MECHANICAL BRANCH MODELS

GENERAL INSTRUCTIONS

FOR

Assembly and Finishing

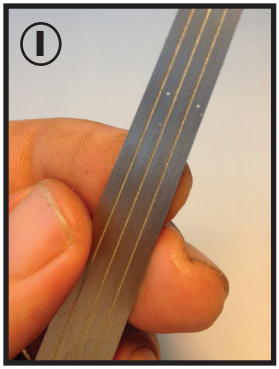
26' TIMBER POST LOWER-QUADRANT SIGNAL KIT

FROM 26th NOVEMBER, 2016
(And Until Further Notice)

Mechanical Branch Models takes pride in the accuracy of its models. However, sometimes compromises have to be made to enable assembly. Parts are as thin as possible which means they are easily distorted and damaged. Always exercise care when handling and assembling parts.

It is recommended that soldering be used for assembly, unless otherwise noted. Drill holes prior to removing parts from the fret.

Remove etched parts from the fret only as they are required so that they can first be identified.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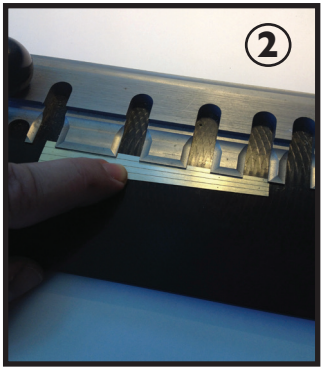
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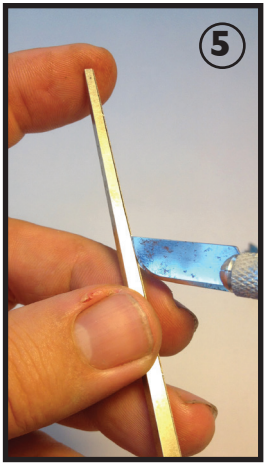
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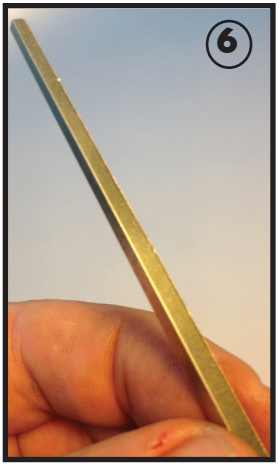
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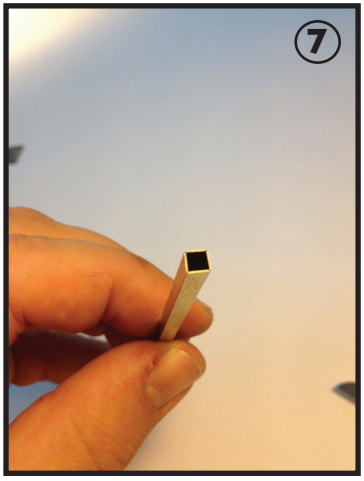
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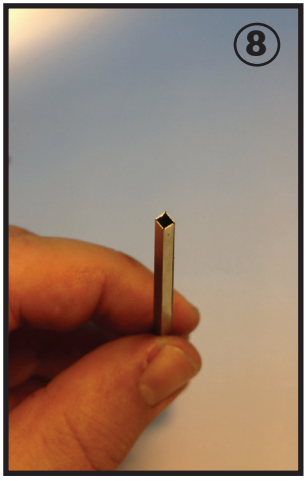
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List of parts

a Flat pulley wheel
b Pivoting pulley wheel bracket
c Back spectacle
d Flat pulley wheel base
e Lamp bracket
f Pivoting pulley wheel
g Counterweight bracket
h Counterweight
j Landing
k Signal arm bracket
m Ladder stiles x 2
n Signal post, 26'
p Counterweight lever
q Signal arm
r Signal base
s Arm boss and spectacle
0.07mm wire
0.18mm wire
0.32mm, 0.44mm wire
1.0mm OD, 0.55mm ID brass tube
Cast brass signal lamp
Cast brass finial
Red and blue/green gel sheet

