

ASSOCIATION OF NORTHERN IRELAND CAR CLUBS

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Part i: Types of Navigation

Navigation Rallying

Handbook



# Navigation Rallying

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A Navigation Rally is a rally that is run on open public roads, normally at night, and is a test of the combined skill of the driver and navigator to plot a route on a map and then drive that route correctly and within a given time schedule.

The routes make the best use of the fantastic network of quiet country lanes that exist in Northern Ireland and many events have sections that follow famous stages from our closed road stage rallies.

The route is not known by the competitors before the event starts. The key points (Time Controls) of the route are given to competitors at the event starting venue and then when they arrive at the first time control, will receive instructions to enable them to plot the route on to the map. These instructions are given in various formats, each of which will be discussed in detail in this book. If the competitor plots and drives this route correctly, they will arrive at the next time control where they will receive instructions to make their way to the third time control, and so on.

The rally is scored by giving penalty marks for being early or late relative to their time schedule at each time control, and at unknown locations between time controls. Heavy penalties are given to crews who take an incorrect route. The lowest score at the end of the rally wins the event.

## Map References

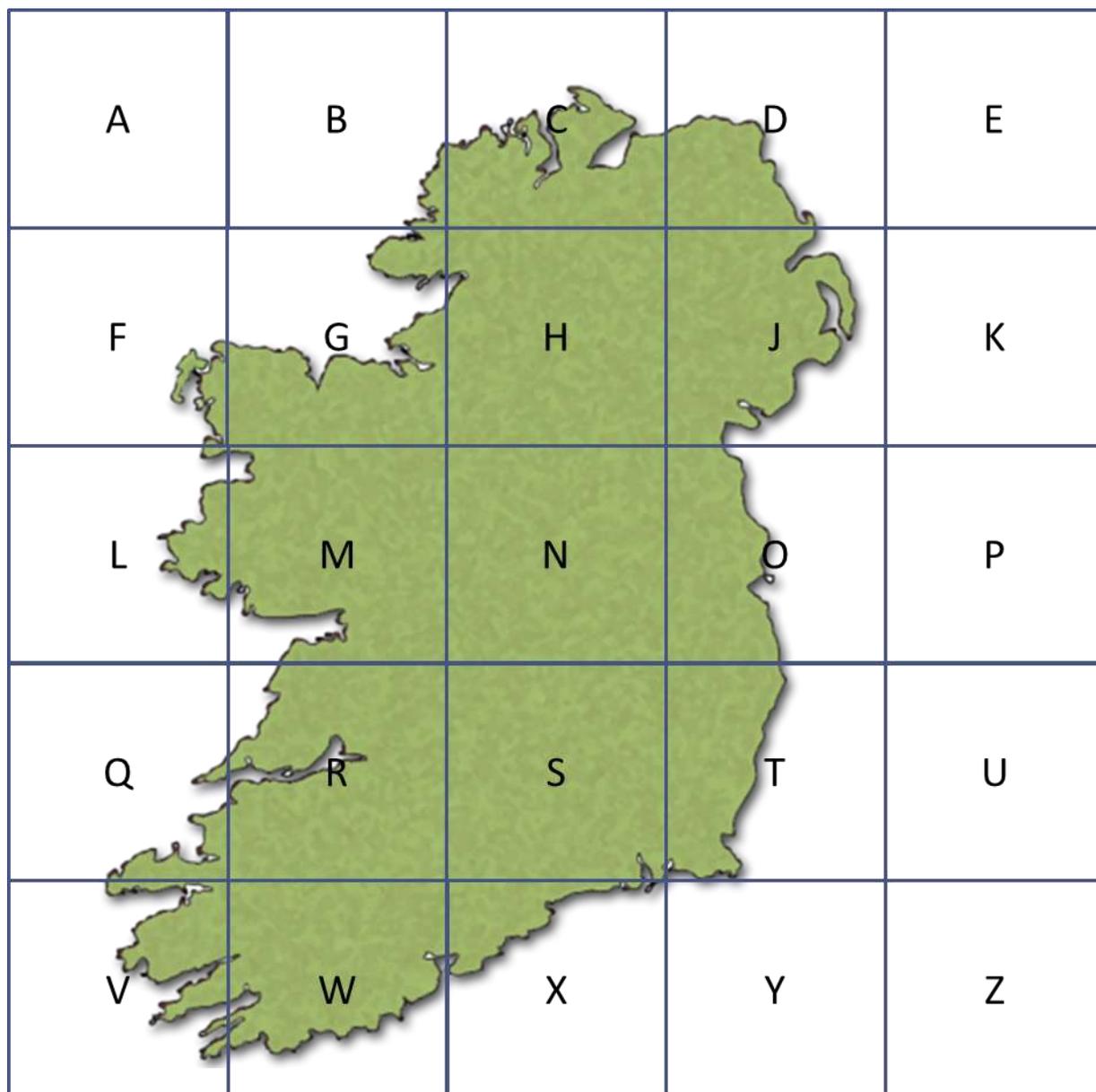
**Map References**, or Grid References, define locations on maps using coordinates.

