

Road Rally - Navigation

First of all try a visit to:-

<http://www.donbarrow.co.uk/>

For navigational equipment and courses!

This section is designed to help the potential navigator with no experience at all, however it may be helpful to a well-experienced navigator. I apologies if some aspects teach some to suck eggs.

What do you Need to be a Navigator

A Map

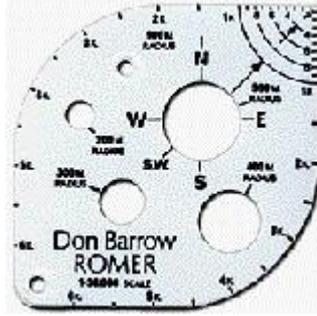
Ordnance Survey provides a wide scope of maps. For any type of motor sport the main ones to use are the Landranger 1:50,000 series. Further details & even printouts are available at www.ordnancesurvey.co.uk Normal 1:50,000 maps not retail at about £6.00. Always make sure you have the correct maps for the event.

Top Tip: - If you are using more than 1 map, then try joining them, partially where maps have overlaps. Cut down the edge and sellotape together. Be careful though, 1 map is bad enough to refold in a car, I know it may work out expensive but if you are to use lets say 163 & 164, cut the west half off 163 and the east half off 164 and join them, then you have two maps the size of one. Always however have the other half available if not another complete map.

Top Tip 2: - Always re-fold the map at each control to hopefully cover the amount of route you expect to use without re-folding en route.

A Roma

This is a navigators assistant, depending on the type can provide you with lots of information to assist your plotting. Almost a necessity at £3 - £10.



A Map Light

You need to see your map in the car, a good map light is essential, a dim light makes it very difficult to distinguish between yellow and white roads. You will obviously have to discuss this with your driver & make sure its fitted in the right place. Cheap ones could cost a fiver but probably a better alternative is to buy an expensive one, these will probably have an integral spare bulb and will not vibrate so much. I have also known navigators to use head mounted lights with pencil beams. With any light you must be careful not to distract the driver.

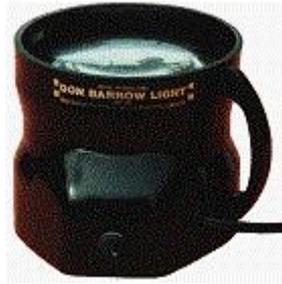


An Illuminated easy to read Accurate Watch

You will always find you suddenly need to look at the time; a watch that is easy to read is a real bonus, with clearly defined seconds. Make sure you know how to put it right at the start, to the second; rally time will not always be spot on with GMT. Self-illumination is also a bonus.

A Potti

No not because you're worried about you're drivers driving! Its best described as an upturned flowerpot with the bottom replaced with a magnifying glass and a small light to illuminate the map. An excellent help but not essential, could cost up to £70.00.



A Clipboard

You can clip your time sheet to the clipboard as well as using it to lay your map on while marking the route. Your clipboard can also have a wealth of information put on it, a chart you will see later, compass directions, average speeds etc.

A Map Measurer

Not essential I don't use one. You will however need to advise your driver how time is going, you may need to speed him up or slow him down, you can obviously calculate how much time is remaining, I will now take a guess at the distance, it may help to check if you are not good at reading distance.

Other Ancillary equipment

I say other ancillary equipment, well some is essential, a pencil to mark your route on the map, not too hard, an HB is too hard really aim for a 3 or 4 B (soft) they do not need so much pressure and will show a darker line. Make sure you have more than one, although a sharpener is a good idea to carry, you do not want to be trying to sharpen a soft pencil while traveling and plotting. Also you tend to lose them in the footwell! A well trained to keep them behind is a good idea

A pen or two are a good idea for filling in the paperwork.

A rubber for when you make a mistake plotting.

A pencil case to keep it all together.

Top Tip: - a piece of string so you can hang your roam and rubber around your neck prevents you losing them.

The Navigational Clues

12 Car Navigational rallies and other Navigational orientated events use a multitude of clues and hints, to transfer the information you receive through your window at the start of a section, to a navigable route on the map. The following information is by no means conclusive but should give you a good idea of what to expect.

