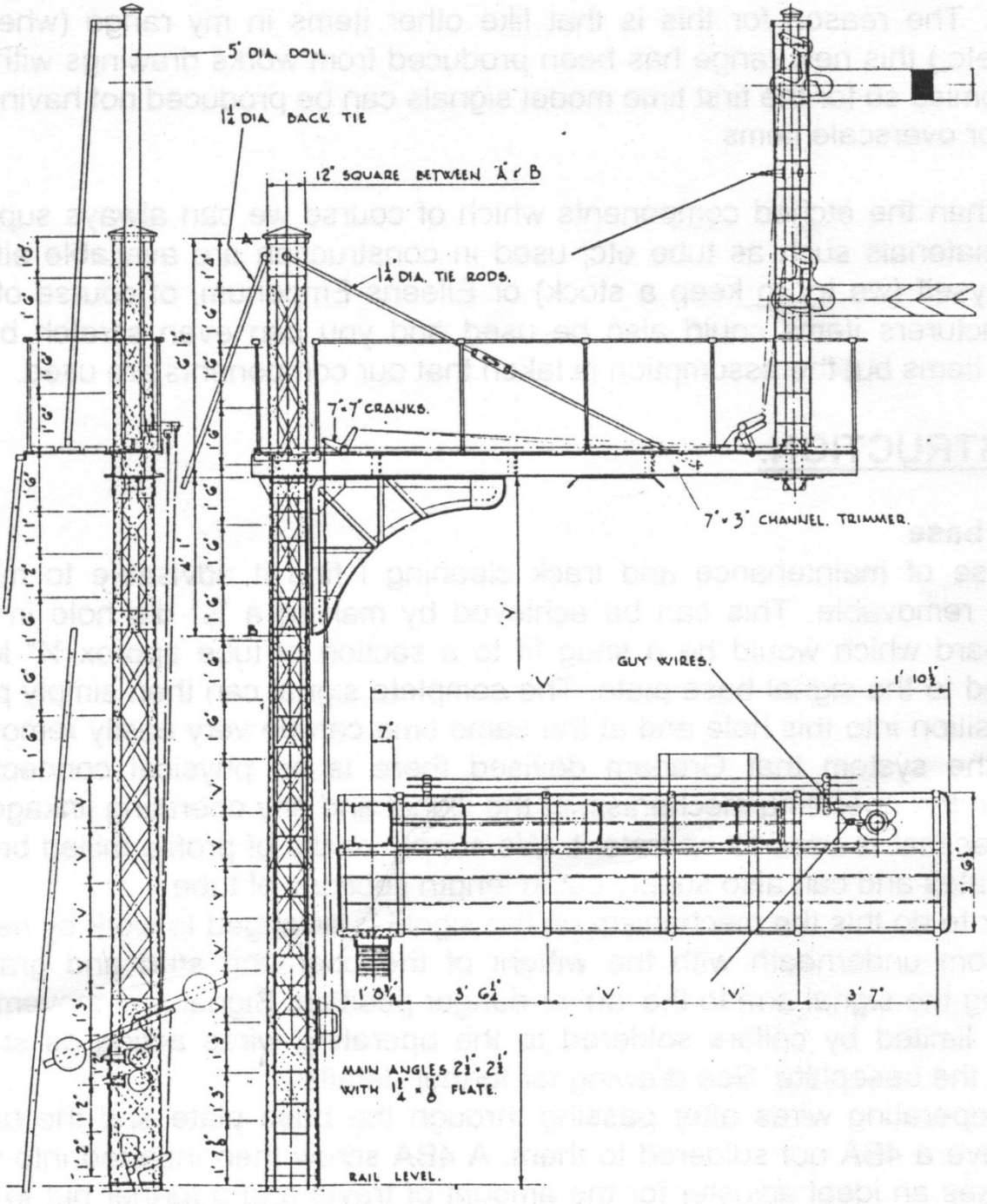
# SIMPLE 4mm SCALE SIGNAL CONSTRUCTION

## Using the new etched, milled and cast components in the Alan Gibson range.

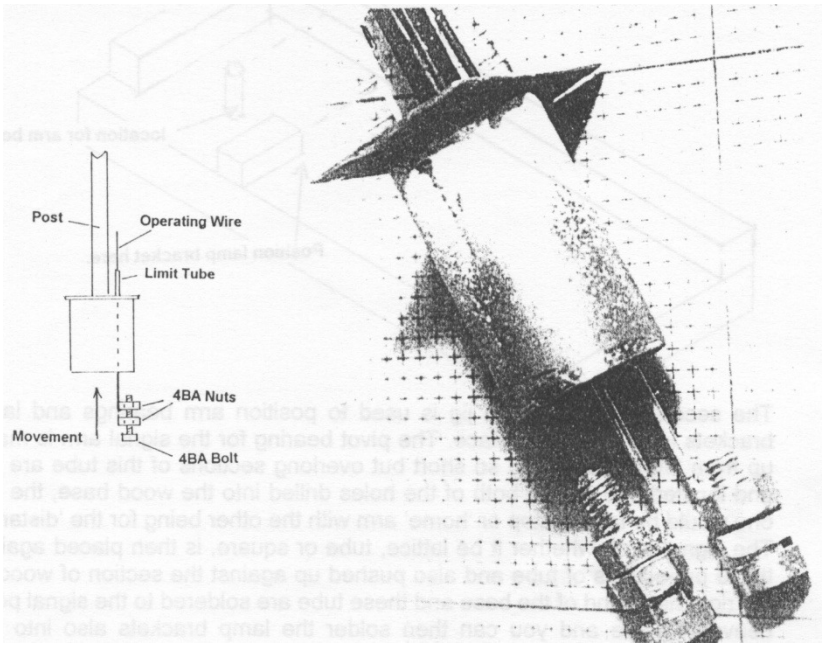


This booklet is put together purely to explain how we have constructed signals using our range of signal components which in themselves were produced at the behest of Graham Warburton — Signalling Guru of the LMS Society to whom our grateful thanks are extended.
The initial range of components quite naturally are biased towards the LMS but these lead into BR with a hint of LNWR, LNER and SR thrown in for good measure with many of the items creeping into use on the Taunton Model Railway Groups 4mm scale layout of Bath Green Park Station, no need to be told that Graham is a leading light in that group.
These words are not meant to be the be all of signal construction in themselves as each of us has our own way that we will always do things, however already we are being asked to put in print basic instructions for signal assembly. Already a few close friends have pointed out that several of the quoted measurements in this booklet differ from those published by other people. The reason for this is that like other items in my range (wheels, loco's etc;) this range has been produced from works drawings with no compromise so for the first time model signals can be produced not having to allow for overscale items.
Other than the etched components which of course we can always supply, other materials such as tube etc, used in construction are available either from ourselves (we try to keep a stock) or Eileens Emporium, of course other manufacturers items could also be used and you can even scratch build certain items but the assumption is taken that our components are used.