Grid lines on maps define the coordinate system and are numbered to provide a unique reference to features.

Here is an example of a map reference and where it refers to on a map.

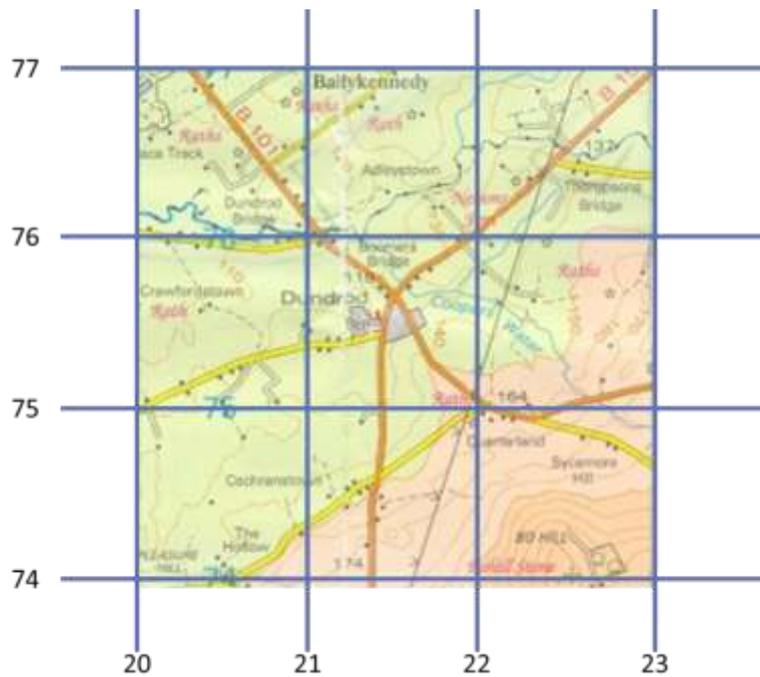


J 215 757



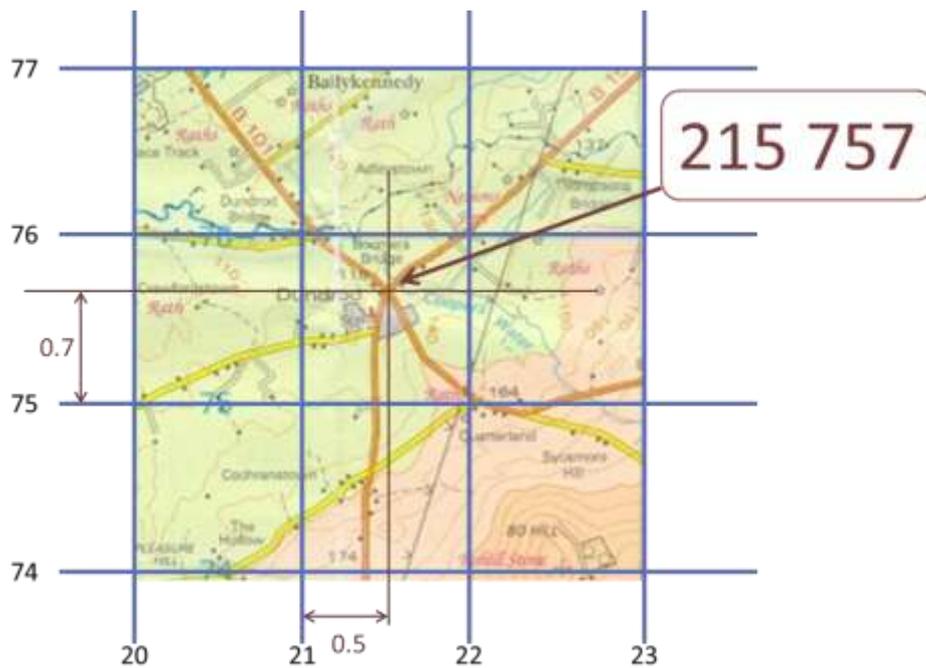
All Ordnance Survey of Northern Ireland (OSNI) maps, which are the standard maps we use for rallying, are based on the Irish Grid Reference System. Ireland is