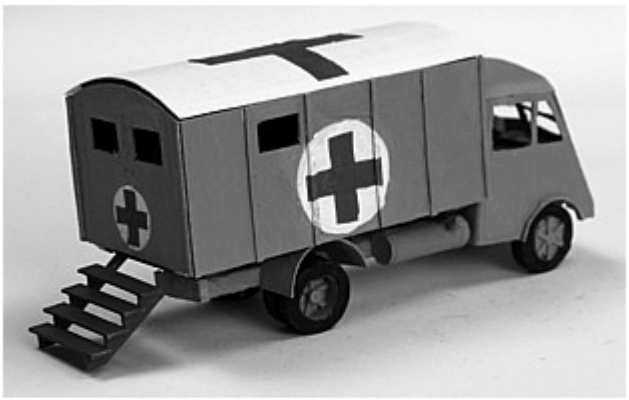
Constellation Miniatures

by Alexandre Karadimas

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

AHN_II

Requires Booklet n°11 "AHN_I"



Renault **AHN ambulance**, historically correct. All rear box bodies in this booklet have a removeable roof.

The **"LC-Koffer"** rear box body is historically correct. Designs for **removeable floors** with different furniture are provided.





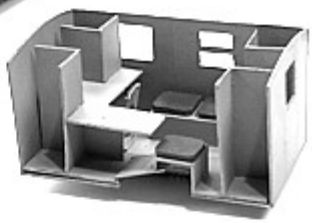


Raised roof option

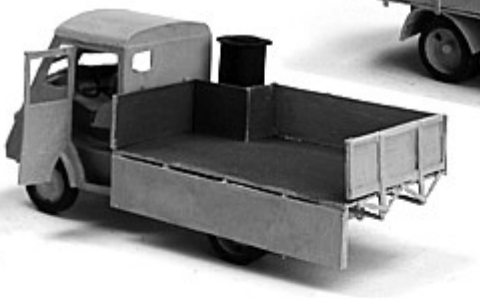


Wood gas generator





Open sideboard option



Triangular chairs

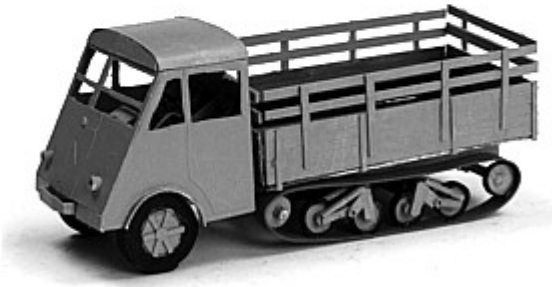




Pak 36: Booklet n°6

Breda 20/65: Booklet n°9





LRDG vehicle inspired by the CMP Ford F-30. The historically correct cargo bed is also provided p. 10. Two variants of a **removeable weapons platform** are provided.

While this "Muletier" (inspired by the Opel Maultier) is fictional, its **Horstmann suspension** is historically correct.

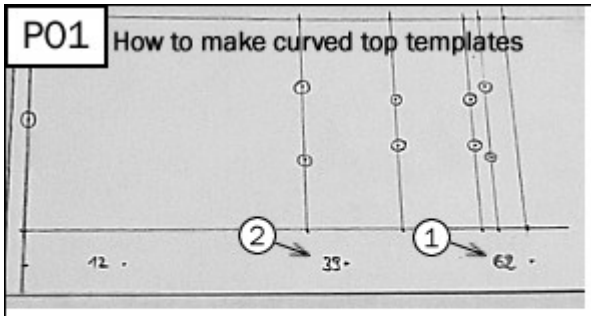
Download this booklet and others for free from **http://www.constellation-miniatures.com**
Visit the Youtube channel: https://www.youtube.com/@ConstellationMiniatures

Booklet 12 – AHN_II Version 1.1 – May 2026

Production aspects

Truck box body - squaring block

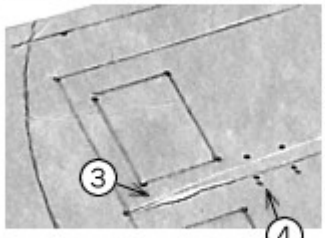
P01 How to make curved top templates





When drawing the templates for the front and rear parts, prolong the lines to make the **compass** necessary to make the LC-Koffer (1) and also the AHN ambulance (2). Cut the top of both templates by following the curve (see Step A10).

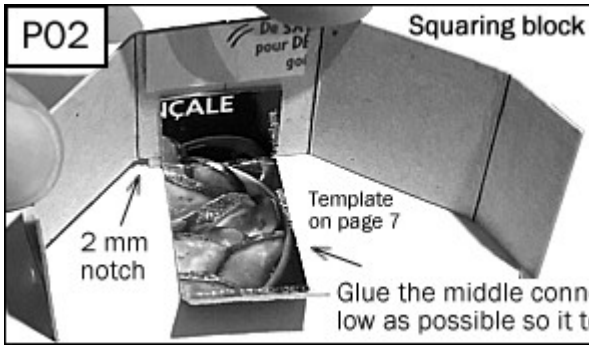
The **porous side** is showing in this box body design, it is recommended to use **thicker cardboard** (0,5 mm).



Make shallow cuts, like on the cargo bed, on the hatches and door outlines. Use a new blade in order to avoid straying cuts (3).

Cut out the windows.
(4) Verify the dots' position if necessary.

P02 Squaring block





Glue the middle connector between the two halves as low as possible so it touches down on the table.

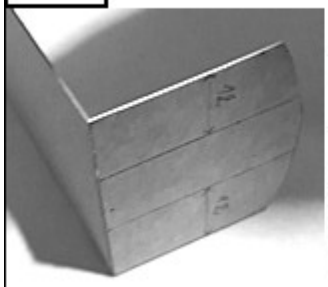
Use metal parts or pebbles to weigh down each square.

In these designs, glue the front and rear panels to the sides of the floor part, using two squaring blocks.

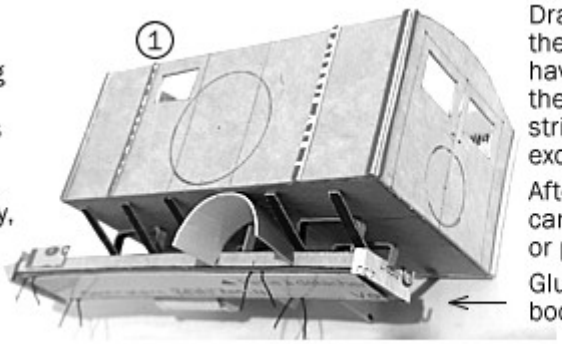
The sides will be glued to the sides of the floor and the front and rear parts, they don't require squaring blocks.

Part A - AHN Ambulance

A01 AHN ambulance box body



Before glueing the **front part**, draw two lines 12 mm apart from its sides. After assembly, glue 1 mm strips of cardboard (1) on them.



Draw lines and circles on the side as depicted. After having glued the sides to the assembly, glue 1 mm strips of paper on the lines except on the circles.

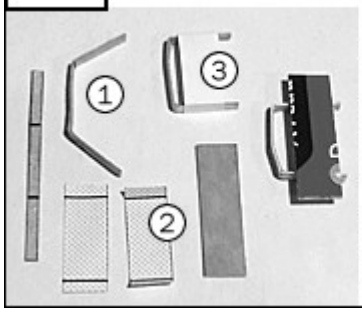
After painting, the circles can be used to either paint or position white disks.

Glue the ambulance box body like a cargo bed.

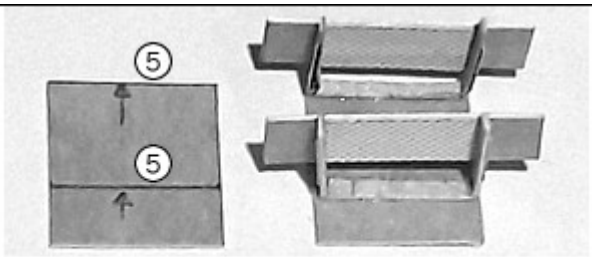
Note 1: windows switch position with the sides (see Step B03)

Note 2: roof assembly is as on Steps B05 & B06.

A02 AHN ambulance stretcher racks



(1) Fold the "stretcher arms" part. (2) Fold the "paper" part and glue it to the arms (3) to hold them in place. (4) Glue the "guide" part centered over the paper part, smooth side upwards. (5) Glue the arms on the "back" part to the limit indicated by the arrows.

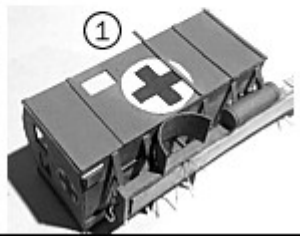


Place these racks on adhesive tape to paint them. These racks as well as all box bodies' interior walls are painted in a **light grey** colour.

A03 AHN ambulance after painting

Use the "Ambulance floor" template p. 7 to make crosses of different sizes out of thin kraft paper. First cut the crosses to shape, then paint them red.

