

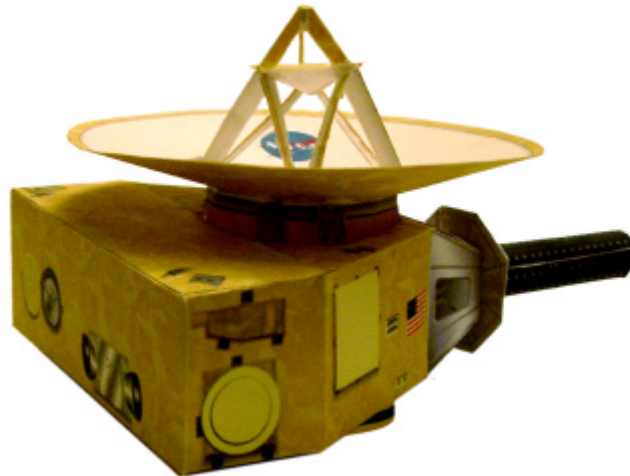
# New Horizons Paper Model Assembly Instructions

Ver 1/3/06

This scale model of the New Horizons spacecraft is designed for anyone interested, although it might be inappropriate for children younger than about ten years of age. Children should have adult supervision to assemble the model.

## YOU'LL NEED THE FOLLOWING:

- A good pair of scissors.
  - An art knife, such as X-ACTO® #11, with a sharp new blade. Children must have adult supervision to use an art knife. You'll also need a cutting surface such as a linoleum pad, or thick chipboard, when using the art knife. **Use caution**
  - Wooden toothpicks for applying glue.
  - Glue. Use regular white glue (Elmer's Glue-All® or equivalent). You might also try a thick white glue, sold in art and fabric stores, called "TACKY GLUE" (Aleen's or equivalent).
  - Doublestick tape or a low-moisture glue, such as a glue stick.
  - A pencil or pen.
  - A metal ruler to use as a straight edge.
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- Space. Set up a well lighted, comfortable work area, with room to set glued parts to dry.
  - Time. Don't hurry. Plan for about 2 hours if you concentrate solely on assembly.
  - Patience. Be sure you understand how parts are going together. Try fitting the parts together dry first before you apply glue.



## TIPS

- Read all of these instructions. Examine the parts sheets and read the names of all the parts. Look for names on some of the tabs. Notice the difference between the top and bottom decks as well as the top and bottom of the center column.
- When referring to folding tabs up and forward mean towards the side with the spacecraft graphics. Down and back mean away from printed side
- When instructed to fold a part, consider scoring it first. To do this, line up a metal ruler or straight edge along the line to be folded, and very lightly scratch it with an art knife, only breaking the surface of the card stock. You have to be very careful not to cut through if you do this. While this is more time consuming, it will result in much neater folds, and may help the parts fit together properly.
- The liquid glues work best when applied very thin and given a half minute to soak in and dry a bit.

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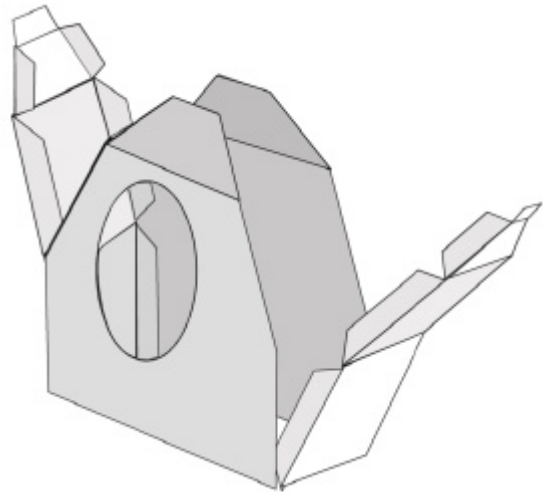
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## ASSEMBLY

- Cut out spacecraft TOP DECK and BOTTOM DECK.
- Cut out and remove material from deck center holes.
- Form folds along edges where RTG mount sections meet gold deck sections.
- Fold center hole tabs upward.
- Fold back white portions of BOTTOM DECK center hole tabs.
  
