Using an Algorithm-Diagram

The top row of cyclic bight-numbers are used for the left to right half-cycles, so they are read by going from left to right. The bottom row of cyclic bight-numbers are used for the right to left half-cycles, so they are read by going from right to left.

The knot is tied in an upwards direction, so the left to right half-cycles cross the codings going from lower left to upper right,  for under, and  for over. The right to left half-cycles cross the codings going from lower right to upper left,  for over, and  for under.

To make it easier to see we have written a "U" and "O" for the unders and overs above the top cyclic bight-numbers and below the bottom cyclic bight-numbers. Then we can mark them off as we use them.

The best way to see how to use an algorithm-diagram is to do an example. This time we will go all the way through a 7 Part 4 Bight Casa knot. P/B=n +r will be 7/4=1 +3 therefore the remainder (r) equals three (3). Next we have B-r=v, so 4-3=1 and our count value (v) equals one (1). We mark off four (4) dots for the number of Bights we have, and count off our cyclic bight-numbers.

0 1 2 3

Then we mark off our Casa-Coding marks for seven (7) Parts. Which will be six (6) marks, (P-1).

\ / \ / \ /

Going from left to right we write the cyclic bight-numbers above the coding marks. Then going from right to left we write the cyclic bight-numbers under the coding marks.

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1 2 3 0 1 2
\ / \ / \ /
2 1 0 3 2 1
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Now to make the overs and unders easier to see we write (O) or (U) above and below the cyclic bight-numbers for the overs (O) and (U).

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U O U O U O
1 2 3 0 1 2
\ / \ / \ /
2 1 0 3 2 1
O U O U O U
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That ends the set up of our algorithm-diagram for a 7 Part 4 Bight Casa knot. Now we can either tie the 7 Part 4 bight Casa knot or write down the overs and unders for the 7 Part 4 Bight Casa knot into an algorithm-table to be used later.

It might be easier to follow each step or half-cycle with the drawing of the 7 Part 4 Bight Casa knot. Starting on the left side of the algorithm-diagram we do half-cycle #1 which is a free run. Note: All odd numbered half-cycles go from left to right, so we use the top of the algorithm-diagram.

U O U O U O
1 2 3 0 1 2
\ / \ / \ /
2 1 0 3 2 1
O U O U O U

Half-cycle #2 going right to left using the bottom cyclic bight-numbers. We are looking for cyclic bight-number zero (0). Wherever we find a zero (0) we look at the coding to see if it is an under or an over. Where we have the "U's" and "O's" under the cyclic bight-numbers we can just mark it with a line. Here we have an Over (O).

U O U O U O
1 2 3 0 1 2
\ / \ / \ /
2 1 0 3 2 1
O U O U O U

Half-cycle #3 going left to right and looking for cyclic bight-number zero (0). Above the zero (0) we have an "O" for over. Mark it with a line.

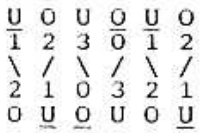
U O U O U O
1 2 3 0 1 2
\ / \ / \ /
2 1 0 3 2 1
O U O U O U

Half-cycle #4 going right to left and looking for 1. This time we have two cyclic bight-numbers. Mark both of the ones (1). Now reading right to left we have under (U), over (O), under (U). The last under is crossing under the standing end.

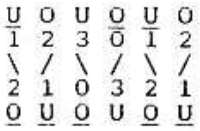
U O U O U O
1 2 3 0 1 2
\ / \ / \ /
2 1 0 3 2 1
O U O U O U

This would be a good time to point out that on half-cycles going right to left, using the bottom of the algorithm-diagram, we can check our selves using the standing part. The crossing made at the cyclic bight-number for that half-cycle will always be crossing the standing part. And, if the cyclic bight-number for that half-cycle is the last crossing on the left it is crossing the standing end.

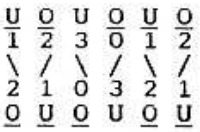
Half-cycle #5 looking for "1". Mark all the ones (1) and read off the overs and unders going from left to right. Here we have under (U), over (O), under (U).



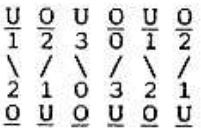
Half-cycle #6 looking for "2". Reading right to left we have under (U), over (O), over (O), under (U), over (O). We put the two overs together for: U O2 U O



Half-cycle #7 looking for "2". On knots with an odd number of parts the left to right half-cycles will have the same over and under sequence as the right to left half-cycle before it. Which has the same cyclic bight-number.



Half-cycle #8 looking for "3". This is the last half-cycle which is equal to two times the number of bights (2B). We have four (4) bights so 2*4=8 the number of half-cycles in this knot.



We used the cyclic bight-number (i) in order for each of the even half-cycles (h_e) and the odd half-cycles (h_o). If we needed to know what the cyclic bight-number (i) is for any given half-cycle we can use these formulas:

For even half-cycles (h_e) it is: $i=(h_e-2)/2$

For odd half-cycles (h_o) it is: $i=(h_o-3)/2$

For a better understanding of algorithm-diagrams I recommend reading "The Braiding of Column-coded Regular Knots" by A. G. Schaake and J. C. Turner, both from New Zealand. Georg Schaake is the person that came up with these algorithm-diagrams ad introduced them to me. I will never be able to thank him enough for that and all the other help he has gave me.