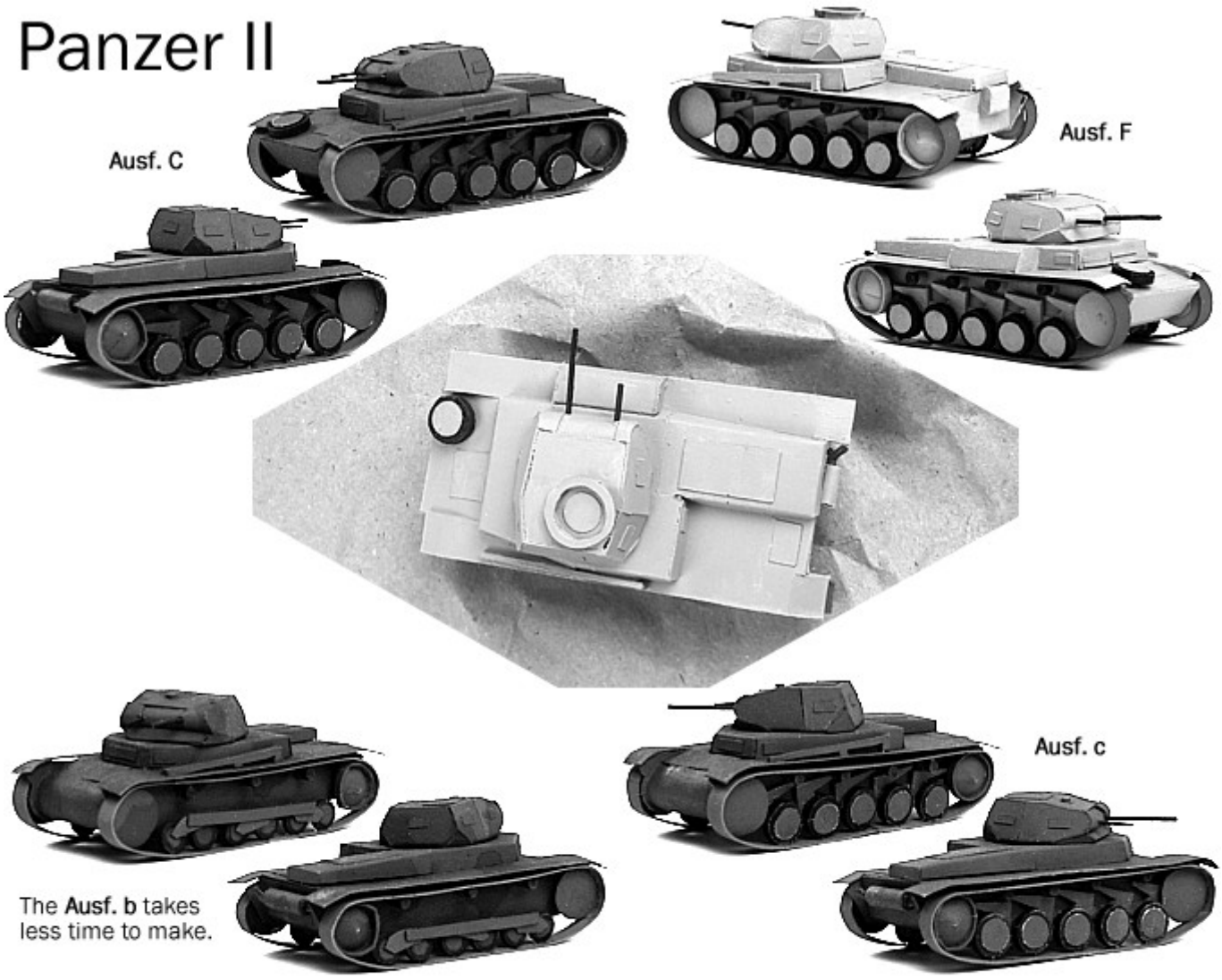
Constellation Miniatures

by Alexandre Karadimas

Make your own 1:64 miniatures with common household tools and materials



"Ausf." stands for "Ausführung", meaning model. Ausf. b and c (not capitalized) were developmental pre-series models which were also used in combat, their hulls had a round front.

In this design, the road wheels and suspension of the Ausf. b are faster and simpler to make than the standard road wheels, but the Ausf. b had a slightly different hull size and superstructure than the Ausf. c and subsequent models. For the sake of simplification this "Ausf. b" uses the Ausf. c hull.

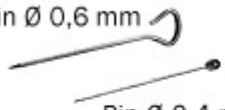
Download this booklet and others for free from **http://www.constellation-miniatures.com**
Visit the Youtube channel: https://www.youtube.com/@ConstellationMiniatures

Booklet 07 – Panzer II Version 1.2 – May 2026

Tooling, Materials and Production aspects

T01

Tools required for all Constellation Miniatures designs



Pair of nail scissors



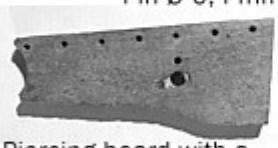
Small "snap-off blade" utility knife



Pair of thin pliers with a wire-cutting capability







Piercing board with a Ø 4 mm hole drilled through it, larger holes are useful

(1) Mechanical pencil Ø 0,7 mm or less (2) Roller pen (even a depleted one) to draw folding lines.



(*) Use a toothpick to apply glue to parts

(3) Set square in metric (4) Stationery hinge clips (5) Household glue, in liquid or gel form (*)

T02

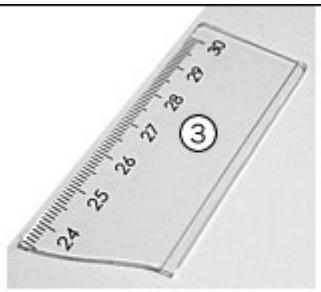
Tools required for this design

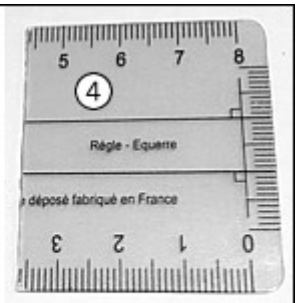


Hole punch Ø 6 mm (preferred) or Ø 5,5 mm



(1) Metal file to deburr wire after cutting. (2) Permanent marker to mark metal wire.





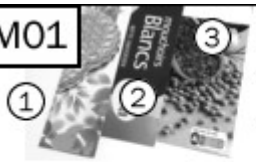
Recommended: a segment of a transparent ruler (3). (4) This ruler of the "aleph.pro" brand has matching measures on both sides, making it a small set square.

Always cut downwards on a cutting board and never towards any part of your body.

Please don't cut yourself.

Cutting board: a flat piece of wood, MDF, thick plastic or any other suitable material

M01



Cardboard used in packaging is technically called "thin cardboard". We will distinguish between "very thin" cardboard, as can be found for instance in packaging for biscuits (1), "regular" cardboard found for instance in breakfast cereal boxes or tissue boxes (2) and "thicker" cardboard (3).

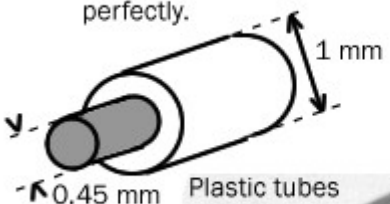
Glue works better on the porous side of cardboard packaging. The smooth, printed side is better suited to be painted over.
Glueing two smooth sides together doesn't work well.



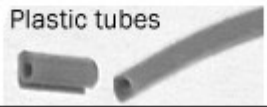
When accumulated in a front grille, the difference between regular and very thin cardboard becomes quite visible.

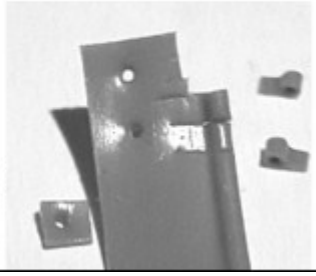
M02

Double Wire Clips can be found in bread packaging for instance, they have very malleable wire. DWC plastic can be transformed into parts that match the wire perfectly.



