RALLY NAVIGATION

Paul Barrett –Chelmsford Motor Club

1. TYPES OF RALLIES:

12 CAR RALLIES

As the name suggests these are limited to twelve competing cars, which should be standard or only slightly modified. These events are navigational in nature so high performance cars are not necessary. They generally run on weekday evenings and consist of forty to ninety miles around the local lanes. Members of up to six clubs can be invited but often entries are only from the organising club.

Chelmsford MC 12 car rallies are aimed specifically at beginners and novices (experts do not qualify for the annual championship but may enter individual events). The club runs an annual winter series for which experts will be eligible, competitors will also be encouraged to marshal and swap seats. Beginners will get the route information before the start, and sometimes photocopies of sections of the route. Novices will get the route as they leave the start, often in sealed envelopes to be opened at time controls. Experts also get sealed envelopes and also have harder clues to solve.

Timing is to a 30mph average with time controls every six to twelve miles with perhaps one short section to get a result between the experts. See the section on timing below. Typical entry fees are £10, plus £15 third party insurance.

SCATTER RALLIES

These have no fixed route and therefore no time schedule –crews usually have to visit as many points on the map in a fixed time period, obtaining a clue at each. They are popular in southern England and in University motor clubs.

ROAD RALLIES

These almost always take place on Saturday nights and are open to MSA competition licence holders, who also have to belong to clubs in the region. Most events are part of one or more championships. There will usually be thirty to sixty cars, although some Welsh events run with ninety, covering a route between one hundred and twenty and two hundred miles.

There are two types of event – road rally and navigational rally. The former have restrictions on the type of car that may be used and have a more speed – focussed format, often with sections on rough roads ('whites') timed to the second. The latter are open to all cars that meet the noise restrictions, although many events enforce all or part of the road rally rules, and place a heavier onus on navigational problem solving.

Navigational events tend to run in southern England, Scotland and Northern Ireland with road rallies being centred in Wales, central and northern England (plus CMC's Preston rally in Norfolk). Beginners often have a separate event to enter with easier navigation and / or a shorter route. Again, they are timed at 30mph but controls are usually every two to six miles which means there is much more work for the navigators. See the section on timing below.

Cars may be standard and un-modified but many drivers fit harness spot lights (two are allowed if the car doesn't have driving lights), seat-belts, roll cages and sump-guards. A map light is also needed (see Basic Equipment below).

Endurance rallies are now very popular – these are for under 1400cc slightly modified cars and include driving tests on private land or forests timed at 40mph.

Typical entry fees for road rallies are £50 - £75, endurance rallies £200 plus £15 - £26 third party insurance.

STAGE RALLIES

These are solely speed events penalties are given for total time elapsed on defined (and often pace noted) special stages on private land, although there is a time schedule to maintain between the stages with penalties of perhaps ten seconds a minute for early or late arrival.

Modified cars are mandatory – roll cages, bucket seats, harnesses, plumbed in fire extinguishers, electrical cut-out switches, fireproof overalls, crash helmets and intercoms are minimum requirements. Drivers are required to have completed a training course before applying for a licence.

The cheapest form of stage rallying is Multi-use (or single-venue) – these events take place entirely at one venue, usually an airfield, during one day. There will be eight to twelve timed stages, often reversed in direction half way through the day, covering thirty to fifty miles. Typical entry fees are £170

Forest rallies offer a more competitive driving experience but are more expensive than tarmac events, both in entry fees (£350 for 30 miles to £1000 for an 80 mile international) and damage to the car. The best events are in Wales, Yorkshire, the Lakes and Scotland although there are events in Kent and Hampshire and Nottinghamshire. Navigation between the stages is by tulip road book – see Navigational Techniques below and co-drivers need to ensure the correct service times are adhered to.

Closed road tarmac rallies offer the best value-for-money but always involve travelling from East Anglia, either to Belgium and France (local) or Scotland and Ireland. These events are usually pace-noted in the days before the event; there are many systems of noting in place which will not be discussed here. Typical entry fees are £350 for 150 miles of stages at national level, rising to £750 for an international event of a similar length.

HISTORIC RALLIES

The Historic Rally Car Register co-ordinate championships for historic and classic cars in both stage and road rally formats.

An historic rally car must be in period trim as made before 1968, post-historic cars made between 1968 and 1974 are allowed in both disciplines but classic cars made between 1974 and 1979 are only allowed in stage rallies but will be allowed in road rallies in 2006.

Historic road rallies, such as CMC's East Anglian Classic, which is a two-day event, have a number of formats:

Night rallies run in the same format as road rallies for modern cars (and often as part of the same event)

Day time events that have timed driving tests on private land and average speed sections called Regularity Sections on the public road. Cars on regularity sections have to maintain exact average speeds for defined distances and are timed at secret timing points to the nearest second (eg 28mph for 2.3 miles followed by 24.3mph for 4.25 miles). Speed tables and accurate distance measuring equipment are required, along with a good head for numbers.

Two day rallies combine the two formats and tend to be most sociable events, being based at a hotel for the whole weekend.

