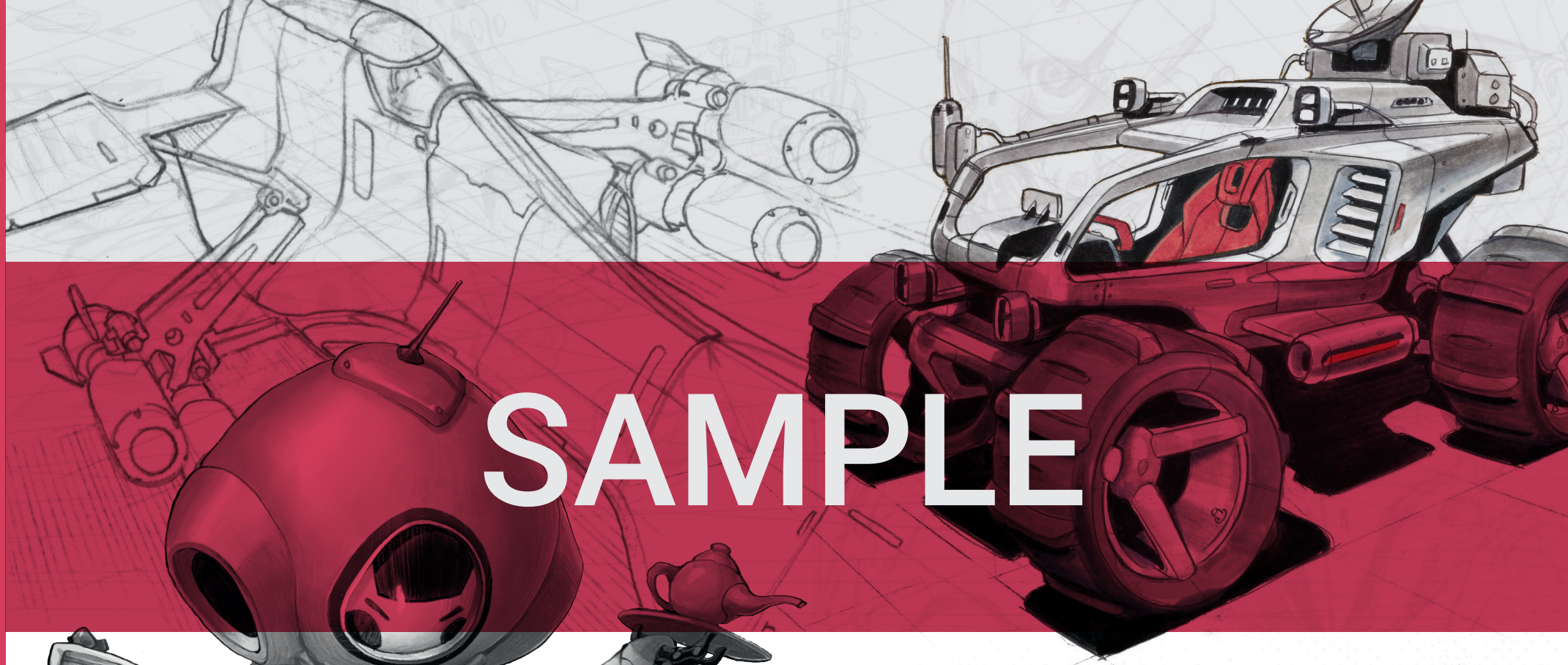

SAMPLE

BEGINNER'S GUIDE TO

SKETCHING

ROBOTS, VEHICLES & SCI-FI CONCEPTS

WITH ARTISTS INCLUDING JOHN A. FRYE, LORIN WOOD, AND GUIDO KUIP

BEGINNER'S GUIDE TO

SKETCHING

ROBOTS, VEHICLES & SCI-FI CONCEPTS

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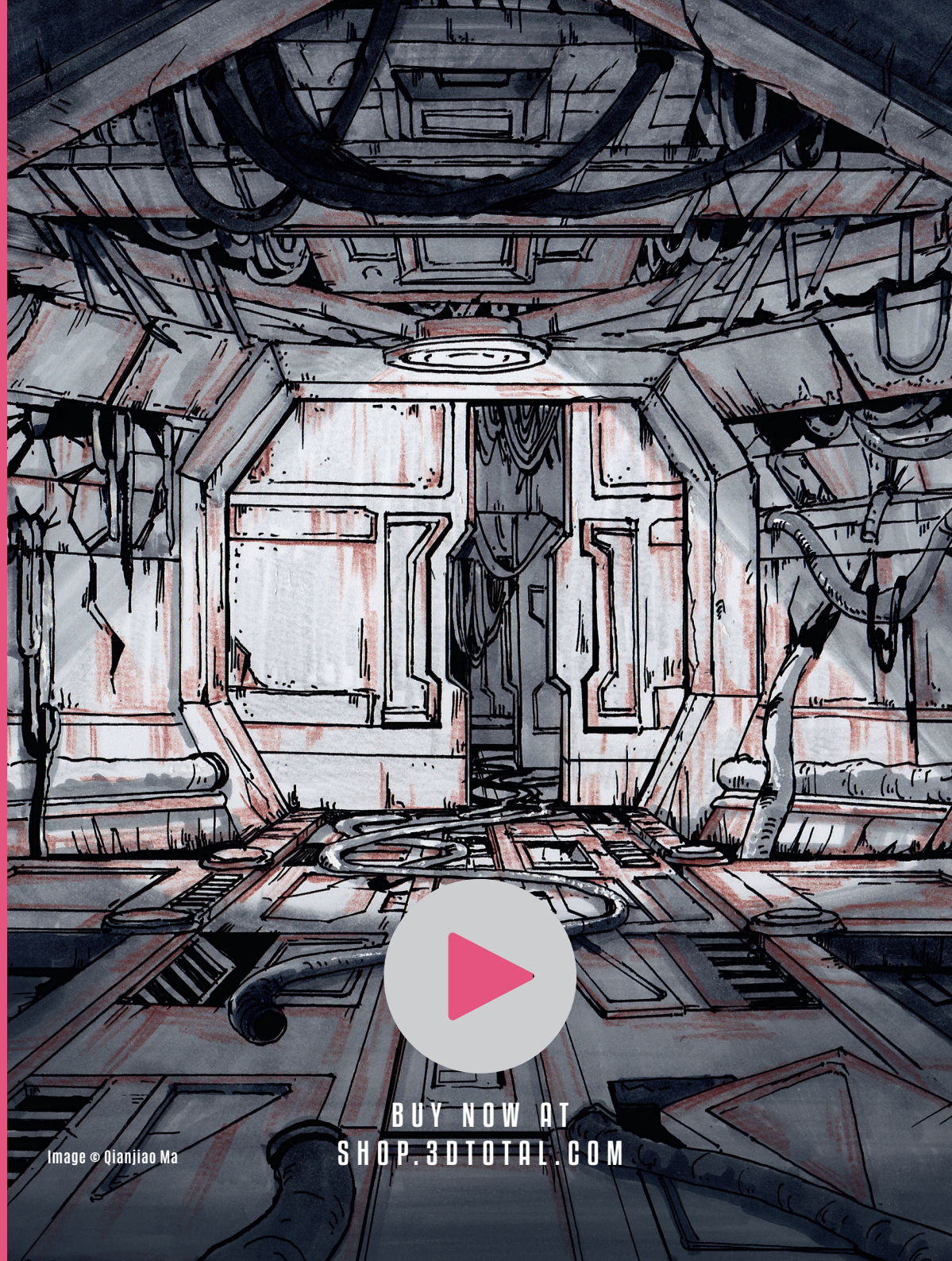
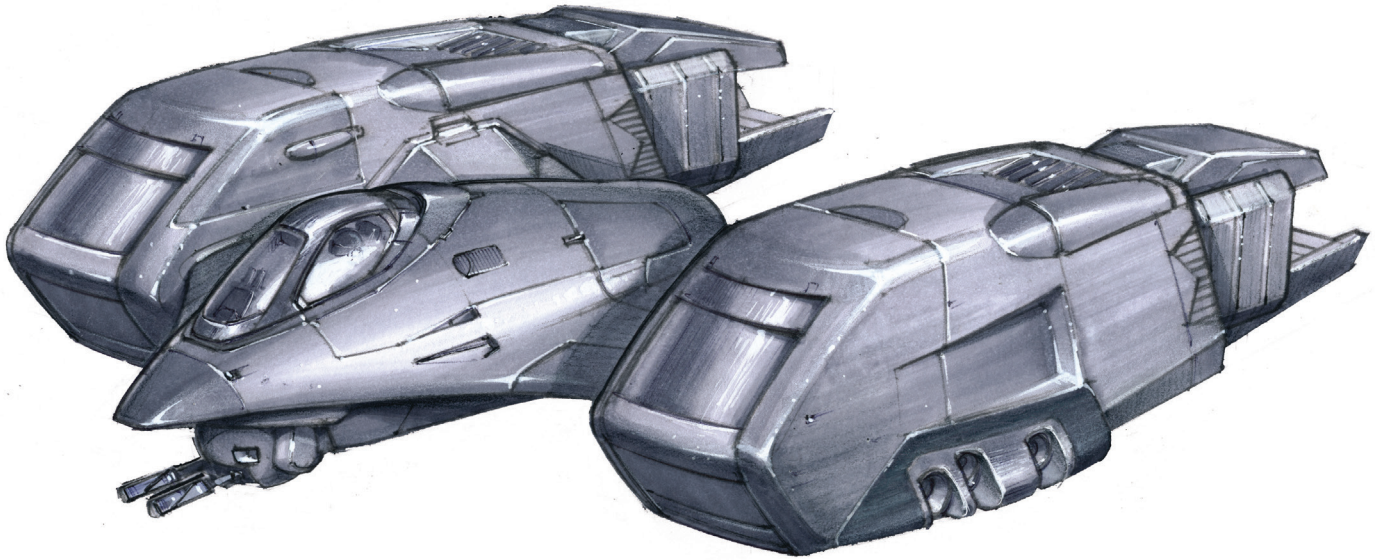


CONTENTS

COMBAT SPACESHIP

BY LORIN WOOD
lwoodesign.com | All images © Lorin Wood

DOWNLOADABLE RESOURCES



Over the next few pages, concept designer Lorin Wood breaks down the process of creating a sleek combat craft. Drawing inspiration from real-life fighter planes will give the design believability, while large engines will add a powerful futuristic edge. A simple two-point perspective view will give a clear overview of the ship's features, and gray markers will be used to capture its brushed metal surface.