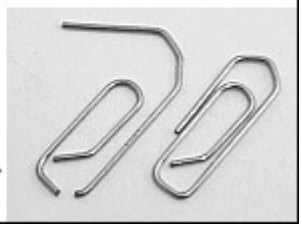
Plastic tubes



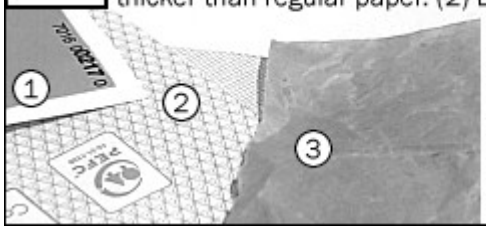


The barrels of the weapons will be made from regular **paperclips** which have a diameter of more or less 0,7 mm.



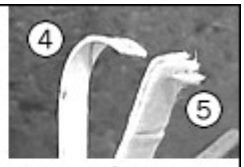


M03 (1) **Rigid Paper** can be found for instance in train tickets and magazine covers, it is thicker than regular paper. (2) Different patterns at the back of envelopes makes them a good source for **regular paper**, use a different pattern for each series of parts.



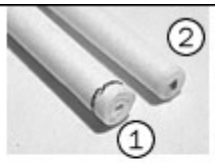
(3) **Thin Kraft paper** can be found in paper bags for fruits & vegetables.



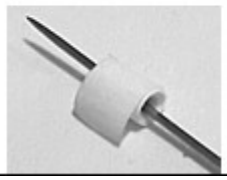


Rigid Paper is made of a single layer (4) whereas cardboard (5) is made of several layers that come apart when bent.

M04



This design uses paper stems of ear cleaning swabs ("**Q-tips**"). It is necessary to use a variety that has a **hole** in its center (1). Note that different varieties have been marked differently (2) so that the workshop's materials supply remains manageable.



(5) Q-tips stems are a tight roll of paper. Conical shapes can be made by pushing in the center with a nail or a similar object.

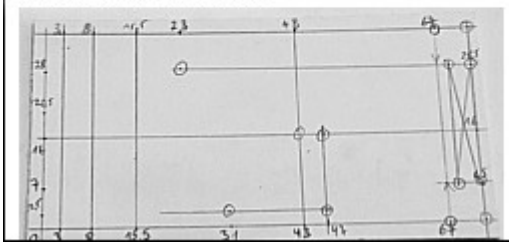


Some parts have a simple design and are best draw in batches, using a ruler. Severals examples are shown in the Steps illustrations.

Other parts have a complex design, which would be too time-consuming to draw from scratch. In these cases we will first make a **template**, a piece of cardboard with all the markings needed to replicate these parts, as well as indications to modify and position them precisely afterwards.

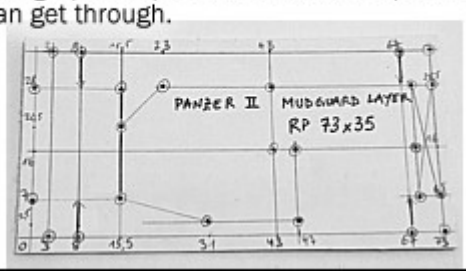
P01 **How to make templates**

1. On a white piece of cardboard, draw a rectangular frame and write the measures on all sides.



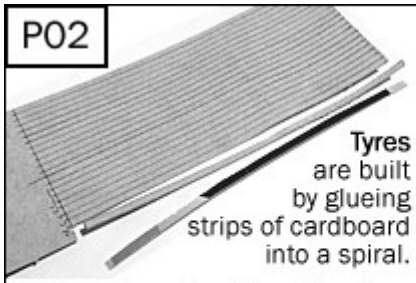
2. Use these marks as a grid to position points of the template. Draw the template.
3. Pierce the points as indicated then cut to shape.
4. Label the template. Draw the location of the folding lines with a distinct colour, also mark "special" dots.

First pierce with the Ø 0,4 mm pin then use the Ø 0,6 mm pin and wiggle it so the Ø 0,7 mm graphite tip of the mechanical pencil can get through.



Most templates are on the central pages (pages 6 & 7)

P02



Tyres are built by glueing strips of cardboard into a spiral.

2. Coil the strips around a pen to give it a shape.





3. Start by glueing a portion of the strip to the wheel rim, so you can position it precisely at the depth you want. Let the glue harden.

1. For both ends of the strip, shave off about 1 mm from the smooth side, in order to avoid a visible "step" where the strips ends.



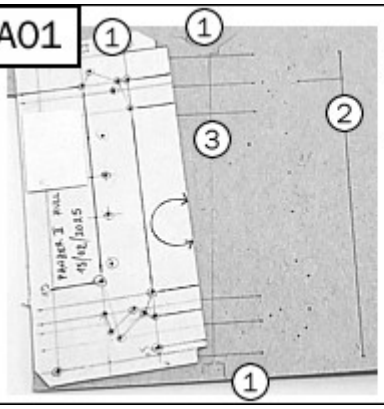
4. Glue the rest of the strip in a spiral, all at once. While the glue is still fresh, apply pressure on the spiral or rub it against a flat surface, so that the outward side has an even aspect.



Part A - Panzer II

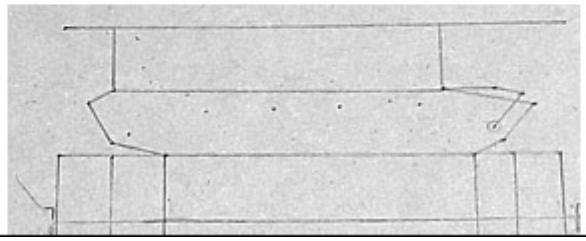
Hull subassembly

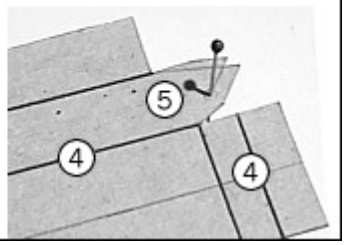
A01



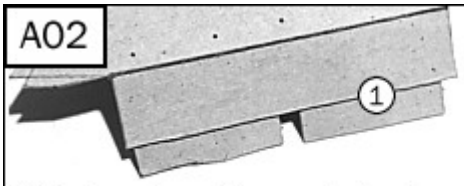
(1) Make notches on both ends of a template that has to flip. These notches are replicated on the part and they allow for correct alignment.

(2) Connect dots from the outside inwards and (3) from the central line outwards. (4) Draw the folding lines with a ballpoint pen. (5) Pierce remaining dots with the thin pin.

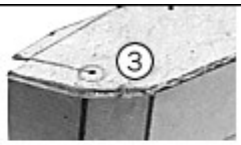




A02



(1) Cut cardboard "connector" parts and glue them on their porous side under one half of the hull's top side.

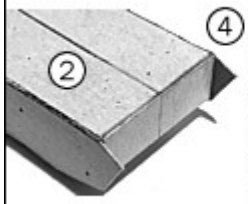


(3) Glue the front side against the side panels. (4) Glue the rear side inside the structure, aligning its top with the hull top.





If you wish to make the hull part from two pieces of cardboard, use a piece of smooth paper to hold them together, and then proceed as in Step A01.



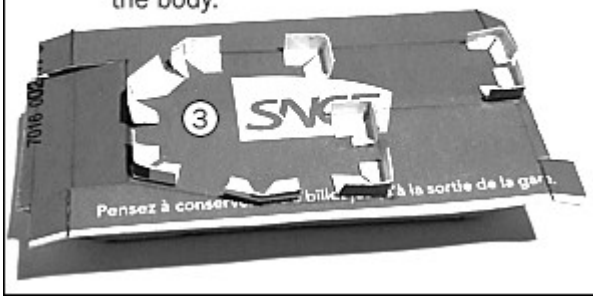
Notice that it is the porous side of the hull that is outside, not the smooth side. (2) When the glue has hardened, close the shape by glueing the other half (see how on Step D02, page 11).



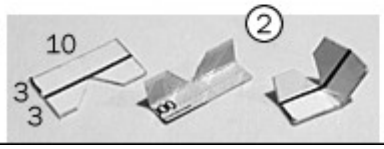
(5) After the cutting, use connector parts on those two pieces: the piece of smooth paper is not strong enough to hold them together.

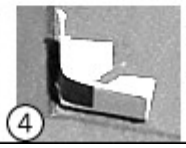
A03

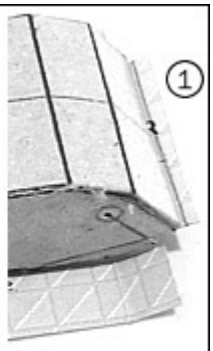
Dry fit the **mudguard layer** to the top of the hull before glueing. Align the mudguard layer on the rear border of the body.



