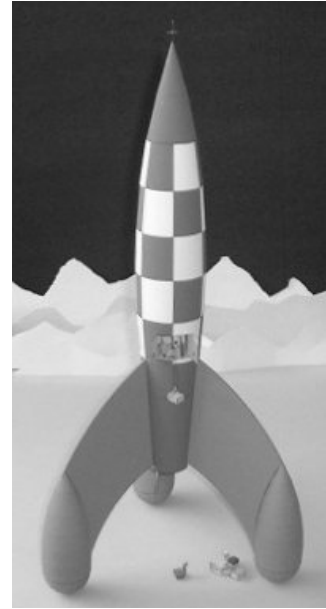


Assembly Instructions for the Tintin^{*} Moon Rocket

History

Shortly after WWII, the Belgian cartoonist Hergé (Georges Rémy), author and illustrator of the wildly popular Tintin stories, began considering the possibility of a Tintin adventure set in outer space. With the papers and news magazines filled with descriptions of the amazing German rocket weapons that fell into Allied hands at the cessation of hostilities, it seemed a natural progression in his hero's career, especially since Hergé already had a long-standing fascination with advanced technology. The problem, however, was the story. After several years, having introduced a new scientific character, Prof. Tryphon Tournesol* (based on the celebrated stratospheric and oceanographic explorer Auguste Piccard), Hergé felt he was ready to proceed. The new adventure, titled *Objectif Lune (Destination Moon)*, began publishing as a weekly serial in March 1950, and continued until October of that year, when Hergé vanished. This was actually not uncommon for the artist, who often felt overworked, and used this technique both to get a rest and increase his popularity with a bit of a mystery. After a long hiatus, the story resumed in October 1952 as *On a Marché sur la Lune (Explorers on the Moon)*, and finally concluded in December 1953. Collected and considerably shortened, the serials were printed in book form: *Destination Moon* in 1953, and *Explorers on the Moon* in 1954. The two books have never been out of print since. A great deal of ink has been spilled claiming that Hergé stole the title and the spaceship from the American movie *Destination Moon*, which was released in February 1950, or that the movie producer George Pal stole the title and the spaceship from Hergé, but even though the similarities are striking, the production dates of the two projects make it a virtual certainty that this is simply one of those amazing coincidences that sometimes happen in the world of fiction (although it must be admitted that the moon rocket did not actually appear in the strip until almost two years *after* Hergé's fugue and the release of the motion picture).



In any event, the star of the story is the unnamed moon rocket. A rather pneumatic-looking and curvaceous concept, it stood 62.75m (205' 10") tall, and had a dual propulsion scheme, utilizing chemical fuels for landing and take-off, and an atomic propulsion system for extra-atmospheric operation. With a few exceptions, Hergé worked hard to ensure scientific accuracy in the story and even had a large model built that could be opened to show a completely finished interior. This helped the artist (his assistant Bob de Moor, who did all the drawings of the rocket - Hergé concentrated on the characters) keep scale and perspective consistent throughout the story. A few clangers crept in – the fin construction looks (and is, as you will find out in building the model) woefully flimsy; and the crew positions seem perversely designed to maximize crew discomfort during acceleration. Regardless, the vehicle is impressive, colorful, and was at least intended to make engineering sense.

The Model

This model is a 1:144 scale replica of the unnamed Tintin moon rocket. It is recommended for those who have some previous paper modeling experience, as some of the parts are either very small or difficult to form properly. A number of optional parts are supplied which will allow a detailed interior of the cargo and airlock sections of the rocket to be made, and scaled figures of the intrepid lunar explorers and some cargo items are provided to allow a simple diorama to be set up. If you wish to do the detailed interior, read the instruction addendum [tindmdetail.pdf](#) BEFORE beginning parts 2 and 3

The model breaks down into six general sections: the center fuselage (part 1), the aft fuselage (parts 2-5), the forward fuselage (parts 6-10), the fins (parts 11), the landing pods (parts 12-20), and the optional bits.

Optional or Alternate Features

Separate instruction packages have been provided (Tindmdetail.pdf and Compass.pdf) to cover the optional interior detailing and the use of beam compass cutters in paper modeling, respectively. Part 20 requires the use of alternate parts, depending on the thickness of paper used. All optional or alternative parts are marked with an asterisk (*). A part locator sheet (tinparloc.pdf) is also provided to help find the parts on the various sheets. It is imperative to follow the supplementary instruction sequence for the interior details, or it will be impossible to complete those parts without surgery to the model. In addition, the fin construction is somewhat unusual, and it will save a lot of frustration and reprinting of pages if the instructions below are closely followed as well. Using a beam compass for cutting many of the parts will result in a much neater job, with virtually invisible seams on assembly.