Navigation is not an exact science; a new organiser may have a new idea and use it. There is only limited information available on a map and this has to be used. Variations on the following may be used.

Getting Started

The first thing I could recommend to do is to buy a map. Once you get a map, **Study It!** Find out what all the abbreviations are, practice your navigation.

You will always find our 12-cars will use Ordnance Survey 1:50,000 Scale Maps. Witney can be found on map 164, West Half. We regularly use 163, sometimes 150, 151, 174. Not very often any others.

Come and do a table top rally, basically these are rallies run in a pub! You can practice your navigation at your own pace and with the opportunity to ask questions.

To give you some idea of what to find on a map likely to be used and a guide of what to expect, I have broken down the various aspects as follows.

1. Tulip Diagrams
2. Map References
3. Spot Height's
4. Contour Lines
5. Road Numbers
6. Landmarks
7. Grid Lines

8. Herring Bones
9. Compass Directions
10. Clock Face
11. Distances
12. Trace
13. Directions at junctions
14. Junctions - Road Colours
15. Fractions of a grid square
16. Black Spots and Quiet Zones
17. Compilations

After this very long section on navigation, there is further information under the following headings.

1. What does your driver need to know.
2. If you get lost.
3. Controls.

After each of these navigation sections, i have given an example of how to plot the following route from outside Welch Way Car Park in Witney to the triangle in Finstock. The map used is Landranger Map 164. The start is at M/R 355099 and the finish is at 362162.



Tulip Diagrams

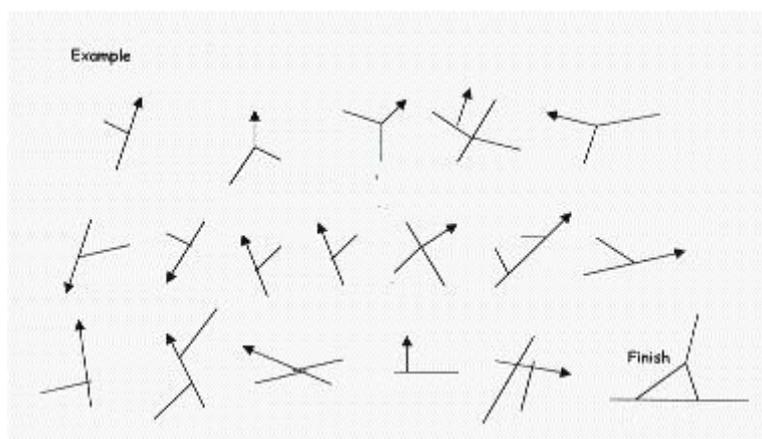
These are basically pictures of road junctions you have to follow.

You may find they are listed as if the top of the paper they are on is north, however they may be turned and sometimes even mirrored.

Sometimes you may get dots and arrows or just dots or just arrows. Normally you will approach from the dot and depart in the direction of the arrow. You may however find them reversed!

Another point to bear in mind when dots and arrows are not used is that there may be two or more options of route. In this case you would need to look at the next available junctions to see which way will work.

They will normally read left to right, top to bottom, however it may read right to left bottom to top!



I apologise for lack of dots and quality.

Map References

Along the corridor and up the stairs! What? An OS map is divided into 2cm squares, these are known as grid squares, the lines making the squares are grid lines, the up and down ones, eastings, the side to side ones northings.

If you look around the edge of the map each of these lines are numbered, you will also find them numbered faintly on the map every 10 lines.

A map reference will read something like 164/**453672**. The 164 is the map number and not always shown.

The **45** and **67** will relate to the numbers on the grid lines. To start with, start in the lower left hand corner and work to the right looking for grid line (easting) number 45. Then work up the map until you reach grid line (northing) number 67. Where these two grid lines cross, they relate to the Grid Square to the right and up.

The 3 and the 2 are fractions of a grid square, imagine them as .3 and .2. Once you have located your square then move from the bottom left hand corner .3 to the right and .2 up. This is then the location of your Map Reference!

A map reference will normally locate you to within 50 meters of a particular point! You may find even further divisions used such as **463567275**. The extra 5 will relate to .35 and the extra 75 will relate to .275. You can actually pinpoint down to 12.5 meters like this. You may have to puzzle it out yourself though.