The rules for **historic stage rallies** are essentially the same as for modern events, except that cars are divided into age and capacity classes.

2. Basic Equipment

As you gain experience, see what other crews are using and develop your own preferences you will assemble your own personal kit. Here are some suggestions to get you started.

- Map board – measuring about 18" square eg- two pieces of cardboard stuck together, and edged with black (gaffer) tape. Please never ever be tempted to use solid wood because if you are unlucky enough to be involved in a crash, a wooden board will act like a guillotine, and cut you in half!!

- A map light – some cars have build in lights that can be OK.

- A marshal's / plotting light, above the passenger door, or a halogen light mounted in the roof-lining.

- Map Romer (usually kept around the neck on a piece of string) –The famous Don Barrow has for many years produced a romer, available directly from him at 4 Sandy Lane, Whirley, Macclesfield, Cheshire, SK10 4RJ Tel: (01625) 429092, and from many good auto shops, and there is another called the Basic Roamer available from Basic Navigation Supplies, Greenhollow, Stolford, Bridgewater, Somerset, TA5 1TN Tel(01278) 652582.

- Illuminated map magnifier –An essential piece of equipment. You could make your own or you can purchase them at prices ranging from about £30.00 for a Basic Terrain follower to £80 for a top-of-the-range Don Barrow.

  Demon Tweeks supply a full range of navigational and rally car equipment including the above items.

- A good supply of 2B pencils – eg Pentel or Staedtler clutch pencils at 0.7mm and 0.9mm lead widths and a couple of rubbers.

- A selection of different coloured pens for helping frozen and wet marshals and recording code-boards.

- Tracing paper cut into a couple of 20x10cm pieces.

- Two Clip boards (A4 size), one for the time card, one for road book or passage check card if issued separately.

- A good easily readable clock or watch set to the exact time of the rally Master Clock, which should indicate GMT or BST.

- Anti-travel-sickness pills. – Kwells seem to be the most powerful but cause drowsiness and dry-mouth. Sturgeon do not seem to have these side-effects but are less effective and need longer to take effect (two hours as opposed to forty minutes). Depending on how resilient you are it's worth experimenting.

- A good torch.

- For historic events most navigators use two stop-watches and a set of speed tables.

- A stopwatch is useful for stage rally navigators as well.

- Electronic trip meters (eg Brantz or Terratrip) are necessary for historic events (showing distance only, not speed) and for stage rallies (except single-venue events)

3. NAVIGATIONAL TECHNIQUES

3.1. Basic Information

The definitive rules for all motorsport in the UK are published by the MSA in the form of a book known as the Blue Book – every club has a few copies and one is sent to every competition licence holder. It is not necessary to memorise the whole book, but every competitor should be familiar with the general regulations in sections A, B, C, D and E and the specific regulations for rallies in section K. The Blue Book is supplemented by specific rules and information for each rally called the Supplementary Regulations.

Before any rally you should fill in the entry form and post it along with the entry fee or, if it is a 12 Car, enter by calling the organiser well in advance of the event. You cannot enter on the night and most entry lists close a week before the event. Supplementary Regulations and publicity for the rally can be obtained from the organisers or the competition secretary of your motor club. Road and stage rallies post entry lists and 'final instructions' in the days leading up to the event.

All road events use the 1:50 000 Ordnance Survey maps, the SRs will specify the number and edition of map(s) used – ensure you turn up with right ones! The covers and keys can be cut off for ease of folding on the move and some navigators highlight gridlines and spot heights (see section on techniques below). No other forms of map marking are allowed.

When you arrive at the start of the rally you will be required have your car scrutineered for adherence to the rules, perform a noise check and then to 'sign on' – show your club card and competition licence (if required) and proof of insurance if you are not using the Alexander Forbes scheme offered by the organisers.

Quiet Zones and Black Spots will be given in the route instructions, or on a separate sheet issued before the start, these should be clearly plotted on the map a quickly as possible – the penalty for not obeying could be exclusion!

There are a few acronyms used in rallying:

GW (Give Way) junctions may be defined by the road book or within the navigation, you must stop at these – the penalty for the first offence is exclusion.

Coloured Roads Only: Often abbreviated with the acronym **CRO**. If this appears on the route instruction it means you can ignore any white roads on the map when plotting your route. When the organiser intends you to use white roads you might see **AR** – All Roads, **CAR** - "Consider All Roads" or **MUW** - "May Use Whites", but usually the absence of CRO on the card is enough.

You may be required to go **LWR** (Long Way Round), a **NAM** Not As Map grass triangle (**GTA**). Any junction where this is required will be defined within the navigation. **MR** means map reference.

Route instructions for some non-competitive sections may be given out before the start but the majority of information on road rallies will be spoon-fed in the form of paper handouts that are either given to you by the marshals en-route or in sealed envelopes to be opened at specified controls. The route should be drawn on along side the roads on the map in pencil, draw a line a few mm to the nearside by convention (ie left going up and right coming down the map).