divided into 25 squares, each measuring 100x100km, each identified by a single letter.

Within each square, lines are printed on maps at 1km intervals, which run from 00 to 99, with the origin of each square at its bottom left.



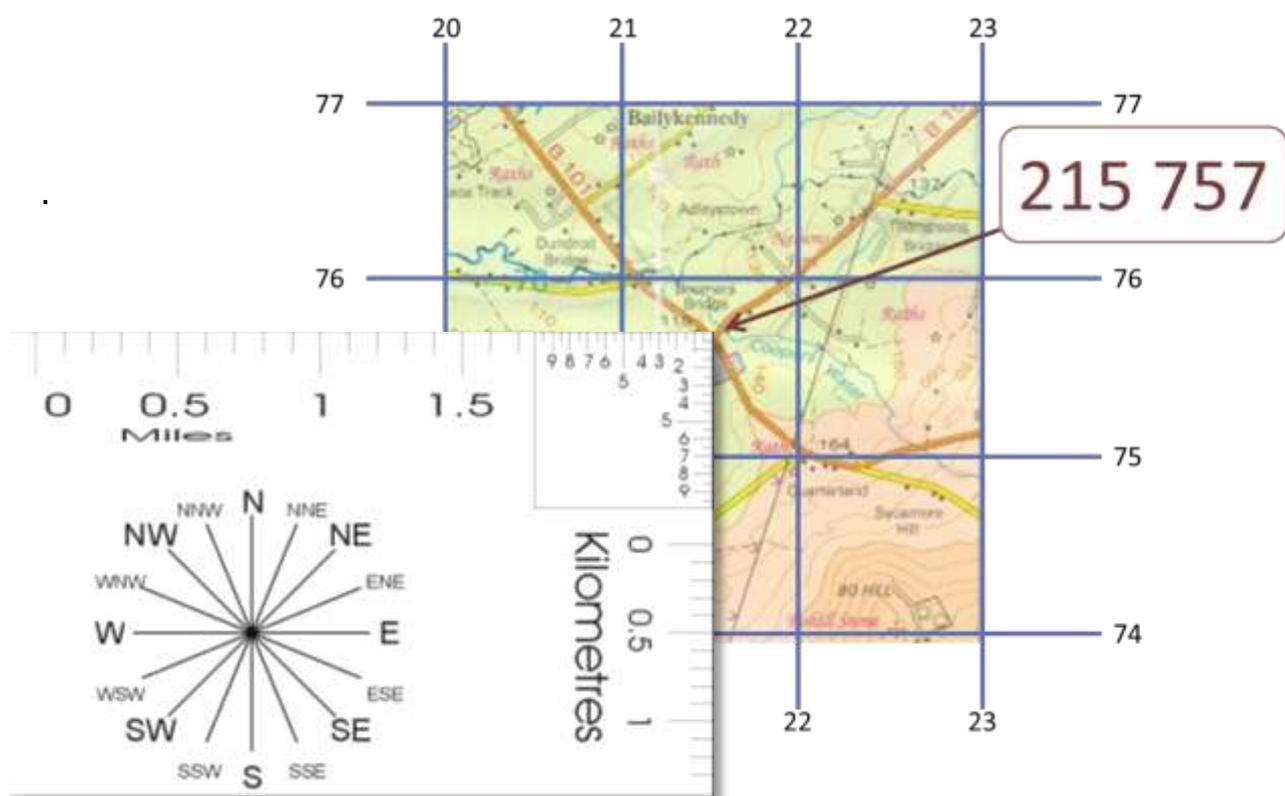
This shows a section of square J with the grid lines labeled. The crossroads we are interested in lies between the eastings of 21 and 22, and the northings of 75 and 76.

