



## **BUILDING INSTRUCTIONS**

Building a model out of paper is really not new. It is, in fact, a lost art that used to be extremely popular before the First World War! If you take your time, you can make a Museum Quality paper model for display. You should expect to spend around 2-3 hours. On the other hand, if you just want to spend some time with the kids, get your scissors out and start gluing! Either way, you will have lots of fun!

### **SUPPLIES NEEDED:**

- **Sheets of cardstock**
  - ✓ >60 lb. bond paper (these may sometimes be labelled as cover weight, coverstock, cardstock etc.).
  - ✓ These papers are readily available at office supply stores.
  - ✓ These papers should run through your computer printer without issue, however, you should check your printer settings as it may have a 'thick paper type' for better print result.
- **Wooden skewers or chopsticks to use as dowel.**
- **One scrap or unneeded CD to use as base.**
- **One sturdy ruler.**
- **One Craft knife**
  - ✓ e.g. X-Acto® or equivalent. "Break-away" blade box cutter style is preferred (you always should work with a sharp blade).
- **One pair of scissors.**
- **White PVA glue**
  - ✓ Always use very sparingly!
  - ✓ Always apply glue to paper with a toothpick or unrolled paper clip, never directly from the bottle!
- **Markers**
  - ✓ Different markers color for edges of your model.
  - ✓ Use mainly grey color but you can color match.
- **OPTIONAL**
  - ✓ Hole punch (to make holes to pass dowel through).
  - ✓ Toothpicks (to apply glue)

### **TIP:**

Remember, if this is your first time building a paper model, it is unlikely that you can achieve museum quality. If you build the model one more time, I can assure you the end product will be much better because of your improved paper model building skills.

### **BEFORE YOU BEGIN:**

- Look through each step of the Instructions package carefully. They show you how to put the model together and in the order that works best.
- Assembly should take at least twice as long as you think. If you build it faster (you can), you are rushing the build! Your model will always look better if you slow down... It always does!

**TIP:**  
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if you slow down

### **PRINTING AND GENERAL INSTRUCTIONS:**

- Make sure the cardstock is compatible with your printer (office supply stores may have several different types, depending on whether you are using a laser or inkjet printer).
- Print out the model parts on cardstock.
- Keep everything at the same scale (i.e. print at 100% or at 'shrink to fit' or the parts won't go together correctly).
- If the printer won't accept the cardstock because of paper jams or other mishaps during printing, print on regular paper and glue to cardstock or very thin cardboard (spray glue is ideal for this because other types may not hold correctly, and might cause the paper to buckle).
- Score along all folding lines (center of solar panels, interior lines on tabs, etc.)
- Have fun with the model! Don't be afraid to try building the shape. In the worst case, you'll have to reprint the sheet and try again!

### **SAFETY:**

- Be sure you are working with sharp knives, dull knives are unpredictable.
- Work on a flat, stable surface and keep body parts out of the way of the knife!

### **TIPS:**

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- Avoid cutting out parts before you're ready to assemble that particular portion of the model (whole sheets are harder to lose than little tiny parts!)
- Cut out inner shapes (like the pass through holes for the solar array arms) before cutting the outer edge.
- To make a mountain fold, aka, a peak fold, fold the paper so that the fold is pointing up.
- To make a valley, fold the paper so that the fold is pointing down.
- Score along folding lines before cutting out shapes. To create a score, make a pressure line or dent in the paper with a blunt tool, such as a dead ballpoint pen or screwdriver. Many folds should be scored so they have a clean fold line. This technique adds a lot of detail to a model. You'll notice a lot of real cars on the road apply this same technique to add detail to door panels and fenders.
- How to roll tubes perfectly?

- ✓ In most cases, problems with working with the paper vs heavier parts breaks down to the most basic element of model making: Slow down! The golden rule in paper

modeling is Work slowly, Speed comes later. Think about what you are doing, and if it doesn't feel right, back off and try a different approach.