- Cut out SPACECRAFT SIDEWALLS.
- Fold back all the tabs along wall edges. Notice names of wall section tabs.
- Form folds between walls sections.

## SPACECRAFT BODY

- Cover top side of each 'long wall tab' on spacecraft walls with doublestick tape or glue stick.
  
- With wall section lying flat and facing up, align long edge of TOP DECK on fold of 'long edge tab' marked 'Top Deck'.
- Attach and rub to assure adhesion.
- Repeat for BOTTOM DECK.
  
- Spread thin film of glue on tabs of one 'short sidewall' section.
- Secure tabs to undersides of top and bottom decks.
- Make sure assembly is not twisted.
- Repeat for other short sidewall.
  
- Spread thin film of glue on tabs of one 'diagonal sidewall' section.
- Secure tabs to undersides of top and bottom decks.
- Make sure assembly is not twisted.
- Repeat for other diagonal sidewall.
  
- Spread thin film of glue on tabs of one 'RTG mount' sidewall section.
- Secure tabs to undersides of top and bottom decks.
- Repeat for other RTG mount sidewall.
  
- Fold RTG mount end tabs one over the other. Place a dab of glue between each and hold flat until glue sets.



Spacecraft sidewall attachment

## CENTER COLUMN

- Cut out CENTER COLUMN. Do not fold tabs.
- Curl CENTER COLUMN into cylinder with long tab behind other end.
- Apply glue and align so dashed line near long tab is just covered by other edge.

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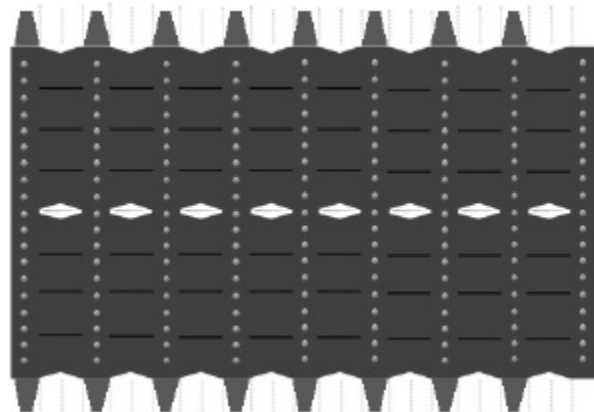
- ❑ Insert center column through TOP DECK and BOTTOM DECK center holes so CENTER COLUMN sticks out evenly. Make sure all tabs in both deck center holes remain outside of holes.
- ❑ Position CENTER COLUMN on so white portions of BOTTOM DECK tabs fold over bottom edge of CENTER COLUMN.
- ❑ Apply glue to back of BOTTOM DECK center hole tabs and secure grey portion to outside of CENTER COLUMN and white portions to inside.
- ❑ Apply glue to backs of TOP DECK center hole tabs and secure to CENTER COLUMN, so tab ends align with top edge of graphics on CENTER COLUMN.
  
- ❑ Cut out PROPELLANT TANK.
- ❑ Fold tabs forward.
- ❑ Insert PROPELLANT TANK into bottom of CENTER COLUMN with graphics and tabs facing out.
- ❑ Position PROPELLANT TANK so ends of tabs align with bottom edge of CENTER COLUMN.
- ❑ Orient PROPELLANT TANK so triangular pattern points straight away from RTG mount.
- ❑ Apply glue to back of PROPELLANT TANK tabs and affix to inside walls of center section.

## RTG

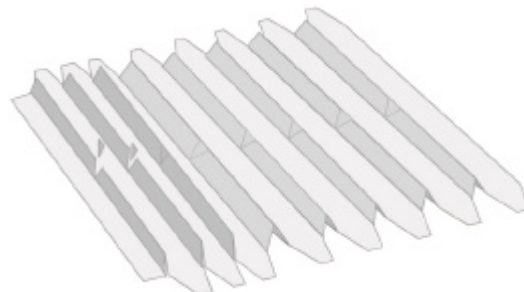
- ❑ Cut out RTG THERMAL SHIELD.
- ❑ Fold in half and glue.
- ❑ Trim away any edges sticking beyond either side.
  
