

INTRODUCTION

Protofour Track Construction Templates are paper patterns designed to assist the modeller in the construction of authentic trackwork, firstly by eliminating all need for draughting and measurement, and secondly by presenting all the essential information for construction in plan form. The use of paper templates, in conjunction with Protofour track construction techniques (Section 4.1.6.), considerably speeds track construction and enables realistic and reliable trackwork to be produced by a person with no previous modelling experience.

To obtain the maximum benefit from the system the track construction templates should be used in conjunction with Protofour Track Planning Templates (Section 4.1.2.), and with the Protofour wiring system and Wiring Templates (Sections 4.1.8. & 4.1.9.).

The track planning templates are 1mm/1ft. scale reductions of the construction templates, printed on self-adhesive paper, and are used in the initial stages of layout planning. They may be used for accurate and realistic layout planning to any scale and gauge combination.

The template patterns cover almost the entire range of prototype trackwork and include plain line, standard turnouts, diamond crossings, single, double and outside slips, tandem and three-way turnouts, double junctions and a scissors crossover. Simple crossovers, curved turnouts, Y-turnouts and other less common formations can be produced by modifying one or more of the standard templates.

The template track formations are dimensionally correct and are scaled directly from the data used in prototype track construction. They are printed on a special paper with a high distortion resistance. The first set of templates to be produced are to 1:76.2 ratio (4mm/1ft. scale) and are drawn to Protofour standard dimensions. They are NOT suitable for BRMSB standard '00' gauge or for 'H0' standards. With care the less complex templates can be used for BRMSB/'EM' gauge construction.

JIG CONSTRUCTION

The construction templates may be used for planning purposes on the baseboard itself, but construction of track 'on site' is neither advisable nor necessary. The templates may be affixed by double-sided adhesive tapes to a laminate-faced blockboard or chipboard base, and the resulting jig is instantly ready for use in comfort and in conditions of adequate lighting. The procedure for track construction in jigs is given in Section 4.1.6.

The use of 'instant jig' techniques allows the modeller to commence trackbuilding at once, and be certain that he will produce accurate, reliable and correctly scaled track much more quickly than with any other system of construction. Furthermore, by cutting parts from standard templates and using them to build up more complex formations, the modeller will find that the system is extremely adaptable with no diminution in the reliability of the trackwork.

CHARACTERISTICS OF PROTOFOUR CONSTRUCTION TEMPLATES

- * The templates are based on data taken from the handbook of the Permanent Way Institution. Some of the minor variations in the practices of the individual companies will be covered in due course in data appearing in the Protofour Manual.
- * The serial number of the template indicates the prototype track formation on which it is based. For example, PTS/B6-R indicates a plain turnout from the straight road, with 'B' type switches and a 1:6 crossing angle, the secondary road diverging from the right.
- * In plain turnouts the six standard switch units, designated A to F, are combined with a variety of crossing vee angles. These combinations ensure that the radius from the point of entry of the switch through to the crossing vee changes gradually; this contrasts with average model railway practice where a sharp change of radius is the norm, with consequent mediocre running through the turnout. The effective radius of a turnout is increased as the switch series is ascended, i.e. from A to F. In practice the 'A' series (small effective radius) turnouts are generally found in industrial and similar sidings and only the shorter wheelbase vehicles are allowed to operate over them. Both the 'A' and 'B' series of turnouts are available in the template series and selected examples from the 'C' and 'D' series will be produced later. No specific rules govern the type of vehicle which can operate successfully over a given turnout. In general the 'A' series turnouts should be restricted as in the prototype and the longer wheelbase vehicles used only over turnouts in the 'B' to 'F' range. Vehicles with extra-long wheelbase should be tested on the shortest lead turnout over which the vehicle may be expected to run.
- * Although the templates are accurately drawn it is ESSENTIAL to use track, check and cross-

ing flangeway gauges (Section 4.1.5.), and switch blade gauges (Section 4.1.7.), during construction.