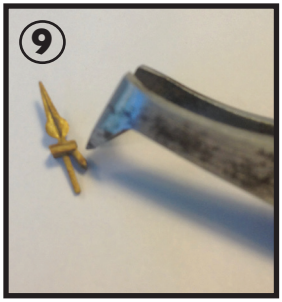
General guidelines

Solder assembly is recommended. Excellent results can be obtained with a 140 degree tin/lead solder and a solution of 10% Phosphoric acid as a flux. Carr's Green label flux can be used as an alternative. Clean as you go and remove all flux residue by washing in CLR or soapy water to prevent corrosion. A fibreglass brush is recommended for polishing. Side or end-cutters are recommended for removing parts from the fret. File any residual material off until the edge is flush and smooth.

Instructions

Step 1. Figure 1. Remove the signal post etch from the fret. Drill out the holes as marked with a number 80 drill (0.35mm). Take note of the small triangle on the frame which indicates the front face of the post.

Step 2. Figures 2-6. Fold up the etch carefully using a Hold-And-Fold or similar device to hold the part securely while folding the etch along the half-etched fold lines. The half-etched fold lines should be on the inside of the post when folded.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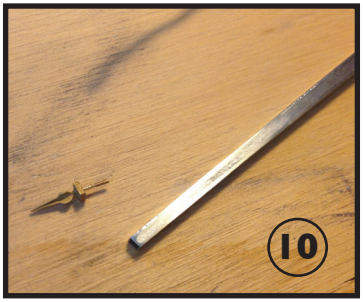
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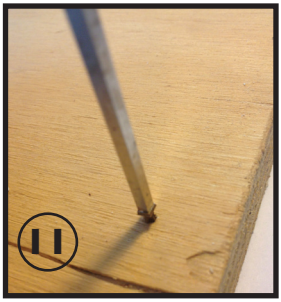
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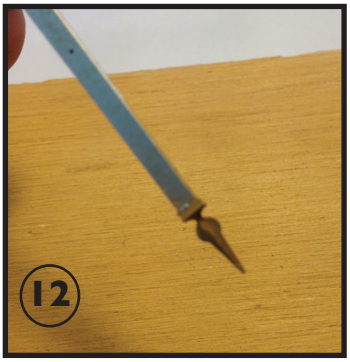
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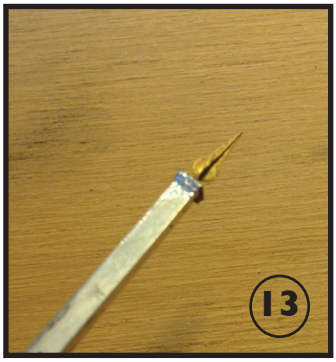
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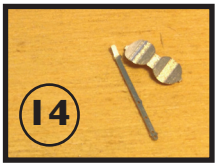
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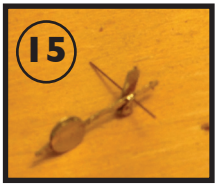
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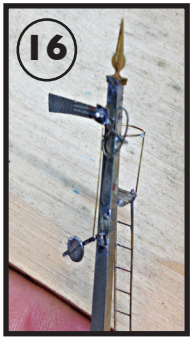
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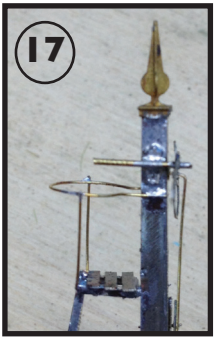
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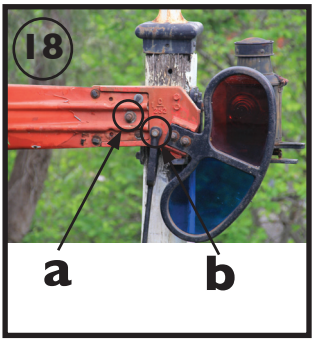
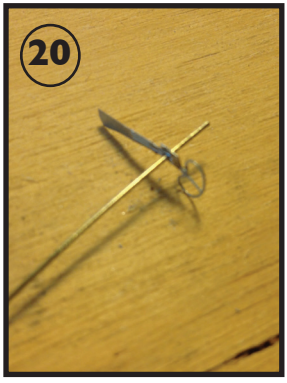