If measured from the preceding grid line, the distance to the crossroads is 0.5km in and 0.7km up.



All map references are written with the Eastings first, followed by the Northings.

Therefore, our crossroads has a map reference of 215 757.



In practice, a **romer** is used to plot map references. A romer is a basically a ruler that allows us to plot map references accurately. To use it, the corner of the romer is placed at the origin of the grid square of the reference. In this example, 215 757, the corner of the romer is placed where the easting 21 meets the northing 75 and the romer is then moved in 5 divisions and up 7 divisions. The crossroads is now at the corner of the romer.

Note: Although the full map reference for this crossroads is J 215 757, in practice the J is often dropped as the next point with the same numbers, i.e. H 215 757, is 100km away and it is unlikely that there would be confusion between the two. At times the map number is given. We always use OSNI Discoverer series maps, so in this example, Dundrod is in Sheet 14. Therefore you may see this map reference written as 14 215 757.



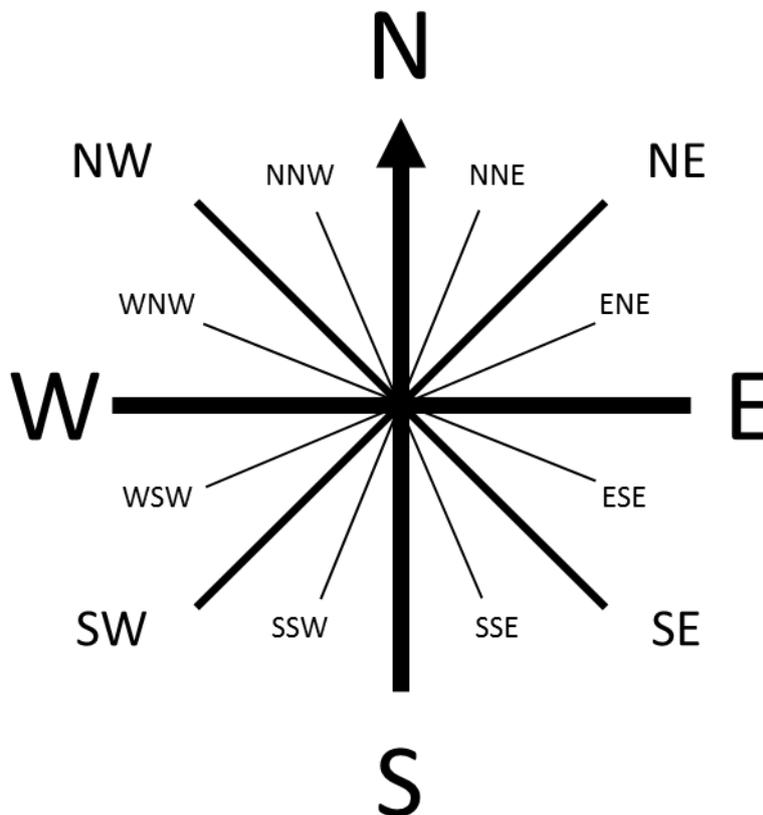
Now that we have defined our location, we need to define our direction.