**CONSTRUCTION.**

**Signal base.**

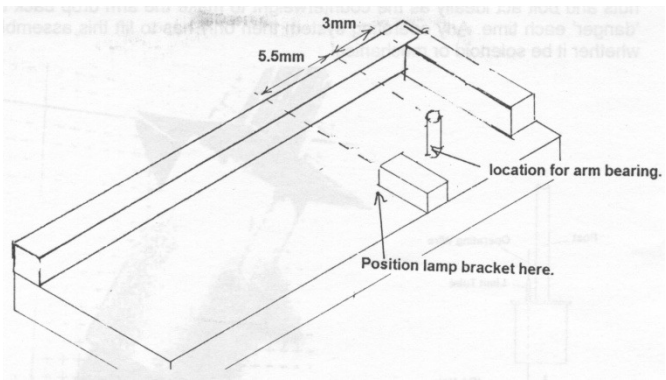
For ease of maintenance and track cleaning we find it advisable to make signals removable. This can be achieved by making a 1/2 dia hole in the baseboard which would be a snug fit to a section of tube approx 1/2" long soldered to the signal base plate. The complete signal can then simply plug into position into this hole and at the same time can be very easily removed as in the system that Graham devised there is no physical connection between the operating mechanism of the signal and any operating linkage or whatever that is used to operate it. We supply packs of profile milled brass base plates and can also supply cut to length sections of tube.
In order to do this the mechanism on the signal is arranged to work by being lifted from underneath with the weight of the operating stud and gravity returning the signal arm to the 'on' or danger position. Signal arm movement can be limited by collars soldered to the operating wires acting as stops against the baseplate. See drawings for further details.
These operating wires after passing through the base plate and the base tube have a 4BA nut soldered to them. A 4BA screw then inserted into this nut makes an ideal adjuster for the amount of travel and a further nut to act as a locknut will hold everything in the correct position. The weight of these nuts and bolt act ideally as the counterweight to make the arm drop back to 'danger' each time. Any operating system then only has to lift this assembly whether it be solenoid or mechanical.