18
a
b


19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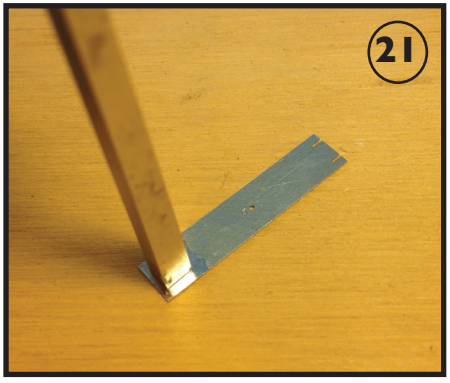
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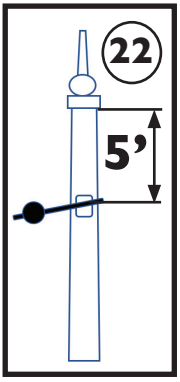

22
5’

Step 3: Figures 7-8. Before soldering, check that each end of the post appears square and even as shown. Run a fillet of solder along the corner of the post where the two edges of the etched-part meet.

Run over the post with a file or emery paper to remove burrs and to smooth out the solder at the joint. Rinse off any residual flux and filings.

Step 4: Figures 9-13. Remove the sprue from the finial casting. Attach the finial casting by running a bead of solder between the casting and the top of the post. The method shown is to put the finial upside-down in a 2mm hole to hold it while soldering.

Step 5: Drill out the holes in the Counterweight Bracket (g) with a number 80 drill (0.35mm). Remove from the fret and fold up.

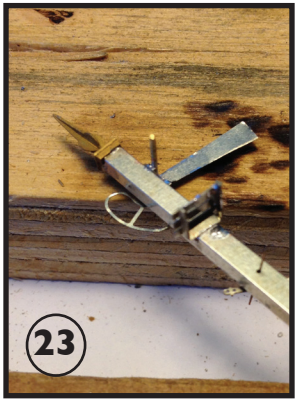
Step 6: Figure 15. Fit the Counterweight (h) to the Counterweight Lever (p) and drill out the 0.35mm holes in the Counterweight Lever

Step 7: Insert a length of 0.30mm brass wire through the bracket, lever and bracket. Solder in place. If you want the signal to operate, a piece of paper can be used as a shim to prevent solder flowing along the wire and thereby fixing the counterweight arm in place. Trim off excess wire and solder the assembly to the front of the post (Figures 16, 22).

Step 8: Figures 17, 38. Attach the signal arm bracket to the side of the post.

Step 9: Figures 18, 19 and 20. Assemble the signal arm by soldering the Arm to the Arm Boss. Clear out hole A with a 0.35mm (#80) drill. Drill out hole B to 0.46mm (#77).

Insert a length of 0.44mm wire into hole B and solder in place. Trim the wire to about 10mm long on the back face of the signal arm, and flush with the front face.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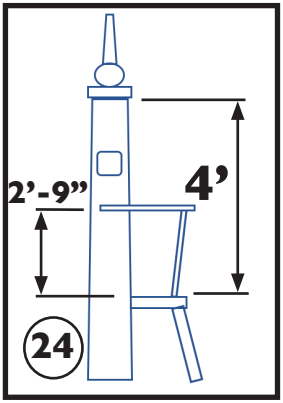
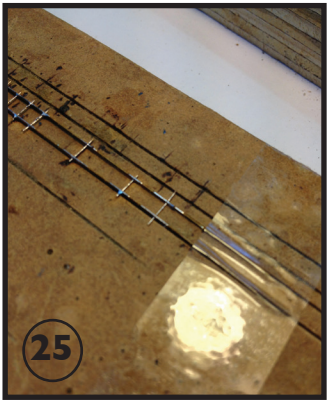

