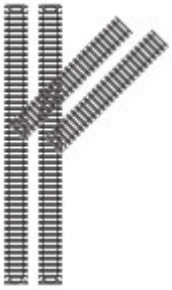
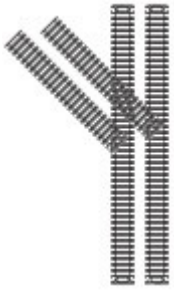
ASB TURNOUT TUTORIAL - LHM

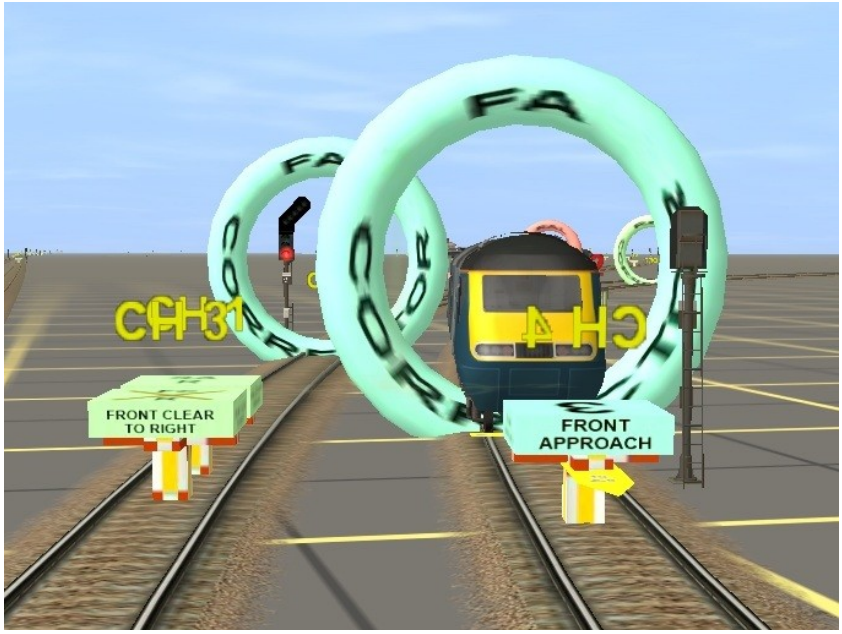
(Issue 3.2)

ASB stands for Active Signal Box. The concept is a trackside object intended for area specific train control. It is a visible object (rather than a rule), enabling an indication of control status to be shown. This is my second 'ASB'. The first, 'ASB Crossover' is available on the Auran DLS. ASB Turnout goes a stage further than Crossover, controlling junctions and providing secure protection at Double Track Turnouts helping eliminate SPADS and train-thru-train effects.

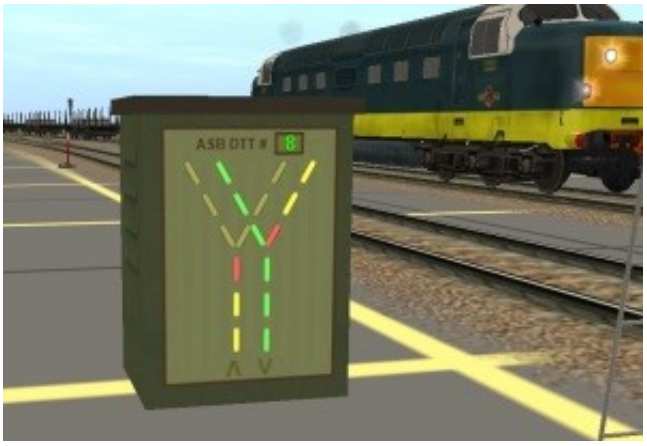


ASB Turnout supports either Left Hand Main running or Right Hand Main running.
This Tutorial concerns the LHM asset for layouts where trains drive on the left, e.g. UK Routes.
For RHM routes, see RHM Tutorial.
Please ensure the correct Controller is used!





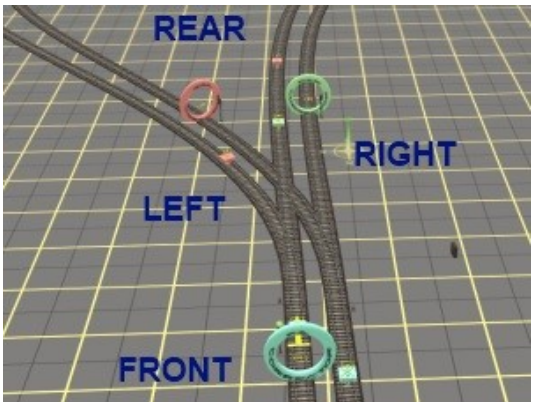
Setting Up the LHM Controller



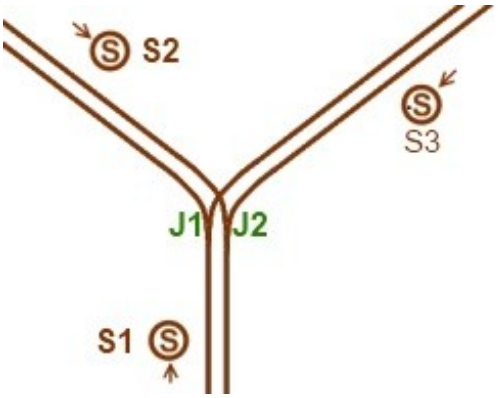
This is the 'brain' of the system. It controls the signals and points, (switches) after receiving instructions from the Driver Commands and the Triggers. After you've placed and named the signals and points, the Turnout Controller is the first asset you should set-up as it will automatically choose a free Channel for you. Each Turnout (or Junction) must work on a different Channel. The maximum number on any one map is 99.

This Controller is used on Turnouts where trains drive on the left!
No train will be allowed through that does not have appropriate Driver Commands.
The illuminated lines indicate:-
Off: No train expected. Green: Path clear. Yellow/Red: Train expected but path denied.

Terminology:
Throughout this Tutorial I will talk about 'Left', 'Right', 'Front' and 'Rear'. You should always view your Junction with the 'single' end pointing towards you. This I call the 'Front' of the Junction. The 'Rear' is the 'double' end. 'Left' and 'Right' refer to the diverging tracks as seen from the Front.