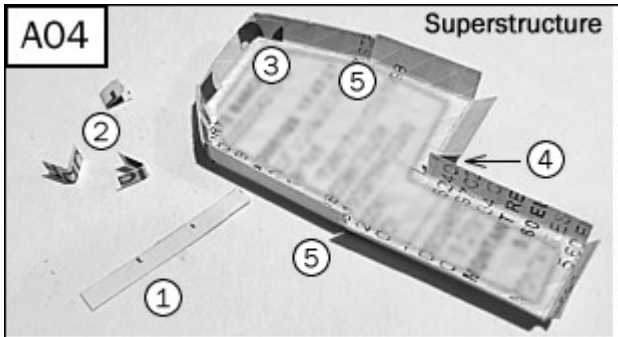
(1) The "mudguard layer" is longer than necessary on the front panel so it can be trimmed to fit
(2) Prepare "corner" parts from 10 x 6 mm Rigid Paper parts folded in two as depicted.
(3) Position them as depicted, slightly behind the lines (4) to give the superstructure part some room.



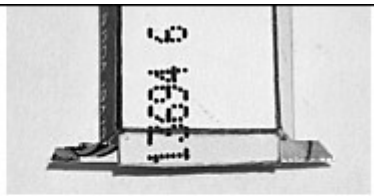




A04



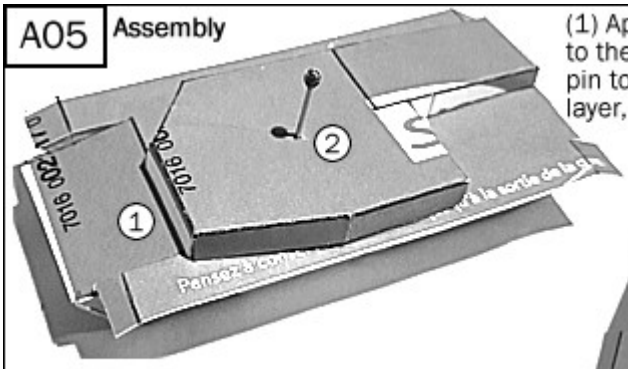
(1) Cut 8 mm parts from a strip of paper 3 mm wide.
(2) Fold them in half.
(3) Glue them on the inside of the corners, using a toothpick to push them. Note: you will have to glue one piece at a time and hold the sides in position until the glue has hardened.
(4) See step A05.



Glue a 24 x 2 mm paper strip to the rear side. Once the glue has hardened, fold the tabs and glue them like the others.

(5) These angles are very small, trim the panels carefully and adjust the paper rapidly while the glue is still fresh.

A05 Assembly



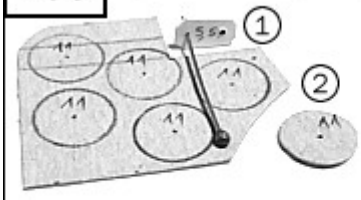
(1) Apply glue to the "corner" parts and connect the superstructure to the "mudguard layer". (2) Once the glue has hardened, use a thin pin to pierce the turret axis through both the top and the middle layer, stopping at the bottom of the hull.

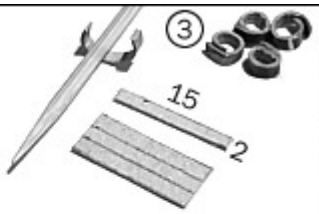


(4) Glue a 13 x 4 mm panel of Rigid Paper on this panel.
(5) The Panzer II **Ausf. F** superstructure has a square front, just prolong the template lines.

Enlarge with a toothpick, then make a 21 mm long **axle** from a toothpick and insert it in place.

A06 Sprocket wheel (front)







(1) Use a 5,5 mm compass to draw disks with a diameter of 11 mm on a single layer of regular or thicker cardboard. (2) Use nail scissors to cut out the disks.

(3) Cut 15 x 2 mm strips of cardboard, give them a rounder shape then glue one end onto the other. These will also be used for the idler (Step A08).

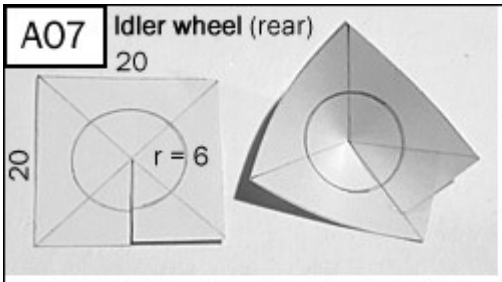
(4) An internal, non-visible spacer is made from a piece of cardboard (here, a snippet from the hole punch). Glue it to the disk then glue a cylindrical spacer (3) on it.

Use a pin to position and glue 4 mm pieces of Q-tip stem as return rollers.



(5) Apply glue to the end of the assembly and position it over the axis hole. Optional: glue a Ø 4,5 mm cardboard disk.

A07 Idler wheel (rear)



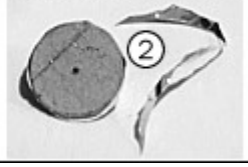
On a piece of smooth paper, draw a 12 mm diameter circle in the center of a 20 mm square. Cut and glue on a diagonal as depicted above to create a cone.

(1) Apply glue inside the cone and glue a disk of diameter 8 mm on to it, smooth side visible, using the circle as a reference.
(2) Use nail scissors to trim the paper from the disk.



(3) Give a 31 x 2 mm strip of cardboard a rounder shape then glue a piece of paper ot one end.



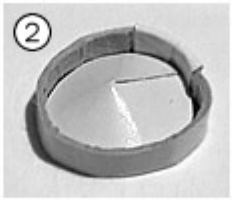


(4) Glue the other end of the strip to the paper, using a hinge clip to keep it in place. When the glue is hard, fold the paper over to glue it to the other side. Trim the excess.



A08 Idler wheel (rear)



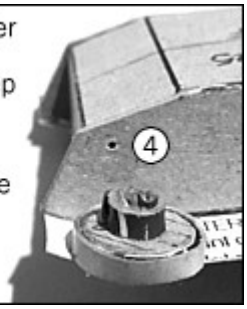




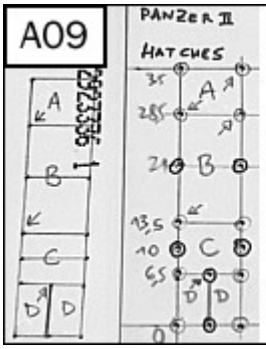
(1) Use a round object to give the cylinder a round shape.

(2) Apply glue inside the cylinder and slide it onto the cone.
(3) Glue a 2 mm piece (see Step A06) on the backside.

(4) Glue the assembly using the rear dot as a reference.



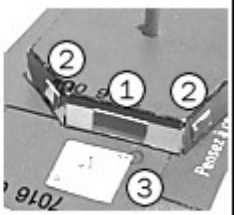
A09



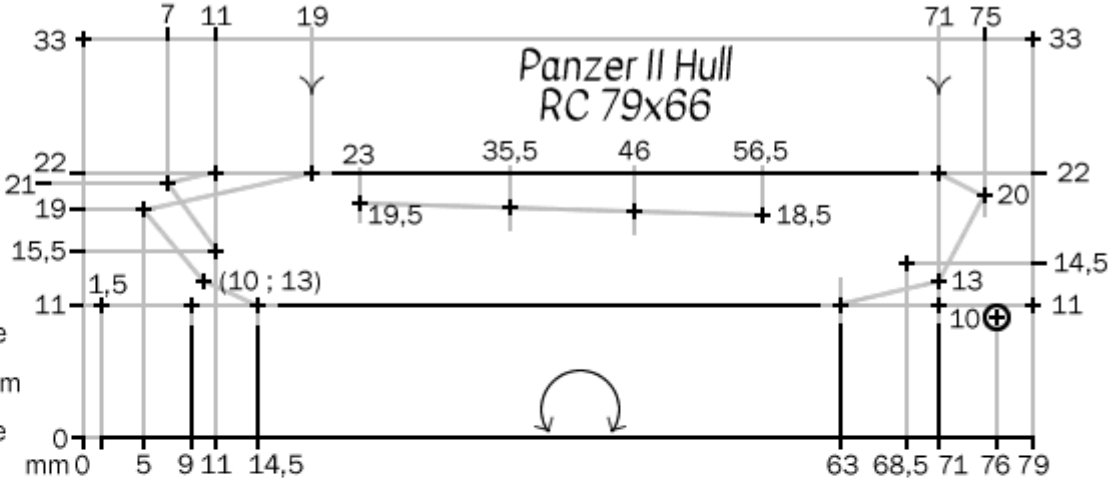
Hatches and viewports are made from rigid paper.
The arrow on the hatches indicate which corner has to be on the positioning dot. Notice the position of hatch A on the image on the right (3). See Step A05 to see how to position hatches B and D.
You can cut hatches B and C in two or pass the cutter on their dividing line for further realism.

