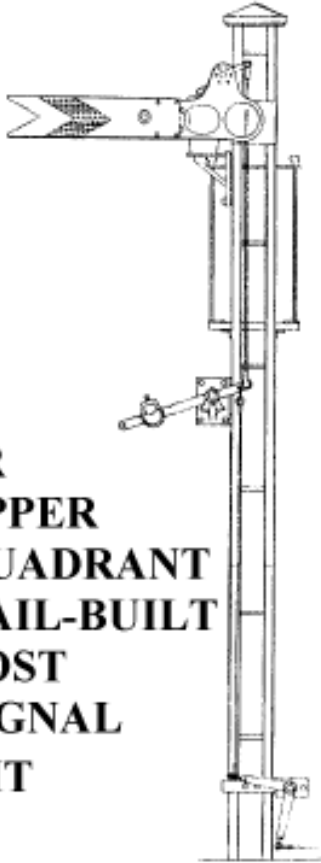


**SR  
UPPER  
QUADRANT  
RAIL-BUILT  
POST  
SIGNAL  
KIT**



**Complete kit to build a working (un-motorised) home or distant signal in any height up to 30ft. Some marking out, cutting and shaping of parts is required.**

The Southern Railway began installing this type of signal in the 1930s on all three sections in both new installations and as replacements for the various pre-grouping types still in existence. The design was continued by BR's Southern Region. Some examples are still in use on Network Rail.

**Parts supplied:**

- S0012/1 arm etc fret
- S009/4 ladder fret
- S0032 rail-built post casting
- SC006 lamp casting
- SC0020 post cap casting
- 30mm x 1/16" brass tube (arm bearing)
- 30 x 0.8mm brass rod (arm spindle)
- 50mm x 26swg nickel silver wire (axles)
- 2 off 150 x 0.31mm brass wire (operating wire, arm stop/corrugations, stanchions)
- Red, yellow and blue-green glazing
- Baseplate

**ASSEMBLY INSTRUCTIONS**

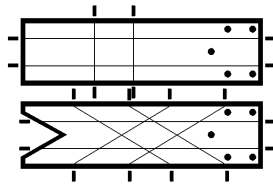
The test kit was built using 50W and 25W (low temperature) soldering irons, 188°, 145° and 70° solders and liquid fluxes, minidrill and slitting disc, various files, pliers, drills etc, and tinsnips and small scissors for cutting out the frets. Unless otherwise stated, left- and right-hand mean as viewed from the front of the signal. A selection of prototype photographs will help assembly, and these should be easy to find, as this type of signal was very common.

Burnish both sides of the frets before removing any parts, and tin the smaller parts before removal. Parts 4-6, 11, 12 & 14 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 it to shape.



Using the vertical 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.

If you wish to model the earlier corrugated pattern of arm (fitted prior to 1936), deeply scribe the corrugations on to the front of the arm, using the horizontal half-etched marks as a guide, and solder two pieces of 0.31mm brass wire onto the rear face at the same distances from the top and bottom edges. Unless your prototype demands it, avoid modelling a corrugated distant arm - the rear is very difficult to paint!

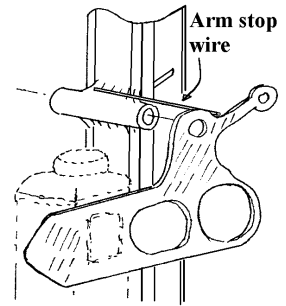
Solder the arm to the half-etched side of (3), ensuring the arm's half-etched bolt heads are on its front face. You will need to remove some of the corrugation wires so the arm will fit to the plate. Solder the arm assembly to the 30 x 0.8mm brass rod spindle. To keep things square, drill a 0.8mm hole 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 30ft high. If you require a shorter post, cut it to length just below one of the cross-bolts, which are a scale 2ft6in apart. Remove any flash, and straighten the post using gentle finger pressure if it has become distorted.

If you do not intend to operate the signal, drill the cast post bearing hole no.68 (0.80mm). For a working signal, it is best to remove the cast bearing and replace it with the 1/16" brass tube supplied. Square off one end of this tube and solder (188°) a length of 0.31mm brass wire parallel to its length, so the wire projects around 4mm beyond the squared end. This 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's vertical position should be 3mm below the post top, identical to the whitemetal tube just removed, and the end should project around 1mm in front of the post. Ensure the tube is at right angles to the vertical post axis, and solder (70°) it in place. Use the slitting disc to cut the rear of the bearing back so it projects around 1.5mm from the post's rear face. Test for free operation of the arm - you may need to file down the top of the spectacle plate or the underside of the wire to achieve this.

If not replacing the bearing, then just solder (70°) the 0.31mm wire stop in the crook of the bearing/post joint, as shown above.

Cut off the bottom right-hand corner of the S0012/1 fret to form a 3x4mm rectangle. Solder (70°) it to the front face of the post, so it completely covers the area behind the right-hand spectacle.

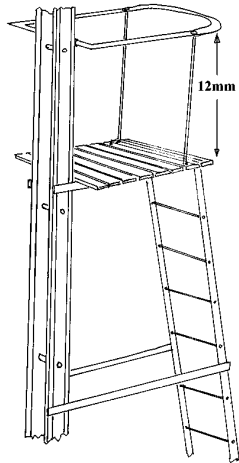
If you intend to use the large rectangular baseplate to mount the signal on the layout, first scribe a longitudinal centre line along it. Orient the post with the bearing and lamp bracket on the left, then solder the post around 15mm from one end of the baseplate, ensuring squareness in all three planes.

