu to build the database by inserting, duplicating and editing the individual rows but we would suggest that you start by using Option 2 from the Development Tools on the Advanced Tab to **Build Industries Grid from Cars**.
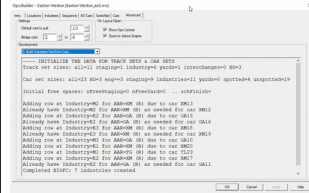
This creates a basic Industries Grid based on the cars already placed at the Industries. One row will be created for each Industry and AAR car type combination.

The grid is created with one row for each AAR car type placed at each industry, together with an R to signify that the Industry will receive the specified load.

You can right click in any cell to add a new blank row, duplicate a row or to delete any unwanted rows.

Editing the Industries grid ensures that it contains all the data needed to generate the Waybills for cars on your layout.

Locale column is filled automatically to match the label in the Locale column and can't be edited except on the Locations tab.

Industry column must be a valid industry label from the layout.

S/R column
S = industry ships the named load in this car type
R = industry receives the named load in this car type.

Staging column shows where the car starts and ends its journey. *Tilde (~) means that any staging area is valid.* Cars terminating at an Interchange must use the actual code for the Interchange, the tilde (~) must not be used.

AAR column can contain a two character code, in which case only the specified car type can be used to carry the load. If the AAR column is edited to show a single character AAR code then any car with a matching first character can carry the load.

Load column Any loadname is acceptable for a closed car, open cars will also accept loadnames that are not in the TrainPlayer loads database. If no load image exists for an open car then TrainPlayer will use a Tarpaulin Image on the car.

ViaOut is an optional Class Yard for routing an outbound car.

ViaIn is an optional Class Yard for routing an inbound car.

The Edited Industry Grid

Here we have added several new lines to our Industries grid to provide for shipping some goods as well as receiving them. We have modified all the load names to match with our Industries and added Via destinations to the Middleton Industries to prevent these from having to make facing switch moves in the absence of run around loop.

Inbound cars to M1 and M3, and outbound cars from M2 will be forced to travel Via EY yard to ensure the Middleton Industries can be serviced using trailing switch moves.

This will require some choreography with the Sequence grid when we get to Step 6 which is the next task on our list.

Notes

Tilde (~) in the ViaOut column means a car travels direct from Industry to Staging without being routed through a Class Yard.

Tilde (~) in the ViaIn column means a car travels direct from Staging to Industry without being routed through a Class Yard.

Tilde (~) in the Staging column means that any Staging area can generate waybills or Empty Car Orders for this Industry. In the grid on the left we have set the WS staging specifically but as this is the only Staging at Easton-Weston it would have worked exactly the same if we had left this as a Tilde.

While Tildes can represent any Staging area, they cannot represent Interchanges. Any Industries exchanging cars with Interchanges must use the explicit Interchange code in the Staging column.

ViaIn and ViaOut destinations must be Class Yards, they cannot be Staging, Interchange or Industry.

The Comment column is to enable a User to enter Notes.

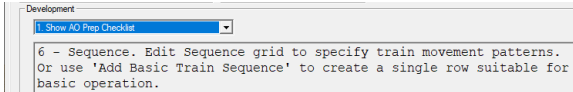*The Bridge Traffic column is an Advanced Topic which will be covered in detail in a later document.*

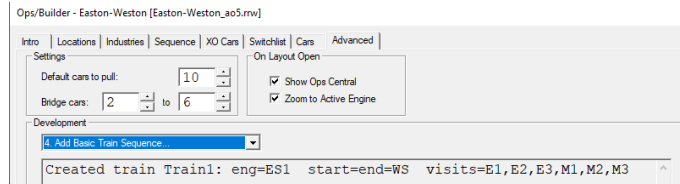| **Now might be a good time to Save your layout again to preserve your work before we move on to the Train Sequence** |
|---|

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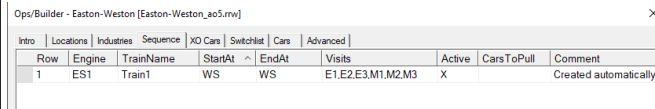| Step 6. SET UP THE TRAIN SEQUENCE - Edit the Sequence Tab for the planned Train Movements |
|---|

Open your saved file and select **Show AO Prep Checklist** from the Advanced Tab of Ops Central. Alternatively you can use the prepared layout **Easton-Weston_ao5** which is in your **Advanced Ops Layouts/Tutorials/** folder.

```
Development
1. Show AO Prep Checklist                    ▾
6 - Sequence. Edit Sequence grid to specify train movement patterns.
Or use 'Add Basic Train Sequence' to create a single row suitable for
basic operation.
```

Add Basic Train Sequence from the **Advanced Tab** menu.

