



**Complete kit to build a working (un-motorised) home or distant signal in any height up to 25ft. Some marking out, cutting and shaping of parts is required.**

The Great Northern Railway began installing somersault arm concrete post signals in 1918, following their earlier use on the M&GN. After the grouping, the LNER modernised many of these signals by fitting upper quadrant arms and a new lamp, and used this revised design for both new installations and renewals until the advent of tubular steel posts in the mid-1930s. Some examples are still in use on Network Rail today.

**Parts supplied:**

- S0012/1 arm etc fret
- S009/4 ladder fret
- S0018 concrete post casting
- SC0025 lamp casting
- 30mm x 1/16" brass tube (arm bearing)
- 30 x 0.8mm brass rod (arm spindle)
- 50mm x 26swg nickel silver wire (axles)
- 10 x 1.0mm brass rod (post peg)
- 2 off 150 x 0.31mm brass wire (operating wire, arm stop)

Red, yellow and blue-green glazing  
Baseplate

**ASSEMBLY INSTRUCTIONS**

Ideally, the kit should be built using 50W and 25W (low temperature) soldering irons, 188°, 145° and 70° solders and liquid fluxes, minidrill and slitting disc, various files, pliers, drills etc, and tinsnips and small scissors for cutting out the frets. In these instructions left- and right-hand mean as viewed from the front of the signal. A selection of prototype photographs will help assembly, although you may need to search for these, as this type of signal was not as common as other post types.

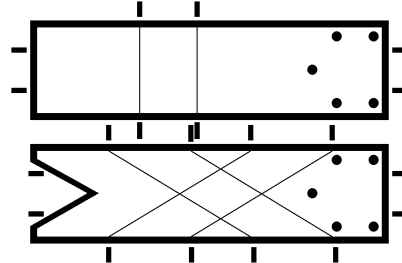
Burnish both sides of the frets before removing any parts, and tin the smaller parts before removal. Parts 4, 5a, 6a, 15 & 16 on the S0012/1 fret are not required and may be discarded. Grip the etched parts in smooth pliers when filing off tags to avoid bending them.

**The Signal Arm:**

Use 188° solder for this section.

Open out the spindle hole in the spectacle plate (3) to 0.80mm (no.68), and the operating wire hole to be a loose fit on the 0.31mm brass wire. For the latter, start with a no.80 drill and work up in size. If you break the etch (which is close to scale size), repair it by soldering on one of the etched washers and filing to shape.

Using the half-etched lines as a guide, scribe painting lines on both sides of the appropriate signal arm – home (1) or distant (2):



To do the rear side, use a scriber to punch guide pips through from the front marks.

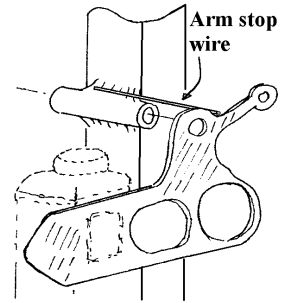
Solder the arm to the half-etched side of (3), ensuring the arm's half-etched bolt heads are on its front face. Solder the arm assembly to the 30 x 0.8mm brass rod spindle. To keep things square, drill a 0.8mm hole in a wood block, insert the spindle then drop the arm on to it face down. When soldering, do not press the arm at the spectacle plate end, or it will tilt. Remove the excess front spindle and file it almost flush with the spectacle plate. Leave the excess rear material for now as a painting handle. Joggle the operating wire arm back 0.5mm so the operating wire will clear the spectacle plate.

**The Post:**

**Warning:** being cast in whitemetal, the post is easily melted or distorted. Handle it carefully, and ensure you have picked up the low-temperature (70°) iron before making any joints!

The post as supplied will build into a signal 25ft high. If you require a shorter post, remove the excess from the bottom end of the post. Remove any flash and mould lines (don't forget the inside of the holes), and straighten the post using gentle finger pressure if it has become distorted. The front of the post is that face which has the larger holes in it.

Square off one end of the arm bearing tube. Solder (188°) a length of 0.31mm brass wire parallel to the length of the tube, so it projects around 4mm beyond the squared end. This wire forms an arm stop, to prevent the arm falling below the horizontal. Clamp the tube to the left-hand side of the post so the wire falls in the crook of bearing and post as shown.