Viewports are made from a 2 mm strip of rigid paper.

(1) The front viewport is positioned centrally on the front panel. It is 6 mm long for the Ausf C and 8 mm long for the Ausf. c and b.
All other viewports are 4 mm long.
(2) Position the side viewports at middle height on their panels and towards the front panel.



Panzer II
Templates
Scale 1:64
Page 1/2





+ Pierce for 0,7mm

⊕ Special purpose

Folding line

Connect to symmetrical counterpoint

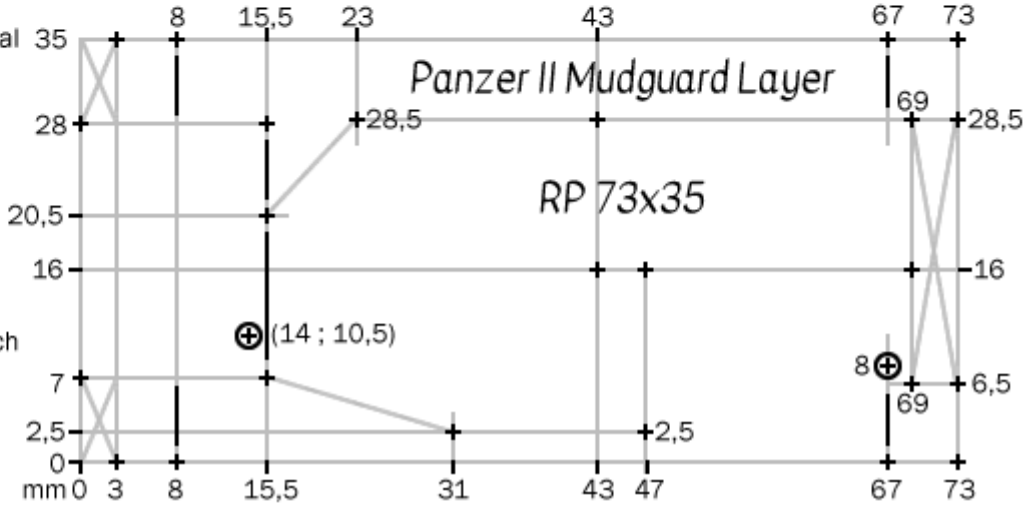
RC: Regular Cardboard
RP: Rigid Paper

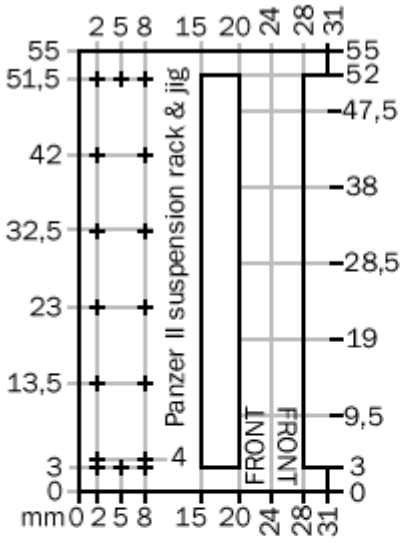
Idler wheel compass

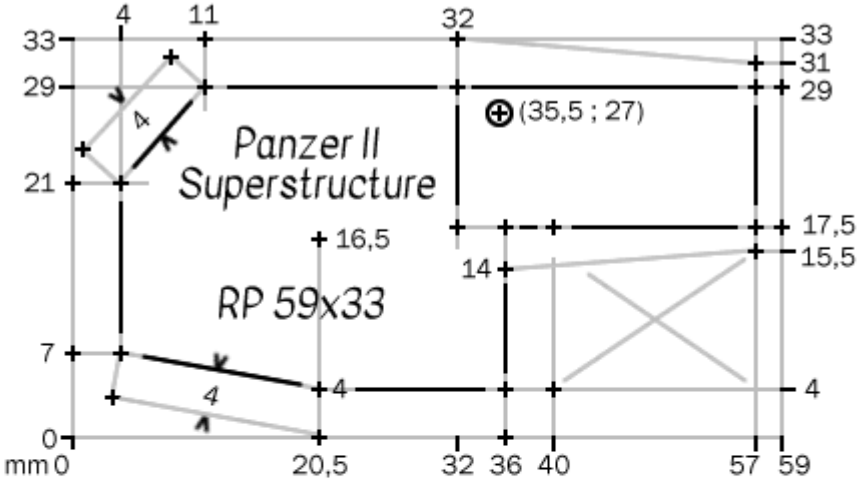
+ 4 + + 6

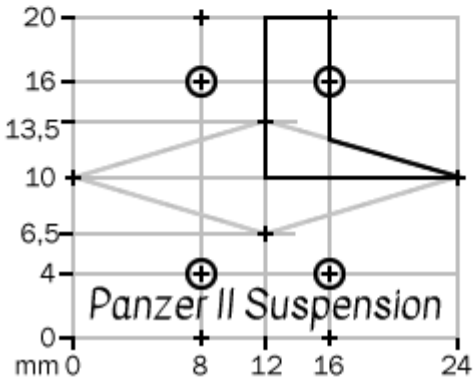
Sprocket, Ausf. F turret hatch

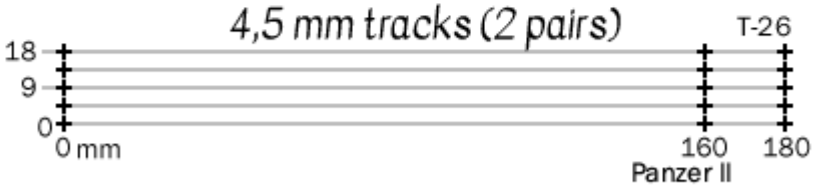
+ 4 + + 5,5











This is a large template, you may want to make a single one for both models.