The shortest route defined by the navigation in the order in which it is presented (unless explicitly stated otherwise as longest route) should always be selected.

The following sections discuss the requirements for timing, the types of section and route instructions typically used. The last section is not definitive but should cover most techniques found by beginners and novices on 12 Car rallies and the majority of road events.

3.2. Timing

Schedule – Types of section

Standard (competitive) and Transport (link) sections are timed at 30mph, except on motorways where 50 mph is allowed. Neutral (quiet, sensitive) sections are timed at 20mph. Regularity sections will have a defined average speed always less than 30mph. 12 Car rallies are usually timed at 30 mph. Watch out for short sections on narrow lanes or whites where the organisers may have thrown in a complex handout or 'adjusted' the distance slightly to make the section more competitive – these sections usually sort the experts out to get a result.

30mph is two minutes per mile. It is usually to possible to average 40mph or more down country lanes so there is usually a bit of free time for plotting or making mistakes (eg a six mile section, 12 minutes could probably be driven in nine or ten so there may be two minutes' plotting time – see Plotting below). On sections timed to the minute the seconds are ignored so you actually have fifty nine seconds longer than the actual section time before incurring penalties. The time card will indicate your Due Time with no penalties at each control. Penalty for booking in before Due Time is two minutes per minute DO NOT BE TEMPTED TO BOOK IN EARLY! Lateness is penalised at one minute per minute up to a maximum of thirty minutes fifty-nine seconds (OTL). Once you have gone OTL it is best to cut part of the route and re-join within your time schedule.

Penalty for missing a Passage Check (Board with letters written on them that must be recorded in the relevant place on the time card) is usually One Fail, but may be reduced to five minutes on road rallies.
Not visiting a time control, visiting twice, OTL or wrong direction of approach or departure will be penalised One Fail per control.
The results are calculated by adding up the fails first, then the minutes. A crew who have been the correct route slowly on, say, 0F 25 mins penalty will beat the speedy crew who missed a code board or time control and finished on 1F 0 mins.

Make Up

Any lateness incurred must be carried into the next section except for the amount of make up stated on the time card.
For example if you drop 4 minutes on one section but arrive three minutes early on the next section which has a 'Make Up' allowance of 2 minutes you may only book in two minutes early and carry the other minute into the next section.
Penalty for too much make up is One Fail or 30 mins for the first offence and exclusion for the second. If you miss a time control you may make up any time into the first control you visit, as long as it is not a Neutral control.
On sections of four miles or less there is usually no limit on the amount of make up allowed. On longer sections make up is limited to one quarter of the time allowed (ie you must not do the section in less than three-quarters of the total section time), but this is rounded to the nearest whole minute, so 12 and 13 minute sections have 3 minutes make up while 14,15 ,16 and 17 minute sections have 4.
Make up is only allowed on Standard (competitive) and Transport (long link sections over four miles long). No make is allowed on Neutral sections which are by definition quiet sections, usually through villages.

Plotting the route

Good road rally crews aim to plot on the move – plot and bash, the navigator needs to work out the route instruction and call the next junction before arriving at it and then carry on plotting whilst keeping the actual position of the car in mind. Drivers must never go past a junction that hasn't been called and should listen to the instructions so that they slow down before a junction rather than sailing past it! 12 Car rallies usually have long sections and beginners are given some plotting time before the start (pre-plot). It takes a lot of practice to be confident of plotting on the move.

Some navigational techniques used in 12 car, Road and Historic rallies are described below:

3.3 Types of route instruction

GRIDLINES and GRID SQUARES
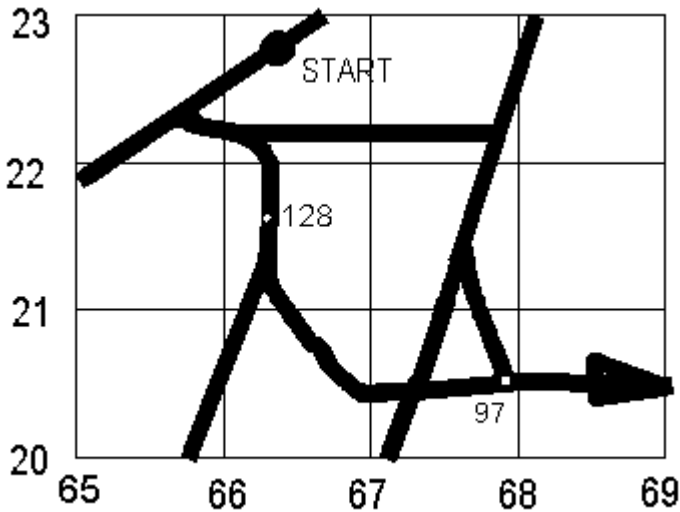
The grid of the map can be used to define the route by the crossing of gridlines. This example is simply a list of the numbers of the gridlines across which your route must travel in order.

66 66 22 21 67 21 21 68

These numbers could be given to you as a continuous string:

6666222167212168

or with a couple of spot heights mixed in to confuse you:

666622128216721219768

Devious organisers will use this method when you're in an area of the map where the northing and easting gridline numbers are   similar!