**Signal post jigs.**

Firstly to ease construction a couple of simple jigs are required. These are ideally made up on a scrap section of MDF with the smaller sections being in say 1/8" (3mm) square, this can be obtained from your local DIY store. Glue a section across the right hand end of the MDF, this is used as an end stop for the top of the signal post. Then drill a 3/64" (1.2mm) hole 3mm away from this with a further hole 24mm away from this. Place short lengths of 3/64" dia brass tubing into these two holes and place a length of timber or whatever against these two spindles and glue two short lengths of wood at right angles with their furthest edge 5.5mm away from each tube. Remove the length of timber and glue this at the back edge of the section of MDF and allow the glue to dry.

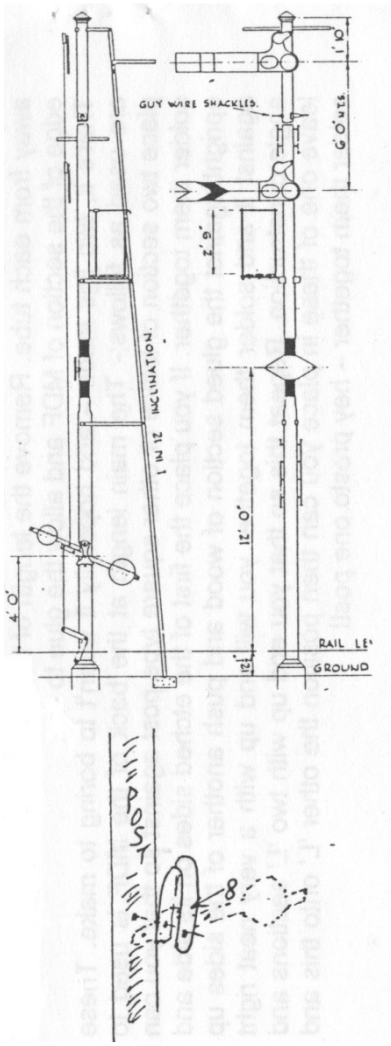
That's it, two jigs made. These are used as follows;- The main length at the back of the MDF is used to place two section of lattice or other square type post against so that you can solder them together. If you place the first of the etched sides on its side and upright against the glued section of wood and push another of the sides up against it and solder them together you will end up with a very neat right angle construction. Repeat this so that you end up with two 'L' sections and leave one of these in place you can then position the other 'L' onto this and solder them together and you'll have one post!

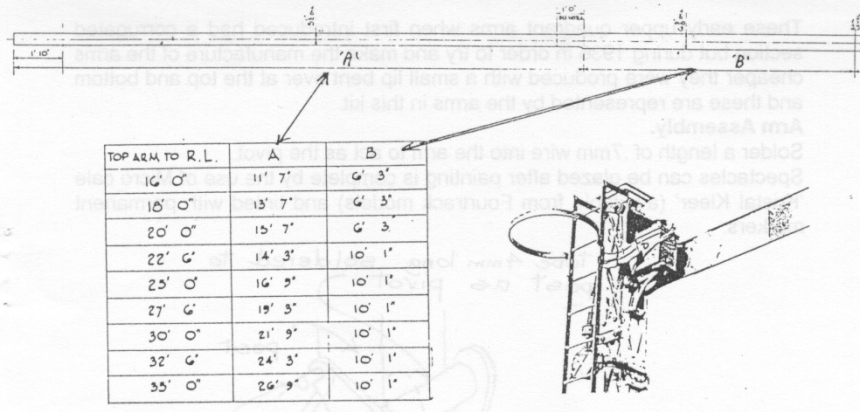


The second section of the jig is used to position arm bearings and lamp brackets into the correct place. The pivot bearing for the signal arm is made up from 3/64” brass tube so short but overlong sections of this tube are cut and located into one or both of the holes drilled into the wood base, the top one would be for the stop or ‘home’ arm with the other being for the ‘distant’. The signal post, whether it be lattice, tube or square, is then placed against these projections of tube and also pushed up against the section of wood at the right hand end of the base and these tube are soldered to the signal post. Leave in place and you can then solder the lamp brackets also into the correct position. Lift the assembly carefully off the jig and cut and file the lengths of pivot tube down so that they just protrude from each side of the post. For any cutting I recommend the use of a slitting disc in a mini drill of whatever make.

