

NewTrack kits for 1 in 8 slips

The P4Track Company

part of **Exactoscale Ltd**, 20 Waterson Vale, Chelmsford, Essex CM2 9PB
tel: 01245 263779

These instructions cover the 1 in 8 single and double slip kits which form part of The P4Track Company's range of kits and components for 4mm scale bullhead track, as follows:

4NT SS08	P4 1 in 8 single slip
4NT DS08	P4 1 in 8 double slip

Whilst these kits are designed to be as straightforward as possible to assemble, the inherent design of a slip results in several features that make assembly of these kits more demanding than a simple turnout. For example, obtuse crossings of a relatively shallow angle (1 in 8 is generally regarded as the limit for a fixed obtuse crossing) can be difficult to build well enough to achieve reliable running, good alignment of the slip road(s) is very sensitive to the bending and spacing of the switch rails and (for a double slip) space for operating the switch rails is very restricted.

All this is a roundabout way of saying - this is not a beginner's kit. As a minimum, you should have built a NewTrack turnout kit first and been happy with building it and how it went together. These instructions have been written assuming you have at least that level of experience. Many details covered in our turnout instructions have not been repeated here - the turnout instructions are available on our website, if required.

General Guidance

Terminology: Diamond crossings and slips each include four crossing assemblies, two of which are 'common crossings' (like those used in turnouts of the same crossing angle). These are at the outer ends of the completed track assembly. The other two (at the centre of the completed track assembly) are obtuse, or 'K', crossings. Within a common crossing assembly, the vee is made up of a point and a splice rail with wing rails positioned on either side of the vee. In an obtuse crossing assembly, the outer running rail is known as the stock rail, the two short running rails which are machined to a point are the point rails with, inside them, the check rail.

In a diamond crossing, the remaining running rails are all known as closure rails, short ones linking the obtuse and common crossings and long ones running from the obtuse crossings to the ends of the assembly. Check rails are provided for the common crossings, just as in a turnout.

Slips have the additional curved connections forming the slip road (or roads, in a double slip). For our purposes, we will call the rails that go within the diamond formed by the four crossings the 'inner slip rails' and those that lie entirely outside the diamond the 'outer slip rails'. These curved connections are each in three sections - the inner slip rails consisting of a switch rail, a closure rail and another switch rail, and the outer slip rails consisting of a stock rail, a closure rail and another stock rail. As with NewTrack turnouts, switch rails are supplied pre-assembled with their adjacent stock rail, and we will describe this as a 'switch assembly'.

Special Chairs: As with a NewTrack turnout kit, the aim has been to provide accurate representation of all the chairs used by the prototype. Many of the chairs are standard running rail chairs, known as S1 chairs. The common crossings use the same sets of chairs as used in turnout kits, and the same check chairs, small footprint L1 chairs and slide (P) chairs. New for the slips are even smaller footprint M1 chairs and four mouldings of special obtuse crossing and slip chairs providing a series of 69 different chair components numbered (imaginatively) from 1 to 69. Different kits use different combinations of components and any one kit will only use a limited proportion of the chair components from the mouldings supplied. At the end of these instructions will be found a table showing how the mouldings and special chair components are used.

The Drawing (or Template): Use the drawing as a guide to what goes where, not as a constructional template (which is not needed with moulded bases with the correct timber layout). The drawing shows timber numbers (1 - 45) and, alongside each timber which involves special chairs, the part numbers of the chairs used. The part numbers are in the correct order, reading vertically along the timber. Note that some timbers have other chairs (e.g. M1 chairs) as well as the special chair parts.

Gauge Issues: This kit is intended for use with rolling stock with wheelsets to P4 standards. Track that complies with these standards will normally have flangeways that are nominally 0.68mm wide, though for crossing flangeways a lower limit of 0.65mm is allowed. Our common crossings are assembled in a fixture designed to give this lower limit. We aimed to achieve the same dimension with our obtuse crossings but have ended up with a flangeway that is a little narrower. This has the beneficial result that wheelsets are better steered through the crossing but the disadvantage that running clearances for wheelsets with a back to back at the P4 minimum of 17.67mm become uncomfortably small. To avoid problems with such wheelsets, it is important to hold the track gauge through the obtuse crossings accurately to 18.83mm.

