MODEL SIGNAL ENGINEERING
Part of WIZARD MODELS LIMITED
PO BOX 70 BARTON upon HUMBER DN18 5XY
01652 635885 www.wizardmodels.ltd

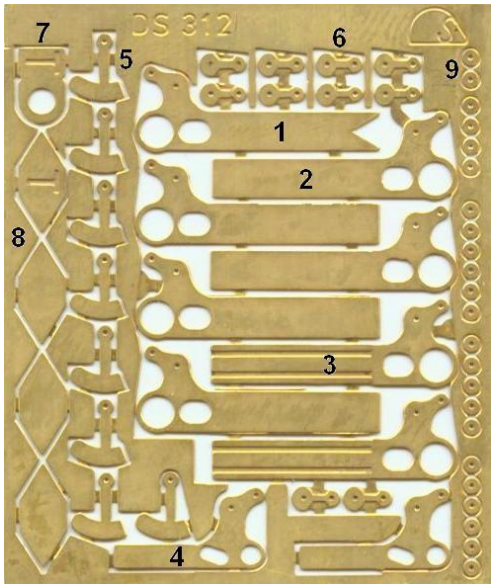
SCALE	CODE	
7mm	S012/2	

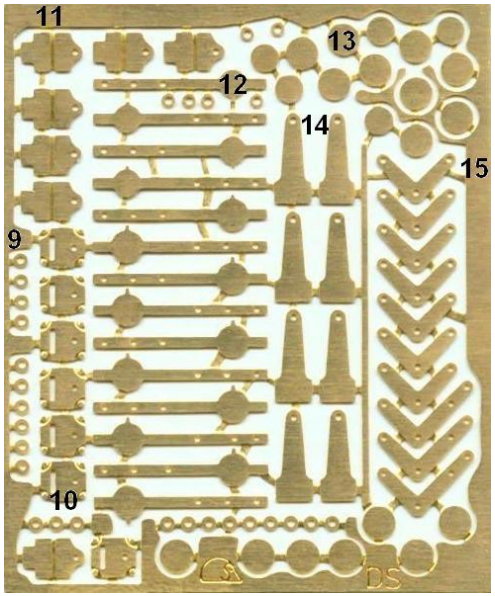
UPPER QUADRANT SIGNAL PARTS

Moving parts for home, distant & shunting signals

This is not a complete kit. For a complete signal you will need a post, lamp, finial and ladder.

The LMS, LNER and SR introduced upper quadrant signal arms in the late 1920s. At first, the arms were of the corrugated steel pattern, but this changed around 1936 to the plain type. These signal arms were used for all new installations, and also gradually replaced the lower quadrant arms on signals inherited from the relevant pre-Group companies (a process that is still not complete!). BR adopted the design, and new semaphore signals are still being installed today, where replacement by colour lights is inappropriate. All three companies began by installing the arms on wooden (*S06, S017, S028*) and lattice steel (*S7/02, S7/02/2, S022, S7/41, S7/42*) posts and dolls. Concrete posts were also used, particularly on the LNER. In the 1930s, the LMS and LNER switched to tubular steel posts (*T18, T532*), whilst the SR began making posts from bolted lengths of scrap rail (*S032*). BR continued these designs.





Identification and quantity of components on frets:

1. Plain distant arm (1)
2. Plain home arms (5)
3. Corrugated home arms (2)
4. Plain miniature arms (2)
5. Back-blinders (8)
6. Operating wire lugs (10)
7. Rule 55 fireman's call plunger plate (1)
8. Rule 55 track circuit diamonds (4)
9. Washers (51)
10. Balance lever bracket backplates (7)
11. Balance lever bracket jaws (7)
12. Balance levers (7 in two sizes)
13. Balance weights (21 in two sizes)
14. Crank brackets (8)
15. Cranks (10 in two sizes)

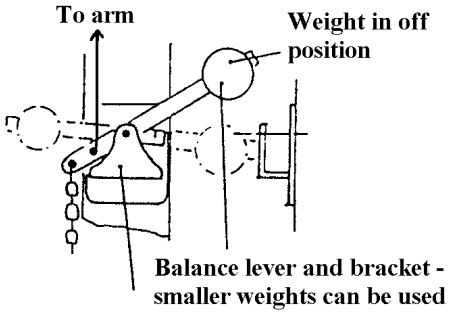
ASSEMBLY

Arms

Open out the spindle holes in the arm (1, 2, 3 or 4) and operating wire lug (6) to 1.00mm (no.61). For the earlier corrugated pattern of arm, solder two pieces of 0.45mm brass wire onto the rear face at the same distances from the top and bottom edges as the etched front corrugations.

