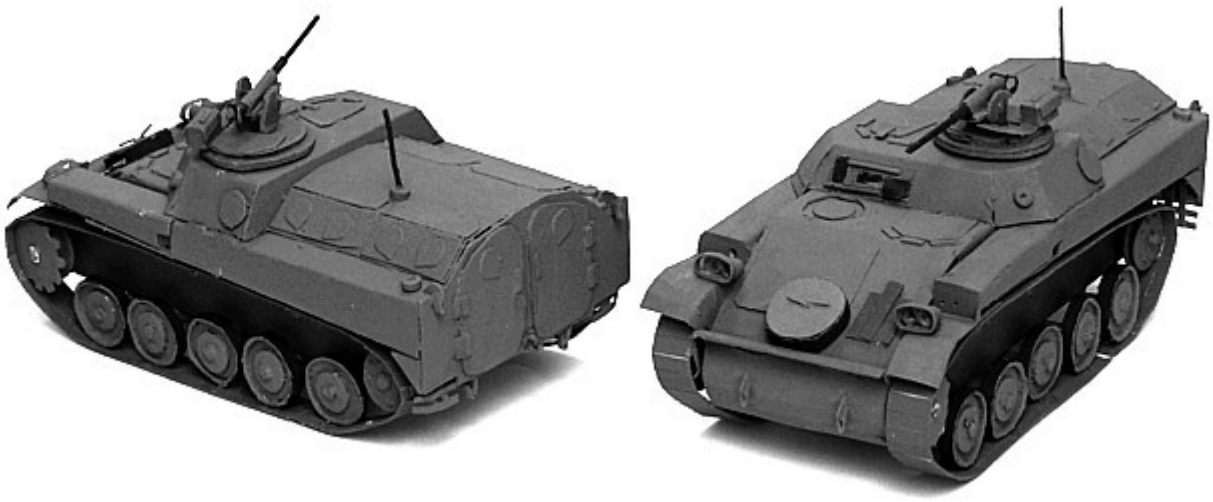
Toothpick Miniatures

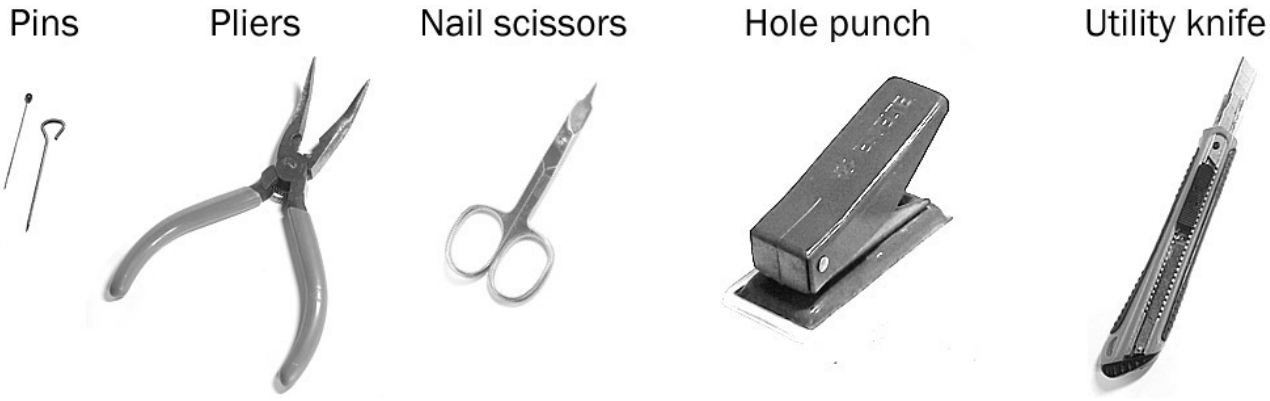
by Alexandre Karadimas

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



AMX-13 VTT Armoured Personel Carrier

Required tooling:



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Booklet 3 – AMX-13 VTT Version 1.0 – March 2024

Required tools and materials

1. Tools

Commonly found at home

- 1 small segmented blade or "snap-off blade" utility knife. Cutting plastic will wear the cutter's edge quite rapidly.
- 1 pair of thin pliers with a wire-cutting capability.
- 1 cutting board, made of a piece of wood, MDF, thick plastic or any other suitable material.
- 1 piercing board with a Ø 4 mm (*meaning: of a diameter of 4mm*) hole drilled through it (see image B01 on page 9) to make piercing cardboard much easier.

- 1 pair of nail scissors (slim ends are preferable) for cutting paper and thin cardboard precisely.

- 1 hole punch (common stationary item), the standard versions punches Ø 5,5 mm or Ø 6 mm holes. *This design only uses the round clippings of thin cardboard, about 20 units of them per model.*

- 1 pin Ø 0,6mm, common stationery item.
- 1 pin Ø 0,4mm, typically used to hold cloth while sewing or in newly bought shirts, to make more precise holes to start with.

- 1 mechanical pencil to precisely mark cardboard and paper. *Note: it can't be substituted by a regular pencil because the templates have holes specifically made for mechanical pencil tips.*
- 1 set square in metric or at least a ruler in metric.

- stationery hinge clips to hold small parts together while the glue dries. *If you don't have these hinge clips, you can hold the pieces together between your fingers until they are glued together.*

- Household glue, in liquid or gel form, to assemble the parts together.

Recommended additional tooling

- 1 hand drill with a Ø 1 mm and Ø 2 mm drill bits. *Such a drill usually costs about 10 Euros or US Dollars, including the drill bits. If you can't have the drill it itself, using the two drill bits will bring the same results.*

- 1 magnet (Ø 5mm to 10mm approximately) that can be part of a handle to assist in painting the miniature.

- 1 calliper (the very economical plastic variety is sufficient, costing about 3 Euros or US Dollars). *It is useful for assessing the thickness of your materials and makeshift tools.*

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

Please don't cut yourself.

2. Materials

Commonly found for free or nearly free

- Thick cardboard (1,5mm thick, like in delivery pizza boxes) is used for the bases of the miniatures.
- Thin cardboard used in packaging (typically in breakfast cereal boxes or tissue boxes) is used to make most of the model's body. The thinner the cardboard, the better.
- Rigid or thick paper (for instance, train or subway tickets). It is used in several parts of the body.
- Thin kraft paper found for instance in paper bags for fruit & vegetables is used in road wheels and tracks.

- Toothpicks are used for the wheels axles.
- Ear cleaning swabs ("Q-tips") with paper stems are necessary to create the headlights, the return rollers and many details. *The cheaper brands are easier to work with.*

Wire, which may be found at home or bought economically

- Bailing wire under Ø 10 mm can be used for the axles of the return rollers.
- Ø 0,45mm medium wire can be obtained from from plastic-wrapped "double-wire" metal clips ("DWC") typically used to seal bread bags. Its plastic sheath is necessary for the M2 weapon and some smaller details. *If you don't have bailing wire for the return rollers, you can used DWC wire instead.*

- Ø 0,3 mm thin crafting wire (typically sold online or in supermarket "hobby" sections) are used to fasten the axles to the body.
- *Ø 0,25 mm thin plastic-wrapped"freezer" wire*, used to seal bags for the freezer, can substitute for thin crafting wire.

- 1 paperclip is preferred to provide a straight barrel to the M2 weapon. *Bailing wire or DWC wire can be used instead but it will not look as good.*

Technical aspects

Working on a small scale

The 1:64 scale is at the very limit of where one can operate visually and physically without optical help. The millimeter will be the unit of measurement here, it is not practical to provide more precise values. Below 0,5 millimeter, it is up to you to decide whether the result is satisfactory or not.

Setting up templates and jigs

Some pieces have a simple design and are best drawn in batches, using a ruler. Illustrations will feature an example whenever this is the case.

Other pieces 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 pieces, and indications to position them precisely.

By using templates, you will be sure to have the same dimensions on all pieces.