Assigning Assets:
In order to work, ASB Turnout needs to take control of the two points, (switches) at your Turnout, plus two of the three Signals. To do this you must assign them to the ASB. The signals and the individual points MUST be named in Surveyor or they will not show for assignment. You can either use the assets auto-name, (if present) or give them a name of your choice. The assets at the Junction should be placed as shown below. When you first open the Controller, click on the '+' and it will automatically select the next available Channel. Then click on the white plan to open a list of signals. Select the signal you have designated to be 'Signal 1' for this Junction, then do the same for Signal 2 and then the 2 junction levers. Each asset will highlight in turn.



The chart shows a 'Y' shaped layout but the track may go straight with the 'turnout' to the left or right. It doesn't matter. The set-up is the same.
See the set-up video at http://www.youtube.com/watch?v=WLz83qZif_o

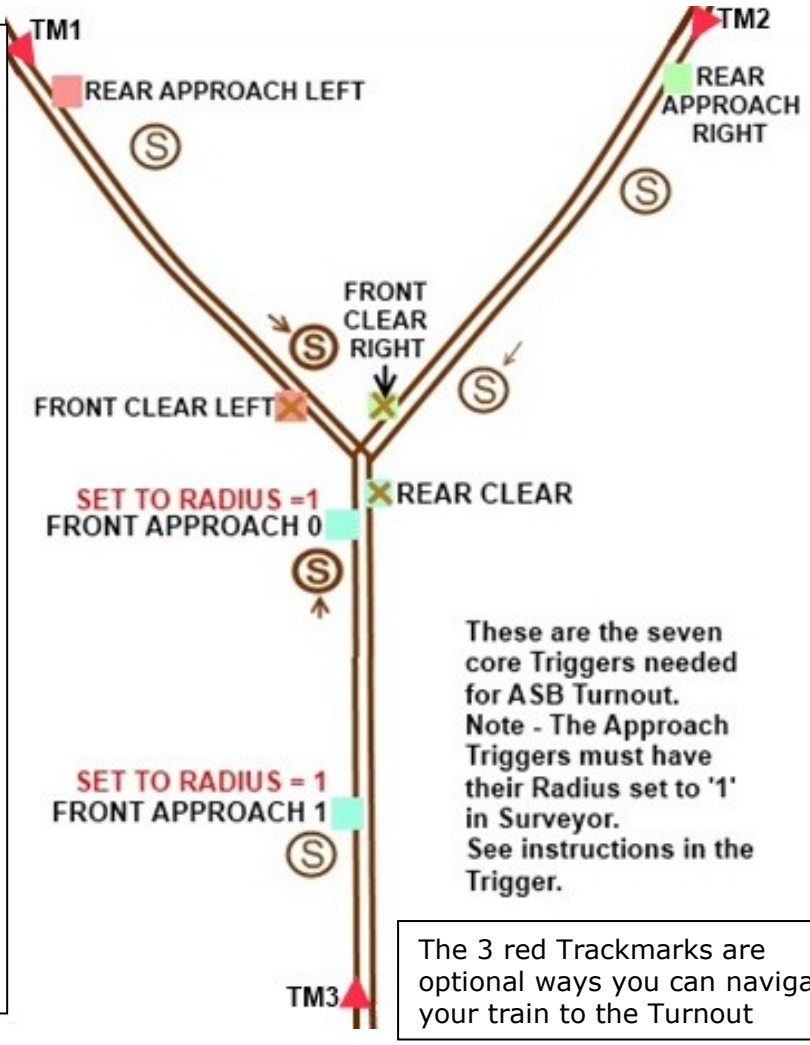
Placing Triggers (LHM)

Once you've set the Channel in the Controller and assigned the 4 assets, it's a good time place the needed Triggers on the track.

Placed Triggers will automatically jump to the Channel you just set in the Controller, speeding up the process. Beware if you go back to change a Trigger later, you will need to set the Channel manually by opening the dialogue box.
('?' in Surveyor).

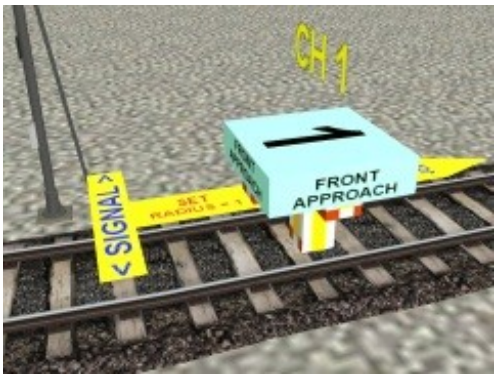
The chart on the right shows placings for the 7 essential Triggers. Optional extra triggers are discussed later.

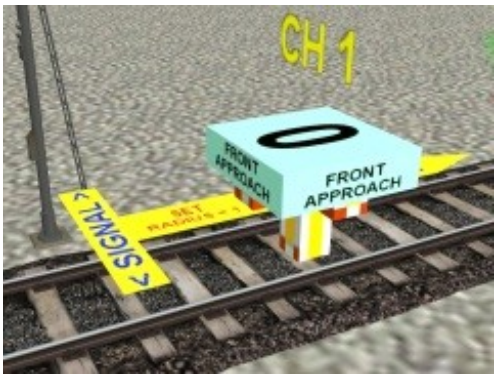
The 7 Triggers are.....
Front Approach '1'
Front Approach '0'
Rear Approach from Left
Rear Approach from Right
Front Clear to Left
Front Clear to Right
Rear Clear to Front



The 3 red Trackmarks are optional ways you can navigate your train to the Turnout

Front Approach '0' and Front Approach '1' (FAP)
The Front Approach Triggers are the most critical of all the Triggers. Not only do they tell the Controller a train is coming but they must keep track of that train's approach so the Controller can correctly switch the junction to the left or right. It's easy if there's only one train around but if they're queuing up, the Controller works harder! The Front Approach Triggers therefore work on a block system, counting down to '0' at the Junction.