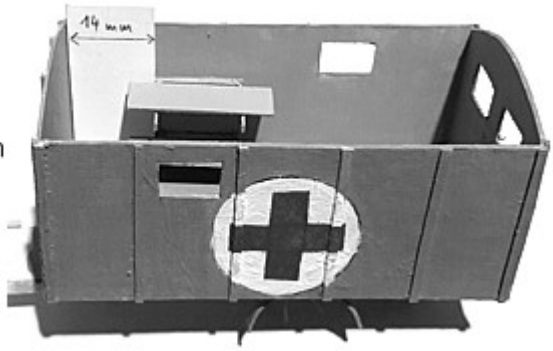




The roof is painted white.

Paint 1 mm strips separately. (1) Once the crosses have been glued, glue these strips at their position (see template) then paint them over with white and red.

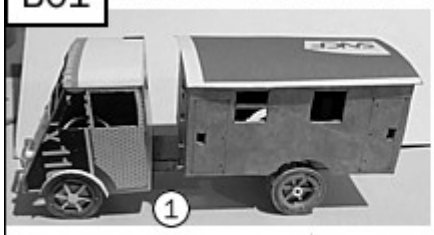
Stretcher rack distance from rear (or front, as shown below) is 14 mm.

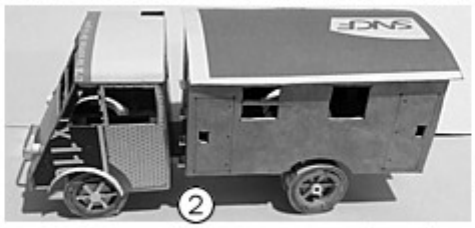


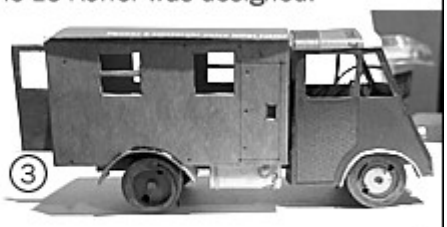
Part B - LC-Koffer

AHN-305 chassis, "Instandsetzung" variant on AHS chassis, ambulance rear panel version

B01 AHN-305 - The "Kfz. 305" were trucks to the "S" standard for which the LC-Koffer was designed.





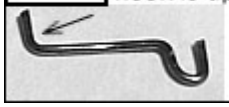


The AHN truck chassis (1) is not to the "S" truck standard, therefore a dedicated "AHN-305" will be used instead (2).

(3) A shortened LC-Koffer can be installed on the standard AHS chassis. This was used for an "**Instandsetzung**" maintenance vehicle for the Würzburg radar. This name will be used here.

B02

The last bend on this **hook** is upwards.





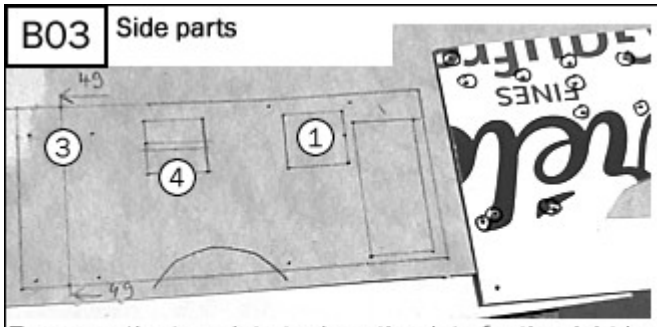
Glue the hook, inserted in its holder, on the bottom of the chassis.

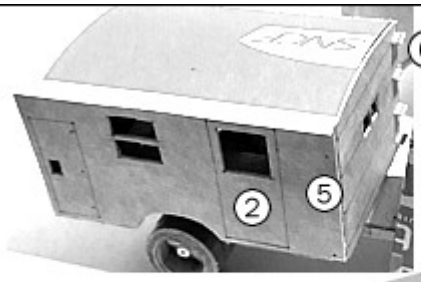


Vertically, the hook should not protrude from underneath the box body.

Fenders are 26 x 10 mm.

B03 Side parts



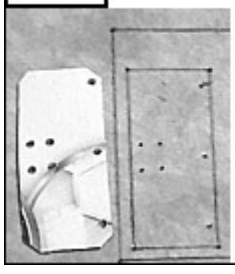


The lines on the front (5) are to position steps (6), which are 3 x 2 mm pieces of thicker cardboard. You can glue them on one side or both sides.



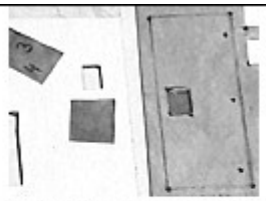
Turn over the template to draw the dots for the right hand side. The window on the right hand side (1) can be part of of a door (2). In that case, there is no forward hatch.
(3) Notice that this side is going to be an AHS "Instandesetzung" box body.
(4) Notice the sliding windows and the fixed windows switch positions with the sides.

B04 Hatches and doors



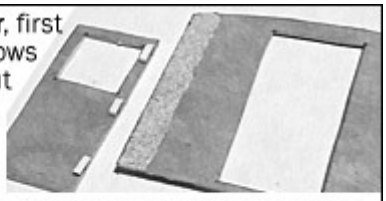
The hatch positioning template is placed inside the outline. Notice the cut corners to help in positioning.

The hatch lock is always positioned towards the outside.



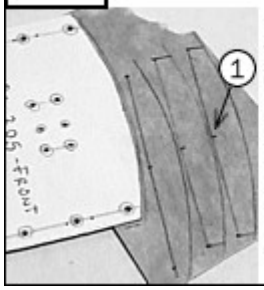
You can cut out the hatch lock opening. On the other side, glue a 4 x 3 mm piece of thin kraft paper.

For an **open door**, first cut out the windows before cutting out the door.

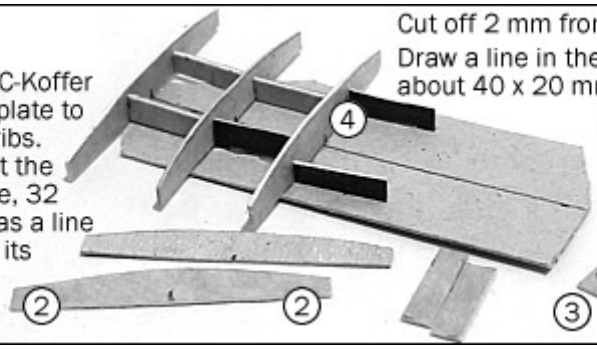


Use 3 x 1 mm pieces of thicker cardboard as hinges, glue them:
- straddling the hinge positioning dots and
- flush with the door side.

B05 Roof structure



Use the "LC-Koffer front" template to draw five ribs. Notice that the bottom line, 32 mm long, as a line marked in its middle (16 mm).



Cut off 2 mm from both sides of the ribs (2).

Draw a line in the middle of a piece of cardboard about 40 x 20 mm (it can be oddly shaped).

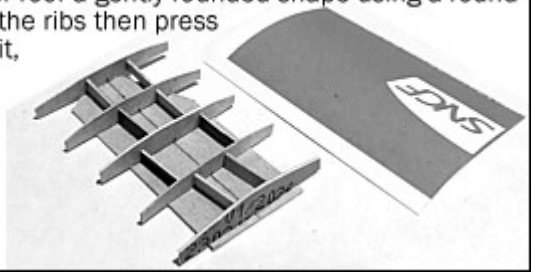
(3) Make ten 10 x 3 mm spars. Glue the ribs to the piece of cardboard at the 16 mm marker (4), perpendicularly to the line. After each rib, glue a pair of spars, which doesn't need to be aligned to the others.

B06 Roof assembly



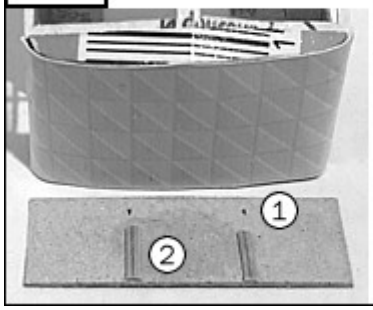
When linking the dots together on the piece of rigid paper, leave one end free lengthwise, so the roof can be adjusted to the box body.

Give the rigid paper roof a gently rounded shape using a round pen. Apply glue to the ribs then press the rigid paper on it, making sure the assembly is in line and centered.



B07

The Kfz. 305 often had a **platform** over their roof panels, for tools and also a spare wheel.

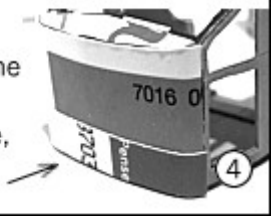


Cut a piece of cardboard (AHS: 26 x 12 mm, AHN: 32 x 12 mm), draw marks 10 mm from the sides (1). (2) Glue two 8 x 1 mm strips of carboard aligned on those marks and against the back of the platform.