Most templates are on the central pages

Half-templates (1/2 templates)

The most complex templates are for one half of the piece only, in order to save time. To use them, draw a line on the piece of cardboard and align the template to it.

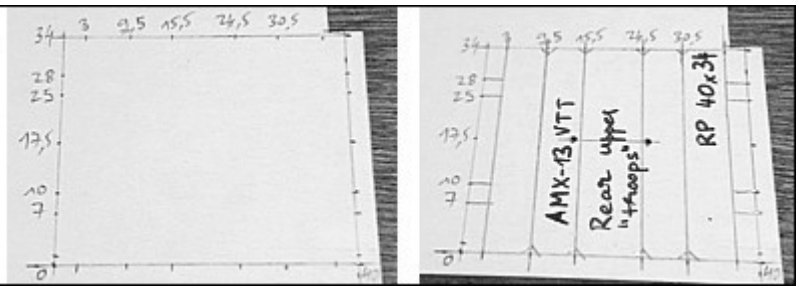
Duplicate the markings then flip the template over and duplicate the markings for the second half.

Piercing holes on templates

To pierce, first use the Ø 0,4 mm thin pin then enlarge each hole with the Ø 0,6 mm pin, wiggling it until it is be wide enough to let the Ø 0,7 mm graphite tip of the mechanical pencil through.

How to make your templates

1. Select a white or light piece of cardboard.
2. Draw a rectangular frame.
3. Mark all measures on opposing sides.
4. Use these marks as a grid to position points of the template. Draw the template.
5. Label the template and cut it to shape.
6. Also write down the dimensions of the cardboard piece you'll use it on.



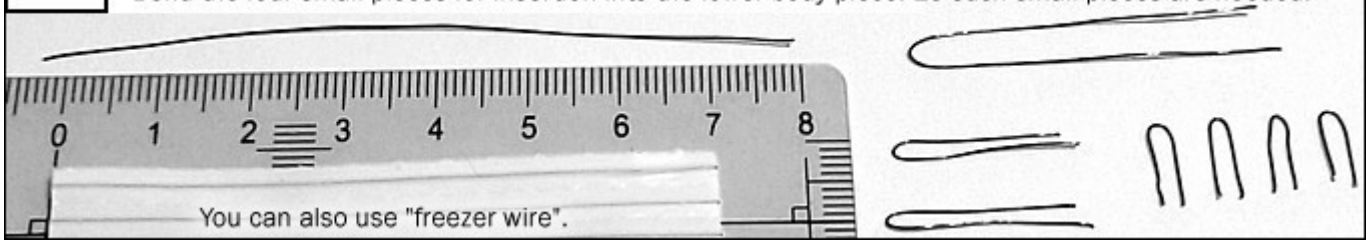
Glue works better on the **porous side** of cardboard packaging. The smooth, printed side is better suited to be painted over.

You can use a **roller pen**, even a depleted one, on the folding lines. This will make folding easier and more precise.

Part A: Vehicle body before painting

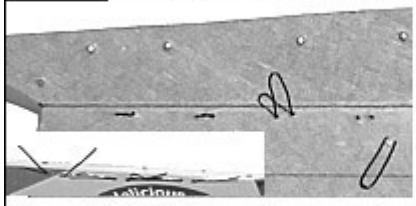
A01

Bend a 8mm piece of thin wire in two to see where to cut it. Repeat the process with the two halves.
Bend the four small pieces for insertion into the lower body piece. 10 such small pieces are needed.



A02

Insert wire loops, flatten them on the other side.

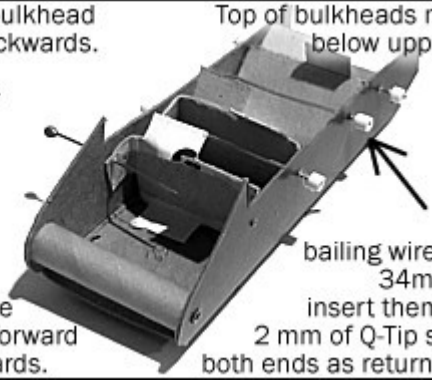


Cut 2x 26mm pieces of Ø 6 mm paper straw and glue them where the front and rear axles are.

Fold the upper side tabs of each bulkhead piece forwards, the lower ones backwards.

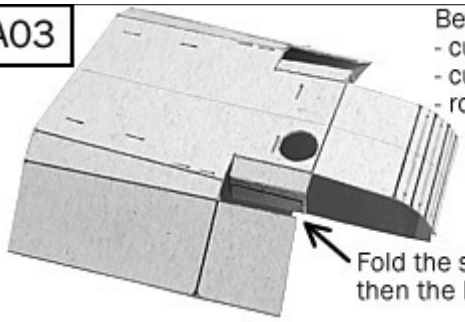
Use positioning lines to glue the bulkheads to the bottom, two forward ones forwards, the last backwards.

Top of bulkheads must be below upper limit.



Cut 4x bailing wire pieces 34mm long, insert them, place 2 mm of Q-Tip stem on both ends as return rollers.

A03

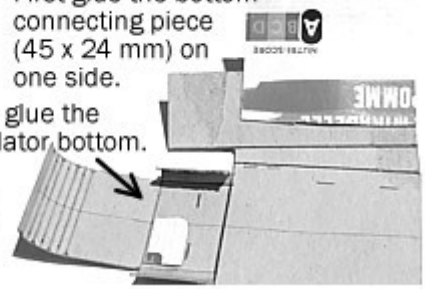


Fold the small sides first, then the larger sides.

Before cutting the rest of the shape:
- cut the slits,
- cut the ventilator hole,
- roll the ballpen on the fold lines.

First glue the bottom connecting piece (45 x 24 mm) on one side.

Then glue the ventilator bottom.



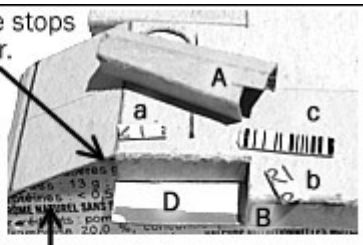
Then close the shape by glueing the other side of the bottom.

A04

Draw guiding lines 13 mm of either side of the underside's central divide.

Lower and middle body assembly:
- Apply glue to the upper bulkhead tabs and the upper edges of the lower body.
- Glue the lower body and the middle body together, using the guiding lines.

The middle body's underside stops the lower body's inner corner.



Do not mind if the front part is not flush with the lower body, this gap will be hidden by the side boxes and the mudguards.

Left-hand side "side box":
- cut two short thin cardboard pieces ("a" and "b") and a longer one ("c")
- glue "a" inside the sidebox on position "A", "b" inside the middle body on position "B" then "c" on top of piece "a"
- glue the side box on position "D", apply glue on piece "c" so it forms a bridge from "a" to "b".

Right-hand side "side box":
- Cut, fold and glue the right-hand side "side box"
- Cut 20mm of Q-tip stem.
- Glue it inside the "side box" against the outer wall.

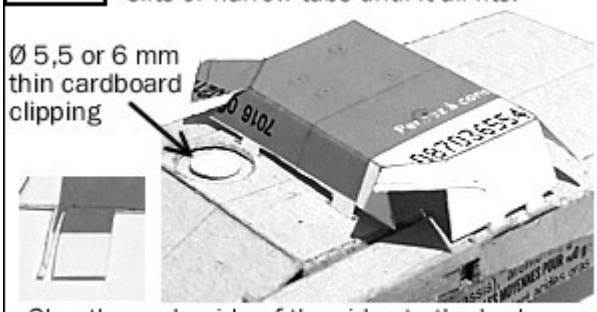
Side box cover: glue thin cardboard pieces on the side boxes and mudguards, then trim them to fit.

Perforate patterns before.