This is done using compass points.

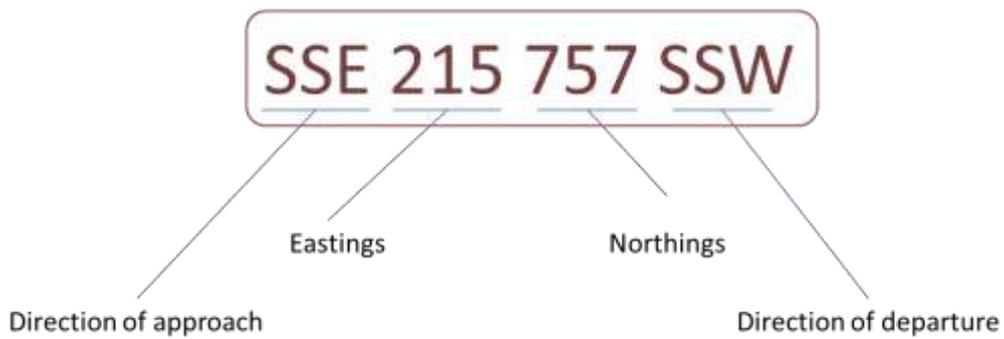
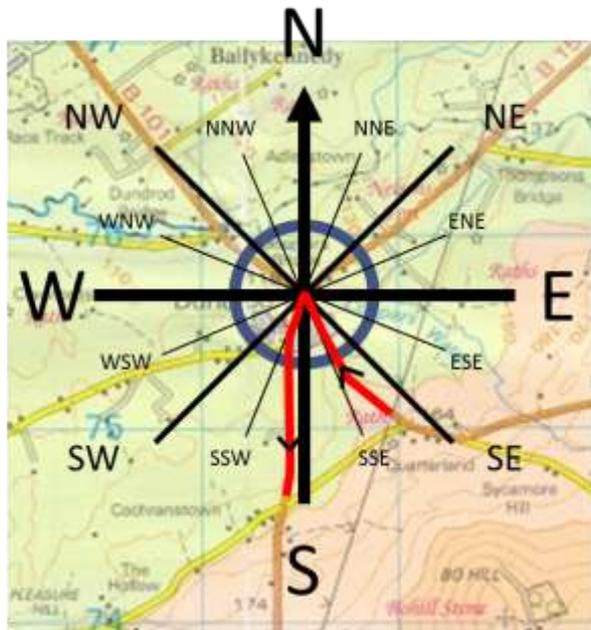
The four cardinal directions are North (N) , South (S), East (E) and West (W)

The four ordinal directions are Northeast (NE), Southeast (SE), Southwest (SW) and Northwest (NW).

These are further bisected to give the 16 point compass rose.



We use these compass points to define the direction of approach to the map reference and the direction of departure from the map reference.



The full definition of our crossroads is that it is located at 215 757, we approach it from the SSE direction and leave it in the SSW direction.

## Tulip Diagrams

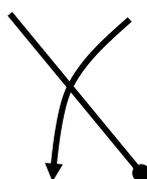
**Tulip diagrams** are simple illustrations that represent road junctions.

If we trace the junction we are looking to define, including all roads at that junction, it gives us the tulip diagram.



We use a ball to represent the direction of approach and an arrow to represent the direction of departure. The shape of the junction may also be simplified.

