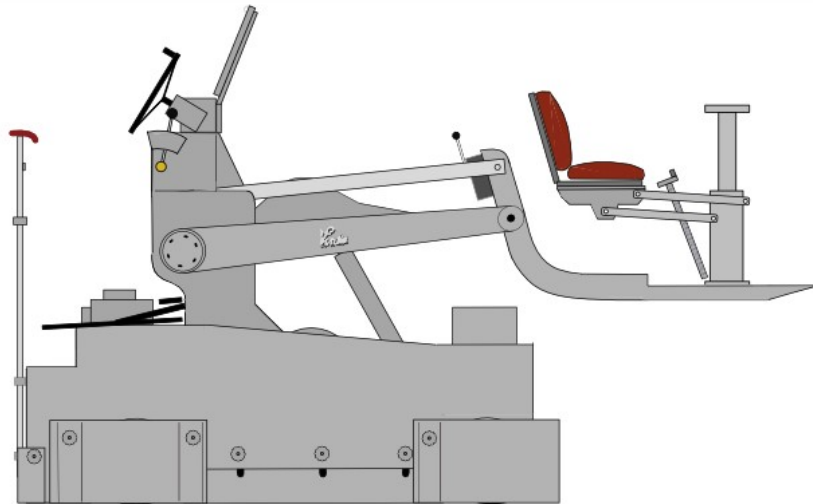


The Vinten Heron Camera Crane

Cut-out card construction kit



Background

The use of camera cranes goes right back to the start of film-making. The movement of the film camera towards or away from the actors and action not only added some variety to the scene, but further enhanced the story line: moving the camera away from an actor and raising it at the same time would show the actor within a crowd – or perhaps in isolation (as in the case of “High Noon”).

Cutting together the film images taken from different camera positions further helped to keep the film viewer’s interest, and could also be used to direct the audience’s attention to specific elements in the story. One of its main uses was to show which character was currently speaking or initiating action of some kind.

When BBC television first started up, transmissions alternated between a mechanical system with fixed camera positions and a vastly superior, although still basic, 405-line electronic system with movable television cameras: the electronic system was soon adopted. So, from 2nd November 1936 (the world's first regular high-definition television service), similar conventions to those established in the film industry could be adopted. This, for example, allowed directors show the audience the pictures from two, three or even four different camera positions or viewpoints.

In the film industry, the film camera was often mounted on a “dolly” or moveable platform. To minimise problem with uneven flooring, the dolly was often mounted on tracks. As a result, the camera could “track in” for a close up or “track out” to get a wider shot. This required a certain amount of setting up, to ensure that the track was evenly laid. As a result, a film was (and is) created shot by shot. In television, however, the programme in the early days was necessarily “live” – it was being acted in the studio at the same time that the audience at home was watching. For the actors, it was much more like acting in a theatre than in the shot-by-shot method used for the cinema. So developed the theatrical style, multi-camera, live or as-live method of television production, which was the most typical method of television production until sometime around the 1980s. For this type of

production, the television camera dollies had to run on the studio flooring – it was unfeasible to lay tracks in the studio, especially when the cameras needed to move, during the transmission, from one theatrical set to another in a very short space of time. However, the terms “track in” and “track out” were still used in television to mean movement towards or away from the action.

The Vinten Heron Camera Crane was designed specifically as a television camera crane and originally developed for the BBC in the mid-nineteen fifties (1955): until then, the other camera dollies or camera cranes had been adaptations of the film industry cranes (most notable the Motion Picture Research Council Crane, manufactured under licence in the UK by Mole-Richardson and universally known by technical staff as the “Mole” crane (although BBC management referred to it as the “MPRC Crane”)). Vinten had previously produced a motorised television camera dolly with an electrically operated crane arm and electrically driven rear steering wheels. However, the construction of the crane limited the height that the Motorised crane arm could reach, and the control of the power and steering was a skill that not every driver (“tracker”) completely mastered – it would seem to speed up as the turn became tighter.

Using the experience gained for the Vinten Motorised, Vinten designed a hydraulically operated crane that would be able to crane up higher, would easily fit in a smaller television studio, and which would be able, also, to go in any direction. The ability to go fully sideways – to “crab” – made the Vinten Heron Camera Crane an extraordinarily flexible television camera crane, and the hydraulic system made it virtually silent in operation: it could perform for some time just on the pressure in its hydraulic reservoir. The reservoir was pressurised by an electrically driven pump, the electric motor running on 240 volts three phase AC (and not the more usual 415volts AC three phase).

The BBC bought models for its London and regional studios, and used the Heron Camera Crane on any and all productions, from “Captain Pugwash” (a live or “as-live” show with camera cranes looking down onto drawing boards on which the animators moved the characters) to music programmes such as “Top of the Pops” and “Best of Both Worlds” to situation comedies and serious drama productions. The biggest innovation in the Heron Camera Crane was its ability to crab (move sideways), thus allowing it to move freely in any direction, giving it the flexibility of a camera pedestal but with increased height, range and speed.

The Vinten Heron television camera crane was a two-man camera “dolly”. The cameraman sat at the front with the television camera mounted on a Vinten pan-and-tilt head (another beautifully balanced and accurate piece of kit from Vinten): in those days the television cameras were large and heavy, both the black and white cameras and the early colour television cameras. The Vinten Heron Camera Crane had to be substantial enough to “crane up” and “crane down” on shot (lift the cameraman and camera up and down with the pictures going out directly to the audience) without jerk, judder or hesitation. The tracker or dolly operator at the rear positioned the whole crane in the correct position, and then could track in or out, or crab left or right, again on shot, with a nice smooth action with no jerk, judder or hesitation. The tracker and cameraman could also make the crane do a figure of eight on the ground or in the air!

Please note: In this assembly instruction sheet, BBC “jargon” is used throughout. Other TV companies used different terms: the BBC “Tracker” or “Dolly Op” for example may be termed a “Craneman” in other production companies (e.g. in the US).

Also, the term “cameraman” is used: for most of the time that the early versions of the Heron Camera Crane were in use in the television studios, the technical operations crews were mostly male.

Before You Begin

Decide on your Heron Crane variant

There were a number of variations over time in the build of the Vinten Heron Camera Crane, as crews became used to the functionality that it offered and could see how the crane could be improved.

Sufficient parts are included in this kit to make one of four variants of the Heron Camera Crane: *please note* that some cranes may have been modified over time and show characteristics of more than one mark! In particular, some Mk 1 cranes were modified in much the same way as the Mk 2 production versions.

Vinten ID	Mark	Changes
Pre-production Prototype		Initial production: Dolly (chassis) long control levers and a hand operated brake: recessed foot treadle (dead man's throttle control) Cameraman twist grip for crane elevation
487	Mk 1	Dolly (chassis) control levers replaced by finger-grip knobs with a hand rest on each side Foot treadle (dead man's throttle control) level with rear step
540	Mk 2	A larger hydraulic ram for the crane arm, to allow for the weight of the heavier colour cameras No "step" at rear, to provide housing for the additional nitrogen bottles (total nitrogen bottles = 3) Foot pedal for dolly (chassis) movement and acceleration Wheel tell-tale indicator mounted above the steering column (no longer on the steer/crab changeover unit). Orientation of crab select pedals changed from left-to-right to front-to-rear Backrest/support on "tracker" (dolly operator) bench (this was not used by the BBC). Jib arm parking strut (stay).
541	Mk 3	Cameraman provided with cameraman foot controls for elevation of the crane arm and pan of camera and seat.

(Thanks to Dudley Darby for information and photographs that helped in the preparation of this table.)

You need to identify which version of the Heron Camera Crane to make before you begin. For example, it will be difficult to add the foot pedals for the cameraman's control of elevation and pan after you have assembled the front camera column.

The term “crane” is used throughout these instructions, as that is how this piece of equipment was known in the BBC studios, and how it was described in the Vinten brochures. The Heron was known as a “truck” within Vinten’s and the Vitec group.

Please note: The main “stream” of these instructions are set out for the basic – original – production version of the Vinten Heron (the Mk 1). Instructions for the other versions are clearly marked and/or described in full in these instructions.

Print Out the Construction Sheets

Print out the seven (7) PDF construction sheets onto suitable printer card. This construction kit is ***not*** suitable for assembly using printed paper sheets.

Trial versions of this kit have used White inkjet printer card from Sainsburys and 180 gsm Premium White card from Hobbycraft, which is thinner and easier to cut. The cut outs have been designed for use with 180 – 200 gsm card. If you use thicker card, you will have to adjust some of the folds for the glue tabs in order to accommodate the thickness of the card.

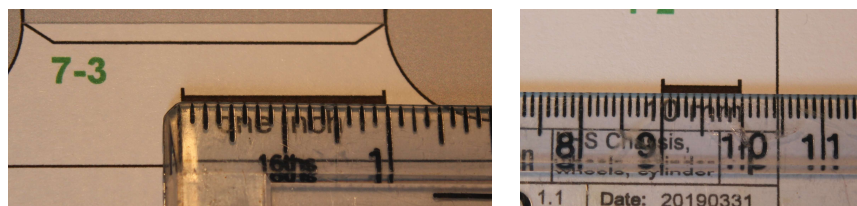
Please note that inkjet printer card is absorbent and soaks up PVA glue (and can then become soft and/or delaminate), so care in assembly is needed.

Decide on the level of detail for your Heron Crane

This kit has been designed to allow all modellers to build a successful model. Extra parts have been included to allow more experienced modellers to create a super-detailed version of the Vinten Heron Camera Crane. In most cases it is possible to add the extra detail at a later stage, but this does not apply to ***all*** fittings: the cable guard guides will be difficult to add later.

Check your scale

This kit had been designed to make a scale 1:12 model of the Heron Crane. Each sheet of the kit contains two scale markers, one showing one Imperial Inch, the other showing 10 millimetres (or 1 cm).



You can adjust the scale if you wish: for example, if you print the sheets onto A3 size card, and check that the 1 inch marker is one half-inch long (the 10 mm marker is 5 mm long), you will have a model which is one-sixth full size (1:6).

Notes about the construction

In every modelling project, there seem to be some parts which are too small to handle (and some parts which seem to be too big for the available tools!) This kit is no exception: there are a lot of small parts.

Please remember that this is a ***card*** kit for the Heron Camera Crane, and because of this it is not possible to replicate accurately every detail of the crane. One particular area is the top of the jib (crane) arm the Heron Camera Crane itself used a casting with some nice curves which are difficult to replicate

in card. Another item is the cameraman's seat: it will look unused and stiff, rather than somewhat crumpled and rumpled (the default state!).

Where possible, card assemblies are used for appropriate parts of the model, but a competent modeller may well be able to substitute everyday objects for some of the components, or to provide additional detail. (Where a suitable everyday object can be substituted, this is noted in the instructions).

Some dimensions have been changed to make it easier to construct: one example is the steering wheel. The spokes of this are very slender when model to true scale: in this card kit they are chunkier than the real thing. An experienced modeller may be able to slim down these spokes once everything is dry.

Many parts are constructed from two pieces of card which fold up and are glued back-to-back: there are two reasons for this. The card is printed on one side only, so folding the card presents two printed faces. More importantly, the card-glue-card sandwich provides a stronger item – on which other parts of the model may depend. You might find it useful to place these folded items under a heavy weight while the glue dries, in order to keep the arms straight and true (make sure that there is no glue leaking round from the edges of the folded card, or your delicate part might end up glued to the weightier item!)

For some of the rods and struts, it is recommended that you use cocktail sticks, sandwich skewers, round craft sticks (or even scent diffuser reeds). These are approximately the correct diameters – but they are not exact. Please be aware of this.

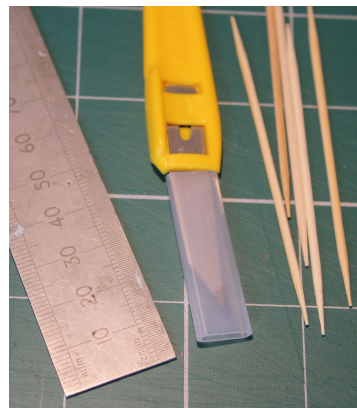
In some places, there are alternative construction suggestions to allow the assembly to be quicker and easier.

There are many folds in this kit: most of these are fold **downs** (sometimes called “hill folds”). In common with all card construction kits, we suggest that you score along the fold line for a hill fold using a very light touch with a craft knife: this usually produces a crisp, sharp corner. However, in the Vinten Heron, there were very few sharp corners on the external metalwork of the chassis: most of the metalwork was radiused over a crease or fold. Therefore, for the main chassis part of this kit, we suggest that you place a steel rule **behind** the fold (hill fold) and crease the card down over the edge of the ruler. This should round the fold or bend satisfactorily.

Please note that all Fold Down lines (hill folds) are shown as grey lines, so that the fold instruction line is not too prominent in the finished model. The Fold Up lines (“valley folds”) are shown as dotted lines, often with a masking white line behind them.

You will need

- Steel ruler
- Sharp craft knife
- PVA Wood glue
- “All purpose” adhesive (strong)
- Wooden cocktail sticks (*note*: manicure sticks are generally too large in diameter)
- Thin wooden burger/sandwich skewers (rods) (optional)
- Christmas Tree hanging wire (optional)
- Acrylic paint to touch in exposed areas (optional)



Any glue used should be one which dries clear. We recommend two different glues: a standard all-purpose adhesive (which acts as an impact adhesive on non-porous surfaces) and a PVA wood glue. The glues have different characteristics which can be used to help make the model construction easier, or to make the model stronger.

We recommend using PVA Wood Glue for parts of the construction as this dries strong and clear. The glue adds strength to the card construction: for example, it is recommended to use this glue for the steering wheel, as the card/glue/card “sandwich” makes this delicate construction more robust: it is also useful to glue the folded sections together. As this model has moving parts, the supports and bearings need to be robust, so the PVA glue can be used here: it adds a plastic layer between the card layers, creating a sort of laminate. If some glue gets on to the surface of the model, it can be wiped clean before it dries, and in any case it should dry clear (although the PVA glue can affect the inkjet dyes and cause them to run or discolour). If you wish, you can dilute the wood glue with a little water.



The PVA glue soaks into the card, and this can make the card more pliable – it is useful in the construction of the cameraman’s seat cushions, for example, to allow some element of moulding to the construction.

(Other suppliers of PVA wood glues are available.)

Where it is inappropriate to allow the card to become soft (and possibly delaminate), the “all purpose” adhesive should be used. A small amount is applied to the joint, and the two surfaces brought together immediately. (If the card used is not very absorbent, the glue can be allowed to become tacky (about 10 minutes) and then the joint is made when the two surfaces are pressed together.).



(Other suppliers of all-purpose glues are available.)

Trial versions of this kit have also been assembled using alternative adhesives, such as a “dot and dab” glue gun. This produces a quick and satisfactory joint, and is useful for some parts of the assembly. However, as the glue melts with heat, an assembled part may become unstuck if another part is added close by. It can also sometimes be difficult to place the dab of glue in a precise location.

We recommend using acrylic paints as these use a similar formulation to PVA wood glue, and help fasten the kit pieces together as well as strengthening the card (once dry)

A number of parts need holes made for pivots and mountings. You can cut out these holes quite successfully with a craft knife, but you may find it easier to use a simple hole punch used for making holes in leather belts – this item can be had for less than £3-50 (post free) online (March 2019).



Part Numbering

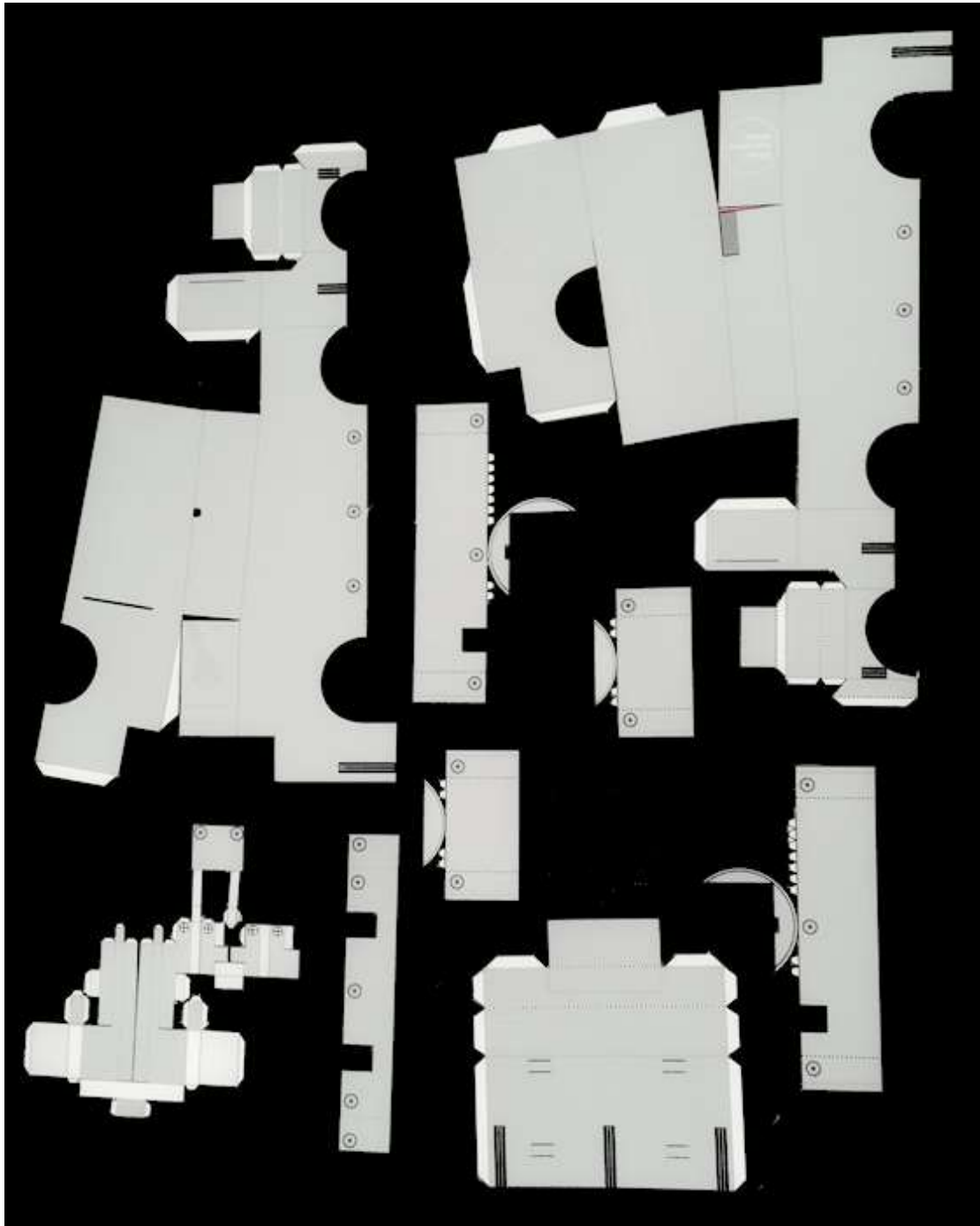
All components have a part number, shown in green, Major parts have the part number inside a green circle or green ellipse. Minor parts attached to a major part have the main part number, then a hyphen, then the part number. Minor parts not attached to a major part have a single number.

You are now ready to construct your Vinten Heron Camera Crane!