To help you a bit more with locating a grid line number in the middle of a map, every 10th grid line is marked slightly thicker. Therefore if you are looking for easting 41 then you will know it will have a thicker line next to it.

There is also a tool available on the market to help you, called a roma, have a look in the rally navigation ads in the media for these; they only cost £2 -£3. I won't explain how to use it now but it's a good investment.

Example

360106 364134 356123 351130 364138 355160

Spot Height's

These are small black numbers with a small black dot next to them. The figures actually relate to the height in meters above mean sea level where the dot is. Certainly in our area you are not likely to see numbers in excess of 300.

Spot heights are normally positioned on roads or in towns to give the map reader some idea of the height above sea level, don't forget they will always have a dot next to them and will actually refer to where the dot is.

Example

118 124 113 104 108

Contour Lines

Whilst we are referring to heights above sea level then lets look at another application. It is unusual for organisers to use contours for navigation, they would be very difficult to follow! However the information is there and could be used. Contours can also help you in reading the road and locating your position, we will talk more about this later.

Contour lines are the light coloured brown lines you will find almost anywhere on any map. They show the lie of the land; basically if you could navigate yourself to walk along a contour line you would never have to walk up hill or down hill you would stay at exactly the same height.

A contour line is similar to a spot height as they are marked in the height above mean sea level. Whereas spot heights may be marked at any height, contours, are in units of 10 meters above sea level, therefore the last digit is always 0.

To find out the height of a contour, follow the contour (sometimes for some distance) keep your eye on the contours next to the one you are following. You should (but not always) come to some small, difficult to read small numbers on either the contour you are following or the ones next to it. These numbers relate to the line they are written on and are the height above mean sea level for the whole length of that contour. If the particular contour you are following does not have a number then look at the adjacent contours and + or - 10 to find the height.

Contours and spot heights are therefore related; if you find a spot height of say 135 then the contour lines adjacent to this spot height could only ever relate to 130 or 140.

Another help in finding the heights of contour lines is that every 50 or 100 meters, the contour is slightly thicker.

Example

This section is not a good one for contours!

Road Numbers

All major roads on OS maps have numbers. Motorways are always prefixed with an M and are blue, A classification roads are always prefixed with an A and are red, B classification roads are always prefixed with a B and are brown. The majority of roads however are unclassified roads marked yellow or white, which don't have numbers. Therefore it would be very difficult for an organiser to use just road numbers alone to define a route, however they are quite often used in conjunction with other forms of navigation.

Example

4095 118 4022 108

I have had to add some spot heights in here as you could not use road numbers alone.

Landmarks

There are loads of landmarks available on a map, anything from a public telephone to an Airport! The less likely you may find are the likes of greenhouses and chimneys. Middle of the range are churches, schools and Pubs! This is to name just a few. The only advice I can give on this is that once you have brought your map is to study the information list down the right hand side of the map.

It is possible an organiser in some areas could just use landmarks to define a route. This is particularly easy in rural areas with farms, which always seem to be named!

Example

Mus, Merryfield Fm, PH, Poffley End, +, 108, PH, Heath, +.

Grid Lines & Grid Squares

We have spoken about grid lines when plotting map references. Grid lines are all over the map and can be used in various ways to define a route; I will therefore further break this section down into different aspects.

Crossing Grid Lines

If you were to follow a route from a to b over some distance, you would find it would cross loads of grid lines. An organiser could therefore give you a list of two figure numbers, which relate to grid line numbers. All you need to do is go from your start point and cross the grid lines in the order supplied. E.g. 53 18 54 19 55 20. Basically cross grid line 53 then grid line 18 then grid line 54 and so on. I can even tell from this short list you would travel in roughly a northeasterly direction as the numbers are increasing.