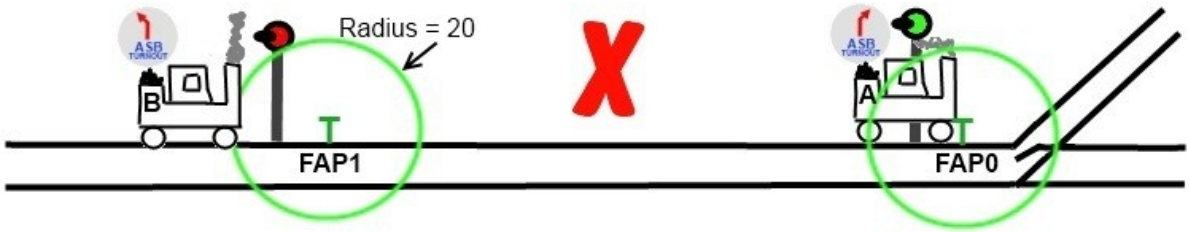




A basic set-up will have just one block but advanced users may have up to four. For now, we'll just worry about the one. Even so, if a train encounters one of these Triggers before it has permission to enter the block, it can result in the train taking a wrong turning!

When a train hits a Trigger in Driver, it will post a message to say the train has arrived, (or departed). It's these messages that ASB Turnout uses to track the trains. However, a Trigger is not a single point. Imagine an invisible circle around the Trigger. The message is sent the moment the train hits that invisible circle, not when it hits the Trigger itself. In most cases that doesn't matter. For these Approach Triggers it does!

When you place a Trigger in Surveyor, they always default to a Radius of '20'. That will cause problems in ASB Turnout...



Train 'A' wants to turn right. It has been cleared to do so and has moved off. Meanwhile, Train 'B' (who wants to turn left) has arrived in the previous block. It's stopped at the signal but has still activated the FAP1 Trigger, resulting in sending Train 'A' the wrong way!

For that reason it is essential you change the Radius of these Front Approach Triggers to '1'.

Now, Train 'B' stops before it activates Trigger FAP1, so Train 'A' will go the correct way.

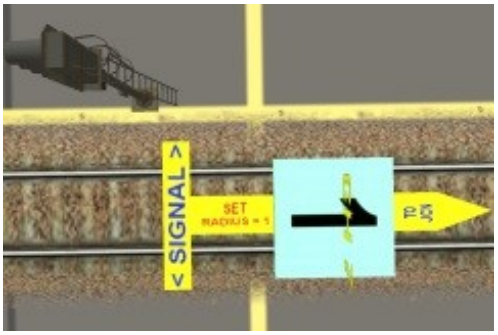
Setting the Trigger to '1' is quite easy.

Go into Tracks – Trackmarks and drop down the 'Advanced' tab.

Change the default of 20.00 to 1.

Press the 'Set Trigger Radius' button, (on the right of the input box) and then click on the Trigger in Surveyor.

Confirm with 'Get Trigger Radius' (on the left) if desired.



Trains need to 'enter' and 'leave' the triggers quickly after the signal turns green so the Approach Triggers need to be placed close behind the entry signal to the block. To help with positioning an arrow is attached to these Triggers, which always points away from the signal. Make sure it points *to* the Junction! Positioning isn't hyper critical, but it should be close.

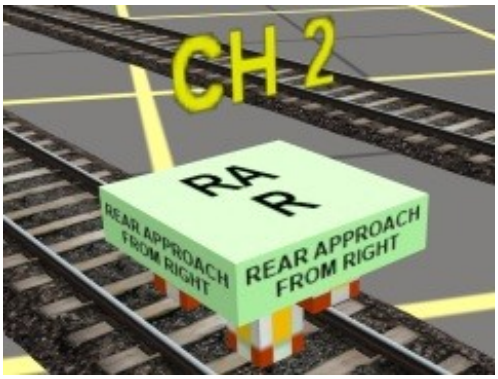
Rear Approach from Left

All the remaining ASB Triggers do *not* need to have their Radius changed and their positioning is less critical.

If you place them just after opening their Controller they will default to that channel, so you may never even need to open them.

This Trigger should be positioned on the left arm of the Turnout in the path of approaching trains.

Rear Approach from Right



As above but this Trigger should be positioned on the right arm of the Turnout in the path of approaching trains.

Both Rear Approach Triggers may be placed as far from the Turnout as you like but probably 2 or 3 signal blocks will do for most. Put them further away if your trains run fast

Special note on placing the above RAP triggers:
The worst case scenario is that *another* train claims the junction a split second before your train hits one of these triggers. Always place the triggers far enough away so that a train has time to stop if the signal at the junction suddenly goes red. If you are running very fast trains this could be as far as a mile away! SPADs may cause a derailment and ASB meltdown!

Front Clear to Left

The 'Clear' Triggers tell the train's Driver Schedule to go to the next Command, and allow the Controller to release the Junction/Turnout for the next train.

This Trigger should be positioned on the left arm of the Turnout, just after the Junction in the path of departing trains.

Front Clear to Right

As its name suggest, the Front Clear to Right Trigger, 'clears' any train approaching from the front, after it has turned right.

This Trigger should be positioned on the right arm of the Turnout, just after the Junction in the path of departing trains.

Rear Clear to Front

This Trigger clears trains that have approached the rear of the Turnout on either arm.

This Trigger should be positioned just after the Junction on the right track as you look at the front of the Turnout, in the path of departing trains.

See the set-up video at http://www.youtube.com/watch?v=WLz83qZif_o

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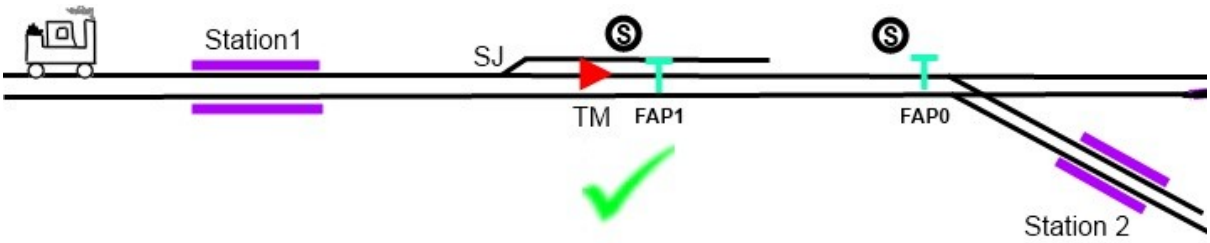
The Basic Driver Commands

Driver Commands are essential to the working of ASB Turnout. Only trains with an appropriate Driver Command in their schedule will be allowed through the Junction.

The 3 'core' Driver Command's function is fairly self evident. When approaching the front of a Turnout they will tell the Controller which way the train wants to go. A 'rear approach' Command is also needed but the 'Y' version above is used for either arm.