Drill a 1.00mm hole through a wooden block, and insert a 3cm length of 1.0mm brass spindle so around 2mm is projecting. Drop the arm on face up, followed by the operating wire lug. Align the two operating wire holes using a steel needle or anything else that won't take solder. Sweat together the arm and operating wire lug. Remove the excess front spindle and file it almost flush with the arm. Leave the excess rear material for now as a painting handle. Joggle the operating wire arm back around 1mm so the operating wire will clear the spectacle plate.

Balance levers



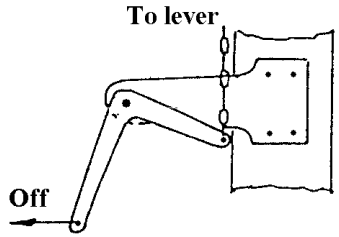
Balance lever and bracket - smaller weights can be used to simulate slotting mechanisms

Sweat two balance levers (12) together, ensuring they are of the same size. Add weights (13) either side to increase the thickness as desired (leave the half-etched tab on one side of the weight to represent the fixing bolt). Fold up a bracket jaw (11), with the half-etched line on the **inside** of the bend. Solder the jaw's tab into the slot on the backplate, using a 0.9mm wire axle for alignment.

Working from photographs, solder the bracket to the appropriate side of the signal post or doll. For straight posts, the bearing hole is typically 28mm (4ft) above the baseplate/ground level, unless the signal is in a public area, when it should be 28mm (4ft) below the arm centre line.

Using the bracket bearing holes as a guide, drill no.65 (0.90mm) right through the post/doll. Insert a 0.9mm wire axle through the hole in a washer (9) and solder it in place. Pass the axle through the bracket holes, trapping the balance weight arm in the bracket such that the weight is positioned correctly according to your photographs. Any slop may be removed by adding washers inside the jaw. Oil the balance weight arm bearing, then solder the wire at the rear face of the post. Remove excess wire and tidy up the joints.

Cranks



Crank fitted at base of post to change motion from horizontal to vertical

Consider from which direction the signal box operating wire would have approached the signal. Solder a crank (15) to the front of a bracket (14), using a 0.9mm wire axle, such that when the bracket is soldered to 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 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 (as it will on bracket signal dolls). In this case, solder a washer to the axle, pass it through the crank and bracket, and then fix it at the rear of the bracket. Multiple cranks on the same bracket should be spaced away from each other with washers. Finally, solder the bracket to the post, so the lowest crank hole is just above the baseplate/ground level, and the rectangular

section of the bracket is symmetrical about the post.

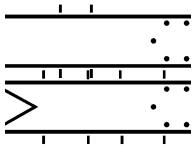
Rule 55 symbols

Add the appropriate symbol (7 or 8) to the post, centring it 91mm (13ft) above the baseplate/ground level. The "T" indicates that a telephone is provided – if you have not modelled this, then fill in the half-etching.

PAINTING

Degrease by washing in hot water and leaving to dry. Spray overall with white car primer and detail paint as follows (checking photographs as there is a lot of variation):

Arms



Full size arm painting template

Front face and edges of the blade are red (stop signals) or yellow (distant signals), with a white stripe (stop) or black chevron (distant). Rear face is white, with a black stripe or chevron. For the miniature arm, the white stripe is 2.6mm wide, and is 3.5mm from the arm end. The spectacle plate is usually black, but grey and white are also common.

Glaze the spectacles with MSE's *LENS* material; 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 *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. Use green if you are illuminating the signal with a white LED.

Balance levers and cranks

Usually black, with grey becoming more common in recent years. The Southern Region always used grey. Often the balance lever and weight are painted white for better visibility, especially on walking routes.

Rule 55 symbols

Painted white, with a 7mm deep black or grey band above and below on the post. Fill in the "T" with black paint.

FINISHING OFF

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 protruding through the bearing to solder on the back-blinder (5). Carefully open out the hole in the back-blinder so it is a tight fit on the spindle – no more than no.60 (1.00mm) is suggested. Place an oiled paper washer over the spindle end, and drop on the back-blinder. 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. Once correctly in position, solder the back blinder to the spindle. Wash off any surplus flux, then prime and paint black or grey as chosen above.

The Operating Wire:

Blacken a length of 0.45mm 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 inner balance 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 right at the measured distance. Put the hook in the arm hole so the wire is to the rear, and then the bottom bend through the balance lever hole from the left-hand side, forming a hook to retain it. The wire can pass either face of the track circuit plate - both are found on the prototype.