**The Platform and Ladder:**

Use 188° solder for the start of this section.

Open out the holes on the end-but-one plank of

the platform (15) and in the handrail (16) to no.78 (0.40mm). The other pair of holes on the platform should be filled with solder, and the tag of the handrail removed. The handrail needs to be 12mm above the platform, so add two overlength 0.31mm brass wire stanchions through the holes in the platform, with the half-etched side of the latter on top. An easy way to do this is to take a 1/4" balsa block, lay the platform face down on it, drill two no.78 holes through the block using the holes in the platform as a template, insert the stanchions through the holes and solder in place.



Place the handrail over the stanchions, then solder it in place 12mm above the platform. Remove any excess wire with side cutters. As these will not cut exactly flush, a "bolt-head" is naturally left at each cut. Tin the platform tags and the handrail rear.

Now switch to 70°

solder.

Bend in the two tags on the platform so they grip the post, then solder the handrail to the rear of the post so the **platform** is 20mm below the arm bearing centre line. Solder the tags to the post, noting that the nearest platform tread should not be soldered to the post, otherwise the platform will not be level.

Use the minidrill and slitting disc to form a 5mm long channel in the baseplate, perpendicular to the centre line and 23mm 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 7.) If not using the baseplate, solder pieces of scrap wire either side of the post which are long enough to reach the ladder end.

Now switch to 145° solder.

Cut the side stiles from the top end of the ladder, thus leaving a rung as the topmost edge. Cut the ladder to length, so its bottom end fits in the baseplate channel or can be soldered to the fixing wires. Solder the ladder top and bottom, with the half-etched side to the rear.

Add pairs of ladder bracing struts (17). Solder them to the ladder and post, remembering to use 70° solder at the post end. Check their height and number with photographs; one pair halfway up the ladder is common. The ladder end joints should be on the outside of the stiles, and never exactly level with a rung. Remove any excess strut length and tidy up.

### The Balance Weight and Post Fittings:

Use 188° solder for this section, except where stated.



Sweat the two balance weight levers (5a) together. Add weights (6a) 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. Fold the tags back 90° and tin them.

Insert the straightened nickel silver bearing wire, trapping the balance weight arm in the bracket such that the weight is to the left of the post as shown on the heading drawing. Oil the balance weight arm bearing, then solder (145°) the wire at the bracket hole front and rear faces. Remove excess wire and tidy up the joints.

Solder (70°) the bracket tags to the left-hand side of the post as shown in the heading drawing. The height varies between prototypes, so check with photographs, although it is usually within arm's reach of the platform, for greasing purposes. The plate should be slightly in front of the post, to give clearance for the later insertion of the operating wire.

Consider from which direction the signal box operating wire would have approached the signal. Solder a crank (9) to the front of the bracket (8), using a nickel silver wire axle, such that when the bracket is soldered to the front or left-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. Many SR signals had a pulley wheel (10) instead of the crank. [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 left-hand side of the post, so the lowest crank hole is just above the baseplate/ground level, and the bolt-heads are facing outwards and are symmetrical about the post. Use pliers as a heat sink to stop the baseplate/post joint melting.

Add the track circuit plate (13) if needed (not on distant signals). Fill in the horizontal pair of half-etched holes, centre it 52mm (13ft) above the baseplate/ground level, and remember to use 70° solder.

### The Lamp and Post Cap:

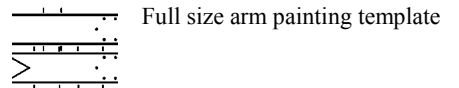
Use 70° solder or glue for this section.

Remove any casting sprue and mould lines from the lamp and post cap. Fix 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. Fix the cap to the post top. This is very near to the post/arm bearing joint, so to avoid a disaster, either use glue, or only solder the right-hand rail.

### Painting:

Degrease the post and arm assemblies by washing in detergent water and leaving to dry. Spray overall with white car primer, mounting the arm in its bearing to avoid painting the spindle and inside of the bearing tube. Detail paint as follows (but check with photographs as there is a lot of prototype variation):

**Black (some parts pale grey from later BR days):** – bottom 24mm of post including crank assembly; lamp and lamp bracket; arm bearing; post cap; arm spectacle plate including V-shape on its reverse; arm rear band/chevron; front chevron on a distant arm.



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.

### Final Assembly:

Ensure the spindle moves freely in its bearing – clean off any paint that might have crept in. Remove any excess bearing and 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 (8) to no.66. Place an oiled paper washer over the spindle end, then place the back blinder on the spindle, 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 (as seen from the rear of the signal), and solder (145° or 188°) it to the bottom of the left-hand half, thus increasing the depth. Once correctly in position, solder (70°) the back blinder to the spindle, taking great care not to unsolder the bearing tube. Wash off any surplus flux, then prime and paint black or pale grey as detailed above.

Blacken a length of the 0.31mm brass 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 rear 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 rear, then pass the bottom

bend through the balance lever hole from the rear, 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.

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