- ✓ On making tubes, especially on the very long ones, the first trick is to make sure you pre-curl the paper around a smaller wooden dowel (a round pencil is a staple in a professional paper modeller's tool chest!). You want to get the paper so curled that it basically holds the tube shape without any glue before you attempt to glue (a perfect example of the 'Slow Down' principle!). If it doesn't, you are going to have trouble gluing; it will get messy as you fumble with it, etc. Also the edges should really be over curled, so it dimples in before the glue is applied - you can smooth it out later. Many builders rush the pre-curling step, and go quickly to the glue. They will pay for not properly pre-curling paper.
- ✓ If you can't get a finger into the tube for some back pressure when you glue, you'll want to run a smaller diameter wood tube through the inside and apply pressure with that. Professionals usually keep a set of long ratchet sockets of various size diameter steel cylinders.
- ✓ Now sometimes the size of the tube is just not agreeable to either of those situations. The last method to insure that the tube is perfect is to make it twice - as in make an identical one slightly smaller than is necessary out of a scrap piece of paper. This one doesn't have to have perfect seams. Then take the printed part and wrap it around this inner support tube. If you made the inner tube too big, you can just redo it a bit smaller. If it is too small, wrap additional sheets/strips of paper to thicken it up so that when you wrap the actual tube part, it's seam lines up just right.
- ✓ You may also want to take old magazines/junk mail and roll them and insert them into the bodies to keep them from getting dented, and makes them heavier and keeps pressure on the tube to keep them round. Although, for flying models you will not want to do this!
- ✓ **DO NOT USE TOO MUCH GLUE!** Glue should be applied with a toothpick or an unfolded paper clip, and spread very thin.



Ok, let's start building!

**First, let's print out the design.pdf on card stock.**

## STEP 1

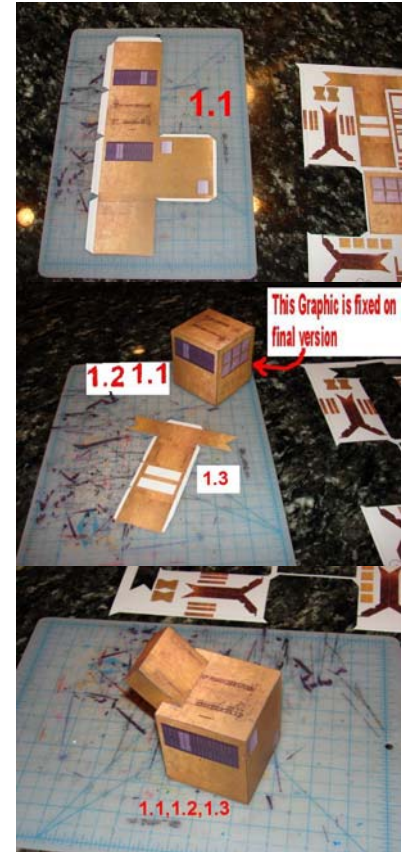
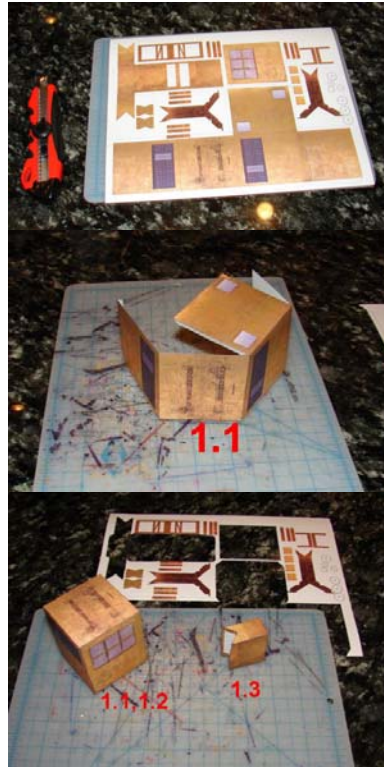
Parts 1.1, 1.2, 1.3

Fold and glue 1.1

Fold and glue 1.3

Glue 1.2 to 1.1

Glue 1.3 to 1.1/1.2



## STEP 2

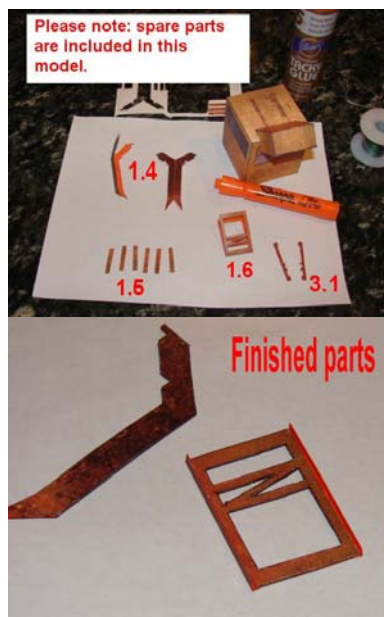
Parts. 1.4, 1.6, 3.1, 1.5

Cut 1.4 Fold and glue twice

Cut 1.6 use razor blade and metal ruler for the inside detail

Cut 3.1 Glue to 1.6

Cut out 1.5 glue to 1.4



**STEP 3**

Add more support.