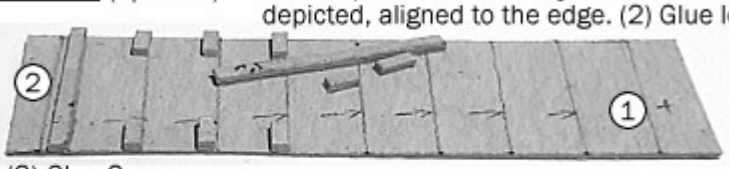
Glue the platform to the roof panel. Wait until the glue has hardened to glue 1 mm strips of rigid paper to the sides (3), trim the excess.

(4) For the "**Instandsetzung**" vehicle, glue a 28 x 5,5 mm piece of rigid paper over the roof panel instead.

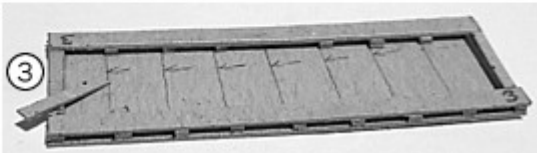


B08 Raised roof (optional)

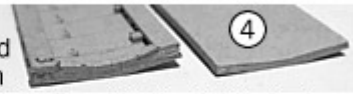
(1) After having used the template leave some cardboard on each side of the part. Cut 1,5 mm strips from **double-layer** cardboard and cut these strips in 3 mm bits. Cut these bits as depicted, aligned to the edge. (2) Glue long 1,5 mm pieces on each side, cut to fit.



(3) Glue 3 mm strips on the upper and lower edges, fill the blanks on the sides.



(4) Cut a piece of double-layer cardboard 1 mm taller and 1 mm longer than the assembly. Bend both slightly in the middle, then glue the assembly on the larger part.

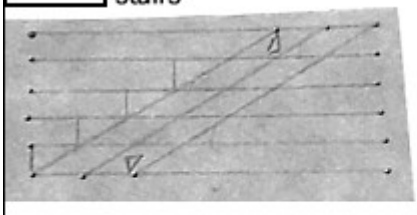


(5) Draw positioning lines. Turn the new assembly upside-down and glue it to the roof, correct the bend if needed.



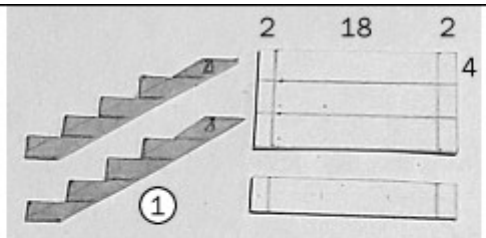
Positioning lines.

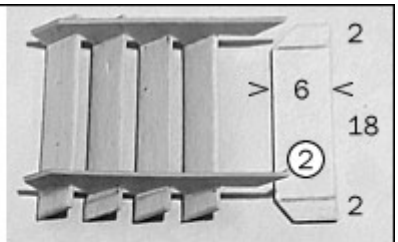
B09 Removeable ambulance stairs



Where the horizontal lines meet the diagonal, draw perpendicular lines four times, one for each step. Mark the "up" position.

(1) Cut out the stairs' strings.



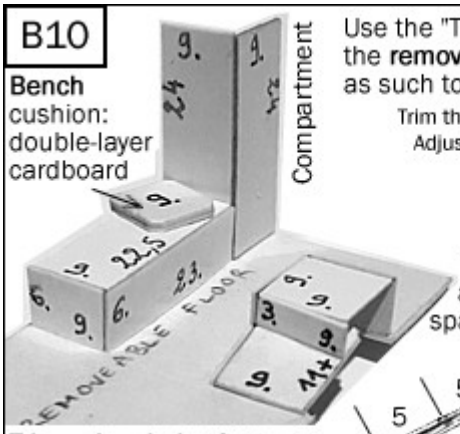


Mark four 22 mm cardboard strips as depicted, then cut them off. First glue only the lowest and highest treads. Once the glue has hardened, glue the two others. Wait and glue the stairs to a platform as depicted (2). Below the box body, glue two pieces of thicker cardboard, each 12 mm away from the middle, then glue on top of them pieces of cardboard overhanging 2 mm inwards.



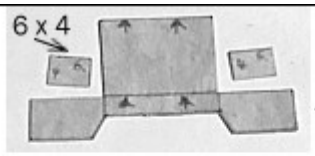
B10

Bench cushion: double-layer cardboard



Use the "Table top" template to make the **removeable floor**, label the part as such to avoid confusion.

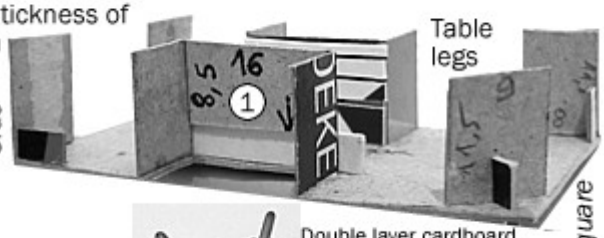


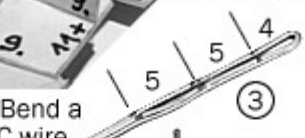


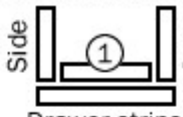


The stretcher rack straddles the fender opening. Glue the 6x4 stabilising parts as depicted.

Tool cabinet, (2) use the tickness of a piece of cardboard as a spacer for the drawers.







Triangular chair: (3) Bend a 50 mm piece of DWC wire in two, mark the two strands as depicted.

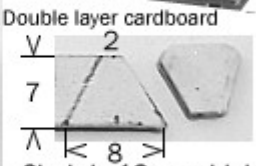
(4) Bend the three marked parts at 90°, notice the fourth part is at an angle.











Chair is 13 mm high.

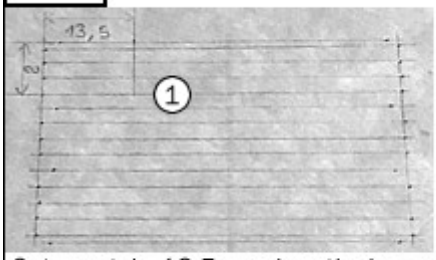
Base: 7 mm square

(5) Widen the front part to 2 mm, then (6) widen the rear parts until they fit into a piece of DWC plastic. (7) Apply glue to a 4 mm strip of Thin Kraft Paper, glue the chair and the seat together, push the paper inside the loop.

Part C - Wood gas generator

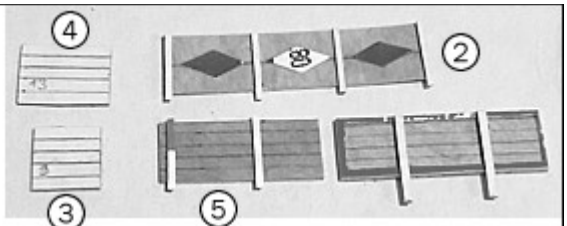
Cargo bed modification, headboards, wood gas generator

C01 Wood gas generator cargo bed



Cut a notch, 13,5 mm lengthwise, and at least 8 mm from the right hand side of the cargo bed. Match it with the limit of a plank (1).

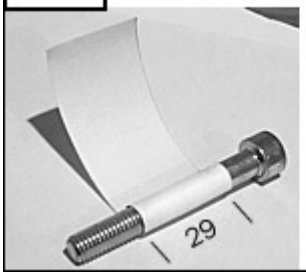
The **sideboard** has one rhombus segment less (2).



The **headboard** is divided in three sections:
(3) the small headboard is about 9 mm long, it will have to be adjusted after painting.
(4) the 13 mm intermediate piece
(5) the long headboard which is 8 mm shorter than its nominal length, and might be adjusted as well.

C02

The body of the **wood gas generator** is a Ø 9 mm cylinder 29 mm high.



Use a Ø 8 mm cylindrical object as a guide (here, it is a M8 screw) to roll a 29 x 11 mm piece of regular paper.



For the **top**, first glue a Ø 11 mm disk then a Ø 6 mm disk (or hole punch snippet).



The cylinder's seam is towards the cabin.

Draw a line 3 mm from the cylinders's bottom and a line 90° from the seam, as depicted.
Cut two 3 mm segments from a double-layer 1 mm strip and glue them right above the 3 mm line, and 1 mm apart from the 90° line.

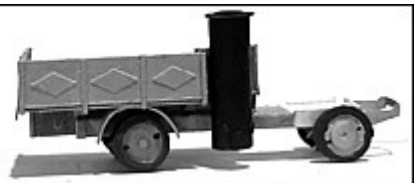
C03 Wood gas generator assembly



Draw a line diametrically opposed to the rear line. Cut a Ø 4 mm disk and glue it on this line, flush with the cylinder bottom. Cut two 1 mm slices of a Q-tip stem and glue them as depicted.

Glue the headboard then the 13 mm piece behind it. The 9 mm part comes last.