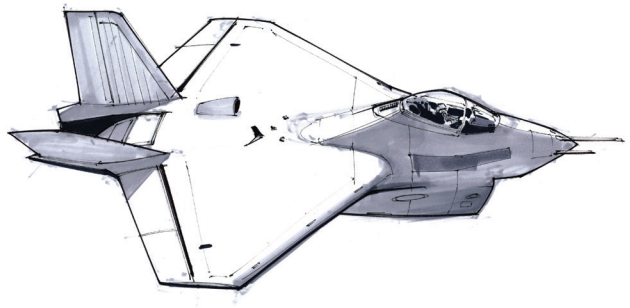
TOOLBOX

- Ballpoint pen (or pencil)
- Cool gray markers – Copic C1, C3, C5 and C7 (or other markers in 10, 30, 50 and 70% gray)
- White paint marker, white-out, or white gouache
- Black marker (optional)
- Ruler

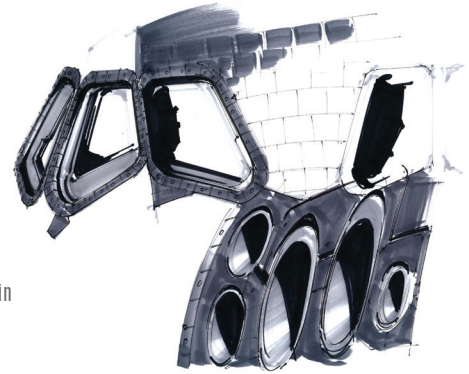
RESEARCH

When it comes to designing for science fiction, the best resource is always going to be reality. For this design I want to focus on some contemporary fighter planes for reference, specifically experimental aircraft. In these types of craft, while the engineers have limitations to what they can create, the forms are often pushed to the limits of the familiar. I also include some older retro-experimental aircraft with shapes that can easily be identified at a quick glance. This will ground the design and bring a logic to the craft: where the pilot sits, which direction it moves, where the exhaust comes out, and so on. I also want to research some small and interesting details, even if they don't get used, as they'll sit in the back of my mind and help to inform the shapes as I create the design.

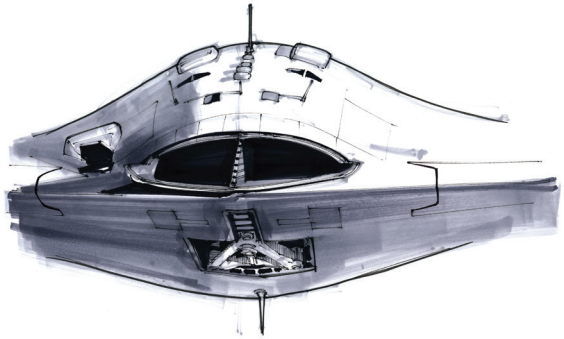
I want to stress the importance of *the idea*. It is always good practice to develop a simple narrative or scenario before the drawing starts, to give it purpose. Why does this thing exist? That question will dictate the visual function and aesthetic of the design (such as textures or wear and tear). The tools are secondary; they always will be.



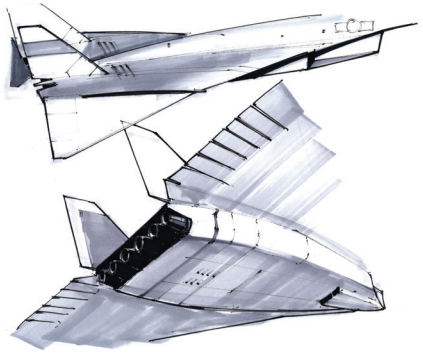
VTOL (vertical take-off and landing) I am thinking of a stout ship for my final design. The X-32 was an experimental VTOL (vertical take-off and landing) fighter plane that was being designed for multiple branches of the military. I want to implement some of these exaggerated shapes into my spaceship.



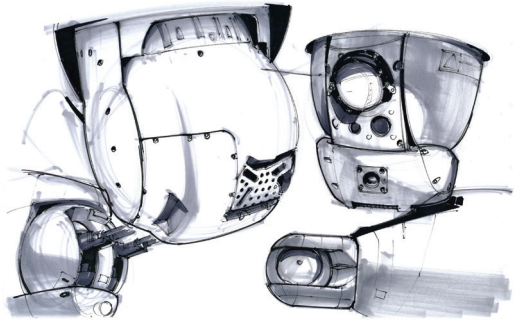
Space shuttle As my design would operate in orbit, I think some obvious details from this space shuttle are in order. At a distance, the shuttle appears simple, but upon closer inspection, it is actually covered with scale-like heat-shielding pads that break up the overall hull. To help it manoeuver in the vacuum of space, there are embedded vectoring rockets in the nose that are very interesting details.



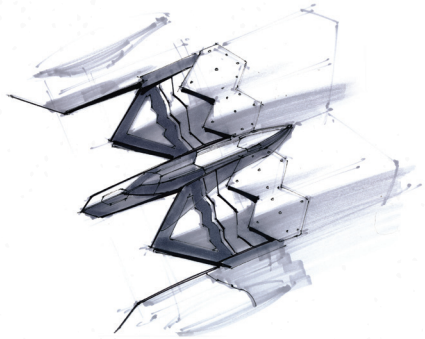
Drone exhaust I like this drone exhaust detail because it is embedded into the fuselage of the plane as part of its stealth design. I am also a fan of the simplistic X-15 rocket plane exhaust and angular "wedge" tail fin.



Supersonic bomber In contrast to the X-32, one of my favorite planes from the 1960s is the XB-70 Valkyrie, a huge experimental supersonic bomber concept. The timeless "classic" retro shapes appeal to me. One look at the long, slender neck and wedged features, and instantly the plane reads as "fast." The monster engine housing holding the six engines is the specific detail I want to utilize from this plane.



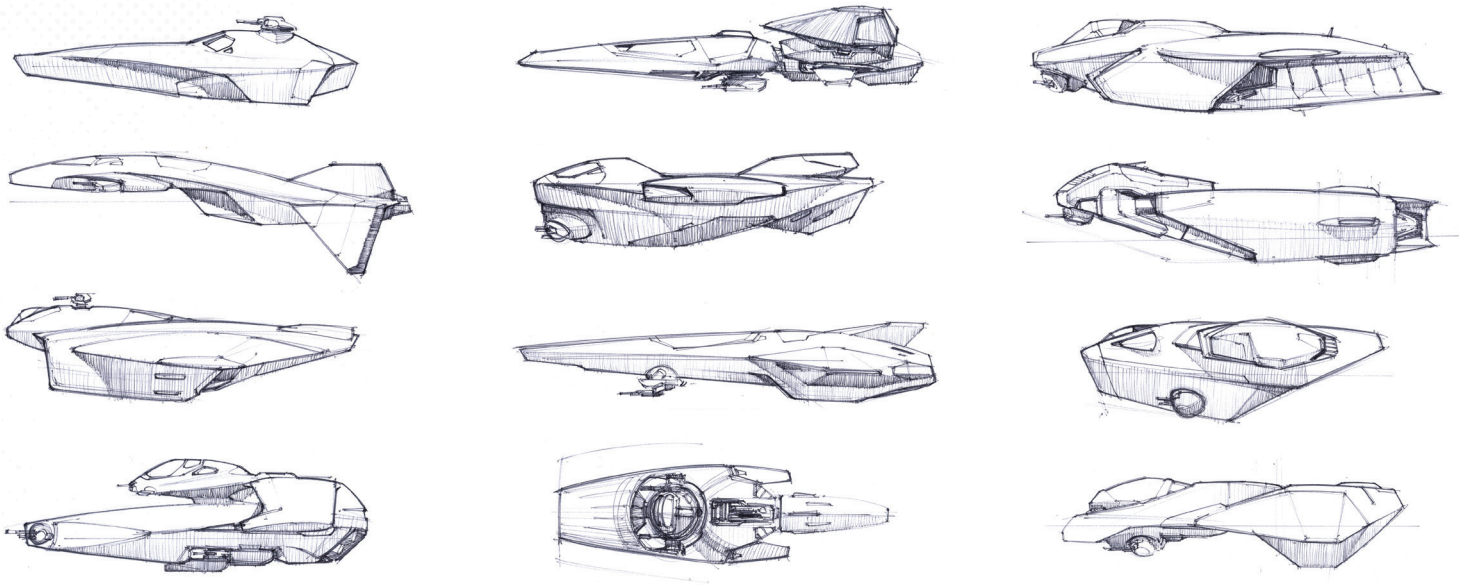
Bomber turrets There will be a weapons turret on the final design somewhere. I look initially at World War II bomber turrets, but find them to be too utilitarian to pass for sci-fi. Fortunately, drones and science aircraft have them in spades. I look at smaller drone turret shapes and details, which can all easily pass for a spacecraft weapon of some sort.



Vectoring flaps The F-22 and X-Plane vectoring flaps will add functional movement to my design. The toothy exhaust of the F-22 is visually striking, as are the brick-like X-Plane flaps.

FLAT THUMBNAILS

It is good to churn out as much variation as possible to explore all proportion options before settling on a single design. As the ship does not exist in reality, this should free up your imagination. Keep your research sketches in mind, but do not be a slave to those designs. Since this craft will operate primarily in space, there is no need to worry about aerodynamics, but I still add a relatively sleek look to the first few thumbnails. At this stage, my sketches are loose, exploring shapes with relatively little fine detail. There is no elaborate rendering at this stage, so you can use a ballpoint pen (or pencil) to draw these. I use a ballpoint pen and a touch of gray marker.



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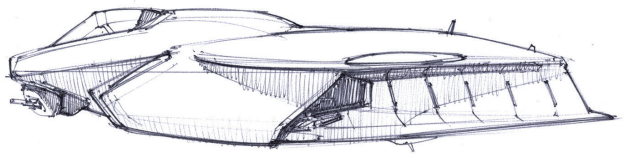

Accessible realism This design has a couple of features that will really sell it as fantastical while still maintaining an accessible realism. The engines being separate from the fuselage is a composition used on some World War II fighter planes, so the design has a base in reality, as I wanted. Minor alterations to the exhaust will take this design from mundane to science fiction. The nose turret was not just used on fighters and bombers during the war, but is used on modern-day drones as well.