Diagrams on this page are not all at the same scale

Panzer II
Templates
Scale 1:64
Page 2/2



Flip it along this side

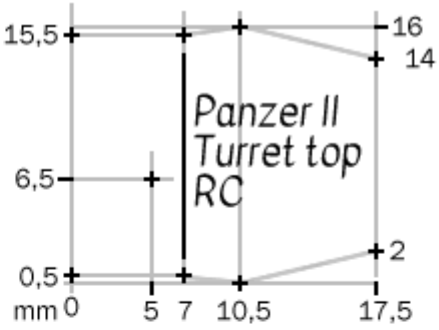
+ Pierce for 0,7mm

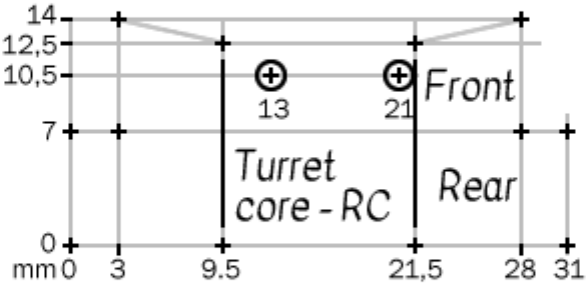
⊕ Special purpose

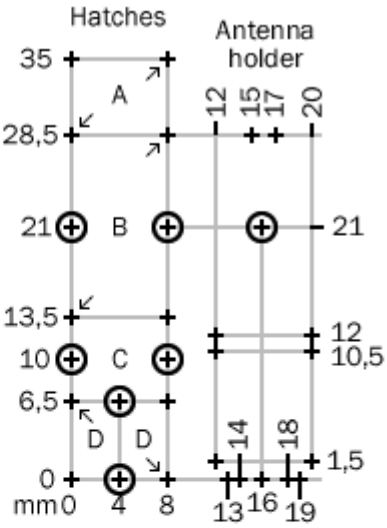
Folding line

Connect to symmetrical counterpoint

RC: Regular Cardboard
RP: Rigid Paper

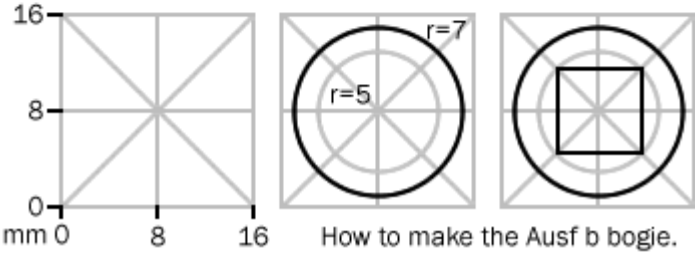






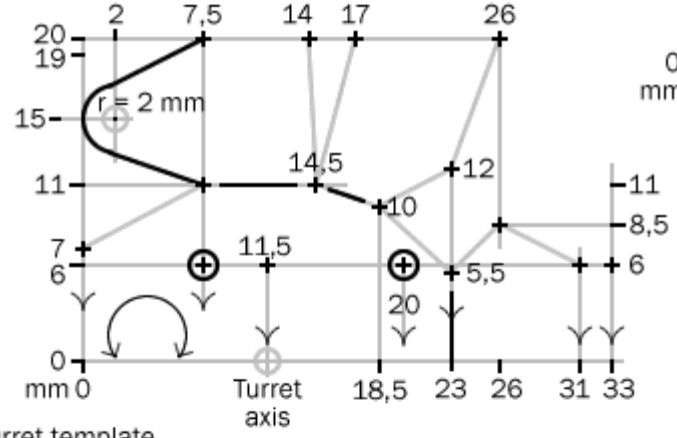
Ausf. b bogie

+	5+	+7



How to make the Ausf b bogie.

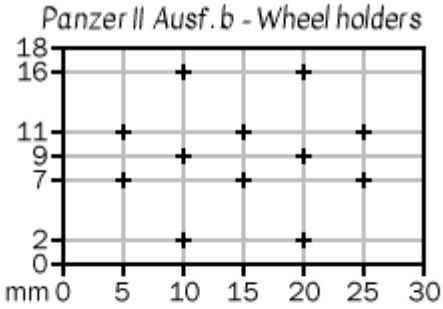
Panzer II Turret - RC 40 x 33

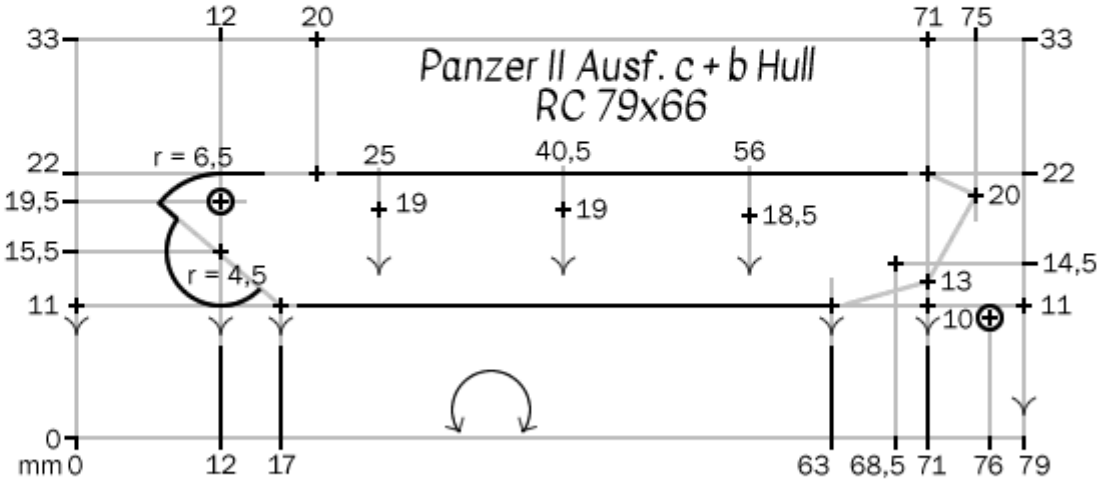


Turret template

+	+2

Panzer II Ausf. b - Wheel holders





Ausf. c+b template

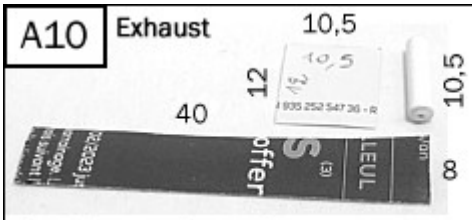
+	4,5+	+6,5	

This is the template for the Ausf. c, which is compatible with the mudguard and superstructure parts described in this booklet, but its return rollers positioning dots are in the style of the Ausf. b.

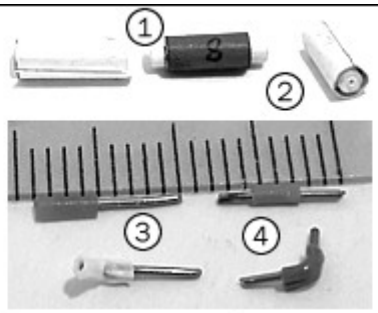
You can use this template to make an Ausf. c, the procedure is depicted in the step D03. page 12

Diagrams on this page are not all at the same scale

A10 Exhaust



Cut 10,5 mm from a Q-tip stem variety that has a **hole** in its center. Cut a 10,5 x 12 mm piece of smooth paper and a 40 x 8 mm piece of paper (smooth or regular).



Cut and deburr two 8 mm parts from DWC wire.

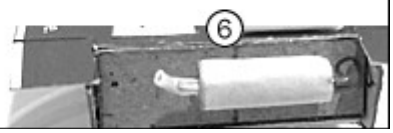
(1) Glue the 40 x 8 mm part around the Q-tip, roll the smaller paper part then (2) glue it on the assembly as well; notice that a gap becomes visible.

(3) Cut 4 mm of DWC tube and slide 3 mm of it on a metal part. Grab the lower half of the DWC tube with pliers and bend it against a hard surface.

(4) Insert 3 mm of DWC tube and slide it on the middle of the second metal part. Use the pliers to bend it at an 90° angle.
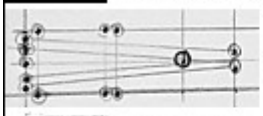


(5) Pierce the positioning dot with a pin. (6) Insert both wire parts into the Q-tip hole, apply glue around the seam on the cylinder, then insert the other end of part (4) into hole (5), finally glue the cylinder to the hull.

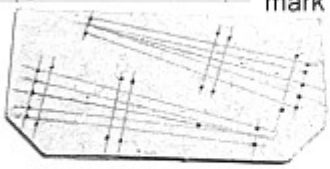


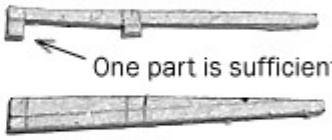
A11

The **antenna holder** is a small and delicate part, it should be the last to be glued before painting.



The **simpler** way to make this part is to glue two layers of cardboard together (smooth side on porous side), then mark and cut them as shown.



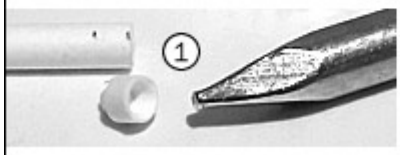


One part is sufficient.

If you want a version with a **groove** (see (3) below), cut two parts from a single layer of cardboard and a 1 mm wide strip of cardboard.

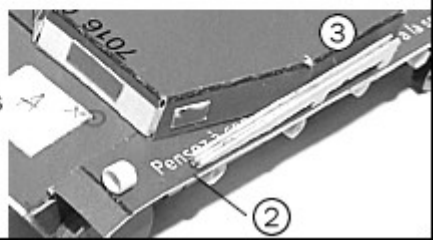
Glue the strip aligned with one part's lower limit, use excess material on the legs. After the glue has hardened, glue the other half and trim.



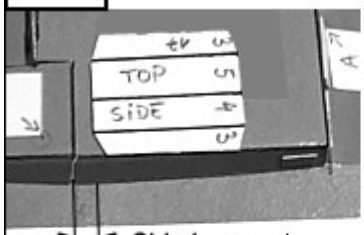


Headlights (optional): cut 2 mm from the stem of a Q-tip (1) then use the point of a nail to push its center in. Glue the headlights behind the mudguard folding line.