Ops/Builder - Easton-Weston [Easton-Weston_ao5.rrw]

Intro | Locations | Industries | Sequence | XO Cars | Switchlist | Cars | Advanced

```
Settings                            On Layout Open
  Default cars to pull:  [10]  ⬍      ☑ Show Ops Central
  Bridge cars:  [2]  ⬍ to [6]  ⬍     ☑ Zoom to Active Engine
Development
4. Add Basic Train Sequence...                ▾
Created train Train1: eng=ES1  start=end=WS  visits=E1,E2,E3,M1,M2,M3
```

Open the Sequence Tab

Ops/Builder - Easton-Weston [Easton-Weston_ao5.rrw]   ✕

Intro | Locations | Industries | Sequence | XO Cars | Switchlist | Cars | Advanced

Row	Engine	TrainName	StartAt	EndAt	Visits	Active	CarsToPull	Comment
1	ES1	Train1	WS	WS	E1,E2,E3,M1,M2,M3	X		Created automatically

Add Basic Train Sequence (ABTS) command will generate data for a single train operating from a single Staging yard and visiting all Industries on the layout. This will be sufficient to operate the layout after generating the first switchlist.

If you prefer you can skip ABTS altogether and fill in your Sequence grid for yourself, or you can start with ABTS and then edit the grid to match your vision for the Ops plan.

Each grid row should specify an <u>Engine</u> and a <u>Train Name</u>.

<u>StartAt</u> is the Staging supplying inbound cars to the layout.

<u>EndAt</u> is the Staging receiving cars pulled from the industries.

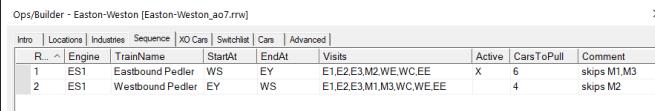<u>Visits</u> is a comma delimited list of all Industries to be visited.

The <u>Active</u> train is marked with an X, this can't be edited.

<u>Cars To Pull</u> allows you to set different values for individual trains to override the Default value on the Advanced Tab. If this is left blank the Default value is used (usually 10).

Edit the Sequence Grid

The <u>Sequence Grid</u> can be edited to include as many trains as you wish, right click in the grid to Add, Move, Delete or Duplicate then Edit a row.

We have edited our Sequence on the <u>Easton-Weston</u> tutorial to use two trains, an Eastbound and a Westbound Peddler.

Ops/Builder - Easton-Weston [Easton-Weston_ao7.rrw]   ✕

Intro | Locations | Industries | Sequence | XO Cars | Switchlist | Cars | Advanced

R... ^	Engine	TrainName	StartAt	EndAt	Visits	Active	CarsToPull	Comment
1	ES1	Eastbound Pedler	WS	EY	E1,E2,E3,M2,WE,WC,EE	X	6	skips M1,M3
2	ES1	Westbound Pedler	EY	WS	E1,E2,E3,M1,M3,WC,WE,EE		4	skips M2

Note that the Eastbound train is not authorized to call at M1 or M3 because these are facing spurs, and the Westbound train can't call at M2 which is an Eastbound spur.

We rely on the data in Industries grid to route cars to and from these restricted spurs Via the EY yard at Easton.

In the example we have edited the grid to show a sequence of two trains; <u>Cars To Pull</u> has been set lower on the Westbound train because one or two outbound cars are also pulled by the Eastbound train and routed through EY yard.

After the last train has run the sequence will start again at Row 1. This switchlist will not be identical to the first as the cars on the layout are no longer in their original positions.