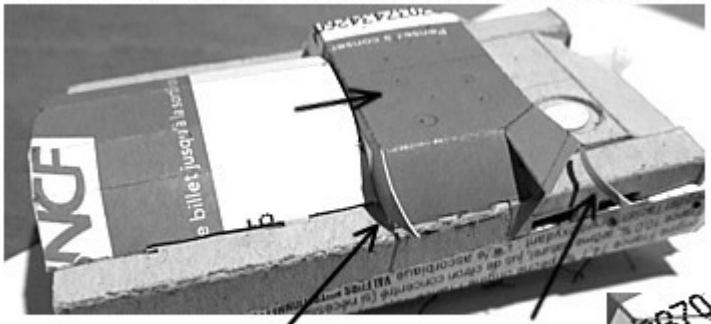
A05

Dry fit both upper structures, prolong slits or narrow tabs until it all fits.

Ø 5,5 or 6 mm thin cardboard clipping



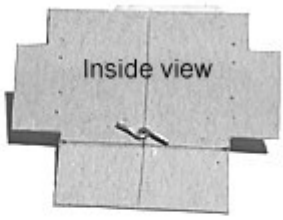
The rear structure pushes the back panel of the front structure.

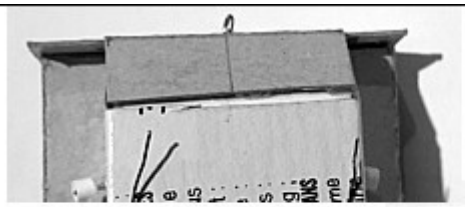


- Glue the underside of the sides to the body.
- Do not apply glue to the diagonal parts or the rear part of the front structure, these parts will be trimmed.
- Do not apply glue on any tabs, this would make them soft.

Using nail scissors, carefully trim the shapes until they fit, then glue them to the structures.

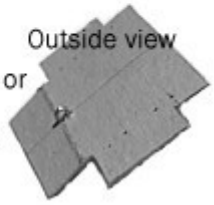
A06





Glue the rear piece, centering it mainly on the rear of the lower body.

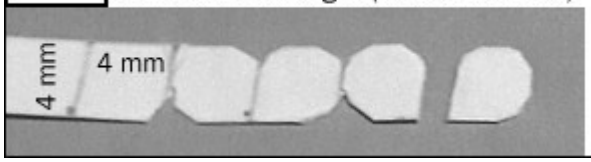
Trailer hitch:
- Wrap a 20 mm piece of medium wire or bailing wire around a Ø 1 mm nail.
- Pierce the rear body piece and widen until the trailer hitch can be inserted.
- Open it on the other side.

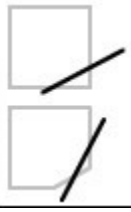


Cut the upper side of the rear part following directly the shape of the rear upper structure.

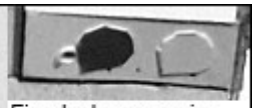
A07

To make the fire hole covers, cut three corners in two stages (see illustrations).





Use the positioning dots to glue the fire hole covers



Fire hole cover in open position
Ø 2 mm fire hole (toothpick diameter)

A08

Top hatch (cut 1mm on corners & use positioning dots)

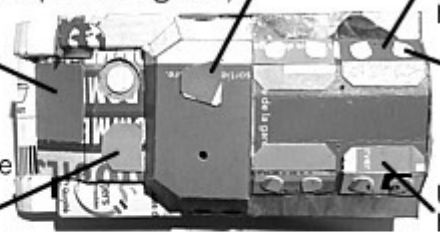
"Troop" lower hatches

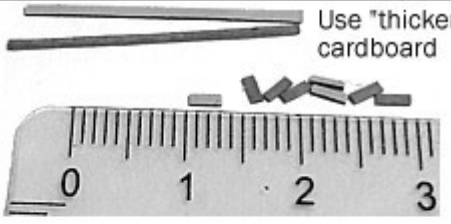
Engine hatch (use positioning dots at the top, leave 1 mm clear from the side)

Fire hole covers

Driver hatch (distance 2mm from side and at least 1 mm from fold in front)

Upper hatches



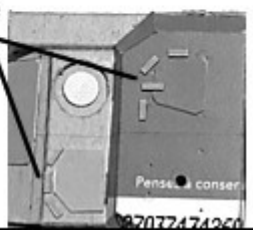


Use "thicker" thin cardboard

Cut 3 mm x 1 mm pieces to use as episcopes, rear door hinges and rear door handles.

Perforate top of middle body and enlarge hole with toothpick.

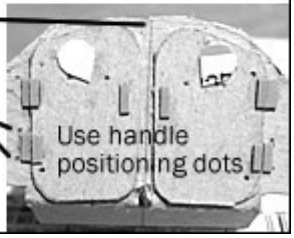
Positions for the episcopes and top hatch hinge



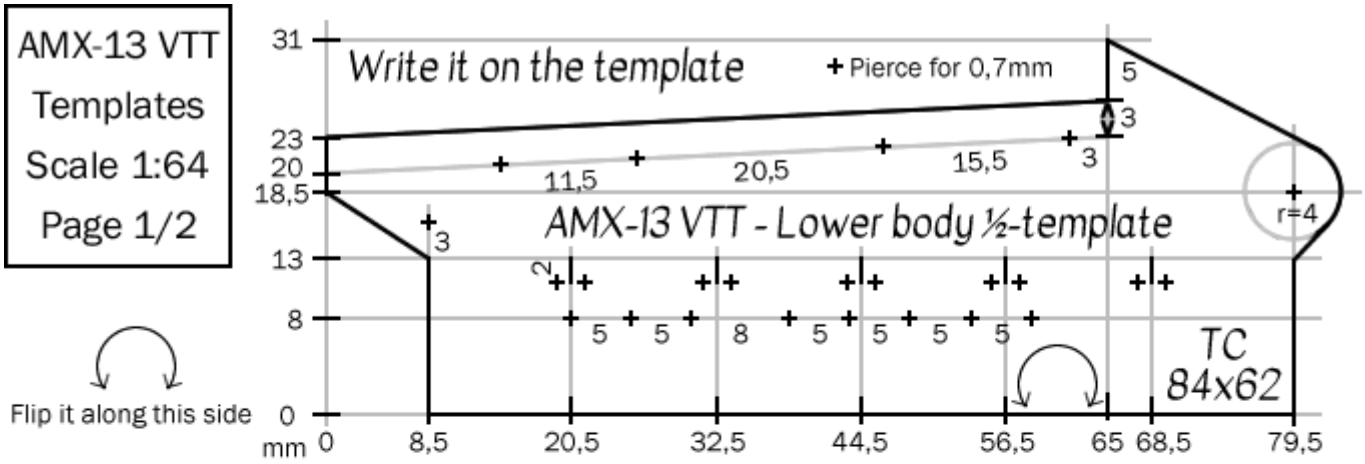
Position doors relative to the central line.

