5760 SPLICED TREBLE DODGING MINOR (147 METHODS)
BY JOHN S WARBOYS

This is an explanation of how I managed to achieve getting the standard 147 into 5760 changes (the equivalent of eight extents), one extent fewer than my previous composition of 6480 changes. I thought this might be possible if I was able to utilise some additional splices not used in the previous composition.

Using techniques described in previous composition write-ups, I sought a set of 48 full courses which between them contained every possible row eight times, and which could then be manipulated by various splicing techniques to incorporate the additional methods not already included in those 48 courses. As with previous compositions, this process was very lengthy but I eventually came up with something which I thought could work.

The selected 48 courses are outlined below. Annotation of the additional manipulations then follows on the next page, followed by explanations of those manipulations.

Course	Method	Cambridge-over	Norwich-over	London-over	Carlisle-over	Wilmslow-over	Oxford-over	Kent-over	Peveril-over	(a) Group 101 (Green)	(a) Group 102 (Blue)	(a) Group 103 (Yellow)	(a) Group 104 (Pink)	(a) Group 105 (Orange)	(a) Group 106 (Red)	(b) Group A, C, D	(b) Group F, G, O, Q	(b) Group E, I, N	(b) Group K, L	(b) Group J, M, S	(b) Group B, H, P, R	(c) Group 1 (A, J, K, N)	(c) Group 2 (B, D, F)	(c) Group 3 (C, E, L, S)	(c) Group 4 (G, M, P)	(c) Group 5 (H, I, O)	(c) Group 6 (Q, R)
A	Surfleet S	A								A						A									A	
B	Kirkstall 4D	B									B						B						B			
C	Surfleet S	C								C								C								C
D	Surfleet S	D								D								D								D
E	Ipswich S	E								E									E						E	
F	Burnaby 4D	F										F					F						F			
A	Marple 4D		A								A					A									A	
B	Marple 4D		B								B					B									B	
C	Marple 4D		C								C					C									C	
D	Lightfoot S		D									D					D							D		
E	Lightfoot S		E									E					E							E		
F	Old Oxford 4D		F									F						F								F
A	London S			A						A						A								A		
B	Cunecastre S			B						B						B								B		
C	Lincoln S			C						C						C							C			
D	Combermere 4D			D								D						D								D
E	Kelso S			E						E								E					E			
F	Kelso S			F						F								F					F			
A	Fountains 4D				A					A						A								A		
B	Alnwick S				B						B										B					B
C	Tewkesbury 4D				C					C						C							C			
D	Glastonbury 4D				D					D								D				C				
E	Alnwick S				E					E										E						E
F	Northumberland S				F					F							F							F		
A	Wilmslow 3D					A								A		A				A				A		
B	Dunedin 3D					B								B			B							B		
C	Ely 3D					C								C				C						C		
D	Belvoir 3D					D								D			D							D		
E	Wilmslow 3D					E								E						E				E		
F	Wilmslow 3D					F								F						F				F		
A	Rochester TB						A							A						A		A				
B	Duke of Norfolk TB						B							B						B					B	
C	Oxford TB						C							C						C					C	
D	Duke of Norflok TB						D							D						D					D	
E	Rochester TB						E							E						E		E				
F	Rochester TB						F							F						F		F				
A	Pontefract 3D							A						A						A		A				
B	Berkeley 3D							B						B							B				B		
C	Warwick 3D							C						C			C							C		
D	Pontefract 3D							D						D					D					D		
E	Caernarvon 3D							E						E	E									E		
F	Barham 3D							F						F							F						F
A	Mendip TB								A	A										A					A	
B	Pennine TB								B	B										B					B	
C	Norton-le-Moors TB								C	C											C			C		
D	Cotswold TB								D	D								D							D	
E	Peveril 3D								E			E						E								E
F	Chiltern TB								F	F						F								F		
A		1	1	1	1	1	1	1	1	2	2	1	0	2	1	2	1	2	0	2	1	1	2	1	2	2	0
B		1	1	1	1	1	1	1	1	2	2	1	0	2	1	2	1	2	0	2	1	1	2	1	2	2	0
C		1	1	1	1	1	1	1	1	2	2	1	0	2	1	2	1	2	0	2	1	1	2	1	2	2	0
D		1	1	1	1	1	1	1	1	2	2	1	0	2	1	2	1	2	0	2	1	1	2	1	2	2	0
E		1	1	1	1	1	1	1	1	2	2	1	0	2	1	2	1	2	0	2	1	1	2	1	2	2	0
F		1	1	1	1	1	1	1	1	2	2	1	0	2	1	2	1	2	0	2	1	1	2	1	2	2	0