Example

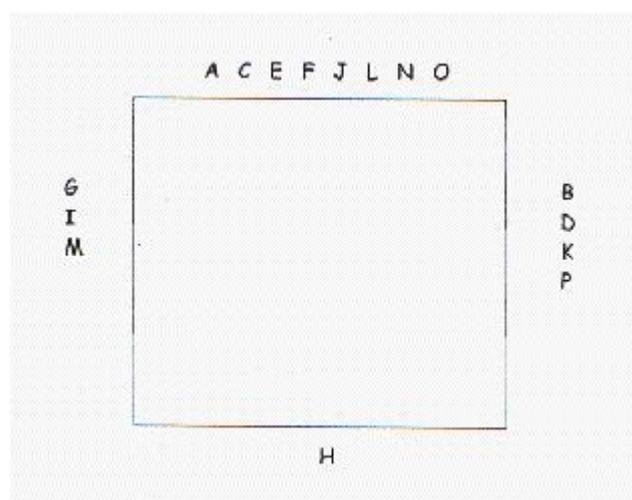
10 36 11 37 12 13 37 13 36 13 36 14 36 15 16 36

We have spoken about grid lines when plotting map references. Grid lines are all over the map and can be used in various ways to define a route; I will therefore further break this section down into different aspects.

Crossing Grid Lines

Imagine a box on your route instructions with letters of the alphabet around the sides and on the top and bottom! Simple, start with a, if it is on the top then depart the square out of the top. Then b, if it is on the left then depart the next square to the left. Then c, if it's on the top then depart the square out of the top. Then d, then e, then f, and so on.

Example



A point to bear in mind with all the above is that there may be two or more options of route. In this case you would need to look at the next grid line or grid square and decide which way will work.

Herring Bones

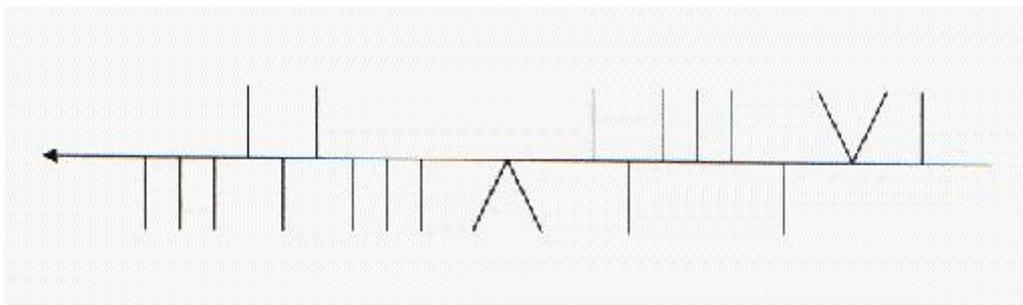
Once you have finished your dinner on a Friday you may spot on of these! It is a true description, a straight line with lots of smaller lines coming off the sides.

Normally starting at the left, work your way along the line. If the first smaller line you pass is on the left of the line, this means you have to miss a road to your left. If on the right then you miss a road to your right. If smaller lines are both sides this will mean miss a road to the right and left at the same time, basically straight on at the cross roads.

If you come to a miss a road to the right and the road you are on has a turn to the left basically you miss the straight on road and take the left (and vice versa). Likewise if you come to a V on the left and on the map you arrive at a cross roads, then you will need to miss two on the left, so turn right (and vice versa).

The herring bone may have a dot to say start this end and an arrow to say finish this end. Alternatively it may have neither and you may have to sort out which end to start.

Example



Compass Directions

A minimum of two ways could be used here, either directions or degrees. We all know North is up, South is down, West is left and East is right. Well that's it basically, normally applied to junctions, the top of the map is north, if you come to an N then head to the top of the map. If then you come to an E then head to

the right of the map, W left, S down and so on. We can also add to this NW, $\frac{1}{2}$ way between N and W, SE, $\frac{1}{2}$ way between S and E etc.

Adding further NNW this is $\frac{1}{2}$ way between N and NW, WNW, $\frac{1}{2}$ way between NW and W. By using up too three letters we can define 16 directions.

Example

NE N NE NW NE WNW SSW SSW NNW NNW NE

NE NE ENE NNW NNW NNW WNW N ESE

Degrees. As there is 360 degrees on a compass its very similar to above, 0 or 360 is North or up, 90 is right or East, 180 is South or down and 270 is West or left. We now have 360 directions to head.