Tools and materials

Card stock: The prototype was built with 135g/m2 (36lb) HP photo-quality ink jet paper with matte finish. Since this is a representation of a piece of comic-book art, a matte finish is most appropriate for the paper. In fact, no piece of Hergé's artwork ever showed the slightest sign of a specular highlight, so glossy paper is just a waste of money. You will need 13 sheets of white card stock for the parts sheets *tindm01.pdf* through *tindm11.pdf* (sheet *tindm08.pdf* is printed three times), and one sheet of ordinary typing paper of about 20# weight for sheet *tindm12.pdf*; and another 10 sheets for *tindm01A, B, C, D.pdf*, *tindm02A, B, C, D.pdf*, *tindm08A.pdf*, and *tindm09A.pdf* if you wish to use a beam compass to cut the curved parts. You will need two pieces of stiff cardboard (about 0.02"/0.5mm) of any color measuring about 8.5" x 11" to be laminated to fin parts 11 and other small details. Two or three sheets of heavy (100-120#) cover stock may also prove useful in the fins. Also, several parts used in the pod area may need to be made from the thinner bond paper, and so are printed on sheets *tindm01A, B* and *C*. Three parts (19b) must be made from the thinner paper and are printed on the auxiliary sheet 9A. All parts fit within a 7.25" x 10" rectangular frame, so either 8.5" x 11" or A4 paper should serve.

Glue: Volumes have been written about the choice of glue, but ordinary white glue and tacky white glue will perform perfectly. Regular white glue is better for laminating or for large parts (because it doesn't dry as quickly), and tacky white glue is usually better for small parts, where its stickiness will help hold things together while it sets. A glue stick such as Uhu's *Stic* brand is very useful for laminating double thicknesses, as it is easy to apply and does not tend to curl or warp the laminate. A tiny amount of cyanoacrylate (CY) glue may be useful in reinforcing some tiny parts.

Toothpicks: Both flat (for applying glue) and round (for forming small parts) are useful.

Tweezers: Both pointed and flat types are useful for manipulating small bits. A squeeze from the flat tweezers will make a wet glued joint set instantly. The flat tweezers can also help control the exact location of bends on small parts.

Scissors: For roughing out parts. Don't try to finish-cut with scissors unless you have extraordinary skill.

Razor knife: A pair of X-acto knives with #10 and #11 blades is about ideal. Always use a sharp blade - dull ones will raise a welt around the cut and can tear the paper. Invest a few dollars in a blade sharpener like the Swedish Edger sharpener with a diamond stone; it will save you a fortune in blades. I've used the same blade for over six months since getting the sharpener, and it's still as sharp as when it came out of the package.

Razor blades: The single-edged type with a folded-over steel cap on the back edge are sold cheaply in boxes of 100 at hardware stores to be used in paint scrapers. These are actually sharper and thinner than

X-acto knives and are invaluable for long straight or slightly curved cuts, and for cutting small, round, thick parts by nibbling and shaving off tiny bits from curved edges.

A very dull knife: The smaller blade of an old jack-knife is ideal. Use this for creasing bend lines without cutting the paper. Alternatively, use the smallest size of ball-ended burnishing tool.

Cutting board: Craft shops sell cutting boards that are self-healing and are perfect for paper modeling. The board need not be bigger than the sheet of paper. Don't use wood or cardboard - the tip of the knife can get caught in an old cut underneath and either ruin the edge you're trying to cut or break off the tip of the blade. The darker board colors (green or black) are preferable, as they can make it easier to see where to trim edges that have not been cut quite right.

Straight edge: A thin stainless steel scale about 6"-12" (150-300mm) long is ideal. Office supply stores carry these, usually about 1" or ½" (25 – 12 mm) wide and .02" (0.5mm) thick. Don't get the ones with a cork spacer on the back, and don't try to use a school-type wooden ruler with an inset metal strip on the edge - if the edge is not in contact with the paper, you cannot get a dead-straight cut.

A good light. Some are sold with a 2.5x magnifying lens built in, which is ideal for old eyes or small parts. The fluorescent type with the ring-type bulb is cooler and more shadow-free to work with, but some people can see the flicker and don't like them ... your choice.

Miscellaneous: Various diameters of brass or aluminum tubing from the hobby shop, knitting needles, and pieces of dowel run through the pencil sharpener are all useful for forming parts. Short lengths of different-sized plastic drinking straws can be useful in holding the ends of conical parts shut while you work on the other end. If split lengthwise, they can also make useful low-pressure clamps. Flat strips of basswood or spruce from the hobby shop are very useful for applying pressure to hard-to-reach spots.

A beam compass cutter: Not mandatory, but very useful for certain large-radius cuts. See the supplemental instructions (Compass.pdf) for suggestions on making or obtaining this device, and suggestions for its use.

Hints

- Keep your hands clean
- Don't cut out parts until you need them
- Stick to the assembly sequence
- Use as little glue as possible. On long glue lines, you will have better luck if you just apply the glue in small closely spaced dots, kind of like spot-welding. It's quicker, and the glue stays wet longer.
- Always dry-fit the parts to make sure the assembly goes together smoothly before gluing them
- The edges of the parts are best colored by rubbing lightly with the side of a soft colored pencil or pastel stick, and this should especially be done on edges of dark parts that are intended to be exposed, like the sharp trailing edges of wings and fins, or the edges of inlets and exhausts. On several previous prototypes, coloring the edges of light-colored parts where they butted together tended to accentuate the joint, rather than hiding it; so I recommend leaving these edges white or only very lightly coloring them. The lightness or darkness of the color is more important than the actual color match.
- If you use a beam compass for cutting parts, always work from the longest radius to the shortest in sequence across the page. On any given page, make all the compass cuts before making any other cuts.