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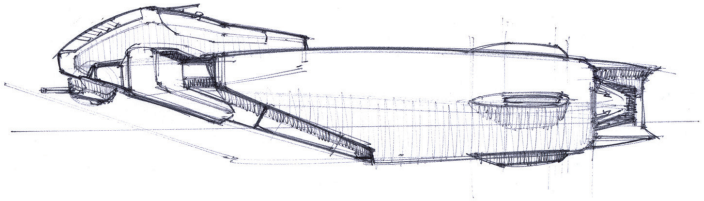
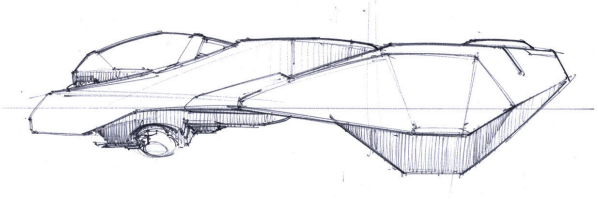


Extreme and minimalist This one is a more extreme and minimalist version of the previous thumbnail. I envision much larger and longer engines than the previous, thus making the cockpit a minor element to the overall design. What I want with these two thumbnails is a "fast read" - the viewer can identify this craft in a matter of seconds and understand its function, as with modern-day planes.

X

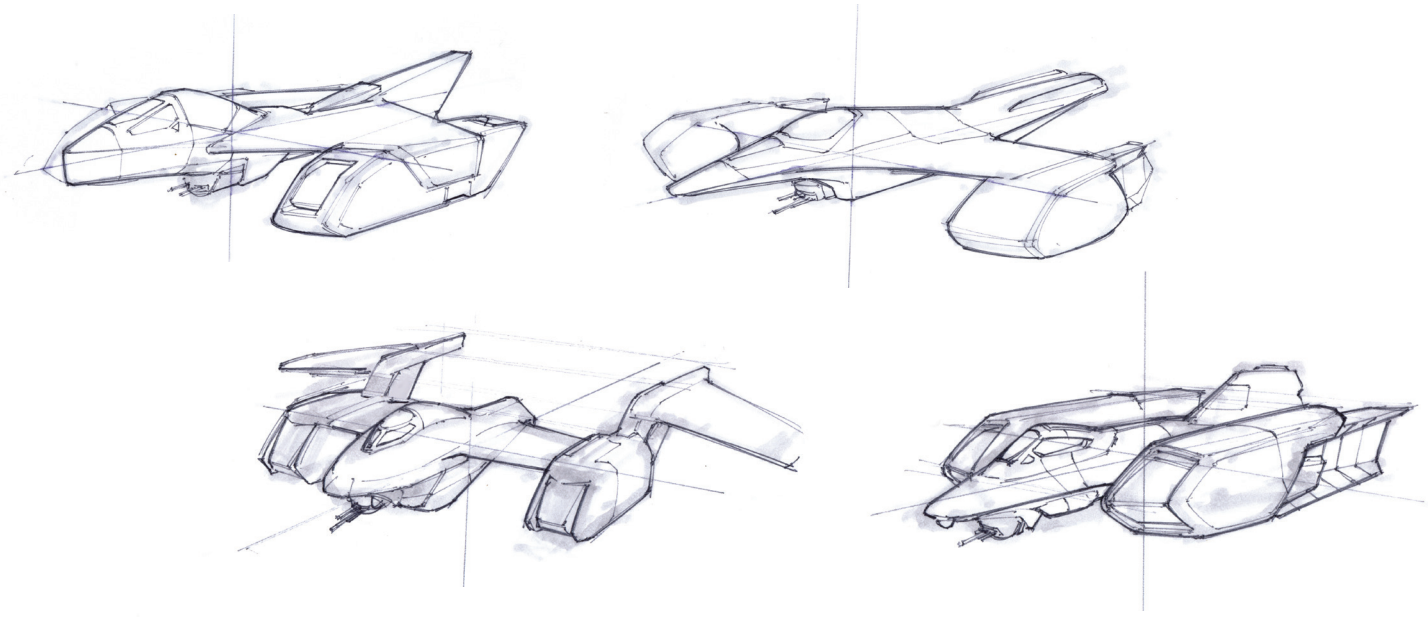


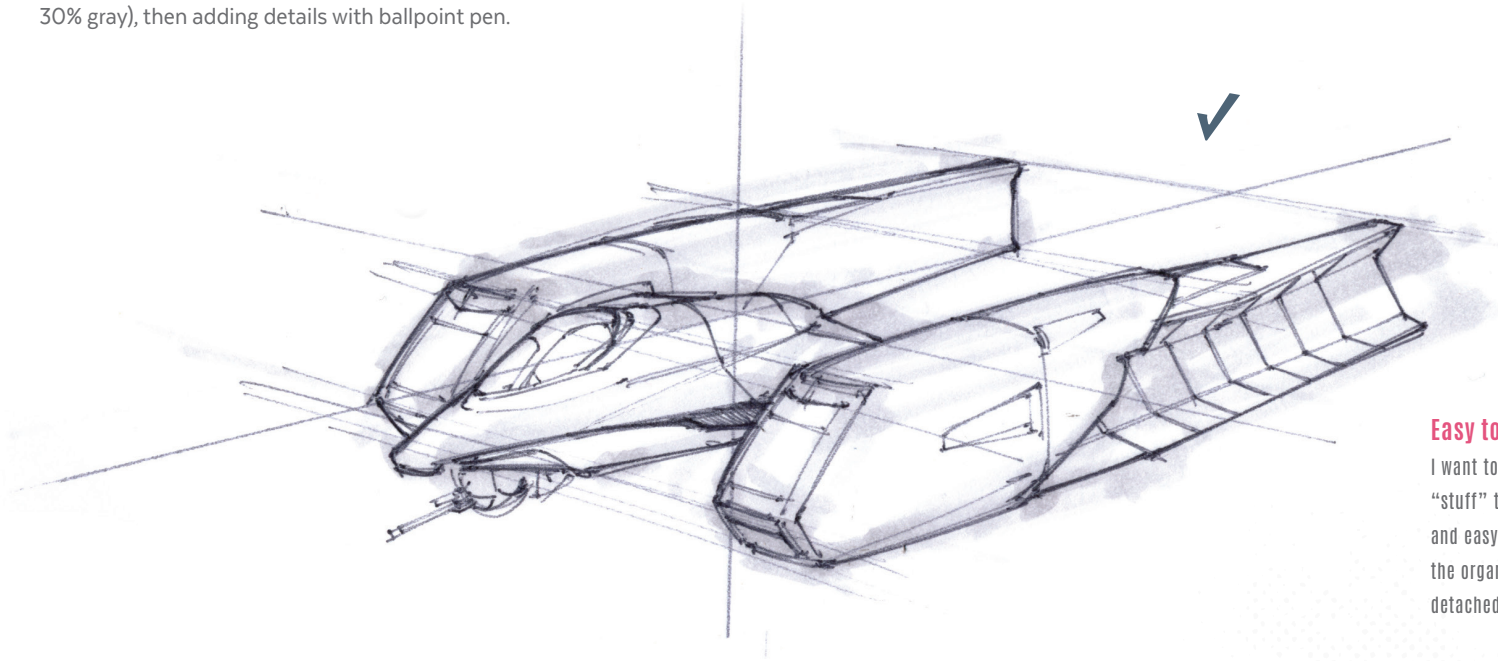
Over-complication Here I've gone too far into the "nonsense realm" that science fiction artists tend to fall into quite often. As a designer, I always try to find a shape language that is not only familiar to the real world, but simply "feels right." This thumbnail shows me arbitrarily making overly complicated forms for the sake of making them - science fiction for the sake of science fiction. A good design rule of thumb is "less is more."

PERSPECTIVE THUMBNAILS

Taking the two thumbnails from the previous section, I draw some variations of these designs in a two-point perspective view to establish the proportions. This is an important step as we rarely, if ever, see anything as a flat profile. Perspective fleshes out a design and helps the designer and viewer to understand the dimensions of the vehicle by providing more information.

Like the previous thumbnails, I keep these sketches simple. I am still focusing on the shapes, while loosely incorporating some of the design language and elements from my research sketches. I recommend roughing out the basic proportions with light cool gray markers (10% to 30% gray), then adding details with ballpoint pen.



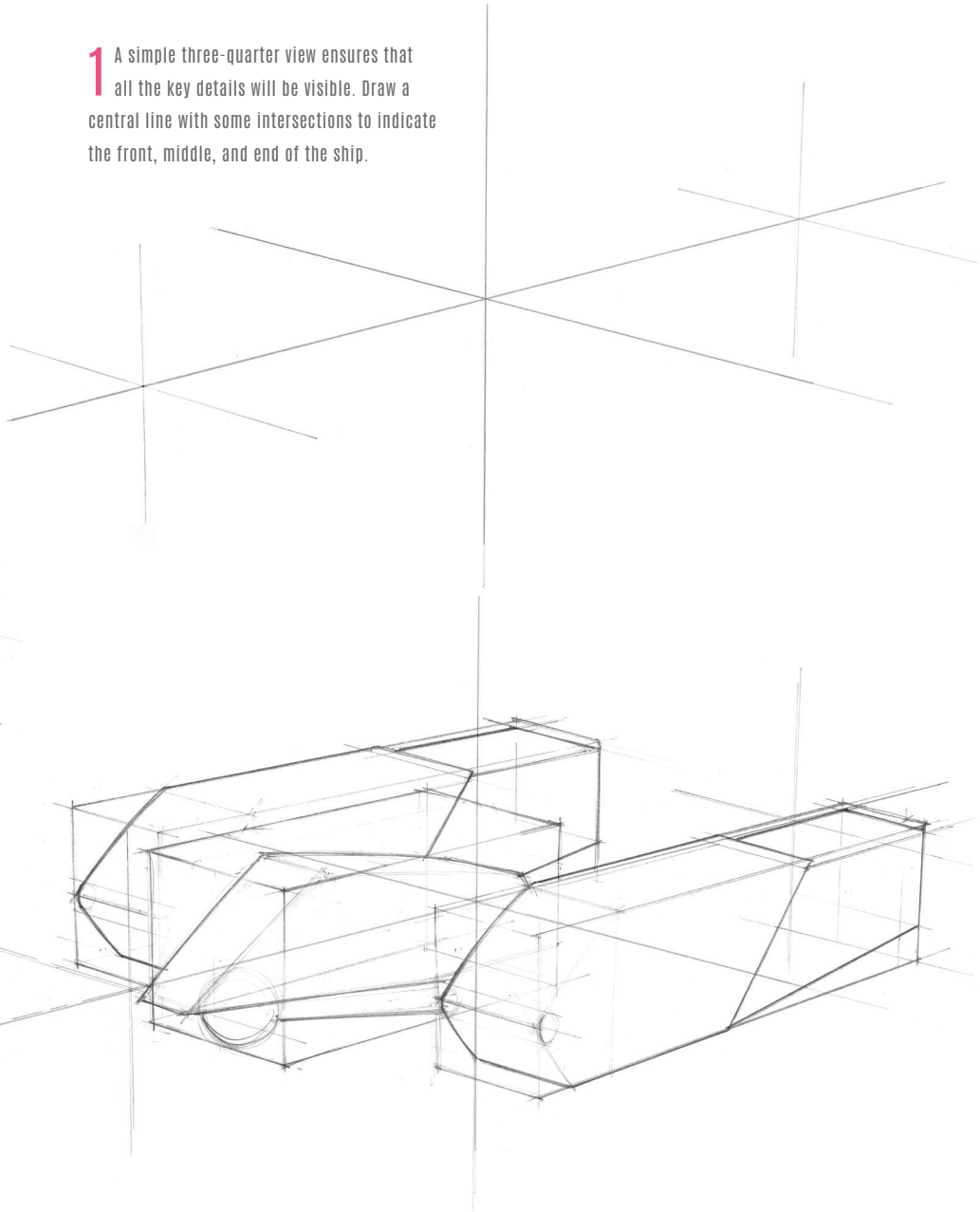


Easy to understand This angle and design is the one I want to flesh out for the final. It is the lack of excess "stuff" that I find appealing - the shape is straightforward and easy to understand. I am going to let the cockpit keep the organic forms of the X-32. Meanwhile, I'll keep the detached engines rigid, like the XB-70 housing, for contrast.