Measuring the track gauge where there is a check rail with a flangeway of less than 0.65mm is tricky as our standard track gauge will not fit in the flangeway. The simplest solution is probably to use the Scalefour Society's rectangular gauge (item no. 191) which can be used vertically with the pointed ends downwards.

Slide Chairs: The slide chairs in these kits are a new moulding of the correct scale length (previous kits have used a compromise length chair with sufficient length for EM or 00 switch openings. Even with the correct length moulding, there is a small conflict with the adjacent L1 chair on the first slide chair on the single slip switches. Use a scalpel to remove a tiny slice from one of the chairs in each case to avoid this. For the double slip, special slide chairs (27 and 28) are provided for the first two slide chair positions. These need to be cut to length when being finally assembled - aim to get the join in the centre, taking small slices off and checking repeatedly. Note that, unlike the rest of the slide chairs, these chairs lie parallel to the timbers. Smooth the join so the switch rails can slide freely.

Preliminary Steps

Checking the crossings: In these slip kits, all the crossings are straight and it is worth checking that they really are straight before going further. A straight edge held against the gauge face of the rail is one way but there really is no substitute for holding the crossing up and looking along the rail (it helps to be a little short-sighted to do this!). Carefully tweak the rails with finger and thumb nail until you are satisfied they are straight right to the rail ends. If there is a more fundamental problem with alignment in the soldered section (unlikely), get in touch with Exactoscale.

The crossing should also be flat and this is best checked by placing the crossing upside down on a flat surface. There should be no rocking nor any daylight under the centre of the crossing. To correct any misalignment, place the centre of the crossing on a strip of 1mm ply and gently press the rail ends downwards, repeatedly checking to see if it is flatter.

Checking the Switch Assemblies: Where the straight road of the switch assembly is the stock rail, checking that it is straight is easy and any misalignment should be gently corrected by bending with fingers and thumb. Once the straight road is straight, check that the switch rail makes even contact with the stock rail over the whole length of the planed (tapered) section of the switch rail. Careful bending can correct a poor fit. Careful use of small pliers may be necessary, but avoid kinking the rail. Beyond the planing, the switch rail should be a smooth curve.

Where the switch rail forms the straight road, you need to make sure the gauge face of the switch rail is straight and this is best done by holding a straight edge against the gauge edge of the switch rail (the way the switch rails are machined, looking at the base of the switch rail can be very deceptive). When you are happy with the switch rail, make sure that the stock rail and switch rail make contact over the whole length of the planing, adjusting the 'set' just beyond the toe of the switch so that its angle matches the angle of the switch planing. Then make sure the remainder of the stock rail has a smooth curve.

We hope that the switch assemblies as supplied will need no adjustment but to achieve the best possible result, all these checks and any consequential adjustments are worth making.

Deburring the rail ends: The rails are generally cut to the correct length and need to be prepared by deburring the ends so the chairs can be slid on without damage. Additionally, and as part of the same process, it is worth filing back the rail web by around 0.5mm so that the crosspiece of the fishplates can be accommodated even when the rail joint is closed right up. This both enables more realistic rail joint gaps to be achieved and reduces the risk of plastic fishplates being cut in two by the rail webs.

Rail ends that should be left for now are the inner ends of the common crossings. The crossings supplied are identical to those in the B8 turnout kits but for a slip they will need to be shortened at the inner end.

Other Points: The tags included on the etch under the obtuse crossing are a little too long and will conflict with the next timber along. Before starting assembly, it is best to trim them back a little else they will be impossible to fold down when required.