Example

45 0 45 300 45 280 200 210 340 340 45 50 50 70 340 320
290 355 100

As per most navigation, normally reads left to right and top to bottom. Watch out it may be reversed.

Clock Face

This is very similar to compass directions, 12 is at the top, 3 is right 6 is down and 9 is left.

How is this applied to a map? It would normally be applied just to junctions; basically you arrive at the junction and depart in the direction of the hour hand of a clock! If its 12 then you head to the top of the map, if its 3 then you head to the right of the map & so on.

Another application to this is to assume you always arrive at the map from 6 O'clock therefore if you arrive at 6 and the next direction is 3 then you turn right, 9 and you turn left & so on.

With both the above the remaining times can be used to define the direction of travel more accurately. You may possibly find to be even more accurate than $\frac{1}{2}$ pasts may be used!

Example

1 12 1 11 1 10 7 7 11 11 2 2 2 2 11 11 10 12 4

It could also use the 24 hr clock!

13 12 13 23 13 22 19 19 23 23 14 14 14 23 23 22 12 16

Distances

If you look at the bottom of the map under the grid line numbers, you will find a scale, basically 2 Centimetres = 1 Kilometre & $1 \frac{1}{4}$ inches = 1 mile. You will not normally find inches and miles used anymore, you will have to modernise. Working in Meters and Kilometres will also be far easier, as grid squares are in 2cm divisions, if a road was to pass straight from one side to the other side of a grid square then that would be 1 Kilometre.

Example

.3 .3 .1 .3 .1 3.1 1.4 1.3 .3 .2 .8 .3 .2 1 .3 .9 .7 .6 .6 1

Trace

Probably the easiest if in a conventional format. If you get passed a piece of tracing paper with a squiggly line on it then all you will need to do is just lay it on the map, line the start points up, turn it until the roads line up and hey presto, a defined route.

A variation to this is to not give you a start and finish, mirror the route or issue it on plain paper. Another option is just to give you the junctions or bends.

Example

Can't really do an example of this!

Directions at junctions

Another pretty easy form of navigation, we have probably all used it at sometime, TR = Turn Right, TL = Turn Left SO = Straight On. Additions to this may include BR for Bear Right, FL for Fork Left and even HPR for Hairpin Right.

Example

TL SO SO TL TR TL TL SO TR SO TR SO SO SO TL SO
SO SO TR TR

A variation to this is to use the following chart for a number corresponding to a letter of the alphabet.

A	B	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	10	11	12	13

N	O	P	Q	R	S	T	U	V	W	X	Y	Z
14	15	16	17	18	19	20	21	22	23	24	25	26

Therefore 2018 = TR, 2012 = TL, 1915 = SO and so on.

Example

2012 1915 1915 2012 2018 2012 2012 1915 2018 1915
2018 1915 1915 1915 2012 1915 1915 1915 2018 2018

Junctions - Road Colors

We have already talked about road colouring; well this in some circumstances could be used for the clues to navigation.

Lets picture a yellow road crossing a red road; this junction could be defined as RYRY. To define a route the organiser will normally use the first letter as the road you approach on and the last letter is the road you depart on. In this example therefore you will arrive on a red road and depart on a yellow road.

You may have already realised there will be a choice of two roads to depart on, well this is a problem you will need to overcome yourself by following the route further to see which way will work.

You will however normally find the majority of junctions only consist of three roads like RRY! This will make it a bit easier, you may think? You may find a row of YYY, maybe up to six times, this can provide all sorts of plotting problems, however an organiser will normally check to make sure it will only define one route.

A variation on this will be just to jumble the letters up and ignore the approach and depart colours, this can prove very challenging!

Also remember our chart earlier, this could also be applied, e.g. 18251825 = RYRY

A potential problem with this is also motorways, they are blue = B and brown roads also = B. This is not normally a problem, as you don't normally use motorways on road rallies, if you cross them this should be oblivious.

All junctions will always consist of 3 or more roads and quite often-different colours. Therefore the organiser could use this very basic information to define a route.

A potential problem with this is also motorways, they are blue = B and brown roads also = B. This is not normally a problem, as you don't normally use motorways on road rallies, if you cross them this should be oblivious.