C	B	A	E	F	D
54326 Du *Yo* **19**	35426 Ki	54632 Du	23456 Ip *Cm* **5c**	24536 Bu	54263 Du *Yo* **19**
42563 Su	64235 Ki	43526 Su *El* **9**	56342 Ip *Cm* **5c**	43265 Bu	46532 Su *Bs* **12**
63254 Su	52364 Ki	54632	42635 Ip	36452 Bu *Yo* **23**	32654 Su *Bs* **13**
54326	43652 Ki *Bo* **8**	26354 Su *El* **9**	64523 Ip *Bo* **5c**	65324 Bu	54263
35642 Bo	26543 Ki	32465 Su *Cm* **36**	35264 Ip	52643 Bu *Yo>Du* **25>33**	25346 Bo
26435 Su	35426	65243 Bo *El* **9**	23456	24536	63425 Su
35642	6	26354			25346
54326 No	35426 No *Wk* **7**	43526 No	23456 Lf *Be* **25**	24536 Ol *Bm* **4**	25346 Lf
26435 Ms	26543 Ms	26354 Ms *Di* **8**	56342 Lf *Es* **18**	52643 Ol	46532 Lf
63254 Ma *Ol>Ws* **5a>6**	64235 Ma *Ne* **21**	65243 Ma *Ta* **19**	42635 Lf	65324 Ol *Bm* **3**	32654 Lf *Es* **17**
35642 Ma *Be* **5a**	52364 Ta *Ne* **22**	32465 Ta	35264 Lf	36452 Ol	54263 Lf
42563 Ta *Ws* **6**	43652 Ma	54632 Ma	64523 Lf *Wm* **31**	43265 Ol	63425 Lf *Wm* **31**
26435	26543	26354	23456	24536	25346
	6				2
54326 Ox	35426 Dk	43526 Rc	23456 Rc	24536 Rc	25346 Dk
35642 Ox	64235 Dk	54632 Rc	42635 Rc	52643 Rc	63425 Dk *Cn* **1**
63254 Ox	52364 Dk	65243 Rc	64523 Rc	65324 Rc	54263 Dk
26435 Ox	43652 Dk *Cn* **2**	26354 Rc	56342 Rc	36452 Rc	32654 Dk
42563 Ox	26543 Dk	32465 Rc	35264 Rc	43265 Rc	46532 Dk
54326	35426	43526	23456	24536	25346
	2				
54326 Ey *Yo* **18**	35426 Dn	43526 Cj	23456 Wl *Bp* **16**	24536 Wl	25346 Bl
42563 Ey	64235 Dn *Wl* **24**	26354 Cj	64523 Wl	65324 Wl	32654 Bl *Do* **7**
26435 Ey	52364 Dn	54632 Cj	35264 Wl	43265 Wl	63425 Bl
63254 Ey	43652 Dn	32465 Cj *Fr* **14**	42635 Wl	52643 Wl	46532 Bl
35642 Ey *Yo>Du* **17>32**	26543 Dn *Bp* **15**	65243 Cj	56342 Wl	36452 Wl	54263 Bl
54326	35426	43526	23456	24536	25346