**STEP 4**

Parts 2.1, 2.2, 2.3

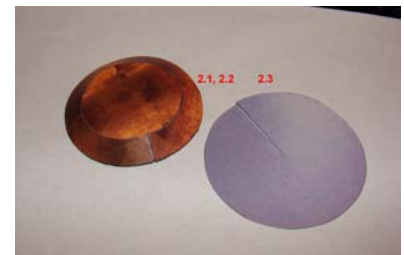
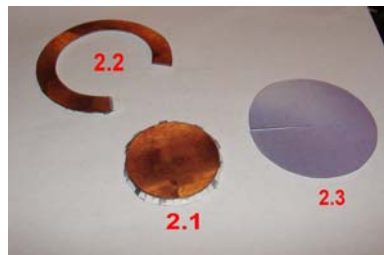
Cut 2.1 many times around the edge

Cut 2.2 and glue to 2.1

Cut 2.3 out cut along grey line to the center cutting a star as shown.

Glue 2.3 to the back side of 2.2/2.1

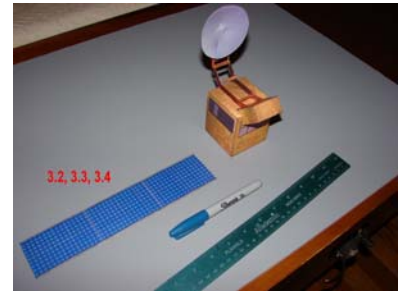
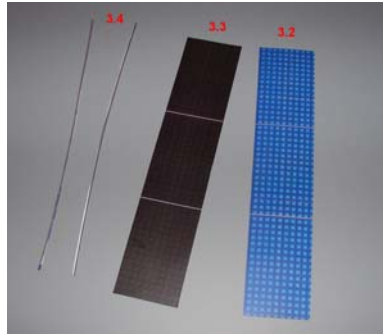
Glue 1.6/3.1 to 2.2/2.1



### STEP 5

Parts 3.2, 3.3, 3.4

2x Glue 2 of 3.4 to backside of 3.2 and glue that to 3.3

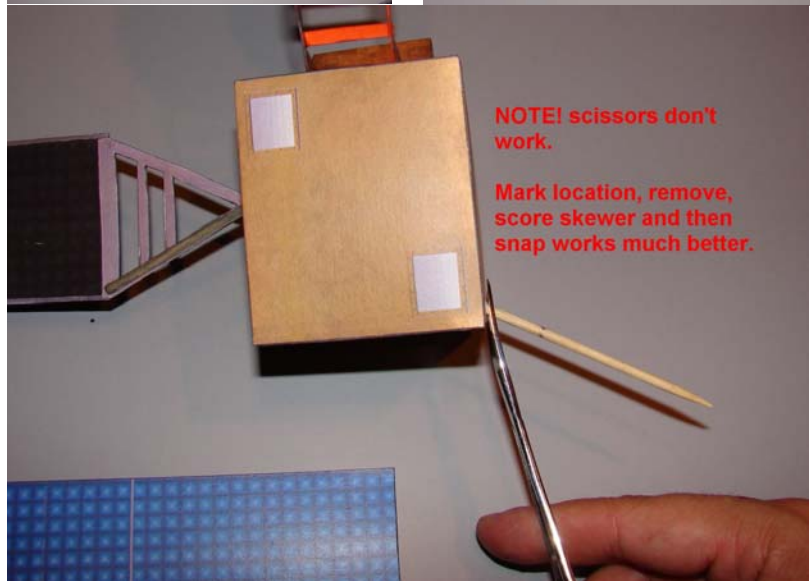
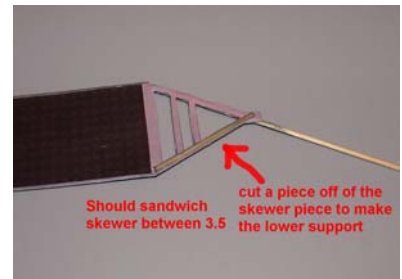
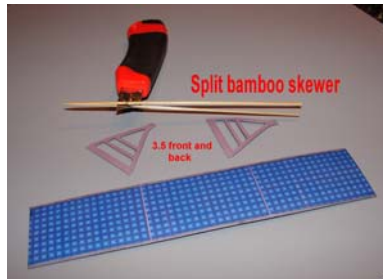