The tulip diagram to describe our junction would then look like:



# SAMPLE ROUTE INSTRUCTION

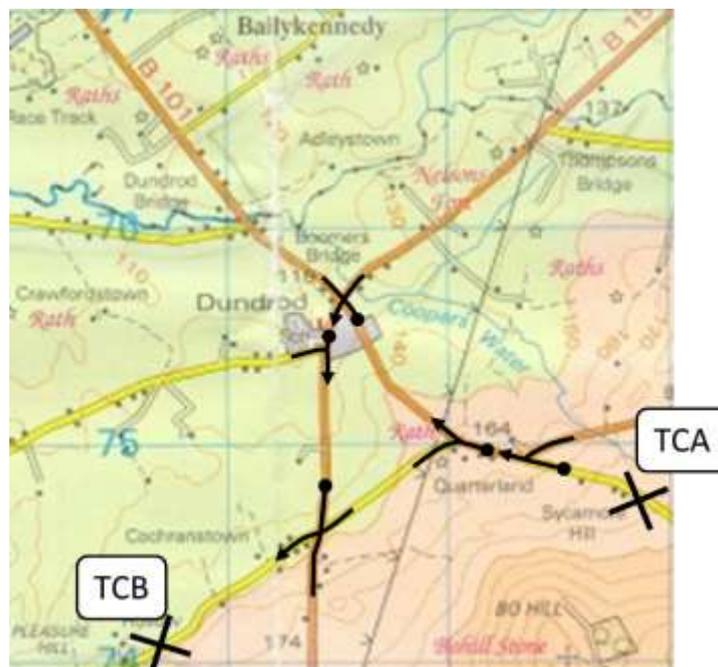
TCA 229 748

TCB 207 741

Travel from TCA to TCB using the following tulip diagrams:



Solution:



## Map Trace

**Map Trace** illustrates the route to be taken without any map being shown.

The route can be found by copying the map trace on to a transparent page, like tracing paper and when laid on the map will reveal the route.

# SAMPLE ROUTE INSTRUCTION

TCA 229 748

TCB 207 741

Travel from TCA to TCB using the following map trace:



Solution: (hint – the trace is upside down)



## Clock Face

**Clock Faces** illustrate road junctions using the hands of a clock to represent directions.



If this crossroads junction was considered to be the hands on a clock, then the time would be 5:32.



# SAMPLE ROUTE INSTRUCTION

TCA 229 748

TCB 207 741

Travel from TCA to TCB using the following clock faces. Approach each one by the hour hand and leave by the minute hand. Take 12 o'clock as North