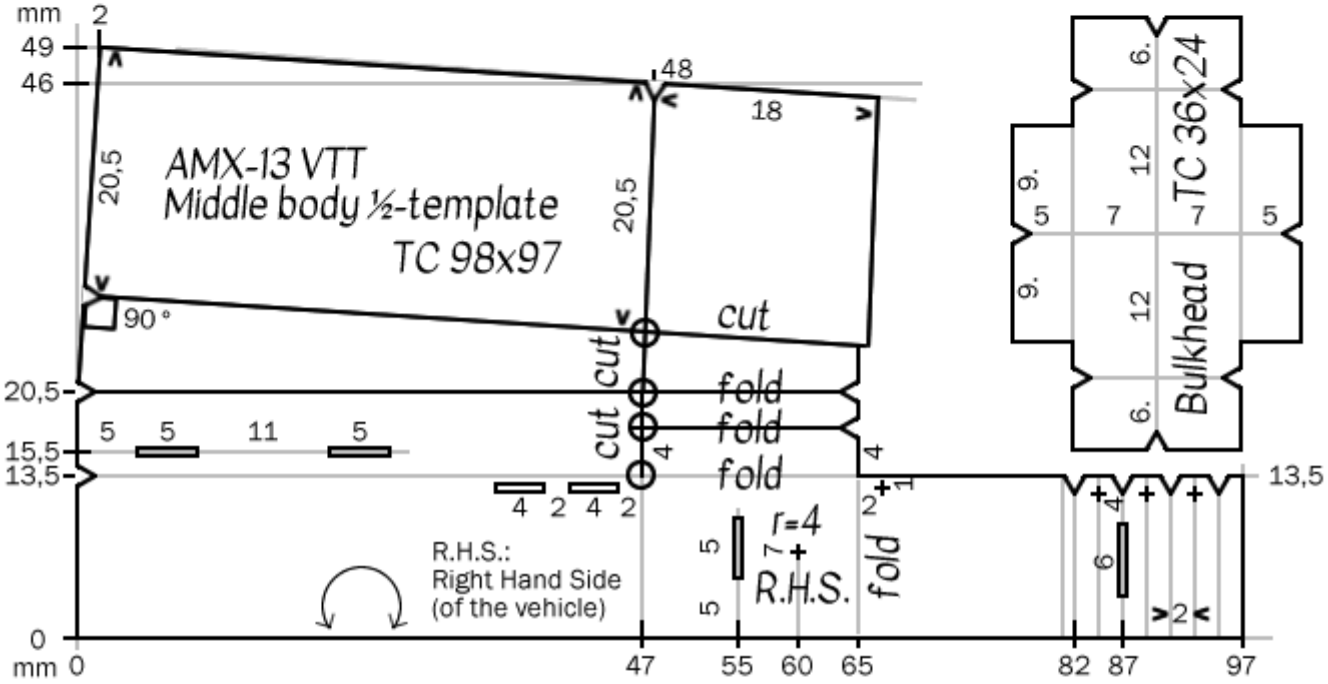
Use positioning dots to vertically position door hinges against the doors.

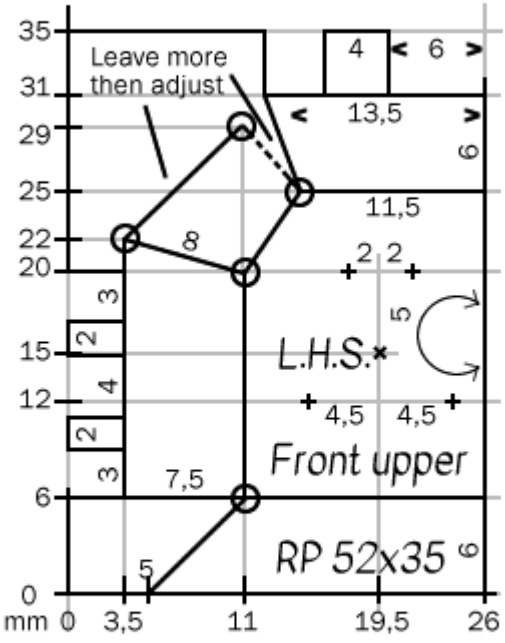
(Don't forget the rear fire hole covers)

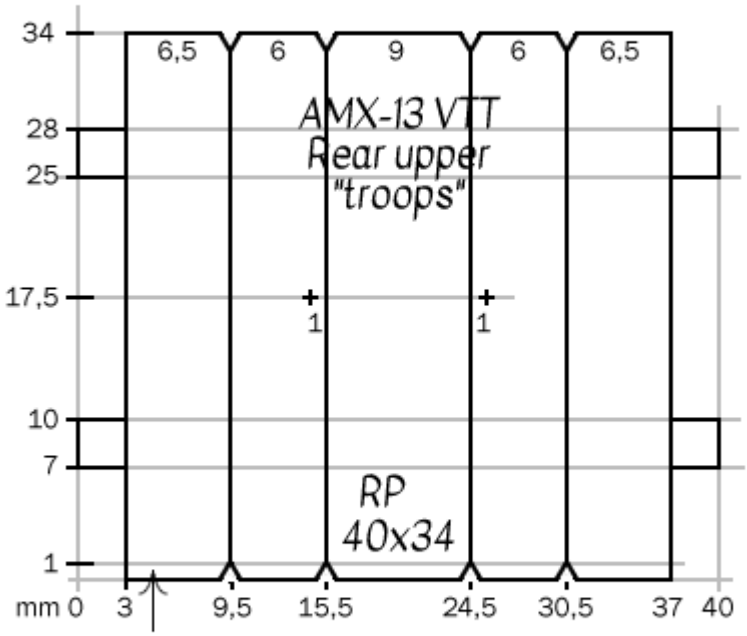


AMX-13 VTT
Templates
Scale 1:64
Page 1/2









Trim excess after
(unglued) first assembly

○ Pierce the points of intersection

× Turret axis on left side of vehicle
(L.H.S.)

+ Positioning points for top hatch
on right side of vehicle

+ Pierce for 0,7mm

TC: Thin Cardboard
RP: Rigid Paper

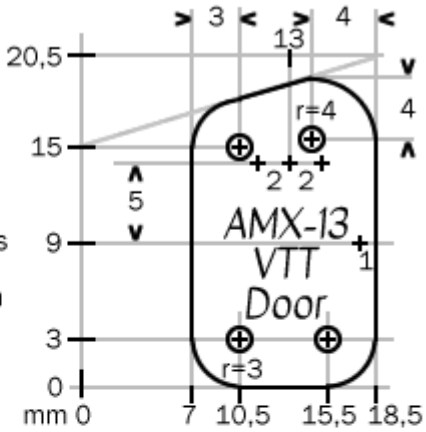
Diagrams on this page are not all at the same scale

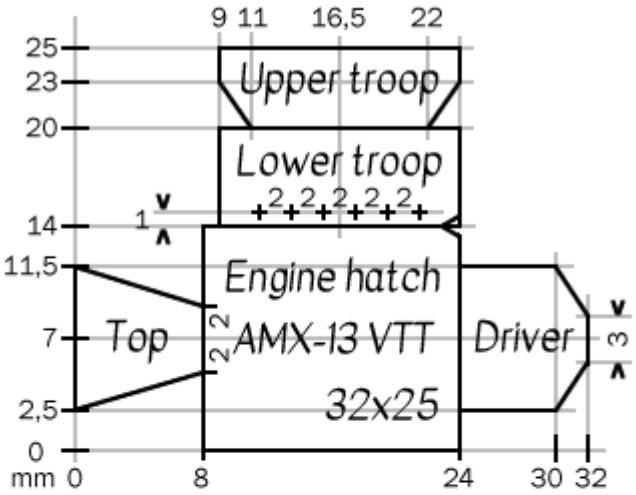
AMX-13 VTT
Templates
Scale 1:64
Page 2/2