Glue the rear struts flush with the bottom of the chassis, 3 mm of the cylinder should be sticking out downwards.
The assembly is **fragile**.

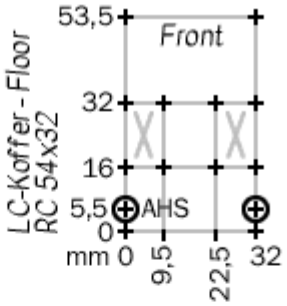
AHN II
Templates
Scale 1:64
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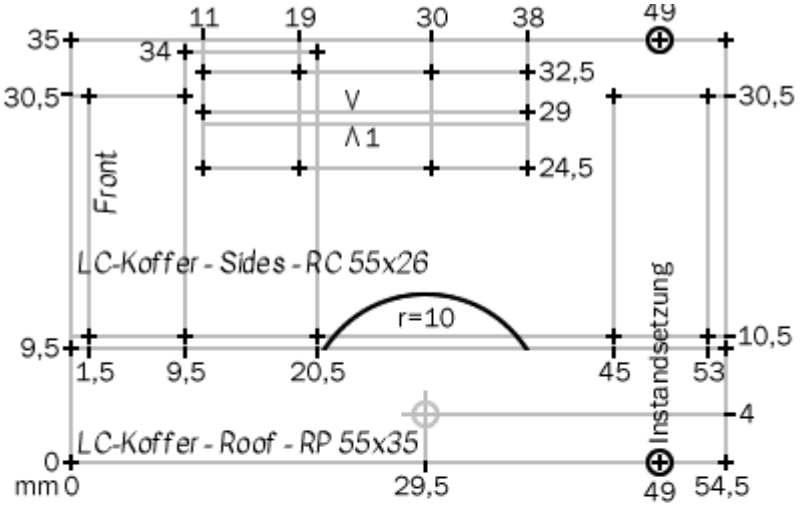
+ Pierce for 0,7mm

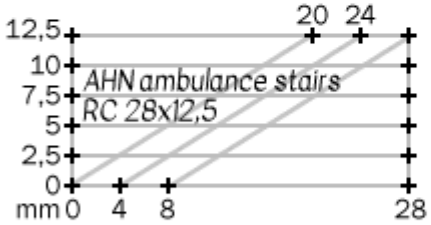
⊕ Special purpose

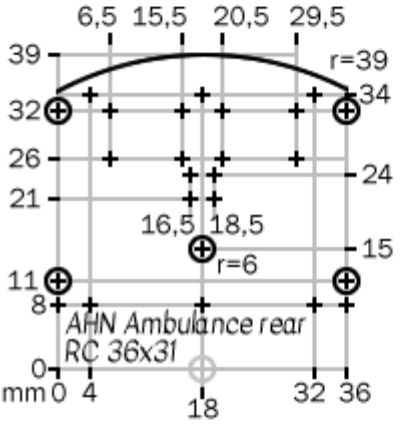
Folding line

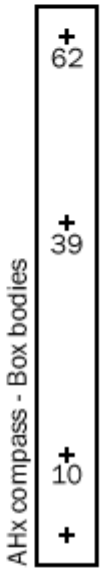
RC: Regular Cardboard
RP: Rigid Paper

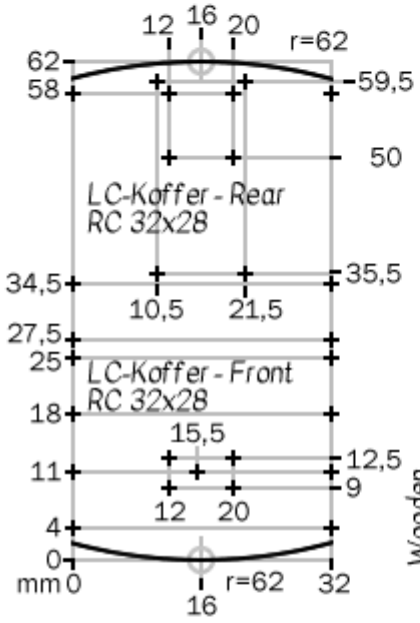


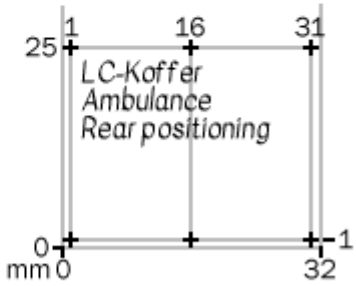




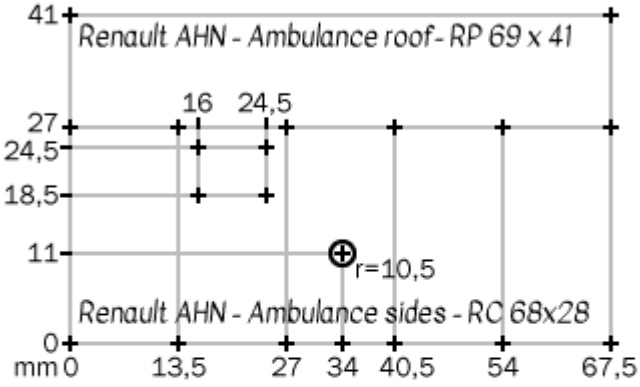


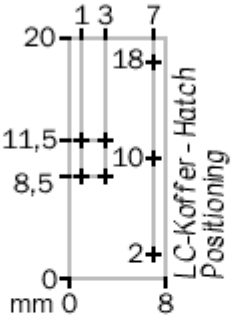


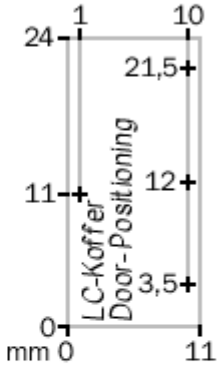


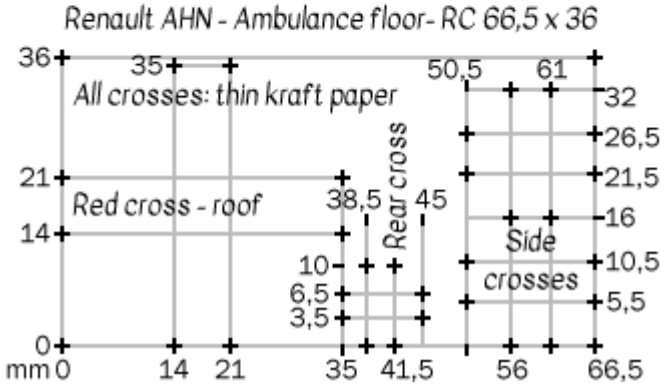


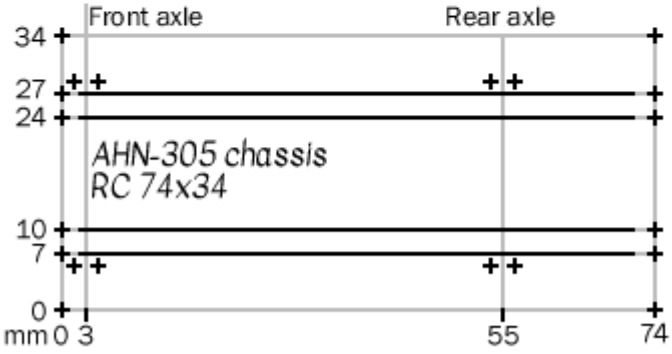












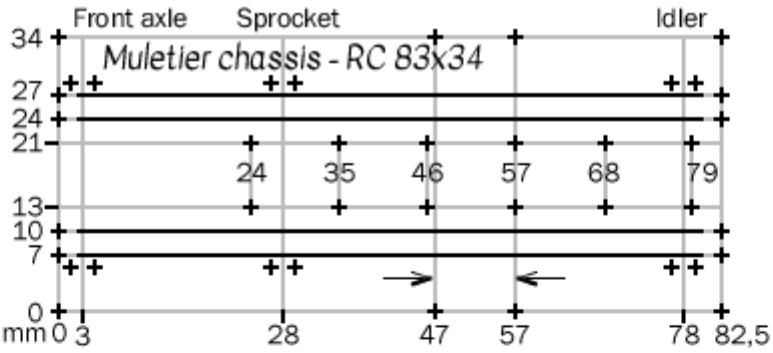
Diagrams on this page are not all at the same scale

AHN II
Templates
Scale 1:64
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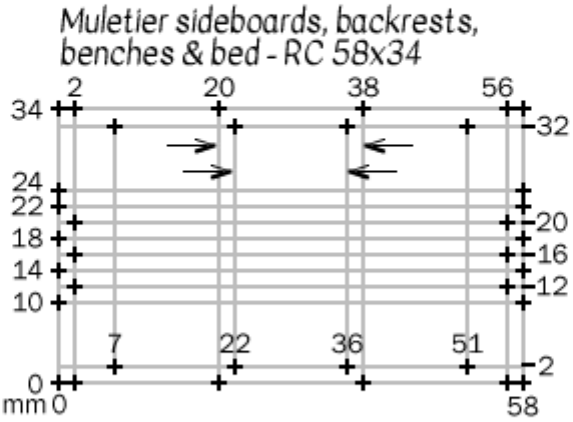
+ Pierce for 0,7mm
× Calculated / intersection
⊕ Special purpose
I—I Folding line
→ (Marking) Align part to this line