Once a Driver Command is activated it puts the train into Autopilot to take it through the Turnout/Junction. It will not pass to the next Command until it is clear of that Turnout. Trains in Autopilot do not switch junctions as they do in Trainz AI. That's fine for the Turnout as the Controller is working the signals and switches. But it must have a clear run to the Turnout once the ASB Driver Command is reached. For that reason if you only use a few ASB Junctions it will probably be necessary to add an N3V 'Navigate Via' or preferably 'Drive Via' Command to pre-route the train. Be sure the Commands and Triggers on the map react in the correct order. Here is a typical example. (Some images N3V)

First a Surveyor Layout: Correct for this situation. (A Track Mark is needed due to 'SJ').

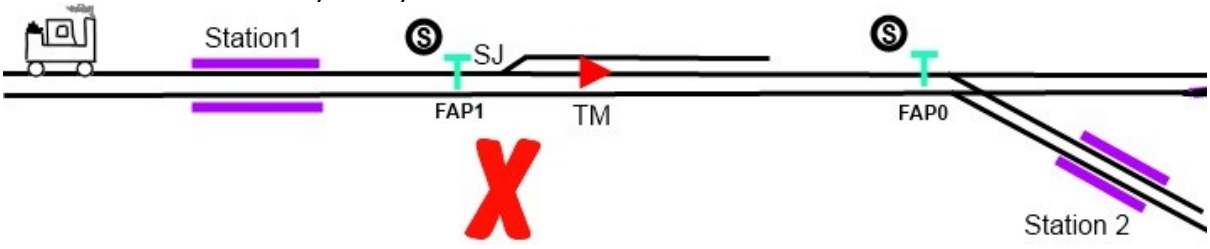


The shown train's Driver Schedule may look like this....

etc.....

The train visits Stn1, loads and 'Navigates' past 'SJ' and the TM before activating the ASB Command and then hitting FAP1 Trigger on the map correctly.

Now an incorrect Surveyor Layout....



Here, the train will hit Trigger FAP1 before the ASB Driver Command is reached. As a result the train will not be recognised and stop at the junction signal.

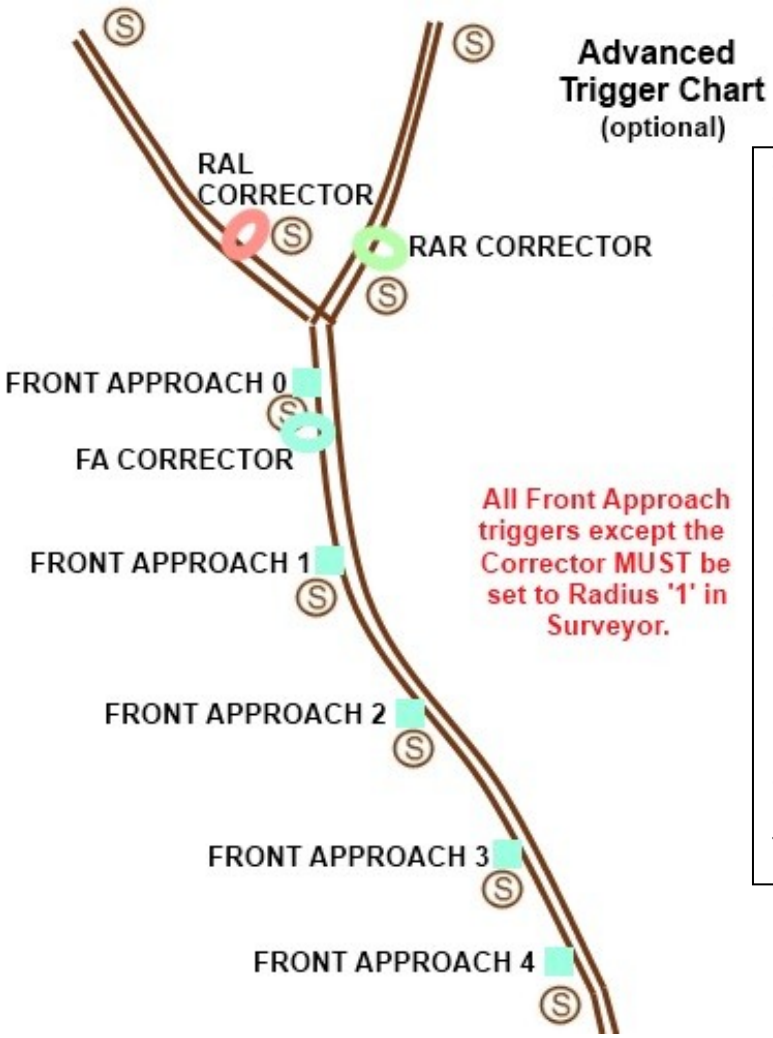
Even if you change the Driver Command order, it's still wrong.

etc.....

If this were used, the train *may* make the junction if 'SJ' happened to be set OK. But after the Turnout it would reverse to 'TM'!

The train's schedule must be on the relevant Driver Command *before* it hits the first Trigger! (Except - see Advanced below).

The Extended Assets



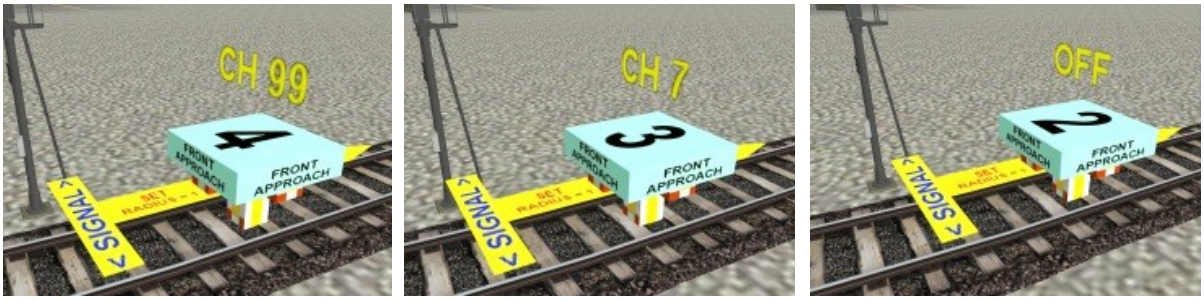
There are 6 optional extra Triggers you can use to enhance the system.