⊕ Pivot for compass

\+ Pierce for 0,7mm

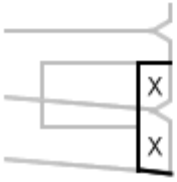
Flip it along this side

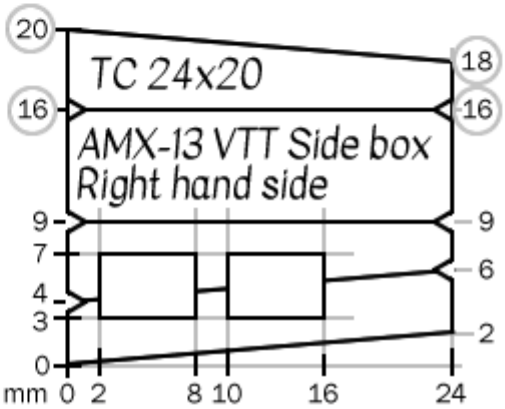


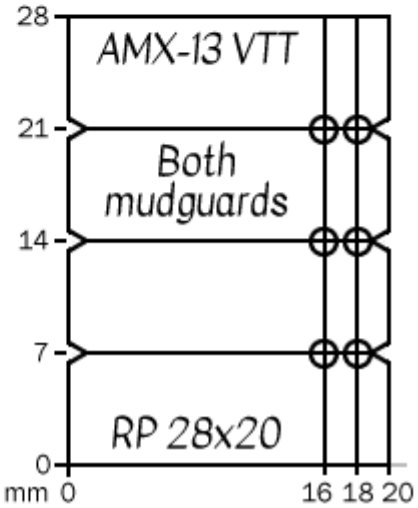


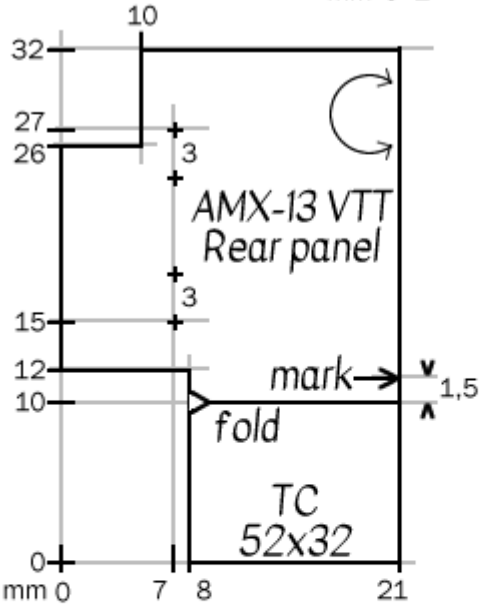
These values have to be adapted to the thickness of the material. Start reducing them by 0,5 mm and keep adjusting them until you have a flush fit with the model.

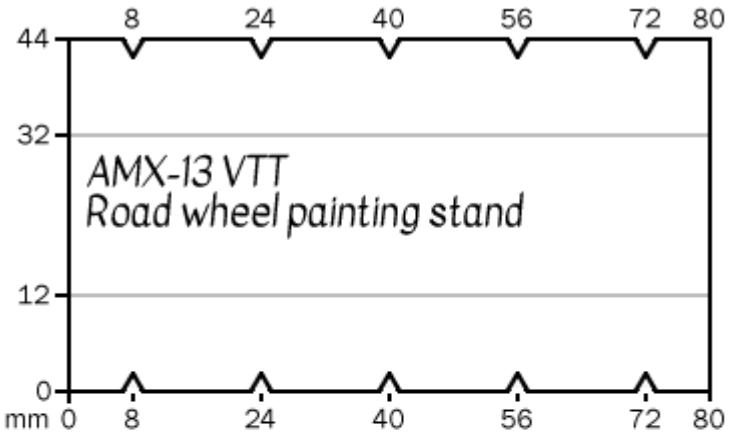
For left side box:
1. Flip right hand side template.
2. Prolong markings as depicted below.
3. Remove part marked X.



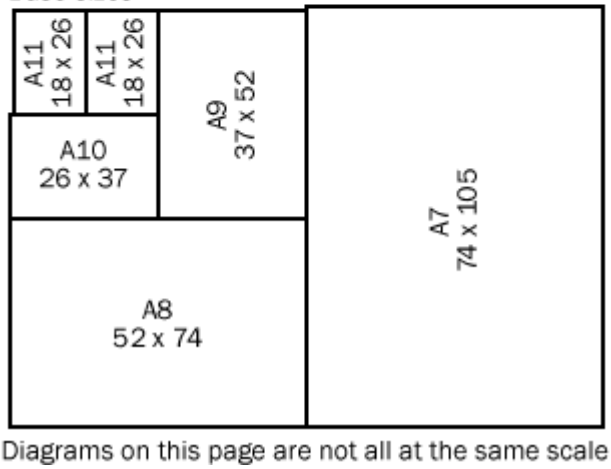


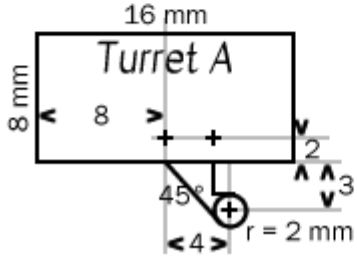


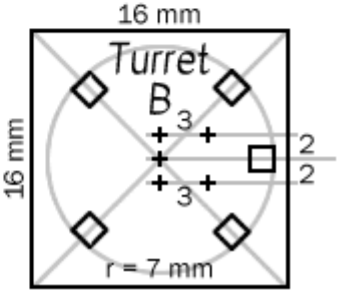




Base sizes







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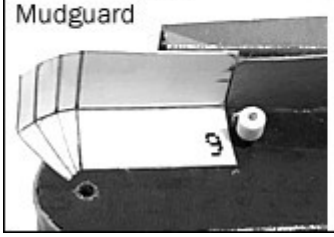
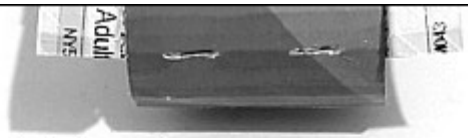
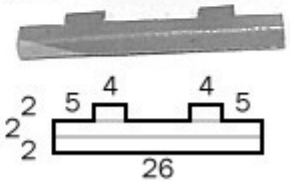
A09

Mudguard





Splash guard

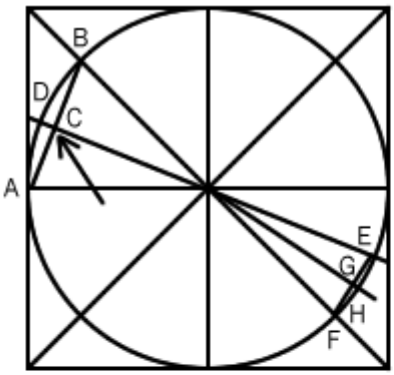


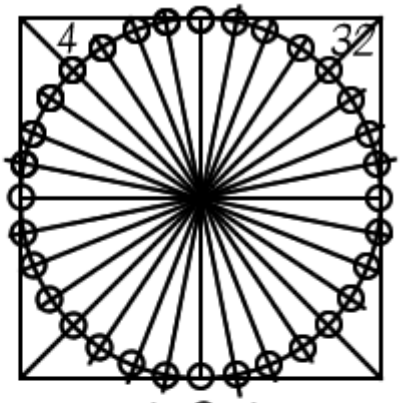
Use adhesive tape to fasten two paperclips to the bottom of the body.

This way, you can use a magnet glued to a handle to paint the model without touching it.

Base 4 protractor

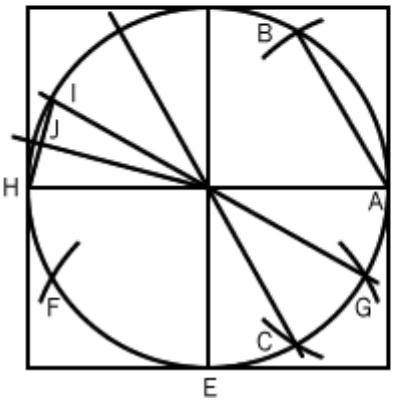
- Draw a large square, then draw lines between the corners and between the middle points.
-Draw a circle from the intersection of these lines.
- C is the middle of the segment [AB], it divides the angle by two.
- Prolong the line between the center and C to intersect the circle (points D and E).
- Repeat the process between E and F.
- Repeat the process or use set square to extent to the whole circle.
- Pierce the intersections (32 points) and the center of the circle.

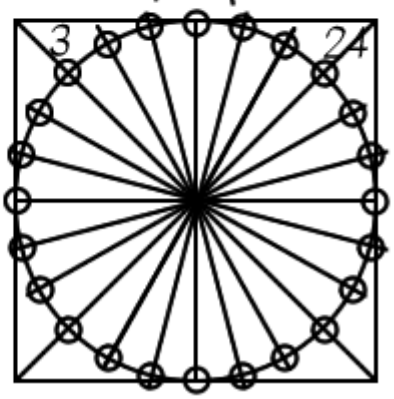




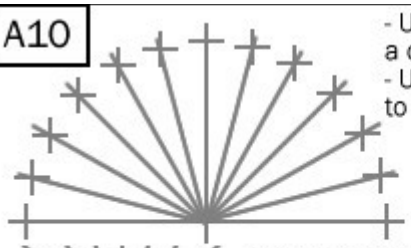
Base 3 protractor

- Draw a large square.
- Draw lines between the middle points.
- Center the compass on point A and draw a circle of the same diameter as the main one, which it intersects at points B and C.
- Repeat the process from point E, intersection points F and G.
- Divide the angles using the method explained above (points H,I & J) and extend to the whole circle.
- Pierce the intersections (24 points) and the center of the circle.