Construction

Chassis

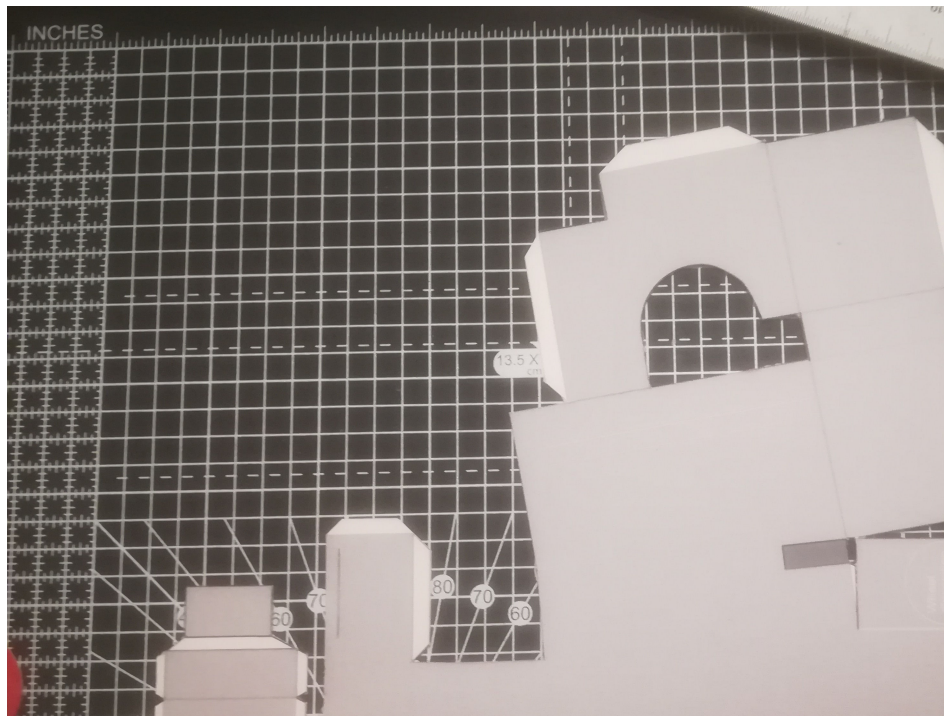
Major chassis components cut out ready for assembly:



Left Hand Side

Cut out the Left Hand Side of the chassis (part **1**) from sheet **1**.

Make sure that you cut out and discard the areas coloured **red**. There is a cut line long the bottom of the red semicircle to separate the rear part of the chassis.

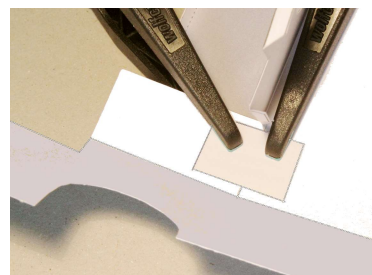


Cut along the slit for the Jib Guard (this is marked with a green arrow).

There are five (5) “Valley folds” (fold UPs). Two are on the main internal spacer (Heron internal width) and two for the glue tabs for these: the other is on the inside front, to form the jib guard. Fold all the fold lines.

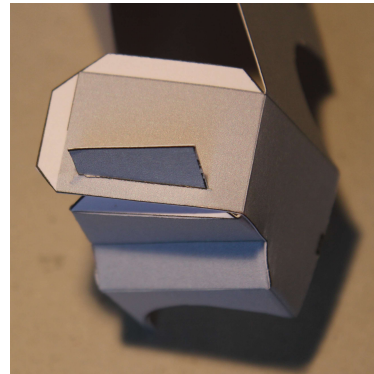
The top rear and the top of the slope are butt-jointed on the Left Hand side chassis. You may find it useful to use the glue tab, part **1-5**, to glue these two top parts together.

The illustration shows spring clips holding the glue tab in position. These are not essential tools, but can be useful in situations such as this.



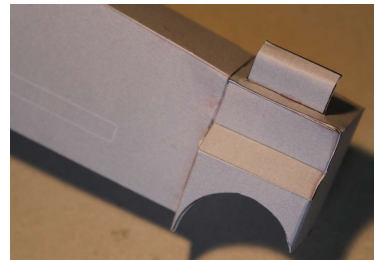
The front forms a sort of “box” around the front wheel. The angled inside part is designed to clear the front wheels. The inside side piece includes a glue tab to glue to the top, and the jib guard.

Poke the jib guard through the slot. This not only makes a strong joint, but also makes the jib guard more secure. Glue the glue tab to the inside top.



Fold the inside front so that it is parallel to the main side, and glue all tabs.

Gently curve the top of the jib guard towards the outside.



Bend up the Heron internal width piece (or stretcher): bend down the symmetrical piece (so that it lines up behind the first piece), and glue the two parts together. This forms a strong internal structure. Bend up the glue tabs ready for the right hand part of the chassis.

Now bend up the internal rear part of the chassis. The rear wheel cut-out on the inside should line up with the cut-out on the outside.

Glue the rear inside glue tab under the rear top.

Please note that there is no back to the chassis at this time.

The completed left hand part of the chassis:



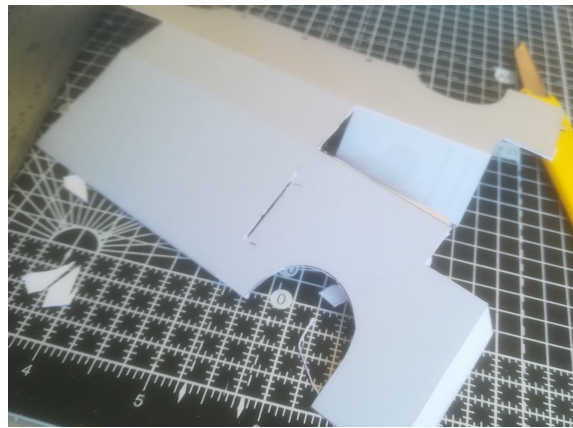
Right Hand Side

Cut out the Right Hand Side of the chassis (part **2**) from sheet **2**.

Make sure that you cut out and discard the areas coloured **red**.

The round “dot” halfway down the top side is for the hydraulic hose for the elevation ram.

The long slot in the inner side (marked with a green arrow) is for the glue tabs on the Heron internal width piece (as described earlier). It is suggested that you cut this slot with the side on the flat, and only make it wide enough to take a double thickness of card (this depends on the weight of card which you are using for your model).



Cut along the slit for the Jib Guard (this is marked with a green arrow).

Later builds of the Heron Camera Cranes had a lever or rod fitted to the hub of the right hand side jib arm, and this rod extended into the chassis. If your Heron is to include this rod, there is a rectangle marked at the start (rear) of the sloping top section which you need to cut out. (You don't cut this out if your Heron does not have this feature.)

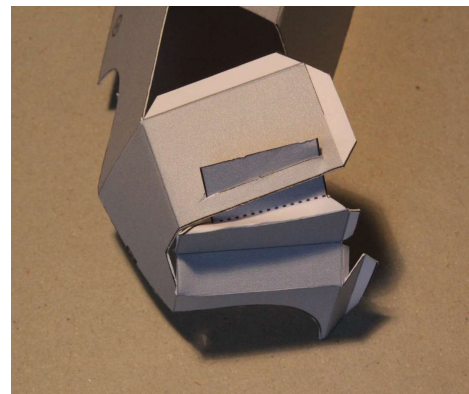
There is just one (1) “Valley fold” (fold UP) on this side: this is on the inside front, to form the jib guard. Fold all the fold lines.

As with the Left Hand side, the front forms a sort of “box” around the front wheel.

Poke the jib guard through the slot. This not only makes a strong joint, but also makes the jib guard more secure.

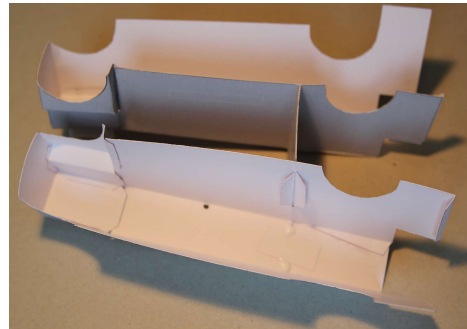
Fold the inside front so that it is parallel to the main side, and glue all tabs.

As with the Left Hand chassis, the top rear and the top of the slope are butt-jointed. You may find it useful to use the glue tab, part **2-13** (on sheet **3**), to glue these two top parts together.



Glue the rear top to the tab for the inside rear.

Feed the tabs for the Heron internal width piece through the slots in the Right Hand side chassis piece, fold up and glue in position.



Extra Detail

There are treads on the right hand chassis top. The position of these are marked. To add extra detail, cut out two treads from the group of four (part **2-7** on sheet **2**) and glue these in the marked positions.

Some Herons seemed to have a tread to the rear of the steer/crab changeover unit: use a spare tread.

Wheels (Cable Guard, Chassis Insert)

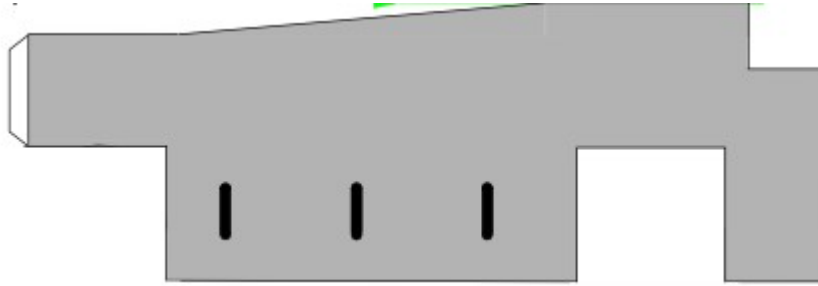
You have two options here: you can construct the Heron Camera Crane with (imitation) wheels, or you can construct it without the wheels. It is simpler to construct the Heron Camera Crane without wheels, but you should note that the front wheels are clearly visible in the real Heron Camera Crane from the front inside. With the crane arm in a typical position, it was not always easy to see these wheels.



In studio use, the cable guards were dropped as near to the studio floor as possible, to allow the crane to push away all types of cables – including mains cables and (in particular) microphone cables: there were all sorts of cables trailing around a studio floor! With the bottom of the guards near to the floor, it was near impossible to see the Heron wheels from the outside.

Simple Version

If you wish to make this simpler version of the Heron, cut out the left hand side chassis insert and wheel set (part **1-1**) from sheet **3**, but cut along the line marked in green and with green arrow markers. You should have just a side of the chassis with the cable clamp slots printed on it, as shown below.



Glue this to the inside of the left hand chassis component, such that the bottom of the chassis and the bottom of this insert are level with each other.

Now cut out the right hand side chassis insert and wheel set (part **2-1**) from sheet **3**, but once again cut along the line marked in green and with green arrow markers. You should have just a side of the chassis with the cable clamp slots printed on it.

Glue this to the inside of the right hand chassis component, such that the bottom of the chassis and the bottom of this insert are level with each other.

Please note that if you go this route, your Heron Crane will not be as rigid as the full build version.

If you are building a Mk 3 Heron Camera Crane, you will need the tracker backrest (part **3-10**) and tracker backrest supports (parts **3-8**, **3-9**): otherwise you have finished with sheet **3**.

Chassis Strengtheners with no Wheels

You can use the chassis strengthener without the wheels.

Green lines and Arrow markers are shown for each wheel set on sheet **3** to show where to remove the wheels. Cut along the green lines.

The rest of the assembly follows as described below in the section “Chassis Strengtheners”, but ignore all references to wheels and wheelsets.



Full Version

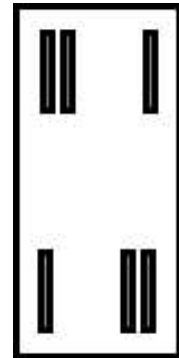
The wheels on the Heron Camera Crane were quite large in comparison to other camera cranes, dollies and pedestals of the same period. This full version helps to show you how the crane was driven and braked, and how the wheels fitted into the chassis.

Cut out the right hand side chassis insert and wheel set (part **2-1**) from sheet **3**. The wheel is made a double thickness: fold down the outer part of the figure of eight (the two wheels drawn “back to back”) for the front wheel, and glue the two parts together. Do the same for the rear wheel.

The “support” or “strut” for each of these two wheels are quite weak. If you wish to make the support stronger, we recommend the use of a spent “barbeque” or extra long match (or, if not available, a trimmed cocktail stick) glued to the inside of the support struts. The lengths needed for these strengtheners are shown as “Front strengthener length” and “Rear strengthener length” (no part number) on sheet **3**: alternatively you can cut these strips out directly and use these markers as the strengtheners.

Before doing anything else! We need to consider the wheels used on the Vinten Heron Camera Crane. The Heron Camera Crane had a total of 6 (six) wheels: on each side there was one wheelset with a single wheel (which was used for power, that is, to move the crane), the other wheelset had two wheels, these double wheels being used for braking. The double wheels were used to make sure the wheels remained true in direction during braking.

The back left wheelset was a single wheel, the front left was a double wheelset. The back right wheelset was double, with the front right having a single wheel.



The wheels were quite wide, and enough copies of the wheels are provided for you to cut out the wheels and glue them onto the wheels already on the chassis insert (as above).

On the left hand side rear, glue two copies of the wheels (part **1-2** on sheet **1**) one on top of the other onto just one side of the wheel and axle: at the front, glue two copies of the wheels (parts **1-3** and **1-4** on sheet **1**) onto *each* side of the wheel mounting.

On the right hand side, the rear has two copies of the wheels glued onto both sides of the wheel mounting (parts **2-3** and **2-4** on sheet **3**), while the front has two copies of the wheel (part **2-2** on sheet **3**) just on to one side. You can make the wheels thicker by gluing on extra copies: spares are parts **1-5** and **2-5** on sheet **3**.

Making a more substantial wheelset

The card wheelsets are relatively fragile, but there is an alternative.

Instead of adding additional card wheels to make up the thickness, you can make very strong wheels and supports from common objects!

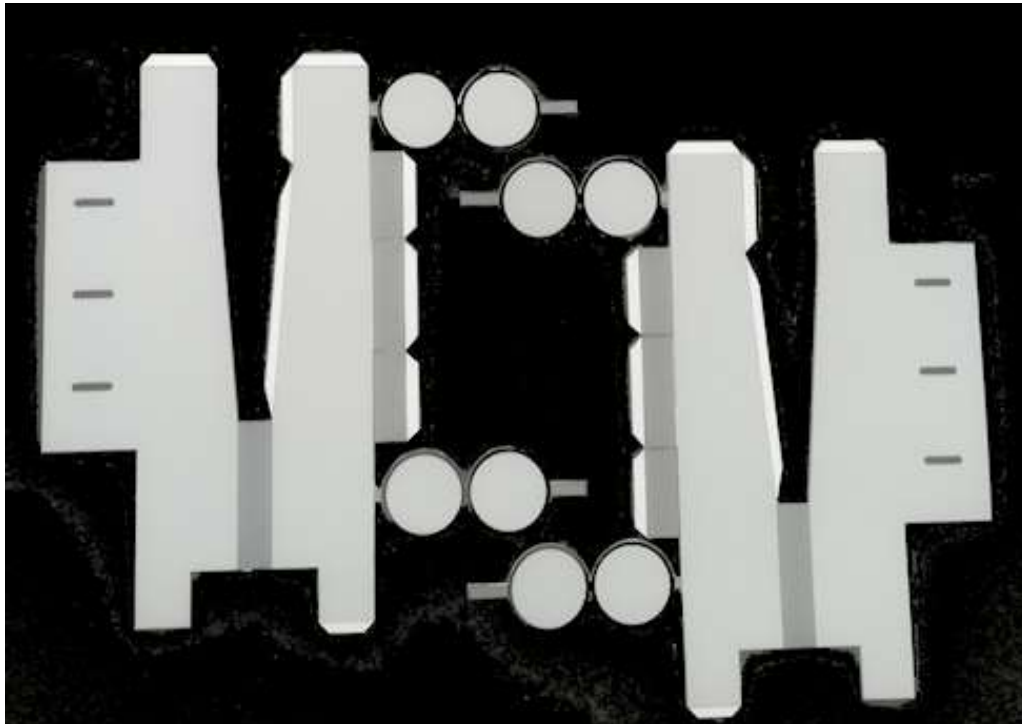
You can buy packs of felt furniture floor protectors: in these, there is often a set of circular felt pads. These are almost exactly the right size for the Heron Camera Crane wheels.



If you cut a rectangular section from the rim to the centre, and into this glue a suitably shortened stem of a long (spent) barbeque lighting match, and then glue this to the card wheel set and strut, this will be very strong. Glue one of the copies of the wheel on the outer edge of the felt disc, and if desired, fill in the slight difference in diameters with Milliput or a similar modelling compound (or even Polyfilla or builders caulk). And then paint the rim/tread black!

Chassis Strengtheners

Chassis Strengtheners and wheelsets cut out ready for assembly:

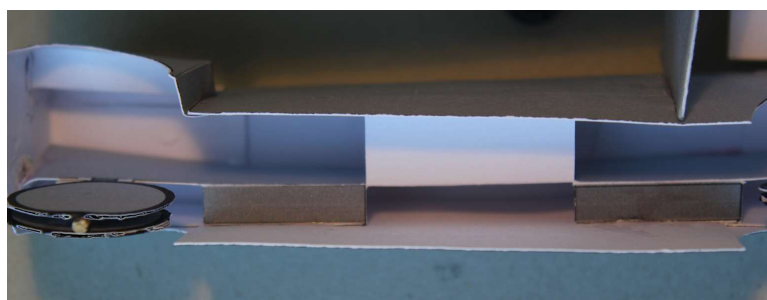


With the wheels made to the required thickness, the chassis insert and wheelset can be glued into the respective parts of the chassis.

Glue the left hand chassis insert (part **1-1**) to the inside of the left hand chassis component (part **1**), such that the bottom of the chassis and the bottom of the side of the insert are level with each other.

The centre of the chassis insert and wheelset is glued down the centre underside of the main chassis (part **1**): there are no guidelines printed for this, so that you will need to do this carefully by eye. Using a slower-drying glue will make it easier to make any necessary adjustments.

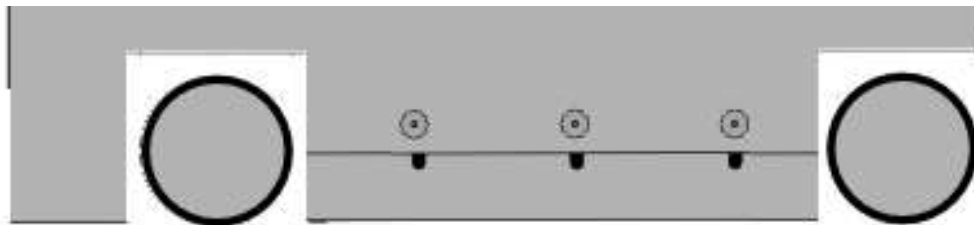
There are support struts from the centre piece to the outer chassis and to the inside of the chassis cover: the two outer struts go to the inside part of the cable guard (these are fold downs (hill folds): the centre section folds up (valley fold) and glues to the inside of the inner chassis cover.



The right hand side is assembled in a similar manner. Glue the chassis insert (part **2-1**) to the inside of the right hand chassis component (part **2**), such that the bottom of the chassis and the bottom of this insert are level with each other. On this side, too, the centre of the chassis insert and wheelset is glued down the centre underside of the main chassis so that the wheel supports are exactly in the middle across the width: there are no guidelines printed for this, so that you will need to do this carefully by eye.

Glue the two outer struts to the inside of the cable guard (these are fold downs (hill folds), keeping the strut at right angles to the centre piece: the centre section folds up (valley fold) and glues to the inside of the inner chassis cover.

Each side of the chassis should now have the chassis with the centre cable guard in position, level with bottom of the chassis, with the bottom of the wheels barely visible beneath.



Chassis Rear And Treadle

Pre-Production Prototype


Cut out the chassis rear (part **3** on sheet **2**), but cut along the valley fold line (Fold UP line) identified by blue arrow markers. Cut along the faint markings below the fold line that you have cut along, and also cut the two vertical slits down from this to the lower fold line. The slits are to take a thickness of card, so the slots should really be double cuts with some slight sliver of card between the cuts carefully removed. You should have just a bottom part of the rear with a cut out on the step “riser”.