- * It is recommended that electrical connections be planned before track construction commences, so that Wiring Connector and Turnout Bonding Strip may be added during construction in the jig. For details of Wiring Templates, Wiring Connector and Turnout Bonding Strip, see Section 4.1.8.
- * The positions of all rails are indicated by solid lines of the same width as the rail.
- * Other rails, not part of the unit, are included as an indication of the minimum spacing of tracks. These rails are shown as hollow lines.
- * Plain track templates indicate sleeper positions in outline, while other templates indicate timber positions as centrelines. In the former case, where sleepers are provided precision cut and pre-punched for rivets, the outlines merely ensure correct spacing. In the latter, the use of timber centrelines assists in the accurate marking out prior to punching the rivet holes in the turnout timbers. Accurate location of rivets is essential if chairs are to be fitted.
- * A dot at the intersection of the crossing timber centreline and the rail indicates the position of a rivet in the Protofour construction system. In most cases the rivet position coincides with the position of a chair.
- * Special chairs used in turnouts are indicated by a letter. P = slide chairs; B = block or double chairs; A-H and X-Z = special crossing chairs.
- * Crossing timber ends are indicated by a solid 1mm line. The outside edge of this line represents the pre-grouping length of the timber, the inside edge the post-grouping length.
- * Timber positions carry a serial number to assist in identification during assembly.
- * Minimum track spacings are indicated by a centreline. Thus, adjacent formations may be correctly spaced by cutting the templates along the centreline and placing them together.
- * An indication of the minimum back-to-back spacing is given on plain turnout and certain other templates. This is to facilitate the setting out of crossovers by fitting together two templates of the same 'hand'.
- * The crossing vee centreline is provided to assist in the alignment of the unit when an individual crossing is incorporated into a junction. It is also of use when crossing timbers are laid perpendicular to the centreline of the 'straight road', which was the case with certain pre-grouping railway companies.
- * Stretcher bars and typical rail joints are indicated, although the latter vary widely in practice. Rail joints can be simulated by cutting a slot in the rail about one third of the way through the rail, as it is only necessary to cut completely through the rail where electrical breaks are required.
- * As aids in the assembly of trackwork not covered by the standard turnout range, and for use as jigs in the construction of vees, a set of templates covering common crossings with angles from 1:4 to 1:16 is available.

No responsibility can be accepted for unsatisfactory results obtained through the use of photocopies of the Protofour templates. Inevitably, distortion occurs in the photocopying process.

The full range of Protofour templates and associated products is given in the Protofour Catalogue and Price List.

ADAPTATION OF STANDARD TEMPLATES

The construction templates may be tailored to suit special situations and some of the possible adaptations are outlined below.

1. Curved formations and Y-turnouts. Curved turnouts with the curves of both roads in the same direction, or opposite directions (Y-turnouts), may be fabricated from standard templates in either of two ways:

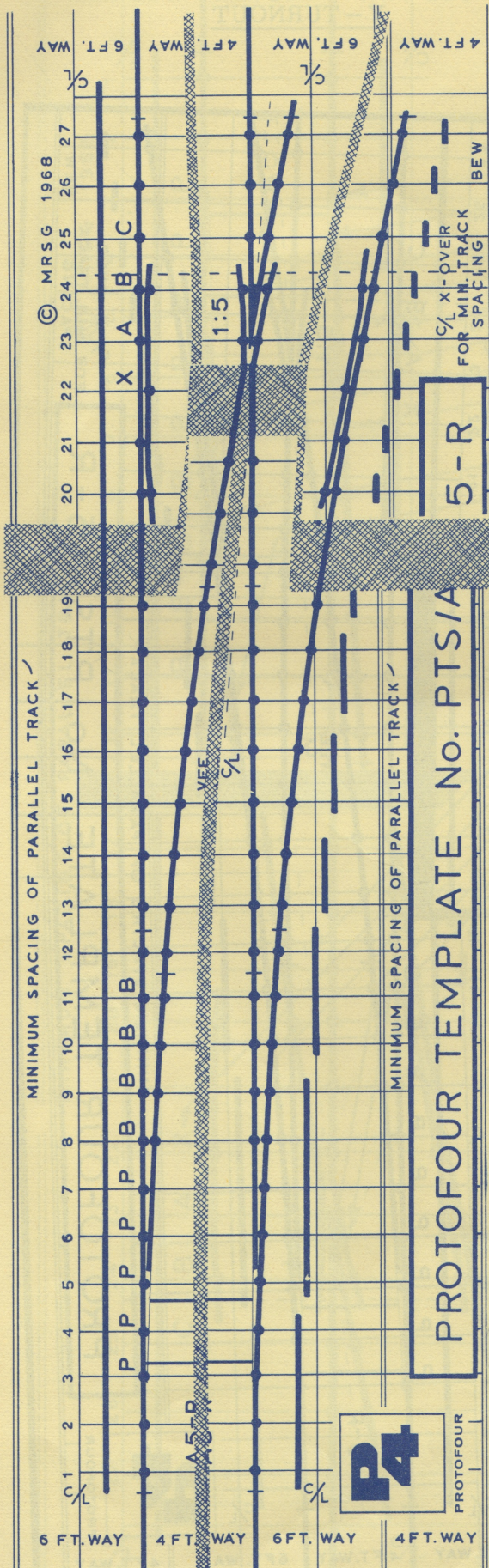
- a) by curving the template and constructing the turnout entirely in the jig,
- b) by curving a partly assembled standard turnout.