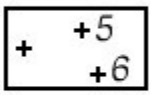


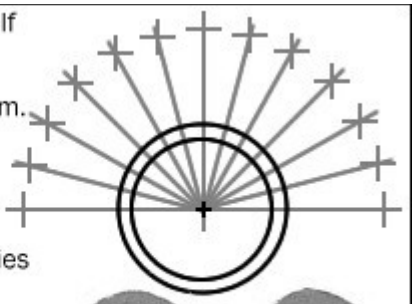


A10

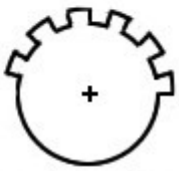


- Use the Base-3 contractor to draw lines on half a circle.
- Use a concentric compass (see below) to draw two circles of diameter 10 mm & 12 mm.

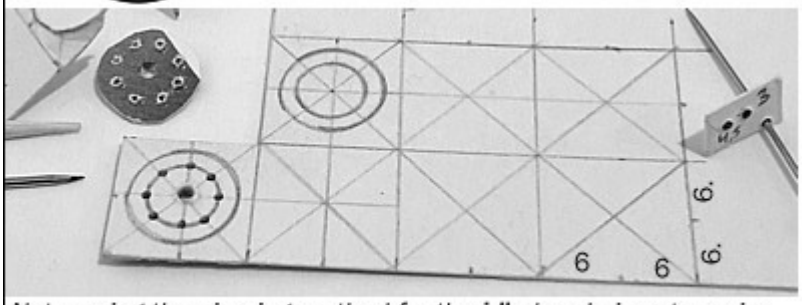




Draw the lines between the 10 mm circle and the 12 mm circle, then mark the sprocket lines and cut.

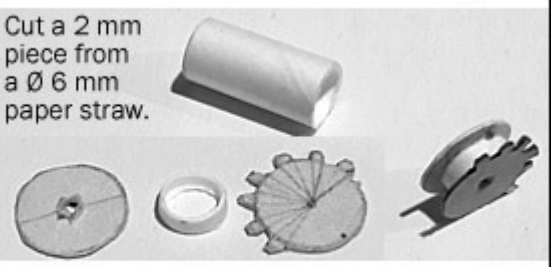


- Cut the extremities of the **sprocket**'s teeth to make them appear less angular.
- Cut a cross across the sprocket's axis.



*Note: using the piercing method for the **idler**'s axle is not precise enough, the cross-cut axis of the sprocket is more precise.*

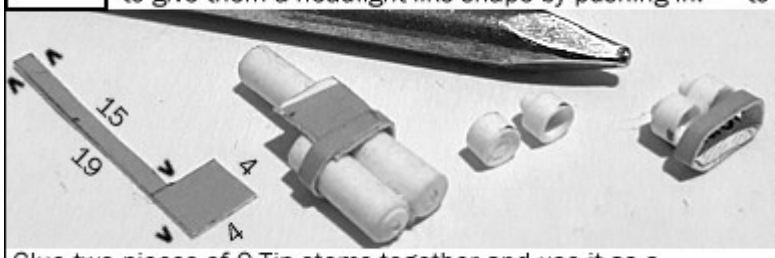
Cut a 2 mm piece from a Ø 6 mm paper straw.



The Ø 10 mm inner wheel of the sprocket assembly can hardly be seen, there is no need to cut gear teeths on it.

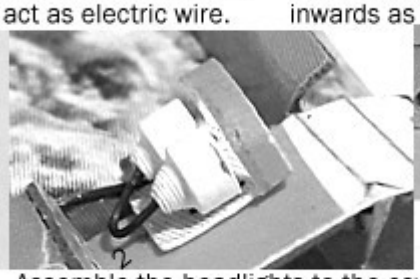
A11

Cut 2x 2mm pieces out of a Q-Tip stem. Use a nail to give them a headlight-like shape by pushing in.



Glue two pieces of Q-Tip stems together and use it as a jig to wrap the long part of the headlight cover around it.

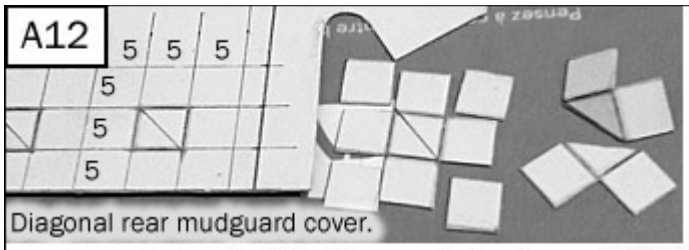
You can insert thin wire to act as electric wire.



Position the assembly as inwards as possible

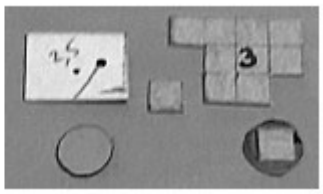
Assemble the headlights to the cover and position it 2 mm ahead of the sidebox cover.

A12



Diagonal rear mudguard cover.

An air intake consists of a Ø 5 mm disk and a 3 x 3 mm spacer, both made from thin cardboard.



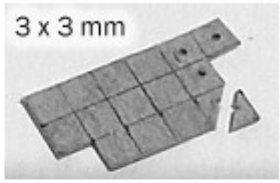
Make the rear chains by cutting and glueing four 5 x 1 mm strips as pictured. Glue one set per side inside of the rear mudguard.

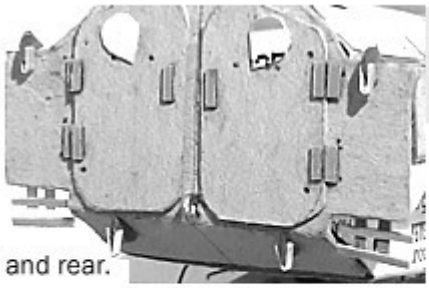
Position left hand side: to the back, mid-height.

Position right hand side: to the bottom, in the middle.

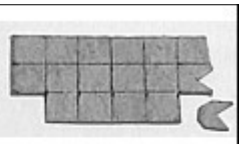
A13

Shacklebolts: fold 5 x 1 mm strips of rigid paper in two and glue them to the supports.



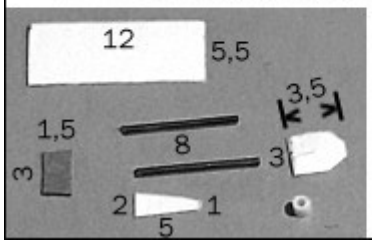


Lower shacklebolts, front and rear.



Rear upper shacklebolt supports.

1 mm slices of Q-tip stem.



Tools: assemble but glue to the model only after painting.

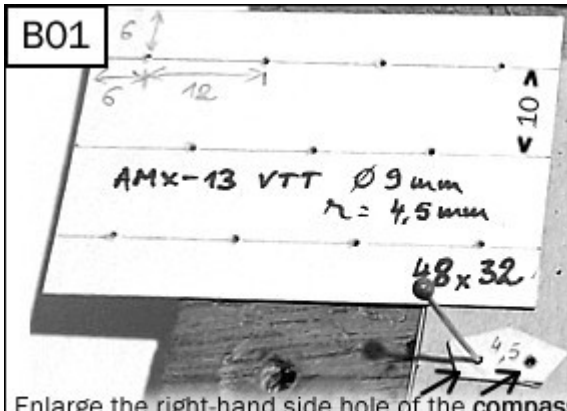
Pick cylinder: 1 mm of DWC sheath

The **antenna**'s base is a piece of Q-tip stem cut at an angle.