Cutting parts

When cutting, always try to "split" the boundary line. Always use the sharpest blade available. Where re-entrant corners or sharp interior curves are involved, the X-acto #11 blade is ideal. For ordinary gentle curves, a X-acto #10 blade is actually better, because it forces the handle to be held more vertically and doesn't wander off-line as easily. In addition, it does not dull as quickly, and the tips never break off. For straight line cuts, an ordinary single-edge razor blade is ideal. They are sharper than X-acto blades, and thinner, so they don't raise the edge of the cut as much. In addition, they are extremely cheap.

In this model, the exposed edges of some parts are not marked with a distinctive line, in order to reduce the prominence of the edges on assembly. Tick marks have been provided at the corners to assist in cutting these edges. On other parts, the edges have a black line. This is either hidden later or is part of the decoration and should not be removed. The best way to cut the curved edges of the fuselage and pod parts is with a beam compass, using the auxiliary sheets (tindm01A, B, etc.) to locate the centers when they are off the page. Otherwise, the centers are marked on the page. The use of a compass will result in very clean regular edges that virtually disappear on assembly. Use of the beam compass is covered in the addendum to these instructions.

Occasionally, it is necessary to "undercut" or "overcut" a part. In undercutting, the knife is held at an angle such that the exit point of the blade on the backside is further inside the part boundary than the entrance point on the front side. In overcutting, the angle is such that the backside exit point is further *outside* of the boundary than the entrance point on the front side. In both cases, the entrance point is exactly on the part boundary. Undercutting helps avoid gaps where parts join, especially when the parts are thick. Overcutting is seldom used.

Bending and folding parts

Throughout the instructions, "crease" means to run a dull blade or burnishing tool along the fold line and fold so as to crush the crease (valley fold). "Score" means to cut one half to one third of the way through the part along the line with a sharp blade and fold so as to open up the cut (mountain or roof fold). Scores are used only where an exceptionally sharp fold is needed. Creases and scores may be made on the front or back of the sheet, as indicated on the sheet or in the instructions. A fold line is not always indicated on the face of the part, to avoid markings that should not appear. In any case, a fold line will be indicated by extensions of the fold line beyond the boundaries of the part. Use a straightedge to guide the creasing or scoring tool.

Lines marked #-----# should be creased on the back side; lines marked x-----x should be creased on the front side, lines marked o-----o should be scored on the back side, dashed lines - - - - - with no symbol are always to be scored on the front side.

Backside creases and scores require you to transfer the fold line to the back of the card. To do this, prick the paper at the ends of the fold line with the point of a pin or the tip of the X-acto knife. Turn the paper over and align the straightedge with the protruding prick marks. If they are difficult to see, just rub a fingertip (lightly!) over the general area, and you will feel them easily. Lightly mark the line with a pencil line after you have creased or scored it to indicate you have finished with it. It is best to mark and score or crease such lines one at a time, because if there are too many marks on the backside, it is all too easy to get confused as to which two constitute a pair.

General Assembly and Hints Specific to this Model

In these instructions, "forward", "front", or "upper" refers to the sharp end; "Aft", "back", or "lower" refers to the engine end. "Top" and "Bottom" are almost meaningless on this model, except that the joining

seam on parts 1 through 10 may be considered to be the bottom. The assembly takes place in numerical order, and the parts should be built in that sequence.

For parts 1 through 10, the assembly can be aligned by sighting on the seams on the bottom centerline. The red/white pattern should always alternate at each black line. For parts 12 through 20, the seams are along the face that attaches to the fin. All joining strips (usually with the letter “a” added to the basic part number) have an arrow on the centerline which points toward the front. The pointed end of the joining strips will fit into triangular recesses in the joining strips of the adjacent part, as an additional aid to alignment.

If you use a compass to cut the curved parts: On sheet 3, cut the red edges of parts 4b and 4c before cutting the curved edges of part 11. On sheets 3 through 7, after setting the compass radius for the L.E. side of parts 11, 11a, or 11b, cut all the nine L.E. sides on the various sheets with the same setting, then reset for the T.E. radius and make all nine of those cuts. This will ensure that the parts fit together perfectly.

Enough! Let’s build the model!

Fuselage:

Part 1 - central fuselage.