Cut the 8 horizontal slots for the tracker bench support pole mountings.

Cut out the Pre-production prototype rear top – this is part **3B** on sheet **2**.

Fold up all the valley folds (fold UPs) and fold down all the hill folds. Cut out part **3B-1** on sheet **2**: this is the right hand side treadle support and pedal, and when folded should be a mirror image of the similar section on part **3B**. Glue this part to the flap on part **3B**.

As in other parts of this kit, the “**Z**” folds are used to make the printed area display correctly (and to add some strength to the assembly).

Each side of this back piece is shaped like this  in plan view. There is a piece which forms the side of the recess, a piece across the back, and then the treadle support coming back out. On the top and rear of the treadle support are two pieces which represent the angle iron supports for this. The treadle supports slot into the matching slots in the back piece: the glue tabs at either end glue to the rear of the rise.

The main plate is supported on a double fold: as in other parts of this kit, the “**Z**” folds are used to make the printed area display correctly (and to add some strength to the assembly). In this case, it is also used to make sure that the main plate is assembled at an angle to the horizontal: it should be something like 5 degrees above horizontal.

The pedals are constructed by folding up the distance pieces, folding down the support and then the pedal is folded back on itself and is glued back to back to the support piece. The completed pedal should be parallel to the main base plate (and so at an angle to the horizontal).

The treadle is part **3B-3** on sheet **3**. Cut a cocktail stick to the same width, colour this dark grey and glue between the ends of the two treadle support struts. Glue the treadle onto the treadle supports so that the rear end of the treadle lines up with the rear of the treadle supports.

Extra Detail Treads for the treadle are part **3B-4** (two tranches) on sheet **3**. Cut these out and stick on the treadle in the positions marked.

Treads for the pedals are part **3B-2** on sheet **2**. Cut these out and stick on the pedals in the positions marked.

Now add the Tracker Bench mountings (*see below*).

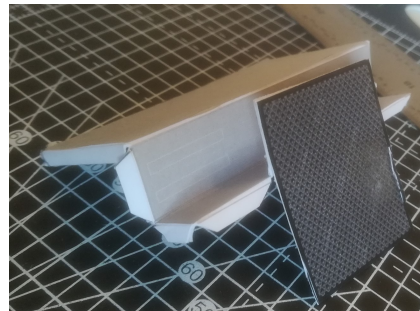
Mk 1

Cut out the chassis rear (part **3** on sheet **2**). Cut the 8 horizontal slots for the tracker bench support pole mountings.

There are two (2) “Valley folds” (fold UPs). One is at the end of the flat piece of the step: the other is at the top of this step, and returns towards the back of the Heron Camera Crane to form the support for the treadle. (the treadle was a sort of “Dead Man’s Handle” in that, if the tracker (Dolly Operator) did not have his or her foot on the pedal, the crane would not move. Many trackers soon learned that, for many (but not all!) of the Mk 1 Heron Camera Cranes, this treadle was actually “progressive” (not binary off and on) and could be used in conjunction with the hand controls to provide a very precise acceleration. Later Marks of the Heron Camera Crane included a special foot pedal for this function.)

Fold all the fold lines.

The treadle folds back over its support and is glued to the support. The support and treadle can pivot around the fold to the vertical part of the step (riser).



Extra Detail There are treads on the step of the Mk 1 Heron back and on the top of the back of the Mk 3. The position of these are marked. To add extra detail, cut out the treads from the group of four (part **3-12** on sheet **2**) and glue these in the marked positions.

Now add the Tracker Bench mountings (*see below*).

Mk 2 and Mk 3

Cut out the chassis rear (part **3** on sheet **2**), but cut along the fold line identified by green arrow markers. You should have just a bottom part of the rear. Cut the 8 horizontal slots for the tracker bench support pole mountings.

Cut out the Mk 2/Mk 3 rear top – this is part **3A** on sheet **1**. This fits onto the chassis rear using butt joints to make one continuous smooth surface. To help make these butt joints, and to provide some strengtheners, there are a number of glue tabs which go behind the butt joints. These are part **3A-1** (full width across the back), parts **3A-2** and **3A-3** which join the horizontal side pieces, and parts **3A-4** and **3A-5** which joint the vertical part of the rear replacement part to the main chassis side

There is one (1) “Valley fold” (fold UP). This is at the end of the flat piece of the step, and returns towards the back of the Heron Camera Crane to form the support for the treadle.

Fold all the fold lines.

The treadle folds back over its support and is glued to the support. The support and treadle can pivot around the valley fold.

Extra Detail There are treads on the top of the back of the Mk 3. The position of these are marked. To add extra detail, cut out the treads from the group of four (part **3-12** on sheet **2**) and glue these in the marked positions.

Now add the Tracker Bench mountings (*see below*).

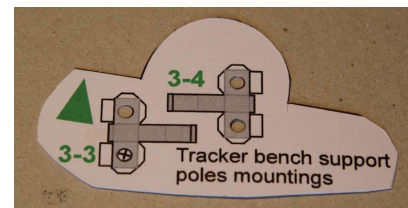
Tracker bench mountings

This is the same for all version of the Heron.

There are four tracker bench pole mountings. These are parts **3-1**, **3-2**, **3-3** and **3-4** on sheet **2**.

Make the holes for the mounting poles before cutting out the mounts – the parts are very small and fiddly. You will find that a leather hole punch is very useful for making these holes.

You may find it easier to separate out the bench supports from the main sheet before preparing the holes and cutting out the pieces.



Each mounting is made up in the same way.

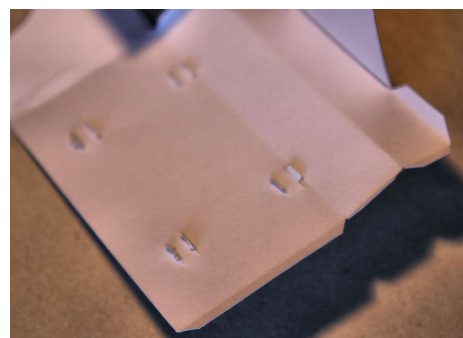
Fold the unit into an open box (the opening is at the rear), and glue the trapezoidal glue tabs behind the front and bottom. The rectangular tabs should be left pointing outward.



Note that there is a small “distance piece” that keeps the mounting away from the chassis rear panel.



Now insert the mounting tabs into the slots in the lower rear (back) of the crane, and add a blob of glue to the inside where these tabs emerge.



You will probably find it easier to leave the assembly of the Tracker bench, and its assembly onto the back of the Heron Camera Crane once most of the crane is assembled. See the section “Tracker Bench” later in these instructions.

Assembly: Back to Chassis sides

The rear (back) of the chassis can now be glued to the inside of the left and right chassis components. As you do this, make sure that the chassis is square – the left and the right side should be perfectly at right angles to the rear. If you do not get this correct, there will be problems later.



You may need to splay out the inside of each chassis to clear the glue tabs for the tracker bench support: this is quite acceptable (the photograph shows this during assembly – the tabs are not yet glued into the correct position, but clearly shows the principle).

The chassis assembly should look something like this: remember that it is most important to get everything fully square at this point (this one needs a little adjustment!).



Wheel Position “Tell Tale” and Control Cover

Pre-Production Prototype

The Heron Crane could be changed from rear-wheel steering to “CRAB”, in which case all sets of wheels, front and rear, all turned to face the same way. This change could only be made if the rear

wheels were pointing directly towards the front of the Heron, and to help the tracker find this position, there was a “tell tale” or direction marker mounted on the left hand side rear of the chassis.

Glue the pointer (part **1-9** on sheet **6**) in the location marked on the chassis base already constructed – there is a guide line marked “Wheel disposition telltale” to help you.

You can now optionally add a raised rim around this tell tale – it was actually under a glass cover.

Carefully cut out the rim piece, part **1-10** on sheet **6**: it is probably better to cut out the inside part, then cut round the outside.

If you want to make a “glass” cover for the tell-tale, cut a piece of clear plastic to the size of the rim piece. Many items of supermarket food packaging include suitable rigid clear plastic areas, but please completely clean the plastic before use. Cut out the circle of plastic, glue this in top of the rim already in place, then mount a second rim (part **1-11** on sheet **6**) on top. An extra rim (part **1-11**) is provided in case of any slip-ups.

Mk 1

The Heron Crane could be changed from rear-wheel steering to “CRAB”, in which case all sets of wheels, front and rear, all turned to face the same way. This change could only be made if the rear wheels were pointing directly towards the front of the Heron, and to help the tracker find this position, there was a “tell tale” or direction marker mounted on the left hand side rear of the chassis.

Cut out the body of the wheel position “Tell-Tale”, part **1-6** on sheet **6**. Cut round the tabs – discard the red area. Roll the side to form a cylinder, and glue to the top piece using the tabs.

Centre the cylinder onto the base (part **1-7** on sheet **6**) – there is a guide line to help you. *Note* that there are no glue tabs for this fixing – it is a simple butt joint. Glue the extra top piece (part **1-8** on sheet **6**) onto the top of the cylinder - there is a guide line to help you.



Glue the pointer (part **1-9** on sheet **6**) on top of this piece (part **1-8**): this is the tell-tale to show the orientation of the rear wheels.

You can now optionally add a raised rim around this tell tale – it was actually under a glass cover.

Carefully cut out the rim piece, part **1-10** on sheet **6**: it is probably better to cut out the inside part, then cut round the outside.

If you want to make a “glass” cover for the tell-tale, cut a piece of clear plastic to the size of the rim piece. Many items of supermarket food packaging include suitable rigid or semi-rigid clear plastic areas, but please completely clean the plastic before use. Cut out the circle of plastic, glue this in top of the rim already in place, then mount a second rim (part **1-11** on sheet **6**) on top. An extra rim (part **1-11**) is provided in case of any slip-ups.

Mk 2 and Mk 3

The wheel position tell-tale was incorporated in to the driving console. The change-over gear remained in position on the chassis. This is the part described below.

Cut out the body of the wheel position “Tell-Tale”, part **1-6** on sheet **6**. Cut round the tabs – discard the red area. Roll the side to form a cylinder, and glue to the top piece using the tabs.

Centre the cylinder onto the base (part **1-7** on sheet **6**) – there is a guide line to help you. *Note* that there are no glue tabs for this fixing – it is a simple butt joint. Glue the extra top piece (part **1-8** on sheet **6**) onto the top of the cylinder - there is a guide line to help you. This represents the flat top to the steer/crab changeover unit, which was present on the Heron Mk 2 and Mk 3.

For assembly of the Mk2 and Mk3 wheel position telltale, please see the section “*Steering Wheel And Steering Gear*”.

Pedals

Now come the pedals! The pedal assembly will be stronger if the whole thing is built around a cocktail stick cut to 6mm long. If you are using this, cut out the holes in pedal parts **1-13** and **1-14**, and the central holes in parts **1-16** and **1-17**.

Cut out the main pedal piece, part **1-13** on sheet **6**. Fold down the two foot pedals so that they are at right angles to the pedal body. Optionally cut out part **1-14** on sheet **6**, and glue back to back to part **1-13**.

There are pads to glue onto the pedals. Many Herons, particularly the early versions, had ridged tops to the steering mode change pedals: some photographs show Mk 1 Herons with what look like rubber tops. A choice of tops is provided in group part **1-18** on sheet **6**. Select the pedal tops that you wish to use, cut them out and stick on top of the pedals already in position.



Roll the cylinder, part **1-15** on sheet **6**, and make a butt joint – the circles drawn next to the cylinder should help you find the correct diameter. Add the bearing bush part **1-15** to one end.

If you are using a cocktail stick, thread this through the cylinder and bush. Now glue the pedal piece on to the other end, finish with the other bush (part **1-17** on sheet **6**).

Mk 1

The Mk 1 Heron Camera Crane originally had the crab/steer change pedals in line with the back of the crane, so the tracker clicked down left or right depending on the mode needed.

If you are using a cocktail stick mount, carefully make a hole in the side of the crab control in the centre of the rear of the cylinder for a Mk 1. Glue the pedal assembly to the wheel position tell-tale cylinder.



Mk2 / Mk 3

The Mk 2 and Mk 3 Herons had the crab/steer change pedals in line with the side of the crane, so the tracker clicked rear down or front down to change steer mode.

If you are using a cocktail stick mount, carefully make a hole in the side of the crab control in the centre of the side facing inwards for a Mk 2 or Mk 3.

Glue the pedal assembly to the wheel position tell-tale cylinder.



(Please note that photos which purport to be of the same version of the Heron Crane show both orientations of the foot control. Generally, it is likely that Mk 1 had the transverse pedals, while Mk 2 and Mk 3 had the fore and aft pedals.)

Mechanism Cover

On the right hand side of the rear chassis is a cover over some part of the drive mechanism. Cut out part **2-6** from sheet **2**. Fold down the two straight sides.

Curve the piece attached to the larger part-circle to match the curve of the circle: fold this down and glue its top edge to the larger part-circle circumference (this is a butt joint): glue the tabs behind the vertical sides.

Curve the piece attached to the small semicircle to match the curve of this circle: fold this down and glue its top edge to the small semicircle circumference (this is a butt joint): glue the tabs behind the vertical sides.

Glue this assembly to the right hand side chassis already constructed: there is an outline plan of this part to help you position it correctly.

Cable Guards

A television studio, certainly during the period of live or “as-live” transmissions, had a mess of cables all across the studio floor. Camera cables were thick and heavy, but there were microphone cables for the sound booms and stand microphones, power cables for “practical” props such as standard lamps, prompt cut controls for the floor manager: for some shows there were also teleprompt or autocue cables, but these were often wrapped round the camera cables.

It was very important that the camera pedestals and cranes did not run over these cables. If the camera was “on shot”, the picture would wobble. But more importantly, the cable could be damaged – and sometimes sparks could fly! Cable guards were used on all pedestals and cranes to try to push the cables out of the way (although junior members of the studio technical operations crew were usually assigned as “cable bashers”, whose job was to feed out and restack (in a figure of eight, non-tangled heap) the camera cables and other cables.

The Heron Camera Crane had cable guards all around, and each part was adjustable for height, so the guards were clear of the studio floor but close enough to move most of the cables out of the way.

Cut out the rear cable guard (part **3-11** from sheet **2**). Fold down the two end pieces – these wrap around to the sides of the crane.

Extra Detail

There are cable guard guides printed on the chassis and rear, but you can make a more detailed model by adding the cable guard guides. Cut out parts **3-13** (a group of two guides) and **3-14** (a group of three guides) from sheet **2**. Each guide has two side guide rails and a backing plate: the two side slide guide rails glue onto the left and right sides of the backing plate to make a channel, as shown in the “how to assemble” hints on sheet **2**. and in the illustration below:



(Part **3-14** (a group of two guides) is provided as a spare copy.)

Glue the guides in the positions shown on the chassis and rear.

There are cable guard guides available for the other cable guards around the wheels. Cut out parts **1-19** (a group of two guides), parts **1-20** (a group of two guides, one of which is a spare), and **1-21** (a group of two guides) from sheet **5**. Each guide has two side guide rails and a backing plate: the two side slide guide rails glue onto the left and right sides of the backing plate to make a channel, as shown above and as described in the “how to assemble” hints on sheet **5**. Part **1-20** comprises two smaller guides, which glue onto the front of the left hand chassis and on the inside of the front: the other guides are full length. Part **1-19** glues on the outside at the front of the chassis. Part **1-21** glues either side of the rear wheel.

Similarly, cut out, shape and fix parts **2-8** (a group of two guides), parts **2-9** (a group of two guides, one of which is a spare), and **2-10** (a group of two guides) from sheet **5** onto the right hand chassis.

There are four spare (un-numbered) guides available in case you need to rework some of the guides: they are tricky to construct neatly.

Fixing the Cable Guards

Now glue the rear cable guard over the cable guard guides. The cut-out on the rear cable guard should clear the tracker bench pole mounts. The sides fold round to the side chassis guides. The marked cable guard clamps should line up with the cable guard guides. The rear cable guard on the Heron is actually somewhat proud of the rear of the chassis, and if necessary, you can place some scrap card between the guard and the chassis.

The rear wheel cable guards are made similarly for each side. Cut out parts **1-22** and **2-11** from sheet **5**. Fold down the side and curve the side to fit the curve of the top piece. Glue this butt joint. *Please note* that the vertical part of the cable guards do not follow the full arc of the top of the guard – they have a fold UP (valley fold) before the end of the arc at each end. Fold UP (valley fold) the end pieces: then gently curve the extreme ends inwards so that the ends, when pointed, touch the main chassis. If you have used the additional cable guard guides, make sure that the side “flaps” of the cable guards clear the cable guard guides. There are tabs on the ends of the cable guards, and there are two slots in the chassis either side of the wheel. The tabs should line up with the slots. Insert the tabs into the slots and glue on the inside. This will help to ensure that the edges of the cable guards are truly vertical.

Glue the rear wheel cable guards into position (the cable guard clamps are at the top): the marked cable guard clamps should line up with the cable guard guides.

The front cable guards wrap around the front of the Heron Crane. Again the two front cable guards are symmetrical. Cut out parts **1-23** and **2-12** from sheet **5**. Fold down the side and curve the side to fit the curve of the top piece – this is nearly one-half of a circle, and you should take care not to crease the card as you fold it. The remaining part of the guard is curved with more or less the same radius as the two parts already formed, but there is no top piece to aid you. The curve has been shown, but marked in red (“discard”): you can use this to form the curve, and then remove it. There are various techniques for curving card, including lightly pulling the width of a craft knife blade along the inside of the curve. Glue this butt joint, sides to top circle. Fold UP (valley fold) the end pieces: then gently fold (on the fold line) the extreme ends inwards so that the ends, when pointed, touch the main chassis. On the outside rear of each of the front cable guards there is a tab, and there is a corresponding slot on the main chassis. The tab should line up with the slot. Insert the tab into the slot and glue on the inside. This will help to ensure that the edge of the cable guard is truly vertical. If you have used the

additional cable guard guides, make sure that the side “flaps” of the cable guards clear the cable guard guides.

Glue the front wheel cable guards into position- the cut-out of the circle should fit snugly round the front end of the chassis, with the cable guard clamps at the top : the marked cable guard clamps should line up with the cable guard guides.