Example

YYY YYY YRR RBRB BBY YYY YYY YYY YBB BYB BYBY
YYY YYY YYY YYY YYY YYY YYYY YYY YYY YYY

You may not believe it but although there is a list of six YYY's in this, it still defines only one correct route!

Black Spots and Quiet Zones

Black Spots are prohibited from entry! If you find a route will not clearly define a route, you may find there can only be one route because the alternative will take you through a black spot.

Quiet Zones are as they state, Public Relations sensitive areas; vice versa to the above you may find an ambiguous route, head for the quiet. Pointless to define them if you are not going to use them.

Example

Black Spots:- 3511 3609 3812 3813 3514 S 1/2 3413 3715 3415 3516
N 1/2

Quiets:- 354127 500m

Compilations

This can be a combination of any of the above combined together. If the organiser wishes to make it very teasing, you could find just a lie of numbers across the page sometimes without spaces. It could consist of road numbers, grid lines map references etc etc. What you would need to do in this situation is

to find what information is available at your start point, does it tie up with any of the numbers? Don't forget it could also be mirrored.

Example

+ + YRR 118 ENE Poffley End Delly End 108 352154N TR

What does your driver need to know?

Your driver will primarily need to know, where to go. You could survive an event just by giving him this information.

However you could make his job far easier, When you say slot left, add to it, slot left approx 200 meters, just after wood on left. Use the landmarks, you can even tell from the map if the road has a fence along side it or not.

Use the contours; if they are close together you know you will be going steep up or down hill, T-Junction turn left at top of hill.

Your driver can benefit you as a team by having some idea of the time schedule, this is partially important on regularity sections. Advise him if he need to go a bit faster, more often than not advise him to slow down a bit, its pointless waiting outside a control for 10 minutes.

It will also help your driver to warn him of the road, you could keep your head down and read every bend to him and feel when you have been round it with g-force. If you have a 30 right immediately before a t-junction then read it as 30 right into t-junction turn left.

You can tell from a map a lot of junction priorities, you can if not guess at most, always warn your driver if he is expected to stop.

When reading the road, accepted practice is to give degrees as the information together with an estimate of distance, "100 30 right" will mean 100 meters bend to the right approximately 30 degrees.

With junctions, a slot will normally mean a road off to the left or right. You could amend this by saying "100 turn 60 right" or 200 turn hairpin left. A T-junction is as it describes, you approach from the bottom of the t and go left or right, these will normally be a give way.

Warn your driver of road classification changes, if you are on a brown road and entering a yellow, then advise him, as it will possibly be narrower. You can actually find a guide to the width of a yellow by its width on the map. There are

only two widths the narrower is a road of less than 4 meters wide and the wider one is more than 4 meters wide. This information is actually quite important as the smaller one may mean having to stop to pass oncoming traffic.

Normally on leaving a control you will have your work cut out plotting. The best advice here is to get your driver to proceed at a steady pace advise him approx 1.5 K to next junction, T-junction give way, turn right, no bad bends, and tell him to shut up. You should now get on and plot in comfort and peace. Once you get to the junction then give him the info to the next junction and so on until you have it plotted.

If you get Lost

Don't pack up and go home! However if you do try to advise the organisers. Back track your steps and look for landmarks, not just churches and schools but hills and unfenced roads, telephone boxes and bends. Knowing your rough location, within about a mile you should be able to find out where you are. Put yourself right and assess the time, consider cutting and running (cut and run) this basically means take a short cut to the control to prevent dropping too much time.

If you get too confused with the plotting, think about the time you have available, plot the next control and head for it. If you still have time look at the map and think where the organiser would have taken you, perhaps use some of these roads as you may find a code board.

Controls

Time Controls

These will certainly be the start and finish and others on route called TC's. You will normally have a map reference for these. You may even get a direction of approach or depart, this will be shown by a compass direction either before or after the reference. Before and it's the approach direction after and it's the depart direction.

These controls will be timed from the start of one to the next. These will also be where you have your slip of paper with your navigation passed through the window at your departure time.

If you have to wait in the control, before you get out and have a chat, take the opportunity to re fold your map to allow the view of the whole of the next

section. Look at the road departing the control; you may even be able to tell your driver which way to go at the next junction before you even get your route.