Cut out part 1 to the part outline. For parts 1 through 4, the larger end is the forward end. Cut out part 1a. The small arrowhead on part 1a indicates the forward end. This is typical for all parts in the model. Form parts 1 and 1a slightly into a cylinder shape around a dowel. It isn’t necessary to form it to the final shape - just get some curvature into it. Apply glue to one half of the printed side of part 1a between the short lateral lines - this is where the fore and aft edges of part 1 should go - and glue it to part 1. Make sure there are no loose edges. Now apply glue to the inside of the opposite straight edge of part 1 and bring it round to butt against the edge you’ve already glued down. Make sure the forward and aft edges of part 1 are lined up and then press the joint firmly to set the glue. Cut out part 1b, being careful not to confuse it with part 1d. Form 1b into a hoop and dry-fit it into place inside the forward (large) end of part 1. It should be positioned so that only the serrated tabs stick out - the thin line at the bases of the notches should be just even with the edge of part 1. Each end of the 1b strip should butt against an edge of part 1a - a little bit of gap is OK, but there should be no overlaps. When the fit is right, remove the strip and apply glue to the continuous face of 1b. It will help if you just apply the glue as closely spaced dots - they won’t dry out so quickly. Handling the strip by the serrated edge, set the end in place butted against part 1a and work it into place around the inside circumference of part 1 with thumb and finger, being careful not to get any glue that squeezes out onto the exterior of part 1. In general, if glue squeezes out of a joint, you are using too much glue. Set aside to dry.

Cut out part 1c on the rectangular outline box. Score the paper along the dotted line and fold down. Spread glue lightly on one of the facing surfaces, or rub with stick glue (better), and press together. Set it under a flat weight until dry. If you use stick glue, it will be ready in about 30 minutes. White glue will take considerably longer. Flatten out part 1c if it has any curl and cut out the part to the outer circle. Be sure to cut the very shallow offset on the “bottom” side, which allows relief for part 1a. If this is not done, there will be a noticeable bulge on the outer surface of part 1 when finished. Cut out the inner shaded circle. Put part 1c inside part 1 by turning it slightly and pushing it in. Use your fingers to work the disk around so that the relief fits directly over part 1a. Part 1c should be pushed in from the aft side until it just butts up against the aft edge of part 1b, with no overlap. The radial line marked on 1c should line up with the joint in part 1. Part 1c should not be such a tight fit that it must be forced into position; that will cause a bulge on the outside when glued. If it is too snug, trim or sand the edges slightly until it just fits in place. If it is too small, you’ll have to push it in a little further until some or all of it overlaps part 1b, or build up the edge with narrow strips of very thin paper. From the front side, use a toothpick to apply a half-dozen spots of glue into the corner between 1b and 1c to hold things in place and let it set. This is a good spot for tacky glue. Set it aside to dry. Cut out parts 1d and 1e just like parts 1b and 1c, and laminate part 1e as before.

When the joint between 1b and 1c is dry, glue part 1d into the small end of part 1 and put part 1e inside part 1 by turning it slightly and pushing it in. Using your fingers and working through the holes in parts 1c and 1e, position part 1e so that the relief is over part 1a and the disk is snugged up against the inside edge of part 1d, just like 1c was against 1b. With a toothpick put a few glue fillets into the corner of 1d and 1e and set aside to dry. The part is complete. This is the only fuselage part that has two bulkheads.

Part 2 – air lock compartment / loading deck.

If you are planning to include the optional interior, please look at the supplementary instructions before proceeding with parts 2 and 3. Parts 2, 2a, 2b, and 2c are assembled exactly the same as parts 1 through 1c, except that there is a serrated joining strip (2b) and bulkhead (2c) only at the aft end, and you will be able to insert part 2c by dropping it in from the big end. Make sure the end of 2a with the arrowhead points forward. When part 2 is finished, the fuselage assembly can be started. Set part 1 on the table with the forward end downward (part 1e should be seen). Using your fingers, lightly brush the tabs of part 1d inward so that the open end of part 2 can just slide over them. Without using any glue, bring parts 1 and 2 together until they are firmly butted at the joint, making sure the longitudinal seams line up. Verify that everything fits properly. Also make sure that none of the tabs on 1d get caught or hang up when bringing the parts together. If the parts don't fit, something has either been printed wrong or cut wrong, and you might as well start over, as there really isn't any way to correct it. The most common cause for bad fits is a slight change in the printing parameters when the sheets were printed, such as using the "fit to page" option when printing. This will show up when two parts from different sheets are brought together. If the bad fit is between two parts from the same sheet, then there has been a cutting or assembly error, and you'll just have to print another sheet and make another part. Assuming everything fits, separate the parts and apply dots of glue to the inside end of part 2 and replace part 2 into position. Make sure the edges fit neatly and that the seams are lined up. Sight from the ends and make sure the assembly is straight. Work quickly, as you will only have a few seconds before the joint becomes immovable. If any glue squeezes out of the joint, wipe it off with a tissue before it sets. Set aside to dry.

Part 3 – cargo compartment.

Parts 3, 3a, 3b, and 3c are assembled exactly the same as parts 1 through 1c. Before joining the ends of part 3 with part 3a, make sure to cut out the two slots and the two half-slots at the aft (small) end of part 3, noted by arrows. Also cut out the slots in parts 3a and 3b. The locating tabs on the fins will fit into these slots later. When gluing 3a and 3b to 3, make sure the slots register. Join part 3 to the part 1-2 assembly. Proceed to part 4.