About the Sequence Grid

<u>StartAt</u> can be any track class except for Industry. If it is Staging or Interchange it will supply inbound cars with new Waybills for the Industries. If StartAt is a Class Yard there will be no inbound cars, if it is XOreserved then only specified XO dedicated service cars can move onto the layout.
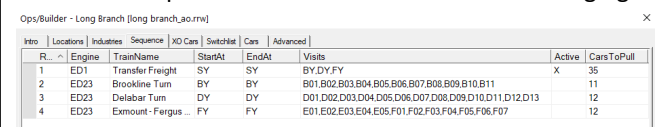
<u>EndAt</u> must not be an Industry. If it is Staging or Interchange then cars with a matching destination will be pulled from the Industries. If it is a Class Yard only cars with a matching ViaOut code will be pulled from the Industries. If it is XO reserved only XO cars with matching destinations can be pulled.

The <u>Visits</u> column contains a comma delimited list of Industry, Class Yard and XO reserved locations which will be visited by the specified train. Only the cars standing at these locations which also have a destination matching the EndAt location will be highlighted for pulling by the specified train. Cars in the StartAt Staging location can only be selected for a train if their destination matches a location which is part of the Visits list.

The <u>Cars To Pull</u> value is used in two ways. If the <u>StartAt</u> position is Staging or Interchange, AO will supply the specified number of cars to the layout. If the <u>EndAt</u> position is Staging, Interchange or Class Yard the specified number of cars will be pulled from the Industries for return to Staging.

Balancing the Inbound and Outbound Cars

When <u>StartAt</u> and <u>EndAt</u> are both Staging or Interchange and trains operate directly between Staging and the Industries with no Via destinations then the cars selected to enter the layout from Staging will always balance the cars selected to be pulled from Industries for return to Staging.

Ops/Builder - Long Branch [long branch_ao.rrw]   ✕

Intro | Locations | Industries | Sequence | XO Cars | Switchlist | Cars | Advanced

R... ^	Engine	TrainName	StartAt	EndAt	Visits	Active	CarsToPull
1	ED1	Transfer Freight	SY	SY	BY,DY,FY	X	35
2	ED23	Brookline Turn	BY	BY	B01,B02,B03,B04,B05,B06,B07,B08,B09,B10,B11		11
3	ED23	Delabar Turn	DY	DY	D01,D02,D03,D04,D05,D06,D07,D08,D09,D10,D11,D12,D13		12
4	ED23	Exmount - Fergus ...	FY	FY	E01,E02,E03,E04,E05,F01,F02,F03,F04,F05,F06,F07		12

The first train at <u>Long Branch</u> operates from Staging and the Transfer Freight doesn't visit any Industries to pull cars.

The Inbound cars from the first train are divided between three Classification Yards. As the train doesn't pull cars from Industries it is important to set the Pull Value to balance the Cars to Pull value of the three local trains. If there are not 35 vacant spots available the first train will bring in fewer cars. *Note: Cars to Pull Train 1 = Cars to pull Trains 2, 3 and 4.*

Each of the three local trains will pull the specified number of cars from the Industries in their sector and exchange these for the inbound cars brought to the yards by the first train.

The next Transfer Freight will return these cars to Staging and bring in more cars for the local Industries to maintain a running balance between Inbound and Outbound cars.

| **Save the layout and move on to the next step which is to provide an Introduction to your layout.** |
|---|

Step 7. PREPARE THE LAYOUT INTRODUCTION - Edit the Layout Introduction and Information page.

Open your saved file and select **Show AO Prep Checklist** from the Advanced Tab of Ops Central. Alternatively you can use the prepared layout **Easton-Weston_ao6** which is in your **Advanced Ops Layouts/Tutorials/** folder.
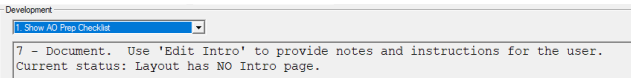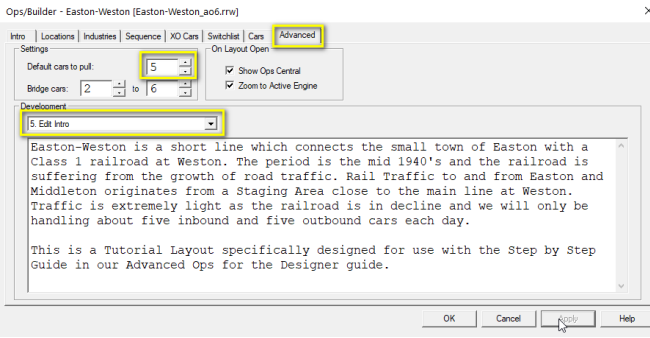