Three more Front Approach Triggers to allow for earlier activation of the Turnout. Ideal if you run fast trains.

Plus 3 'Corrector' Triggers which attempt to solve the problem of stuck trains on start-up. Ideal if you save the game a lot.

Note that the Front Approach Triggers go just *after* the approach block signals. The Corrector Triggers take up position just *before* the pre- junction approach signals.

Front Approach Triggers, '2', '3' & '4'



Like the Approach Triggers '1' & '0', these triggers should be placed just after the relevant block entrance signal as shown. They should count down to '0' at the Turnout. You don't need to use them all but don't miss any out. 3,2,1,0 is OK. 4,3,1,0 is not. The minimum use is 1 & 0. **The Trigger Radius MUST be set to '1' for this type of Trigger.**

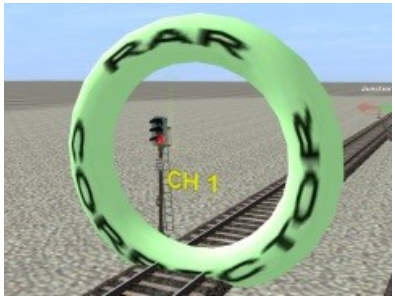
Corrector Triggers:

The ASB Turnout system works by hitting Triggers in the correct order. Therefore trains should not start a Session in-between triggers or they will get stuck. When you design your Session, ideally all trains should start outside the approach triggers on start-up or the Junction will not see the starting train's approach.

In the case of Rear Approach triggers, trains should not be placed between the trigger and its Junction. In the case of multiple Front Approach triggers, trains should not be placed between Trigger 1 and its Junction. However, sometimes it's not possible to keep to this rule and Session design means a train has to be placed (at the start of a new Session), close to a Junction.

This is where the 'Corrector' Triggers come in. They should be placed just in front of the signal approaching the junction where you think there will be a problem. The Corrector Trigger will act as a wake-up for unexpected trains in this start-up situation.

Note that Corrector Triggers are no longer needed to correct game-saves as this version of ASB Turnout is game-saveable itself.



The correct 'Corrector' should be placed in the correct position at the 3 entrances to the Turnout!

FA = **F**ront **A**pproach
RAL = **R**ear **A**pproach from **L**eft
RAR = **R**ear **A**pproach from **R**ight.

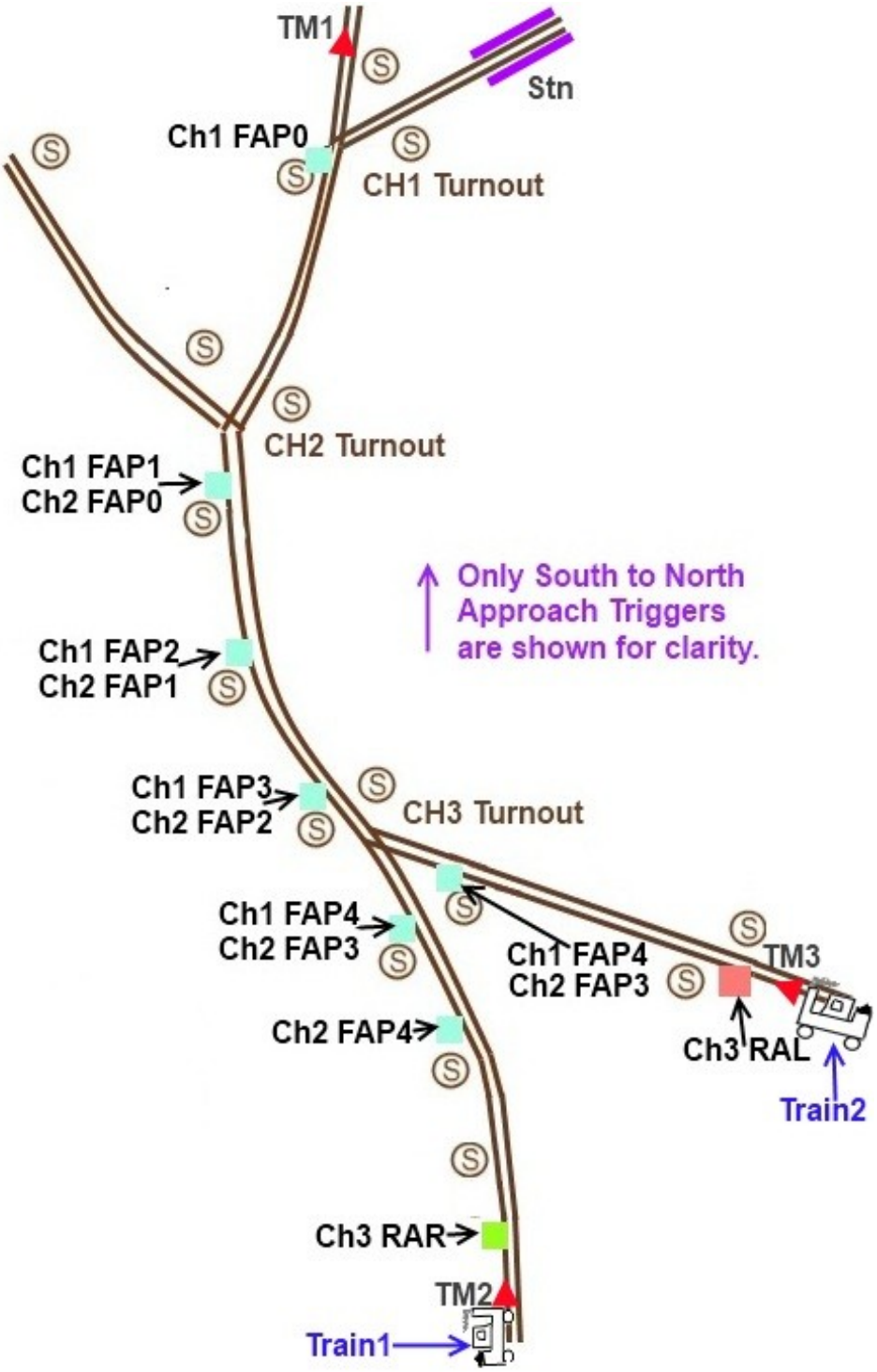
If you're going to use Corrector Triggers, its best to place them at the same time as you place all the other Triggers. If you add them later, don't forget you will have to set the Channel manually. ('?' in Surveyor)

Advanced Assets and Gameplay

I initially planned ASB Turnout to work like ASB Crossover - as a way of protecting isolated turnout junctions. However as it switches points too, it soon became obvious the system could do more, providing an alternative method to navigate trains across an entire Route. It will still only do 'Double Track Turnouts' but you can have a lot of them!