Each grid square can be specified by a four figure map reference, defined by the intersecting gridlines at the SW corner of the square, so you may get this list of grid squares through which your route must pass in order:

6622 6522 6622 6621 6620 6720 6721 6720 6820

This route could also be given as the North, South, East or West sides by which you should LEAVE each grid square:

W E S S E N S E

Or, less commonly, as the direction from which you will ENTER each grid square:

E W N N W S N W

Note that these directions will only be specified using the four cardinal compass points, N, S, E and W. You will not get a NE or a WSW direction in the string.
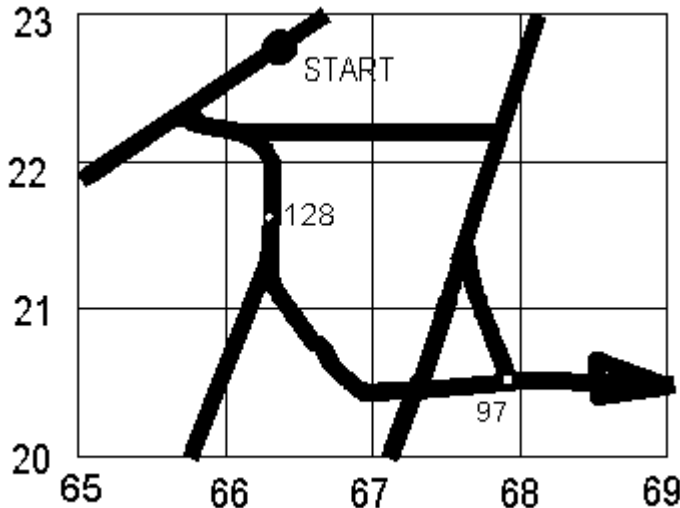
On another variation of the theme, this same route may be defined as **T**op, **B**ottom, **L**eft and **R**ight departure from grid squares:

L R B B R T B R

This may also be indicated by a box with the direction of the departure from the nth square given, ie leave the first square on the north side, the next square heading east, etc:
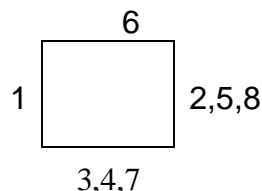
GRID REFERENCES

Often called Map References, they are most commonly given to six figures, based on each grid square on the map being divided into tenths in each direction. For example:

672203

The explanation will be simplified if we split up the 6-figure reference thus:

67..2 20..3

To plot the grid reference onto your map you must go **"along the passage and up the stairs"**, so the first part relates to the grid line numbers across the map and the second part the numbers up the map. From the intersection of gridlines 67 (across) and 20 (up), you go 2 tenths of a square to the right and 3 tenths of a square up and you have your point.

An essential piece of equipment for speedy and accurate plotting of grid references is a Romer.

To be precise, the six figure grid reference does not define a single point, but a 100 metre square, in the same way that the whole 1 km grid square is defined by the four figure grid reference **6720**. If a grid reference is required to greater accuracy than 100m, then it may be given in eight or ten figures. For example:

44255677 or 4425056775

In this case the additional figures represent further subdivision of the 100m square indicated by the preceding figures. It is quite common to use simple fractions or decimals in place of the additional figures.

442½567¾ or 442.5 567.75

DIRECTION OF APPROACH & DEPARTURE

Grid References can also have the direction of approach and/or the direction of departure attached. The approach direction always comes before the reference and the departure direction comes after it.

NE345980 means approach 345980 from the North East.
765987**W** means depart 765987 to the West.
N123456**SW** means approach 123456 from the North and depart to the South West.

A typical route defined by map references might therefore be:

   TC1   664228SW

 via **W670222E**   via   **NNE672½204½**
 via **679205E**   **TC2** **W689½205**

Alternative, more time consuming, techniques include defining a route by **avoiding references** – you have to plot enough from the list to block all but the only possible route (Hint – look for the references which are closest to the start of the section) or by converting the digits of the reference into letters, eg A=1, B=2 etc or A=0, B=1.

COMPASS DIRECTIONS
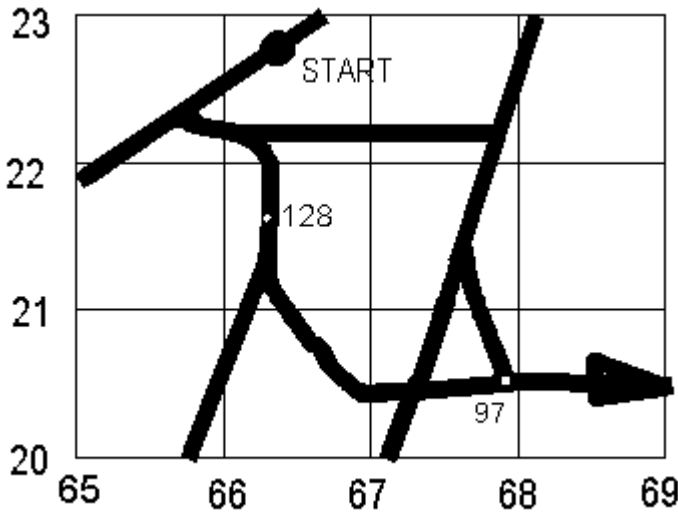
When compass directions are given to more than the four cardinal points, they will usually relate to directions of departure from junctions, for example:

ESE E SSW SSE E

Thus you would leave the first junction going to the ESE (turn left) and leave the second junction going to the E (fork left) etc.