(2) Glue the antenna holder so that its tip is flush with the start of the front of the superstructure.

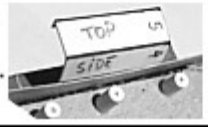


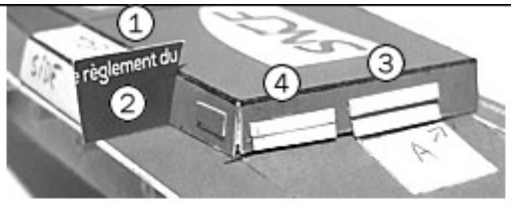
A12 Ausf. F features



2,5

Side box: make a part from rigid paper as depicted above. Glue the tab under the SIDE panel 2,5 mm forwards from the superstructure folding line and flush with the border of the mudguard.





(1) Close the box shape by glueing the other tab, so that the box top is flush with the superstructure.

(2) Adjust two pieces of smooth paper with the inclination of the superstructure side panel and glue them to the box. Trim the excess.

Prepare 1 mm strips of regular cardboard. The **viewport** (3) is made from two strips 8 mm long, positioned according to hatch "A". The lower element is aligned on the lower border of the superstructure, leave a visible slit between the two elements.

The **decoy** viewport (4) is made from two strips 7 mm long, positionned centrally in the remaining space and also to the lower border, but there is no slit between them.

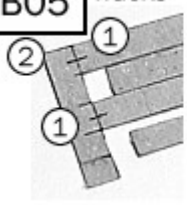
Ausf F exhaust: cut two 6 mm parts from a Q-tip, glue them on a 15 x 6 mm piece of smooth paper as depicted. Glue the paper onto itself, then glue a piece of smooth paper on each end. Trim the excess and puncture one side to insert the wire elements.



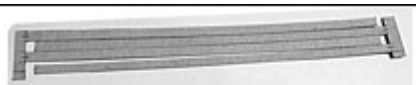




B05 Tracks



This step has been inserted here to save space.



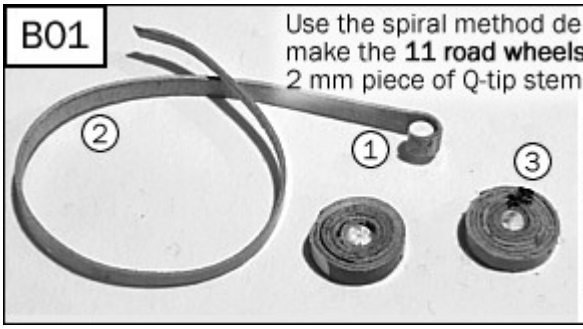
(1) Notice the markings on the cardboard, they identify the tracks belonging to the same pair. The handle (2) allows a pair of tracks to be handled during painting and also to be suspended to dry afterwards (3). Paint both sides of the tracks in one go, with a lighter medium grey colour.



Part B - Panzer II

Road wheels & suspension subassembly

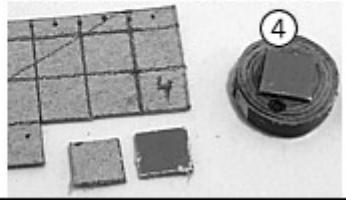
B01



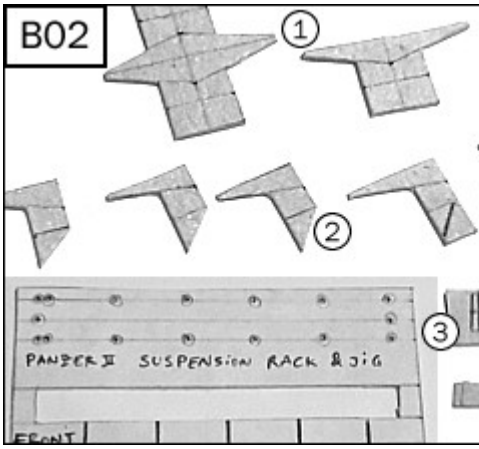
Use the spiral method depicted in step P02 (page 3) to make the **11 road wheels** (including the spare). Use a 2 mm piece of Q-tip stem as the central hub (1).

The road wheels have a **diameter of 8,5 mm**. This will require **2 mm** strips of regular cardboard (2) about **110 mm** long but this length may vary significantly depending on the type of cardboard you use.

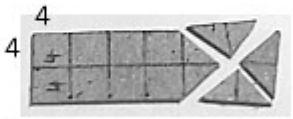
(3) Mark the opposite side to the one that was smoothened and glue the porous side of a 4 mm square of cardboard to it (4).



B02



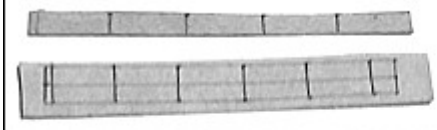
Glue two pieces of cardboard together and use the **suspension** template. This will create four pieces of suspension, two for each side. Five pieces are required for each side. (1) The pointy ends are difficult to cut in two and don't hold their shape, it is better to cut them off. (2) Cut a diagonal on each piece using the positioning line, as depicted. (3) The suspension rack template creates a pair of racks, one for each side.

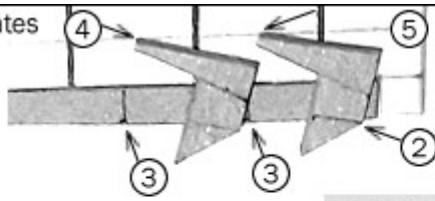


Draw lines on double-layer cardboard (same thickness as the suspension parts) to create 4 mm squares, then cut 10 triangles as shown above.

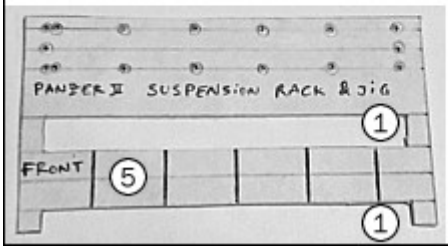
B03

The **suspension rack** template creates a pair of racks, one for each side.

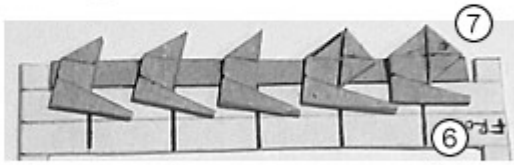




Align the **upper tip** (4) of the four most forward suspensions with the middle line on the jig (5). The rear suspension (6) is at 90° with the rack.



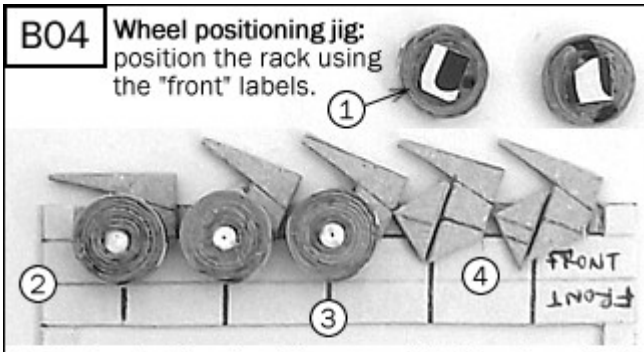
(1) Insert the rack on the **positioning jig**, the vertical lines on the jig are **not relevant** at this stage. (2) Align the lower **"knee"** of the suspension (2) with the lower side of the rack, using the positioning lines drawn **on the rack** (3).



Glue the triangles from step B02 next to each suspension (7). This provides the surface necessary to glue the wheels.

B04

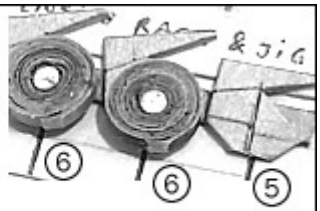
Wheel positioning jig: position the rack using the "front" labels.



Apply glue to the wheels' spacers (1). Glue the wheels so that their lower end is flush with the horizontal line (2) and central with the vertical line (3).
(4) It is not important if the tip of the suspension is not aligned, it may have to be trimmed (5). Notice that the wheels spirals' ends (6) are positioned on the bottom, where the tracks will be glued.

When painting, first apply the main colour on the rack & suspension parts. Before painting the road wheels (and the spare wheel) in a dark grey colour, insert a piece of paper between them and the suspension (7).