2'-9"
4'
24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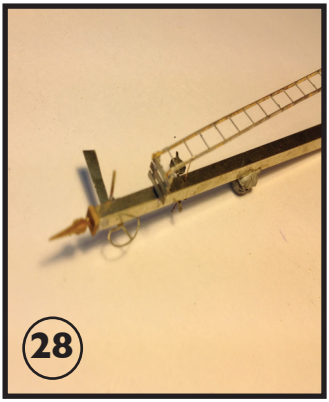
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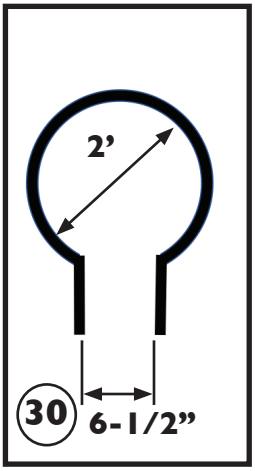
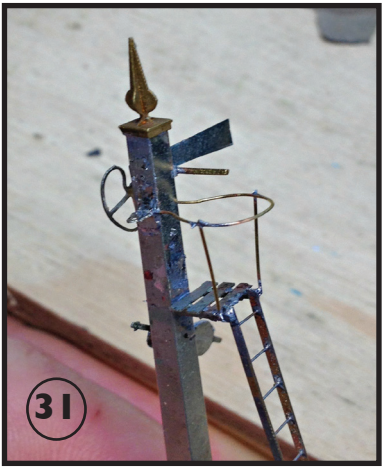

2'
30
6-1/2"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Step 10: Figure 21. Attach the base to the bottom of the post. Keep the 0.20mm hole in the base, adjacent to the corner of the post, clear of solder.

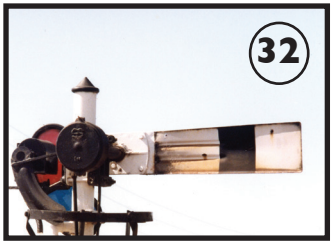
Step 11: Figures 23, 24. Fold up the landing. Attach as shown in Figure 24. Ensure the landing is square to the post.

Step 12: Figures 25-27. Fabricate the ladder. Assembling the ladder can be very fiddly and to achieve a straight and even result, it is recommended to use some simple assembly jigs. As shown in the figures, I use a small length of 12mm MDF with shallow parallel grooves cut into it with a razor saw. These grooves are 12" (3.5mm) apart as per the distance between the stiles of a standard signal ladder. Tape down the ends of the ladder stiles and pass some 0.18mm brass wire through opposing holes, at the top and bottom ends of the ladder and one or two at the middle. Check that the rungs are square to the stiles before adding the remaining rungs. Overheating the brass will cause distortion.

Ensure that the solder joints are sound before trimming the excess wire either side of the stiles. Carefully file the stiles to remove excess wire and solder.

Step 13: Figure 29. Position the ladder between the landing and base. Ensure the stiles of the ladder abut the frame of the landing at the top end and fit in the grooves in the base at the other. Solder in place. Trim the ladder to length.

Step 14: Using 0.18mm wire, form the safety railing to 2' (7mm) diameter as shown in Figure 30. Solder to the post. Add two short lengths between the railing and the top of the ladder stiles, as shown in Figure 31.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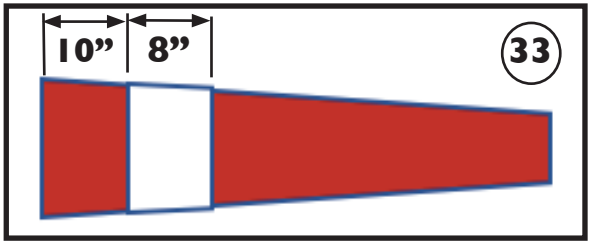
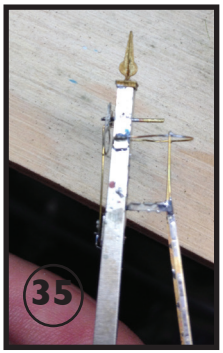