Part 4 - engine bay

Cut out and assemble part 4a to 4, and form into a conical cylinder as before. As with part 3, be sure to cut out the slots in 4a and the 4 slots and 4 half-slots at the front end and toward the aft end of part 4, again noted by arrows. Cut out part 4b and glue it into the small end of 4 the same as the other parts, except that it should be flush with the edge of part 4, with no protruding tabs. Cut out strip 4c, form into a cylinder, and glue inside part 4b, staggering the seams. 4c should be placed so that a slight amount of 4b, equal to the doubled thickness of 4d, is exposed. The wide red line on the edge of part 4b is about the right distance. The small end of 4 should now be three layers thick (4, 4a/b, 4c). Take some time to work the small end of the assembly into as perfect a circle as possible. Laminate and cut out part 4d as before. If you want engine detail, cut out the black circular center; otherwise, leave as is and ignore parts 5 through 5e. After cutting out the part, use a black felt-tip or black ink to blot out the white spot in the center, which is used to locate the center point if you use a compass to cut the part. When dry, test fit it and adjust with sandpaper to make sure it fits inside 4b, but not inside 4c. If you are going to detail the engine, DO NOT glue 4d in place at this time, but proceed to part 5. Otherwise, go ahead and glue it in place and attach and align part 4 to part 3, as before, and skip part 5.

Part 5 - engine

Cut out part 5, and form into a conical cylinder with the printed side on the inside. Use watercolor or pencil to match the color as best you can at the wide edge, which will show on assembly. Glue part 5a to the outside to join the seam, taking care that the end is flush with 5 at the top (small) end, and doesn't reach

quite to the bottom at the big end. Cut out 5b and form into a cylinder with the printed side inward. Join at the seam with part 5c on the outer surface. Make sure to make the notch in the lower (white) end of the cylinder at the seam. Cut out and laminate the disks 5d and 5e. When dry, cut 5d and 5e to the circular boundaries and glue 5d to the face of 5e as indicated. Apply a tiny bead of glue at the corner between 5d and 5e and glue 5b in place, with 5d inside the dark end of 5b. Apply a small bead of glue to the inside edge of the unprinted end of 5b and glue it in place over the narrow end of 5. The notch in the lower edge of 5b should fit over the joining strip 5a on the cone 5. Try to keep the axis of the cylinder 5b lined up vertically with the axis of the cone 5.

When everything is dry, work the lower contour of part 5 until it is as circular as possible. Stand the engine assembly on the table with the wide end of the cone down, and lower part 4d onto it until it touches the table. If it won't go easily, don't force it - wrap some sandpaper around a dowel and sand out the opening in 4d uniformly until 5 fits in easily. If it is slightly loose, don't worry; the glue will lock things up. When everything fits well, apply a bead of glue around the joint on the unprinted side. When this is dry, apply glue to the inside corner of 4b/4c and glue the 4d/5 assembly into the opening. Alternatively, assemble dry and use a long toothpick to position spots of glue at the inside junction of 4 and 4d from the front. Once part 4 and 5 are firmly joined, pick up the part and clean up any glue that may have squeezed out of the joint. When everything is dry, glue the 4-5 assembly to the 1-2-3 assembly, paying attention to the seam alignment.

Part 6 - forward fuselage.

On parts 6 through 10, the large end is the aft end. The pointed end of all "a" parts will be aft and the forked ends forward. Cut out and assemble parts 6 through 6c just as before. Dry fit the assembly to the forward end of part 1, and if satisfied with the fit, glue the two together.

Parts 7, 8, and 9 - forward fuselage.

Cut out and assemble these parts just as before. Dry fit each assembly to the forward end of the previous part, and if satisfied with the fit, glue them together.

Part 10 - nose cone

Cut out parts 10 and 10a. Note that part 10 does not quite come to a point. It is important to cut this tip off. Paradoxically, the cone can be formed to a neater point if it is cut off slightly here. This section has no former or curved end connector strip. Unlike the previous sections, this part must be fully formed to the final shape before any gluing takes place. Use dowels, pencil points, and eventually a large needle or pin to form the shape. Be sure to form the strip 9a to the same contour. This takes some time and patience. When you think you have it just right, put it aside, take a break, and then come back and form it some more. Glue one side of the strip 10a into part 10 with the point exactly at the bottom edge of 10. When the glue is dry, apply glue to the other half and a tiny bit to the edges of part 10 toward the point. Using whatever tools you used to form the part, keep working it while the glue sets. Make sure that the edges near the point are glued together. Your thumbnails can help bring the edges together until the glue sets.

If you wish to add the radio antenna, laminate part 10b just like the fuselage formers. Using a straight pin, pierce the part exactly in the center. Using the sharpest blade you have, cut away all the white area, leaving a ring with a cross in the center. It will be easiest to cut out the triangular central areas first and then cut the outer circular shape. This is a very tough part to make, and a spare is provided. You can reinforce the part a bit by adding CY glue with a pinpoint to stiffen it up after it is cut and repair any breaks or delaminations. Find a dressmaker's pin (the kind with a spherical plastic head) the same thickness as the one you used to pierce the antenna and add a drop of white glue around the base of the head and drop it into 10 so that the point comes out the tip. Make sure it doesn't lean off to one side. Ideally, it should extend 15 mm (~0.6 in) from the tip of 10, but it is more important that it be straight and secure than the right length. For extra security, wad up a small pellet of facial tissue and glue into the inside of the tip of part 10 to lock the pin in place firmly. When the glue is dry, carefully slide the antenna down the pin so it is centered on the exposed length of the pin. A piece of 1/16" (1.5mm) tube will be very useful for pushing the fragile part along the pin. Use a Q-tip or similar stick inside part 10 to keep the pin from being pushed

out the back. Use a tiny drop of CY to lock the antenna in place if it is loose, otherwise leave well enough alone. Glue part 10 to the front of part 9.

