

graymac's
TPWS & AWS
for Eejits

a simplified look at how to get started

WARNING:

This is NOT a definitive guide, but it might help the confused, abused and misused, failing which there's always Morris Dancing!

Installing TPWS and AWS along with the signalling in BVE is often a cause of confusion and consternation to those who would like to attempt it. This is only a very simple guide, but it will (I hope) quickly show how a basic system can be fitted. If the dimensions on the simplified diagram are followed a working system will result. Be aware that there are situations where alterations may be needed. These placings of the working items (.Beacon) and visual items (freeobj) will quite probably be fine, but the distances between the loops and signals here are NOT CARVED IN STONE.

Once the route developer gains the confidence and knowledge it is possible to understand and address the many complexities which need to be considered in order to make the working truly faithful to the prototypical railway. Experienced practitioners know this well, my only wish is to help anyone with an interest to make a start.

I strongly recommend routebuilding beginners to avail themselves of the excellent route building tutorial by Dennis Lance, accessible online at: <http://www.freewebs.com/dennislance/> Dennis has produced some of the best route work I have seen in BVE, you must see the Maplestead and Clarendon routes and you will agree. Do not forget to read the notes which come with the BRSigns, looking at some queries on various forums I wonder if anyone does bother? There's an old maxim which goes something like, "If all else fails, READ THE INSTRUCTIONS!"

I made the simple graphic plan on the opposite page to put in front of me when I was starting to fit out IWR, my first effort. Being of a graphical mindset I found it easier to put the information I had read into a pictorial form. I *am* guilty of oversimplifying, but in order to indicate the need for awareness of the more complex issues which can crop up I reproduce, see below, some important information, thanks to Dennis.

Just to let you know, I noticed Graymac's guide perpetuates a common error, TPWS loops do not have fixed placement; from quoted from Group Standard GERT8030;

C2.1.3 Rules for positioning track sub-system

The infrastructure controller, in association with train operators, shall develop and implement the rules for the positioning of OSS transmitters that optimise their safety benefits. The rules shall take account of:

- a) the braking performance of trains as defined in Railway Group Standard GM/RT2045
- b) the attainable speeds of trains on the approach to the signal or other location
- c) the distance from the stop signal to the point of conflict at the crossing or convergence ahead
- d) the gradient of the line on the approach to the signal or other location

- e) the interleaving of other location OSS functions where signal OSS and TSS functions are or will be installed
- f) the risk of inhibition of the vehicle TPWS self test on power up
- g) the risk of unwarranted intervention during movements in the opposite direction on bi-directional or reversible lines.

The provision and positioning of TPWS track sub-system is dependent upon track layout, the location of signals and the attainable speed of trains. The provision and positioning of TPWS track sub-system shall be reviewed if a change to the infrastructure or the operational use of the railway is proposed which may affect the track layout, signal location or the attainable speed of trains.

As far as I'm aware, rules governing the positioning have not been explicitly published although the

distances given in the braking performance standard should give a good guide as to where the OSS should be positioned (as ideally the train stops before the signal).

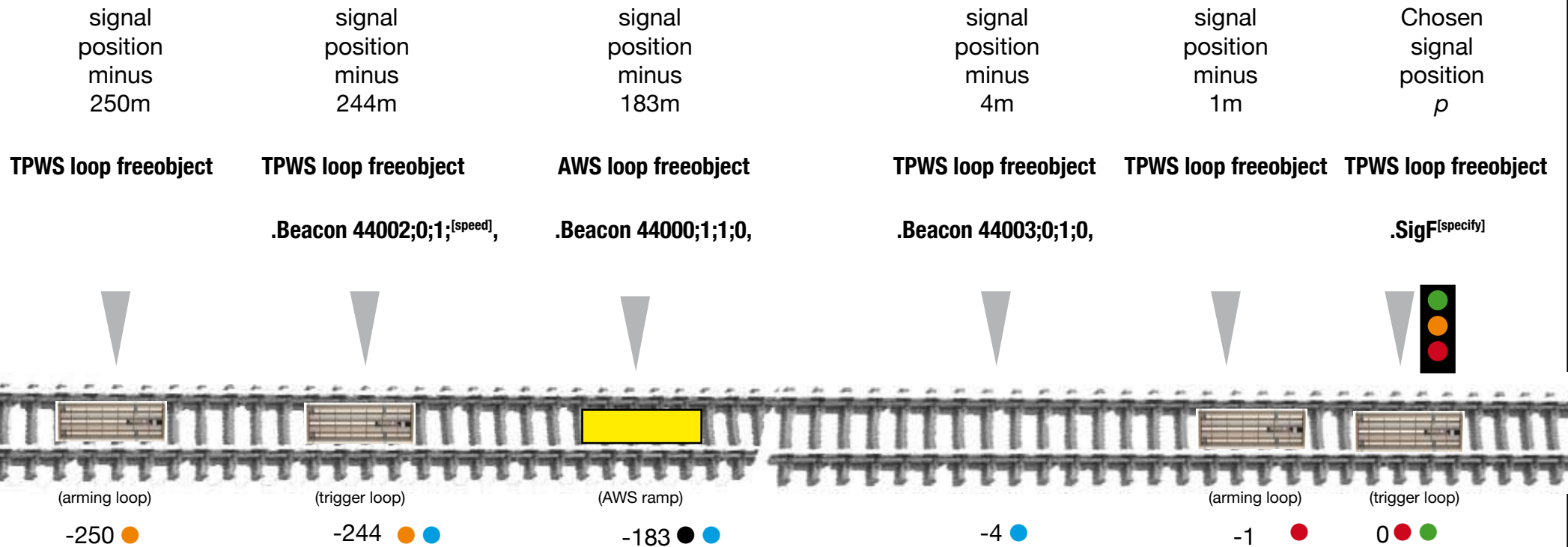
Similarly, AWS may be in one of two positions, ref group standard GERT8035