Pierce through the antenna hole, then insert 15 mm of a 25 mm piece of wire.

Part B: Wheels before painting - Part C: Tracks before painting

B01



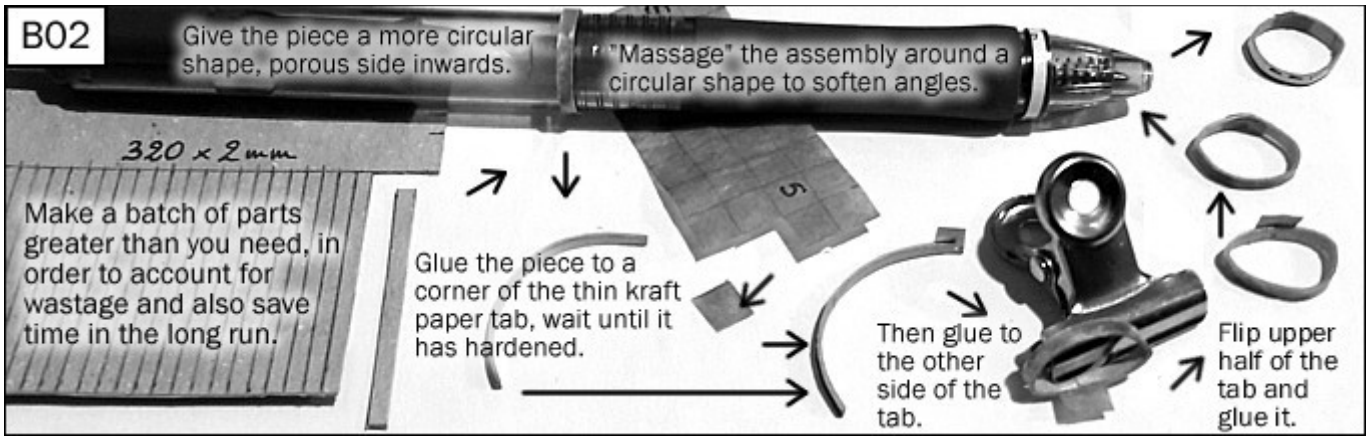
Enlarge the right-hand side hole of the **compass** for the Ø 0,7 mm graphite tip. but keep the left-hand side Ø 0,4 mm pin hole as a precise pivot.

Glue two pieces of cardboard together: a single piece of cardboard would be too thin.

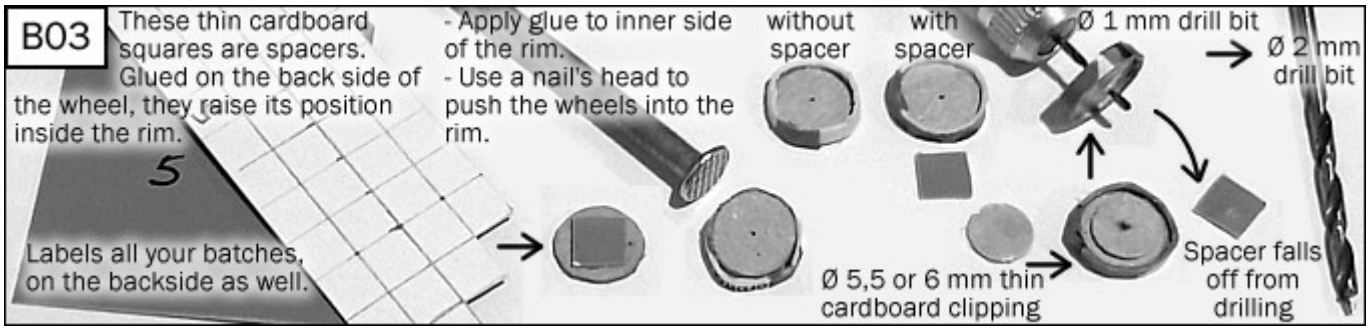
Use markings as a center for the compass.

Cut the disks out using nail scissors.

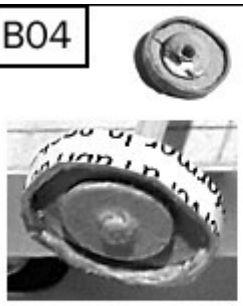
B02



B03

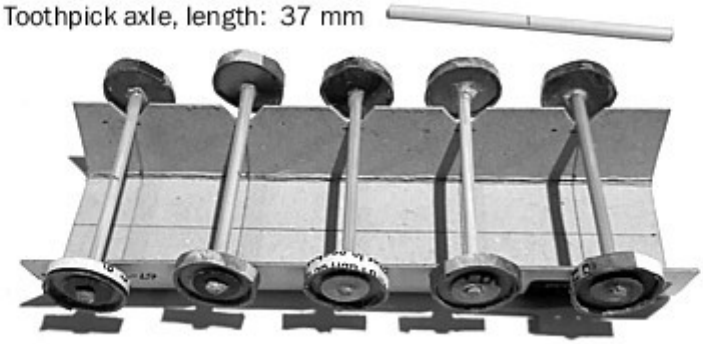


B04



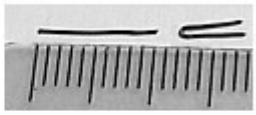
Glue so that the axle protrudes just enough to be visible.

Toothpick axle, length: 37 mm



Assembled road wheels on their painting stand.

Spare road wheel: Fold a 10 mm piece of thin wire in two.



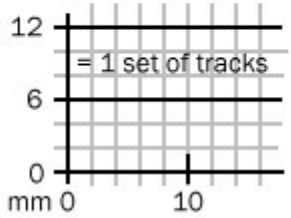
Fold handles on top side and the rest on the hidden side.

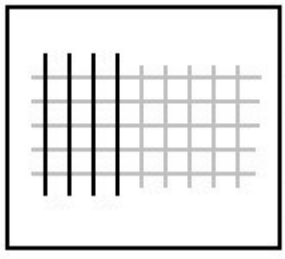
C01

Vertically: draw a line every 2 mm. Mark every 10 mm with a distinct colour, to better monitor the progression when cutting.

Horizontally: draw a line every 2 mm. Every 6 mm the line is of a distinct colour. Draw as much pairs of tracks as possible, there is little time difference between drawing & cutting 36 mm or 64 mm.

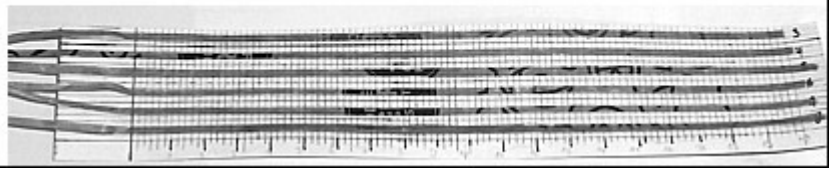
A set of tracks is 200 mm (20 cm) long.





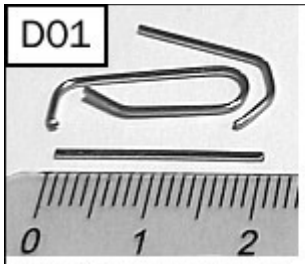
Important: Leave at least 6mm of uncut cardboard above and under the cuts.

Once all vertical lines have been cut, glue 2 mm wide strips of thin kraft paper to the middle part of each set of tracks. When the glue has hardened, cut sets of tracks loose as you need them.



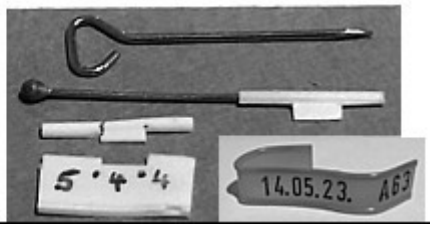
Part D: the turret

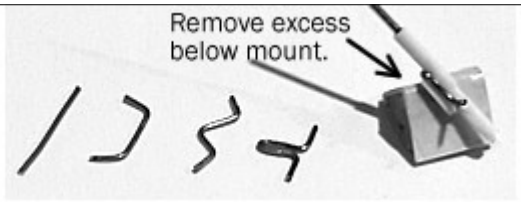
D01



Paperclip metal has the correct thickness (Ø 0,8 mm) for the **barrel** and cannot be bent of out shape.