Also with the addition of the 'Go Manual' and 'Go Auto' Driver Commands, since ASB Turnout works the same either with autopilot or manually driven trains, it makes it easy to drop in and out of self-drive.

I've said above that the train's schedule must have reached the relevant Command *before* it hits that Junction's first Trigger. That' not necessarily true if you're using the system as your main navigational method with multiple turnouts. Consider several turnouts one after the other in close proximity.....



Not to scale

With multiple Turnouts (above), the associated Triggers may be far in advance of the actual junction, leap-frogging themselves as they approach.

Here, Train1 hits Turnout/Channel 3's 'Rear Approach Right' Trigger, closely followed by Turnout 2's 'Front Approach 4', then Turnout 2's 'Front Approach 3' AND Turnout 1's 'Front Approach 4'. And all this before its even reached the Turnout on Channel 3! Train2 is in a similar situation. Note the shared Ch1 FAP4 & Ch2 FAP3 triggers on *both* arms!

Here's what **Train 1**'s Driver Schedule might look like.....

To TM2 Ch3 Ch2 Ch1 To TM1

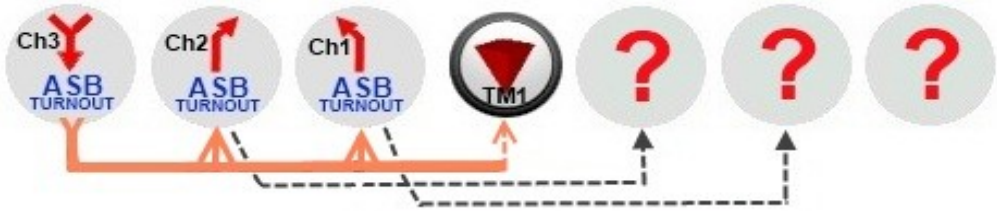
Train 2 goes to the station so looks like this....

To TM3 Ch3 Ch2 Ch1 To Stn

It looks complicated but ASB Turnout will sort out the mess. It will let one of the trains through and hold the other, setting up the later junctions for the winner.
But how, if the Commands have not yet been reached?

Each ASB Turnout approach Driver Command looks ahead down the list of Commands to see what's next. It checks itself plus each of the next three Commands, ignoring non-ASB Commands! It will then send that information to the relevant Controller.

In the example above, as soon as the Channel 3 Command is reached, that Command will announce its presence to the Channel 3 Controller. It will also tell the Controllers on Channel 2 and Channel 1 that it's coming, and which way it will want to turn. As a result, the Triggers on those channels will be active for that train. The Ch3 Command will look at the 3rd Command in line too and see that it is not an ASB Command, so will do nothing with it.



Of course the other ASB Commands will look 3 Commands ahead too but not till they reach their turn at the head of the Driver Command Schedule. (Info - see Blocker)

As you can see from the plan above, there will be times when you will want to place several Front Approach Triggers (set to different Channels) behind the same signal. It can get a bit cluttered but at the moment it's the only way.

Placing does not need to be spot-on so I would recommend staggering them slightly as shown, to ensure the train sees them all!

Do experiment with Junctions and Triggers. The rules are here so it's really a question of visualising what is happening in relation to Triggers, Diver Commands and where your train will be.

Due to this '3 Trigger look ahead', it is highly recommended that you DO NOT add and remove Driver Commands while running in Driver. Doing so may result in unpredictable results. The system was designed expecting Driver Command routes to be pre-programmed in Surveyor!

And on the subject of DONT's, the system expects the driver to remain in his cab. Please don't move him to another train or confusion may result.

The Advanced Assets:

Currently these comprise 9 extra Driver Commands which are used for special occasions.

The four 'X' Specials are intended <u>INSTEAD</u> of approach triggers. They are effectively a Driver Command and a Trigger all in one. They are designed to be used where you want a train to stop immediately in front of a Turnout and wait before it requests permission to cross the Junction. e.g. Where a station is just before the Turnout. **So they should be preceded by a 'Wait', 'Load' or 'Manual Load' Command!**

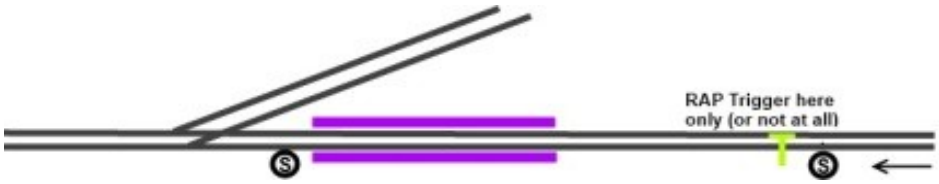
They are similar to the basic red Commands but should be used <u>INSTEAD</u> of the red ones in the above situation. The only difference is in the case of the Rear Approach Commands. Here there is a different one for each leg. This is because it also contains the Trigger information. Note that these Commands also 'Block'. See 'Blocker' below.

If you do use these Commands instead of Triggers, you will need to tell the Controller when it does its 'Trigger Review'. Tick the appropriate box to keep it happy!

<u>Special trigger Rules when using these Commands:</u>

Front **Ap**proach:
You <u>must still include</u> the '0' FAP trigger. FAP trigger '1' is optional, but needed if you have trains that don't stop. **The extended FAP Triggers, 2, 3 & 4 <u>must not be used</u> in this situation!**

Rear **Ap**proach:
RAP Trigger optional. If you do place **a RAP Trigger it can only be in block '1'**, after the signal. Treat it almost like a FAP1 Trigger, even reducing the Radius!



If you use the above Commands, the special Trigger Rules will have the effect of slowing all trains through that track, so only use it when you want most trains to stop and wait. DO NOT use these Commands on trains that don't stop and wait! Non-stoppers should continue to use the normal red Commands. If all your trains stop and wait, the only *approach* Trigger you'll ever need is the FAP '0'. (You'll still need all the 'clears')

Go Manual: When an ASB Command is activated it normally runs the train in Autopilot. If you want to drive a train through the Turnouts yourself while other trains continue in Autopilot, add this Command. This and 'Auto' are the only Commands you can add safely in Driver on the move. Even then I would recommend adding it as the next but one Command. Adding it at the front, just as the Commands move-on may result in the schedule stopping.