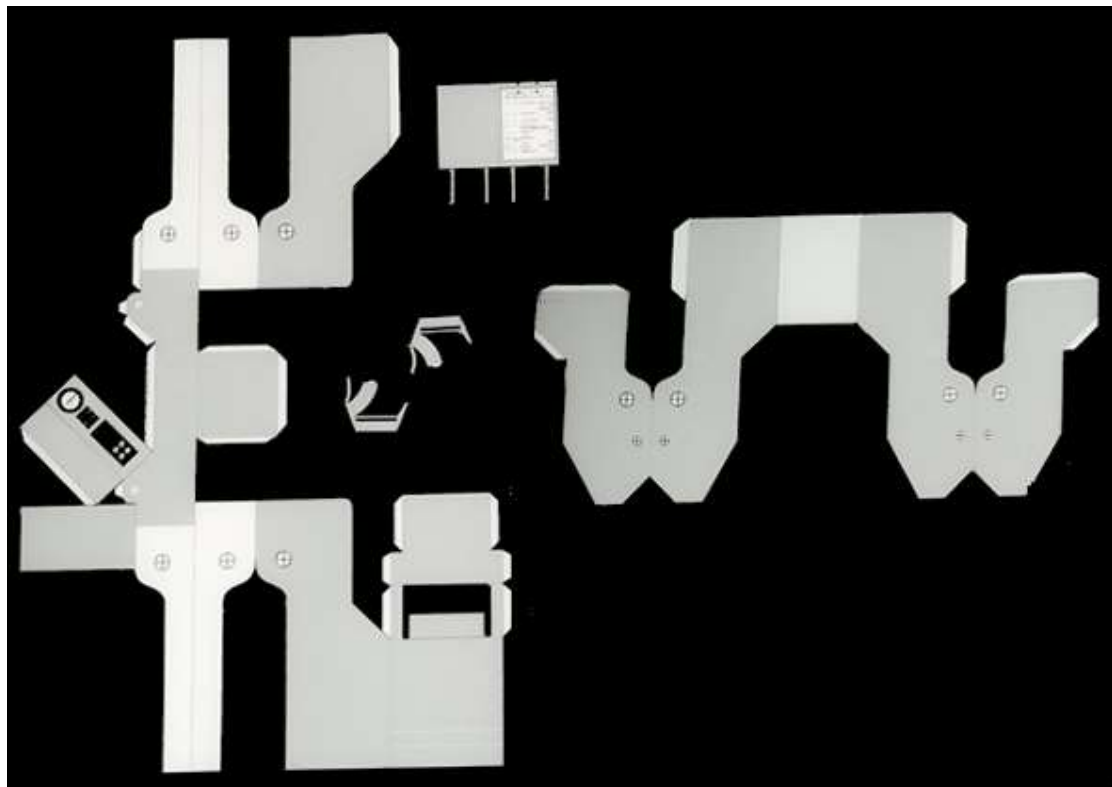
Extra Detail

The cable guard clamp knobs are very prominent on the Heron Crane: they were quite large (and could be adjusted quickly) and were quite “knobbly”. Although the knobs are printed on the sides and cable guards, you can add knobs to make these proud of the surface. Part **3-16** on sheet **2** is a group of 50 cable guard clamp knobs. All you have to do is to cut them out and stick them over the printed knobs. There should be plenty of spares: it is quite a tricky job.

Note that the largest of the punches on the leather hole-maker is approximately the same diameter as these cable guard knobs, and make it easy to cut them out. Although circular, but with the curves printed, they form a reasonable facsimile of the knobs. You can of course cut them out fully by hand.

Driving Console

Main driving console pieces (both inner and outer driving console components) cut out ready for assembly:



Driving Console Inner

The model driving console and jib support is made in two parts, an inner and an outer. The inner console provides the bearings for the upper jib arms – these are not load-bearing arms as such, but are

used as part of the parallel motion to ensure that the camera mounting platform is always horizontal. If you do not have a leather hole punch tool, check the material you are going to use for the pivots (it is recommended that you use cocktail sticks (no pivot rods are shown on these cards)), you should make the holes for your bearings before doing anything else - you will find it easier to make the pivot holes at this point.

It is necessary to assemble the inner console before adding this to the main console.

Cut out part **4** from sheet **5**. *Note* that here are two sets of pivot holes: one set is for the jib parallel arm set, and these pivot holes are only on the inner console. The other set (shown larger in the side pieces) are the main jib bearings, and these **MUST** line up with the similar pivot holes in the outer driving console.

The Driving Console Inner piece has eight (8) valley folds (fold UPs). Identify these folds and bend the parts up. Each side of the inner console is made from a double thickness of card (to support the jib parts). So fold down each side and glue the matching top halves to each other, back to back. If necessary, weigh down these side “cheek pieces” with some suitable weights to keep them flat as the glue dries.

If you do have a leather hole punch, check the material you are going to use for the pivots (it is recommended that you use cocktail sticks (no pivot rods are shown on these cards)), and now make the holes for your bearings. The punch should be able to go through the two thicknesses of card.

Upper Jib Arms (Parallel Motion)

The upper jib arms are pivoted on the inner console, and are used to make sure that the camera platform is always parallel to the ground. These arms are not load-bearing, so are much thinner than the main jib arms.

Cut out parts **5-12** and **5-13** from sheet **4**. *Please note* that one end is marked as **Mk Front**, the other end as **Mk2/M3 Front**. You will need to remember which end to use when you assemble the parallel motion arms to the inner driving console.

Note that each arm has a small bearing (circle) associated with it – these have not been given a separate part number.

Using an appropriate tool, make pivot holes in each part of the arms (*note* that, in this sheet, the pivot holes are marked with a solid circle): these holes should just be big enough to take the bearing you are going to use. Fold each arm in half longitudinally, and glue. You might find it useful to place these arms under a heavy weight while the glue dries, in order to keep the arms straight and true.

Once the Upper jib arms have completely dried, you can pivot these on the inner driving console.

Pre-Production and Mk 1

Identify the end marked as **Mk 1 Front**: you need to use the other end to mount on the inner console.

Thread your selected bearing material (cocktail stick cut to approximately 30 mm length) through the upper pair of holes in the sides of the inner chassis, and glue to the holes in the appropriate end of each of the upper (parallel) jib arms. The end of the parallel motion arms that you are using has oval markings on each one, and when assembled these markings should be hidden within the driving console.

Note that the inner console is not yet fixed in position, so the sides will flex as you manipulate them.

Mk 2, Mk 3

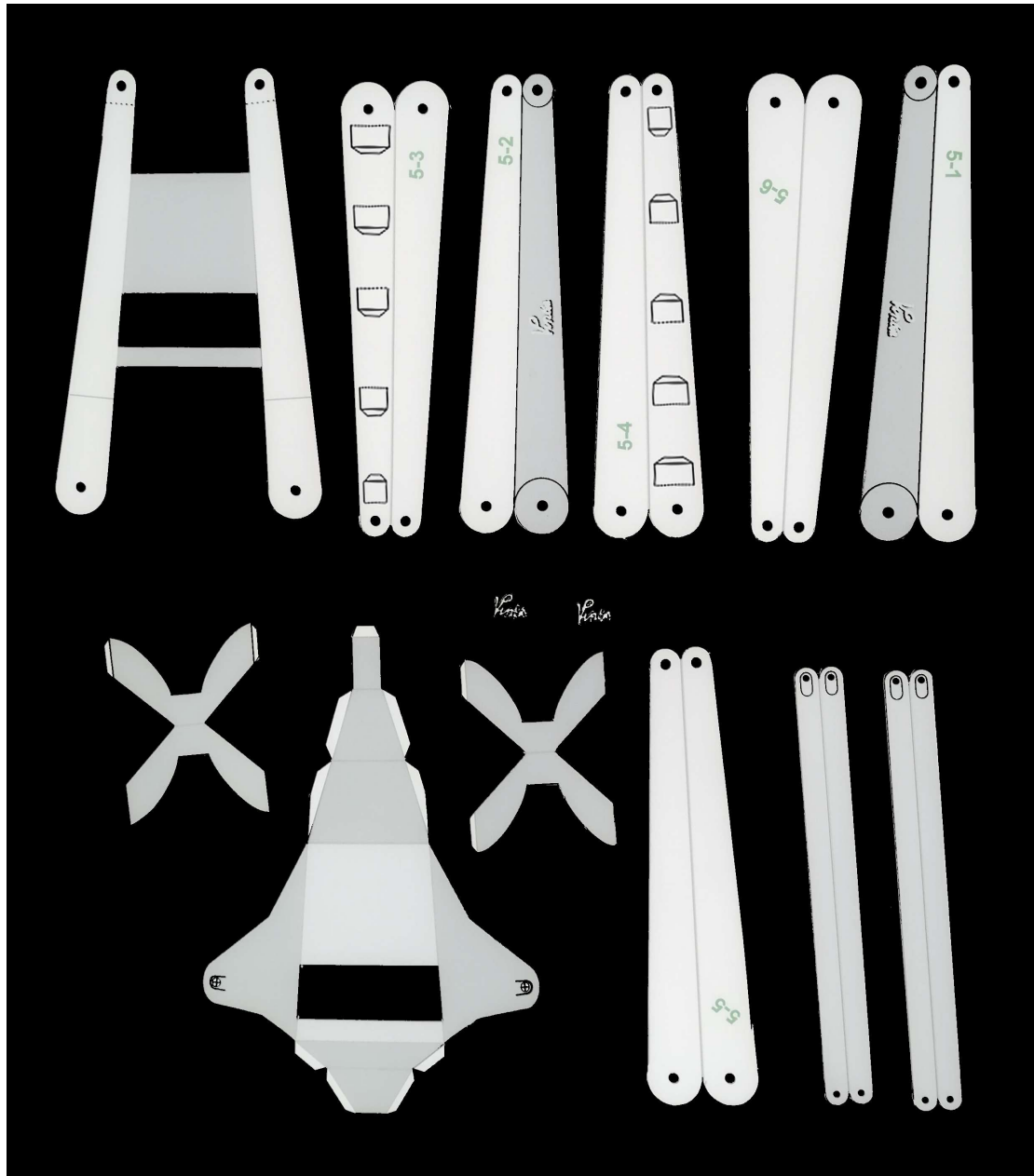
Identify the end marked as **Mk 2/Mk 3 Front**: you need to use the other end to mount on the inner console.

Thread your selected bearing material (cocktail stick cut to approximately 30 mm length) through the upper pair of holes in the sides of the inner chassis, and glue to the holes in the appropriate end of each of the upper (parallel) jib arms. The end of the parallel motion arms that you are using has just the black pivot hole marking on each one. The front end (the currently free end) has oval markings on each one: this represents the slot in the arms to allow the front platform to tilt back slightly and automatically cut power to the jib arm hydraulic ram. This prevents the front platform from hitting an obstacle and so raising the front wheels of the crane off the floor.

Note that the inner console is not yet fixed in position, so the sides will flex as you manipulate them.

Jib Arms

Major components of the jib arms and ram top assemblies cut out and ready for assembly.



Jib Arms

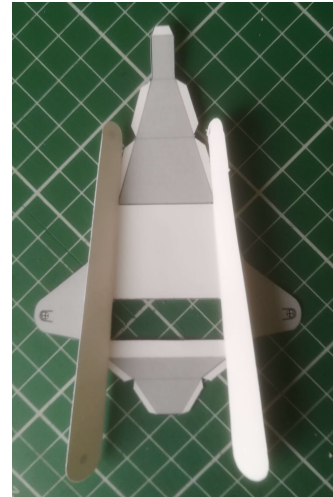
Cut out the main jib arm assembly, part **5** on page **4**. Cut out and discard the red trapezium in the top part. Fold down the two side arms, and then bend the rear ends of each arm slightly towards each other so that they are parallel (a fold down line is marked to help you, but this is not really a fold – it is just an

indication of where the bend occurs): push the front parts slightly apart right at the front end (again, a fold UP line shows where to do this) so that these arms, too, are parallel with each other (and should also be parallel with the rear part of the jib arms).

Please note that the jib arm base assembly (part **5** on page **4**) and the Ram Top Mounting (part **5-9** also from sheet **4**) can conveniently be glued together at this stage.

This ensures that the top of the jib assembly and the bottom of the ram top assembly are truly flat with respect to each other and are correctly aligned. Construction then follows the sequence as described for each part separately (as below).

You will need to make sure that the printed faces are glued together, face to face. The cut-out trapezia should lie directly over one another.



The jib arms are thick – they need really to be some 6.4 mm thick in 1:12 scale. You have the option of making the jib arms simply by laminating (gluing) the jib arm sides together, or you can make the jib arms to the correct scale width.

Flat Jib Arms (Simple construction)

Copies of the arms are printed on sheet **4**, and you will be able to make a satisfactory model using the parts supplied (although you will not get the full scale width of the jib arms). *Please note* that parts **5-1** and **5-2** **MUST** go on the outside of each arm, and these parts are “handed”.

Cut out part **5-5**. Using an appropriate tool, make pivot holes in each part of the arms (*note* that, in this sheet, the pivot holes are marked with a solid circle): these pivot holes should just be big enough to take the bearing you are going to use. Fold the arm in half longitudinally, and glue. Keep the arm flat at this point: they need to be bent later.

Once the glue has dried, gently bend the jib arms to match the bends on the arms of part **5**, and glue to the *left* hand side of the main jib arm assembly (with the narrower end at the top).

Cut out part **5-3**. **DO NOT CUT ALONG THE INTERNAL FLAP MARKERS**: simply cut along the outlines of the jib side piece. Using an appropriate tool, make pivot holes in each part of the arms (*note* that, in this sheet, the pivot holes are marked with a solid circle): these pivot holes should just be big enough to take the bearing you are going to use. Fold the arm in half longitudinally, and glue. Keep the arms flat at this point: they need to be bent later.

Once the glue has dried, gently bend the jib arms to match the bends on the arms of part **5**, and glue to part **5-5** already assembled on the jib arm.

Once these jib arms have completely dried, you can add part **5-1**. This part is cut out, folded in half longitudinally and the halves glued together. This can now be glued to the jib arms strengtheners already constructed, and then the assembly is glued to the *left* hand side of the main jib arm assembly, part **5**. Check that the grey side is facing outwards, and that the word “Vinten” is the right way up. *Note* that you will need to bend the arms to match the bend already formed in the jib arms: you may well find that the pivot holes need to be adjusted because the bend in the arms effectively shortens the

jib arms. Because of these laminations, you may want to smooth out the edges and ends of the jib arms: you can fill in the slight difference in dimensions with Milliput or a similar modelling compound (or even Polyfilla or builders caulk). Then paint the modified parts of the jib arm a suitable grey colour.

The right hand side is assembled in a similar way. Cut out parts **5-6** and **5-4** (again, do not cut the flaps, just cut the outline of the arm), make pivot holes in each part of the arms, fold each arm in half longitudinally, and glue to the *right* hand side of the main jib arm assembly, part **5**, in a similar sequences as described for the left hand jib arm. Now add part **5-2**: cut it out, fold in half and glue longitudinally. Glue this to the jib arms strengtheners already constructed on the *right* hand side of the main jib arm assembly, part **5**. Check that the grey side is facing outwards, and that the word “Vinten” is the right way up.

Extra Detail The “Vinten” logo was a chrome fitting on the jib arm of the Heron. Copies of this logo are included (as part **5-15**) on sheet **4**: there are two bitmap logos (derived from photographs) and two new vector graphic images. You will need a sharp craft knife, a steady hand and good eyesight to cut out the Vinten logos: stick these over the printed logo on each of the jib arms.

Full Width Jib Arms

The jib arms were quite a feature of the Vinten Heron, and the green rectangle at the end of part 5-4 shows you the correct width of these jib arms.

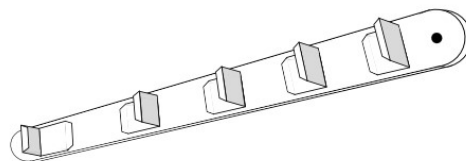
You can make full width jib arms using the parts included on the printed sheets, although it is best to do the construction in two stages.

Please note that parts **5-1** and **5-2** **MUST** go on the outside of each arm, and these parts are “handed”.

Cut out part **5-5**. Using an appropriate tool, make pivot holes in each part of the arms (*note* that, in this sheet, the pivot holes are marked with a solid circle): these pivot holes should just be big enough to take the bearing you are going to use. Fold the arm in half longitudinally, and glue. Keep the arm flat at this point: they need to be bent later.

Once the glue has dried, gently bend the jib arms to match the bends on the arms of part **5**, and glue to the *left* hand side of the main jib arm assembly (with the narrower end at the top).

Cut out part **5-3**. Cut along the cut lines shown for each of the five spacer flaps on one half of part **5-3**. Fold each of the spacers up (a valley fold) and fold each glue flap downwards.



Using an appropriate tool, make pivot holes in each part of the arms (*note* that, in this sheet, the pivot holes are marked with a solid circle): these pivot holes should just be big enough to take the bearing you are going to use. Fold the arm in half longitudinally, and glue. Keep the arms flat at this point: they need to be bent later.

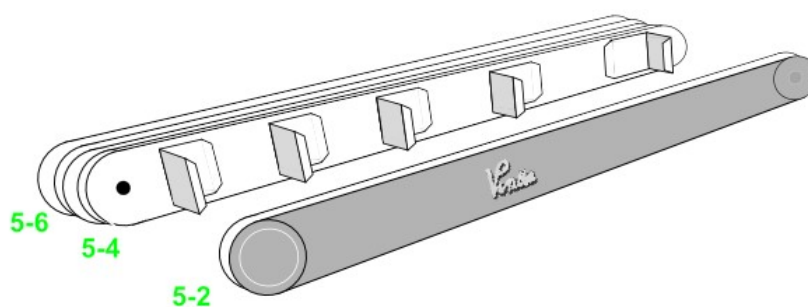
Once the glue has dried, gently bend the jib arms to match the bends on the arms of part **5**, and glue to part **5-5** already assembled on the jib arm.

The right hand side is assembled in a similar way. Cut out parts **5-6** and **5-4**: again, you need to make the cuts for the spacer flaps on part **5-4**, bend up the spacers and bend down the glue flaps. Make pivot

holes in each part of the arms, fold each arm in half longitudinally, and glue to the *right* hand side of the main jib arm assembly, part **5**, in a similar sequences as described for the left hand jib arm.

It is best to leave the rest of the jib arm assembly until *after* the jib arm has been assembled and pivoted on the main console, otherwise it will be difficult to insert the pivots easily.

When the jib arms are assembled and are moving correctly as described in the section “Mounting the Jib”, you can add part **5-1**. This part is cut out, folded in half longitudinally and the halves glued together. This can now be glued to the jib arms strengtheners already constructed, making sure that the curves at the front and rear are correctly aligned. Check that the grey side is facing outwards, and that the word “Vinten” is the right way up. *Note* that you will need to bend the arms to match the bend already formed in the jib arms:



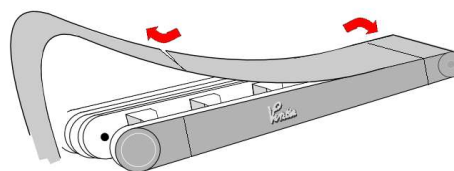
Now add part **5-2**: cut it out, fold in half and glue longitudinally. Glue this to the jib arms strengtheners already constructed on the *right* hand side of the main jib arm assembly, part **5**, as shown in the illustration above. Check that the grey side is facing outwards, and that the word “Vinten” is the right way up.

Next glue the bearing covers (parts **5-7**, **5-8**) to the outside of the bearings, aligned with the light coloured marker (a spare copy of each one is provided). If your Heron is to include the control rod from the jib bearing into the chassis, do not use part **5-8**, but use instead part **5-18**, as this includes a marker for the bearing for the top of the rod. Cut out some spacers (from part **5-20** on sheet **2**) such that the control rod will clear any nuts that you are going to add (see also the section “Control Rod”).

The jib arm top surfaces are provided by parts **5-21** and **5-22** on sheet **5**. *Please note* that these pieces are “handed” – there is a left hand and a right hand piece.

Cut out part **5-22**: this is the *right* hand jib wrapper. Cut out the four “V” angle pieces. Use the jib arm bend joiners (parts **5-23** and **5-24**) to join the jib arm wrapper parts together so that the edges of the “V” cut-out form a butt joint. Identify the centre section of this wrapper – it is the part which is angled inwards.

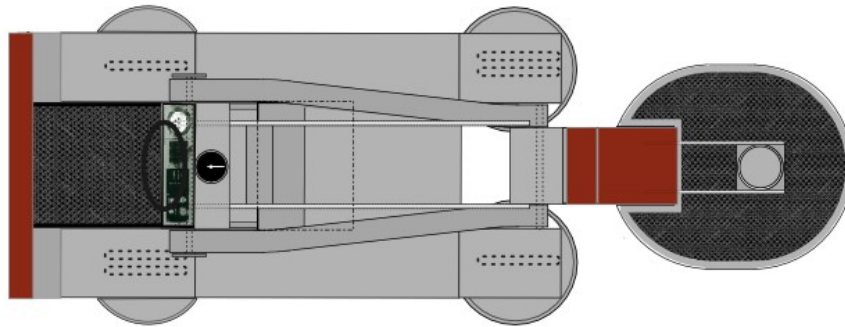
Glue this central section to the angled jib arms, and then continue to wrap the jib arm surface round the two curved ends and then along the bottom of the jib arm. The bottom of the jib arm should already be angled to match the top. The jib arm wrapper joins in the middle of the central section at the bottom, and there is a straight joiner (included in part **5-24**) to help make this join (glue to the inside of the wrapper pieces).