Compass directions are sometimes used to specify the precise directions by which you cross gridlines, so the same route would be:

SW E E SSW SSE E

Tip: If you have trouble remembering your compass points, try thinking of "Never Eat Shredded Wheat" - in a clockwise direction !

Compass Bearings will be given in terms of degrees instead of compass points. You must remember that 0 or 360 degrees is North, 90 is East, 180 is South, 270 is West etc. For example:

110 90 200 160 90

CLOCK FACE DIRECTIONS

These are occasionally used to specify approach and/or departure directions at junctions and there are two main and quite different methods in use.

Firstly, you leave each junction in the direction of the hour hand, assuming that you arrive at the junction from six o'clock. Thus 12 o'clock means straight ahead, 3 o'clock is a right angle turn to the right and 7 o'clock is a hairpin turn left. So our route would be:

8:00 11:00 4:00 11:00 10:00

By the other method, you approach from the direction of the hour hand and leave by the minute hand. If you assume that the clock stays orientated so that 12 o'clock is always North it will be thus:

2:20 10:15 9:35 1:25 11:15

However, if the clock can change it's orientation you will just have to look at the angle between the hour and minute hands at each specified time to determine the angle through which you should turn at each junction.

Tip: If you wear a digital watch it won't help you much !

JUNCTION DIRECTIONS

Each junction is reduced to a simple two (or three) letter acronym. Here is a list of all the usual acronyms you're likely to come across. It's fairly self explanatory but you must appreciate the difference between a TR and a RT.

SO Straight On   SOX Straight On at Crossroads

TL Turn Left   TR   Turn Right

LT Left at T Junction   RT   Right at T Junction

LX Left at Crossroads   RX   Right at Crossroads

FL Fork Left   FR   Fork Right
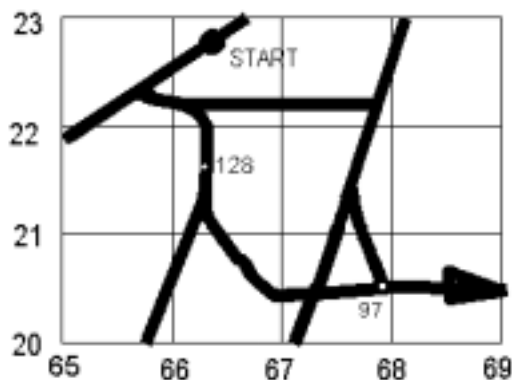
The following sequence will take you across this map sample.
TL FL RT SO LX SO

SPOT HEIGHTS

Spot heights are those points that the OS has measured to be exactly that height (in metres) above sea level. They are marked on the map thus: **.123** always with a small dot marking the exact point. Only those spot heights where the dot is on the road should be considered. You may be asked to pass through the following spot heights:

73 55 42 88 107 66

If the shortest route passes through another spot height that is not listed and the instruction says something like *"pass through these spot heights only"* you should work out a route to avoid it. Always look very carefully at the location of the dot, as it may be just off of a junction, thereby not requiring the most obvious route to pass through it or avoid it.

Variations on this theme may give you the spot heights as a continuous string:

7355428810766

and may even mix spot heights with grid line numbers in the string.

You may be given consecutive pair of spot heights added together, which would be:

128   130   173

Spot heights could also be given as additions and subtractions from the previous number:
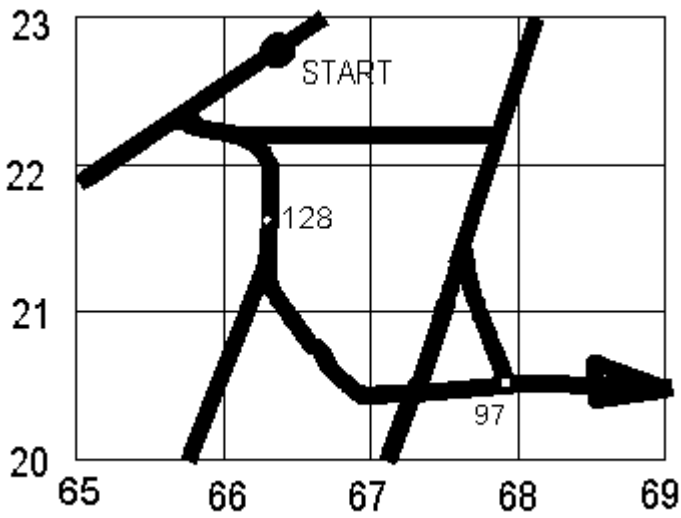
73 -18 -13 +46 +19 -41

or they may be given as additions and subtractions from an original starting point:

74 -18 -31 +15 +34 -7

Tip: Use a highlighter to show up all spot heights where the dot is on the road. This makes them much easier to see when plotting a route.
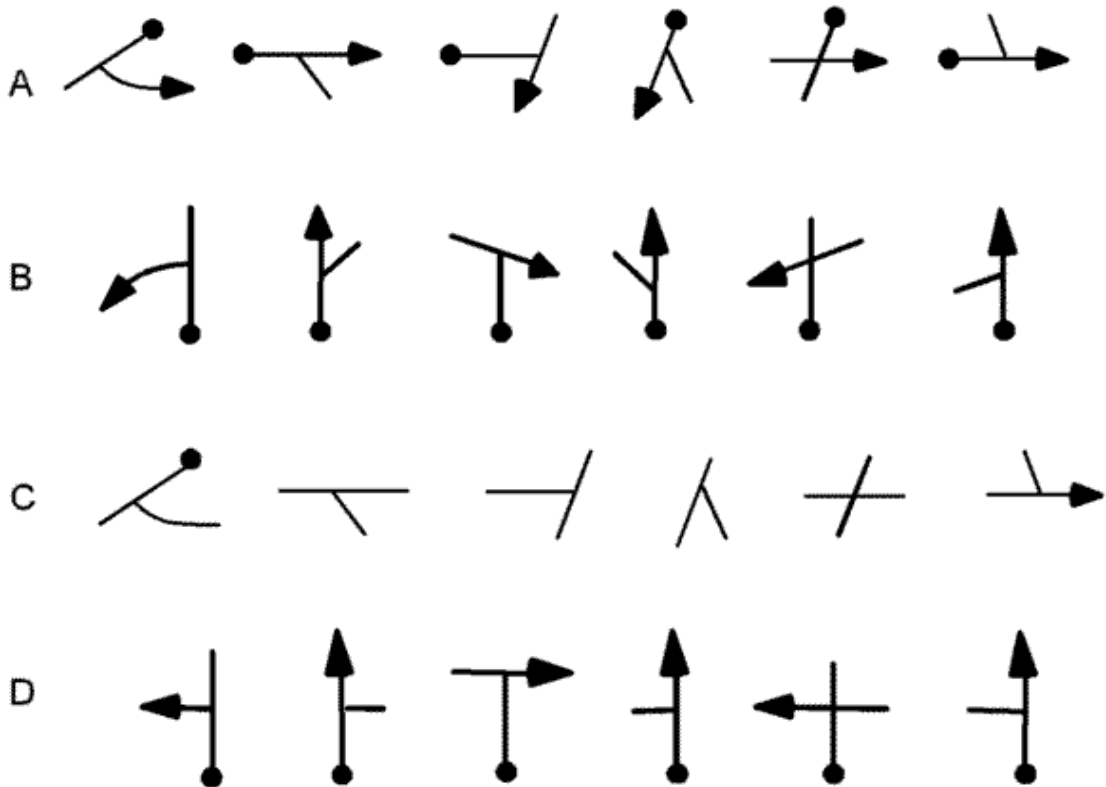
TULIPS

The name of this type of navigation comes from the Tulip Rally, which first used it in the 1950s.

Tulip, or ball and arrow instructions, are simple diagrams of the route junctions with the ball indicating where you come from and the arrow indicating where you are going to. Normally they are given in order.

Tulips may be orientated as on the map, or turned around so that the ball is always at the bottom, or most of the balls and arrows may be left off deliberately. Sometimes they may be squared up. Here are a few variations on the same route described with tulips:

Tulip Roadbook

Commonly used to describe the route of non-competitive link sections, endurance and stage rallies, the Tulip Road-book uses tulip symbols to detail a route, but provides additional information on distances, road signs etc. Here is an example for the same route:

| Intermediate Distance	Total Distance	Tulip	Comment	Distance to Go
0.00	0.00	TC3	Time Control	3.97
0.52	0.52		Swan Lane	3.45
0.36	0.88		Newtown 3	3.09
0.95	1.83		Give Way Join A286	2.14
0.49	2.32			1.65
0.53	2.86		West Street	1.11
0.44	3.30			0.67
0.67	3.97	TC4	Time Control	0.00