See 'In The Cab' Video at http://www.youtube.com/watch?v=ZBHZXBdTKzI

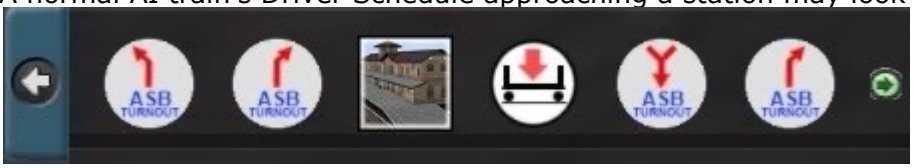
Go Auto: As above but returns the train to Autopilot when finished. Just drop it in the Schedule and AI will take over after the next junction. Note that these two Commands only work on ASB Assets. Auran Commands and others will behave as normal.

Manual Load and Manual Unload: To be used for a manually driven train after a 'Go Manual' Command has been issued.
Use the 'Manual Load' Command instead of the normal Auran 'NavigateTo *station*' and 'Load' Commands. This will allow you to drive the train into the station yourself without Trainz AI taking control.
For full implementation, see below.

Using the Manual Load/Unload Commands

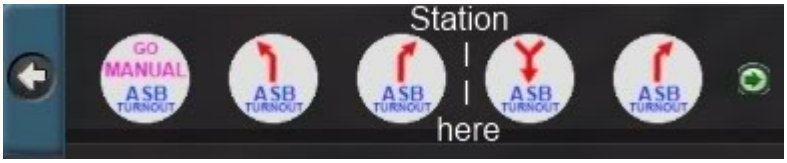
Reason:

A normal AI train's Driver Schedule approaching a station may look like this....



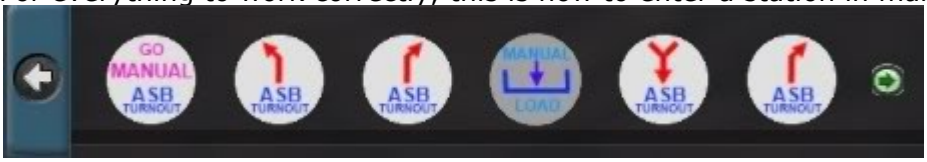
That's fine but Trainz AI will grab control of the train as soon as it leaves the previous ASB Junction.

If you want to drive into the station yourself you could just omit the Trainz Station Commands like this.....



Again, this works, the train will unload and load. However, events like the door animation may not work.

For everything to work correctly, this is how to enter a station in manual mode....



Usage:

Note that the Manual Load and Unload Commands do not 'Navigate'. ASB Turnout will do that! So when you set up a Manual Load Command you need only specify the Station or Industry you are heading for. Track information is not required.

These commands were specifically designed for stations and for them only a 'Manual Load' Command is required as this will unload passengers too.

You can also try these Commands with varying degrees of success for Loading and Unloading at Industries. In which case the correct, (load or unload) Command should be used.

The Driver Schedule will not move on to the next Command until you stop at the nominated Station or Industry. When you stop, you must be at the correct place in the Station or Industry or loading will fail. This is particularly important for multi industries like Seaport. If you arrive with a train load of Crude Oil and stop at the Coal Delivery, loading will fail.

Blocker: I've said previously that the ASB Driver Commands look 3 Commands ahead. That's usually OK but there are times when you may want to block this feature. See below for the most likely usage.

Using the Blocker

Portals:
New trains emitted from Portals or trains that are destroyed by a Portal are no problem for ASB Turnout. However, you should be aware of one issue if you re-emit an existing train and driver from a portal.

When any train is created in Trainz, the program allocates a unique ID number to it. ASB Turnout uses this ID number, along with the Driver's Schedule to make its calculations. Unfortunately, when a Portal re-emits an existing train, it allocates a different ID number. In some cases due to the '3 Command Look Ahead', this can confuse ASB Turnout. Fortunately the blocker provides a solution.

Ch1

Ch20

In this example, after turning right a train will enter a Portal, which will teleport it to another Portal just before the Turnout on Channel 20. The 'Turn Right Ch1' Command has just been reached so it will send info to the CH1 Controller. As normal, the Ch 1 command will also look ahead and see the Ch20 Command, sending the train ID info to the Ch20 Controller as well. However, when the train eventually comes out of the Portal it will actually be a different train with a different ID number!

In fact, because of the way ASB Turnout works, the Ch20 junction will still work as the new ID number will also be sent. But, Ch20 will still be expecting the original, (now destroyed) train to come too! This is not good!

So, to avoid any problems with this, if you are entering and re-emitting from a Portal, (be it the same Portal or a different teleported-to one), use a Blocker as shown below.


Ch1 Ch20

Now, the Ch1 Command will not see the Ch20 Command and will not send the wrong information. The Ch20 Command will send its own, (new and correct) ID information when the train emits from the Portal.

The only other thing to ensure is that the current ASB Turnout is complete before it enters the Portal, (ie that the train has left the appropriate 'clear' Trigger.) And don't put any approach Triggers on the 'wrong' side of the Portal!

Of course, if you have more than 3 non-ASB Commands on either side of the Portal, the problem does not occur anyway.

Changing Trains or de-coupling:
A train's ID number will also change if you de-couple it.... or of course if you move the driver to a different train. For that reason I have said that neither should be done when using ASB Turnout. However, provided any ASB Turnout is completed and a Blocker is used just before any changes take place, this should be possible.
There are too many variables to give specific instructions here but the above Portal information should help with Command and Trigger placings should you want to do that.

Small Loops:
Sometimes if you have a small layout where the train loops back on itself it may cause a Junction to be activated before it should. Coding in the Driver Commands and Controllers has been written to prevent most loop situation problems... but some complex doubling-back loops may, in very unusual circumstances need thought.

As a general rule, if you get a warning saying "....had unexpected Driver Command issued..." then you may need to use a Blocker here. In fact, this warning usually shows if you add the wrong Command - eg. A Front Approach Command and then your train arrives from the rear. If you're sure that's not the case and you can see a loop potential then insert this Command in the Driver Schedule to break the loop. It is rarely needed for this, and unless you get that warning you probably won't need a Blocker here.