The length of the jib wrapper has been set for use with lightweight inkjet card (180 gsm): you may find a gap if you have used a heavier weight card. The straight joiners included a coloured section to help mask the join: you can cut a piece from any unused parts of the kit to fill in the gap if necessary.

The left hand jib arm wrapper is added in a similar way: cut out part **5-21**, cut out the “V” notches, joint the ends as a butt joint and use the angled joint strengtheners from parts **5-23** and **5-24**. Identify the angles central section, glue onto the jib arms, and then wrap the remaining sections round the jib.

Please note that the Vinten Heron Jib Arms were actually a sinuous “S” shape, not with angled bends as constructed with this card kit. The plan view below gives an idea of the true shape of the jib arms.



With care, it is possible to adjust the wrapper strips and jib arm sections before full assembly so that they match this plan, but the angled construction shown on the construction sheets and described here gives a very close approximation to the true shape.

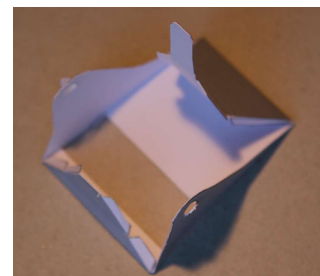
Extra Detail The “Vinten” logo was a chrome fitting on the jib arm of the Heron. Copies of this logo are included (as part **5-15**) on sheet 4: there are two bitmap logos (derived from photographs) and two new vector graphic images. You will need a sharp craft knife, a steady hand and good eyesight to cut out the Vinten logos: stick these over the printed logo on each of the jib arms.

Ram Top Mounting

The Heron Camera Crane had a “hump” between the jib arms – this housed the top bearing of the hydraulic ram used to elevate the crane. There was a smooth casting with nice rounded curves. Unfortunately it is not easy to replicate this for the card Heron (although experienced modellers may be able to do something using modelling compounds or even *papier-mâché*, using the card structure as a basis. Such changes will need to be painted to match the Heron base grey.

Cut out part **5-9** from sheet **4**: cut out and discard the red trapezium. Make suitable holes for the ram pivot – these need not be large, as a piece of wire (for example from a Christmas tree decoration hanging set) is going to be quite strong enough for the pivot.

Cut the “arch” slots around the pivot holes on both sides. The piece with the pivot hole is to stand vertical when the rest of the side is sloping. This piece forms an outer end for part **5-14**.



Fold down the sides to form a sort of stepped irregular pyramid. Cut out the ram top pivot housing, part **5-14** from sheet **4**. As drawn, the part includes sides: make the holes for the pivot wire, fold down the ends and curve the top over the ends. The bottom is fully open. Carefully push this assembly to the top of the pyramid to line up with the pivot holes in the side.

Note that the sides of this part duplicate the support on the “pyramid” sides: you may well prefer to cut the sides off part **5-14** and just curve the top to fit over the existing side pieces – as shown in the illustration.



The top pivot for the hydraulic ram should now stick out from the folded up sides. Once you have done this, glue the ends of the “pyramid” to the sides. Note how the sides are gently curved to create a shape.

If you have not already glued this jib ram top mounting to the jib arms (as was noted earlier as a suggested assembly sequence), this whole jib ram top mounting assembly is now glued to the jib arm assembly, printed side to printed side (face to face): the two cut out areas should overlap exactly.

Extra Detail

Cut out the front and rear Jib Arm Ram Supports. Fold each in half and glue the halves together. These parts fit in the space cut out in the jib arm assembly – one at the rear end and one at the fore end. They are slightly different sizes: do make sure that the rear one is placed at the rear.



These two parts are meant to represent the underneath cast parts of the ram top housing, as shown in the photograph. Not all the features are modelled, of course!

Glue these parts in position: the glue flaps glue onto the jib arms (there are no glue flaps on the upper part of each one). You may need to trim these parts to fit.

Driving Console Outer

This part of the Heron Camera Crane houses the main control mechanisms for the crane and provides the mounting points for the jib arms.

Driving Console Outer

The main driving console is part **6** on sheet **6**. Cut out the part and if you do not have a suitable hole punch, make the holes for the main jib pivot (these are marked with a cross inside a circle (⊗) – *note* that there are no pivot holes for the upper jib (parallel) arms. Cut along the three sides of the rectangle on the middle part of the front of the console.

The top of the driving console was set in from the main side pieces, and on this model this is represented by folding the card to provide a thicker part on the main body of the jib supports.

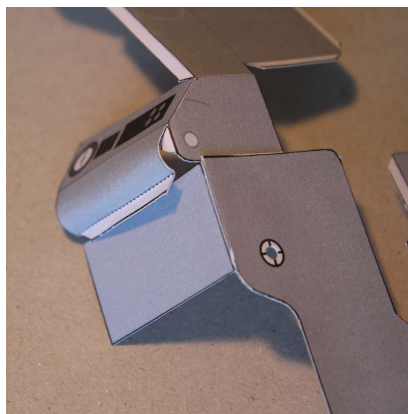
There are four valley folds (fold UPs) on this piece (one on each side, one at the front and one at the rear), the rest are all fold downs (hill folds).

Fold on each side, fold the two matching white parts to overlay themselves, and glue. Then fold back the grey coloured part over the top, and glue (the three parts of each side are in a “Z” formation. This should give a flat side with the top part “recessed”.

If you have a suitable hole punch, you can now punch the holes for the jib pivots: they should be just somewhat bigger than the pivot bar that you are using (for example, a cocktail stick). Depending on the thickness of the card that you are using, the leather hole punch should be able to go through the three thicknesses of card, although you may have to free up the centres following the punch operation.

Fold the two sides down from the top of the control part. Below the control panel there is a piece which has a curve inwards at the very bottom: curl this now (a good way is to fold around a cocktail stick, or very gently round the edge of a ruler). Fold up the glue tab.

The control panel is angled. Glue the top to the glue tab on the top piece, and the left hand side to the left side glue tab. Fold the bottom of the control panel down: the curve or bend at the bottom should curve to meet the lower rear panel (its glue tab should locate behind the panel). This lower rear panel folds down to join the opposite side: glue to the bottom of the control panel “skirt” and to the opposite side.



Pre-production, Mk 1

Bend down the rectangle on the middle front piece: this forms an equipment shelf.

Mk2, Mk3

Bend up the rectangle on the middle front piece, so that it is pointing directly forwards in what would be a horizontal position: this forms the bottom of the electrical equipment box.

Please note that the position or orientation of this electrical equipment box varies and it is difficult to be definitive about its location for early production runs of the Heron Crane or for export versions.

Fold down the front, glue the lower front (straight piece) to the other side. The middle piece is angled, so fold this down and glue the glue flaps to each side.

The next part of the front is bent back upwards to the vertical. **ONLY THE BOTTOM** part of this is glued to the sides of the driving console – *please note* that the upper glue flaps, set in from the sides, will later be glued to the driving console inner, already assembled.

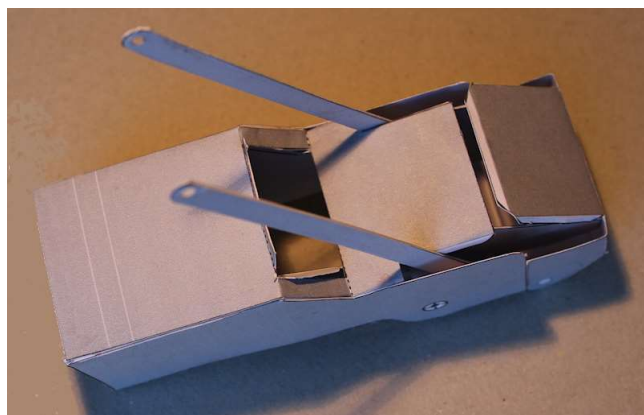
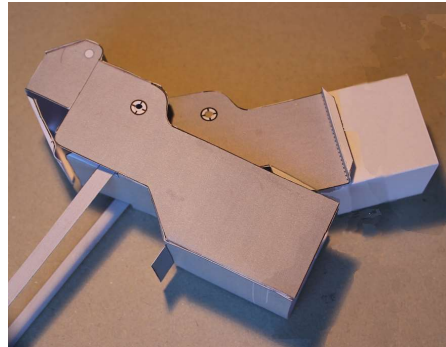
Extra Detail

A suitable rim for the printed control panel dial is provided as part **6-3**.

A representation of the Heron Controls are printed on the Driving Console. If you prefer, you can use a photo reduction of an actual Heron control panel, provided as part **6-1** on sheet **6**. Cut this out and glue on top of the printed controls. You can also cut out a suitable rim for the dial (part **6-2**) and apply this on top of the photo control panel.

Fixing the Driving Console Inner

The driving console inner is now fixed inside the driving console outer. Feed the small jib arms through the front top of the main driving console (outer). The front top of the main driving console folds down – used the glue flaps to glue this to the slanting front of the inner driving console. The lower slanting part of the inner console (which matches the slanting bit of the main console) has glue tabs to glue to the slanting part of the main console, and the vertical front of the main console above this joins to the vertical part of the inner console. You should have two “slots” in which the small jib arms can freely move.



The cut out flap in the front middle section of the driving console is folded down so that it is parallel to the bottom of the console. This forms an equipment tray.

Equipment Box

The electrical “distribution” box or control box is made from part **4-14** on sheet **3**. Note that the bottom is not included on this part. Fold down the sides, top and back, and glue using the glue tabs.

Please note that there were differences in the way that this electrical equipment box was designed and mounted between different production builds of the Heron Camera Crane.

Mk1, Mk 2, Mk 3

The electrical “distribution” box or control box is now glued to the equipment shelf (forward facing flap) so that the back is level with the driving console front.

Variations

The electrical “distribution” box or control box is fitted onto the equipment shelf using butt joints on the sides and the glue flap on the rear. The front of the box overhangs the equipment shelf.

In this version of the Heron Crane – an export version – the electrical equipment box *appears* to angled downwards below the “shelf” position. To achieve this, fold the equipment shelf forward and then down to match the angle at the sides of the driving console, then use this as the bottom of the equipment box, which is glued to it using the glue tabs provided.



Extra Detail

A number of electrical connections were made to this equipment box: at least three main connectors on each side.

These can be represented by stiff wire (for example, from paper clips) carefully cut and bent to the right shape, and painted. The cables are then made from thin string or from the insulation stripped from thin cables (such as one of the strands of a 25-way data cable).



Mounting the Jib

You need a cocktail stick trimmed to at most 48 mm long (make sure that the pointed ends are removed). The actual length required will depend on the thickness of your jib arms: the minimum length will be something like 42.75 mm. To help you, the maximum and minimum lengths are shown on sheet **6**.

Place the suitably trimmed cocktail stick through the jib mounting hole in the right hand side main driving console – this stick should go through the inner driving console and appear through the matching hole on the other. There should be sufficient bearing showing on either side to mount the jib arms.

Slightly flex the larger end of the right hand jib arm on the jib arm and ram housing assembly, and slip and glue the pivot holes at the end onto the cocktail stick bearing. Be careful not to get any glue onto the jib and console sides, otherwise you might glue the whole thing up solid.

Now slightly flex the larger end of the left hand jib arm, and locate and glue this onto the other end of the bearing (other side of the console).

If you are making a simple version of the jib (that is, not the correct width jib), you next glue the bearing covers (parts **5-7**, **5-8**) to the outside of the bearing: this covers up the bearing holes in the jib arms (a spare copy of each one is provided).

Control rod

If your Heron is to include the control rod from the jib bearing into the chassis, do not use part **5-8**, but use instead part **5-18**, as this includes a marker for the bearing for the top of the rod. Cut out some spacers (from part **5-20** on sheet **2**) such that the control rod will clear any nuts that you are going to add (see below).

Once the glue has dried, check that all the jib arms are free to move.

Extra Detail

Cut out the hexagonal bolt heads (from part **5-16** (a group of 48 bolt heads)) and glue each one individually to the bearing covers (end caps).

Control rod

If your Heron is to include the control rod from the jib bearing into the chassis, fold part **5-19** on sheet **2** back on itself and glue back-to-back. Slot the bottom end of this into the slot cut into the chassis, then use a piece of stiff wire or a sliver of cocktail stick to pivot the top end of the control rod onto the pivot added to the jib arm – if the jib arms elevate, this control rod must also be free to move.

Add the bearings from part **5-20** on sheet **2** to cover the end of the pivot.



Steering Wheel And Steering Gear

The Heron steering wheel is dished, which means that a number of pieces are needed for its assembly.

Carefully cut out parts **6-4**, **6-5** from sheet **5**. Glue these pieces back to back (the black sides should be visible).

If you want the steering wheel to be a more accurate representation, carefully trim the spokes (once the glue has dried) so that the spokes are no more than 1 mm wide.

Cut out the inner circle from pieces **6-6**, **6-7** (the steering wheel rims) and then cut round the steering wheel rims outside to free them up. (It's more difficult to cut out the middle if you have already cut round the outside.)

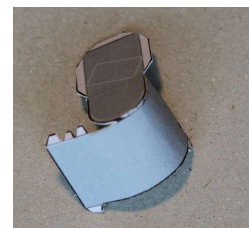
Glue the rims on the spokes to the underside of one of the steering wheel rims: the segments should be the same radius as the wheel rim, so they should fit. The net result is that the spokes of the steering wheel are dished. Glue the other rim to the underside of the rim assembly, so that black shows above and below. Straighten up the centre boss so that the centre is flat.

Cut out part **6-8** from sheet **5**. Roll up as tightly as possible – the short side is the height (here is one case for softening the card using the PVA glue!). Once this is dry, glue at right angles to the steering wheel rim at the end of one of the spokes. This forms a handle of the steering wheel, making it easier and faster to turn the Heron's wheels.

Extra Detail Cut out the hexagonal nuts (part **6-9** (a pair of nut shapes)) and glue in the centre of the steering wheel hub.

The steering wheel was angled, and was geared to the steering mechanism in a two-part hub assembly mounted on top of the driving console.

Part **6-10** on sheet **6** is the main vertical part of the steering hub: part **6-11** is the angled part which supports the steering wheel. Both of these parts assemble in a similar manner. Curve the part attached to the centre point of the curved ends to match the radius of the end, fold down and glue to the end piece (part **6-11** has two end pieces). Fold down the rectangular side piece and use the glue flaps to glue to the curved section. For piece **6-11** glue also to the other end piece: this looks a bit like a tube with one flattened side.



Glue part **6-10** to the top of the main Driving Console (outer part): the position is marked. Glue part **6-11** to the side of this, at an angle: again the position is marked.

Extra Detail Cut out part **6-13** (two bearings): glue one each end of the angled steering mounting/gear.

Add Steering wheel

Roll part **6-12** to form a tight cylinder. Glue this to the higher end of the angled steering gear, and then glue the steering wheel onto this. Take care to get the centre of the steering wheel, the shaft, and the centre line of the angled bearing all in line.

Mk 1 Steering Bearing

Cut out part **6-14** and glue to the top of the vertical steering bearing (the one fixed to the driving console). It is just slightly inset from the rim of the bearing.

Extra Detail Cut out part **6-15** (two bearings): glue both (one on top of the other) to the centre of part **6-14**: these form the end bearings of the vertical rod of the steering mechanism.

Mk 2/Mk3 Wheel Position Tell Tale

Glue the pointer (part **6-30** on sheet **6**) on top of the main steering column already constructed (part **6-10**) - there is a guide line to help you: this is the tell-tale to show the orientation of the rear wheels.

You can now optionally add a raised rim around this tell tale – it was actually under a glass cover. Carefully cut out the rim piece, part **6-31** on sheet **6**: it is probably better to cut out the inside part, then cut round the outside.

If you want to make a “glass” cover for the tell-tale, cut a piece of clear plastic to the size of the rim piece. Many items of supermarket food packaging include suitable rigid or semi-rigid clear plastic areas, but please completely clean the plastic before use. Cut out the circle of plastic, glue this in top of the rim already in place, then mount a second rim (part **6-32** on sheet **6**) on top. An extra rim (part **6-33**) is provided in case of any slip-ups.

Direction Controls

The direction control hand rests (or control quadrants) flare out of the sides of the top of the driving console. The parts are small (even at 1:12 scale) so most of the joints are butt joints.

The pre-production prototype Heron Camera Crane did not have the control quadrants but instead had long handles on the control levers (these were for direction of movement and speed of movement – the further forward or back, the faster the crane would move). This pre-production prototype crane also had a lever for braking. For production, the long levers were replaced by shorter levers surmounted by a spherical knob, and the brake became operated by a pedal. You need to select the appropriate controls to match the version you currently modelling.

Pre-Production Prototype – Lever control and Shot Card holder

Roll up parts **6-18**, **6-19** into cylinders and close the end caps over each end: these caps show you the size (diameter) that these cylinders need to be. Glue onto the console sides in the positions marked.

Parts **6-20** and **6-21** each consist of five parts: a bearing with protruding handles, a handle and end piece, and a spare handle and end piece. Cut out the bearing with the long ends. Wrap the bearing around the bearing attached to the side (as above) and then join the long arms together. Roll the handle along the long side to form a cylinder (diameter shown by the end cap) and glue this cylinder over the end of the handle. Add the end cap.

The shot card holder for pre-production prototype Heron was mounted on the right hand side just below the control knob, as shown in the photograph alongside. Cut out piece **6-24** on sheet **5** and fold up to make a tray. Glue to the side of the driving console below the lever controls and at an angle upwards.



This prototype version of the Heron Camera Crane had a hand operated brake. The lever for this was mounted in the middle of the back panel of the driving console. Part **6-25** on sheet **5** comprises four pieces – left and right hand side of the lever, handle and end cap. Glue the angled lever parts together, fold up the two mounting plates and fold up the two curved side pieces (one on each half lever). Fold down the long rectangle and glue over the curve of the quadrant: the wrong side of the card will be seen: you need to colour this exposed card black.

Glue, using the rectangular mounting plates as glue tabs, to the middle of the rear of the driving console. Roll up the handle, glue over the top of the lever and add the end cap.

Production Herons - Knob Control

All production models of the Heron Camera Crane had knob-based control levers and foot operated brakes.

The knobs on the levers were positioned just above a hand rest or quadrant: the control was greater as the knobs could be pushed with the hand resting on the quadrant, giving a greater degree of finesse.

Before attempting to make the angled control hand rests or quadrants, cut out the red areas on parts **6-16** and **6-17** on sheet **6**. Both these parts are small and flimsy, so take great care in cutting out these pieces. Please note that the quadrants are “handed” so that the glued joint on each one faces to the front of the crane (and so is less obvious).

Fold down along the line at each end of the top of the quadrant (the part with the slit) and then fold down along the side of the “triangular” part (it’s actually a quadrilateral). Curve the top around the curved side piece and glue. If you are using PVA glue, this will help to strengthen the piece. Fold down the glue tab (white part) and glue both to the bottom of the side and to the straight bottom part of the other end “triangle”.



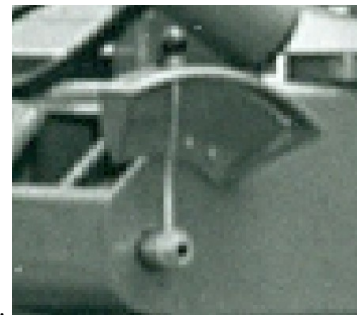
In the model you are able to see both sides of this control quadrant. You may like to touch up the inside of the control quadrant with a suitable grey colour acrylic paint (acrylic paint will help stiffen the part. Alternatively, you can use some extra parts as detailed below.