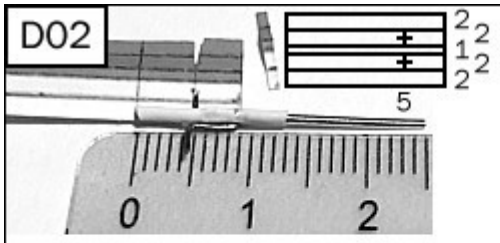
- For the **central part**, use the sheath of a Double Wire Clip (DWC).
- Enlarge the hole with a thin pin, then with a medium pin.
- Insert barrel until only 12 mm of it is left outside.

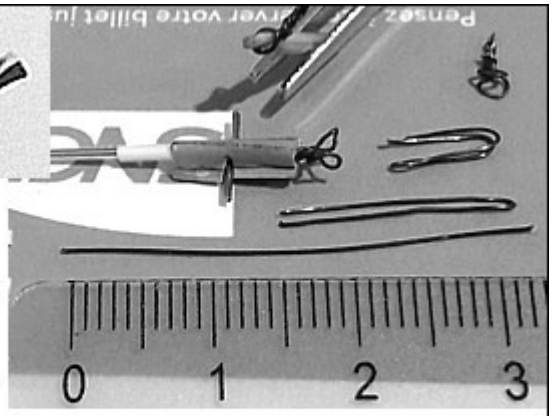




- For the **mount**, cut a 12 mm part from the DWC's wire.
- Bend a 3 mm handle at 90° from both ends.
- Bend the part in the middle, leaving just enough space for the central part's tab. That tab must be flush with the mount's underside.

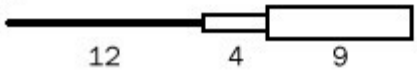
D02





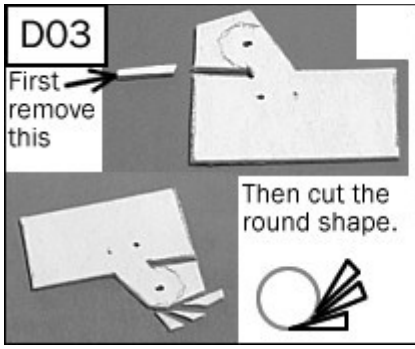
- For the weapon's **upper cover,** make folding marks on a piece of rigid paper to the specifications above. Pierce it on both side, 5 mm from the border, and cut from the hole to create two slits. Adjust.

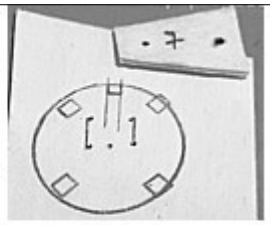
- For the weapon's **lower cover,** cut a thin cardboard piece 9 x3 mm. Glue the upper cover to the lower cover so that the mount axles are trapped between the two.

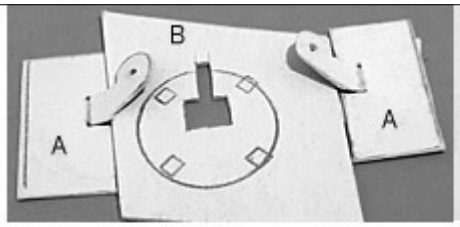


For the **handles**, cut 3 mm of thin wire and fold it twice.
- Twist the double loop against a flat shape, like the tip of a screwdriver.
- Screw that assembly into the rear part of the weapon.

D03

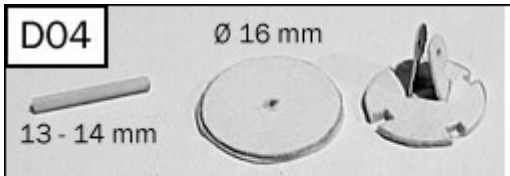






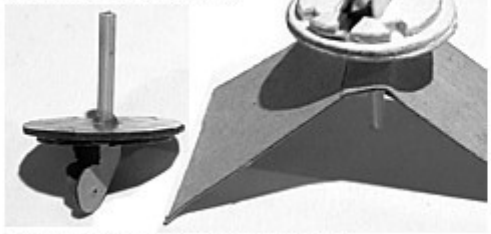
- Be sure to perforate the hole for the weapon's mount on both parts "A".
- Dry fit the "A" parts into part "B", if necessary remove excess from parts "A".
- Glue the parts together. Once the glue has hardened, cut the assembly along the circular line. Finally, cut the episcope holes.

D04

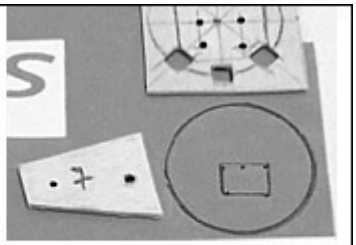


- Make a Ø 16 mm disk of thin cardboard, from a single or a double layer depending on the material and also the general look.
- perforate it with a Ø 2 mm drill.
- cut a 13 to 14 mm piece of toothpick.

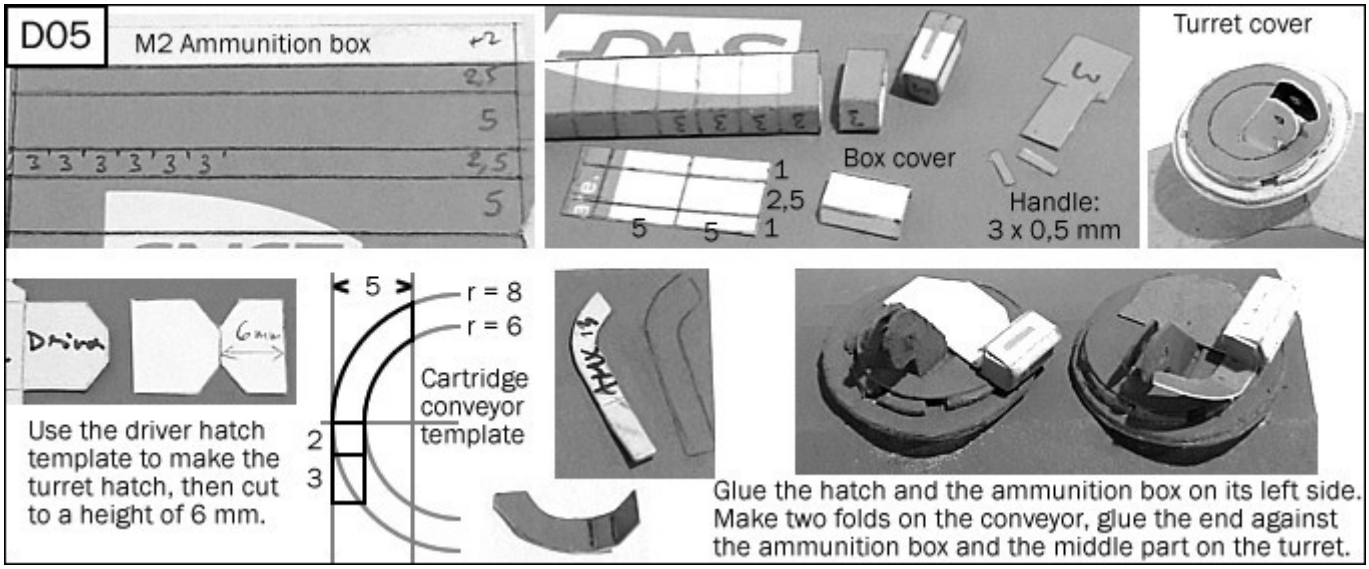
A stand makes work on the turret details easier.



Glue the three parts together.



For the turret cover, use the template on rigid paper to draw the position points.



Part E: Painting and assembling the model