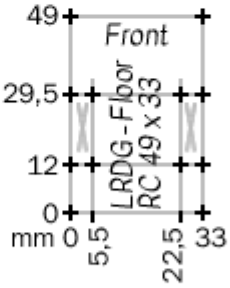
RC: Regular Cardboard
RP: Rigid Paper

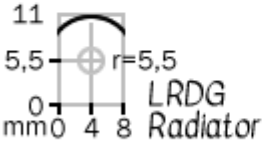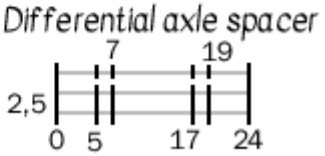




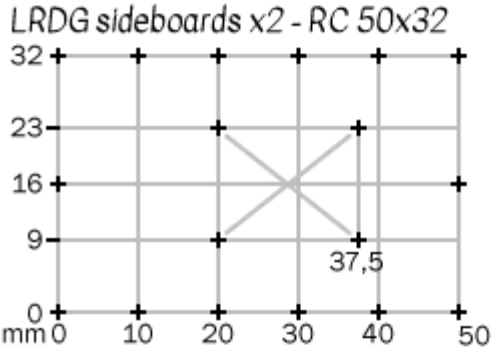


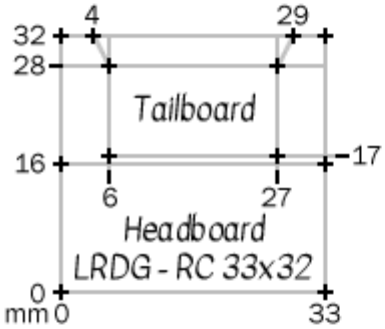


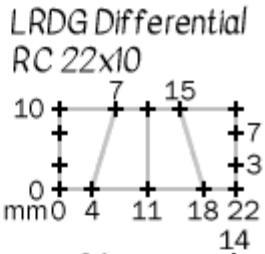


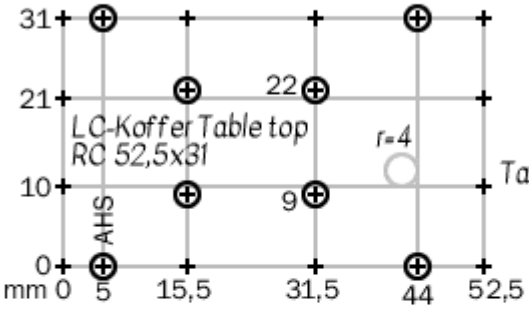


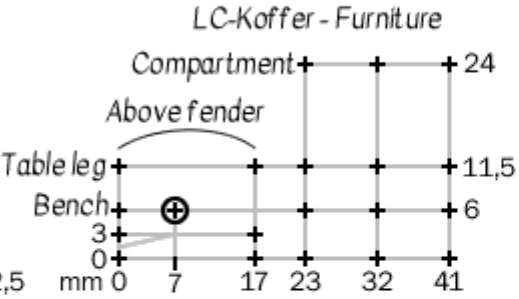


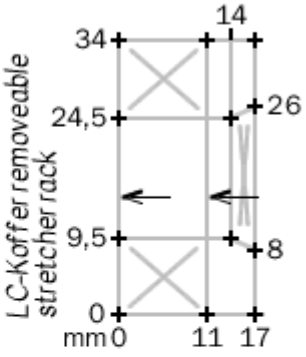


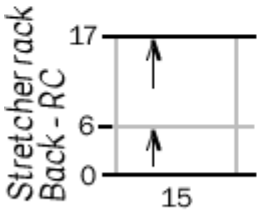


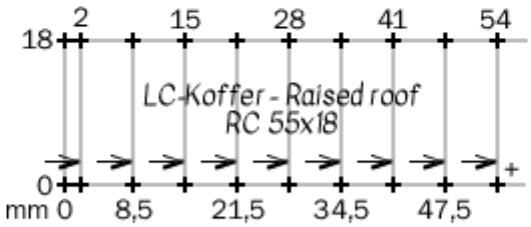


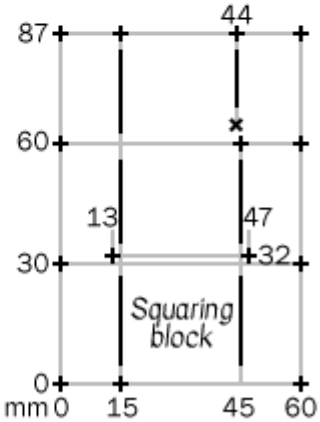


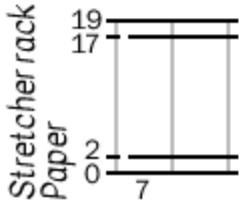


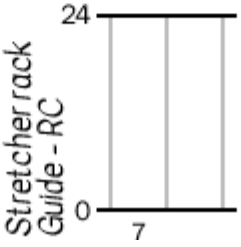


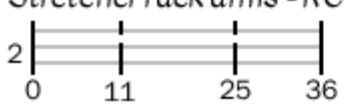












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Part D - LRDG truck

Inspired by the Ford F30 30-cwt 4x4 truck

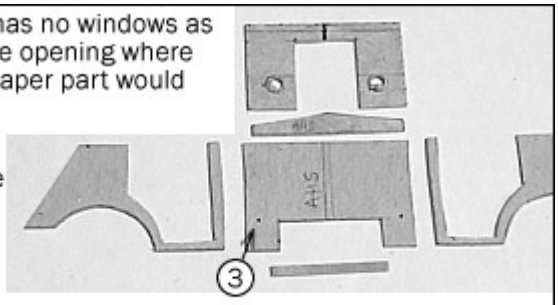
D01



For the cabin, use the AHS template and draw an **open door version** (see booklet n°11 , part F).
(1) The dots for the windows bottom are used to draw this cabin's top. (2) Notice the front lower part has been omitted as well.

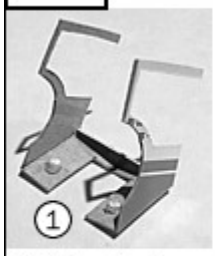
The front part has no windows as well. Cut out the opening where the "radiator" paper part would have been.

Use a "single "door" template to draw then cut out the door opening on each side.

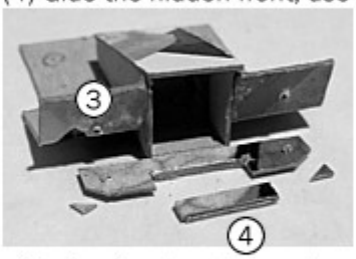


(3) Leave at least 2 mm free on each side for the "open door" lower parts).

D02 LRDG cabin assembly







(1) Glue the headlights and the dashboard to the front part, then glue the sides to it. (2) The sides are quite fragile at this stage, glue them to the cabin back with caution.

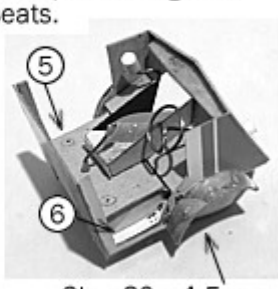
Note: the control panel may be too tall, it will have to be shortened.

(3) Make an AHS floor, switch the sides for the steering wheel hole.
(4) Glue the hidden front, use the positioning dots to remove 2 mm.

(5) Perforate the seats' positioning dots but don't glue the seats.

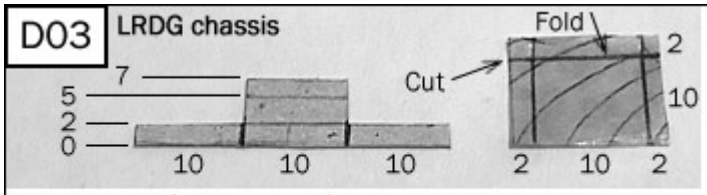
Apply glue to the **sides** of the floor part as well as on the front and rear parts, then glue it to the cabin.

(6) Glue the "lower floor" parts (see Step F03 in Booklet n°11)

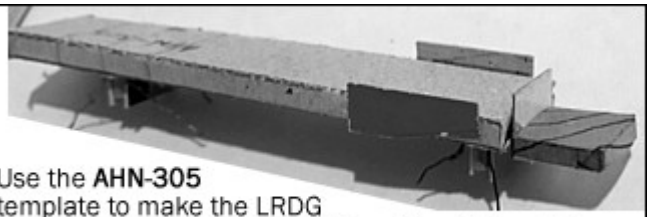


Glue 20 x 4,5 mm fenders

D03 LRDG chassis



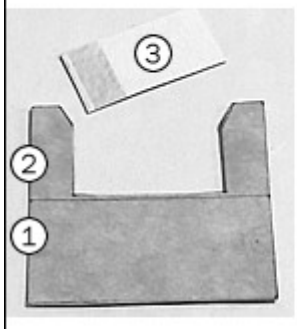
The "chassis front" part is 1 mm higher than the AHN part and also narrower. Cut, fold and glue a piece of thin kraft paper as depicted.