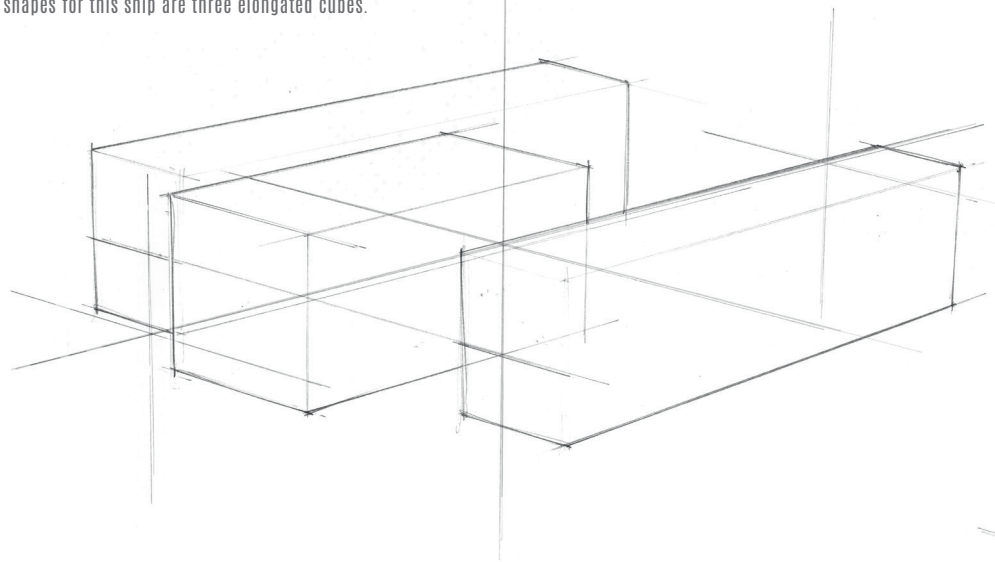
BASIC SHAPES

For the final design, I begin by laying down a basic grid of perspective lines in pencil to help to keep the general proportions and angles relatively accurate and symmetrical. The grid includes center lines for the main body of the ship, and two for the front and rear for reference. Notice the vertical lines angle inward as the "camera" perspective is higher than the ship, and so all vertical lines should adhere to these. As this is only going to be a presentation of the design of the vehicle itself (as opposed to a fully rendered scene in an environment) this three-quarter angle will suffice.

1 A simple three-quarter view ensures that all the key details will be visible. Draw a central line with some intersections to indicate the front, middle, and end of the ship.

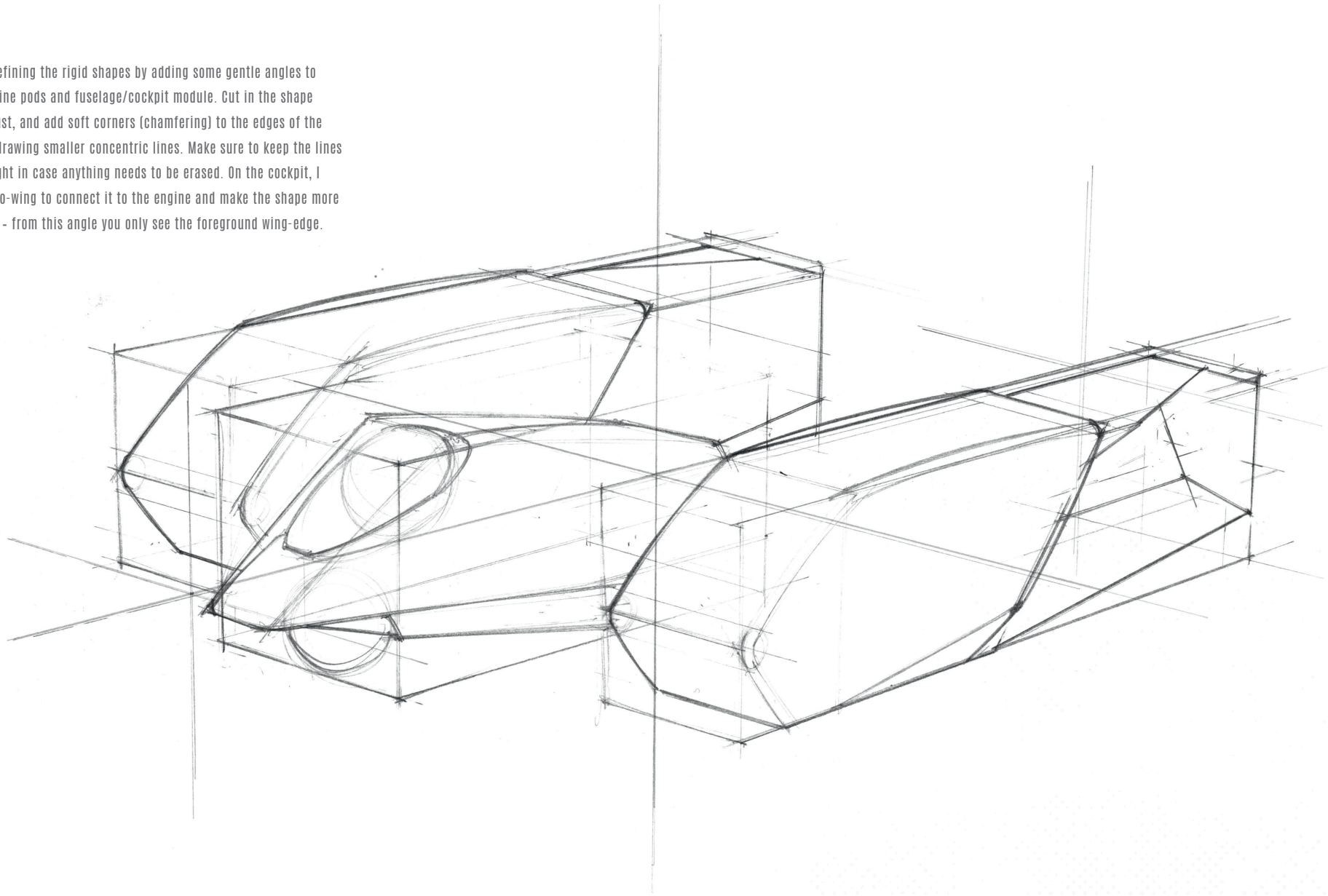


2 Use a ruler to help roughly establish the base geometry of the ship. It is always best to reduce a complex form down to its most rudimentary shapes (e.g. cones, cylinders, cubes, or spheres). The most fundamental shapes for this ship are three elongated cubes.



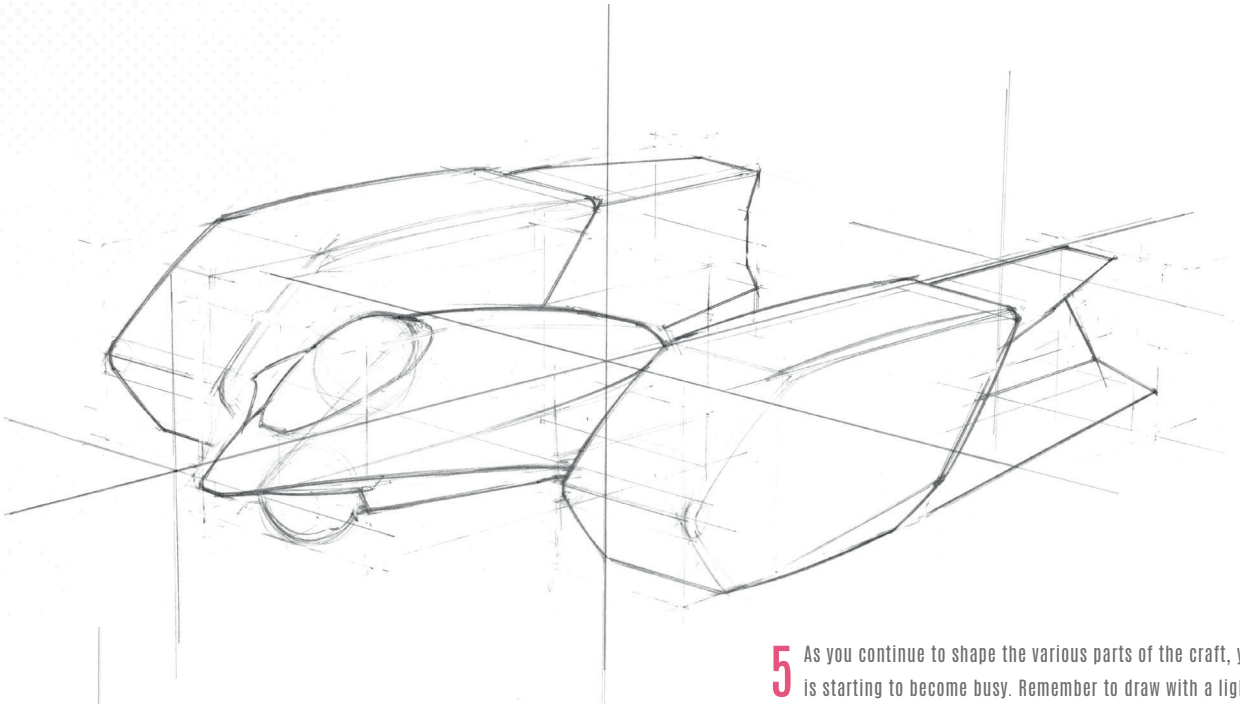
3 Begin to "carve out" the more refined shapes of the ship. The engines and cockpit module are going to be more aerodynamic, so cut some swept-back angles for the fronts of those. The exhaust cowling, just over halfway down the rear of each engine, is angled backwards. It's possible to approximate that these details will be symmetrical by measuring them against the perspective guides. Loosely rough in a sphere near the nose for the base of the weapon turret.