### STEP 6

Part 3.5 Split bamboo skewer

Glue one of 3.5 to panel

Cut skewer to 3.5 as shown glue remaining skewer to tip of 3.5 sandwich the other 3.5



**STEP 7**

Parts 1.7, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 5.3, 5.4

Cut 2.9 and 2.4

Roll 2.9 into cylinder glue

Glue 2.4 on the inside of 2.9 Let dry

Glue onto box

Cut 2.5 Roll with pencil into cylinder glue

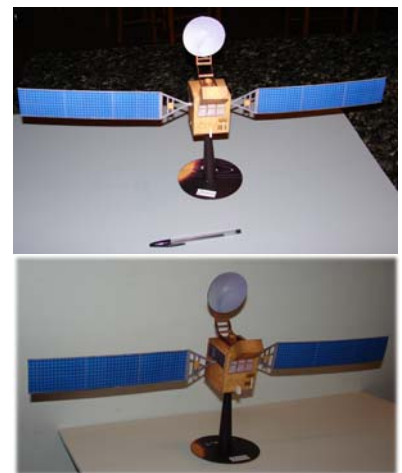
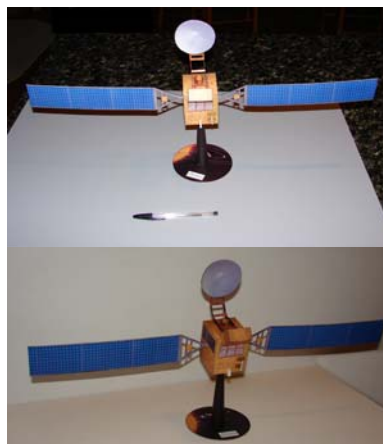
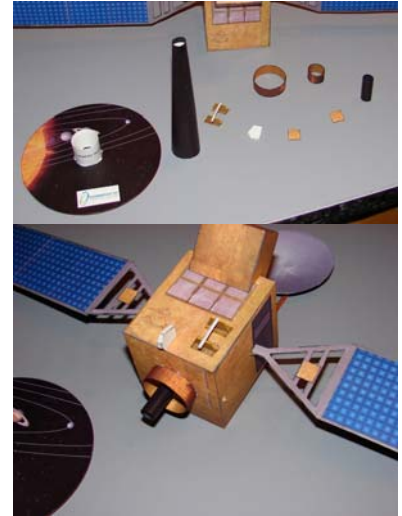
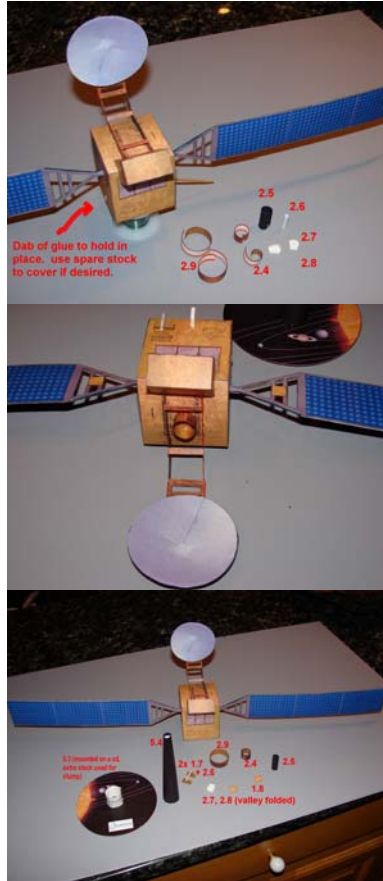
Glue onto box center of 2.9/2.4