Fins

There are three identical fins. Each is a solid laminate of card and paper to achieve a specific thickness of 2mm (0.083 in.). Since everyone will have different materials on hand, you should perform a few tests with scrap material to ensure that the build-up yields the proper thickness. It will do no harm if the stack is slightly too thick, but it should definitely not be too thin. The stack I found appropriate was a piece of 0.018" (0.46mm) cardboard laminated to the central part 11 and a piece of 110# cover stock (about 0.011" (0.28mm)) laminated to each of the outer parts 11a and 11b. Remember that, when selecting materials, each glue layer (at least 5 are needed) will add about 0.005" (0.13mm) to the stack. Your results may vary; so make a few trials with a square inch or so of scrap materials to make sure your stack builds up to 2mm.

Part 11 – fin

Cut all the red edges of the fin core (part 11) to the contour, including the short segments in red along the boundaries that do not appear to do anything. These will later become alignment and attachment tabs for joining to the fuselage and the landing pod. Make sure that the notch under the "parrot's beak", which is the pointed area at the corner between the L.E. and the Pod edges, is cut cleanly. Apply glue to the back face of the part and laminate it to your selected heavy cardboard. Set aside to dry.

Cut the two curved edges of part 11a (labeled L.E. and T.E.) and the short straight cut at the bottom of the "parrot's beak" to the contour and then cut the other edges to the red lines, not the part boundary. Be sure the notch under the "parrot's beak" is cleanly cut out. Apply glue to the back face and laminate to your selected doubler stock. Repeat with part 11b. Set aside to dry.

When all is dry, use the pre-cut curved edges of part 11 as a guide and cut through the cardboard along both of the curved edges and the bottom straight edge of the "parrot's beak". Cut the remaining red boundaries through the cardboard, including the short red line segments making the alignment tabs. DO NOT make any cuts along the Pod or Body sides.

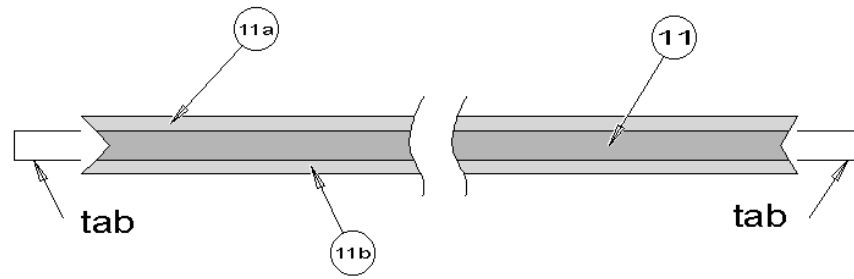
Make the same L.E. and T.E. curved cuts on part 11a and the short straight cut under the "parrot's beak". Now, position your straightedge over the printed part of part 11a and *undercut* the straight "body" side cut. The undercut should be about 30°. Now undercut the series of six short straight cuts along the "pod" side. The undercut at the cut just under the "Parrot's beak" should be at least 45°, relaxing to about 30° at the lowest cut.

Repeat with part 11b.

Apply stick glue to the back side of part 11a and lay in place on the face of part 11. Make sure the points of the "parrot's beaks" are exactly in line, and adjust the two parts until the curved L.E. and T.E. faces fall exactly on top of each other. Put the parts under a weight until the glue dries. Note: be careful when applying weight to parts with large glue areas like this – they have a tendency to slither around and get out of alignment.

When the laminate is dry, glue part 11b to the other side of part 11, using the same alignments. Again, set aside to dry under weights.

When all is dry, use the cut edge of the outer part 11a as a knife guide, and continue the cut, using the same undercut angle, halfway into the center laminate along the straight "body" side, and then the "pod" side. *Be sure not to cut off the two small tabs on the straight "body" side, and the single small tab on the lower straight cut of the "pod" side!* Turn the part over and cut the other halfway through the center laminate from that side, again maintaining the undercut angle. When done, the two curved edges should be cut square to the surface, and the other edges "V"-shaped into the center (except for the three small tabs) as shown in the cross-section below:



Cut out a leading edge cover strip 11c, and glue it to the exposed L.E. curved side (the convex side), starting at the upper corner, to cover the bare cardboard laminate. Cut out a trailing edge cover strip 11d, and glue it to the exposed T.E. curved side (the concave side), starting at the body side corner and covering the exposed cardboard laminate. Leave the last 1/4" (6mm) at the pointed end unglued until after the landing pods are installed.