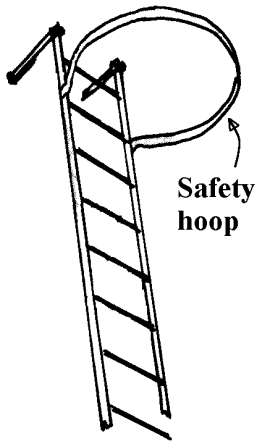
The tube centreline should be 4mm below the post top (i.e. the base of the post cap), and the end should project around 1mm in front of the post. Solder (70°) the tube to the post. Use the minidrill and slitting disc to trim the rear of the tube so it projects around 1mm behind the post. Test fit the arm in the bearing, and trim the stop wire.

If you intend to use the large rectangular baseplate to mount the signal on the layout, first scribe a longitudinal centre line along it. Orient the post with the bearing on the left, then solder the post around 15mm from one end of the baseplate, ensuring squareness in all three planes. Drill the post and baseplate and use the 1.0mm brass rod to strengthen the joint.

**The Ladder:**

Use the minidrill and slitting disc to form a 5mm long channel in the baseplate, perpendicular to the centre line and 16mm from the post rear face. (If the post has been cut to a shorter height, the channel should be positioned to give a ladder slope around 1 in 12.) If not using the baseplate, solder pieces of scrap wire either side of the post, which are long enough to reach the ladder end.

Remove the end rung from the ladder S009/4, then bend the side stiles over at around 105° just above the new top rung, with the half-etched side on the outside of the bend. Cut the ladder to length, so its bottom end fits in the baseplate channel or can be soldered to the fixing wires, and its top end fits around the post, just below the base of the post cap. Jiggle the top of the ladder in to suit the post width, then solder the ladder top (70°) and bottom (188°); the top bend should be positioned 3mm from the rear of the post.

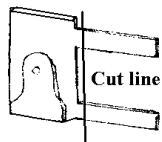


Add pairs of ladder bracing struts (17). Solder them to the ladder (188°) and post (70°), joggling them to account for the width difference. Check their height and number with photographs. The ladder end joints should be on the outside of the stiles, and never exactly level with a rung.

Form the safety hoop from strip (14). Wrap it around a 9/32" or 7mm drill; the natural spring of the brass will open it to the correct 8mm diameter. Bend the end tags to the ladder width and solder (188°) them to the outside of the ladder stiles as shown above, typically 4-6.5mm below the arm bearing. Remove any excess tag or strut length and tidy up.

### The Balance Weight and Post Fittings:

Use 188° solder for the start of this section.



Sweat the two balance weight levers (5) together. Add weights (6) either side to increase the thickness as desired.

Open out the axle hole to

no.76 (0.50mm), and the two operating wire holes to no.78 (0.40mm). Fold up the bracket (7), as shown, with the half-etched lines on the inside of the bends. Cut off the two side straps as shown.

Drill a no.76 (0.50mm) hole through the post from its right hand side. The bearing hole should be on the vertical centreline and 20mm (5ft) above the baseplate/ground level, unless the signal is in a public area, when it should be 16mm (4ft) below the arm centre line. Insert the straightened nickel silver bearing wire, trapping the balance weight arm in the bracket such that the weight is to the rear of the signal. Oil the balance weight arm bearing, then solder (145°) the wire at the bracket hole front and rear faces. Push the wire at the rear of the bracket through the hole drilled in the post, and solder (70°) the whole assembly to the right hand side of the post. Remove excess wire and tidy up the joints.

Consider how the signal box wire would have approached the signal. Solder (188°) a crank (9) to the front of the bracket (8), using a nickel silver wire axle, so that when the bracket is soldered to the front or right-hand side of the post as appropriate, a horizontal pull on the lower lever will translate into a downwards pull on the other lever. Use one of

the etched brass washers to space the crank off the bracket. There is no need to make the crank work, unless it is to form part of the eventual operating mechanism. Some signals had a pulley wheel (10) instead of a crank, but this does not appear to have been very common. [For a working crank/pulley, solder (188°) the axle into the bracket, add a brass washer, then the crank or pulley, a paper washer, then solder (145°) a second brass washer on top.] Finally, solder (70°) the bracket to the front or right-hand side of the post, so the lowest crank hole is just above baseplate/ground level, and the bolt-heads face outwards and are symmetrical about the post. Use pliers as a heat sink to stop the baseplate/post joint melting.