**Tubular posts.**

In the prototype tubular posts consisted of two lengths of tubular steel - the larger one being towards the bottom of the post for stability reasons and these can be represented by telescopic lengths of brass tubing of 2mm and 2.5mm dia. Lengths for these tube and other relevant dimensions are shown in the attached drawing. Bracket dolls can obviously be made from just single lengths of the 2mm dia tube.

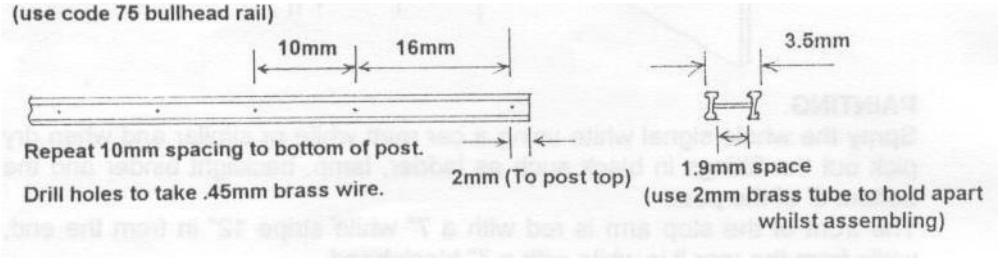





| TOP ARM TO R.L. | A | B |
|---|---|---|
| 16' 0" | 11' 7" | 6' 3" |
| 18' 0" | 13' 7" | 6' 3" |
| 20' 0" | 15' 7" | 6' 3" |
| 22' 6" | 14' 3" | 10' 1" |
| 25' 0" | 16' 9" | 10' 1" |
| 27' 6" | 19' 3" | 10' 1" |
| 30' 0" | 21' 9" | 10' 1" |
| 32' 6" | 24' 3" | 10' 1" |
| 35' 0" | 26' 9" | 10' 1" |

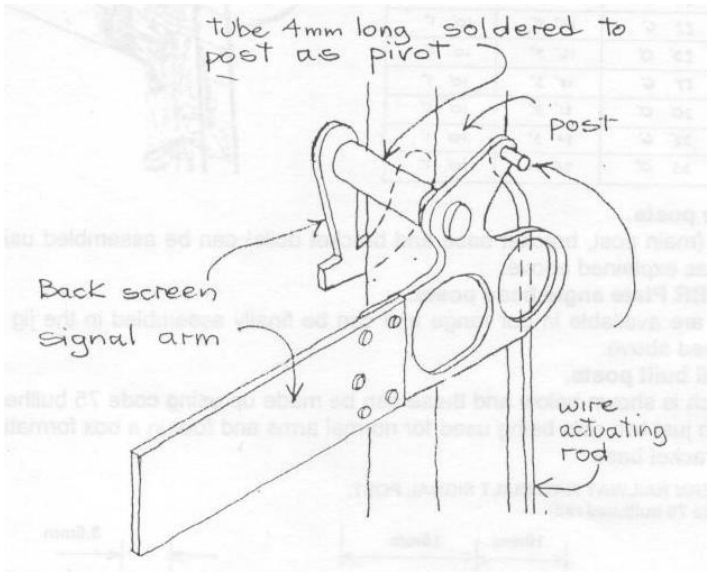
**Lattice posts.**
These (main post, bracket base and bracket dolls) can be assembled using the jig as explained above.
**LNER/BR Plate angle base posts.**
These are available in our range and can be finally assembled in the jig as explained above.
**SR Rail built posts**.
A sketch is shown below and these can be made up using code 75 bullhead rail with just two rails being used for normal arms and four in a box formation as a bracket base