Prior to this step your OC grid Intro page should be blank.
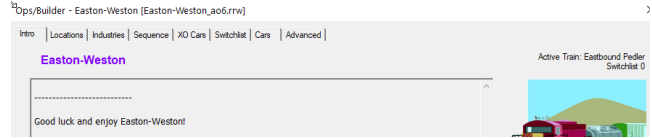
This page can only be edited from the Advanced Tab.

Open the Advanced Tab and select option 5 to Edit Intro

Click the Apply button to update the data.

The next time you view the Intro Tab your text will appear in the layout Introduction.

Check out the other Advanced Tab Options

Retain the check mark for Show Ops Central to ensure that the Welcome Screen is displayed each time the layout opens.

Retain the check mark for Zoom to Active Engine to ensure the correct engine is selected for each Switchlist.

Set a value for Default cars to pull this value can be also be overwritten for individual trains on the Sequence tab.

You can adjust the values for Bridge Traffic. These values are only used on trains which travel from one Staging area to another. Setting a high value here can ensure a Staging Yard is emptied and all its cars transferred to another Staging area.

Once the settings are checked you can test the Ops Plan.

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Step 8. TEST THE LAYOUT - Use "Test Layout" to check for Data Errors in the Ops plan. Report on any missing or corrupt data.
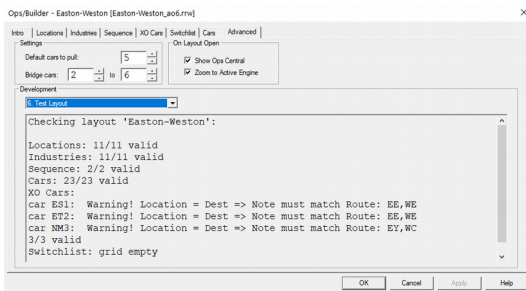
Error messages and reports with row numbers should be investigated and fixed before moving on to Step 9 to "Generate First Switchlist".
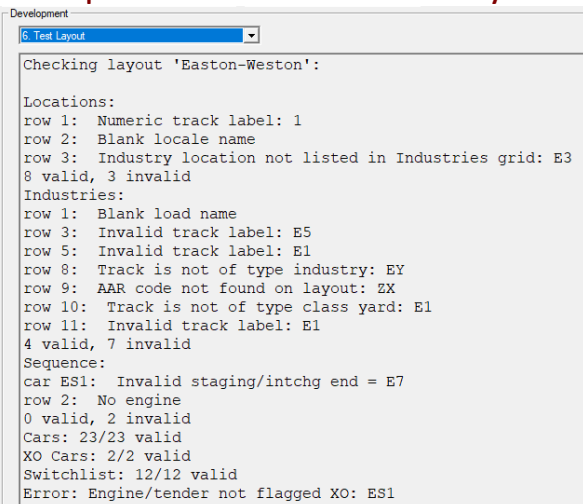
Test Layout is run from the menu on the Advanced Tab.

Ideally this will give us a clean bill of health and enable us to move on and Generate our first Switchlist.

We get three Warnings from testing Easton-Weston. We could fix this on the XO Cars tab by copying the Route information for these three cars into the Note column. However we can safely ignore this Warning because we know that this problem will be fixed by AO when we Generate our First Switchlist.

Warning messages may not necessarily be errors. It is your decision whether or not a Warning needs any action. Warnings should not prevent a layout from working.