Extra Detail

This is not so much extra detail as extra colour. You have two alternatives. Parts **6-37** on sheet **6** provide an inside to the main quadrant. Cut out and glue inside the quadrant. For a more complicated solution, parts **6-39** on sheet **6** are a smaller mirror image of the quadrant, with the folds UP rather than folds down. Carefully cut this out and glue inside the quadrant sides, top and cheek pieces. Given the small size of these parts and the thickness of the card that you are using, you will need to trim the additional parts to size before gluing.

Please note that the additional card will make the quadrant thicker than is strictly correct for the scale.

When the glue has dried on these two quadrants and side cheeks, glue the quadrant onto the sides of the driving console. *Please note* that only part of the glue tab is glued to the side – the rest of the quadrant stands proud of the side of the console top, as shown in the real Heron photograph. There is a marker on the console side to help you locate these pieces.



Roll up parts **6-18**, **6-19** into cylinders and close the end caps over each end: these caps show you the size (diameter) that these cylinders need to be. Glue onto the console sides in the positions marked.

Parts **6-22** and **6-23** each consist of two parts: a bearing with protruding handles at each end with a circle for the knob, and a further circle to mount at right angles across the first one.

Note that all the black circles have slots in them so that the extra piece can be slotted in during assembly. Cut out the bearing with the long ends.

Wrap the bearing around the bearing attached to the side (as above) and then join the long arms together.



Pass the long ends through the slit in the hand rest /quadrant – you may need to slightly kink this, as was done on the actual Heron Camera Crane itself. Add the extra circle at right angles to the circle on the long piece to get a three dimensional effect.

Extra Detail

Carefully add a blob of glue on the black knobs at the end of the levers to make a sphere. When the glue has dried, paint the spherical knobs black.

Making a more substantial hand control

Once you have the bearings in place (parts **6-18**, **6-19**), you can make the knob controls from round headed dressmaking pins, available from the haberdashery section of your local supermarket. Using side cutting pliers, trim the pin to length, then insert the pin through the slot in the top of the hand rest/quadrant, and insert the cut end into the bearing. You may have to kink the pin shank, as was done on the actual Heron Camera Crane itself.

Practical controls

To go one stage further, you can make the bearings **6-18** and **6-19** only half the length, and make sure that the centre of the cylinder is clear. You can now insert a suitably straightened and trimmed paper clip through holes prepared through the bearings, and glue to the paper clip the ends of the round headed

dressmaking pins used for the knobs. Now, if you move one side lever – and it should move – the lever on the other side will move too.

Brake

You do not do this if you have added a hand brake (as described above). Otherwise, for all the production Herons, part **6-26** on sheet **6** provides the footbrake. Cut this out and fold the “axle” part down the fold down line: glue the two halves together and glue the shaft to the underside of the pedal shaft. Of course, the bearing should be a rod, so you may want to substitute the long bearing flat piece for a suitably trimmed cocktail stick.

Part **6-27** has two parts – a strengthener under the pedal shaft and a pedal support. The strengthener – the long rectangle - has its edge glued along the centre of the bottom of the shaft (so it is at right angles to the shaft, and makes a sort of **T** shaped girder. The piece with the notch is glued under the pedal, the notch engaging with the underside of the shaft.

Part **6-28** also has two parts (which are the same shape as one of the parts from **6-27**). These parts are used to support the ends of the horizontal bearing or shaft which goes across the width of the inner driving console. The position of these supports are marked. Glue the supports into position, and then glue the brake shaft into these supports.

Extra Detail If you have used a cocktail stick for the brake shaft, you can mount the shaft into holes by the mounts (the centre of the cross shows the centre of the bearing. Now your brake pedal is free to move. You should tension this with a rubber band anchored at one end on the shaft, the other on the driving console inner part.

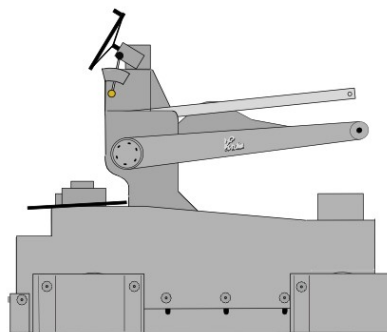
Adding the Driving Console to the Chassis

The driving console module fits directly in front of, and abuts right up to, the chassis width or “stretcher”. There are glue tabs on the inner driving console for this. The jib arms point towards the front of the crane (the rounded cable guards assembled earlier).

The bottom of the Driving Console should align with the bottom of the inside chassis at this point, and the markers for the location of the inner chassis should align.

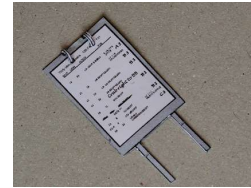
You **MUST** make sure at this stage that everything is square: that the console front is at right angles to the inner sides of the chassis pieces and that the jib arms can swing down between the chassis “arms”.

Check on progress: the diagram below shows how a Mk1 Heron should look at this stage of construction:



Adding the Shot Card – Mk 1, Mk 2, Mk 3

The shot card is part **6-35** from sheet **5**. There are two supporting struts, part **6-35**, which are glued behind the struts already sticking out of the bottom of the shot card. *Please note* that the shot card holder and the shot card are one single piece.



Two small strips (included with part **6-35**) can be formed into a circle, and these are glued over the top of the shot card holder. These represent the rings of a ring binder. The rings should locate in the rectangular imitation punch holes at the top of the shot card.

Glue the bottom of the support struts to the front of the driving console, such that the bottom of the shot card is clear of the top of the driving console. Bend the shot card backwards between some ten and fifteen degrees.



Extra Detail 1 A copy of the Shot card is offered as part **6-38** on sheet **5**. Place the top holes in the card through the rings and on top of the printed shot card, so that your card masks the back connection of the rings and overlaps the original card..

Extra Detail 2 You can make up your own shot cards and place them through the rings and on top of the shot card provided, so that your card masks the back connection of the rings. Remember that you may also need to make a suitable shot card for the cameraman – and it may have different details!

Adding the Accelerator

If you are modelling a Mk 2 or Mk 3 Heron Camera Crane, you can now add the foot pedal accelerator.

Make a slot in the main foot treadle, This is marked as a grey line and to help you find it, it is pointed to by a green arrow.

Cut out part **6-29** from sheet **6**. There are two ends to this – a short one and a long one. Insert the short end into the slot in the main foot treadle and glue underneath. Fold down the longer end so that it is vertical, and glue to the treadle.

Inner Chassis and Ram

Inner Chassis

The inner chassis provided a support for the electric motor and associated pump that pressurised the hydraulic reservoir, and provided, by means of a lower extension, the bottom mounting for the jib arm hydraulic ram.

Unfortunately, even at 1:12 scale, the inner chassis struts are quite small. Care is needed in the assembly.

It is strongly recommended that you do a “dry run” with this piece before final assembly – that is, try all the folds and match to the associated photographs and illustrations before you try to glue it all together.

Before you start on this piece, decide how you are going to pivot the jib hydraulic ram. You can use a suitably shortened cocktail stick(which needs a relatively large pivot hole), but you can equally well use part of the wire used to mount Christmas Tree decorations. This wire is easy to work, and over the short distance needed for the ram pivot mount will certainly be strong enough. The holes needed for this wire are very small, and can be made with a normal size pin (you may need to waggle the pin round a bit just to enlarge the hole slightly).

Cut out part **7** from sheet **2**. There are three main parts, all attached.

1. Left hand inner chassis
2. Right hand inner chassis
3. Lower ram support and from cable guard.

Cut out the separator between the lower ram pivot pieces (the red discard rectangle) carefully cut along the cut lines, and make the pivot holes for the lower ram mounting.

The left and right hand inner chassis parts are joined by a distance piece at the rear, but are separated by a cut line that runs from the front to this distance piece,

On each side, there is a “T” shaped cut to separate out the rear platform and the forward pointing main strut. The shape of this cut is noted by user help each side of the chassis.

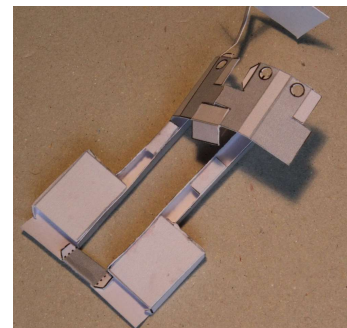
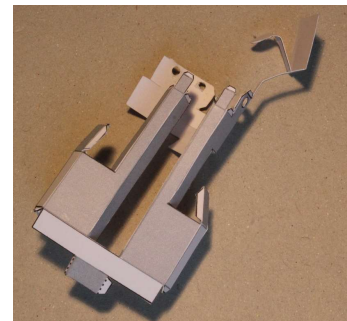
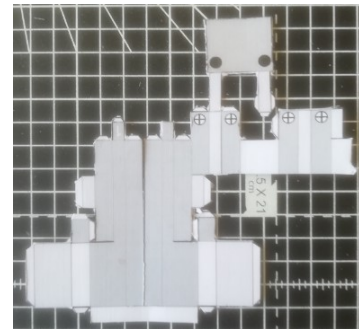
Bend down the inner faces of the right and left hand side inner chassis thin struts.

Bend down the outer faces of the right and left hand side inner chassis. *Note* that the right hand side includes the pieces for the lower part of the inner chassis (the ram mounting) and the front cable guard. Bend down the bottom part of each side strut from the outer face, and glue to the bottom of the inner face to make a rectangular tube.

Bend down the sides of the main rear platform.

These are white, as they are in effect glue tabs to glue to the left and right main chassis pieces already assembled. Fold in the front parts of these rear platforms and glue to the top and bottom of the main platform, and with the front glue tab folded up, glue inside the thin struts pointing forwards.

Bend down the rear rectangle: this is white, as again this is a glue tab to glue to the front of the driving console. Bend down again (so that it comes up on the inside with the grey side visible the small rear rectangle. This is glued back to back to the rear piece, and then glue tabs glue to the inner faces of the left and right inner chassis parts. This acts as a strengthener.



The lower ram pivot support has one side already joined to the right hand side front inner chassis spar. Fold down the bottom and then fold down the inner side of this: the upper part of the ram support is glued inside the main thin spar. The top of the lower mounting can now be folded down and glued to the flap to make a rectangular tube: the front of the main spar can be folded down to join this and close the end.

The two front ram pivot supports are connected by a strut: bend this down (and bend down around this to glue back to back the stiffener piece (“fold down” shown on sheet **2**). The left hand side of the lower ram pivot strut is a mirror image of the piece already made. Fold the two side pieces down from the bottom (this is a lighter grey than the main body colour) and glue the top extension pieces inside the matching left hand strut side pieces. The lighter grey top can be folded over and glue to form a rectangular tube, and the front of the main spar is now folded down and glued in position.

The front of the two ram supports are now folded down and glued in position, The cable guard supports are folded up, glued to the front: the cable guard is then folded down and glued to the struts. The reason for this “**Z**” type fold and glue is to make sure that the printed surfaces are showing here they should.

Hydraulic Reservoir

Part **7-3** on sheet **1** is a straightforward cylinder. Roll the side of the cylinder to a smooth curve, then glue to the two end pieces to the side to complete. The cylinder then rests on the inner chassis, as far towards the back as possible.

Different diagrams and pictures of the Heron Camera Crane show this cylinder in some different positions. Vinten’s public brochures do not show it in a right elevation diagram: internal rough sketches show it proud by nearly half its diameter. Generally, from most photographs, you should be able to see the top of the cylinder above the chassis side pieces, but it has got to miss the jib arms when the crane is fully craned down. The default size of the cylinder should allow it to sit on the inner chassis in front of the driving console and just appear above the side sheets of the main chassis.

Part **7-4** on sheet **1** is a simple folded shelf which you can place in the inner chassis underneath the reservoir to raise it up somewhat. *You should not need this.*

Ram

For the Mk 2 and Mk 3 Heron Camera Crane, you may want to consider using a suitable telescopic drinking straw for the hydraulic ram. This will be somewhat oversize, but it certainly will look the part.

Some drinks cartons come supplied with a telescopic drinking straw rather than one with a bendy end. The telescopic straw can be carefully trimmed and the card mounting pivots can be glued to each end.



Make the holes in the top and bottom cylinder mountings (part of the parts **4-6**, **4-7**), then cut them out. Glue the parts with the pivot holes back to back, fold up the semicircles and glue to the appropriate cylinder end: part **4-6** goes at the bottom of the larger cylinder, part **4-7** on the upper cylinder (thinner cylinder) (the piston rod). You may need to use a cyanoacrylate (a “superglue”) to stick the card to the plastic.

Using card-based cylinders

You will need to make the hydraulic ram from rolled card.

Carefully cut round and discard the centre part of part **4-2** on sheet **1**. You can now cut round the outside. This is a small, thin, flimsy piece, so take care!. Cut out the cylinder base **4-1**.

To make the cylinder, cut the card to the correct full length of the cylinder, but leave as much card as possible on either side – you should have at least 15mm extra card that you can use. Roll the cylinder to a very thin cigarette-type shape. When it unwinds, cut the cylinder to size, re-roll and glue the edges with a butt joint. Add the base to the end marked with the darker band, and the annulus (for the top) to the other (no extra band).

In a similar manner, cut part **4-4** to the correct length but over width, roll tightly without creasing, unwind, cut to size then roll together and glue as a butt joint. Part **4-5** is the end piece (and goes at the opposite end to the darker band) and it provides a guide to the diameter of this cylinder (actually, the piston rod of the assembly).

Make the holes in the top and bottom cylinder mountings (part of the parts **4-6**, **4-7**), then cut them out. part **4-6** goes at the bottom of the larger cylinder (the end with the darker band). The two pivot pieces are at the outer end of the rectangular mounting: there are two circles which glue to this, and which then should fit inside the bottom of the bottom ram cylinder. The two pivot arms keep the ram cylinder in its correct orientation.

For the top mounting, the simplest method is to glue the arms with the pivot holes back to back, fold up the semicircles and then glue part **4-7** onto the upper cylinder (thinner cylinder) (the piston rod), at the end with the slightly darker band. An alternative piece for part **4-7** is supplied, and is clearly marked as such: this is assembled in a similar way to the bottom ram mounting, as described above. The two pivot pieces are at the outer end of the rectangular mounting: there are two circles which glue to this, and which then should fit inside the top of the piston “cylinder”. The two pivot arms keep the ram piston in its correct orientation, but is considerably more difficult to insert and align!

Mk 1 Alternative

The Mk 1 had a much thinner piston rod than the Mk 2 or Mk 3: the diameter of the piston rod is shown in the red (discard) centre of part **4-10** on sheet **1**. If you find it difficult to roll the card to this small diameter, you can substitute a rod of approximately 2.9 mm in diameter. A cocktail stick is probably too small in diameter: a sandwich skewer or a scent diffuser reed would possibly be a suitable substitute. Paint the rod a silver (or light grey) colour.

The top pivot in this case needs to be made from part **4-11** on sheet **1**. Make the holes first and then cut out. Glue the parts with the pivot holes back to back, then glue the spigots onto the side of the piston rod. The long “tongue” can then be glued around the top of the piston rod.

Extra Detail Both parts **4-6** and **4-7** include a band which can be wrapped around the cylinder end where the pivots are mounted. These cover the bands that are darker.

Simple Version

The Ram used in all marks of the Heron Camera Crane had prominent hydraulic couplings or hose entries to the top and bottom of the jib elevation ram. Part 4-12 from sheet 1 is folded up and glued (using butt joints – no glue tabs are provided). The hose entry is then glued to the top end rear of the jib elevation ram cylinder such that it points downwards.

The hydraulic hose itself can be made from a suitable thickness piece of string, coloured black using a broad (thick) black felt tip pen.

Glue one end of the hose into the downward pointing end of the hose connector: the other end feeds into the hole already made halfway down the top of the right hand side main chassis piece.

Fuller Version

For a fuller version, cut parts 4-13 from sheet 1 and fold it up and glue (using butt joints – no glue tabs are provided).

This hose entry is then glued to the bottom end of the jib elevation ram cylinder such that it is on the rear of the cylinder: this bottom hose connector points upwards.

Glue one end of the hose into the upward pointing end of the hose connector: the other end feeds into a hole (position marked) on the front inside of the right hand side main chassis piece.



Extra Detail

The card-based hose connectors are square in cross section (although with care, an approximation to a circle can be achieved), and do not clearly represent to hose couplings.

The hose connectors can be made using any available small brass or copper tubing, with wire twists used to represent various parts of the coupling, especially for the later marks.



Alternatively: The hose connector can be made from the conductor wire of 3-core twin-and-earth household electrical socket connection cable. Strip, cut and bend to size.

The hydraulic hoses themselves are best made from the insulation provided on electrical wiring. In some cases, it is still possible to acquire lighting circuit twin-and-earth connection cable where the “neutral” core/wire has black insulation. Otherwise, the insulation has to be stripped from black bell wire or even modern data cables. Strip the insulation from the bell wire and check that the insulation does not try to curl itself up – it may need a bit of stretching.

Glue one end of the hose into the downward pointing end of the top hose connector: the other end feeds into the hole already made halfway down the top of the right hand side main chassis piece.

The lower hose glues into the upward pointing end of the bottom hose connector: the other end goes into the main chassis inside side sheet near to the bottom. A suggested entry point is marked on the chassis side.

Mk 2 /Mk 3 Jib Support Strut

You only need to make this part if you are building a Mk 2 or Mk 3 Heron Camera Crane. It's mentioned here as it is attached to the main lower ram pivots, so it is next in sequence.

The jib stay (or strut, or prop) was used to keep the jib arm up (approximately mid travel) to allow for some maintenance of the otherwise hidden bits of the Heron mechanism.

The main strut itself is part **4-8** on sheet **1**: cut out and fold in half longitudinally. The fold is approximately a right-angle.

Part **4-9** is a collection of five (5) small parts. The mounting is the part with the pivot holes in the two cheek pieces: make the holes, cut out the piece, and glue to the end of the stay that does *not* have a light coloured band.



The other end of the stay has a metal stay: this is represented by the piece of card with a “V” cut into it. *Note* that this piece has a fold down line across the middle. Fold the piece to make a right-angle fold, then glue to the forked side.

The stay is locked in position over the lower ram cylinder by means of a rod through a metal strap. The strap is one of the components of part **4-9**. Find the centre of the strap, and, using this mark, glue the strap over the light coloured bands near the top end of the strut (the end with the notches (<) cut into it).

Extra Detail Make a locking pin from a piece of thin wire, and after assembly of the ram and the strut (see below), add the wire through one end of the locking strip, under the ram, and through the locking strip on the other side.

Assembly, Inner Chassis and Ram

Pre-production Prototype and Mk 1

The lower cylinder mounting (the larger one) is placed between the two “legs” of the inner chassis assembly. The ram pivot goes through one of the support struts (the rectangular tube), through the lower ram pivot mounting at the end of the cylinder, then through support strut at the other side. Parts **4-6** and **4-7** include some card washers that you can use to space things out.

Mk 2 and Mk 3

The jib stay is laid on top of the jib elevation ram, so that the legs of the stay lie outside of the mountings for the ram cylinder. The straps near the top of the stay drop vertically down by the sides of the ram cylinder.

The lower cylinder mounting (the larger one) is placed between the two “legs” of the inner chassis assembly. The ram pivot goes through one of the support struts (the rectangular tube), through the lower ram pivot mounting at the end of the cylinder, then through support strut at the other side. Parts **4-6** and **4-7** include some card washers that you can use to space things out.