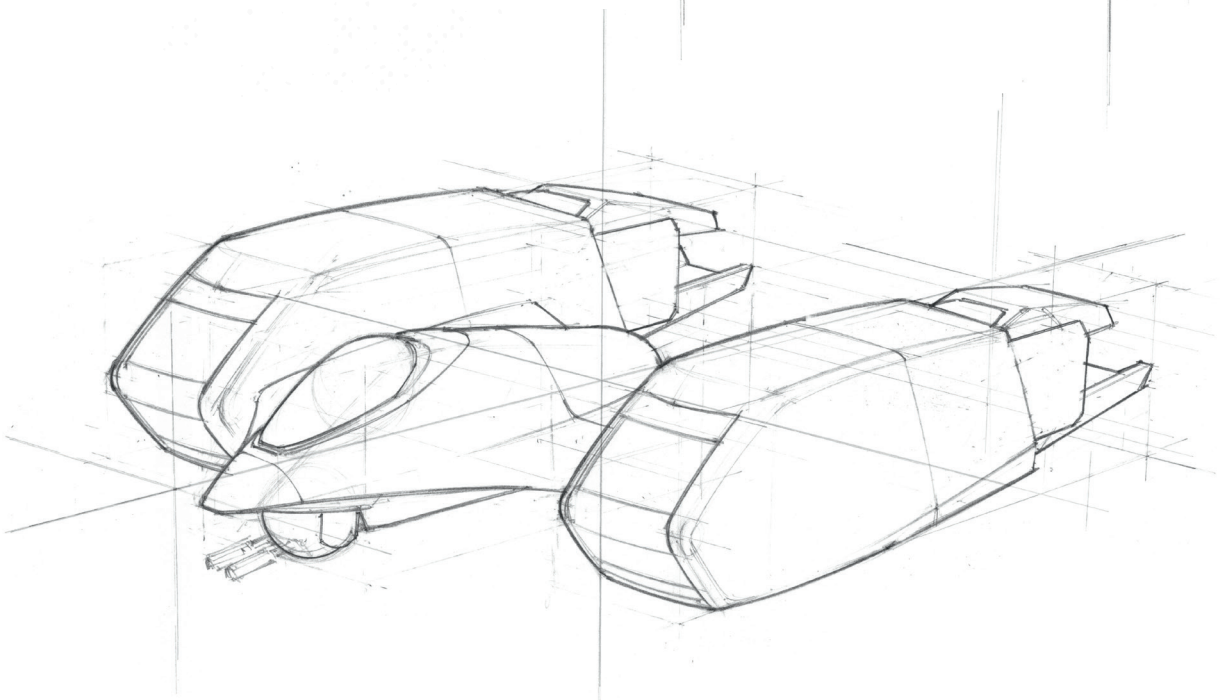
4 Begin refining the rigid shapes by adding some gentle angles to the engine pods and fuselage/cockpit module. Cut in the shape of the exhaust, and add soft corners (chamfering) to the edges of the engines by drawing smaller concentric lines. Make sure to keep the lines relatively light in case anything needs to be erased. On the cockpit, I add a pseudo-wing to connect it to the engine and make the shape more streamlined - from this angle you only see the foreground wing-edge.



DETAILS

This series of steps will clean up the previous sketch, further refining the shapes and adding finishing details to the ship. I will also be adding specific details that were captured in the research steps, which will add some realism to the final design. Remember to continue to keep your lines fairly light throughout the following steps in case you need to make corrections, as we will begin to add more compound and complex forms to make the ship sleek and appealing.

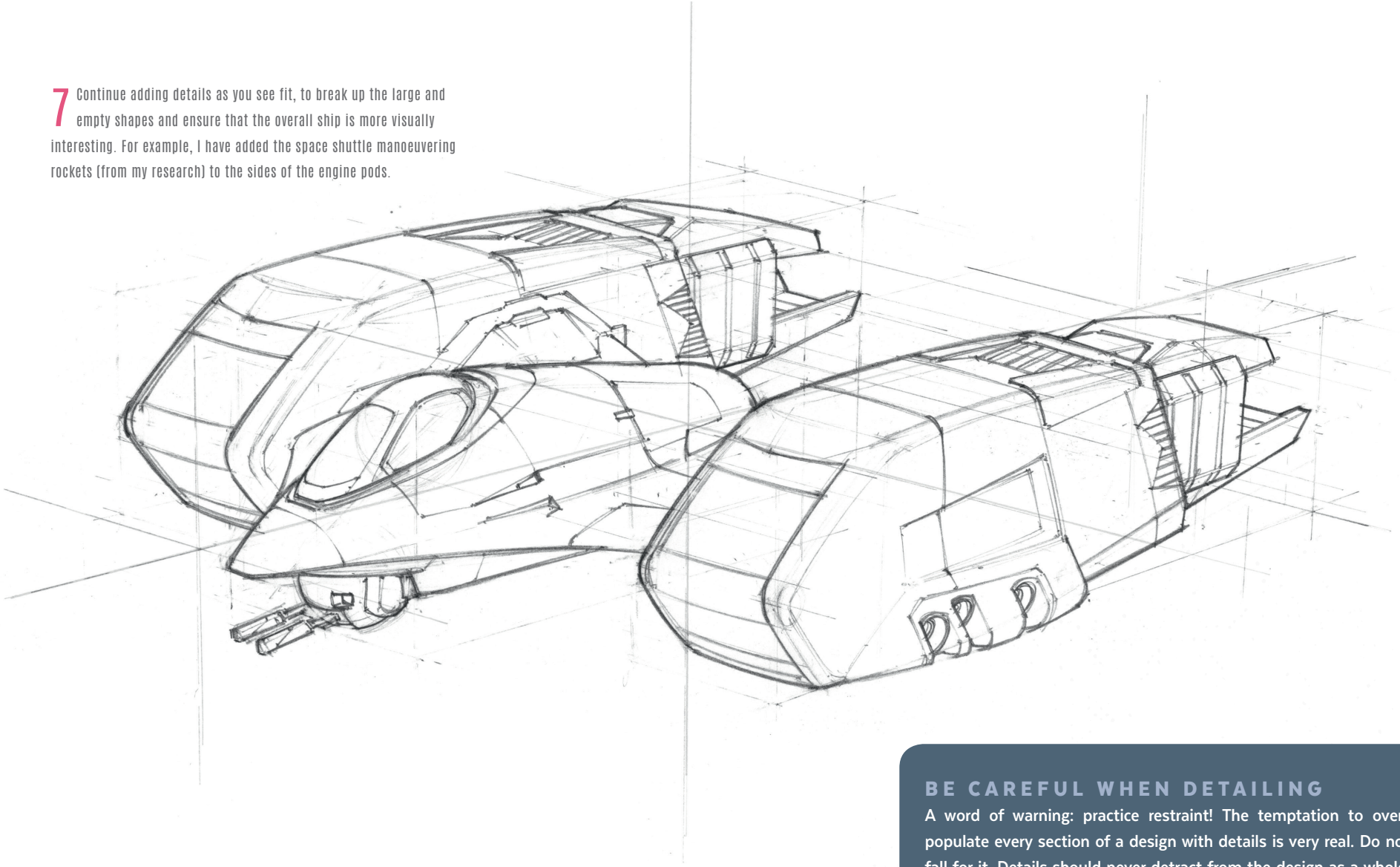




5 As you continue to shape the various parts of the craft, you may find the linework is starting to become busy. Remember to draw with a light hand, and use an eraser to eliminate some of the basic shapes and early process lines to help you see more of the compound shapes. When you are happy with the final lines, make them darker until the ship begins to emerge. Due to the angle, I add the front of the opposite winglet, a detail which situates the cockpit module firmly between the engines

6 I want to make the exhaust ports more in line with some of the F-22 and X-Plane references I sketched. I do this by extending the original elongated cube from the first Basic Shapes step, and mirroring the new vectoring flap details on both engines. Continue to clean up the turret, winglets, and forms around the cockpit so that they are a little more solid, and add some sci-fi "intake" details to the front of each engine. It's a good habit to add contour lines to further define the dimension of the more complex shapes (such as the cockpit module and engines). These can be blended into the detailing in the next step.

7 Continue adding details as you see fit, to break up the large and empty shapes and ensure that the overall ship is more visually interesting. For example, I have added the space shuttle manoeuvering rockets (from my research) to the sides of the engine pods.