HERRINGBONES
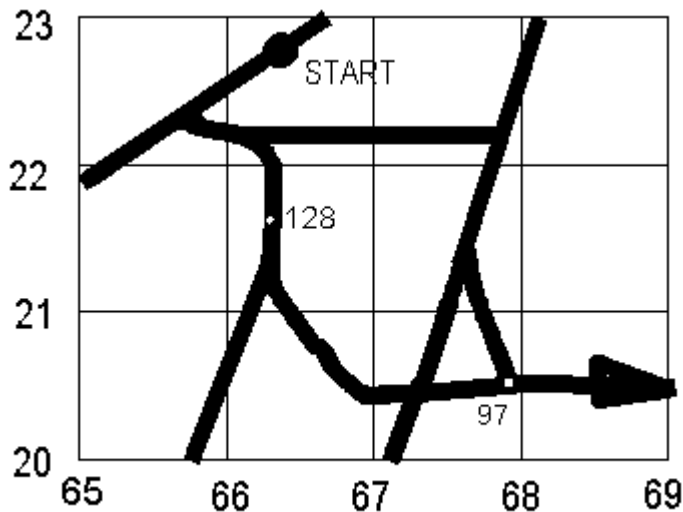
Herringbones, or **Straight Lines** as they are sometimes called, are a very simple method of defining the route, once you understand how they work. Imagine the route drawn with a little bit of of road leading away from each junction, then pulled tight like a piece of string. The route that you take is then a straight line, missing roads on the left and right accordingly. The way to convert the herringbone to a route on your map is to consider 3-way junctions as **leave a road on the left** or **leave a road on the right**.
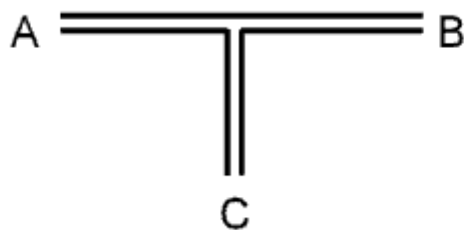
If the junction on the map is shaped like this, going straight on from A to B you would **leave a road on the right**. However also turning from C to A or from B to C you would **leave a road on the right**. For each of these three cases the junction on the herringbone will look the same. Similarly, to **leave a road on the left** you could be going straight on from B to A, taking a right from A to C, or turning right at the T-junction from C to B.
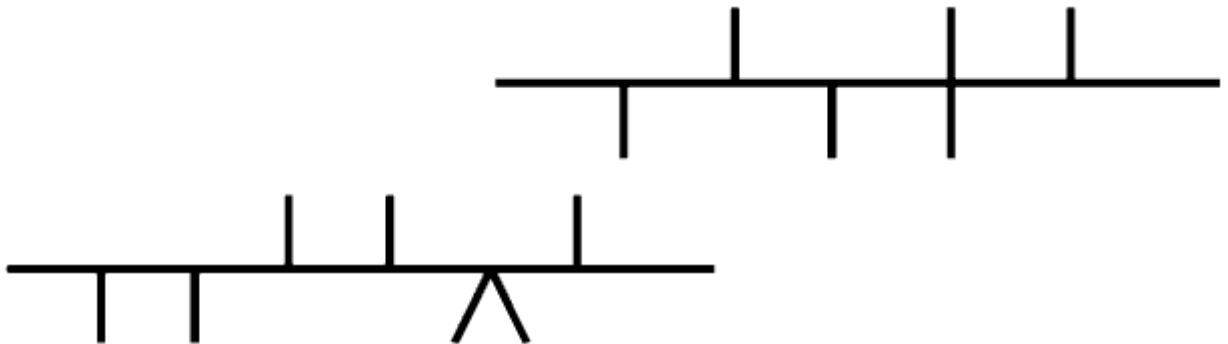
The two example herringbones on this page will take you from the start to finish of this section via different routes. Notice how the crossroads appears when you are turning left, rather than going straight across.

It's usually expected that herringbones will start from the left, but rally organisers often turn them around, maybe giving you a clue in the instructions, like *"the following herringbone describes the route from TC4 to TC3"*, so read all instructions carefully. When you come to a crossroads on your map and it fits with a crossroads on the herringbone, it's a good indication that you're on the right route. If not, then try starting at the other end!

Many herringbones have balls and arrows, similar to Tulips, to indicate start and finish.

More involved navigational events for experts may use mirrored herringbones or circular herringbones, where the start and finish are joined up so you have to work out where it starts by a process of elimination (usually a cross roads gives it away).

ROAD COLOURS

Roads on the Landranger 1:50000 maps that you'll generally be using come in five colours: **G**reen, **R**ed, **B**rown, **Y**ellow and **W**hite. The other one, not used so often, is blue for motorways.

Each junction on the route is described in terms of the colours of the roads involved. The entry road is given first and the exit road last. So the instruction would be something like:

BRR RRY YYY YYY YYY YYY YYY YYBB BBY

You can tell that you're starting on a brown road which finishes at a red road. You'll have to decide whether you go left or right on the red road, but the next junction must be a turning off the red road onto a yellow road. Then you go through 5 YYY junctions before coming to a crossroads with a brown road. The best way of solving these is to guess a good route and count up the number of junctions in front of the one that you are at, varying the route until the instruction fits....

Coloured Roads Only: Often abbreviated with the acronym **CRO**. If this appears on the route instruction it means you can ignore any white roads on the map when plotting your route. When the organiser intends you to use white roads you might see **AR** – All Roads, **CAR** - "Consider All Roads" or **MUW** - "May Use Whites", but usually the absence of CRO on the card is enough.