4:47

4:50

5:32

12:31

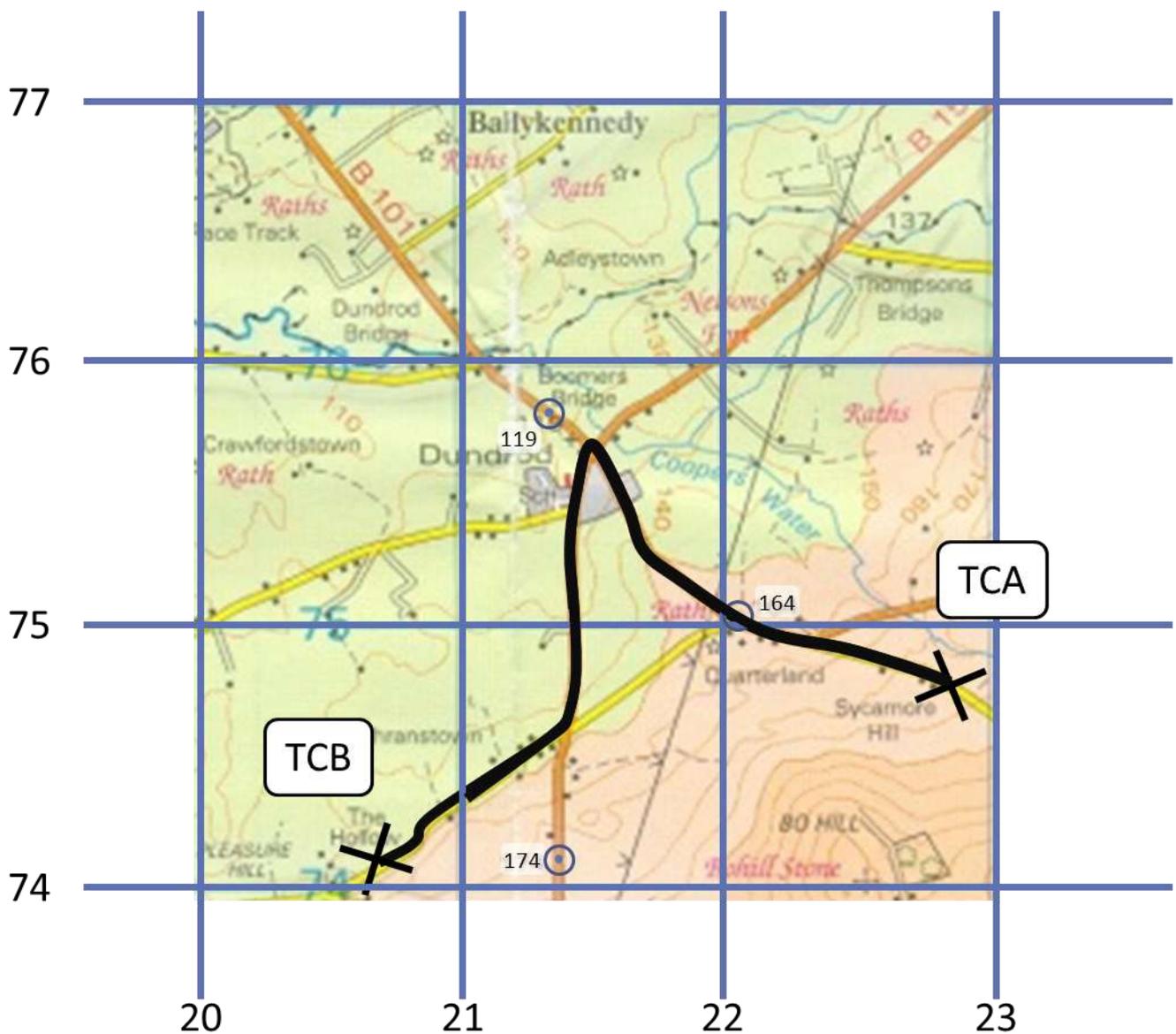
13:40

Solution:



## Spot Heights and Gridlines

**Spot Height and Grid Line** instructions define the route taken by listing which grid lines and spot heights are crossed on the map.



# **SAMPLE ROUTE INSTRUCTION**

**TCA 229 748**

**TCB 207 741**

Travel from TCA to TCB crossing the following Spot Heights and Grid Lines in order.

**75**

**164**

**22**

**75**

**21**

Starting from TCA, we first have to cross a grid line 75. We can only plot as far as the first junction with this instruction, as going straight on and turning right both bring us to grid line 75. The next number, 164, means that we have to miss the road on the right and then the road on the left in order to cross 75 and get to 164. We have to cross 22 next as there are no junctions. To cross 75 again without crossing any other lines, we must turn left at the crossroads and miss the next road on the right. 21 means we must take the next right turn and which brings us to the time control.

## Herringbone

**Herringbone** instructions illustrate the route in a straight line format and show all roads that are to be avoided.

This is a sample of a herringbone instruction:



that defines this route:



# SAMPLE ROUTE INSTRUCTION

TCA 229 748

TCB 207 741

Travel from TCA to TCB using the following map trace:



- The instruction starts at the ball and shows that we must first miss a road to the right.
- Next we must miss a road to the left. This is the yellow coloured road on the map.
- There are two roads to miss at the same time with the next instruction. This happens at the crossroads. Missing two roads on the right means turning left at the crossroads.
- We must miss another road on the right. We must keep heading south and miss the yellow road on the right.
- Finally we must miss two roads on the left at the same time. This time we must turn right at a crossroads. This brings us to TCB.