Repeat all of the above for the other two fins and set them aside for later assembly to the pods and fuselage.

Landing gear pods

Part 12 - upper pod segment

Cut out and assemble parts 12, 12a, 12b and 12c just as you did with the fuselage segments. The attachment strip 12b is attached inside the smaller (upper) end of 12.

Part 13-16 – upper pod segments

Cut out and assemble parts 13, 13a, 13b, and 13c just as you did with part 12, and glue to part 12, lining up the seams. Continue with the remaining parts 14, 15, and 16, attaching each to the previous segment assembly. When cutting out part 16, cut to the unprinted side of the curvy black line at the pointed end of the part. When part 16 is formed, this area will form a slot at the point which will later accept the “parrot’s beak” of the fin as a locator. Trial fit the fin into the slot and, if necessary, use sandpaper to adjust the slot to an easy fit to the thickness of the fin. An emery fingerboard is ideal for this work. Sanding will be easier if a tiny amount of CY glue is applied to the slot edge to stabilize the paper. If the slot is too wide, well, I told you not to make the fin too thin.

Part 17 – lower pod segment

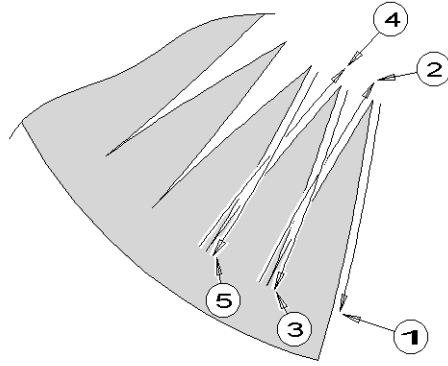
Cut out and assemble part 17, 17a and 17b just as you did with the previous pod segments. Note that, like part 16, there is no bulkhead in this segment. The attachment strip 17b is installed inside the smaller (lower) end of part 17. DO NOT attach this part to anything just yet.

Part 18 – lower pod segment

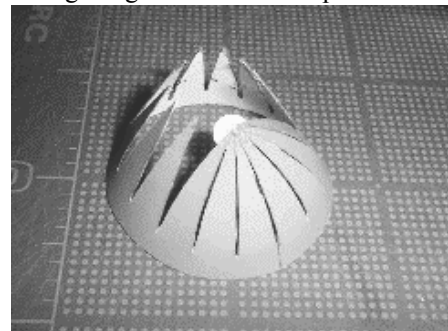
Cut out and assemble part 18, 18a, 18b and 18c just as you did with the previous pod segments. Do not attach part 18 to part 17 at this time.

Part 19 – landing bumper

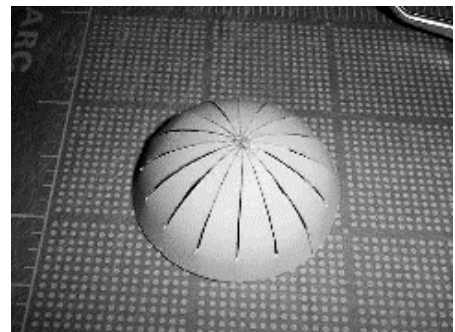
This part requires the most accurate cutting in the entire model. It is extremely important that each pointed gore be cut to exactly the same length, or the final part may be badly distorted, with many unfixable gaps. When cutting the curved edges of the gores, work slowly and carefully, and always cut from an uncut area to a previous cut; never start a cut at an existing cut. Adopt a scheme such as is shown in the figure below, and stick to it.



When all the cuts are made and any color touch-up finished, form the continuous section into a hoop and join with the short strip 19a. The pointed tip of 19a should be exactly at the circular edge of the part. It is important to join the two ends at the proper angle. This is easiest to achieve if you hold the part with the continuous circular edge against the table surface while joining the ends, and keep the tips of the gores on either side of the joint at the same separation that all the other gore points have. When the joint is set, cut out the central disk of one of the parts 19b on the thin paper auxiliary sheet 9A. Glue this to the inside of the tip of any one of the gores, with the tip exactly at the center of the disk. Apply a drop of glue to the inside end of the adjacent gore, and glue it to the disk, keeping the gore tips as close together as possible. Try to follow the lines on the disk to set the angle at which the two gore tips meet. Don't worry about the gaps along the common edges – you'll clean those up later. Now glue down the tip on the other side of the original gore. Keep working around, alternating left and right of the original gore until all the tips are glued down, meeting at a common point. Halfway through the process, the part should look something like figure at the right. The central thin paper disk will probably seem to creep off-center, but don't worry about that; just make sure the tips meet in as close to a single point as possible.



When all the tips are glued down to the central disk, the part will look pretty ugly (see the lower figure to the right), but the next step should fix that. Cut out one of the tapered radiating strips of the parts 19b on the thin paper sheet 9A. Hold the larger end in the point of a pair of tweezers and apply glue to the printed face lightly with a toothpick, starting at the small end. As the glue wets the paper, the strip will curl up to the proper curvature. From the back (unprinted) face of part 19, position the strip over any one of the seams between two adjacent gores, with the pointed end just at the end of the central disk. With a finger on the inside applying *light* pressure to the strip, use your thumbs to push the edges together on the outside, closing the gaps. Again, alternate your way around the interior, closing up the gaps in the seams, until the part is finished. When all is satisfactory, glue 19 to part 18, again lining up the seams.