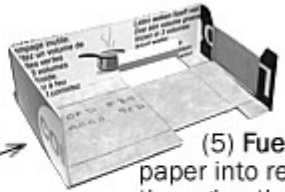
Use the **AHN-305** template to make the LRDG chassis, notice the bottom of the "chassis front" is 1 mm lower than on the AHN.

D04

The **LRDG rear body** is assembled like a box body (AHN, ambulance, LC-Koffer).



Don't separate the headboard (1) from the taiboard (2) before a 22 x 11 mm piece of cardboard (3) has been glued over the opening (try 22 x 12 mm if necessary).



(The CMP Ford F-30 cargo bed is depicted here, see Step D11).

For the **benches**, prepare two 49 x 6 mm (top) and two 49 x 7 mm (side) pieces of cardboard.



Glue 5 mm square pieces, with one corner cut off), to improve the benches' stability.

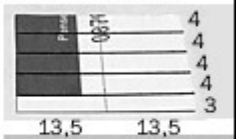
Glue 9 x 7 mm rigid paper patches to cover the openings then trim to fit. If need be, a 17 x 9 mm patch can be used against the floor bottom (4).





Glue 1 mm strips to the sides, aligned to the top and to the wheel opening. Use 7 x 1 mm pieces of cardboard vertically.

Glue 8 x 4 mm rigid paper hatches 1 mm below the lower strip.

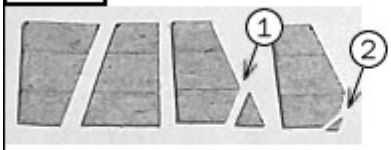


(5) **Fuel tanks**: cut and fold rigid paper into rectangles as depicted, then glue the ends to regular paper.



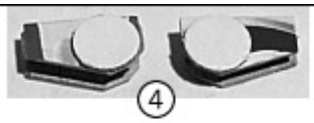


D05 LRDG axle spacer and differential

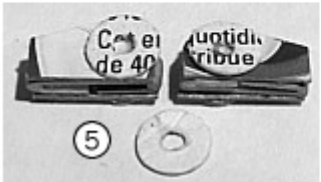




Use the template to make four halves at once. (1) Cut an angle at the highest marker line, then cut the angle at the extremity (2). Both angles will be hidden. (3) Cut and fold an axle spacer, glue it against one of the halves, aligned to its bottom.

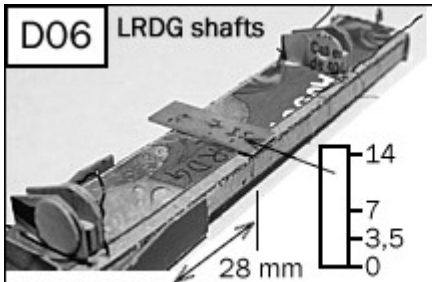


Glue the other half to the axle spacer as well. In this design we will use Ø 6 mm disks (hole punch snippets), Ø 7 mm disks would be more accurate.



Glue two disks to the differentials as depicted (4). Perforate two disks with a toothpick (see procedure in booklet n°11, Step D01), glue them on the other sides (5).

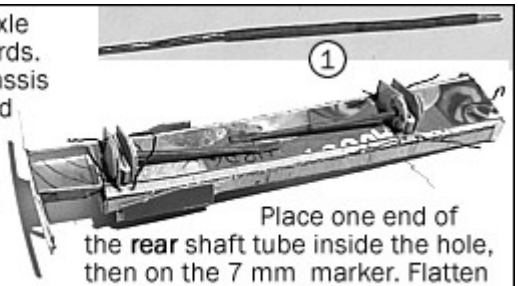
D06 LRDG shafts



(to chassis start)

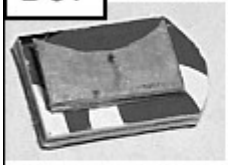
The diferentials are glued on the axle axis, the perforated disks are inwards. Draw a line at 28 mm from the chassis start, draw a marker at 3,5 mm and another at 7 mm.

Prepare two 1 mm tubes from thin kraft paper (1), one 25 mm long (front)and another 30 mm long (rear). Place some glue inside the perforation and on the 28 mm line.



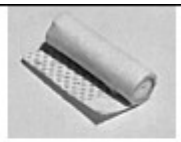
Place one end of the **rear** shaft tube inside the hole, then on the 7 mm marker. Flatten the tube beyond the line.

D07 LRDG cabin details



Make a **radiator** from double-layer cardboard (dimensions p.7), glue the leftovers to the rear of the part to act as a spacer.

Paint separately in the tyre colour. Also paint the engine area in the tyre colour.



For the **condenser**, glue 30 mm of regular paper around a Q-tip to reach a diameter of 3 mm, cut a 6 mm segment.
Perforate the left fender as depicted, make another hole towards the engine (2).

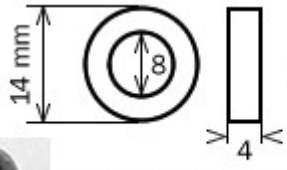


For the **Bagnold compass**, cut 2 mm of q-tip, glue it to the dashboard. Paint the top white.

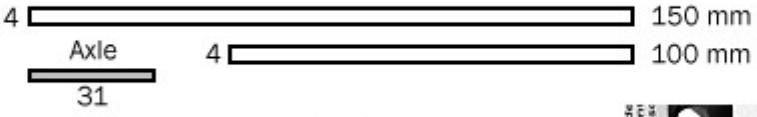


Cut about 20 mm of thin wire, insert it in the condenser (1), insert one end into the engine, make a hook below the fender with the other.

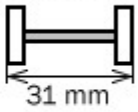
D08



Cardboard strips for one **LRDG wheel**:



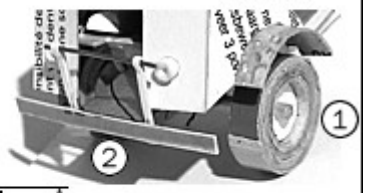
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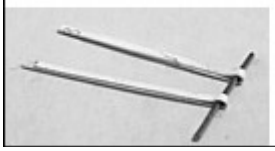




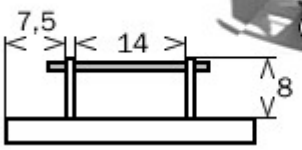
Make a 8 mm **thin rim** and glue it flush with one side of the cardboard strip.

(1) The axle protrudes about 1 mm from the rim. Optional: before assembly, file its ends to a semi-spheric shape.
(2) **Bumper**: 31 x 3 mm



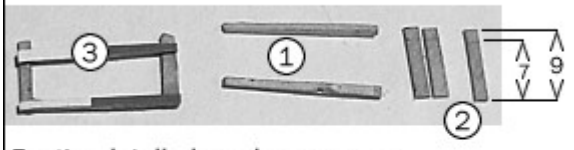


The **transversal bar** is a 20 mm piece of DWC wire. Glue two 1 mm strips of rigid paper around it as depicted.



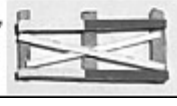
D09

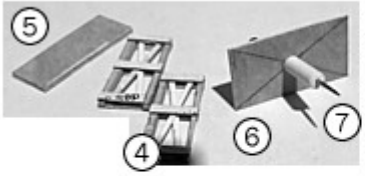
The LRDG used **weapon platforms** to use artillery pieces such as the Bofors 37 mm or the Breda 20/65. In this design there is a detailed version and a simplified version, both are **removeable**.



For the **detailed version**, prepare:
- eight double-layer 17 x 1 mm cardboard pieces (1)
- twelve single layer 9 x 1,5 mm cardboard pieces (2) marked at 7 mm.
- four "diagonals" 17 x 1 mm pieces of rigid paper

Assemble (1) and (2) into a frame (3), glue diagonals between the (1) parts, trim the excess on the (2) parts.

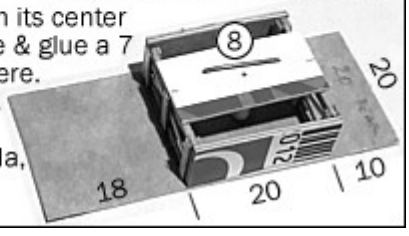




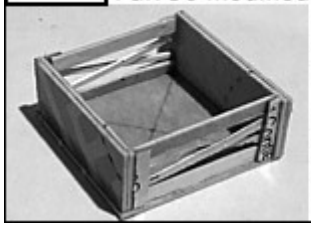
Glue another set of three (2) pieces on the other side of each frame (4).

