Learning Tips No.7: Breaking the Code

'Thing' number 20 in '50 Ringing Things' is "Write out a method using Place Notation". Debbie Phipps, a Level 5 Ringer at Lychett Matravers, Dorset, told us that she had to get help with this one, but discovered that it was not quite as mysterious as she first thought. So, with her input and help, we decided to share more information about Place Notation.

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Place Notation is a compact way to represent a method without writing out all the lines or describing it in diagram form. You can use it to learn a method, but more often it is used to communicate a method to others by text or for a computer program.

The essence of change ringing is that the bells continually change place; they rarely stay in the same place. So noting where places are made, and assuming that all other bells change place, results in a compact notation. The 'rules' of change ringing let assumptions be made that allow even more compactness to be used than we're going to explain here, but this is enough to give you the idea.

Let's start by looking at where places are made in Plain Hunt, both Doubles (PH5) and Minor (PH6). Here are the first three rows of each, with an indication of the changes made between rows:

	Plain Hunt Doubles (PH5)
1 2 3 4 5	
X X |	← A place is made in 5th
2 1 4 3 5	
| X X	← A place is made in 1st
2 4 1 5 3	

	Plain Hunt Minor (PH6)
1 2 3 4 5 6	
X X X	← NO places are made
2 1 4 3 6 5	
| X X |	← A place is made in both 1st and 6th
2 4 1 6 3 5	

Suppose we write these two changes of PH5 as '5.1', where the numbers represent the places made and the dot just separates the changes. For PH6 we could write 'X.16', where the 'X' means 'all change' or 'no places' and we see that 1st and 6th place are made in the same change (there is no dot between). This is the basis of place notation. The main thing we need to add to this is the convention that we write down a complete 'lead' of any method: from when the treble leaves the lead, to when it leads again at backstroke.

Let's work through a sample method. We've chosen Little Bob Minor as it's short: the lead is only eight blows. Here's the blue line for each of the place bells and the grid with the places made written beside it:
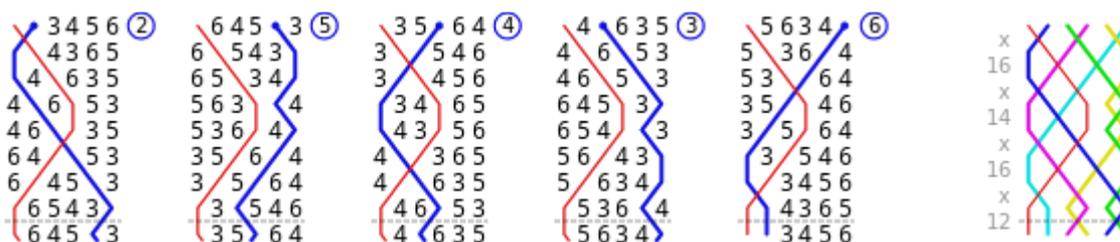
It should now be fairly clear that X.16.X.14.X.16.X.12 is the place notation for this.

There is no single convention for place notation; other symbols are sometimes used, and use can be made of symmetry in a method. Robert Wallis's BLUELINE site at rsw.me.uk/blueline/methods/notation will give you more (it's also the source of the diagrams reproduced above). But now – try one for yourself!

The previous page was the entire article which appeared in Tower Talk issue no.7, but here we have more space. We will use it to go into more detail and also to talk about different symbol conventions and how we can shorten the notation even further. Let's start by looking at some of the symmetry in methods.

The seconds place in Little Bob Minor happens at the lead end – when the treble is leading. If we separate this change out (by using a comma instead of a dot) the rest of the notation will be seen to be symmetrical:

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X.16.X.14.X.16.X   ,12
          ↑
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This is true for the vast majority of the methods we ring (they are said to be 'palindromic'). So we can save space by writing out only the first half-lead, and then adding the lead end: 'X.16.X.14,12'.

Some methods, like Grandsire, are technically known as 'lead head' methods, so the comma comes after the places made at the lead head instead, but the rest is still then taken to be palindromic. Thus we would write the shortened form of the notation for Grandsire Doubles as '3,1.5.1.5.1'.

In very complex methods there may be several symmetrical and non-symmetrical sections, so one form of notation called microSIRIL format uses symbols to introduce each section. Symmetrical sections are preceded by '&' (and only the notation up to the symmetry point is written), and non-symmetrical sections are preceded by '+' (and written in full). So Grandsire Doubles in this form is '+3,&1.5.1.5.1'.

In some books you will find 'le', for lead end, written instead of using the comma: 'X.16.X.14 **le** 12'. You might also see a simple space used instead of the dot: 'X 16 X 14 **le** 12', though this isn't so good when hand written. However, in cases like this, when every other change is an 'X', you don't really need anything to separate the changes because the X's themselves act as a separator: 'X16X14,12'. The Central Council has also tried to introduce a '-' instead of 'X', but this doesn't seem to have been adopted very much.

Now we'll move on to talk about something which is not that widely used, but will probably confuse you if you come across it unexpectedly when trying to write out a method from Place Notation which uses it. It is called "implied places" or "forced places". By defining a fairly simple rule, we can shorten the notation even further (and, as a consequence, end up with a single notation for Plain Hunt of any stage, too). It is:

Working outwards from any defined place, the remaining bells swap in pairs. If there is one left over, it makes a place (an external, leading or lying, forced place).

With the addition of this rule, Plain Hunt simply becomes 'X.1', whether it's Doubles, Minor or any other stage, because these two changes are simply repeated until the bells come round again. Let's see why:

The first change is 'X'. In Doubles, and any other odd-bell stage, the bells swap in pairs (starting from the front) and the one left over at the end of the row makes a place at the back. In Minor, and any other even-bell stage, they all swap because there are none left over.

The second change is '1', so the leading bell stays in the lead. In odd-bell stages the remaining bells all swap. In even-bell stages there is one left over at the end of the row, so it makes a place at the back.

If we now use our rule with Little Bob Minor, we can write something as short as 'X1X4,2'. Taking each of the numbers in turn, we see that specifying a '1' forces a place at the back, as in Plain Hunt. Specifying a '4' means that the bells in third and second place swap, but the lead bell has nowhere to go so it makes a forced place. It also means that the bells in fifth and sixth place swap. Similarly for the '2' at the lead end; the lead bell is forced to make a place too, but all the rest swap in pairs.

Phew! You can see that there are several different conventions, and some of the techniques used to shorten the Place Notation need to be understood so that you can properly read what others have written. But if you just want to write out your own Place Notation for a method, why not just stick to everything that's on the first page of this article?

Finally, we should say that it is possible to, and some (especially handbell) ringers do, ring a method from the Place Notation alone, without ever learning the blue line. But that's too advanced even for this extended version of the article.