All Versions

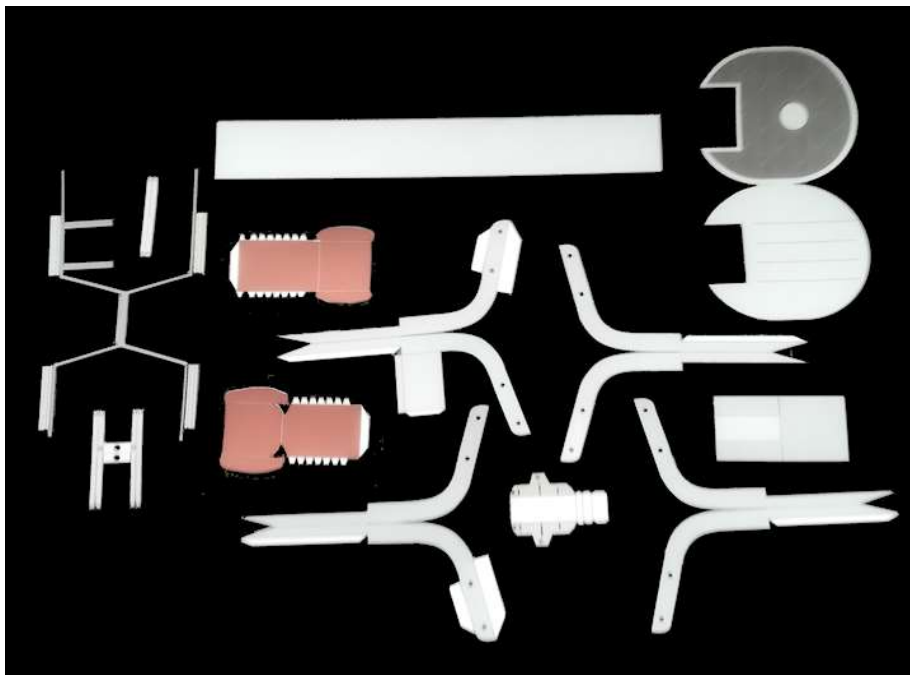
In the jib assembly, the upper cylinder mounting (the smaller diameter cylinder, actually the piston rod) is placed inside the jib “hump”. The upper ram pivot goes through one side of the pivot mounting at the top of the hump, through the upper ram pivot mounting at the end of the cylinder, then through the other side of the pivot mounting at the top of the hump.

Insert the smaller cylinder inside the larger cylinder, and push so that it is fully inserted. You can now offer up the inner chassis to the main assembly. The white areas at the rear and to the sides of the inner chassis are glued to the front of the driving console and to the sides of the left and right main chassis assemblies: the positions are lightly marked.

Check that the jib moves freely up and down, with the upper ram cylinder moving in and out of the lower one, and that both parts of the ram assembly pivot as the jib moves.

Front Platform

Main front platform parts cut out ready for assembly:



Front Platform Struts and Base

The front platform is part 8 on sheet 7, the two halves make up the top and bottom of the platform. Fold the platform in half longitudinally, and glue back to back (top part to bottom part, printed sides outwards). Keep the platform completely flat while the glue dries.

There are two outer struts parts 8-1 and 8-2 on sheet 7) and two inner struts (parts 8-3 and 8-4) to support the front platform: the positions of these are marked on the underside of the platform.

Cut out each strut, make the pivot holes in each half of each strut, then fold each strut in half longitudinally, and glue back to back. Keep these struts completely flat and uniform.

Now glue the outer right hand strut to the outer right hand marker on the underside of the platform: the raised side of the strut should fit inside the cut out in the rear of the platform. The rectangular piece sticking up on the side of this piece folds down to meet the outer strut on the left hand side: the fold down the length of the rectangular flap makes the front of this raised step on the platform. Glue the left hand side outer strut to the bottom of the platform and glue the glue flap on the raised section to the side of the strut.

The two inner struts glue into position the base of the platform, and glue to the underside of the raised part of the platform.

The “skin” of the front platform strut(s) is part **8-5** on sheet **7**. Glue flaps are provided on the upper and lower back straight parts of the outer jib struts: fold these down to be at right angles to the struts themselves. Glue an end of part **8-5** as a butt joint to the rear edge of the raised platform: part **8-6** on sheet **7** is a part to help with this: glue this under the top of the raised platform and ensure that at least half of this is showing, then glue the skin on top of this, making sure that the edges of the skin and the raised platform butt up against each other.

Carefully roll the strut skin piece and glue to the struts (as a butt joint) as you go round this inside curve: glue to the straight side glue flaps of the front part of the outer struts (it is a butt joint on the inner struts). You are advised to let this glue dry thoroughly before attempting the next part!

Carefully roll the skin over the rounded top of the strut, then fold down to glue on the rear straight glue flaps on the outer strut pieces (again, it is a butt joint on the inner struts). Go round and underneath the struts, gluing as you go (butt joints) and up the slop to the form of the platform.

The “skin” should be long enough to have some overlap at the front of the platform. Seal the joint with glue and trim off the excess “skin” to form a round front to the platform. Leave to dry.

Camera Mount Column

Carefully roll, along the long side, the large rectangle from part **8-7** on sheet **7** to form a cylinder: the two long sides join as a butt joint. To help you with this, a glue tab is provided as the other part of part **8-7**. Glue this tab to the inside of one of the long sides of the cylinder, then when the cylinder is rolled, glue the other end to this glue flap and to the long side of the cylinder. Try to get a seamless joint.

This cylinder is glued centrally to part **8-7** from sheet **7**: this is a small “plinth” at the bottom of the camera column. Now glue the plinth and column to the top of the front platform: the position is clearly marked.

Cameraman Foot Pedals and Seat Supports

Pre-production, Mk1, Mk 2

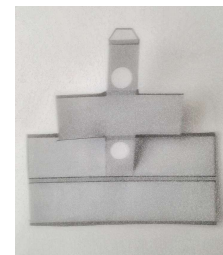
The pre-production, Mk 1 and Mk 2 Heron Camera Cranes had one single pedal for the cameraman: this clamped the seat in position. Although the cameraman seat could pan round using the central column as its pivot, this motion was achieved by the cameraman pushing on the front platform. The cameraman’s seat could easily be pushed around, away from the axis of the camera and viewfinder, if there was, for example, a high shot looking down onto the scene. In this case, the crane was elevated to full height, the camera support was elevated to full height, the cameraman could swing the seat away and stand on the platform to operate the fully panned-down camera.

Cut out part **8-9** from sheet **7**. Make sure that you cut the two small slots towards the bottom near to the edges. Create the bearing holes in the two pieces of part **8-16** on sheet **4**, and then cut these supports from the card. Insert these into the slots in part **8-9**, bend back the white glue flaps and glue. Roll part **8-9** (the bottom column wrapper) to form a cylinder. Wrap around the lower column and check the size: if it is a very loose fit, trim along the long side of the cylinder and offer it up again (*Note: if you have to remove more than a very small amount, you may have to reposition the two bearing pieces inserted earlier*). When satisfied, glue the long edges together with a butt joint. The column wrapper should be free to rotate around the camera support column. Make sure that the two full width markers are at the front.

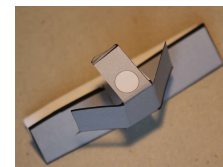


The mount for the single pedal is part **8-17** from sheet **7**. Punch the hole for the mounting, cut out part **8-17** and fold the two quarter circle parts down from the side piece. Carefully roll the front part to curve over the front of the bearing “cheek” pieces. Glue this bearing to the two bottom markers on the column (these should end at the front centre). Two extra cheek pieces are provided, firstly to make the bearing thicker and more like the true mounting, secondly to make a stronger model bearing.

The pedal is part **8-18** from sheet **7**. There is the top of the pedal, two under-pedal pieces and a fold-up cuboid mounting block. Pierce the mounting holes first then cut out the part, taking care to identify which are the cut lines and which are the fold lines.



Fold the front and rear underside down and glue back-to-back to the top pedal piece. The side piece folds down at right angles to the top: all other folds are right-angle fold-downs. The glue flap at the end of the “cross” glues under the top of the pedal, in the space between the already folded and glued bottom parts. The two side pieces fold down and are glued to their mating side and bottom parts: two glue flaps have been provided to help you.



Part **8-19** from sheet **7** is the bearing for the pedal: roll this into a tight cylinder, thread through the cuboid support of the pedal and glue to the bearing on the column.

The next part is the flange mounted one quarter of the way up the cylinder. Again, this is a two-part piece, with parts **8-20** and **8-21** from sheet **4** glued back to back. This should then slip over the camera column and is glued on the marker line – make sure that the nuts are showing on the top.

Extra Detail A collection of spare nuts are provided as part **8-22** on sheet **4**. Cut out the individual nuts and glue in position on the markers on the top of the flange.

The next item is a clamp housing and knob. This is part **8-23** on sheet **5**. The sides, top and bottom fold down, and glue, using butt joints, the sides, top and bottom together. Glue to the side of the column in the position marked above the flange.

Extra Detail The knob is quite prominent. Extra copies of the knob are provided (part **8-24**) to make the knob thicker. Slip a piece of card behind the knob to make it stand away from the housing. The knob is actually black, and a suitable dark coloured knob is provided as part **8-25** on sheet **5**: use this as the final layer for the knob.

The cameraman's seat mountings are parts **8-26** and **8-27** on sheet **7**. The cheek pieces fold down, and the front (with cut out semicircle) is rolled around the front of the cheek pieces and is glued with a butt joint to the bottom of each cheek piece. The mountings are glued to the column on the marks provided: *note* that the rear mounting is *lower* than the front mounting.

If you want to make the Heron a more accurate model, glue the seat mountings to the column with just the rear of the cheek pieces and the end of the semicircular cut-out – do not glue completely round the front. The complete front will help you get the side pieces in the correct position, but can be cut away later.

Extra Detail

Extra copies of the side cheeks are provided (part **8-28**) to make the bearings for the chair support thicker and stronger. If you use these, you can then carefully cut away the front (rolled) part of the bearing which runs across the front of the column, creating the gap between the cheek pieces which then matches the Heron construction.



Cap this column with part **8-11** (the bottom camera mount cylinder top seal).

Mk 3

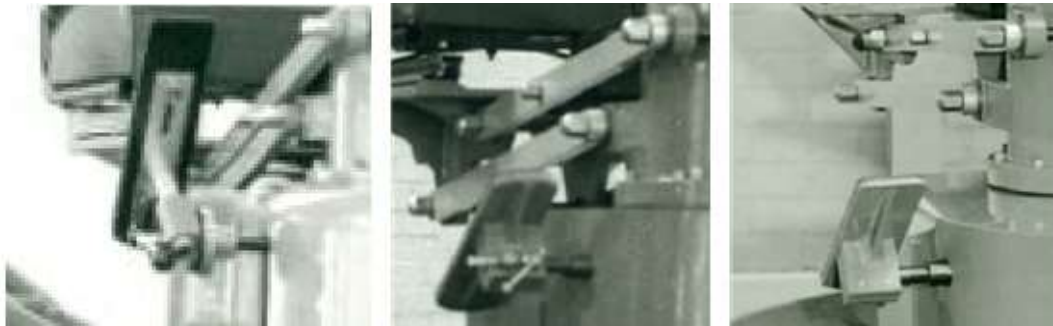
This later version of the Heron Camera Crane was developed to cope with changes in the technology of the studio television cameras. Whereas the old black and white cameras were focused by moving the pickup tube within the body of the camera, this was totally impractical with the early colour cameras, which used three – or four – pickup tubes with the image split using internally mounted dichroic mirrors: and because of colour distortions introduced by individual lenses, the old four lens turret soon was replaced by remotely operated zoom lenses. The cameraman now had his hands full – literally – with zoom lens zoom and focus controls, as well as camera pan and tilt.

The Heron Camera Crane elevation control, previously a twistgrip control on an arm which replaced the typical panning handle on the pan and tilt head, became a foot pedal. A foot pedal was also used to rotate the cameraman's seat: *note* that only the seat moved: the camera pan function was still a manual operation under the direct control of the cameraman.

The various hydraulic controls are contained in a unit which pivots round the central camera support cylinder. Cut out part **8-13** from sheet **4**. Make sure that you cut the two small slots towards the bottom of the rear flap. Create the bearing holes in the two pieces of part **8-16** on sheet **4**, and then cut these supports from the card. Insert these into the slots in the back pieces of part **8-13**, bend back the white glue flaps and glue. The front and sides are one continuous piece of card, folded from the very front of the top and bottom pieces: curve the front to match the curve of the top and bottom parts, and glue to the top and bottom. Glue the side pieces. Fold down the rear and glue.

Parts **8-14** and **8-15** on sheet **4** are the top and bottom “bearings” for the crane elevation and chair pan control unit. Cut these out and stick onto the top and bottom of the unit around the mounting holes.

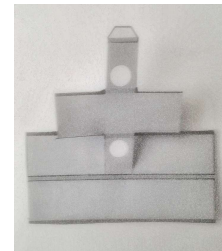
There were at least three different ways of mounting the pedals on the elevation and pan control unit: a long pole into a clamp, a short block to a clamp, and a short block permanently clamped to the bearing:



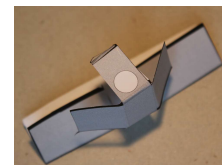
The different mounting methods required a somewhat different action on the part of the cameraman to operate the elevation or pan control. The instructions below deal with one variant: the short block to a permanent fixture.

The pedals are parts **8-29** and **8-30** from sheet **4**. Both pedals assemble in the same way.

There is the top of the pedal, two under-pedal pieces and a fold-up cuboid mounting block. Pierce the mounting holes first then cut out the part, taking care to identify which are the cut lines and which are the fold lines.



Fold the front and rear underside down and glue back-to-back to the top pedal piece. The side piece folds down at right angles to the top: all other folds are right-angle fold downs. The glue flap at the end of the “cross” glues under the top of the pedal, in the space between the already folded and glued bottom parts. The two side pieces fold down and are glued to their mating side and bottom parts: two glue flaps have been provided to help you.



Part **8-31** from sheet **4** provides the two bearings for these pedals: roll each one into a tight cylinder lengthways, thread through the cuboid support of the pedal and glue to the bearing on the column.

Other mountings

You can model one of the other types of mounting for these controls.

The intermediate type of mounting for the pedals follows the same construction method as for the later block mounted pedals described in full above, but you need to fashion a clamp handle. Part **8-35** from sheet **6** provides a knob and a shaft.

For the first type of mounting – the pedals on a long shaft - two free-standing pedals are provided: these are parts **8-32** and **8-33** from sheet **4**. The bottom folds back over the top and the top and bottom are glued back to back. The long rods can be made from part **8-34** from sheet **4**, roll the card lengthways tightly to make a cylinder: the cylinder is glued to the bottom of the pedal. Part **8-31** from sheet **4** provides the two bearings for these pedals: roll each one into a tight cylinder lengthways, glue into the bearing markers one on each side of the hydraulic control unit, and then glue the other end of each part **8-34** to the upper topside of each protruding bearing. (Alternatively, you can use cocktail sticks cut to size for the various rods and bearings.) The clamp is made from part **8-36** from sheet **6**: this provides a knob, shaft and a wrapper to mimic the clamp itself.

Completing the entire column

Roll part **8-10** (the Mk 3 bottom column wrapper) to form a cylinder. This sits above the pedal hydraulic assembly. Wrap around the lower column and check the size: if it is a very loose fit, trim along the long side of the cylinder and offer it up again. When satisfied, glue the long edges together with a butt joint. This column wrapper should be free to rotate around the camera support column. Make sure that the join with the two half-width markers is at the back.

The cameraman's seat mountings are parts **8-26** and **8-27** on sheet **7**. The cheek pieces fold down, and the front (with cut out semicircle) is rolled around the front of the cheek pieces and is glued with a butt joint to the bottom of each cheek piece. The mountings are glued to the column on the marks provided: *note* that the rear mounting is *lower* than the front mounting.

If you want to make the Heron a more accurate model, glue the seat mountings to the column with just the rear of the cheek pieces and the end of the semicircular cut-out – do not glue completely round the front. The complete front will help you get the side pieces in the correct position, but can be cut away later.

Extra Detail

Extra copies of the side cheeks are provided (part **8-28**) to make the bearings for the chair support thicker and stronger. If you use these, you can then carefully cut away the front (rolled) part of the bearing which runs across the front of the column, creating the gap between the cheek pieces which then matches the Heron construction.



Cap this column with part **8-12** (the bottom camera mount cylinder top seal).

Camera Pedestal

Roll part **8-37** from sheet **7** lengthways to form a smooth cylinder, and join the two long sides together using a butt joint. Part **8-38** from sheet **7** can be glued inside along the length of the seam to make it more secure.

Insert the cylinder through the hole in the top of the cylinder already fixed on the front platform (that is, put it through part **8-11** (or part **8-12**). It should be a tight sliding fit.

The cylinder is completed by adding part **8-39** from sheet **7**: this is the plate on which the camera pan and tilt head is to be mounted. Only one of the plates is needed: the others are there to allow you to match the scale thickness of this part.

Fixing the Front Platform to Jib

The front platform locates between the jib main arms and the parallel motion arms. Cut a cocktail stick to an appropriate length: this is the width between the extreme outer edges of the jib arms with the front platform located between them. There should be enough clearance for the front platform to move freely. Pass the cocktail stick through one jib arm, through the *lower* of the holes in the front platform, then through the main jib arm on the other side. Double check the movement of the front platform: it should drop freely. Glue the ends of the cocktail stick to the jib arms, and then cover with the front main jib arm outer bearings, part **5-17** from sheet **4**. You should only need two of these, but four are provided – just in case.

Cut another cocktail stick to the width between the extreme outer edges of the parallel motion (upper) arms with the front platform located between them: this should be less wide than the previous one! Pass the cocktail stick through one parallel motion (upper) arm, through the upper of the holes in the front platform, then through the parallel arm on the other side. Double check the movement of the front platform: it should continue to move freely as the jib is raised and lowered. Glue the ends of the cocktail stick to the parallel motion arms, and then cover with the front bearings (these are part of parts **5-12** and **5-13** from sheet **4**):

Camera Pedestal elevation

This was manually operated by a lever and controls mounted on the rear of the front platform support. There are a number of small parts involved, so for this model, the controls have been made representational rather than accurate. The aim is to create the correct “feel” for this part, rather than achieve absolute dimensional accuracy.

Pre-production, Mk 1

The hydraulic valve and associated paraphernalia was mounted directly on top of the front platform support.

Part **8-40** from sheet **7** folds up into a rectangular box. Glue this centrally on the top of the front platform support.

Roll one of the bearings (part **8-40** from sheet **7**) into a tight cylinder, glue on the left hand side on the valve, and cap with a matching end cap.



The valve lever is three separate items in part **8-40** from sheet **7**. *Note* that all the black circles have slots in them so that the extra piece can be slotted in during assembly. Cut out the two knobs and handles and join these together back to back. Add the extra circle at right angles to the circles on the handles to get a three dimensional effect.

Glue the handle to the end opposite to the bearing.

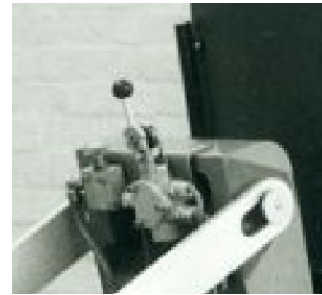
Extra Detail Carefully add a blob of glue on the black knobs at the end of the levers to make a sphere. When the glue has dried, paint the spherical knobs black.

Making a more substantial hand control

If you add a bearing to both ends, you can make the knob controls from round headed dressmaking pins, available from the haberdashery section of your local supermarket. Using side cutting pliers, trim the pin to length, then insert the cut end into the bearing.

Mk 2, Mk 3

The hydraulic control parts were mounted on a plate: this is part **8-40** from sheet **7**: fold down along the horizontal fold line (this part eventually glues on top of the flat part at the top of the front platform mounting).