(5) Make two double-layer 20 x 7 mm parts and (6) one single layer 20 x 10 mm part

(7) Perforate the (6) part in its center and use a thin pin to guide & glue a 7 mm piece of Q-tip stem there. Glue together as depicted. The axle (8) is a piece of DWC wire: 10 mm for Breda, 14 mm for Pak 36.



D10 Simplified weapons platform, Pak 36 modified chassis



The simplified platform is based on a 20 x 20 mm top piece. Perforate its center, flip over, then glue the two double-layer 20 x 7 mm pieces on its sides.

Glue four 7 x 1,5 mm single layer pieces on the corners, then glue two 17 x 1 mm single-layer pieces on top and bottom, as depicted. Glue the diagonals, then the middle 7 x 1 mm pieces & the 7 mm Q-tip.

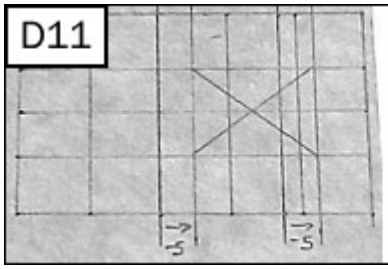
Perforate the **Pak 36** chassis part with a thin pin then insert a 3 mm q-tip stem part in the center.





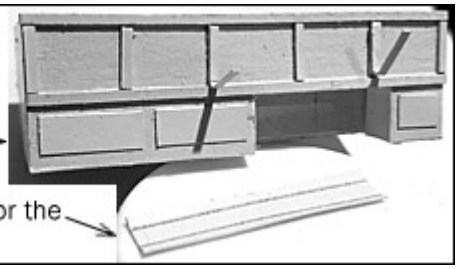
Each side: 3 mm Q-tip + DWC wire protruding 1 mm

D11



For the rear body of the CMP Ford F-30, use the "LRDG" sideboards & floor templates and shift the wheel opening **5 mm to the rear.**

The hatches on the lower body are 11 x 4 mm and 5,5 x 4 mm.



See Booklet n°8 Step A15 for the **sand ramp** and brackets.

Part E - "AHN Muletier" (inspired by the Opel Maultier)

Horstmann suspension

E01

Several steps are necessary to make a **Horstmann suspension**



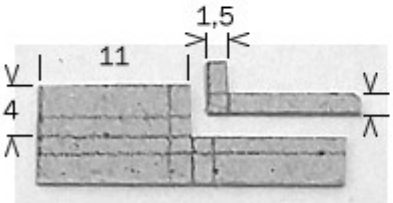
Use Ø 6 mm cardboard clippings from a hole punch (Ø 5,5 mm is acceptable) or make Ø 6 mm disks using a 3 mm compass. Cut 54 x 1,5 mm strips of rigid paper and give them a round shape.

Place the clipping porous side up and glue the strip around it, press the coil against the table.



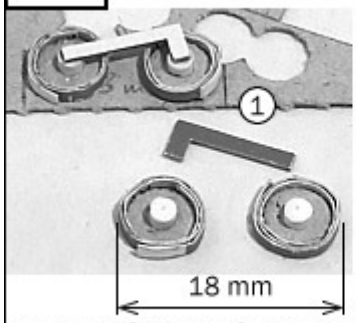
Cut 1,5 mm bits of Q-tip stem and glue them centrally to the wheel. Make eight such assemblies and perforate two others for toothpicks.



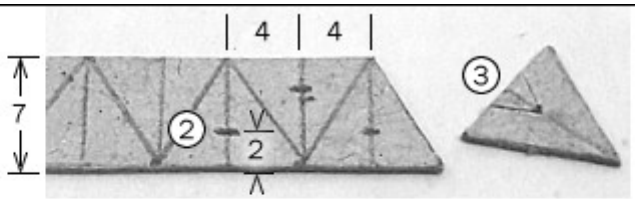


Prepare four cardboard parts as depicted. This way ensures the proper orientation of both pairs.

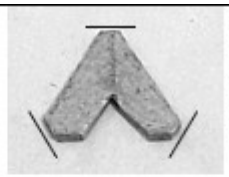
E02



Make a 18 mm jig for the road wheels (1). Glue the L-shaped part to the wheels' Q-tip parts as depicted.



Make four isoceles triangles as depicted, mark a dot 2 mm above the base (2). Use this dot to cut out a triangular hole (3), its sides parallel to the larger triangle.

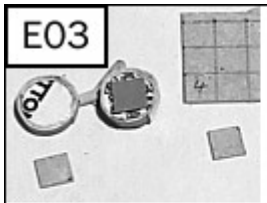


Cut the corners of these triangular parts.

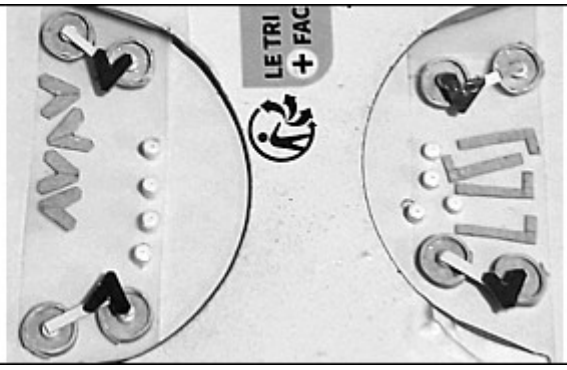
Glue the triangular part on top of the L- shaped part, aligning it to the shorter segment.



E03



Cut 4 mm squares on the rear part of the road wheels. The partial bogie is ready to be painted.

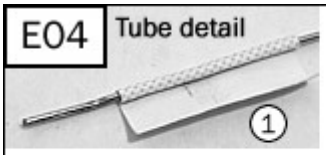


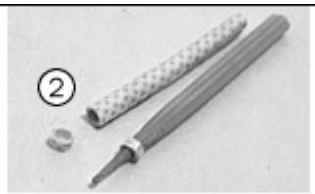
Painting preparation: glue adhesive tape between two sides of a cardboard frame. Place the partial bogies and the parts necessary to complete them on this adhesive tape.

Note: the parts to complete the bogie are placed porous side up.

For the **return rollers**, cut four **3 mm** bits of Q-tip stem, for the "**internal axle**" part cut four **2 mm** bits of Q-tip stem. Also place them on the adhesive tape.

E04 Tube detail

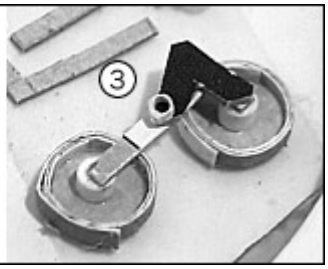




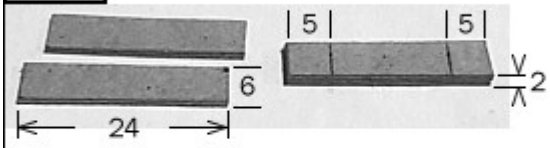
(1) Use the wire from a paperclip (about Ø 0,7 mm) to wrap and glue a strip of regular paper 10 mm wide into a tube.

(2) Cut 1 mm segments from it, restore their circular shape after cutting with the tip of a toothpick.

(3) Glue these segments at the end of the triangular shape as depicted.



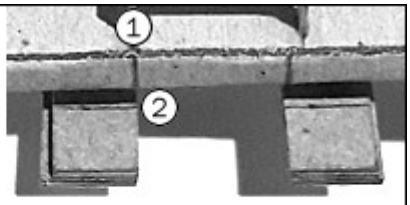
E05 Suspension support



Glue enough layers of cardboard to reach a thickness of 2 mm. Make 24 x 6 mm elements 2 mm thick, draw markers 5 mm from both ends.



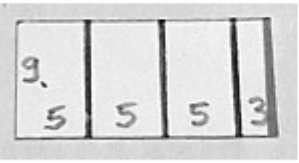
Glue 2 mm spacers on each beam.



Glue the suspension beams to the chassis using the vertical markers (1) to position them on the chassis and the markers on the beams themselves (2) to center them. Paint these beams with a dark colour like for instance the tyre colour.

E06

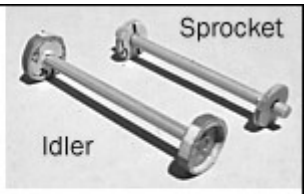
The Horstmann suspensions are fragile, make a hidden **pillar** from rigid paper to bear the load. Paint it in a dark colour as well.





See Step E01 for the **idler wheels**. The idler axle is 31 mm long.

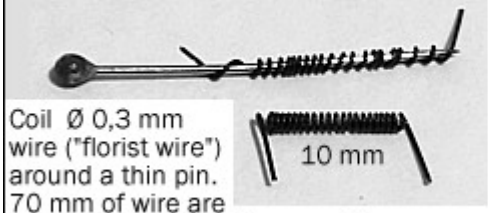
For each **sprocket wheel**, perforate two 6 mm disks, trim the extruded material then glue the disks together.



