

ATTACK REMOTE

KIT ASSEMBLY INSTRUCTIONS



DOWNLOADABLE 3D CARDSTOCK MODEL

SCALED FOR USE WITH 28MM GAMING MINIATURES

BUY ONCE, THEN PRINT AND BUILD AS MANY AS YOU NEED!

THE BASICS OF PAPER MODELING: TOOLS AND EQUIPMENT



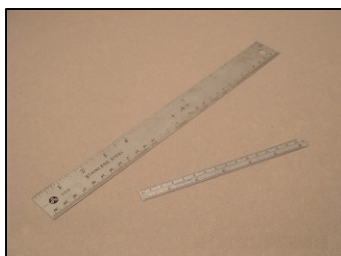
GLUE

There are a variety of glues and adhesives on the market, some of which are nicely suited to building paper models. White glue (also known as PVA glue), glue sticks, Uhu office pens, tacky craft glue, and sometimes even superglue (cyanoacrylate adhesives) all have their own uses. For the great majority of the time, however, you can get by just fine with white glue alone.



SCORING AND CUTTING TOOLS

You'll want to have, at the very least, a sharp hobby knife for cutting parts out of the printed sheet. Scissors are not recommended. For scoring, you can either gently drag the hobby knife across the fold (not recommended), or use specialty tools for scoring without cutting into the paper. Embossing tools such as the ball stylus, an empty ballpoint pen, a scrapbooking bone folder, or even secondhand sculpting tools with smooth and dull blades are great tools for scoring without breaking the paper.



STEEL RULERS

To precisely guide your cuts or scoring, steel rulers come in very handy. Unlike plastic or wood rulers, steel rulers are resistant to sharp hobby knives. You can get by with just a normal 12-inch steel ruler, but you may find that a smaller 6-inch steel ruler is a lot handier and easier to deal with when making small cuts. Along larger parts, steel rulers can also be used as a bending brake.



HOBBY TWEEZERS

Sometimes you'll encounter folds that seem too small to do with your fingers alone. In this situation, a pair of hobby tweezers like the one shown to the left is very handy. In effect, they act as a set of tiny fingers and a miniature bending brake, allowing you to crisply fold very small parts.



BLACK, GRAY, OR DARK GRAY MARKERS

When you cut parts out of the sheet, the edges are naked white. This generally results in a less than pleasing visual effect when the model is fully built, and this is dealt with by a technique called "edging". When edging parts, you will be doing two things: coloring the actual edge itself, and coloring in a portion of the glue tabs. The best marker to use for edging is one that has a soft chisel tip, and which doesn't bleed through thin cardstock. The markers pictured to the left are calligraphy markers with 2mm and 3.5mm chisel tips.



CUTTING PAD/MAT

A good self-healing cutting mat will help your hobby knife blades stay sharp longer, and protect your work surface from damage.

THE BASICS OF PAPER MODELING: TIPS AND TECHNIQUES

Basic Techniques

1. Scoring: Scoring is a technique used to make folding easier by pre-creasing the paper along a fold line. The most common method of scoring is to lightly drag a knife blade across the fold line, slicing through the upper layers of the paper. The recommended method is to instead use an empty ballpoint pen or a ball stylus tool to gently compress the paper along the fold lines. This prevents the appearance of unsightly naked edges and makes for a much stronger model.

2. Cutting: Cutting may seem to be a glaringly obvious technique, but a few pointers are essential. For the majority of cutting where paper models are concerned, a sharp knife and a steel ruler are far more precise and efficient than a pair of scissors. Save the scissors for separating individual parts or groups of parts from the rest of the sheet.

3. Burnishing: Often, you will be building parts that are composed of flat fold-overs. In order to ensure that they stay straight and do not delaminate after building, you will want to burnish the two halves together. You can use your finger, a smooth and flat tool, or even a little rolling pin. Burnishing forces the two layers in a flat fold-over together, spreading out the glue even further and squeezing it into the paper fibers for additional bite.