**SOUTHERN RAILWAY RAIL BUILT SIGNAL POST.**

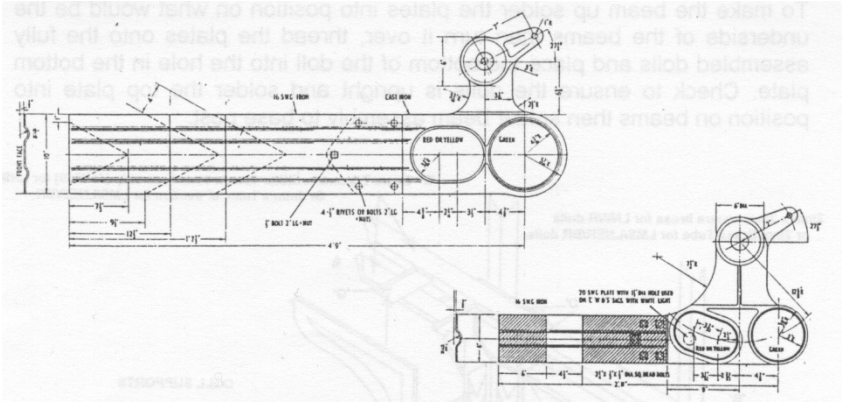



**Signal Arms.**
After the grouping of the big four railway companies in 1923 and as a move towards standardisation it was agreed to use tubular steel for signal posts together with enamelled metal upper quadrant arms over the whole of the railway network in the United Kingdom for all new signalling systems and for renewal of lower quadrant types.
This was never quite achieved even during B.R. days as the ex G.W.R. system whilst modifying their arms to enamelled steel retained the use of lower quadrant arms in most instances.
These early upper quadrant arms when first introduced had a corrugated section but during 1936 in order to try and make the manufacture of the arms cheaper they were produced with a small lip bent over at the top and bottom and these are represented by the arms in this kit.

**Arm Assembly.**
Solder a length of .7mm wire into the arm to act as the pivot.
Spectacles can be glazed after painting is complete by the use of Micro cale Kristal Kleer' (available from Fourtrack models) and tinted with permanent markers.

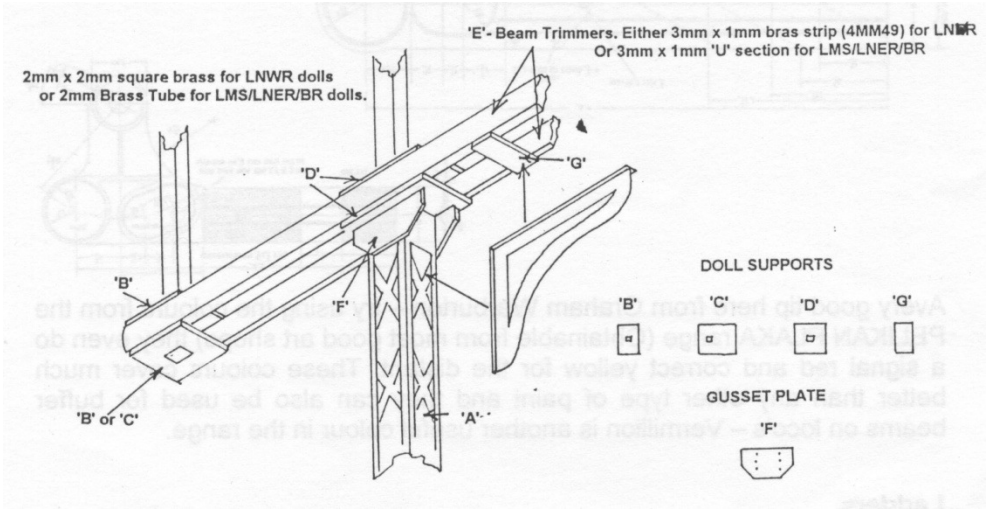



**PAINTING.**
Spray the whole signal white using a car mall white or similar and when dry pick out the fittings in black such as ladder, lamp, backlight binder and the bottom 6' of the post.
The front of the stop arm is red with a 7" white stripe 12" in from the end, while from the rear it is white with a 7" black band.
The front of the distant arm is yellow with a 4" black chevron set back 9" from the end and is white with again a black chevron on the reverse. These colours finish at the end of the arm with the spectacle plate being black.
Miniature arms were painted red with a vertical 4½" band 6" in from the end. The same size arm was used for Shunt ahead and calling on and these were coloured with a 3" wide horizontal white centre band edged with 1½" horizontal red bands with the reverse white with respective black bands. See the drawings below for these details. To help with the marking out of the arms we can supply a small profile milled jig so that you can scratch these markings onto the arm.

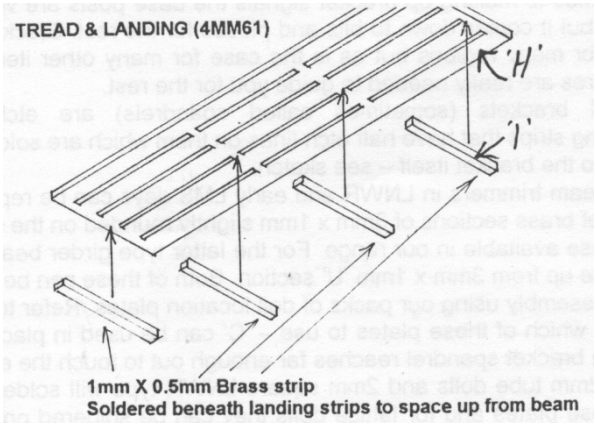


A very good tip here from Graham Warburton — try using the colours from the PELIKAN PLAKA range (Obtainable from most good art shops) they even do a signal red and correct yellow for the distant. These colours cover better than most other types of paint and they can also be used for buffer beams on loco's — Vermillion is another useful colour in the range.
**Ladders.**
Note that LMS signals can be picked out by the ladder going to the top of the post with BR and LNER types having the ladder stopped short of this with a small landing positioned below the arm. The ladder bow if used can be made by use of our profile milled representations.

