The Learning Curve

A regular feature sponsored by the Central Council Education Committee www.cccbr.org.uk/education/

Place notation

Those who are already familiar with place notation probably see it as a simple, practical, and largely obvious convenience. Those who are not, probably imagine it as something complex and mysterious - the sort of thing that only experts understand. It isn't in fact mysterious, and when you understand it, you appreciate that it can be quite useful, so if you don't already know all about it, read on.

What is it?

Place notation is a very compact way to describe a method. That doesn't sound very exciting, but there is a bit more to it.

If someone asked you to describe a method on paper, you might possibly write down all the numbers of a plain course. Figure 1 (left) does this for Double Oxford Minor - a lot of numbers. Perhaps you might write down a description of the work, as in Figure 2. That too could be quite lengthy (and Figure 2 only tells you where one bell starts). More likely, you would draw a blue line, as in Figure 1 (right). That certainly feels more compact, and less dense than lots of words and numbers, but still takes plenty of space (and does it tell you what the Treble does).

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123456
214365
241356
423165
243615
426351
243651
426315
246135
421653
412635
146253
142635
416253
461235
642153
462513
645231
462531
645213
465123
641532
614523
165432
164523
615432
651423
564132
654312
563421
654321
563412
653142
561324
516342
153624
156342
513624
531642
356124
536214
352641
536241
352614
532164
351246
315264
132546
135264
312546
321564
235146
325416
234561
325461
234516
324156
231465
213456
124365
123456
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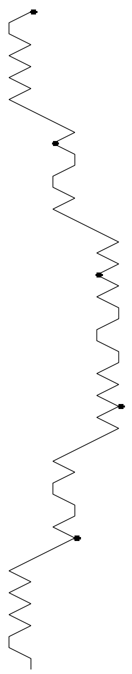

Figure 1: Double Oxford Bob Minor

(2nds place bell) Lead, triple dodge 1-2 up, dodge 3-4 up, makes 4ths, make 3rds, dodge 3-4 up, triple dodge 5-6 up, lie, make 5ths, lie, triple dodge 5-6 down, dodge 3-4 down, make 3rds, make 4ths, dodge 3-4 down, triple dodge 1-2 down, lead, make 2nds.

Figure 2: Verbal description

There is a lot of empty space in a blue line diagram, so thinking about it a little more, you might draw a diagram like Figure 3, sometimes called a grid. You can think of it as chopping up the blue line into separate pieces for each place bell, and overlaying them. It contains as much information as a whole blue line (in fact more, because it includes the Treble) and it also shows how the pieces fit together - the structure of the method. It is pretty compact, but place notation goes much further.

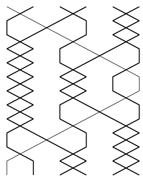

Figure 3: The structure or 'grid'

Look at Figure 3, and you see that most of the lines move up or down, with just a few places made. (That is the essence of change ringing - the bells continually change places). What you might not realise unless you look closely, is that the position of those few places determines everything else, with the help of some very simple rules:

Rule 1 - If no places are specified, all pairs of bells swap places, starting from the front.

Rule 2 - If a place is specified, as many of the remaining bells as possible swap in pairs, again starting from the front.

Rule 3 - If there is an odd number of bells left anywhere, ie there is one left over when the bells are swapped in pairs, then the bell at the end of the row makes an enforced place (an external place).

To see how these rules work, look at Figure 4, which shows 6-bell changes.

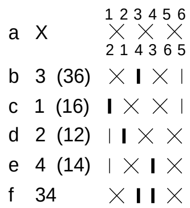

Figure 4: 6-bell changes defined by place

Figure 4 (a) shows what happens with no places and rule 1 applied. All pairs swap, in this example changing rounds into 214365 (but the starting row could be anything - the essence of a change is what it does to it, ie pattern of swaps). In the other examples, only the change is shown, without an example of preceding and following rows.

Figure 4 (b) shows the effect of imposing 3rds place, shown as a thick vertical line to indicate that the bell in 3rds place remains there. There are two bells underneath this place, so by Rule 2 they must swap, as shown. There are three bells above 3rds place so they can't all swap. Applying Rule 3, the bell in 6th place is the odd one out, so the other two swap.

In Figure 4 (c) 1st place is imposed, leaving 5 bells above it. Rule 3 again forces the last bell to make a place, so the other pairs swap. In (d) 2nds place is imposed, which forces 1st place to be made also, and with an even number above 2nds place, all pairs cross. In (e) 4ths place is imposed and Rule 3 determines that 1st place is also made. Figure 4 (f) shows two internal places forced instead of one.

Figure 5 shows the rules applied to 8-bell changes. The places forced in (a) - (f) are the same as on Figure 4, but when Rule 3 is invoked above the place, it is 8ths place that is left over, rather than 6th. Figure 5 (g) shows the effect of 7th place being forced.

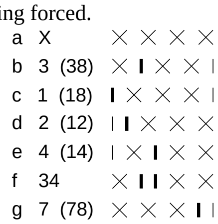

Figure 5: 8-bell changes defined by place

You might be wondering about the extra numbers in Figures 4 and 5. The first one in each example shows the forced place. You have to know this to determine the change. The numbers in brackets show the extra place made as well, if there is one. These two styles form the basis of the short and long ways to write down place notation. The short way writes down the minimum number of places, and the long way writes down all the places.

Now return to Figure 3 and let us work out the place notation for Double Oxford. The first change has no places made (X) the next has 1st and 4th (14). the next none (X), then 3rd and 6th (36) then none (X) then 5th and 6th (56). That gets to the half lead. The second half has the same changes in reverse. Figure 6 is the result.

X 14 X 36 X 56 X 36 X 14 X 12

Figure 6: Full place notation

There are two ways to shorten this. One is to omit the places that can be deduced, and the other (for symmetrical methods - ie most of them) is to stop at the half lead and then note what the lead end change is. For Double Oxford, that gives Figure 7.

X 4 X 3 X 5 le 12

Figure 7: Minimum place notation

As you see, it is much more compact than Figures 1, 2 or 3, but it contains all the information needed to construct the method.

There are a two more things to learn. Dots are used to separate successive places. Dots are not needed in our example, because in a right place method like Single Oxford every other change is a X which separates the numbers without needing a dot. Dots occur in wrong place methods, like London Surprise, and also in all odd bell methods, where an X is impossible. Figure 8 shows Plain Bob Doubles.

5 . 1 . 5 . 1 . 5 le 125

Figure 8: Plain Bob Doubles

A dash can be used for an X. In fact the dash is used in the official CC format for place notation, so Double Oxford looks like Figure 9.

- 14 - 36 - 56 le 12

Figure 9: Double Oxford Minor again

So that's all there is to it? Well, yes and no. It's enough to 'read and write' place notation (eg to consult the Methods committee web site**) but did you know that some people can actually ring from the place notation, without first drawing out the method and learning it? There is not space here to explain how, so it will have to wait until another month.

Tail End

** see http://www.methods.clara.net

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