The sprocket axle protrudes from the sprocket wheel by 1,5 mm on both sides. The total length of the axle part is 32 mm.

E07

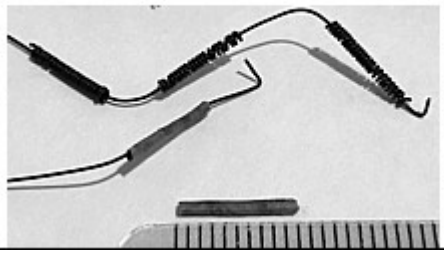
The **springs** for the Horstmann suspension can be made from a coil of thin wire, but at this scale the difference with a Ø 1 mm paper cylinder is hard to see.



Coil Ø 0,3 mm wire ("florist wire") around a thin pin. 70 mm of wire are needed to make a 10 mm coil.



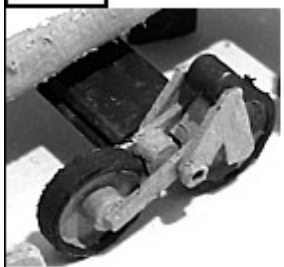
Use nail clippers to cut off the ends.

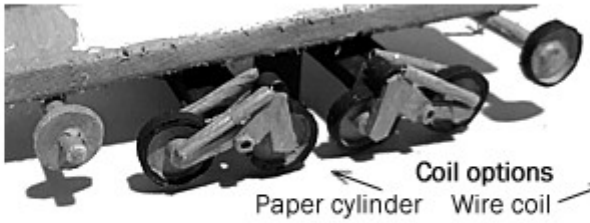


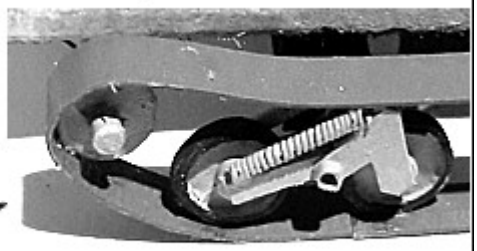
String the coils on a 70 mm piece of thin wire for painting, the wire can be reused to hold axles.

Use the same methode for 1 mm cylinders.

E08 **Horstmann bogie assembly.** These assemblies are somewhat delicate and fragile.





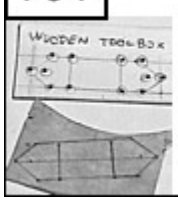


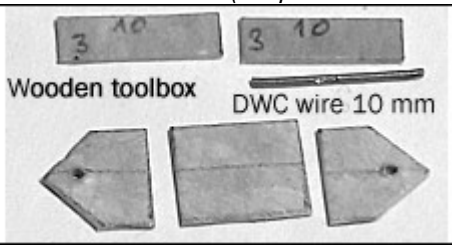
Assemble the bogies as depicted.

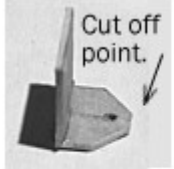
Glue the bogies to the suspension beams. Once the glue has hardened, glue the **inner spring** cylinders, because it would be difficult to do once the tracks are installed. The **outer springs** may fall off during track assembly, glue them afterwards.

(Step F04 inserted here to optimize space)

F04











Glue to the sides of the bottom part. Trim the excess so the sides are fitting exactly. Insert and glue the wire.

E09 Horstmann tracks assembly



Glue the tracks to the return rollers, sprocket wheel and idler. Hold in place until the glue hardens.



Mark a position under a wheel where the track ends meet. Cut one end off and glue it to the road wheels.

Adjust the length of the other end, apply glue to the road wheels, also glue a piece of paper underneath as a connector.



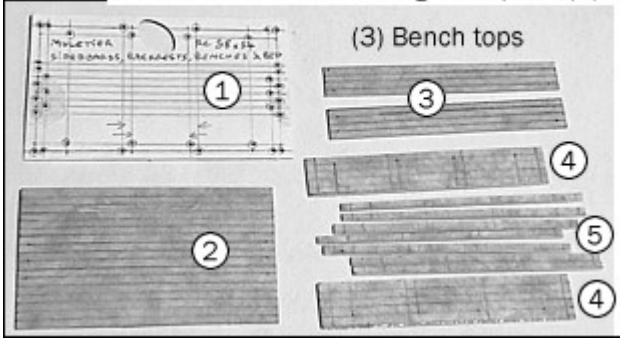
Spacer: 1 to 2 mm between the chassis and the cargo.

Part F - Special versions & details

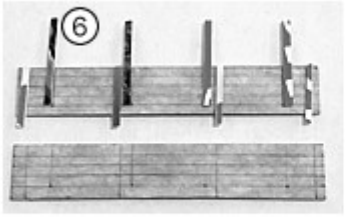
"Muletier" cargo bed, backrest frame, LC-Koffer used on Opel Maultier, open sideboard, wooden toolbox.

F01

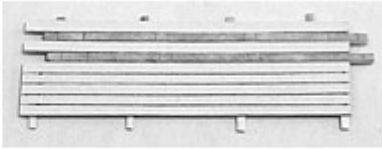
Most elements of the **Muletier cargo bed** can be made from the single template (1).



For the cargo bed (2) and the sideboards (4) draw the additional 2 mm lines manually. (5) Backrest slats.



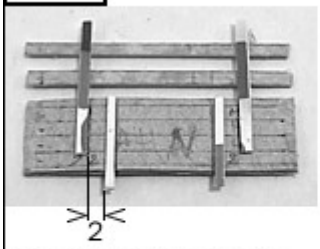
Hinges: 12 x 1 mm
Backrest chords (6): 18 x 1,5 mm



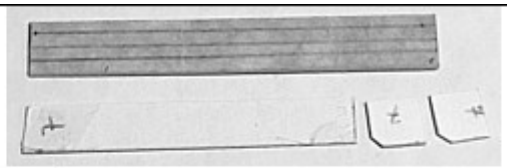
When glueing, briefly use two backrest slats as spacers.

When the glue has hardened, trim over the chords over the slats.

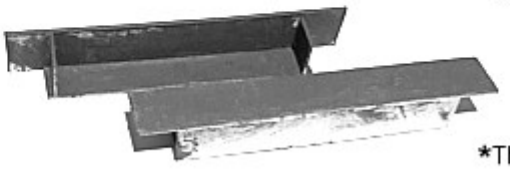
F02



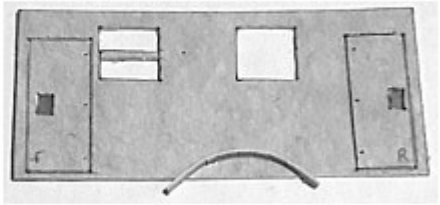
For the headboard, the chords are set 2 mm away from the hinges.



Bench: use 7 mm squares with one corner cut off and a 7 mm strip about 45 mm long.



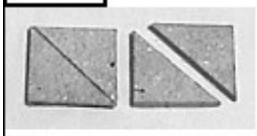
Some **LC-Koffer** used on the **Opel Maultier*** had no opening for fenders. For this, draw the curve but don't cut it out. Give a 1 mm strip of cardboard a round shape and glue it along that line.



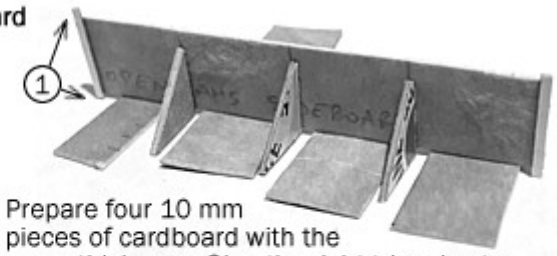
***The LC-Koffer is too short for the "**Muletier**".

The "**LC-Koffer ambulance**" body has a windowless double door at the rear. Make a blank rear part and use the positioning tool (page 6) on it to draw dots for these doors.

F03 Open sideboard



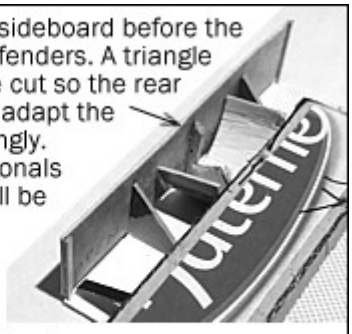
Glue two layers of cardboard then draw two 9 mm squares. Cut as depicted to obtain three right triangles.



Prepare four 10 mm pieces of cardboard with the same thickness. Glue the right triangles to the central positioning lines of the sideboard as depicted, so a gap between the triangle base and the sideboard is created.

(1) Glue hinge parts at the ends so that they reach the bottom as well. Trim the excess on the other side.

Glue the open sideboard before the diagonals and fenders. A triangle may have to be cut so the rear wheels can fit, adapt the fender accordingly. Install the diagonals where there will be visible.



Viewed from the top, the sideboard is not flush with the bed but protrudes by its thickness.