Method a) is the more accurate and satisfactory of the two.

In the prototype, curved turnouts consist of standard switches and crossings joined by curved closure rails. In the model the same procedure applies, and ONLY the closure rails are curved, the switches and crossings remaining unaltered.

The procedure for curving a PTS template is illustrated for a B6-L turnout. Position the

PROTOFOUR

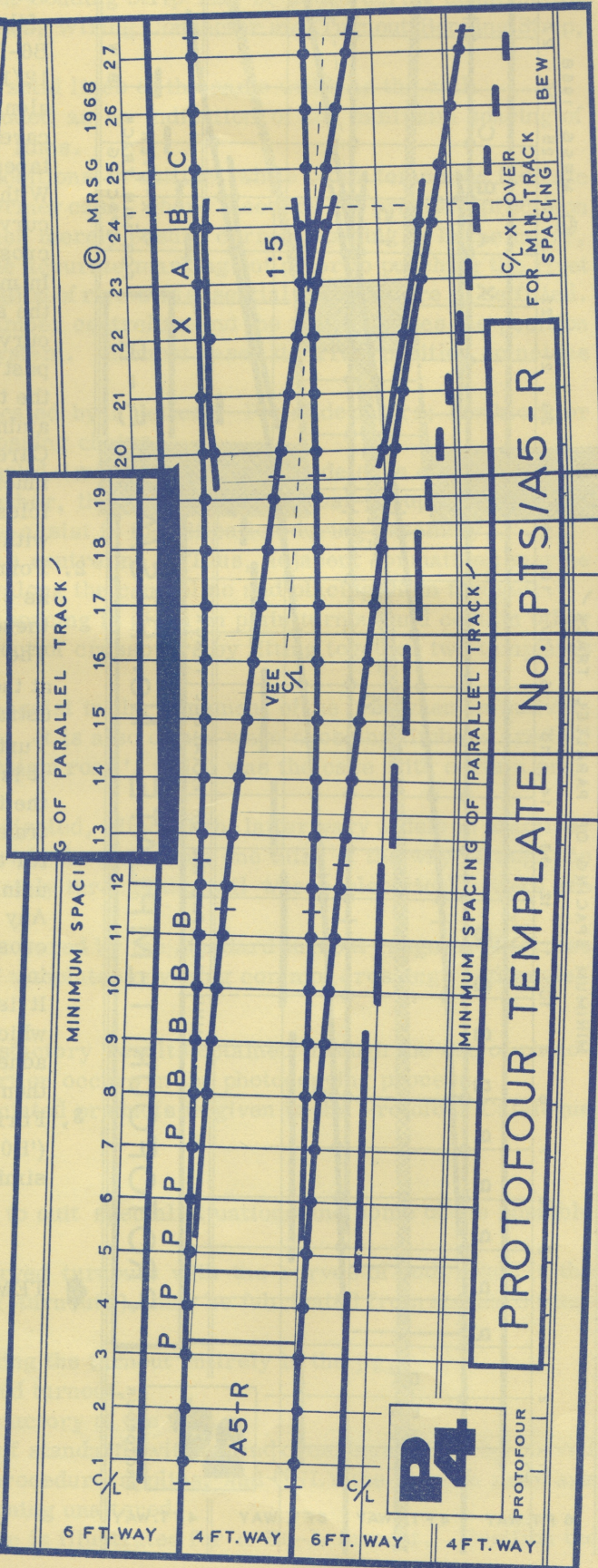
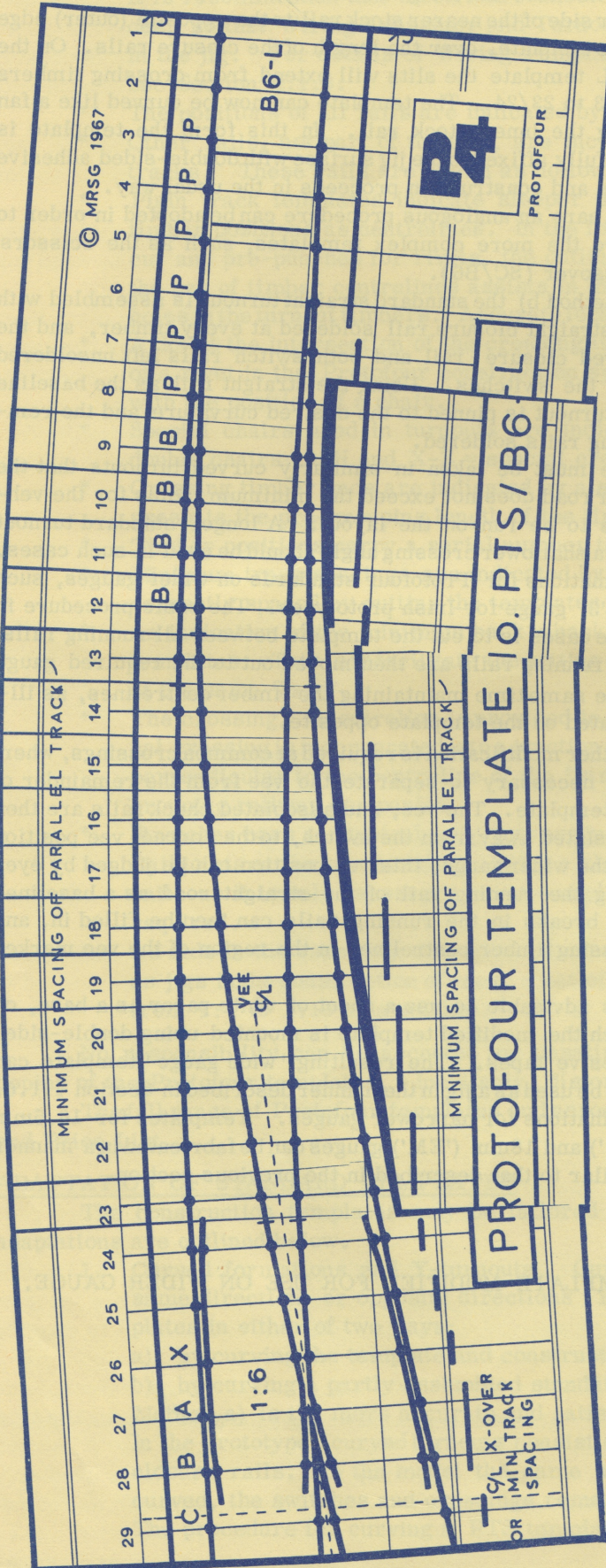