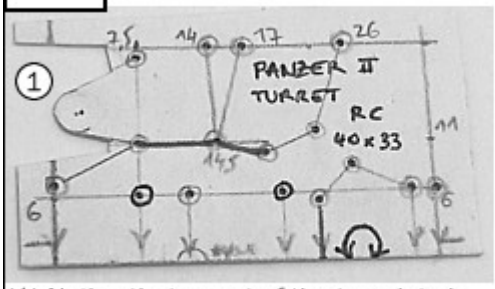


(8) Spray a piece of smooth paper with base coating, then paint it with the main colour. When the paint has dried, cut out Ø 6 mm snippets from that paper with the hole punch and glue them on the road wheels.

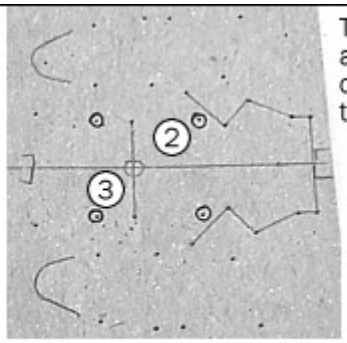
Part C - Panzer II

Turret subassembly

C01 Using the template

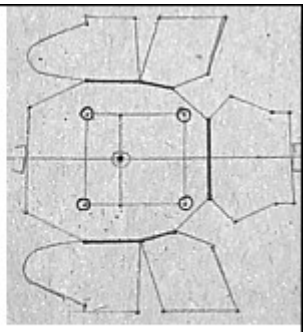


(1) Notice that a part of the template is cut out, in order to replicate the shape.



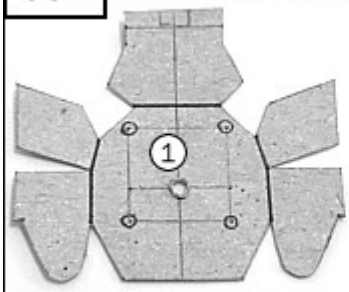
The turret is like a miniature of its own, it is delicate to build.

It is easier to build it from folded parts rather than glueing smaller parts together.

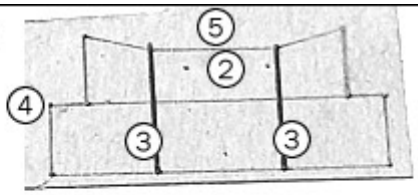


(2) Mark the special purpose dots first, in order to avoid making wrong connections. (3) Pierce the turret axle axis with a thin pin.

C02 Making the turret core

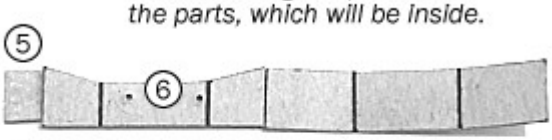


(1) Turn over and enlarge the axle hole with a toothpick, leave the extruded material in place.



(2) Notice that the dots to pierce for the barrels are marked on the porous side (3) Draw folding lines with a ballpen. (4) Separate the two parts of the turret core.

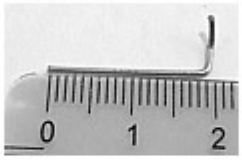
We are seeing the porous side of the parts, which will be inside.



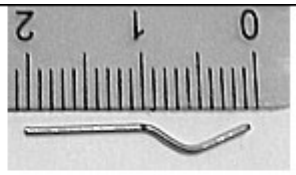
You can use the leftover part (5) to make two connectors. Glue their porous side to the smooth side of the core parts.
The connectors are outside the turret core, so as not to interfere with the barrels.
(6) Pierce the holes for the barrels before closing the turret core.

C03 Making the barrels





Use the wire from a paperclip, about 0,7 mm thick, to make the autocannon's barrel. The straight part should be 18 mm long, the inner part should be 10 mm long and slightly folded in its middle.



Use 20 mm of wire from a Double Wire Clip (DWC) to make the machinegun (MG) barrel. The straight part is 10 mm long and like the other barrel, the inner part is slightly bent in two.



These slight folds prevent the parts from pivoting.



Glue a piece of think kraft paper over the inner part of each barrel to trap it in place. The MG barrel is glued to the side panel, the autocannon barrel to the front panel.

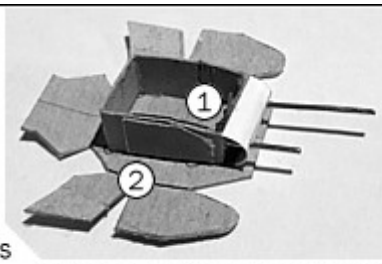
C04 Turret front



Cut 7 mm of Q-tip stem and glue it between the barrels, align its center on them.



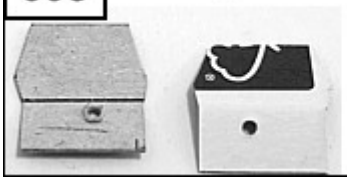
Cut and pierce a piece of smooth paper according to the specifications above. Use a toothpick or a Q-tip stem to give it a round shape.



(1) Apply glue inside the paper then slide it along the barrels. Make sure to glue the paper to the **top** of the front panel. Trim excess on the side.

(2) Glue the core assembly to the turret, using the positioning dots.

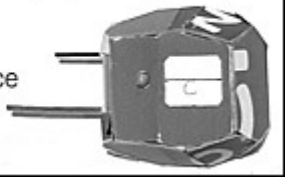
C05 Turret top panel



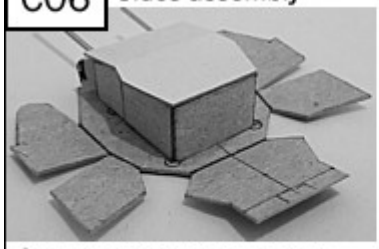
For all versions except the Ausf. F, perforate the piece and enlarge it with a tootpick. Once the turret is assembled, insert a 8 mm long piece of toothpick so it protrudes by about 1 mm.

Don't perforate the **Ausf F** turret top (see Step C08).

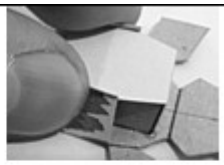
Use the periscope as a reference point to align the center line of **hatch C** to it.



C06 Sides assembly



Glue the turret top, align it with the core's rear panel. Wait for the glue to hardens before the next step.

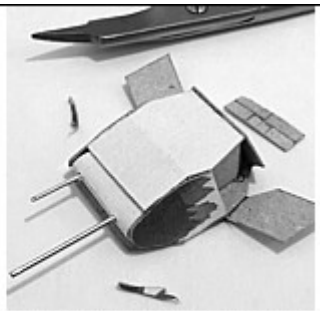


Dry fit the side panels, they have to coincide with the corner on the turret top. You may have to remove about 0,5 millimeter to fit.



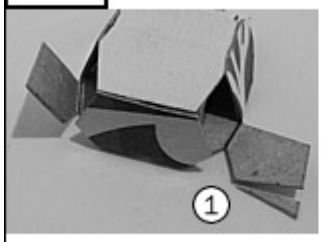
Apply glue inside the side panels and on the sides of the turret top. Glue the side panels to the turret top.

While the glue hardens, keep the assembly down against the table to keep the bottom flat.



Repeat the procedure with the turret rear flap. Finally, use nail scissors to trim these parts.

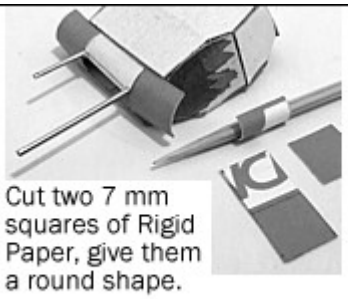
C07 Rear panels



Similarly, dry fit the last two panels before glueing them. (1) In case the rear side needs correction, cut as depicted to keep the shape of the "triangular hole" intact.



Look for acceptable results here, not perfect ones.



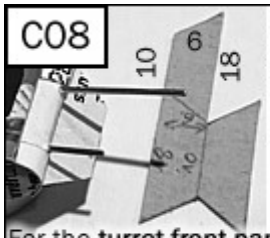
Cut two 7 mm squares of Rigid Paper, give them a round shape.

Glue them on both sides, next to the barrels, with a slight visual interstice.



Make sure no gaps remain.

C08



Glue it on its porous side below the barrels. Trim the excess.