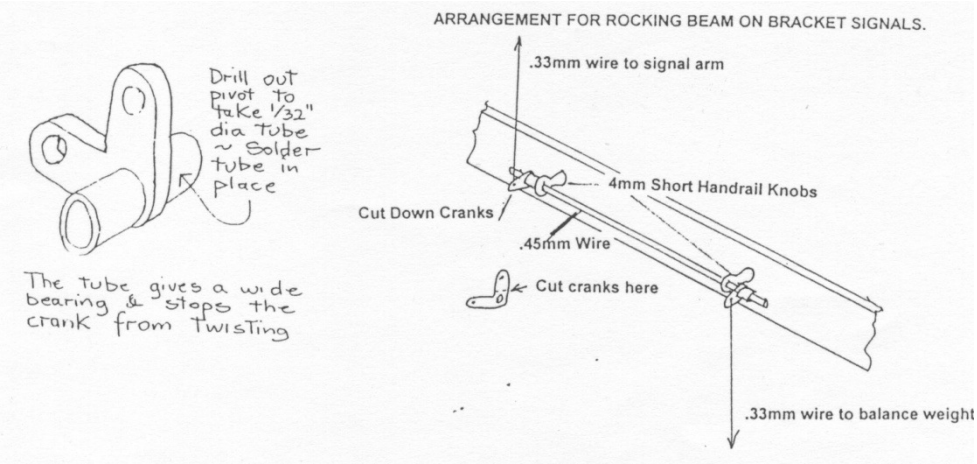
**Bracket signals.**
When it comes to making up bracket signals the base posts are very easily assembled but it comes down to bits and pieces for the rest. Brackets are in our range for many regions but as is the case for many other items in our hobby pictures are really needed to guide you for the rest.
The actual brackets (sometimes called spandrels) are etched with strengthening strips that have half etch lines on them which are soldered into position onto the bracket itself — see sketch.
The main beam trimmers in LNWR and early LMS days can be represented by the use of brass sections of 3mm x 1mm slightly rounded on the ends with some of these available in our range. For the latter type girder beams these can be made up from 3mm x 1mm 'U' section. Both of these can be made up into a sub assembly using our packs of doll location plates. Refer to drawing below as to which of these plates to use — 'C' can be used in place of 'B' if the end of a bracket spandrel reaches far enough out to touch the end of the plate. The 2mm tube dolls and 2mm square LNWR type will solder into the holes in these plates and for lattice dolls they can be soldered onto one of these plates using it as a base.
To make up the beam solder the plates into position on what would be the underside of the beams then turn it over, thread the plates onto the fully assembled dolls and place the bottom of the doll into the hole in the bottom plate. Check to ensure the dolls is upright and solder the top plate into position on beams then solder beam assembly to base post.




When it comes to the tread and landing these can be made up from individual parts but an etched strip is also available in our range of components. Whichever way you choose it needs to be spaced up from the main trimmer beams by soldering lengths of 1mm x .5mm brass to the underside of it so that the landing is held .5mm away from the beam



Plenty of small cranks and washers are etched into the spare areas on our components frets and these can be assembled using 1/32” brass tube soldered into the centre hole of our cranks and using .45mm brass wire as the pivot wire with all operating connections being done with .33mm wire.




Some signals had rocking beams made up on the edge of the bracket trimmers and our short 4mm scale handrail knobs would be useful for the pivots for these.
All handrails around the landings can be made up again using the .33mm or for stronger handling type .45mm brass wire.
Before the fitting of the arms but when all other construction is finished give the signal a good wash under the tap, dry and spray with an off white car spray — I find the undercoat gives a nice finish. Then hand paint the lamps etc in black.
One could go on and on about signal construction but the only true way is to look at pictures and then look at the items available — Graham done just that and look what he got us to produce!
If you are unsure what components to use to make up your signal then send us a picture or sketch and we will be pleased to guide you with no obligation.
See each instruction pack with individual signal packs for further guidance.