4. Edging: Edging improves the appearance of paper models considerably by hiding the naked edges of cut parts. Anything from color markers to soft pencils and various types of paints may be used to edge parts. However, in most cases, matching the color exactly is less of a concern than simply matching the contrast. For most purposes, three or four shades of gray from lightest to darkest will more than suffice.

5. Folding and Gluing: Depending on the thickness of the paper or cardstock used, some parts may be difficult to assemble with fingers alone. In this situation, a pair of tweezers is worth more than its weight in gold. Tweezers come in a wide variety of sizes and jaw shapes, and some of the more exotic shapes are fantastically useful for assembling tiny parts. Tweezers can be used to fold tiny flaps and clamp them in place while the glue sets, as well as making it much easier to attach small parts to other parts.

Special Notes

1. Gluing Tabs: This model includes integral gluing tabs for joining certain parts together. However, the utility of gluing tabs decreases proportionally as the thickness of the paper or cardstock increases. Thick cardstock or paper can be used for printing this model, but it is recommended that you try a test assembly before committing wholly to assembling a model. If the gluing tabs won't fit or otherwise throw off the tolerances of the finished test assembly, leave them off the parts entirely and cut your own gluing tabs out of scrap cardstock.

These separate gluing tabs should overlap both of the parts to be joined, and glued to the unprinted surface along the joining edges of both parts. This is called "backing", and a side effect of this is that parts will fit more or less flush. Backing parts with separate gluing tabs also generally yields better modeling results, but the integral gluing tabs are retained for the convenience of beginners and those who prefer to use thinner media for their paper models.

2. Sealing: In most cases, sealing the model with varnish or other form of spray sealant isn't necessary. However, if you want to add further detail to the model with decals or paint, you may want to seal the model with several light coats of a waterproof glossy clear sealant first. This will protect the model from a moderate level of moisture, and the smooth surface will facilitate the application of decals. You can also apply a final coat of a matte clear sealant to kill the gloss afterwards. Keep in mind that the simple act of sealing a model does not necessarily render it waterproof, and that any application of waterslide decals needs to be done with great care.

3. Reinforcing: At times you may need to reinforce large pieces, either to make them heavier or to increase their strength. To do this, you may wish to glue toothpicks, craft sticks, or other suitable items to the interior of a model.

4. Weighting: If you find that your models are too light, you can weigh them down by gluing various ballast items to the inside of the model. Some items that come to mind include pennies, ball bearings, and washers. Affixing these items to the unprinted side of a model before folding and gluing it into shape will give the model a significant amount of heft and weight.

A NOTE ON RARE-EARTH MAGNETS

What the heck is a rare-earth magnet?

Rare-earth magnets are small, very powerful magnets that are extremely useful for making parts modular, creating functional joints that can rotate, and allowing models to be created as separate sub-assemblies that can be taken apart. Our models will be designed to be as magnet-friendly as possible, and the following pages should help you find suppliers and choose the best sizes to buy.

To the right, the photos show some of the magnets that we're currently using. Rare-earth magnets come in a staggering variety of sizes, shapes, and strength, and because of that variety, there is no real way to specifically pin down a few exact sizes to buy. However, the following dimensions should be used as guidelines for buying magnets, since we will be designing models with interface areas that follow those guidelines.

The large majority of magnet-friendly interface areas on our models will be designed to accept magnets of up to 0.25 inches (6.35mm) in diameter, and up to 0.125 inches (3.175mm) in thickness, so any rare-earth magnets that fit within this size envelope will work.

The best shape to buy is the disc, because discs have a versatility well-suited for nearly all possible joint or connector configuration. Some models will be designed with ball socket joints, which will require a non-magnetic stainless steel ball and one or more ring magnets. The instructions for these models will specify any unique combinations, and will list the relevant suppliers as well.