When white roads appear on tulips or herringbones they are usually drawn with a broken line, while coloured roads are drawn with a solid line.
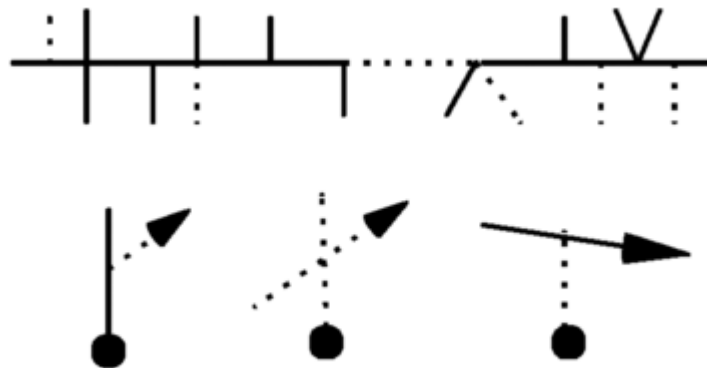
MAP FEATURES

A good knowledge of the map key is essential. Some instructions will make use of the information on the map like the gradient signs, churches, pubs, Pos (Post Office), ETLs (Electricity Transmission Line), road numbers etc.

Such instructions might read: **Under a railway, ETL, A74, PO, church with a tower, ford, HWM.**

A list of features may include spot heights or letters of a place name that 'interfere' with the road as shown on the map. Some of the features may be drawn using the same symbols as on the map as in this example:
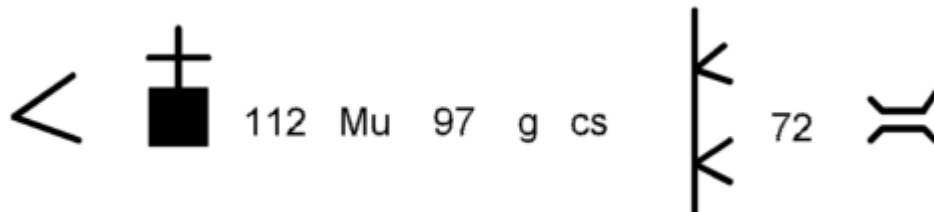
These instructions would mean: Go up a hill with a gradient symbol, pass a church (with a tower), through spot height 112, through where the letters "Mu" from a place name cut the road, through spot height 97, through where a 'g' , then the letters 'cs' cut the road, under an electricity transmission line, through spot height 72 and over a bridge.

Tip: If you cut the key off the map keep it with you as you may need it!

GRADIENTS, OVER and UNDER

In a particularly hilly area a route may be given entirely by a string of gradient symbols, or by the abbreviations D for **Down** and U for **Up**. The double gradient symbol would tie up with a double symbol (very steep hill) on the map.

<div align="center">

>   >   >   <   <<   >   <   <   <

D   D   D   U   U   D   U   U   U

</div>

These are often mixed up with abbreviations O for **Over** and U for **Under**, where you go over and under bridges or under power lines shown on the map. So U can mean Under or Up which you'll have to decide in each case by studying the map.

<div align="center">

D   D   U   O   D   U   U   D   O   U

</div>

PLACE NAMES

Names of places on the map, or even anagrams of them, can also be used to define a route – usually when the names are written over the actual road on the map.

MAP TRACES

A map trace is just what it says, a tracing of the route from the map.

A single trace can be used to indicate the whole route of a section, or it may be split up into smaller traces which must be sorted into order and joined together. Until you're experienced at solving traces you will probably find it a lot easier to solve if you copy the trace onto a piece of tracing paper or clear acetate (always keep some in your Nav-bag) and then try to fit it onto the map. Here is an example of a complete trace, and the same route as you might receive it split into several pieces.

Tip: If you've copied it onto tracing paper and it will not fit to the map, you can then turn the tracing paper over to see whether the devious organiser has given you a mirrored trace!

Another way of presenting a trace is to chop it up into grid squares and mix them up. Here is how you might receive it. Only the road you have to travel along is shown in each grid square.
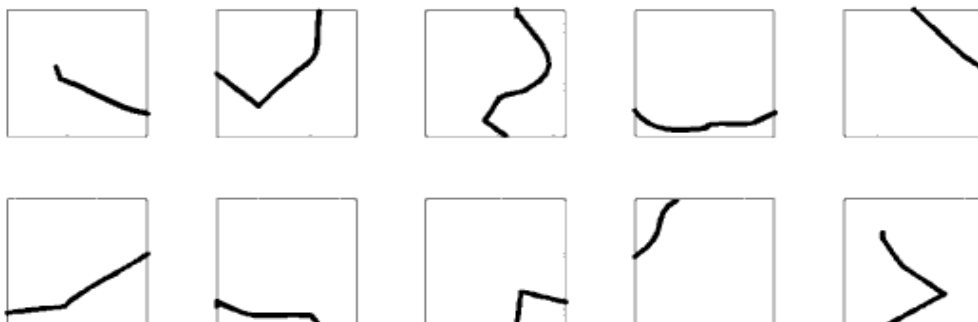
This format can also be changed slightly, just showing the points of entry and exit from squares.