Section 1

23546	Te			24356	Ak	*Nw*	35	25436	Fo	*Mu*	9	45326	Ak			53426	Nb			34526	Gl	*Mu*	12
52634	Te			63524	Ak			53264	Fo			63245	Ak			26345	Nb			42365	Gl		
65423	Te	*Sa*	8	45263	Ak			64325	Fo	*Sa*	9	52463	Ak	*Nw*	32	45632	Nb			26453	Gl	*Mu*	10
46352	Te			32645	Ak	*Nw*	32	36542	Fo			34652	Ak	*Nw*	34	32564	Nb	*Fo*	14	65234	Gl	*Cl*	11
34265	Te			56432	Ak	*Qu*	28	42653	Fo	*Mu*	9	26534	Ak			64253	Nb			53642	Gl	*Mu*	13
23546				24356				25436				45326				53426				34526			

Section 2

23546	Li	*Ce*	6	24356	Cu	*Ca*	20	25436	Lo			45326	Ke			53426	Ke	*Ce>Av*	1>5b	34526	Ce		
65423	Li			45263	Cu	*Ca*	22	42653	Lo			63245	Ke			32564	Ke			65234	Ce		
23546				56432	Cu	*Av*	21	64325	Lo	*So*	23	52463	Ke			45632	Ke	*Ce>Av*	2>5b	42365	Ce		
46352	Li			63524	Cu			36542	Lo			34652	Ke			53426				53642	Ce		
52634	Li			32645	Cu			53264	Lo	*We*	33	26534	Ke			64253	Ke	*Ce>So>Cx*	3>5b>26	26453	Ce		
34265	Li	*Ca>Av*	6>35	24356	Cu			25436	Lo			45326	Ke			26345	Ke	*Ce>Av*	4>5b	34526	Ce		
46352																64253							

Section 3

23546	Ww	*Ti*	26	24356	By			25436	Ol			45326	Cz			53426	Bh			34526	Po		
65423	Ww	*Tr*	30	56432	By			42653	Ol			63245	Cz	*Tr*	29	26345	Bh			53642	Po		
34265	Ww			32645	By			64325	Ol			52463	Cz	*Ww*	35	45632	Bh			65234	Po		
52634	Ww	*Cz*	34	45263	By			36542	Ol			34652	Cz	*Qu*	27	32564	Bh	*By*	36	26453	Po		
46352	Ww			63524	By	*Bw*	10	53264	Ol			26534	Cz			64253	Bh	*Bw*	11	42365	Po		
23546				24356				25436				45326				53426				34526			

Section 4

23546	Nm	*Lo>We*	28>33	24356	Pn			25436	Mp	*Cc*	15	45326	Pv			53426	C2			34526	C1	*Mp*	5d
52634	Nm			32645	Pn	*Cx*	30	36542	Mp			26534	Pv			64253	C2			26453	C1	*Pn*	5d
65423	Nm			63524	Pn	*Bn*	29	42653	Mp			34652	Pv			32564	C2	*C3*	31	42365	C1	*Mp*	5d
46352	Nm			56432	Pn			53264	Mp			52463	Pv	*Cc*	24	45632	C2	*Sg*	20	65234	C1		
34265	Nm	*Bn*	27	45263	Pn			64325	Mp	*Pv*	16	63245	Pv			26345	C2			53642	C1		
23546				24356				25436				45326				53426				34526			

1	The 5-6 sections of lead 53426 of Kelso S and lead 63425 of Duke of Norfolk TB are swapped giving leads of Combermere 4D and Conisborough 3D.
2	The 5-6 sections of lead 45632 of Kelso S and lead 25634 of Duke of Norfolk TB are swapped giving leads of Combermere 4D and Conisborough 3D.
3	The 5-6 sections of lead 64253 of Kelso S and lead 34625 of Old Oxford 4D are swapped giving leads of Combermere 4D and Bamborough S.
4	The 5-6 sections of lead 26345 of Kelso S and lead 56234 of Old Oxford 4D are swapped giving leads of Combermere 4D and Bamborough S.
5	The splice referred to in my write-up of the 147 in 6480 changes as "New Splice 1" is then applied to introduce several additional methods. In this case the starting courses are course 23456 of Ipswich S, course 43256 of Cotswold TB, course 54326 of Marple 4D and course 53426 of Kelso S (four of the leads of Kelso S have already been converted to Combermere 4D); bell 5 is the "grid" bell in this instance. <pre>Before

