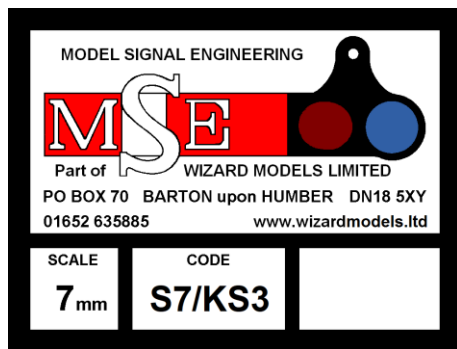




LSWR or LCDR LOWER QUADRANT LATTICE POST SIGNAL KIT

Complete kit to build a working (un-motorised) home or distant signal in any height up to 20'. Some marking out, cutting and shaping of parts is required.

The typical London & South Western or London, Chatham & Dover Railway signal consisted of a lower quadrant arm on a lattice post, with a cruciform finial and round-case lamp, supplied by Stevens & Co. Post-Grouping, the Southern Railway modernised many signals by replacing the arm with the upper quadrant Westinghouse type (kit S7/KS2), but some remained in service almost to the end of steam days.

Parts supplied:

S7/11 arm etc. fret
S7/02 lattice post. ladder & detail fret
S7/02/1 lampman's platform
SC01 lamp casting
SC02 & SC017 finial castings
SC043 balance lever & weights castings
30 x 0.9mm brass rod (arm spindle)
20 x 0.9mm brass rod (balance lever axle)
0.6m x 28swg ladder rung wire (coiled)
100 and 4 off 50 x 0.45mm brass wire (operating wire, arm bolts, stanchions, back blinder)
Red, yellow, green and blue-green glazing
Baseplate

ASSEMBLY INSTRUCTIONS

You will need an adjustable temperature 25-50W soldering iron, 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.

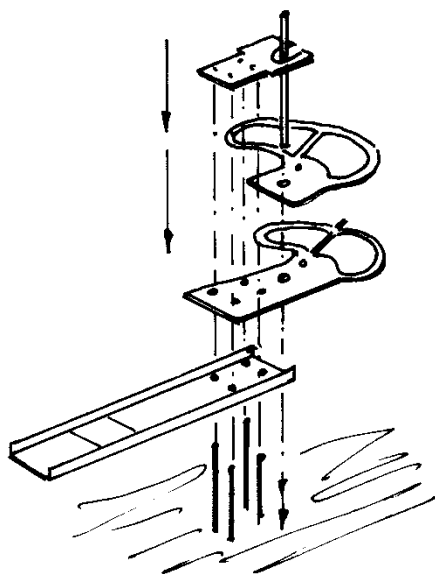
Obtain a balsa wood block to pin the job whilst working; a piece 20cm x 5cm x 1cm should suffice.

The Signal Arm:

Use 188° solder for this section.

Before removing the arm blades from the fret, select the wooden (tapered) or steel (parallel) blade and scribe on the paint lines for the stripes on both the front and rear faces. Use the small marks in the margin of the fret to line up a straight edge and scribe across. If you require a shorter blade, scribe and cut it to length now. If modelling a distant signal after 1910, scribe and notch the end of the blade - the apex of the notch is 11" from the end, on the centre line.

If you have selected the steel blade, fold the half-etched edges over a steel block to get a crisp edge. The folded edges face the rear of the signal.



Open out the square of four holes in the blade, spectacle plates and motion plate to clear the 0.45mm wire. Lay the blade face down on the balsa block. Insert four short lengths of the wire into the four holes in the blade and push them into the balsa block. They will represent bolt heads later, and the next step is made easier if you trim the wires to be different lengths. Tin the area between the wires.

Sparingly tin both sides of the rectangular portion of the larger spectacle plate then drop it onto the blade, threading the four wires through the holes. Solder it to the blade.

Tin both sides of the rectangular portion of the smaller spectacle plate and lay it over its predecessor. Push the longer 0.9mm rod through the spindle hole and into the block, ensuring that the operating rod holes are in

alignment. Solder the plate and spindle in place, ensuring that the spindle is vertical, and the spectacle edges are open to accept the glazing at a later stage.