Part **8-44** from sheet **7** folds up into a rectangular box. Glue this into position on the plate: the position is marked. Make sure that the circle representing the valve mounting is facing outwards (that is, away from the mounting plate).

The valve lever is three separate items in part **8-40** from sheet **7**. *Note* that all the black circles have slots in them so that the extra piece can be slotted in during assembly. Cut out the two knobs and handles and join these together back to back. Add the extra circle at right angles to the circles on the handles to get a three dimensional effect.

Glue the handle to the position shown on part **8-44** (that is, in the centre of the back)

Extra Detail Carefully add a blob of glue on the black knobs at the end of the levers to make a sphere. When the glue has dried, paint the spherical knobs black.

Making a more substantial hand control

If you add a bearing to the marked circle on the back of the control box, you can make the knob controls from round headed dressmaking pins, available from the haberdashery section of your local supermarket. Using side cutting pliers, trim the pin to length, then insert the cut end into the bearing.

Make up a rectangular box from part **8-44**. Glue this into position on the back panel (the position is marked). Make sure that the two light coloured circles are at the left and that the black circle is to the top.

Cameraman Seat

There are some very narrow struts on the cameraman's seat and the cameraman's seat supports: you need a sharp craft knife to cut out the parts and a steady hand with the glue to achieve a satisfactory result. These parts have been left until now as they are quite delicate, and are best done after the front platform has been full assembled.

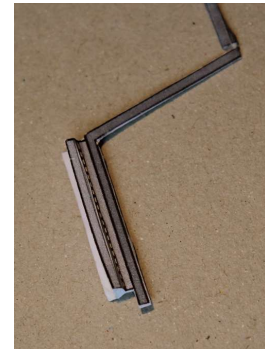
The cameraman's seat can be constructed in a series of stages, which can be done in any order (up to final assembly). The order recommended here is:

1. Seat Frame
2. Frame Mounting
3. Seat Cushion
4. Seat Back
5. Seat Suspension

Seat Frame

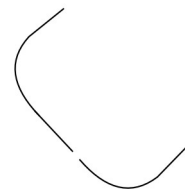
The actual frame for the cameraman's seat on the Heron Camera Crane was made from tubular steel radiused round most of the corners. Unfortunately the card used in the model is flat, so the frame will look angular in comparison to the real thing.

Cut out part **8-46** from sheet **7**. This is quite delicate at this stage. *Note* that at each end of the front there is a cut line that goes just a little way in – the extent of this cut line is clearly marked on the sheet. This cut allow the front bar to be curved round. Fold in half along the middle fold line so that the “top” and “bottom” parts – as laid out on the card sheet – lie on top of each other. Glue these together back to back, but *just glue the dark grey pieces*. The rectangular parts at the edges of the piece will be folded independently on each other and should not be glued together. The centre piece – the top of the back, includes an extra fold that allow this piece to fold back up as an additional strengthener. This is then going to show bare card. Part **8-47** from sheet **7** can be used to cover this – it acts as a further strengthener.



The front bar on each side can be carefully curved from the cut position round and across the front. Where the two sides overlap, glue these together. You may prefer to trim these pieces to length and glue using a butt joint.

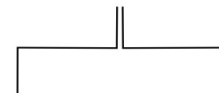
Then fold down the two side pieces so that the sides face forward. Each of the two transverse slats fold down the middle to fold under itself, and are glued back to back: this is a strengthener. Then fold down each slat from one side, and glue each one to the other side using a butt joint.



You may want to cut some extra thin strips of card to add to the underside of the slats to strengthen them.

Frame Mounting

The bottom of the frame on the outer of each side folds up along the dotted line, then down. Similarly, the bottom of the frame on the inner of each side folds up along the dotted line, then down. These two steps together (see diagram) represents the chair on its runners (to allow backwards and forwards movement) on top of a rectangular supporting frame.



The Chair main support plate is part **8-48** from sheet **4**. Cut out, fold back and glue. Make sure that this is truly flat when the glue has dried.

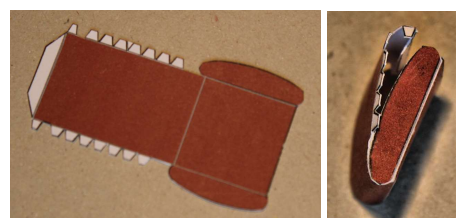
The chair frame bottom runners are glued to the platform. There are marker lines to help you locate the outer frame sides.



Seat Cushion

With both the seat cushion and the seat back, the idea is to represent a flexible covering from stiff card. A little judicious rumpling of the card (perhaps when drying with the glue to act as a softener) may make the seat coverings look more realistic.

The seat cushion or seat bottom part is **8-49** on sheet **7**. The two side pieces bend down, and the cushion covering is rolled first and then carefully stuck around the perimeter of each side piece, using the glue tabs.



Seat Back

The seat back (part **8-50** on sheet **7**) is made in much the same way as the seat cushion, but *note* that the back top has a compound curve.

The sides fold down, and then curve round towards the top. This curve is glued using a butt joint. The top covering is shaped to fit this curve, and is joined to it with a butt joint. You may need to trim this after assembly to show a good join.

If there is a gap, you can fill this either with a modelling filler (such as Milliput) or with Acrylic artists paint – or even with coloured PVA glue. You should at best only need a very small amount.

The seat cushion and back are then assembled on the chair frame.

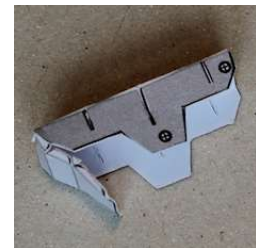
(In the illustration, the seat cushion and back have been “distressed” with acrylic paint to make the seat look as if it has been well used.)



Seat Suspension

Cut out the slots in part **8-51** from sheet **7** and punch the holes for the support strut pivots. The front one of these is very close to the edge – you need to take care with this, and you may want to add some card behind to strengthen it.

Fold down the sides.



Insert part **8-53** from sheet **7** into the middle (larger) of the slots in the side – thread through the other side and centre it. Parts **8-51** and **8-52** from sheet **7** are threaded through the remaining two slots.



The pivot support can now be glue to the underside of the seat platform (part **8-48**): the position is marked for you. Make sure that the two lower pivot holes (one each side) are at the front of the platform, and that the front of the pivot support is in line with the front of the platform.

Carefully create the pivot holes in part **8-55** on sheet **7** and cut out the screw adjuster holes in the spar that joins the two halves. Cut out the part and fold each side support lengthwise, each horizontal part folds over itself and is glued back-to-back. The centre strut or spar folds back over itself and is also glued back to back. The sides fold down at right angles to the screw adjuster strut. *Note* that in the real crane, this strut is pivoted, and rotates to match the angle of the screw height adjuster. In this model, the strut is fixed.

Create the pivot holes in each of parts **8-56** and **8-57** on sheet **7**, fold down lengthwise and glue each support side back to back: you should have two free standing support struts, and two joined by a cross member with a hole in the middle.

Place the struts with the cross member on the outside side of the front of the pivot support (part **8-51**) and fix in place with glue. The struts should be facing forward, slightly upwards.

Struts **8-56** and **8-57** are fastened one on each side of the pivot support (part **8-51**) using the rear, lower, pivot holes. The struts should be facing forward, slightly upwards, but they *must* be parallel with the struts already positioned.

The seat can now be offered up to the camera column on the front platform. The upper struts locate on the upper (front) cameraman seat support mountings, the lower struts on the lower, rear, cameraman seat support mountings.

Finish off by gluing the bearings (from part **8-58** on sheet **7**) – these are just representational.



Extra Detail

With the supports glued in position the seat will not move up and down. You can use small pieces of wire (for example, the Earth core from a piece of household mains wiring) to create the pivots at each end of the seat supports. These should be allowed to poke through the bearing pieces (from part **8-58** on sheet **7**) and then should be painted a light grey or aluminium colour.

The seat adjuster screw is part of part **8-59** on sheet **7**, this must be very tightly rolled and then glued along the long edge using a butt joint: the end caps can be used but they are not essential. The other part is a wrapper which encases the lower part of the screw thread. This too must be very tightly rolled and then glued along the long edge using a butt joint. *Please note* that in trial constructions, the look of these two components was improved if they were made shorter (that is, the screw thread for the adjuster was visible). The blue arrows (▶◀) indicate where the parts need to be trimmed to create this different effect.

Feed the seat adjuster screw through the hole in the middle of the upper seat supports cross member, feed over this the wrapper, and then glue the mounting (part **8-60** on sheet **7**) to the bottom of the wrapper. This mounting is in two folded parts, the main section glued back to back but with the top folded to provide a mount for the bottom of the screw. In turn, the screw mounting is fixed to the mounting provided. In the pre-production, Mk 1 and Mk 2 Heron Camera Cranes, the mounting (made from part **8-16**) is at the bottom of the main camera column wrapper. In the Mk 3 Heron, this mounting is at the rear of the crane elevation and chair pan control box.

Typically, the screw adjuster fitted inside the wrapper and its mounting was such that the turn handle was on the cross member from the two side struts. Depending on how you have set up the angle of the seat support struts, you may have to adjust the length of the screw thread so that it is just proud of the cross member.

The screw turn wheel is part **8-61** on sheet **7**: this glues centrally onto the upper end of the screw thread. The knob is tightly rolled and attached. Alternatively, simply fold the handle in half, glue back to back and attach to the wheel.

Extra Detail

You can use a 2BA screw for the screw adjuster. This size of screw is the one used to fix electrical outlet sockets and light switches to the wall cable box (patress), and often they are quite long.

Using a junior hacksaw, carefully cut the 2BA screw to length. Use cyanoacrylate glue (super glue) or two-part epoxy resin to fix the card parts to the metal shank. In other respects, follow the instruction for the card-based screw.

Pre-production, Mk1 and Mk 2 Heron Elevation Twistgrip

The elevation control was a twist grip mounted on the end of a panning arm. Part **8-62** on sheet **7** is the main part of the control – roll this into a tight cylinder lengthwise. Alternatively, you can cut a cocktail stick to length and use this instead.

The twist grip (part **8-62**) is wrapped around the control itself, cut to length and glued. The hose control entry is part **8-64**, and is built in the same way as the hose entries on the main cylinder. The part folded up and glued (using butt joints – no glue tabs are provided). The hose entry is then glued to the end of the jib elevation twist grip such that it points downwards.

Tracker Bench

The Tracker Bench and Backrest described here are the bench and backrest shown in the Vinten Heron Camera Crane Brochures, but it is known that some production companies – notably overseas – used a much wider bench and a larger backrest (for example, one in use with the Canadian Broadcasting Corporation), but these may be local adaptations.

The tracker bench is part **3-7** on sheet **5**. Cut out the mounting holes in the base of the bench. The bench has a front which is rounded, so firstly roll this part around a suitable sized rod (a cocktail stick or sandwich skewer). There is a gentle curve down towards this point, so fashion this with careful bending. The back, or rear, is more or less straight, and can be folded down on the fold line.

Fold down the two sides. Then roll and fold the seat part of the card to match the profile of the sides. Glue using a butt joint (no tabs are provided).

Note that the tracker bench was covered with a flexible material. It may be possible to somewhat rumple the bench, especially when the card is softened with the glue, to provide a more natural appearance.

Sandwich skewer such as those illustrated are used as they have a very smooth surface and do not splinter. Such sandwich skewers are available from many supermarkets (Waitrose, for example: other supermarkets are available).



Cut a sandwich or burger skewer to size. It is best to use one of these if possible. Parts **3-5** and **3-6** on sheet **5** provide a suitable card alternative if you can not use a skewer: you need to roll these into a very tight cylinder.

Insert one end of the Bench mounting pole through the hole in the upper bench mounting bracket on the rear of the crane and pass through into the matching hole in the lower mounting. Do the same for the mounting pole on the other end of the bench.

There is a stabilising bar between the two poles, part **3-15** on sheet **5**. Fold in half longitudinally, and glue back to back. Do not yet glue the ends (coloured white). Place the stabilising bar approximately one-ninth down from the top of the tracker bench pole top: the position is marked clearly as the *upper* markers on parts **3-5** and **3-6** on sheet **5**, so even if you don't use these parts for the poles, you can still identify where this stabiliser bar need to be located.

Wrap the ends of the stabiliser bar around the poles: the wrappers from each side can overlap each other.



The *lower* markers on parts **3-5** and **3-6** on sheet **5** show where the tracker bench pole height adjustment clamps are positioned. The small pieces of card (parts **3-18** on sheet **5**) wrap round the tracker bench poles at the position marked. The knob and stalks (parts **3-19** on sheet **5**) are glued back to back, but the “shaft” or tongue pieces at right angles to the stalk are *not* glued together - they should be separated out. Once glued, these longer (right angled) tongues or shafts on the clamps (on parts **3-19**) wrap round the tracker support poles and around the height adjustment clamp positions (already fastened (parts **3-18**), so that the clamp knobs are proud of the surface.

Extra Detail

As with all the knobs on this model, a small ball of glue on the knob, painted black, gives a spherical knob. Alternatively, a ball headed dressmaking pin cut to length can be used.

Mk 2/Mk 3 Tracker Backrest (Export Version)

The Tracker backrest (on the Mk 2 and Mk 3 Heron Camera Crane) was never used in the BBC, and seems to have been mainly an export addition. The tracker on most BBC “as-live” television productions often had to jump down from the crane to mark crane positions (in rehearsal) or help clear cables (on transmission): on “Top of the Pops” it was necessary sometimes to clear the dancing audience out of the way of the crane as it tried to get into position. In all these situations the backrest would have been in the way!

Cut out parts **3-8** and **3-9** on sheet **3**: fold in half down the middle and glue back to back. These supports glue onto the tracker bench support poles such that the downward pointing arm locates under the tracker bench and the end of the bottom curve meets the pole. If the very ends of the downward arm and the curving bottom are not yet completely glued, they can be separated out and the card glued either side of the bench support pole.

The backrest itself is part **3-10** on sheet **3**: this folds up into a simple rectangle with the edges glued as butt joints. Once again, it may be possible to somewhat rumple the backrest, especially around the edges when the card is softened with the glue, to provide a more natural appearance.

The tracker backrest is glued to the top of the backrest extension such that about one-quarter of the backrest is above the end of the backrest support.



Hoses

There are many hoses on the Heron Camera Crane: not all of these are represented.

Mk 1

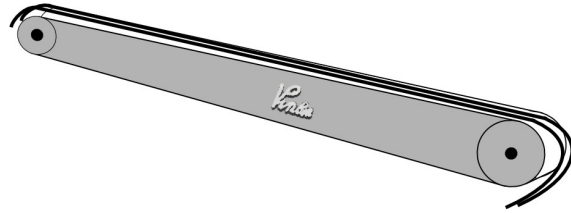
On the left hand chassis top, there are a number of hydraulic hose valves and connectors. You can model the right-angled hose connectors using part **1-24** on sheet **5**.



The hose couplings sit on the dark grey rectangle on the top of the left hand main chassis.

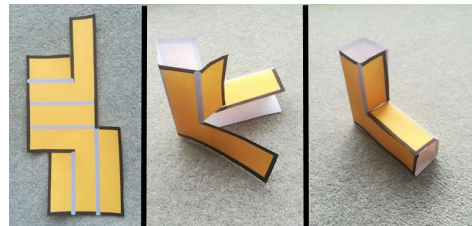


Two hoses run up the left jib arm.



Mk3

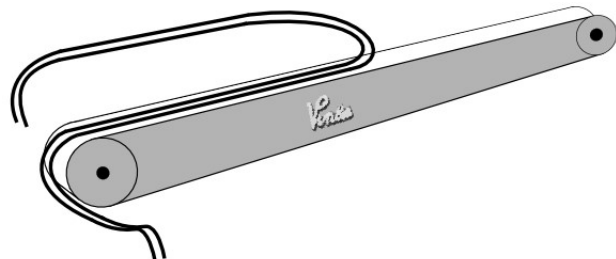
On the left hand chassis top, there are a number of hydraulic hose valves and connectors. You can model the right-angled hose connectors using part **1-24** on sheet **5**.



The hose couplings sit on the dark grey rectangle on the top of the left hand main chassis.



Two hoses run up the right jib arm, then cross over in front of the elevator ram top housing, then back down the left arm and into the connecting block hose couplings.



Completing Your Model

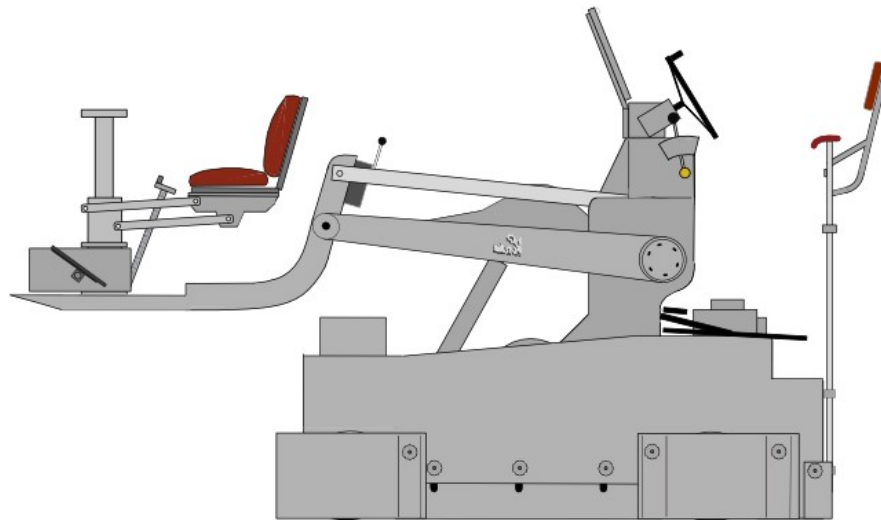
Your model Vinten Camera Crane needs a camera mount and a suitable television camera to make it into a complete model.

The camera mount would typically have been a Vinten pan and tilt head: the pan and tilt television camera mount was specifically designed for television cameras, which at the time typically used a “turret” of four different focal length lens. The camera pick up tube (or tubes) were moved inside the camera to focus the picture. The Vinten pan and tilt head changed the centre of gravity as the camera was tilted to compensate for the weight of the camera and position of the pick-up tube.

(The same was true for some early zoom lenses built for television. They were varifocal zooms, which meant that the subject had to be focussed before one could zoom. The camera was panned to look at a distant object (should be something infinitely far away) and the subject focussed using the camera tube. The tube was then locked in position, the subject of the zoom found, and the lens focussed on the

subject using the zoom focus control. A parfocal (or true zoom) lens remains in focus as the lens zooms (as focal length and magnification changes).

A suitable pan and tilt head and a suitable television camera are available as separate sheets with their own instructions. A suitable model is the panning head for the Vinten 419 hydraulic pedestal and the EMI 2001 colour camera, available on Ebay. *Please note* that part **6-34** on sheet **5** is a suitable camera shot card to match the Heron tracker (dolly operator) shot card provided here, and replaces the shot card available with any camera kit.



Acknowledgements

Thanks to Ross Millard of the Vitec Group for initial help in finding information about the Vinten Heron Camera Crane and identifying possible sources.

For photographs of the various Marks of the Vinten Heron and for all information relating to the changes made to the crane during its working career, thanks are due to:

Derek Blackman Vinten
Dudley Darby BBC Technical Operations
Brian Phillips

For information about the Vinten Heron Camera Crane in use, thanks are due to Dudley Darby, Roger Bunce and many other former BBC Technical Operators. There is a wealth of information about the use of camera cranes in theatrical style multi-camera as-live television production on the BBC Technical Operators web site (www.tech-ops.co.uk).

Lastly, especial thanks to Bernie Newnham (owner of the BBC Technical Operators web site) for his help, comments and critiques during the development of this card cut-out Vinten Heron Camera Crane.

Alec Bray

version 1.3

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