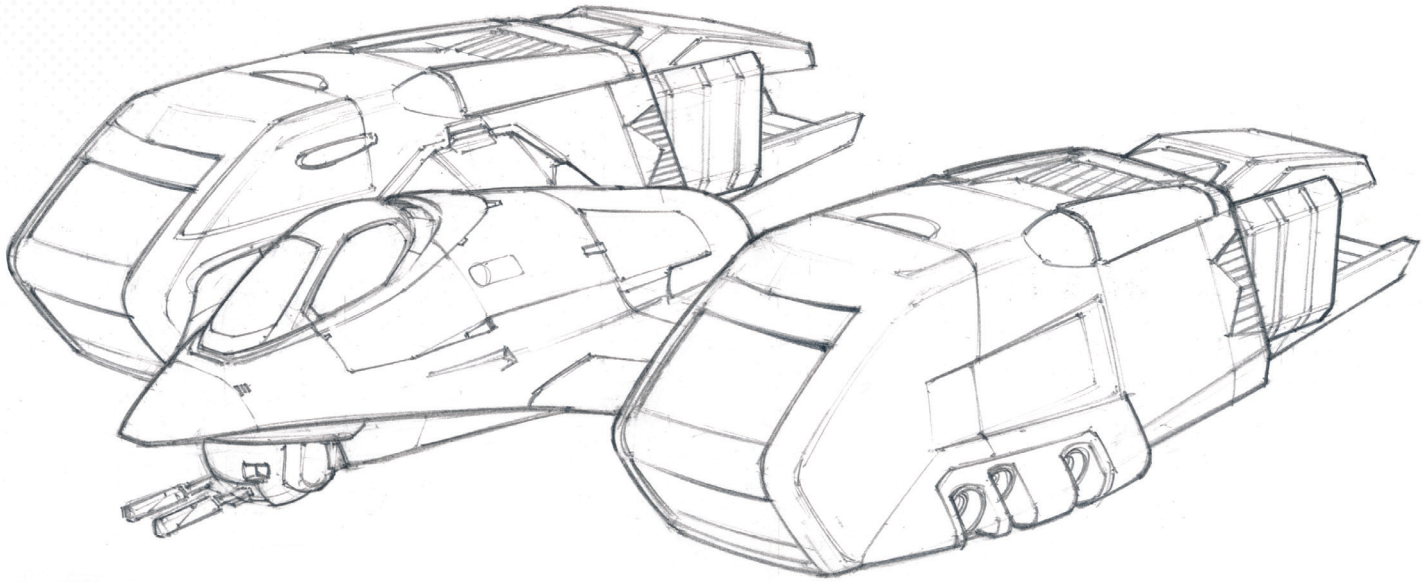


BE CAREFUL WHEN DETAILING

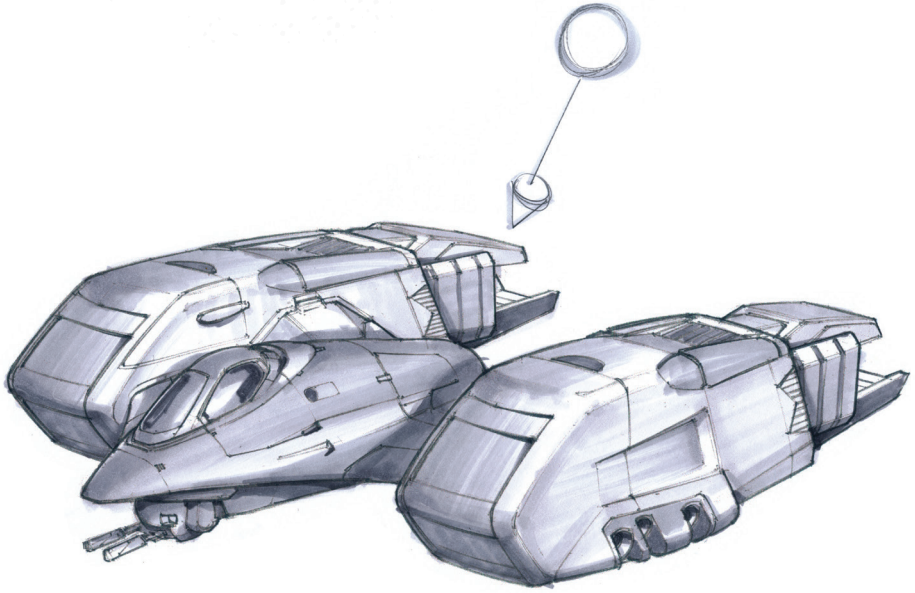
A word of warning: practice restraint! The temptation to over-populate every section of a design with details is very real. Do not fall for it. Details should never detract from the design as a whole. Ideally, every part of the design should work in unison.

FINAL LINE DRAWING

Once I have added enough detail to the final, I begin to erase any excess guidelines and rough sketching. At this point, be aware of the importance of lineweight to help to convey separate shapes and important details that you want to stand out. For example, notice the slightly darker outline around most of the foreground engine and the cockpit module. This provides a quick "read" of the shapes, so that they do not blend together, and helps to make the major details pop out as focal points.



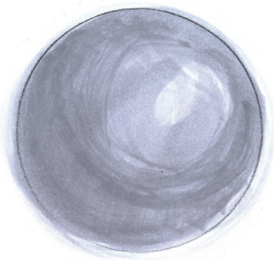
8 The final line drawing after the rough guidelines have been erased.



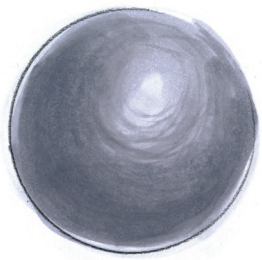
9 A good idea at this point is to either scan your final drawing and print a copy, or make multiple photocopies to render on. Before committing to any final rendering, it is vital to figure out how the ship will be lit. I choose a "beauty pass" with the primary light source coming from just behind the viewer's head (if we were standing in the same space as this craft, from this height, with the sun behind us). I want the ship to be fully illuminated. Again, the focus is on the ship, not an environment or scenario, so we can feel free to shine as much light as we need on it.

MATERIALS: BRUSHED METAL & GLASS

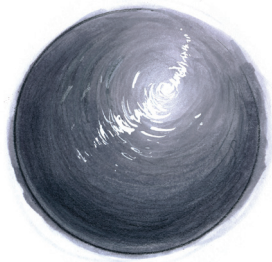
Brushed metal



A Create a base tone with a 30% cool gray marker. This base should be neutral and even, so that you can build up highlights or shadows easily in subsequent steps. Since this type of metal is not highly reflective, it will only reflect bright highlights and dark shadows without the detail. Make several passes with this marker tone so that there is a build-up around the lower-left side, imagining that the light is coming from the top-right.

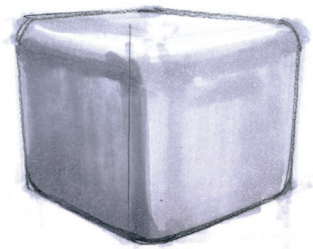


B Take a 50% cool gray marker and "wrap" it around the lower-left of the sphere to add some shadow to the metal. Do this with several passes, so that the marker blends smoothly. Make lighter, sporadic circular motions on the lightest area to simulate the brightest spot on the sphere. These circular touches will add the brushed metal texture. You can go back over this step with the 30% marker to add more subtle circular strokes as well.

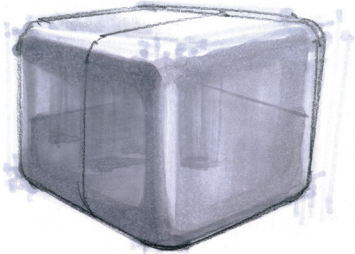


C Use a 70% cool gray marker to create a crescent rim of shadow in the areas farthest from the light. With a white pencil, start at the brightest spot on the sphere and make circular motions outward, getting lighter the farther out you go. Take a paint pen, white-out, or white gouache, and create an intense white hotspot. Note how the light is diffused into flecks that follow the brushed surface of the sphere.

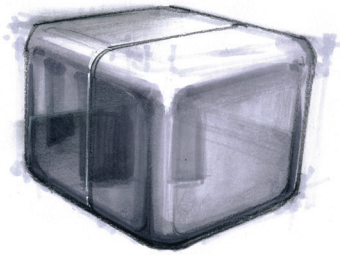
Glass



A As with the brushed metal, we start this glass cube with a neutral tone of 30% gray, but do not fill in the entire cube. We'll create what's called a "1-2-3 read." This helps define an object's form by lighting three sides in three different values. Intuitively, we perceive light coming from above (sunlight), so the top of the cube will be the lightest value. One side will be darker and the third side will be a value in-between.



B Glass on cockpit windows or cars has a darker tint, so the interior contents essentially become silhouettes. At this stage, sketch in some flat, perpendicular reflections on two of the sides (as if the cube is sitting on the corner of a table, reflecting two of the table edges). Shade the lower sections in, but not too dark. Use a 50% gray marker on the darkest side of the cube. To understand how the reflection will wrap around, add a central contour line.

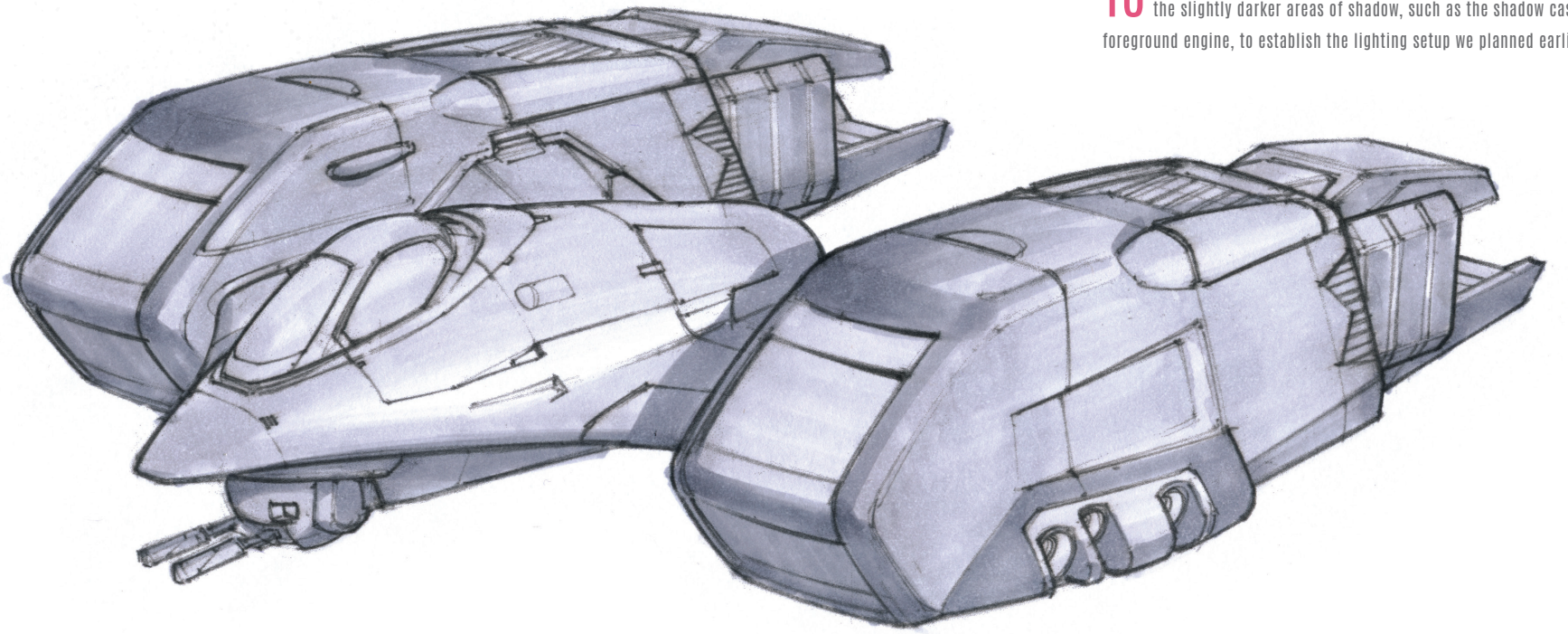


C Add some random shapes inside the cube to suggest transparency. Go over the *reflected section only* with a 70% gray marker, on the darkest side of the cube. Within that section, go over the interior forms so they pop. A dark outline around the base suggests the "table" shadow visible through the glass. Use white to add a hotspot on the facing corner and extend the hotspot slightly across the three facing edges.