23456 Ip   43256 C1   54326 Ma   53426 Ce
42635 Ip   35462 C1   63254 Ma   64253 Ce
64523 Ip   56324 C1   42563 Ma   32564 Ke
56342 Ip   62543 C1   35642 Ma   45632 Ce
35264 Ip   24635 C1   26435 Ma   26345 Ce
23456   43256   54326   53426

After

23456 Cm   43256 Pn   54326 Ma   53426 Av
56342 Cm   24635 Mp   63254 Ol   32564 Ke
42635 Ip   35462 C1   26435 Ma   45632 Av
64523 Bo   56324 C1   54326   53426
35264 Ip   62543 Mp
23456   43256   35642 Be   64253 So
                            42563 Ma   26345 Av
                            35642   64253</pre> |

5+1	A three-course splice is then applied to the courses 53246, 34256 and 54326 of Marple 4D, the last of which now includes leads of Old Oxford 4D and Bedford 4D. The purpose of this splice is to introduce leads of Norwich S and Morning Star TB. A 3-lead splice is also used to convert leads 46325, 56423 and 36524 of Marple 4D to Taxal 4D (with bells 2 and 6 fixed).

```
        Before

        34562 Ma        45362 Ma        53462 Ma
        25634 Ma        23645 Ma        24653 Ol
        46325 Ma        56423 Ma        62345 Ma
        53246 Ma        34256 Ma        53462
        62453 Ma        62534 Ma
        34562           45362           45236 Be
                                        36524 Ma
                                        45236


        After

        34562 No        45362 No        53462 No
        53246 Ma        34256 Ma        45236 Be
        62453 Ms        62534 Ms        36524 Ta
        25634 Ma        23645 Ma        45236
        46325 Ta        56423 Ta
        53246           34256           62345 Ms
                                        24653 Ol
                                        62345
```

5+2	A three-course splice is then applied to the courses 34256, 54326 and 52436 of Surfleet S. The purpose of this splice is to introduce leads of Durham S and Bourne S.

```
        Before

        45362 Su        45236 Su        45623 Su
        62534 Su        36524 Su        23564 Su
        34256 Su        24653 Su        64352 Su
        56423 Su        53462 Su        52436 Su
        23645 Su        62345 Su        36245 Su
        45362           45236           45623

        After

        45362 Du        45236 Du        45623 Du
        56423 Su        53462 Su        52436 Su
        23645 Su        62345 Su        36245 Su
        45362           45236           45623

        34256 Bo        24653 Bo        64352 Bo
        62534 Su        36524 Su        23564 Su
        34256           24653           64352
```

| 6 | The leads from the "new" version of course 54326 of Marple 4D and the course 32456 of Lincoln S are then rearranged by swapping 5-6 sections between courses. The purpose of this splice is to introduce leads of Westminster S and Canterbury 4D.

```
        Before

        32456 Li        53462 No
        56243 Li        45236 Be
        43625 Li        36524 Ta
        25364 Li        45236
        64532 Li
        32456           62345 Ms
                        24653 Ol
                        62345


        After

        32456 Li        53462 No
        56243 Li        45236 Be
        43625 Ca        36524 Ws
        32456           62345 Ms
                        24653 Ws
        25364 Li        45236
        64532 Ce
        25364
```
|
|---|---|
| 7 | The 5-6 sections of lead 34562 of Norwich S and lead 36245 of Belvoir 3D are swapped giving leads of Warkworth S and Dover 3D. |
| 8 | A 3-lead splice is applied to leads 43652 of Kirkstall 4D, 43625 of Tewkesbury 4D and 62534 of Morning Star TB (with bells 3 and 5 fixed) giving leads of Bourne S, Sandiacre S and Disley 3D. |

9	The leads from the "new" version of course 34256 of Surfleet S and the course 52346 of Fountains 4D are then rearranged by swapping 5-6 sections between courses. The purpose of this splice is to introduce leads of Munden S, Sandiacre S and Elston 4D.
	