- ❑ Cut out RADIOISOTOPE THERMAL GENERATOR (RTG) body and RTG END CAP.

OPTION: Here is a higher fidelity RTG body with cooling fins. Follow these steps and substitute it for the RTG from the model Document.

- ❑ Cut out RTG body
- ❑ Score folds along dotted lines on opposite sides of RTG body
- ❑ Fold part along dotted and scored lines as shown below



- ❑ Glue fins together
- ❑ After glue has set cut out tapered sections of fins as shown



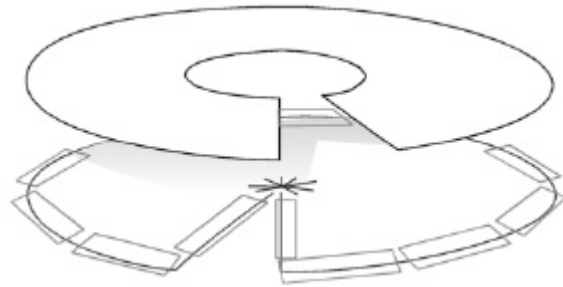
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- ❑ Curl RTG body long-wise so small tabs are on each end of resulting cylinder.
- ❑ Glue long tab behind other edge. Align so edge is just short of graphics.
  
- ❑ Fold over tabs of one end of RTG body.
- ❑ Place glue between tabs and secure together. Use flat end of pen or pencil inside RTG to press end tabs against.
- ❑ Make sure folded end stays circular.
- ❑ Glue folded end of RTG body to THERMAL SHIELD, centered on white circular mounting area. Use flat end of pencil or pen inside RTG to press RTG body firmly to THERMAL SHIELD. Let set.
  
- ❑ Fold over tabs of other end of RTG, placing glue between each.
- ❑ Place RTG END CAP over tabs and hold in place until set.
  
- ❑ Apply film of glue over rectangle on back of THERMAL SHIELD.
- ❑ Attach RTG and shield to end of RTG mount of spacecraft body.
- ❑ Align edges of THERMAL SHIELD square to decks and walls.

## HIGH GAIN ANTENNA

- ❑ Cut out HGA TOP and HGA BOTTOM. Cut out pie shaped sections. Cut 'radial tabs' in center of HGA TOP.
- ❑ Place doublestick tape or glue stick on backside of HGA TOP around outside edge. If using tape place it so it extends beyond edges. Avoid overlapping layers of tape.
- ❑ Place doublestick tape or glue stick down both edges of pie shaped cut of HGA TOP and HGA BOTTOM. Do not cover center 'radial tabs' on HGA TOP.
  
- ❑ With HGA TOP lying face down, mount HGA BOTTOM on back of HGA TOP.
- ❑ Center HGA BOTTOM and rotated with respect to HGA TOP as shown in illustration.
- ❑ Rub to assure adhesion.
  
- ❑ Trim any edges or tape sticking beyond either side.
- ❑ Form HGA (top and bottom) into cone with HGA TOP on inside surface.
- ❑ Rub seams to assure adhesion



Attachment of HGA BOTTOM to HGA TOP

## FEEDHORN

- ❑ Cut out HGA FEEDHORN and 'extra material for handling' as marked.
- ❑ Curve into a cone shape with black portion inside. This takes patience.
- ❑ Once well formed place glue on face of tab and affix.
- ❑ When glued, cut away 'extra material for handling' down to black line. Trim into black portion as needed to make cone even.
  
- ❑ Place beads of glue on tabs of 'radial tabs' in center of HGA TOP.