The centre insert on the Y chair (timbers 8 and 38) has some particular problems. First, as it has been necessary to add to the base a support for the rail ends of the common crossing, the insert is now too deep. Either the insert needs to be cut so only the upper part remains or a cutout in the centre of the support needs to be made (leaving enough material to support the rails). Secondly, getting the insert into position is tricky. One way of doing it is, at the stage marked \emptyset in Assembly - section 7, to slide the crossing out of engagement with the fishplates, slip the insert into position and slide the crossing back into its correct position. You may decide that leaving it out altogether is easiest!

The smallest chair parts (5 and 6 on timbers 21 and 25) will not stay in place if only solvent is used. A tiny amount of superglue or epoxy will be needed.

Assembly

The basic approach is to build the slip from the centre outwards. The key points to watch are the track gauge through the obtuse crossings (see **Gauge Issues** above), the fit of the switch assemblies to the obtuse crossing and slip road rails and the alignment and gauging of the slip road (initial test builds tended to be a little tight on gauge). The following assembly sequence is recommended:

1 Preparing the Bases: The moulded timber bases (one left hand and one right hand for the single slip; two identical ones for the double slip) should have any roughness cleaned off the timber ends (scalpel or needle file) and then one moulding should have its centre timber removed (the mouldings effectively duplicate the centre timber). The bases are then held in position with a few small blobs of Bluetac on a flat surface (a piece of MDF approx 450mm x 150mm is ideal), having first drawn a single straight line the length of the board at a slight angle. The line is used to align the timber bases so that the web under one rail is straight from end to end of the slip.

It is also important to position the bases so that the spaces on each side of the centre timber are equal.

In the early stages of building the slip, it is worth checking periodically that the web is still lined up along the line drawn on the board and that the spaces each side of the centre timber are still equal.

2. Obtuse Crossings: Take the two obtuse crossing assemblies and thread on the appropriate combination of S1, L1 and M1 chairs. Note that the keys on a piece of track generally all point in the same direction except where fishplates or other obstructions would make inserting a key too difficult (we have shown them generally pointing to the right on the single slip drawing and to the left on the double slip). Place the crossings in position and adjust the chair positions so that they fit on their pips and the hole in the etch under the rails is over the centre of the centre timber.

Initially, tack one chair at each end of each crossing assembly (on the same road) using a tiny amount of butanone solvent. Then check track gauge and overall alignment (a straight edge held along the gauge face should line up with the timber base webs right to the end of the slip. If any adjustment seems necessary, a little more solvent will enable a chair to be pressed into a slightly different position (we are talking small differences here, but the gauge must be correct). When satisfied, repeat with the other chairs already fitted to the obtuse crossings, finally using a little more solvent to give a strong bond. Then fit the special chairs that hold the centres of the obtuse crossings (on timber 23). Again, alignment and accurate track gauge are important.

3. Inner Slip Rails: Next, the aim is to assemble the (or one of the) set(s) of inner slip rails. Worth pointing out at this stage that the double slip has what one might call rotational symmetry in that diagonally opposite switch assemblies are identical. Take the appropriate switch assemblies for one inner switch rail, fit the functional chairs on each (an L1 chair, a 1P chair and, depending on the switch, a 55 or a 67 + L1). Fit a brass fishplate (nuts on the outer side) on the stock rail end and then do a trial fitting on the track base pips. Slide the fishplate onto the obtuse crossing rail and then slide the chairs so they are centred on the appropriate timber. They should fit on the pips without great difficulty.

Then take the inner slip road closure rail, carefully bend it (right to the ends) to match as closely as possible the curve on the drawing (actually 2400mm radius), fit a 69 chair on one end and an L1 chair on the other and place it in position on the track base. The 69 chair should click into position on its pip (and may be difficult to lift out again) and the rail ends should line up with the switch rail ends. Some minor tweaking of the curvature of the closure rail and (with great care) of the switch rails may be worthwhile to improve the alignment - which should be a smooth curve from the end of the planing in one switch rail to the start of the planing on the other switch rail. Check also that the rail joint gaps are reasonably consistent, not too large (0.3mm is enough) and positioned centrally between the timbers. Once all is satisfactory, remove the closure rail, fit brass fishplates and reassemble the closure rail with the switch assemblies on the timber bases. The closure rail can then be solvent welded in position and the closure rail special chairs added. Do not at this stage fix the switch assemblies permanently in position.