	``
	        Before
	
	        45362 Du 52346 Fo
	        56423 Su 46235 Fo
	        23645 Su 35624 Fo
	        45362 24563 Fo
	                          63452 Fo
	        34256 Bo 52346
	        62534 Su
	        34256
	
	        After
	
	        45362 Du 52346 Mu
	        56423 El 24563 Mu
	        45362 46235 Fo
	                          35624 Sa
	        34256 El 63452 Fo
	        23645 El 52346
	        62534 Su
	        34256
	``

10	The 5-6 sections of lead 62543 of Glastonbury 4D and lead 63524 of Berkeley 3D are swapped giving leads of Munden S and Berwyn TB.
11	The 5-6 sections of lead 56324 of Glastonbury 4D and lead 64253 of Barham 3D are swapped giving leads of Carlisle S and Berwyn TB.
12	The 5-6 sections of lead 43256 of Glastonbury 4D and lead 36245 of Surfleet S are swapped giving leads of Munden S and Burslem 4D.
13	The 5-6 sections of lead 35462 of Glastonbury 4D and lead 52436 of Surfleet S are swapped giving leads of Munden S and Burslem 4D.

13+	A new splice is used which swaps all the 5-6 sections from the course 52346 of Pontefract 3D with those from the course 34256 of Wilmslow 3D. This means the course of Wilmslow 3D becomes a course of Chadkirk TB instead. The course of Pontefract 3D is no longer a valid method HOWEVER the rows can all be rearranged to be a course of Old Oxford 4D instead. ``` Before 34256 Wl 52346 Po 62534 Wl 35624 Po 45362 Wl 63452 Po 23645 Wl 46235 Po 56423 Wl 24563 Po 34256 52346 After 34256 Cj 52346 Ol 56423 Cj 35624 Ol 23645 Cj 63452 Ol 45362 Cj 46235 Ol 62534 Cj 24563 Ol 34256 52346 ```
14	The 5-6 sections of lead 32564 of Northumberland S and lead 62534 of Chadkirk TB are swapped giving leads of Fountains 4D and Francis Genius 3D.
15	The 5-6 sections of lead 25436 of Mendip TB and lead 26543 of Dunedin 3D are swapped giving leads of Chelsea 3D and British Scholars' Pleasure TB.
16	The 5-6 sections of lead 64325 of Mendip TB and lead 23456 of Wilmslow 3D are swapped giving leads of Peveril 3D and British Scholars' Pleasure TB.
17	The central 20 rows of lead 35642 of Ely 3D are swapped with the central 20 rows of lead 32654 of Lightfoot S giving leads of York S and Evening Star 3D.
18	The central 20 rows of lead 54326 of Ely 3D are swapped with the central 20 rows of lead 56342 of Lightfoot S giving leads of York S and Evening Star 3D.
19	A 3-lead splice is applied to leads 54326 and 45623 of Durham S, and lead 34256 of Marple 4D (with bells 4 and 5 fixed) giving leads of York S and Taxal 4D.
20	The 5-6 sections of lead 24356 of Cunecastre S and lead 45632 of Chiltern TB are swapped giving leads of Canterbury 4D and Stirling 3D.
21	The 5-6 sections of lead 56432 of Cunecastre S and lead 64235 of Marple 4D are swapped giving leads of Abbeyville 4D and Netherseale S.
22	The 5-6 sections of lead 45263 of Cunecastre S and lead 52364 of Marple 4D are swapped giving leads of Abbeyville 4D and Netherseale S.
23	The 5-6 sections of lead 64325 of London S and lead 63542 of Burnaby 4D are swapped giving leads of Southwark 4D and York S.