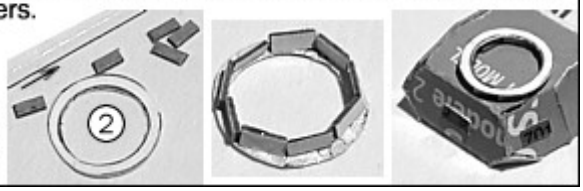


For the **turret front panel**, cut a trapezoid from a 6 mm strip of regular cardboard, as shown.

(1) Glue pieces of smooth paper over the "triangular holes" then trim to create the **chamfered corners**.

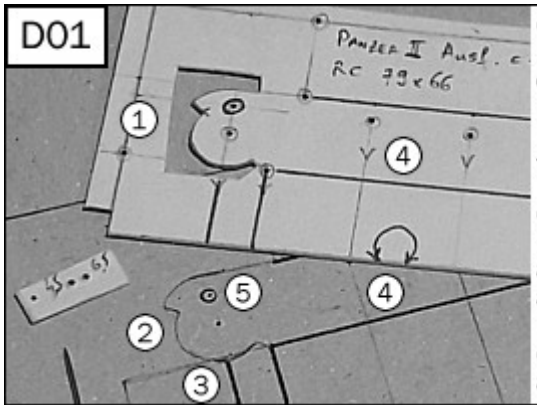


(2) **Ausf F** turret piece: r=4 & r=5,5 circles on rigid paper, 1 mm strip of cardboard cut in 3 mm parts, apply glue to the ring.



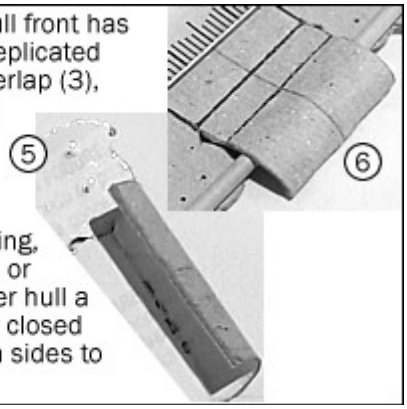
Part D - Panzer II Ausf. b and c

D01

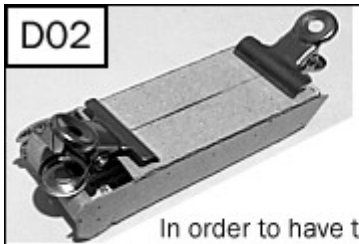


(1) Notice the round shape of the hull front has been cut out on the template, and replicated on the cardboard (2). In cases of overlap (3), round shape has priority because it is visible and the lower portion of the front hull is not.

(4) The lines between the return roller axis dots are used for positioning, and so is dot (5). (6) Use a thick nail or a similar object to give the front lower hull a round shape. Once the hull shape is closed (see Step D02), use dots (5) on both sides to align the top of this part.



D02



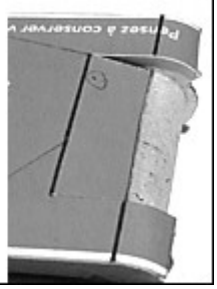




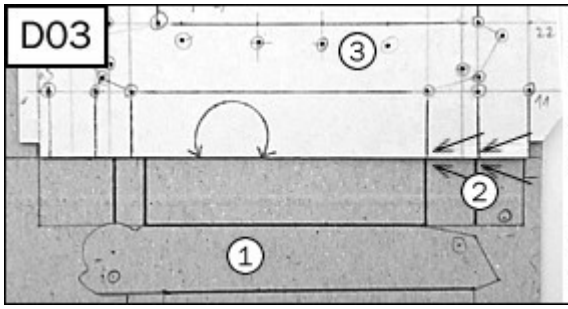
In order to have the proper width, insert the front and rear parts into the hull part but do not apply glue to them yet. Glue the hull on its connectors.

Make sure that the curve of the round front hull follows the curve of the side hull, and also that it is straight and at a right angle with it.

Round the forward **mudguards** like with the hull front. **Measure** before cutting the central panel. As a reference point, it should be aligned with the mudguard folding lines.



D03

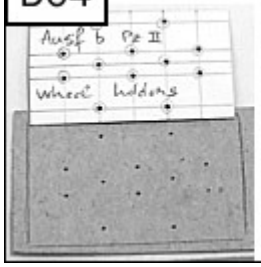


To make the hull for the **Ausf. c**, first use the Ausf c+b template but don't mark the dots for the three return rollers (1).
In a second time, take the template on page 6 and align it on the lines at the rear (2), then mark the dots for the four return rollers (3). The Ausf. c uses the same road wheels and suspension assembly as the subsequent models.

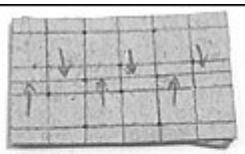


Both **Ausf b and c** have a 13 mm long **exhaust**, use the procedure of Step A10 with a 13 mm piece of Q-tip stem, a 13 x 12 mm piece of smooth paper and a 40 x 11 mm piece of paper.

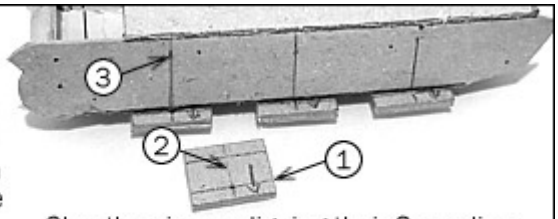
D04 Ausf. b wheel holders



The template is cut out so its borders define the dimensions of the piece. Cut the single layer of cardboard to shape then glue two other layers of cardboard underneath, porous side against smooth side.



Mark the pieces with an arrow towards the central line. Cut the central line first, then the parts.



Glue the pieces aligning their 2 mm line (1) with the hull's border and their central line (2) with the positioning line (3).

D05 Ausf. b road wheels



Glue **3** Ø 6 mm snippets together, porous side against smooth side.



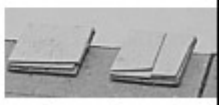
Glue each wheel 1 mm away from the wheel holder's central line.



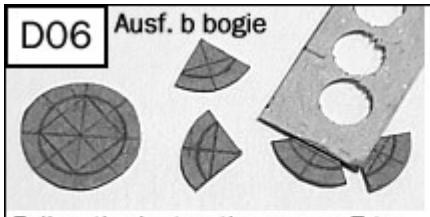
Roll about 12 mm of smooth paper into a tube under 2 mm of diameter, for instance by wrapping it around a piece of medium wire.

Cut 3 mm sections from that tube and glue them against the wheel holders. After this, the assembly is ready for painting.

Note: the wheel holders can be made from uneven bits of cardboard.



D06 Ausf. b bogie



Follow the instructions page 7 to create a "bogie wheel". Three such wheels are enough for two models.

Cut this wheel in four and glue the tips, on the porous side, of these quarters to a discarded piece of cardboard, with the straight line still visible. Paint the smooth side of these assemblies, then separate the bogie parts by cutting the straight line.

Also prepare and paint two 2 mm strips of cardboard, each 32 mm long.

After having painted the wheels and glued the tracks, glue these bogie parts on the painted road wheels as depicted.



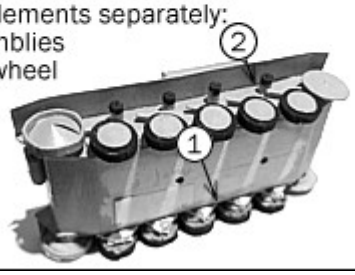
Finally, glue the 32 mm strips (see cover image).

Part E - Assembling the parts and the tracks

E01 Painting and assembly



Paint these elements separately:
- wheel assemblies
- spare road wheel
- tracks
- hull
- turret



(1) Glue the wheel assemblies so that the bottom of the suspension rack is flush with the bottom of the hull. (2) You may have to trim some suspensions if the return rollers interfere. When glueing the second assembly, make sure the top of the hull is level (that is, horizontal).

The return rollers were painted in the main colour, and only their tips and half length were painted in dark grey afterwards.





To install the tracks, give them a rounder shape, apply glue on top of the return rollers, idler and sprocket, then position the tracks there and use toothpicks to keep pressure. Position the tracks to check and trim to adjust for length, apply glue on the bottom of the road wheels and glue together. A piece of smooth paper glued underneath helps keeping both ends in contact.