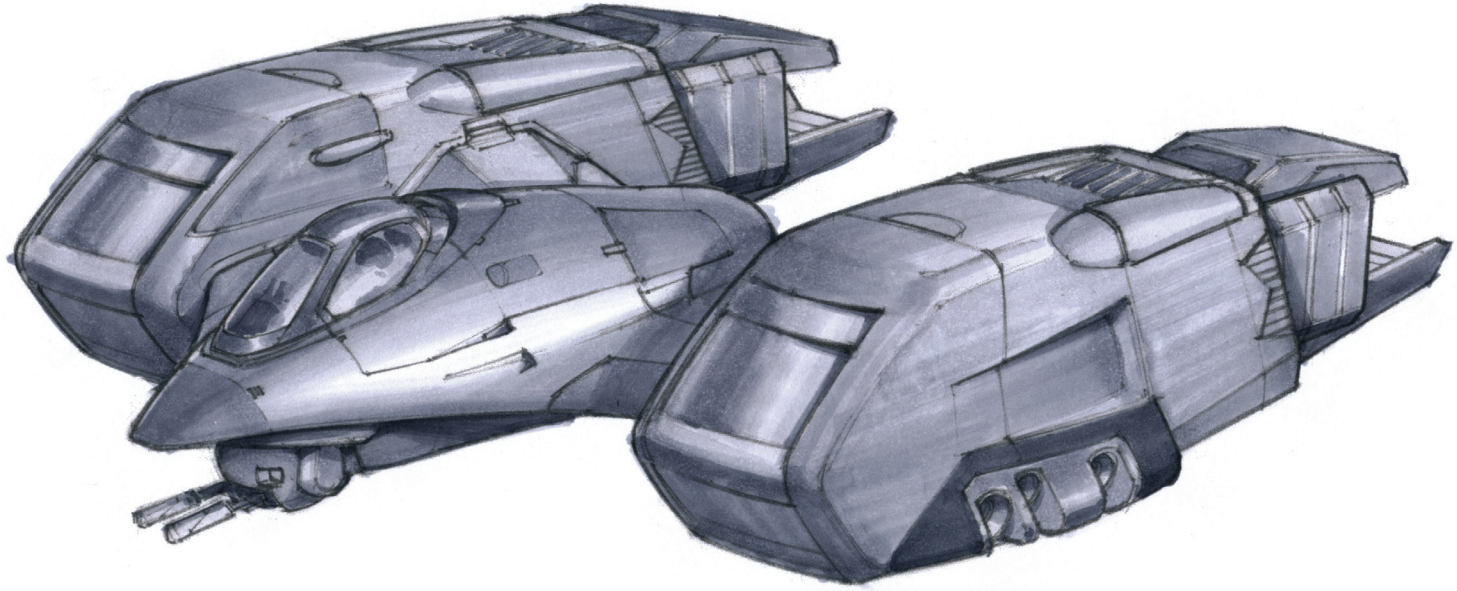
RENDERING PROCESS

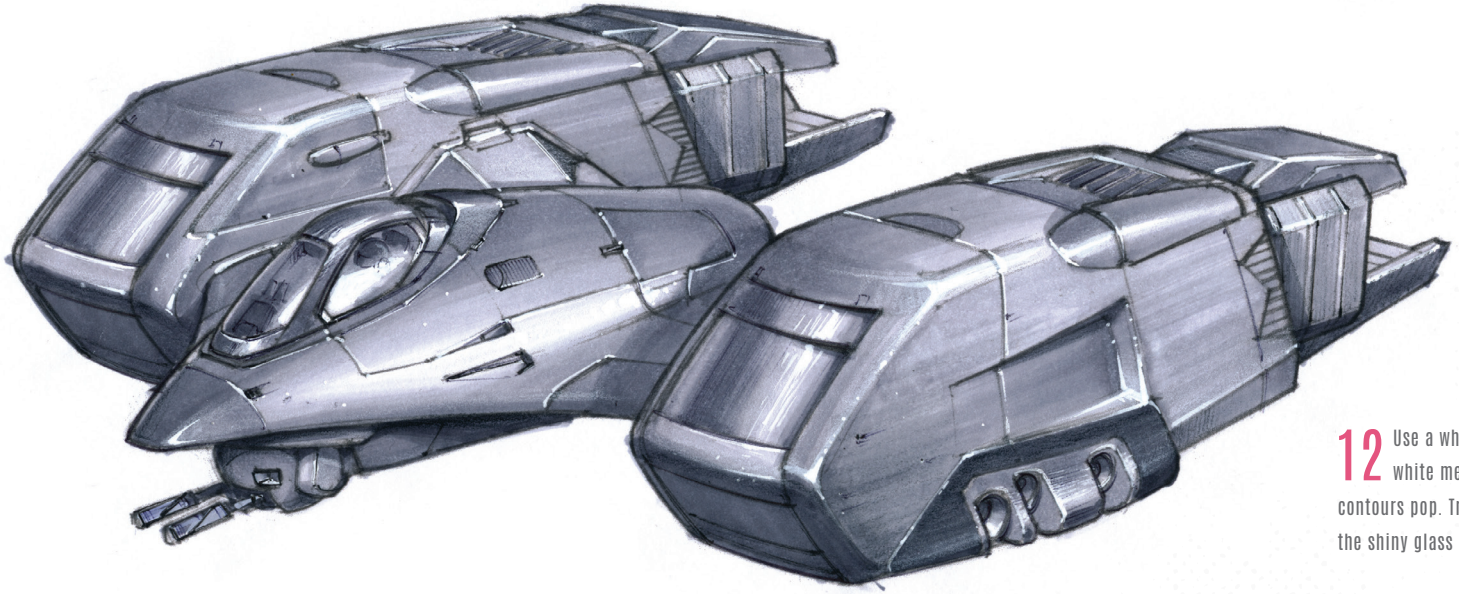
Now we can make a start on rendering the final design. I will be using a range of four gray Copic markers (swatched to the right), with a white paint pen for picking out the final highlights. You can use an optional black marker to add a geometric backdrop to the scene, to make the design pop and provide a very simple environment.

10 Use the lightest gray marker to create the base tone. Lightly block in the slightly darker areas of shadow, such as the shadow cast by the foreground engine, to establish the lighting setup we planned earlier.

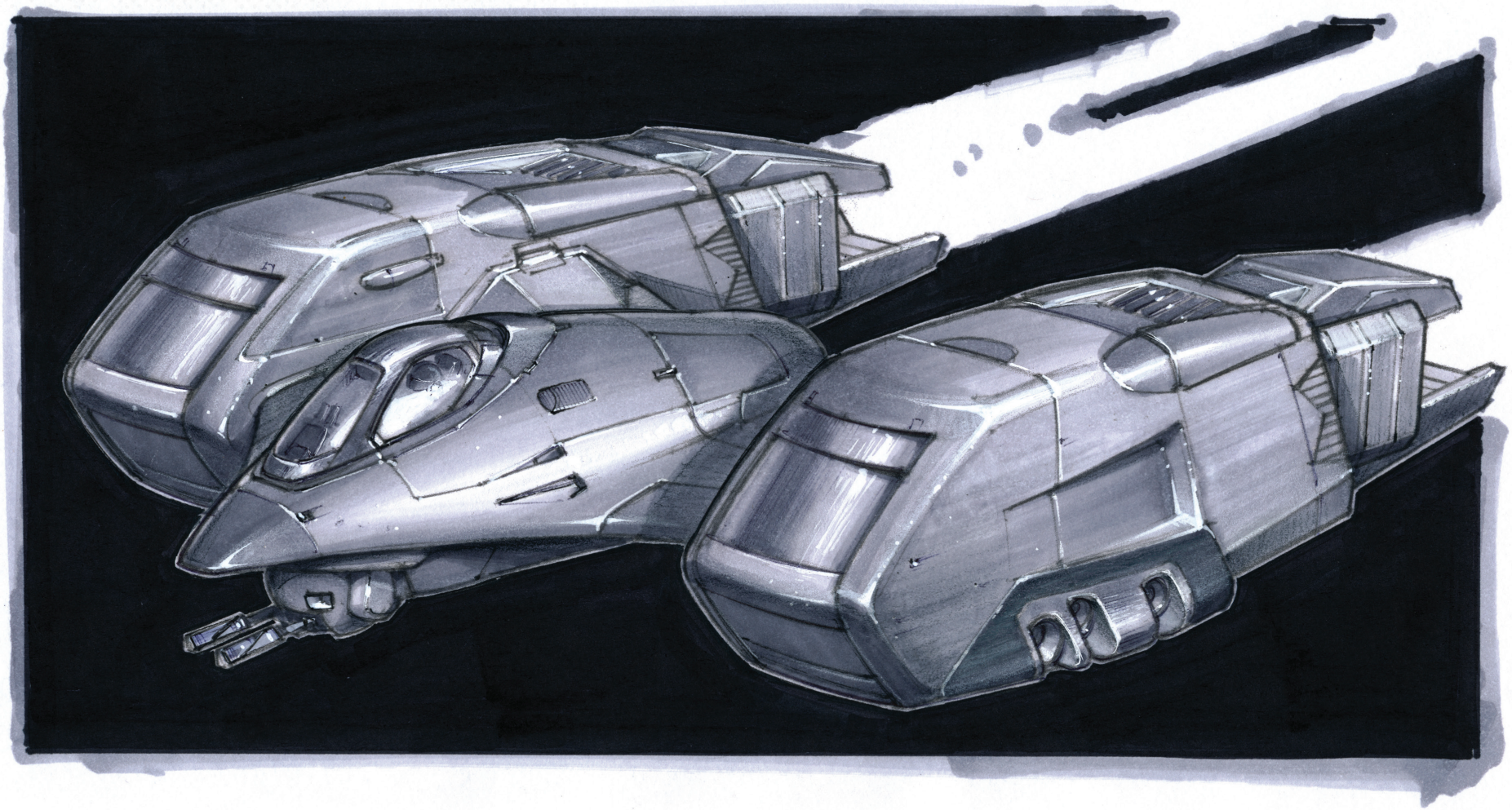


11 Now use the full range of four gray markers to build up more depth. Reserve the darkest gray for the deepest shadows and limited details such as the engine fuselage. Note how the highlight on the side of the cockpit is kept bright to convey its streamlined shape.