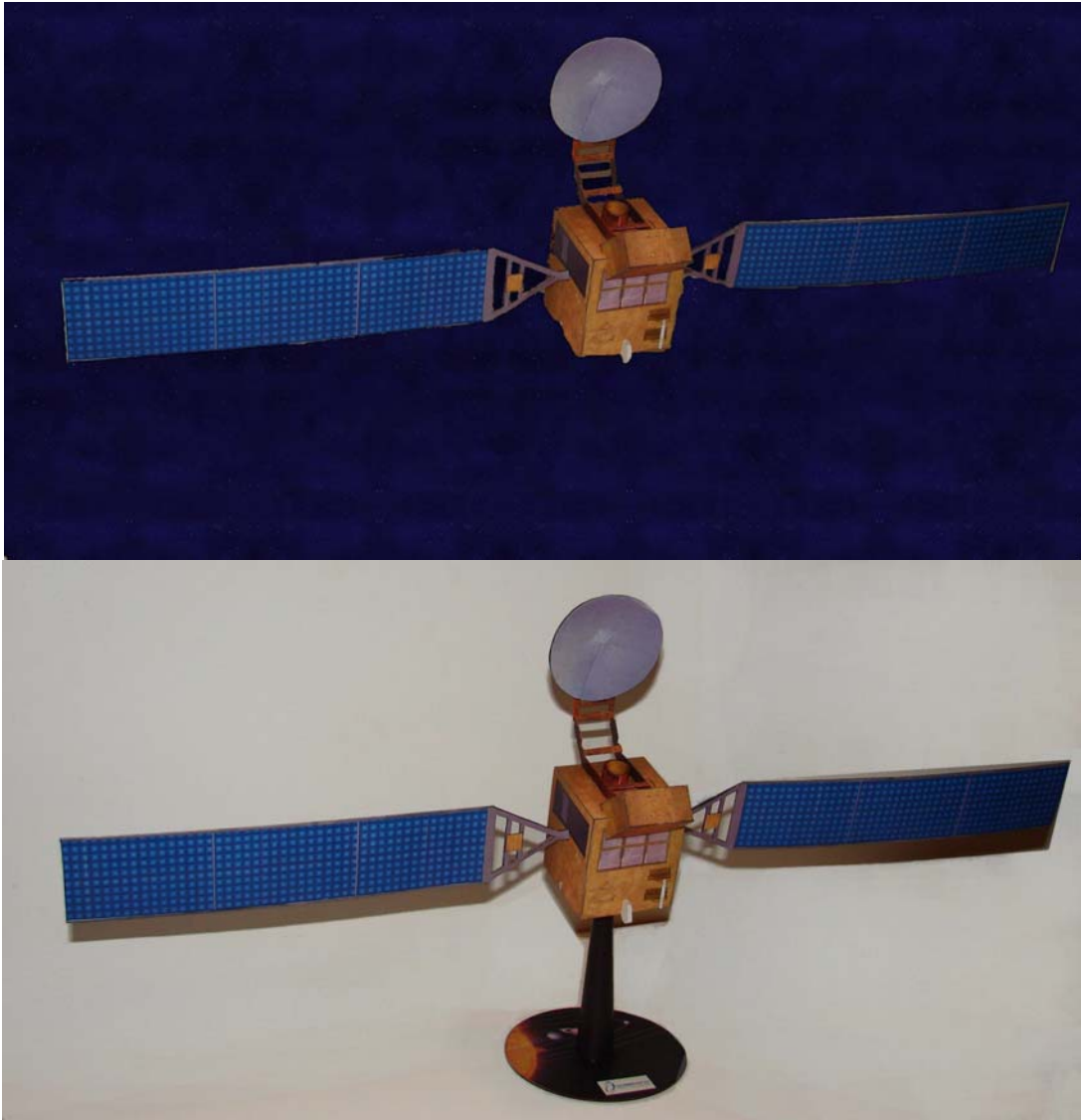
Cut 1.7 glue to 2.6 and glue 2.6 to box

Cut 2.7 2.8 Fold (valley fold )

Cut 5.3 Glue to garbage CD

Cut 5.4 Roll and Glue





### **Congratulations!**

You have now got yourself a beautiful paper model. Remember, building paper model requires a little bit of practice and patience, if you think you can do a better job with the one you just built, why not build it again to make everything perfect. If you are happy with this model, don't forget there are many more models that you can build – watch out for the Russian GLONASS, EU's Galileo and many other interesting models to come. And, if you enjoy building this model, why not tell your friends so that they and their kids can enjoy it also!