10”
8”
33


34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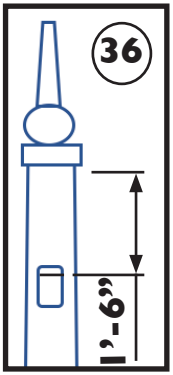
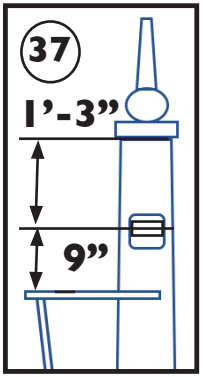

36
1’-6”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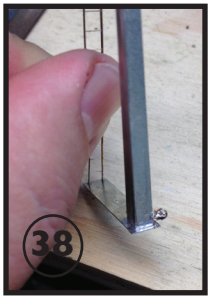
1’-3”
9”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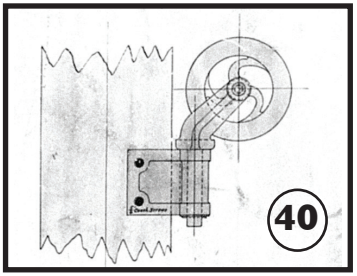
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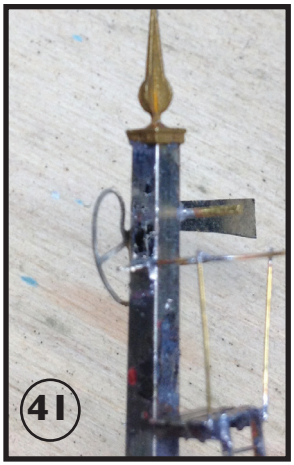
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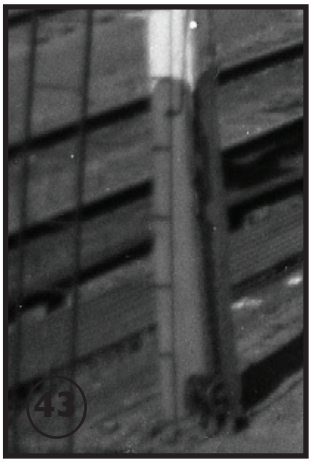
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Step 15: Figures 32, 33. Carefully remove the signal arm. Paint the signal arm face red and the spectacle black. The white bar on the front is backed by an identically-sized black bar on the back face of the arm. Use of masking tape 2.1mm wide will help ensure crisp, clean edges.

Assembly is simpler if the arm and counterweight are fixed in place; however it is also possible to assemble in such a way that the arm can move to replicate the two positions of the prototype.

Steps 16 and 17 apply if a movable signal arm is required:

Step 16: Solder a 2.75 mm length of 1.0mm OD/0.55mm ID brass tube to the arm bracket. This should align with the horizontal groove in the bracket. Through this tube, the 0.44mm signal spindle will pass allowing it to pivot.

Step 17: Fit the signal arm to the post by inserting the spindle into the tube. Do not solder.

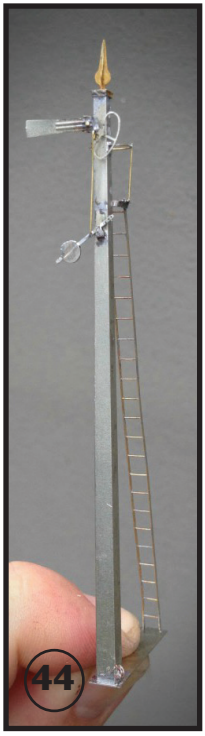
Step 18 applies if a fixed signal arm is required:

Step 18: Solder the 0.44mm signal arm spindle to the arm bracket The Spindle should aligned with the horizontal groove in the bracket.

Step 19: Figure 48. Attach the Lamp Bracket to the post. Don't attach the lamp at this stage to simplify painting later.