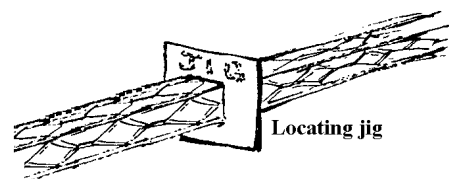
Finally, drop on the motion plate and solder it in place. Remove the arm from the balsa block and shorten the four wires on both sides so they look like bolt heads. File the front of the spindle almost flush with the front face of the arm. Open out the operating rod hole to clear 0.45mm wire.

The Post and its Fittings:

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

The post as supplied will build into a signal 20' tall. For a shorter post, build it to the full height first, and cut it to size afterwards.

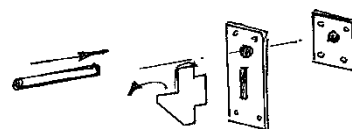
Lightly tin the lattice edges on all four post sides, on both sides of the fret. Cut out the two post halves, but don't bother filing off the remains of the tags - being staggered, they help in locating the post halves when soldering. Use flat-nosed pliers to correct any distortion caused by cutting out. Accurately fold each half-post to 90°, with the half etch being on the **inside**. Use bending bars if you have them. Solder along the inside of the bend to fill the gap as much as possible, although complete coverage is not vital at this stage.



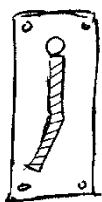
Bring the two half-posts together and slip on the jig on the corner of the platform fret to hold them in place, ensuring the two halves are level. Solder the two long joints along the post, applying light pressure from pliers to help close the gap. When done, remove the jig. Tidy up the joints and file the top and bottom of the post level. Don't worry about any remaining small gaps along the post corners - these can be filled in before painting with 145° or 70° solders, which have better gap-filling properties than 188° solder.

Now is the time to cut the post to length if required, removing material from the bottom of the post, not the top.

If you intend to use the large rectangular baseplate to mount the signal on the layout, first scribe a longitudinal centre line along it. Solder the post around 25mm from one end of the baseplate, ensuring squareness in all planes. Having considered which side of the post the ladder is fixed (normally to the rear), this action defines the front and rear faces of the post.



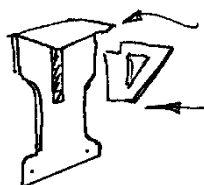
Solder the rectangular bearing plate to the front of the post, so that the spindle hole is 1'6" below the post top. Add the arm stop to its slot as shown, using 145° solder. The front



face of the stop will eventually be twisted to the left to prevent the arm from falling too far.

Push the spindle through the hole and the post, then place the square bearing plate over the spindle at the rear of the post. Using paper washers or metal blackening to

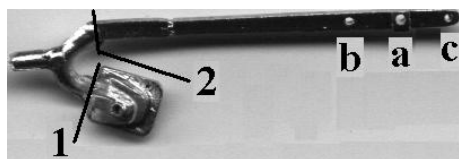
avoid soldering everything up solid, carefully solder (145°) the rear plate to the post, ensuring that the spindle is horizontal and square to the post.



Fold the lamp bracket as shown, with the half-etched line on the **outside** of the bend. Add the triangular support plate as shown. Using Blu-Tak or similar to hold

the arm horizontal and to fix the lamp to the bracket, offer up the bracket to the right-hand side of the post, moving it vertically so the lamp lens falls exactly behind the "on" spectacle aperture. You may need to adjust the position of the lamp on the bracket to achieve this. When satisfied, solder (145°) the bracket to the post and the lamp (70°) to the bracket.

Add your choice of finial (70° solder) to the post top: open bodied (LSWR) or solid bodied (LCDR).



Remove the casting sprue from the balance lever parts by making two cuts with a piercing saw or slitting disc as shown. Tidy up the cuts and any mould lines with files and file flat the rear face of the bracket. Open out axle hole (a) with a 0.9mm drill, then use broaches if necessary to make it a good clearance fit on the 0.9mm brass rod. Treat the holes in the bracket similarly. Open out pull rod hole (b) to 0.5mm, and signal box wire hole (c) to suit your operating wire. Solder (70°) the two weight halves together, then solder the resulting weight to the arm, leaving around 2mm of arm projecting through the weight.