Part 20 – upper pod base

Cut out part 20, making sure to remove the small rectangular areas noted at the upper and lower ends of the joining seam. Glue into a hoop using part 20a for the splice. The slot in the forked end of part 20a should register with the slot in the forward edge of part 20. The square end of 20a should be flush with the lower edge of 20 and show through the notch in the lower edge of part 20. Laminate part 20c, cut out and set aside. Do not attach 20b, 20c, 20d or 20e yet.

When the complete pod is assembled, there should be a definite step between part 17 and 20. The fit here will vary depending on the paper used, so it is necessary to do some experimenting to get the right filler strips. Extra set of parts 20d* and 20e* are provided on the thin paper auxiliary sheets tindm01A, B, and C, in case the regular card parts on sheet 8 are too thick. These can be cut out with the beam compass if desired, using the same auxiliary center locator sheet 8a as is used for the regular card parts on sheet 8.

A suggested trial procedure is given here: Cut out part 20d* in the regular card stock of sheet 8, and form into a smooth ring. Dry-fit it into the inside of the small end of 20, holding it in place along its upper edge with blue (easy release) masking tape or strips of Post-it notes. The lower edge should be flush with the lower edge of part 20. Insert part 17 into the front (wider) end of 20, red end first, until it jams. The red part of 17 should be showing out of the lower end of part 20. If no white shows on part 17, the part 20d* is too thick. Replace it with a 20d* made from the thinner paper and repeat the test. If there is still no white showing, you won't need any filler strips in this joint.

If some white shows, cut out one of the thin paper parts 20e* and tape it inside of the 20d* that's already in part 20. Try part 17 again. If no white shows, then only the single 20d* filler strip will be required for assembly. If some white shows, replace the thin strip 20e* with a regular card strip, and try again. Some combination of one or two thick and/or thin strips will give the right fit. The ideal fit will be when about 0.5mm (0.02") of white on part 17 will show just below the lower edge of part 20. When satisfied, glue the appropriate strip 20d* into the end of part 20, keeping the end flush with the end of part 20. Make sure this joint is pressed down firmly all the way around with no bridging and let it dry completely before gluing in the next filler strip, 20e*. [This is because the wet glue causes the paper to expand. If the second strip is glued in while the first is still wet, that expansion will double on the first strip and will be locked in when the glue dries, so the stack of strips will be too thick.] Finally, cut out the strip 20e* of the appropriate thickness (if required) and glue it in place over strip 20d*, staggering the ends away from the ends of part 20d*, again keeping the lower edge flush with the end of part 20. Let it dry thoroughly.

Before gluing 17 into 20, test the fit again, and sand the inside face of 20e* (or 20d*) if it has gotten too thick. Apply glue to the white area of 17 and insert in place into 20, taking care to line up the seams. This time, insert only until the red part is fully exposed, with no white area showing. Try to get it exactly to that boundary, but no more. Let the glue dry.

When the glue is dry, glue 20c into place inside 20, resting against the front (upper) edge of 20b. Apply glue to the inside of the edge of part 18 and glue the 18-19 assembly to the tabs of 17, again lining up the seams. Likewise glue part 20 to part 16, lining up the seams.

Final Assembly.

Test the small tabs on the fins to make sure they will fit nicely into the slots in the landing pods and the fuselage. Adjust the tabs by sanding or carefully slicing off some of the thickness of the tabs until the fit is good. Dry fit the fin to the pod, and adjust the shape of the small tab near the trailing edge of the fin so that there is no interference with the slot toward the bottom of the pod. When all looks good, apply a bead of glue (Tacky glue is suggested here, as it is not so prone to run or dribble) into the "v" of the pod edge of the fin, and to the small locator tab, and glue the fin to the pod. No glue is necessary in the tip slot of part 16 if the fit has been adjusted properly. The tip of the "parrot's beak" of the fin should fall just even with the outer surface of the pod on part 16. The angular alignment should be automatic, as the "parrot's beak" part of the fin fitting into the tip slot in the pod should set this angle precisely. When convenient, apply glue to the loose outboard end of the fin T.E. cover strip 11d and glue it down. The end should fit into the little notch at the seam of part 20, and the end come flush with the bottom edge of 20.

The fins are best glued to the fuselage one at a time, as everything will have to be braced and propped until the glue dries to hold the fin at a perpendicular angle to the surface of the fuselage. The gluing itself is done exactly as was the joint between the fin and the pod.

Parting Message

Congratulations! You're finished! Take some pictures and post them for everyone to see. Thanks for bearing with my long-winded instructions, and I hope you enjoyed making this model. If you had problems with the assembly contact me through the Smartgroups message area or e-mail me direct at josutton@comcast.net.

*Tintin, Tournesol, Captain Haddock, *Objectif Lune*, and *On a Marché sur la Lune* are © Casterman, Paris, 1953, 1954