Subject to compliance with the requirements of clauses B6.1.2, B6.1.3 and B6.4, AWS track equipment for signals shall usually be positioned as follows:

- a) 180 metres (tolerance +10 %, -5 %) before a signal where the permissible speed is not greater than 160 km/hr.
- b) 230 metres (tolerance +10 %, -5 %) where the permissible speed is greater than 160 km/hr.

Dennis.

Simplified explanation of Signal item placement in BVE



- Overspeed Sensor (OSS) Loops*
- Train Stop (TSS) Loops*
- AWS ramp
- BVE Beacon command
- BR Sigs .SigF

*The OSS and TSS loops are identical in appearance and only a single item needs to be found and registered in the Structure namespace as a free object for this purpose. The AWS ramp in the BRsigs folder can be used as a free object unless you prefer to use an alternative. See the notes included with the BRsigs to correctly identify which of the available signal types you require at the signal position, and also to understand which .Section commands to use.

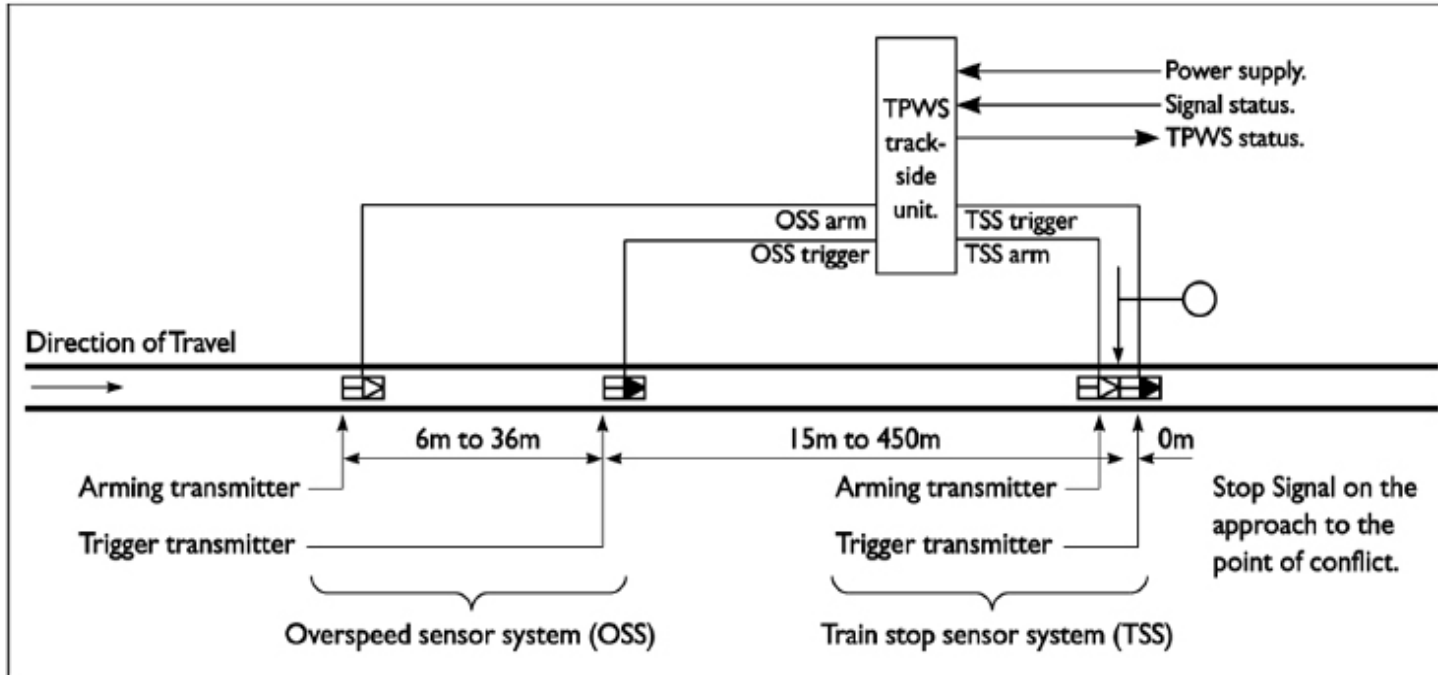
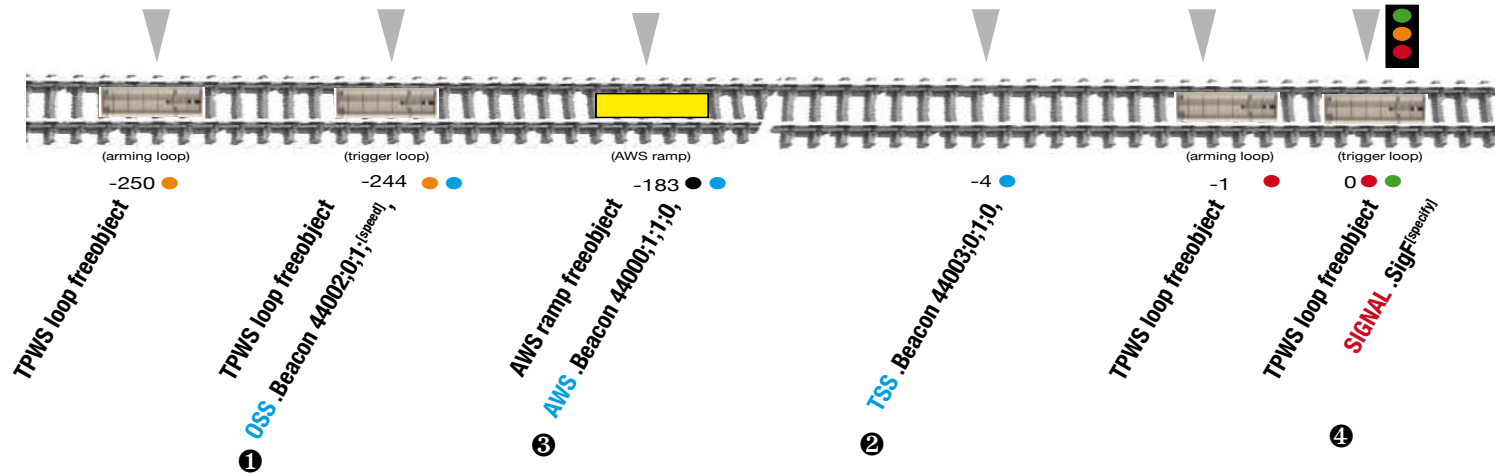


Figure 1 TPWS typical layout

A diagram of a TPWS system, introducing the range of variable distances and relationships between the OSS and TSS components (read the notes on previous page by Dennis Lance in connection with this diagram).

Don't be afraid to experiment, it's BVE so nobody will die! If you use the settings on the simple chart and find you are passing signals at danger, or the train isn't being arrested before the stop signal when over-speeding, then you need to look at changing the positioning of the loops.