- template with the vee at the left. Cut away the template to within 5mm of the nearer (curved) stock rail. Slit the paper between each crossing timber centreline, from 5mm on the outer side of the nearer stock rail to the opposite (outer) edge of the template, over the length of the closure rails. On the B6-L template the slits will extend from crossing timbers 12/13 to 23/24. The template can now be curved like a fan along the inner stock rail. In this form the template is carefully affixed to the jig surface with double-sided adhesive tapes and construction proceeds in the usual way. With care an analogous procedure can be adopted in order to curve the more complex templates, such as the scissors crossover (SC/B6).
- In method b) the standard straight turnout is assembled with the straight closure rail soldered at every timber, and the curved closure rail and both switch rails left unsoldered past the switches. Using the straight rail as the baseline the turnout is pinned to the desired curvature and the remaining rails soldered.
- Care must be taken in similarly curved turnouts that the inner road does not exceed the minimum radius for the vehicles to be run on the layout. A longer standard turnout with a shallower crossing angle should be used in such cases.
2. Formations for Protofour standards on wider gauges, such as 5'3" gauge for Irish prototypes. The basic procedure in these cases is to cut the template between all running rails. The running rails are then moved out to the required gauge at the same time maintaining the timber centrelines, as illustrated on the template opposite.
- Further modification is required at common crossings, where it is necessary to separate the vee from the remainder of the template. The vee, and associated check rails are then translated away from the switch, to the correct vee position for the wider gauge; this vee position can be judged by eye, using the running rail of the straight road as a baseline. Any breaks in the running rails can then be filled in, and crossing timber centrelines in the region of the vee marked in.
- It is advisable to use a sheet of white paper as a base, on which the modified template is mounted using double-sided adhesive tapes. The resulting 'wide gauge' template can then be used as a jig in the manner described in Section 4.1.6.
3. Formations for narrower gauges. Templates for 16.5mm ('H0') and 18mm ('EM') gauges can be fabricated in a manner similar to that described in the previous section.

← TEMPLATE MODIFIED FOR USE ON WIDER GAUGE.

CURVED TURNOUT

Y-TURNOUT



PROTOFOUR

