

Studiolith Ltd.

ROFFORD
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Sole Distributors of **PROTOFOUR** Equipment

INSTRUCTIONS for the INSTALLATION of the PROTOFOUR

TURNOUT OPERATING UNIT, the use of

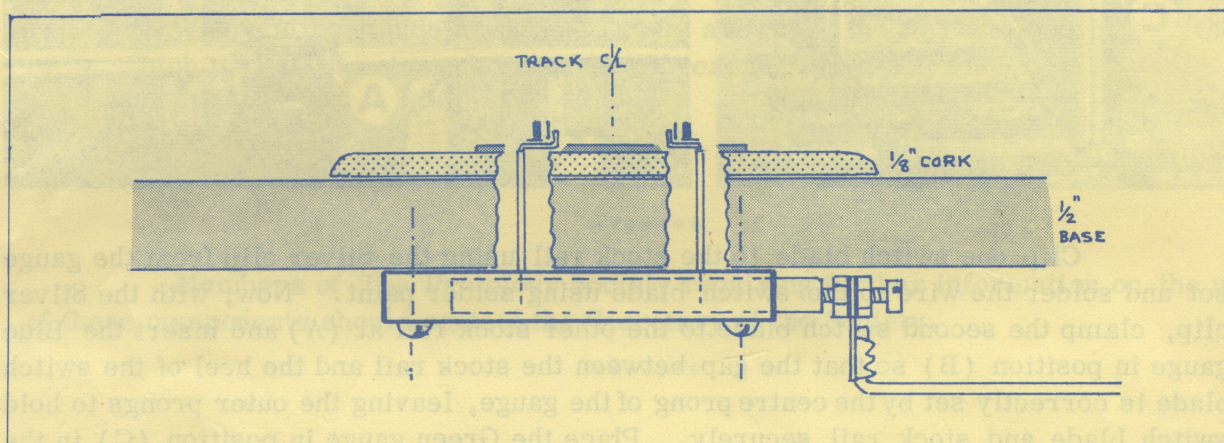
SWITCH BLADE GAUGES, and the

FITTING of TIE RODS.

TURNOUT OPERATING UNITS

In fitting units for the operation of turnouts we are trying to achieve:

1. Movement of the switch blades positively and in unison.
2. Retention of the switch blades at the limit of throw.
3. Prevention of switch blade rise and fall in relation to the stock rails.
4. Maintenance of the correct gap between the open switch rail and the adjacent stock rail.



Protofour Turnout Operating Units are produced in three forms, Type A for normal operations, Type B for use in Double Slips and Type C for Catch Points.

The Type A unit consists of a plastic bar sliding in an aluminium channel. Attached to the bar are two stainless steel tubes into which fit two cranked nickel-silver wires. An 8 BA bolt, fitted with two adjusting nuts and a solder tag, is fitted to the end of the bar for connecting the power source. The unit is secured to the underside of the baseboard by two 5/8" round headed screws.

The Type B unit is similar except that the bar is longer and contains an extra pair of tubes and wires.

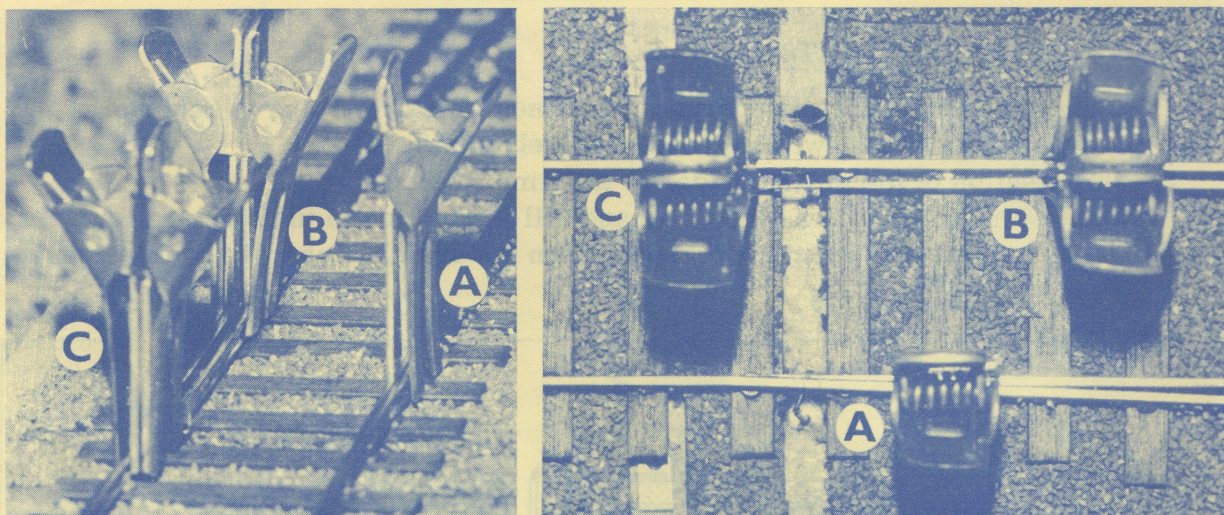
The Type C unit is identical to Type A except that only one tube and control wire is provided.