Looking again at the simple diagram. The components are of two kinds, there's .Beacon and .freeobj items. The Beacons are the only things that actually work in BVE. The freeobjects are there for appearance, so that you see a TPWS loop, or an AWS ramp etc.

The first Beacon ①, here placed at 244m before the signal ④, is the overspeed detector. It can be as little as 15m or as much as 450m before the signal. If the train doesn't stop before the signal when overspeeding then move it further back, where the line speed is low it may work better closer to the signal.

The train stop (TSS) Beacon ② is shown located 4m before the signal ④. This seems to work almost universally.

The AWS Beacon ③ is at 183m before the signal ④, but see notes on the first page.

Just including these four components in the route code will allow the TPWS and AWS to work. The freeobject items, comprising a loop item and a ramp, are there for correct appearance. A loop is placed AT the OSS Beacon and the TSS Beacon position, a ramp is placed AT the AWS Beacon position.

Three additional loops should be provided, one at the signal position and one at 1m before the signal. The other is shown above at 6m before the OSS Beacon, but it may be up to 36m before the OSS Beacon, further being generally for higher speed lines. It is the placing of the OSS Beacon ① before the signal which affects the way BVE behaves, the Beacon being the WORKING part of installation.

Graymac hopes all this is some help, happy coding, simmers, this eejit is back to work on the Ballyfeckin and Waterville route, well in progress.