Some examples of deliberate Errors from Test Layout
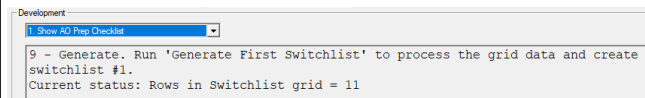

And where to fix them

When the problems are fixed repeat the test, if all is clear then click Save before you Generate your First Switchlist.
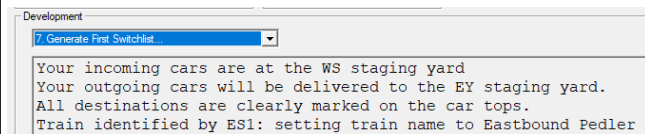
See also: Resolving Errors using the FixOps Subroutine

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Step 9. GENERATE THE FIRST SWITCHLIST - Run 'Generate First Switchlist' to process the grid data and create switchlist #1.

Setting up the Waybills and generating the first Switchlist

This process allocates <u>Waybills</u> to the cars from the Ops Central <u>Industries Grid</u> information and generates the first <u>Switchlist</u>.

```
9 - Generate. Run 'Generate First Switchlist' to process the grid data and create
switchlist #1.
Current status: Rows in Switchlist grid = 11
```

Select <u>Generate First Switchlist</u> on the Advanced Tab menu.

```
7. Generate First Switchlist...

Your incoming cars are at the WS staging yard
Your outgoing cars will be delivered to the EY staging yard.
All destinations are clearly marked on the car tops.
Train identified by ES1: setting train name to Eastbound Pedler
```

When the Switchlist is ready the number of cars to be spotted will be shown on the Control Bar.
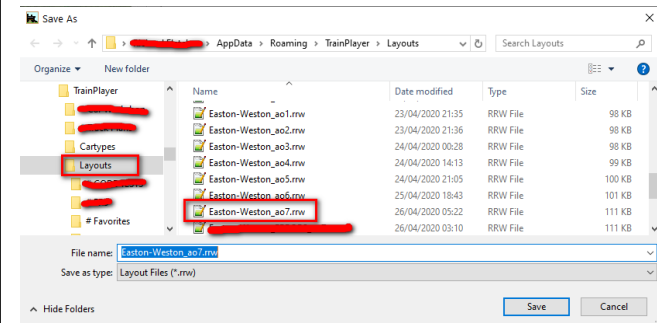
When the process is completed the layout is ready to operate and you will prompted to Save your file.

Step 10. SAVE THE LAYOUT - Save the layout.

The "Save As" dialog will be launched automatically when you click the "OK" button in the previous step.

On completing the Save your layout is ready to operate.

We recommend giving your filename an **_ao** suffix which is a convention we have adopted for AO layouts (not essential).

Saving the layout maintains a record of all the current car positions together with their associated Waybill data.

This enables you to reset the layout back to its original configuration should you want to make any future alterations to the track plan, industries grid data, train sequence or car distribution. After making any such changes you should repeat the <u>Generate First Switchlist</u> process in Step 9 above.

To reset a layout so that it is ready to rerun Switchlist 1 use the Advanced Tab Menu command to <u>Reset Trains to Start Positions</u>.

```
Reset Trains to Start Positions...

Train positions reset to saved.
```
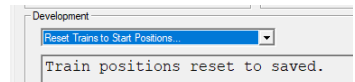
Step 11. OPERATE AND ENJOY
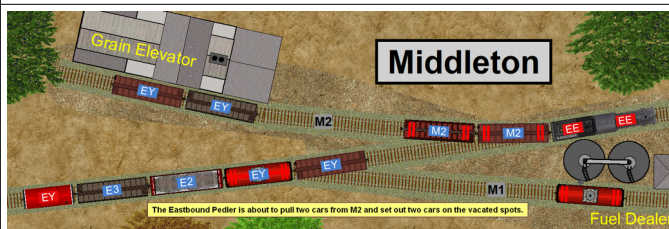
In place of the usual AAR and ID number label on your cartops, you will see a short 'routing' label showing the destination track code from the current car waybill. The aim is to use these car labels to identify the destination for each car and spot it on the track which is labeled with the same code. This means there is no need to constantly refer to the Switchlist, but the Switchlist is available in the OC grid to consult if you should need it.

You just work to match your car labels with the labels on the track. To avoid confusion, only the cars which need to be moved will display their labels. You may also have to move other cars to access the cars you need, any unlabeled cars which you move off spot will be automatically labeled to ensure they can be returned to their original spots.