The following list of known online suppliers for rare-earth magnets is current as of March 23, 2006:

Sources for Small NdFeB Disc Magnets

Amazing Magnets

<http://www.amazingmagnets.com>

Engineered Concepts

<http://www.engconcepts.net>

Force Field

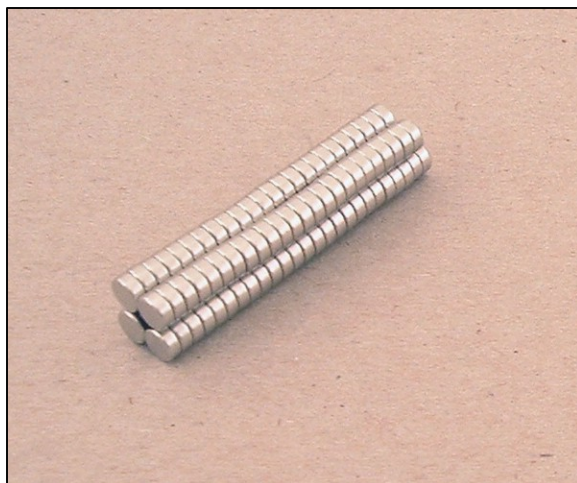
<http://www.wondermagnet.com>

K&J Magnetics

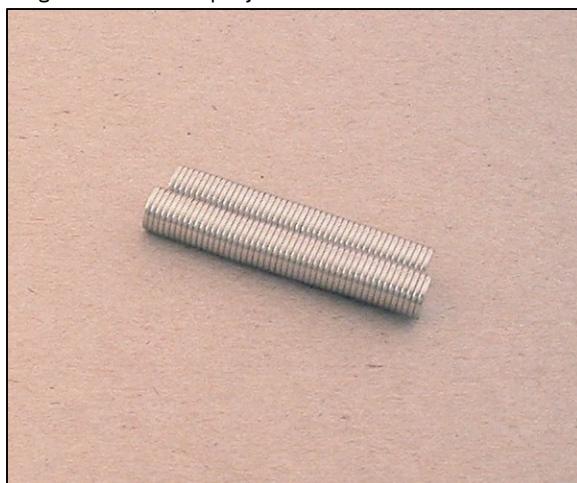
<http://www.kjmagnetics.com>

Rare-Earth Magnets

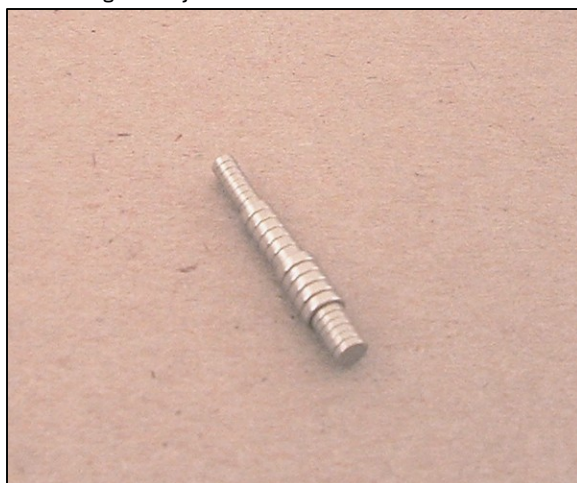
<http://www.rare-earth-magnets.com>



5mm diameter x 2mm thickness neodymium-iron-boron disc magnets, grade N40 (D1024, from Engineered Concepts)



6mm diameter x 0.75mm thickness neodymium-iron-boron disc magnets, grade N38 (D401, from K&J Magnetics)



Assorted sizes and thicknesses of neodymium-iron-boron disc magnets, from Engineered Concepts