If you get that warning and you've haven't got a complex loop, check you *have* issued the correct Command!

The Final 4 Assets



These are the final 4 of the 30 assets in the kit. The two Feathers will attach to supported signals and light automatically if you tick the box in the Controller. For 'supported signals' see my Sen City range, KUID:76656:24010 – 24019 on the DLS.

The Script Library does some of the common calculations for ASB Turnout.

The ASB DTT Textures make the Controller 'light-up' in response to approaching trains.

These final two assets are background assets and need no user input.

****

Signal Choice

ASB Turnout, in common with any script which attempts to control remote signal aspects will not work with all Trainz signals.

This is because the local script in some signals interferes with the ASB script. There is really nothing that can be done to remedy this, other than change to a different signal. If your signal won't go red this may be the problem.

Most Trainz signals should be OK but the few exceptions, (signals that do NOT work) include some of the semaphore signals from TC3 onwards and notably, Bloodnock's excellent VSR range. There may be others!

As a replacement for Bloodnok's VSR range I have produced a small set of British Rail style signals that will work with ASB. These are free on the DLS or see Sen City Signals. (If you use one of these signals for ASB, do NOT enable ATLS on the same signal!)

Note that the script clash only happens with the ASB 'Controlled Signals', (two on each Turnout). Other signals placed in your map will not interfere with ASB or vice versa.

'Signal Missing' in T:ANE

First ensure that sure no signals *have* been deleted or really are missing. If not, there is a T:ANE specific issue which may cause this.

Signals used in ASB Turnout must have a name. Not all signals do. Prior to T:ANE un-named signals just didn't show in Turnout. Now, T:ANE automatically gives these un-named signals a name so they will show in Turnout.

Unfortunately, T:ANE doesn't always seem to give them the same name every time you load the game. If a signal is re-named by T:ANE, Turnout will obviously see it as missing!

The solution is to re-name these auto named signals yourself so they stick. T:ANE's format is to name the signals 'Signal 1', 'Signal 2' etc.

So if you choose a signal with the format 'Signal xxx', you should first re-name it with a unique name of your choice and save the Route before assigning it to Turnout.

The Asset List

There are a total of 30 assets in this kit, (31 with both Controllers). However, you only need interact with 11 of them to get a basic Turnout working.

The Core Assets

1) ASB Turnout Controller LHM ..... (kuid2:76656:80100:1)
2) Front Approach '0' Trigger ..... (kuid2:76656:80110:1)
3) Front Approach '1' Trigger ..... (kuid2:76656:80111:1)
4) Rear Approach Left Trigger ..... (kuid2:76656:80115:1)
5) Rear Approach Right Trigger ..... (kuid2:76656:80116:1)
6) Front 'Clear' Left Trigger ..... (kuid2:76656:80117:1)
7) Front 'Clear' Right Trigger ..... (kuid2:76656:80118:1)
8) Rear 'Clear' Trigger ..... (kuid2:76656:80119:1)
9) 'Turn Left' Driver Cmd ..... (kuid2:76656:80105:1)
10) 'Turn Right' Driver Cmd ..... (kuid2:76656:80106:1)
11) 'Rear App.' Driver Cmd ..... (kuid2:76656:80107:1)

The Extended (optional) Assets

12) Front Approach '2' Trigger ..... (kuid2:76656:80112:1)
13) Front Approach '3' Trigger ..... (kuid2:76656:80113:1)
14) Front Approach '4' Trigger ..... (kuid2:76656:80114:1)
15) Corrector Trigger 'FA' ..... (kuid2:76656:80120:1)
16) Corrector Trigger 'RAL' ..... (kuid2:76656:80121:1)
17) Corrector Trigger 'RAR' ..... (kuid2:76656:80122:1)

The Advanced Assets

18) 'FAP Tn Left **X**' Driver Cmd ..... (kuid2:76656:80103:1)
19) 'FAP Tn Right **X**' Driver Cmd ..... (kuid2:76656:80104:1)
20) 'RAP Left **X**' Driver Cmd ..... (kuid2:76656:80108:1)
21) 'RAP Right **X**' Driver Cmd ..... (kuid2:76656:80109:1)
22) 'Blocker' Driver Cmd ..... (kuid2:76656:80127:1)
23) 'Go Manual' Driver Cmd ..... (kuid2:76656:80126:1)
24) 'Go Auto' Driver Cmd ..... (kuid2:76656:80125:1)
25) 'Manual Load' Driver Cmd ..... (kuid2:76656:80005:1)
26) 'Manual Unload' Driver Cmd ..... (kuid2:76656:80006:1)
27) Feather left ..... (kuid2:76656:24030:1)
28) Feather Right ..... (kuid2:76656:24031:1)

Background Assets

29) ASB DTT Textures ..... (kuid2:76656:21003:1)
30) Script Library ..... (kuid2:76656:80020:3)

System Limitations & Tips

1) The maximum number of Channels/Junctions on any one map is 99.

2) Not all signals will work with it but if they worked in ASB Crossover, they'll work with Turnout

3) Does not support 2-way running on the same track but does support left **or** right hand drive layouts, (if both Controllers purchased).

4) It's not designed or recommended to change Driver Commands on-the-fly in Driver. They should be pre-set in Surveyor, (except for Go Manual/Auto).

5) Moving drivers into different trains or de-coupling trains during play is not recommended as the system may get confused. (But see Changing Trains)

6) Its build 2.4 so will produce a 'warning' in TS12 Content Manager. Should still work though!

7) If a Controller is 'on', only trains with ASB Driver Commands in their schedule will be allowed through.

8) All settings you make save to a Session, not the Route. (Keep a Master Session)

9) Using the 'Stop Train' command in Driver is not recommended and shouldn't be needed. As well as stopping the train it stops the schedule too. Even if you re-start the schedule, events may go out of sync!

10) Beware the Bug of Death! The bug indicates a script somewhere on your route has failed, probably due to a faulty asset. That unrelated faulty script can kill ASB Turnout too! If you see this bug, click on it for info, track it down and remove the faulty asset. Failure to do so may corrupt ASB Turnout.
(Exception - T:ANE produces this bug on save if you have missing assets on your map. If that is your only issue, Turnout will be unaffected.)

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