The units are designed to fit below a baseboard utilising 1/2" Weyroc and 1/8" cork track underlay, in which circumstances the steel tubes will automatically position themselves flush with the top surface of the underlay. Use of thinner baseboard materials will necessitate packing the unit, while thicker baseboards may be accommodated by extending the wires in the tubes.

The units may be fitted to the track at any time after laying. First mark the underlay where the ends of the switch blades will lie, then drill two 3/8" holes at 24mm centres, one for each blade, to allow the tubes to be positioned and to move freely. Where track has already been laid and ballasted, clean away the ballast near the switch blade ends, and drill two 1/8" holes immediately outboard of the stock rails. Using these as a guide, enlarge the holes from below to not less than 1/4" diameter, taking care to leave the track undisturbed.

When the holes are prepared, offer up the unit from below, and check the freedom of movement of tubes and wires; mark the positions of the securing screws, and fit the unit into place.

The unit is now ready for soldering the nickel-silver wires to the switch blades. For this purpose a set of Switch Blade Gauges is used. These determine the correct gap between the switch blade and the stock rail when the switch is reversed.



Clip one switch blade to the stock rail using the Silver clip from the gauge set and solder the wire to the switch blade using solder paint. Now, with the Silver clip, clamp the second switch blade to the other stock rail at (A) and insert the Blue gauge in position (B) so that the gap between the stock rail and the heel of the switch blade is correctly set by the centre prong of the gauge, leaving the outer prongs to hold switch blade and stock rail securely. Place the Green gauge in position (C) in the same manner at the toe of the switch blade so that only the tip of the blade is held in the gauge. Solder the second wire to the second switch blade rotating the wire as necessary to give a close fit.

Remove gauges and clips and operate the switches, checking that the blades fit snugly against the stock rails. If necessary, the blades should be carefully scraped to improve the mating between stock rail and switch rail. Replace the clips and gauges and, using a fine wire, place a small dab of epoxy resin, e.g. Araldite, on the joints of the wires and tubes while the blades are clamped in position.

The baseboard holes are covered by a paper strip, subsequently carefully ballasted, which contains slots which allow unrestricted movement of the wires. The operating unit is now almost invisible.

The above programme is followed for double slips, using Type B units, with the provision of two sets of holes instead of one. Both sets of switch blades at each end of the slip are operated in unison by a single lever, so that two levers control all roads through the slip. This facilitates the simplest wiring of double slips.

Connection from the lever or motor to the unit is by means of a wire, if necessary containing an omega loop to absorb excess movement. This is attached directly to the solder tag, and fine adjustment is carried out using the twin nuts on the thread of the bolt.

TIE RODS

Tie rods must be added to complete the prototypical appearance of turnouts. The function of the tie rod in full-size practice is to ensure the correct spacing of the switchblade pair. Pre-Grouping rods were generally circular in section, while more modern bars are rectangular.

Protofour circular-section rods are made from 26 SWG nickel-silver wire, one end of which is baked with an insulating coating which can be seen through a lens. No: 76 holes are drilled where indicated in the switch blades according to the turnout templates, and the uninsulated end of the rod soldered in its hole when the even position of the rod has been adjusted. The other end is secured in its hole by a smear of epoxy resin such as Araldite.

Only the minimum length of drill should project from the pin chuck when drilling holes, otherwise there is a high risk of drill breakage through mishandling.

The Protofour rectangular-section rods are made in two halves with a central insulated joint, and they may therefore be soldered into the switch blades at both ends.

Where slips, tandem turnouts, etc., are used, the tie rods pass below other rails, which they must not touch in order to preserve electrical insulation.

Members of The Protofour Society requiring further information on the use of these components should contact the Secretary of the Society.