USING RARE-EARTH MAGNETS

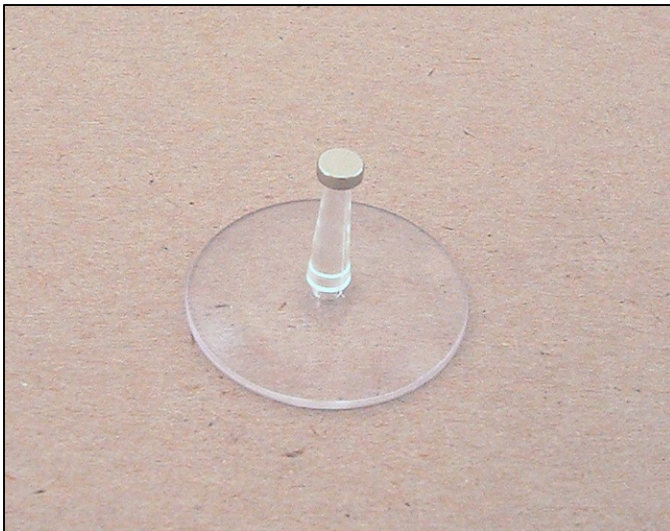


Modular Parts and Articulated Joints

The most fun you can have with these magnets is in using them to make turrets or limbs rotate, or in making parts easily swapped out.

In the photo to the left, thin disc magnets were used for the connection between the model's turret and body. Not only does the turret rotate easily, it can also be swapped out for other types of turret. If you wanted, you could take it even further and magnetize the weapon pods, allowing you to quickly customize the model's weapon loadout without needing to build a whole new model.

The connection strength is strong enough that parts do not fall apart, but you can still slide them apart at the joint with some effort.

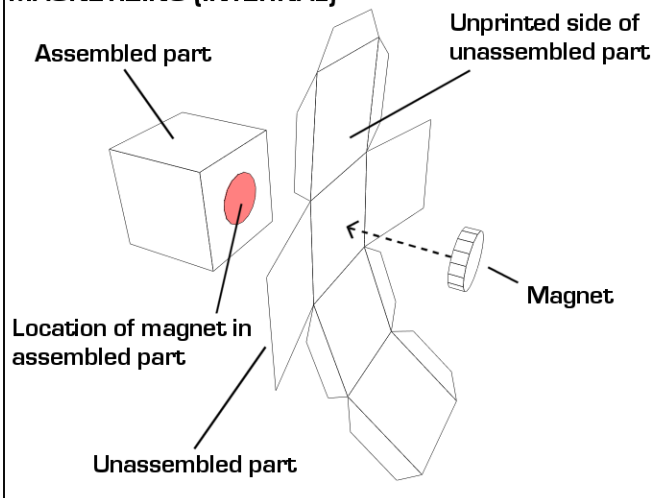


Magnetic Bases

Some companies like Games Workshop sell bags of 2-part clear plastic flight bases with wide bottoms and stems of varying lengths. For small models, these bases are extremely useful. Not only do they look better than a cardstock flying base, they're also much stronger than any base that uses transparency sheets. The small flying bases come 24 to a bag for \$5USD as of this writing.

The base shown in the photo to the left has had the peg shaved off, and a disc magnet glued into place. Now the base can be easily removed from the model, and the connection is strong enough that the model will not come off under normal use. To use magnetized flying bases, all you need to do is glue a thin disc magnet to the underside of the model.

MAGNETIZING (INTERNAL)



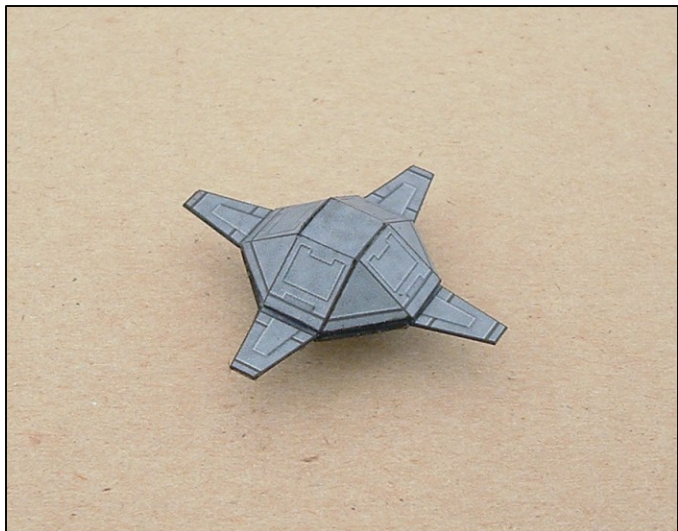
Hiding Magnets

Sometimes you may not want the magnets to be visible, or perhaps the model cannot be assembled with external magnetic joints. In this case, the solution is to glue the magnets to the unprinted side of the relevant parts while building. The diagram to the left illustrates an easy way to keep the poles straightened out.