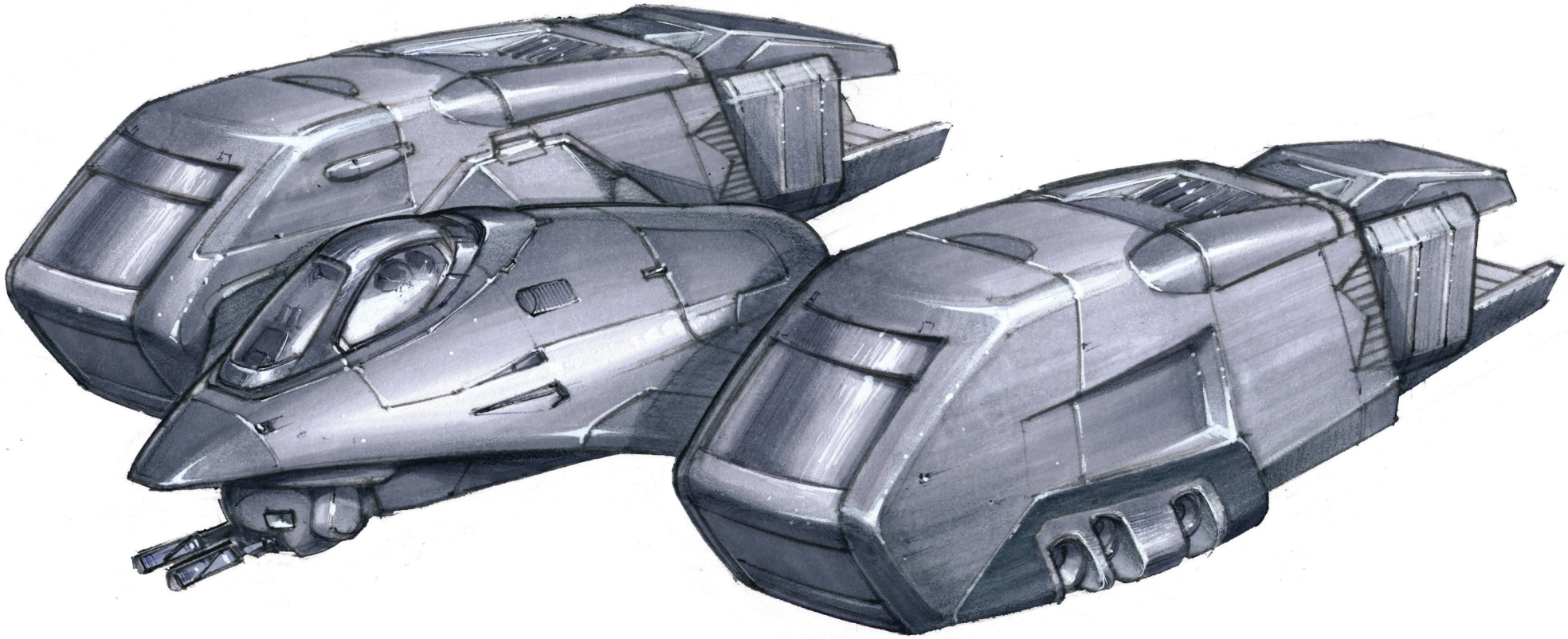




12 Use a white paint pen, or another opaque white medium, to make the surfaces and contours pop. Try it on the panels, grooves, and the shiny glass of the cockpit.

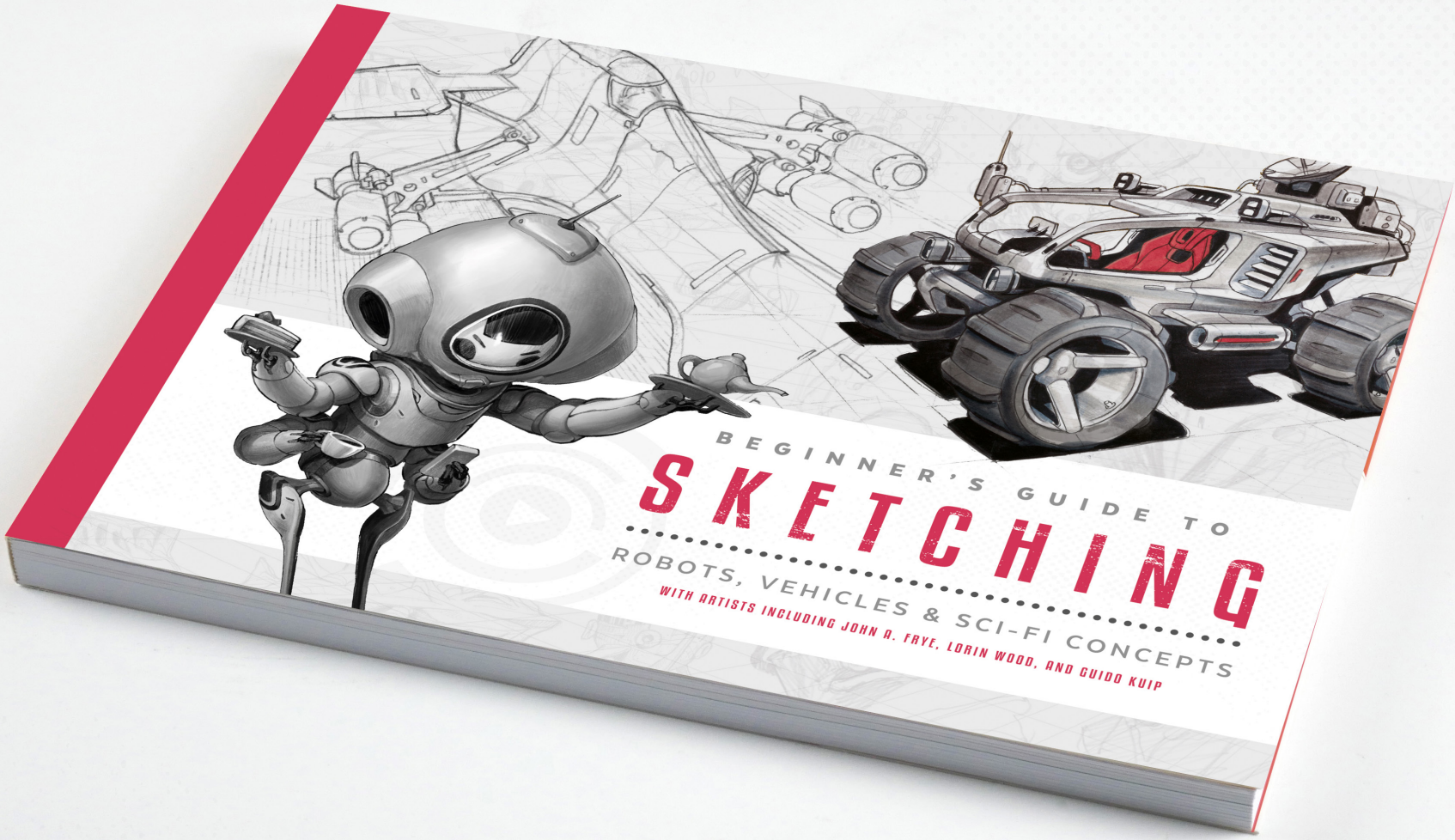


13 To add some action and context, and to make the design stand out, you can use black and gray markers to block out a simple backdrop.



CONCLUSION

There are invaluable steps used here that I hope you will find helpful as you continue your journey of learning the craft of design. As I mentioned earlier, research is key. This is a critical part of good design as you want your final product to be both fresh and new, but remain familiar enough that your audience will easily understand its function. Do not be afraid to make alterations as the design evolves. I feel this ship is successful and I am pleased with the final result, despite some minor changes made along the way, but remember that there is always room for improvement. A healthy mindset is to always be learning and trying new techniques and methods. Try new things, practice, and have fun. Now, on to the next design!



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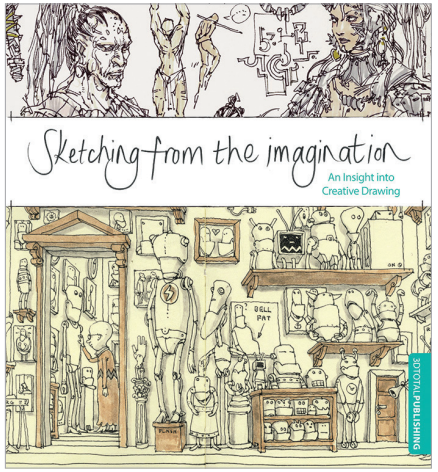

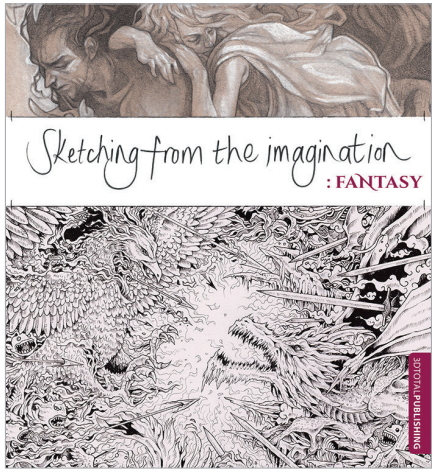

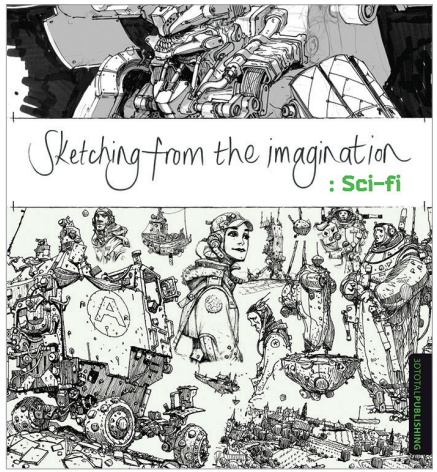

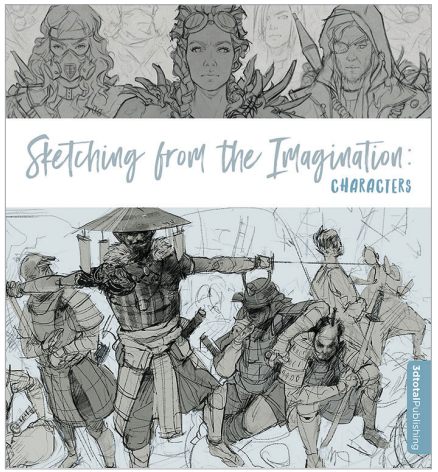

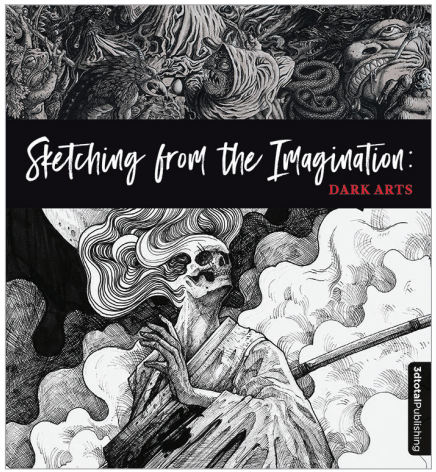

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