24	The 5-6 sections of lead 64235 of Dunedin 3D and lead 52463 of Peveril 3D are swapped giving leads of Wilmslow 3D and Chelsea 3D.
25	The 5-6 sections of lead 23456 of Lightfoot S and lead 25463 of Burnaby 4D are swapped giving leads of Bedford 4D and York S.
26	The central 20 rows of lead 64532 of Warwick 3D are swapped with the central 20 rows of lead 64253 of Southwark 4D giving leads of Tintern 4D and Castleton 3D.
27	The 5-6 sections of lead 34652 of Caernarvon 3D and lead 25364 of Norton-le-Moors TB are swapped giving leads of Quantock TB and Bucknall 3D.
28	The central 20 rows of lead 56432 of Alnwick S are swapped with the central 20 rows of lead 56243 of Norton-le-Moors TB giving leads of Quantock TB and London S.
29	The 5-6 sections of lead 63245 of Caernarvon 3D and lead 63524 of Pennine TB are swapped giving leads of Trinity Sunday TB and Bucknall 3D.
30	The 5-6 sections of lead 32456 of Warwick 3D and lead 32645 of Pennine TB are swapped giving leads of Trinity Sunday TB and Castleton 3D.
31	A 3-lead splice is applied to leads 64523 and 63425 of Lightfoot S, and lead 32564 of Chiltern TB (with bells 2 and 6 fixed) giving leads of Wearmouth S and Cheviot TB.
32	A 3-lead splice is applied to leads 32645 and 52463 of Alnwick S, and lead 35642 of York S (with bells 3 and 5 fixed) giving leads of Newcastle S and Durham S.
33	A 3-lead splice is applied to leads 53264 and 56243 of London S, and lead 25463 of York S (with bells 2 and 5 fixed) giving leads of Wells S and Durham S.
34	The central 2 rows of lead 34652 of Alnwick S are swapped with those from lead 43625 of Warwick 3D giving leads of Newcastle S and Caernarvon 3D.
35	A 3-lead splice is applied to lead 24356 of Alnwick S, lead 52463 of Caernarvon 3D, and lead 43625 of Canterbury 4D (with bells 2 and 6 fixed) giving leads of Newcastle S, Warwick 3D and Abbeyville 4D.
36	The 5-6 sections of lead 62534 of Surfleet S and lead 32564 of Barham 3D are swapped giving leads of Cambridge S and Berkeley 3D.
36+	Lead 45236 of Oxford TB is rung instead as lead 45263 of Kent TB (these 2 leads contain the same rows).

After applying all these manipulations there were now sufficient leads to include 145 of the methods, the missing two leads being one of Cambridge 3D and one of Tintern 4D. I was unable to include these leads using any splices I could think of. There were however "spare" leads of Burton TB (same 5-6 section as Cambridge 3D) and of Burnaby 4D (same 5-6 section as Tintern 4D) and by using changes of method at the half-lead (denoted below by the / symbol) I was able to include the missing methods.

To get the extra lead of Cambridge 3D using spare leads of Burton TB:

```
Before

23456 Bz        23456 Wv
64523 Bz        56342 Ba
35264 Bz        42635 Ba
42635 Bz        35264 Ba
56342 Bz        64523 Ba
23456           23456


After

23456 Bz/Cg     23456 Wv
53624 Bz        56342 Sd
46253 Cg        42635 Ba
65432 Bz        35264 Sd
24365 Cg/Bz     64523 Ba
23456           23456
```

To get the extra lead of Tintern 4D using spare leads of Burnaby 4D:

```
Before

42356 Bu        53426 Nb
25463 Du        26345 Nb
56234 Bu        45632 Nb
63542 Yo        32564 Fo
34625 Bu        64253 Nb
42356           53426


After

42356 Ip        32564 Fo/El
34625 Bu        63542 Yo/Ak
42356           32564

25463 Du        53426 Ti
56234 Ip        64253 Nb
25463           53426

                45632 Ti
                26345 Nb
                45632
```

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