First, position the second, unassembled part so that the correct part of it is mated with the part that you want to magnetically connect it to. Apply a drop of cyanoacrylate glue to the desired mounting spot, on the unprinted side, for the magnet, and then simply position the magnet over the spot and release it.

The new magnet will snap to the proper polar orientation, and will be held in place by the other magnet until the glue sets. Once the glue sets, remove the part and assemble it.

ASSEMBLY INSTRUCTIONS



LOWER CHASSIS

Fold up and glue the center chassis disk (Part 02) over onto itself. Next, fold up and glue the upper disk half (Part 03) and the lower disk half (Part 04).

Glue the upper and lower disk halves to the center chassis disk as shown to the left.



STANDARD ATTACK REMOTE

Glue the left antipersonnel weapon pod (Part 06) and the right antipersonnel weapon pod (Part 05) to the turret body (Part 01) as shown to the left.



ANTITANK ATTACK REMOTE

Glue the left antitank missile pod (Part 08) and the right antitank weapon pod (Part 07) to the turret body (Part 01) as shown to the left.

ASSEMBLY INSTRUCTIONS



LIGHT SUPPORT REMOTE

Glue the left rocket pod (Part 09) and the right rocket pod (Part 10) to the turret body (Part 01) as shown to the left.



HEAVY GUN REMOTE

Glue the left energy weapon pod (Part 11) and the right energy weapon pod (Part 12) to the turret body (Part 01).

Next, glue the left energy weapon emitter shroud (Part 16) and the right energy weapon emitter shroud (Part 15) to the front of the corresponding energy weapon pods.

Last of all, glue the left energy weapon radiator unit (Part 13) and the right energy weapon radiator unit (Part 14) to the rear of the corresponding energy weapon pods.

The seams for Parts 13, 14, 15, and 16 should face downwards. The completed assembly should be as shown to the left.



FINAL ASSEMBLY

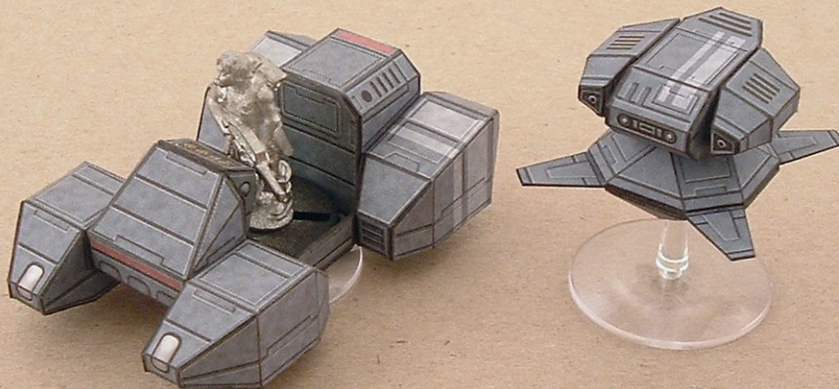
Connect the completed turret assembly to the chassis as shown to the left. The model is now complete.

To attach the model to a standard clear flying base as shown to the left, simply slice a small X (no more than 2-3mm in diameter) in the center of the chassis bottom with your hobby knife. Cut the small peg off the top of the flight base stem, then apply a drop of cyanoacrylate glue (superglue) to the center of the X-shaped cut you made in the bottom.

Next, push the base gently through the X-shaped cut until you feel it come to rest against the center chassis disk, and hold in place until the glue sets.

(Alternatively, you may magnetize the base.)

REFERENCE IMAGES AND NOTES



Runabout Floater and 28mm Copplestone Castings "Future Wars" figure shown for scale.