Fold up lamp bracket (11), with the half-etched line on the inside. Solder (188°) triangle (12) into the half-etched lines inside the bend; one is longer than the other to match the triangle sides. Solder (70°) the bracket to the left-hand side of the post, so its top surface is 6mm below the arm bearing centre line, and the shortest side of the triangle is against the post.

Add the track circuit plate (13) if needed (not on distant signals). Centre it 52mm (13ft) above the baseplate/ground level, and remember to use 70° solder. Two pairs of bolt holes are half-etched into the plate. Either the vertical or horizontal pair was used to fix the plate to the post; if modelling an actual prototype, check from photographs which pair is redundant and fill with solder.

### The Lamp:

Use 70° solder for this section.

Remove any casting sprue and mould lines from the lamp. Solder the lamp to the bracket, so that in side view, the lamp body is in line with the post, and from the front, the lamp lens falls behind the left-hand arm spectacle. You will need to clamp the bracket to the post to prevent it unsoldering, or simply admit defeat and glue the lamp instead!

### Painting:

Degrease the post and arm assemblies by washing in detergent water and leaving to dry.

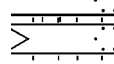
The weathered concrete colour of the post (see the MSE web site for a sample) is not easy to achieve, so you may need to experiment. On a similar post, I sprayed the signal overall with red oxide primer, having first removed the arm, and inserted a spare piece of 0.8mm rod into the bearing hole to avoid gumming it up with paint. I then gave the post two coats of Railmatch 290 ARC Mustard Yellow. This gives a finish that is too green and too glossy, so either let down the second coat with more red oxide, or take care of it at the weathering stage.

The arm should be sprayed overall with white car primer.

Detail paint as follows (but check with photographs as there is a lot of prototype variation):

**Black (some parts pale grey in later BR days):** – ladder, bracing struts, and safety hoop; balance weight assembly; lamp and lamp bracket; arm bearing; arm spectacle plate including the V-shape on its reverse; arm rear band/chevron; front chevron on a distant arm. A black post cap is a common variation.

Full size arm painting template



**Red or Yellow:** front and edges of the arm except the home's white band or distant's black chevron.

**Silver:** lamp lenses front and rear.

Glaze the spectacles; use red (home) or yellow (distant) in the left-hand aperture, and blue-green in the right-hand one. The easiest method is to cut a rectangle approximately to size so the whole of the aperture is covered, fix it in place using MSE's GSA adhesive or gloss varnish, and then trim the edges when set. Coat the front of the glazing with gloss varnish to give a better glass effect.

### Fixing the Arm to the Post:

Ensure the spindle moves freely in its bearing – clean off any paint that might have crept in. Remove any excess spindle length with the slitting disc, but leave enough spindle protruding through the bearing to solder the back blinder on. Open out the hole in the back blinder (18) to no.66 (0.85mm). Place an oiled paper washer over the spindle end, then solder (145°) on the back blinder, with its reinforcing rib to the rear. Adjust its position so it just clears the lamp rear lens when the arm is horizontal, and push it sufficiently far on to the spindle to remove any fore and aft spindle motion. If the blade is too high to cover the lens, cut off the right-hand half, and solder (188°) it to the bottom of the left-hand half, thus increasing the depth. Once correctly in position, solder (145°) the back blinder to the spindle. Wash off any surplus flux, then prime and paint black or pale grey as detailed above.

### The Operating Wire:

Blacken the 0.31mm operating wire, by either priming and painting black, using a permanent marker pen, or (preferably) a proprietary metal blackening solution. Make a small hook in the top of the wire. Measure the distance between the arm hole (arm horizontal) and the outer balance lever hole (lever around 30° below the horizontal). With the short end of the hook facing away from you, bend the bottom of the wire 90° to the left at the measured distance, then trim the bent portion to 2mm in length. Put the hook in the arm hole so the wire is to the front, then pass the bottom bend through the balance lever hole from the right, forming a hook to retain it. It may be necessary to joggle the wire to give clearance for it to pass behind the spectacle plate.

The signal may now be installed on the layout and connected to your chosen means of operation.