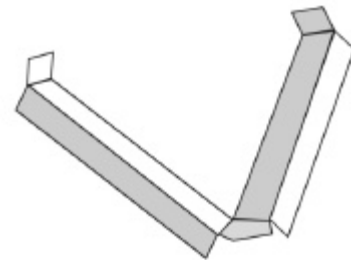
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- ❑ Press HGA FEEDHORN cone halfway into 'radial tabs' and hold it aligned with HGA until glue is set.
- ❑ Fold in tabs on top of spacecraft CENTER COLUMN. Leave tabs partly folded over.
- ❑ Apply glue to outside portion of CENTER COLUMN tabs.
- ❑ With HGA aligned so seam on HGA TOP is pointing straight back, press back of HGA onto glued tabs of spacecraft CENTER COLUMN. Adjust so HGA is centered on CENTER COLUMN and level with spacecraft deck.

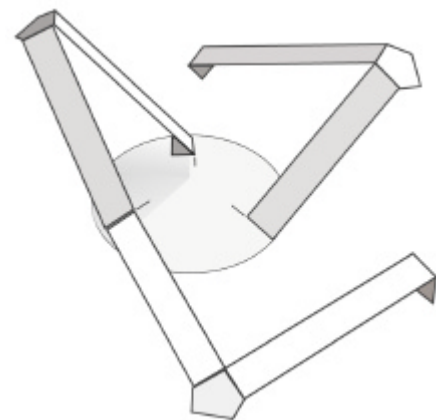
## SECONDARY

- ❑ Cut out HGA SECONDARY DISH and curve into cone with color on the inside.
- ❑ Place glue on face of tab and affix to back side of other edge of cone. Align so line on tab is just covered.
- ❑ Cut out SECONDARY SUPPORTS with 'extra handling for material'
- ❑ Form folds where each support leg joins grey center section along inside edge of support legs.
- ❑ Fold each support leg in half lengthwise.
- ❑ Use doublestick tape or glue stick to affix supports legs halves together.
- ❑ Cut away 'extra material for handling'
- ❑ Fold forward tabs on ends of each support leg.



Fold pattern for HGA SECONDARY SUPPORTS

- ❑ Using the seam on the backside of the HGA SECONDARY DISH as a reference, lightly draw two more lines dividing secondary into thirds radially.
- ❑ With the HGA SECONDARY DISH and SECONDARY SUPPORTS face down, position support legs with the center section pointing away from secondary dish.
- ❑ Glue end tab of one leg of each support leg pair to back of HGA SECONDARY DISH, with tab fold aligned with 1/3 division marks.
- ❑ Glue end tab of other leg of each support leg pair to back of secondary, with fold abutted to fold of adjacent support leg tab.
- ❑ Glue center section of each HGA SECONDARY SUPPORT over alignment rectangles on face of HGA TOP. Adjust positions so HGA SECONDARY DISH is level and centered over HGA FEEDHORN.



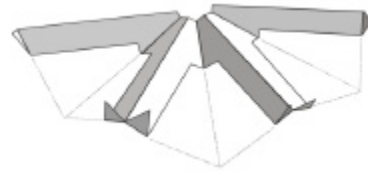
HGA SECONDARY SUPPORT attachment to HGA SECONDARY DISH

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## REX AND SUPPORTS

- ❑ Cut out REX SUPPORTS with 'extra material for handling'.
  - ❑ Form folds thru short portions of center sections, folding legs forwards.
  - ❑ Form folds down long portion of legs bending halves backwards.
  - ❑ Cut away 'extra material for handling'
  - ❑ Glue folded support legs together.
  - ❑ Glue two parts of third leg together.
  - ❑ Fold pointed end tabs forward.
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- ❑ Apply glue to pointed tabs of REX SUPPORTS and affix to gold rim of HGA SECONDARY DISH where HGA SECONDARY SUPPORTS join HGA SECONDARY DISH.
  - ❑ Cut out REX disk and glue to top of REX SUPPORTS.



Fold pattern for REX SUPPORTS

**CONGRATULATIONS, YOUR NEW HORIZONS MODEL IS COMPLETE.**

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