Step 20: Figures 34, 35. Using 0.32mm brass wire, form up the downrod to connect the arm boss to the counterweight arm. The counterweight arm should be just below the horizontal when the signal arm is at horizontal (ie at the "Stop" position). The rod should be approximately 4'-6" long, although there was a lot of variation in the position of the counterweight - sometimes further down the post, sometimes on the side of the post.

Step 21: Figures 36-38. A choice of pulley wheel is available. Form up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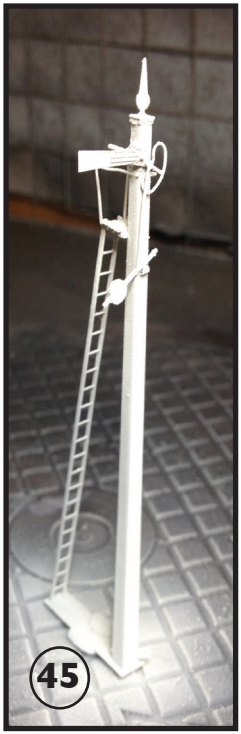
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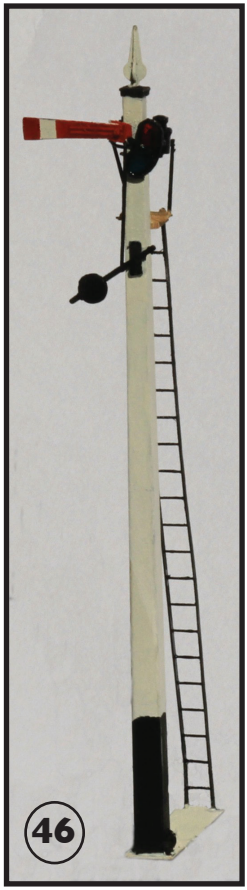
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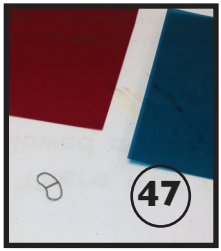
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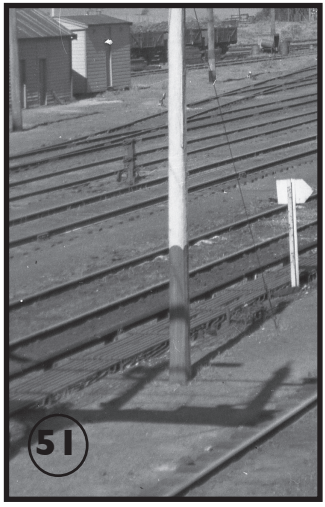
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the pulley wheel and bracket and solder. Attach to the bottom of the post. Attach the fine wire (0.07mm) between the pulley and the end of the counterweight arm to represent the signal cable.

Painting

Before painting, it is recommended that the signal be thoroughly and carefully washed to remove all flux and oil, before being primed. The assembly should then be primed.

Figure 46. The post is white, as is the top of the finial. The ladder and finial base should be painted matt black, as is the lower 20mm of the post (see Figures 50, 51). Sometimes the entire finial was black.

Figures 47, 48. The next step is to apply the signal glass. The blue/green is on the bottom spectacle and red on the top. This is a delicate operation to ensure the "glass" is within the margins of the spectacle etch, and that cement is applied sparingly to keep the "glass" as clear as possible.

For gluing the signal glass in place, "GS Hypo" cement or "Formula 560 Canopy Cement" manufactured by Pacer, are recommended. PVA is not as strong but can be used as a last resort. Cyanoacrylate adhesives are not recommended as they will tend to "fog" the gel. Carefully apply the cement with a toothpick to the back of the frame and place it on the gel sheet. Once dry, carefully trim off the excess gel and glue the assembly, using the same cement, on to the spectacle frame on the signal arm.

Figure 49. Refit the signal arm assembly. Fit the back-spectacle into place and solder or superglue. Trim the excess wire flush with the back-spec. Paint the back spec black.

A hole is provided in the base plate as a means of attaching the completed signal to the baseboard.