How AO works

When a car is selected to be pulled from an industry the industry ID is added to the end of a queue of industries awaiting cars. This simulates placing an order for an another incoming load, or for another empty car needed for loading with a new shipment. When the industry code reaches the front of the queue, an incoming car from staging is allocated to the task and information is taken from the Industries grid to generate a suitable waybill for the car. If no suitable car exists in staging to service the industry the car order is held over for a later session (the Industry remains at the head of the queue awaiting traffic).

Cars spotted at industries are also held in a queue to ensure that no car gets forgotten or left behind. When these cars reach the front of the queue they are candidates for pulling and returning to Staging.

With AO you can deliver a car from A to C via B using two trains neither of which is authorized to visit both the point of origin (A) and the final destination (C). The first train can move the car from A to B so that in a later session a different train can pick up the car at B and move it on to C.

Don't forget to Save your layout each time you finish an Operating Session so you can continue later.

RESOLVING ERRORS USING THE "FIXOPS" SUBROUTINE
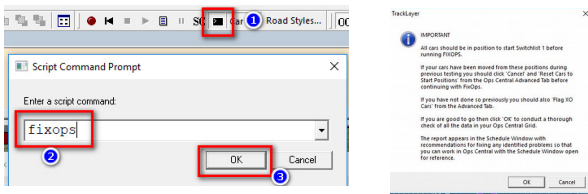
FixOps is a Subroutine to Identify and Analyze incorrect OC Grid Data

FixOps performs a similar task to the built in Test Layout feature (Step 8) but is capable of identifying even more problems in your OC Grid data. FixOps can show exactly what you need to do to fix any problems.

To launch FixOps open the Script Command Prompt (1), type **fixops** into the text box (2) and click OK (3). Read the Intro and click OK to identify and analyze any potential problems found within the OC grid data.
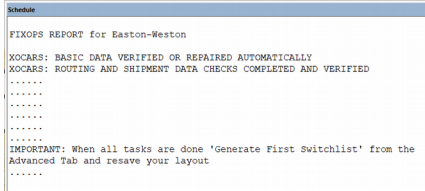
FixOps can be used at any time, either before or after you have generated a Switchlist. The report produced is sent to the Schedule window so that any modifications needed to your data can be applied to the OC grids while keeping the report open alongside the grids for reference.

If you are lucky you will get a clean report such as the one on the left, but if you are not so lucky FixOps should provide you with sufficient information to focus on the relevant grid and row number which contains the problem.

If your first report contained any errors which have since been corrected then you should call Generate First Switchlist as soon as you get a report notifying a Clean Sheet like the one above.

Some Potential Problems identified by FixOps

FixOps tests the data in each of the Ops Central grids and produces a report in the Schedule Window to highlight any suspect data that needs to be adjusted.
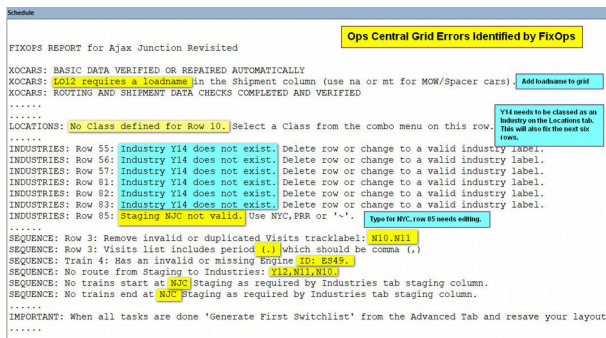
Examples of How to Fix Them

Open **Ops Central** alongside the Schedule Window and make the required adjustments to the data in your grids.

Where possible FixOps will refer directly to the Grid Title and the Row Number of the entry that needs to be amended.

As you work through the list you can rerun FixOps repeatedly to update and reduce your list of outstanding items.

Note:

If your Ops Scenario is not operating as you expected and FixOps fails to find your issue then please send a copy of your layout with a brief explanation of the problem to support@trainplayer.com and we will endeavor to identify the cause of your problem.

Richard Fletcher for TrainPlayer 7.2 – May 2020.