If building a double slip, the second set of inner slip rails should now be dealt with in the same way.

4. Outer Slip Rails: Now for the outer slip rails. The procedure for these is much the same as for the inner slip rails with the main exception that final fitting of the closure rail is best done using a track gauge. (With a radius of 2400mm, no gauge widening is needed). Also note that the functional chair at the toe end of the switch assembly is a check chair - a CCL or CCR as appropriate. Again, use brass fishplates for the stock rail/closure rail joints.

5. Straight Closure Rails (single slip only): On a single slip, the next step is to fit chairs to the straight closure rails connecting the obtuse crossing to the common crossings and to test fit each in position. The main requirement is that the length of the rails should be such that they line up alongside the end of the adjacent switch assembly, halfway between timbers 8 and 9 or 37 and 38.

6. Common Crossing Preparation: Next step (on both single and double slips) is to trim the common crossings to the correct length. The nose of the crossing should be over timber 6 (or 40), set back approx. 0.3mm from the edge, and the rail ends cut so they meet the ends of the switch assemblies (with a small gap, 0.3 - 0.5 mm), with the joint falling midway between timbers 8 and 9 (or 37 and 38). Best to cut slightly long and file back until the length is just right. The rail joints here need to be slightly larger than elsewhere as these are the only essential insulated joints in the slip.

7. Final Stages: Although much remains to be done, all should now be relatively straightforward. Make sure all the functional chairs and fishplates on the switch assemblies and (single slip) straight closure rails are in position and locate easily on their pips. Slide the functional chairs onto the outer end of the common crossings, add plastic fishplates and connect the crossing assembly to the adjacent rail ends between timbers 8 and 9 (or 37 and 38). Locate the common crossing functional chairs on their pips and solvent weld them in position (\emptyset) and then add all the special common crossing chairs (on timbers 3 - 8 and 38 - 43). When doing this, make sure that straight alignment is maintained from the outer end of the common crossing through to the obtuse crossings. Now the inner switch assemblies can be permanently fixed and their special chairs and slide chairs added (and, for single slips, the closure rails connecting the crossings can be permanently fixed too).

Finally, the outer end (closure) rails and check rails can be assembled with their chairs and fitted in position. It is best to use a brass fishplate where the rail joint is alongside the check rail. Again, check that all functional chairs and fishplates are in position on the outer end rails and the outer switch assemblies and then solvent weld the outer end rail chairs and check chairs in position. The switch rail special chairs and slide chairs can now be added and fixed permanently.

Electrical Connections

As has been mentioned, insulated rail joints are needed between the common crossings and the adjacent rails at timbers 8 and 9, and 37 and 38. Elsewhere, brass fishplates can be used but these should not be counted on for electrical connections between rails. All crossing and switch assemblies have tags included in their etches and these can be used for soldered connections to the rails. The eight remaining rails that do not have tags will need to have droppers added.

Laying and Operating the Slip

No special issues rise with laying a slip and modellers tend to have their own preferences for trackbeds, adhesives and ballasting methods. Getting a smooth trackbed without unintentional twist or angular changes in gradient is essential. A thick cork underlay glued with PVA to a well-supported MDF trackbed is one approach, then gluing the track down with Evostick flooring adhesive. This has the advantage that, unlike PVA, it doesn't dry to a hard shell - which is what must be avoided if train running is not to be very noisy.

Operating a single slip is no different from dealing with a normal turnout. We supply adaptor plates for Tortoise switch machines which is one way of achieving slow, quiet movement with a well-hidden and robust drive mechanism. With this approach, stretcher bars become purely cosmetic and it is our intention to introduce a design that can be fitted to turnouts after they have been laid.

Whatever type of stretcher bar and operating mechanism is used, it is essential that the switch rails are able to move freely so they can contact the stock rail over the whole length of the switch rail planing. If they cannot, the track is likely to be undergauge through the switches and poor running will result.