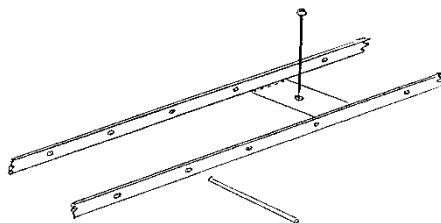
Solder the bracket to the front of the post so that the axle hole is on the vertical centreline and 5'6" below the arm spindle. File the bracket sides flush with the corners of the post. Wrap a piece of paper around the bottom and sides of the lever and place it in the bracket with the weight hanging on the right-hand side of the post. Push the axle through the bracket and lever so it just projects from the rear of the bracket and carefully solder (145°) the axle to the front of the bracket. Remove the paper when finished and cut off the surplus axle.

The Ladder:

Use 188° solder for this section.

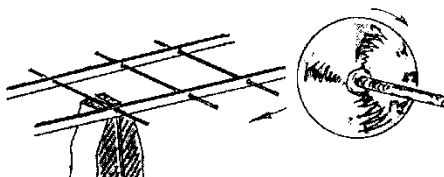
The jig incorporated in the ladder fret helps to keep the ladder aligned whilst the rungs are being soldered in place. Before removing the ladder and jig from the fret, clear the rung holes to suit the 28swg brass wire supplied.

The holes are deliberately etched undersized to prevent failure in production and to give a fine fit to the wire.



Fold up the two side stiles with the half-etched lines on the inside and pin down the whole assembly on the balsa block, using the holes in the five jig spacers.

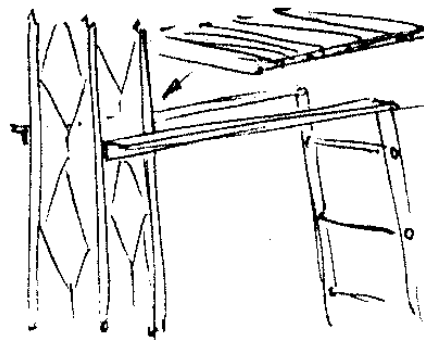
The first rungs to be soldered in should be those adjacent to the jig spacers. Straighten some wire between finger and thumb and insert it through two stile holes. Brush on some liquid flux and apply the smallest amount of solder straight from the iron. Always approach from the edge of the stile furthest from the jig to minimize the possibility of soldering the two together; some solder mask will help here. Once soldered in place, cut off the excess wire, and move to the next pair of holes. Don't cut the rungs to length before soldering in place – a long length of wire is much easier to work with. Once the rungs near the spacers are soldered in, work alternately from the two ends towards the centre, and from the centre towards the ends. Gently push in the stiles as you proceed.



Remove the ladder and jig from the balsa block and tidy up the rung ends using a minidrill and slitting disc. Hold the rungs in pliers as shown to avoid damage. The vibration from the drill is most useful, as it will shake apart any poorly soldered joints! Do not discard the strips in the middle of the jig; these are used in the next section.

The Landing and fixing the Ladder:

Use 145° solder for this section.



Lay the post front face down (assuming the prototype ladder and landing were fixed to the rear) and pin it to the balsa block. Fold the paired angle strips from inside the ladder jig (those without the holes) to give two L-section struts, the half-etched lines being on the inside. Solder the angle together, then solder one strut either side of the post, so the top surface is 3'6"

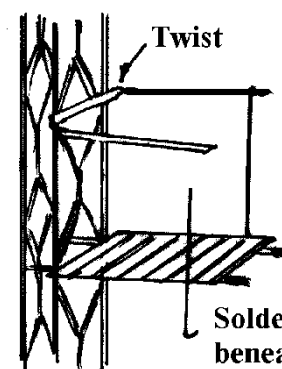
below the arm spindle. Remembering that the post is tapered, ensure the struts are at 90° to the post axis, and not to the balsa block. Also ensure they are parallel when viewed from above.