You will normally have a maximum latest to arrive at TC's, any later than this and you will be excluded. WMC use 10 minutes therefore if you are due at 22.48 and you arrive after 22.58 you will be excluded.

Secret Checks

These may be found anywhere on route and maybe manned or unmanned. They are basically checks to make sure you are going the right way; at manned controls the marshal will just sign your time card. Unmanned controls will normally be just what you would call a code board. This will consist of a board with a letter or number on which you will need to record on your time sheet. WMC have there own set now of 3 characters of vehicle number plates on 1 meter posts.

Time Cards

Below is an example of a 12-car Time Card, this should be self explanatory but if you have any queries please ask!

Presidents Trophy 12Car 14/1/00

Crew:-

Car No:-

	Arrive	Sig	Depart	Sig	Time Allowed	Penalty
Start					25	
TC1					25	
TC2					32	
TC3					40	

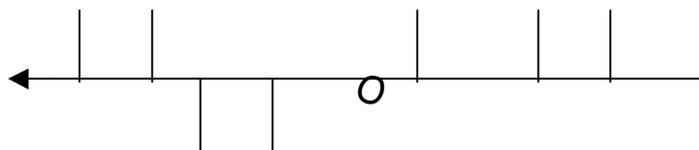
Finish						

Codeboards & Secret Checks

Route Instructions

Below is an example of a 12-car Route Instructions. Now you have had the information above why not give it a go!

Start 367.5 087 S to TC1 N 463020



412.5 058

69 05 04 41 03 41 02 41 01 00

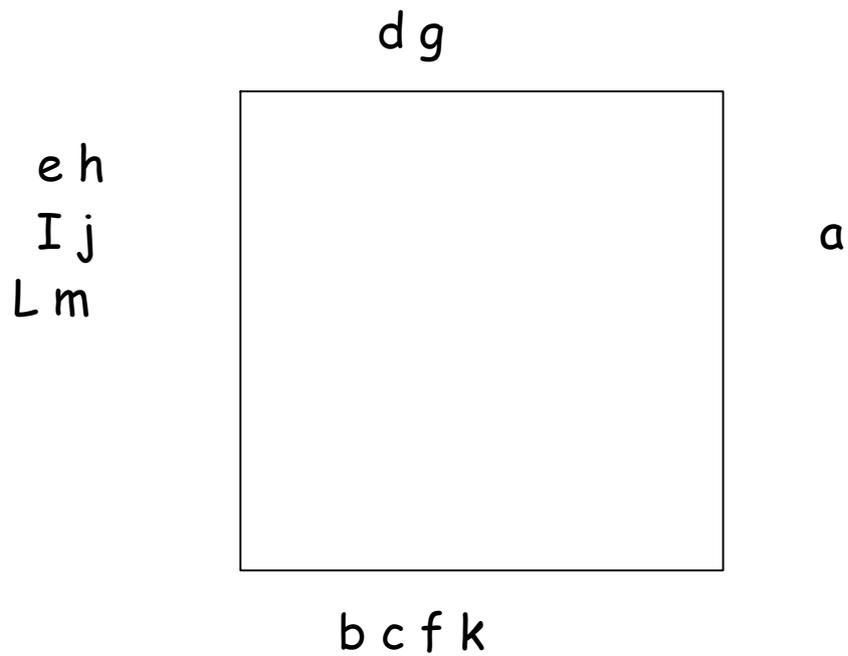
444 020

TC1 463020 to TC2 347927

SE SSW WSW SSE NW

WNW NNE WNW W SW

.1 .8 .35 .7 .2 .3 .8 .05 .8 .45 .6



TC2 347927 to TC3 224977

417



YYY YYY YYY YYY YYY YYBB BBY YYY YBB
BBY YYY YRR RRY YYY YYY YBBY BYB BBY
YYY YYY

TC3 224977 to Finish SSE 265 053

2012 1917 2018 2012 2012 1917 2018
2012 1917 2018

North into Clanfield Going past Rectory Farm,
Advioding Glebe Farm, Too include a Hairpin
Right.

4020256049240086