With a double slip, all the switch rails at one end of the slip should move together and it may be possible to achieve this using the Tortoise adaptor plate arrangement but using larger bore tube to provide extra play to accommodate the potential 'fight' between the four switch rails. We expect to try this approach ourselves before too long.

Special Formations

Slips are quite likely to be used in close proximity to other point and crossing work and you may therefore want to customise the slip. We supply a sprue of matching timbers, including many much longer ones, which may help with this. Things to bear in mind include making sure that the timber spacing under all the special chairs is retained as the chairs have to be in their designed positions, making sure there are joint lines in the formation so that any piece to be laid is of a manageable size and planning the timber layout so that rails do not have excessive unsupported sections. Unlike our turnouts, we do not advise attempting to curve the slips.

Problems and Advice

We hope you will be able to build this slip without encountering any difficulties. If all does not go smoothly, we will do our best to correct problems and provide assistance - but please make full use of these instructions before seeking further assistance.

If there seem to be deficiencies in the kit as supplied, please write to Exactoscale (see address under the heading) describing the problem or enclosing the components you believe to be unsatisfactory.

If you have difficulties assembling the kit, contact us - see our website for contact details. If you damage components during assembly, we will normally replace them provided the damaged component is sent to us first.

These kits have been a long time in development and getting some aspects right has been difficult. We would be interested in feedback and to hear any suggestions you may have for better ways of assembling and using the kits.

Note: Exactoscale Ltd and/or Andrew Jukes (the Suppliers) have taken great care in designing and producing this product. The Suppliers however do not and cannot guarantee accuracy or performance. Anyone using this product does so at their own risk and shall be deemed to indemnify the Suppliers against any and all injury or damage arising from its use.

Part no.	Diamond or Slip Type								Sprue content			
	5	6	7	8	SS7	DS7	SS8	DS8	OCS	OCC	SS	SC
1	2								1			
2	2								1			
3		2							1			
4		2							1			
5				2			2	2	2		1	
6				2			2	2	2		1	
7			2		2	2			2		1	
8			2		2	2			2		2	
9	4	4							2			
10	4	4							2			
11			4	4	3	2	3	2	4		1	
12			4	4	3	2	3	2	4		1	
13							2	2		1		
14							2	2		1		
15		2	2							1		
16		2	2							1		
17	2	2		1						1		
18	2	2		1	1		1			1		
19	2	2		1						1		
20	2	2		1	1		1			1		
21	2									1		
22	2									1		
23	2									1		
24	2									1		
25		2	2	2	2	1	1	1		2		
26		2	2	2	1	1	2	1		1		
27					1	4		4		2		
28					1	4		4		2		
29			2	4	1	1	2	2		2		
30			2	4	1	1	3	2		2		
31			2	2	1	1	2	2		1		
32			2	2	1	1	3	2		2		
33				2						1		
34		2	2							1		
35		2	2							1		
36				2						1		
37							2	4			2	
38							2	4			2	
39							2	4			2	
40							2	4			2	
41					1	2	1	2			1	
42					1	2	1	2			1	
43					3	6	4	8			4	
44							1	2			1	
45					1	2					1	
46							1	2			1	
47							1	2			1	
48					1	2					1	
49					1	2					1	
50							1	2			1	
51					1	2					1	
52					1	2					1	
53							1	2			1	
54							1	2			1	
55							2	4				2
56							1	2				1
57					2	4						2
58					2	4						2
59					2	4	2	4				2
60					2	4	2	4				2
61					1	2	1	2				1
62					1	2	1	2				1
63					1	2	1	2				1
64					1	2	1	2				1
65					2	4	2	4				2
66					2	4	2	4				2
67					2	4	1	2				2
68					2	4						2
69							1	2				1
Totals:												
Parts -	28	32	32	36	51	82	66	104	24	30	32	24
Sprues -	4	4	3	3	4	6	5	6				
Sprues included in Kit												
OCS	2	2	1	1	1		1					
OCC	2	2	2	2	1	2	2	2				
SS					1	2	1	2				
SC					1	2	1	2				