Open out the holes in the corners of the platform to suit the 0.45mm wire. With the half-etched lines on the top surface, tack the landing fret into position on the post, using the long tags, resting it on top of the previously soldered struts. Ensure that the landing is square to the post axis in both side views, then splay out the struts to follow the diverging lines on the landing and solder it securely in place. The appearance of the landing can be improved by gluing on separate planks from balsa or plasticard strip, bringing the overall thickness up to around 3/4mm.

Mark a line across the baseplate 3'6" from the post base. Place one end of the ladder on this line, and the other with the side stiles outside the two tags on the rear edge of the landing. Solder the ladder in place, then cut off any excess ladder length.

Take two of the strips with holes in the ends from the ladder jig to make ladder bracing struts. Solder them to the post and the outside of the ladder stiles, about halfway up the post. The strut/stile joins should be placed so they do not coincide with a rung. Trim off any excess length.

Make up two landing stanchions from the 0.45mm wire, around 25mm long, with a short "L" turned on the bottom of each one. Insert them into the platform holes from below, and solder in place, again from below, aligning them by eye. Twist the handrail at the corners as shown, drop it onto the stanchions and solder it in place, 2'6" above the platform. Note that some handrails had curled ends, blacksmith fashion, whilst others were a complete rectangular hoop. Finally, trim off any excess wire and tidy up.



Solder stanchions beneath treads

Painting:

Degrease the post and arm assemblies - wash in detergent water and leave to dry. Oil the balance lever bearing, then spray both the post and arm assemblies 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): – bottom 4' of post; ladder (although the bottom 4' was often white) and bracing struts; complete balance lever assembly; complete platform assembly; lamp and lamp bracket; arm spectacle plate; blade rear band or

chevron; front chevron on a yellow distant arm.

Red or Yellow: front and edges of the blade except the home's white band or distant's black chevron. If the primer has filled your scribed guide lines, here is a sketch for marking out again:

+11" + 9 1/2" +



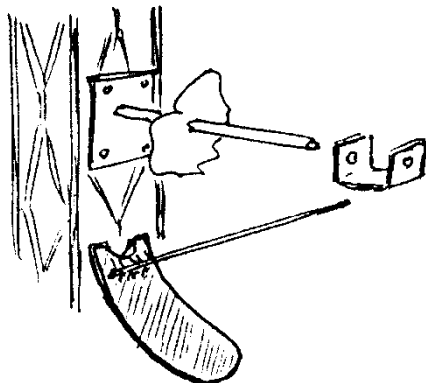
Before 1910, home and distant arms were painted identically. Between 1910 and the 1920s, both were red, but the distant arm had a white chevron rather than a band. After this, the yellow arm and black chevron became standard.

Silver: lamp lenses front and rear.

Glaze the spectacles; use red (home) or yellow (distant) in the top aperture, and blue-green or green in the bottom one. The easiest method is to cut a rectangle approximately to size, so the whole of the aperture is covered, place it between the spectacle frames, fix it in place using 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:

Use 145° solder for this section.



Ensure the spindle moves freely in its bearings – clean off any paint that might have crept in. Push a paper washer on the spindle end tight up to the post bearing. Fold up the small 'U' shaped shackle and run it over the axle oriented as shown above, so that it is also tight up to the bearing. Ensuring that the arm moves freely and clears the front of the lamp, solder the shackle in place. Solder a piece of 0.45mm wire to the back blinder and fix this to the inverted shackle. The cut-out in the back blinder should just clear the lamp back light when the arm is horizontal. If satisfactory, tear off the paper washer and trim off the excess spindle and wire. Wash off any surplus flux, then prime and paint black or pale grey as detailed above.

The Operating Wire:

Make a small hook in the top of the long 0.45mm wire. Measure the distance between the arm hole (arm horizontal) and the right-

hand lever hole (lever around 30° below the horizontal). With the short end of the hook facing you, bend the bottom of the wire 90° to the front at the measured distance, then trim the bent portion to 5mm 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. You may need to joggle the wire to give clearance for it to pass behind the spectacle plate. Prime the wire and paint it black, or to avoid the risk of gumming up the works with paint, use a permanent marker pen instead.

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

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