
THE ART
OF ELITE
DANGEROUS

FOREWORD
FOUNDER

The world of Elite has always meant a great deal to me, from when I began working on the first game with Ian Bell back in 1982 while we were both at Cambridge University. Even before then I had designed the first few ships on an Acorn Atom and written one of my first pieces of machine code: an expanding starfield.

As you will see from this book, the world of Elite Dangerous is rich because a great deal of thought has gone into every aspect. It covers the exciting Kickstarter period, the Alpha and Beta after it, the continual updates like Powerplay and the addition of Horizons. At the time of writing we are eighteen months since that first Elite Dangerous release and still going strong.

Art has been key to the whole series of Elite games, from the 'programmer art' of the early versions, with its wire-frame ships and simplistic images to the beautiful models, landscapes, special effects and now characters of Elite Dangerous. We are all very proud of what we have achieved.

Not only would I like to thank all the players that backed, played and continue to play Elite Dangerous and made this possible, but I would also like to thank all the people who have worked on it here at Frontier. It has been, and continues to be, a labor of love. So many people work hard every day to make it as good as it can be. This book is a reflection of that.

I hope you enjoy it, and I hope you'll continue to enjoy the game for many years to come!

Right On Commander!
David Braben

FOREWORD
ART DIRECTOR

If I'm honest I knew very little about the world of Elite when I was offered the chance to oversee the art direction on the new game. After a few weeks of research it was clear why the job had been offered to me. Growing up in the eighties I had lived and breathed spaceships, obsessing over designs from Blake's 7, Star Wars and Star Trek.

Elite had made those starship fantasies real, and today I wish I had come to the series sooner. The fourth Elite game would be a fresh start but the Elite games' ship silhouettes were iconic and instantly recognizable. A few simple vector lines had created a world and our imaginations had filled in the rest.

Starting from scratch wasn't an option. The challenge would be 'filling in the blanks' and updating those eighties and nineties visions of the future without losing what made Elite's designs iconic to begin with.

Back then those shapes were created under the strictest technical limitations. Today we're free to build how we please, but we try to meet the expectations players held in their imaginations and create new designs that remain faithful to the aesthetics of the Elite galaxy.

Working with a great team of concept artists, 3D modelers and visual effects wizards to define and often redefine the world of Elite Dangerous has been some of my favorite work. I am very proud of what we have achieved and look forward to seeing what's next. I hope you enjoy this look behind the scenes.

Keep Flying!
Chris Gregory

"I WISH I HAD COME TO THE SERIES SOONER"

This is one of my favorite in-game captures. The Viper is cool little ship and this shot captures the vast scales present in Elite Dangerous. The ship, the starport, the planet and distant sun are all destinations the player can visit.

These model ships were made by myself when I was about 12.

I first played Elite on the Commodore 64 in the mid-eighties, and my love for the game continued when I bought an Amiga 500. When Frontier: Elite 2 was released I played the game almost obsessively.

Elite introduced me to 3D computer graphics. It was the reason I decided to work in the games industry. Around the same time I also started a lifelong interest in painting, model making and space exploration which continues to this day.

The model ships are built to scale using the dimensions and diagrams shown in the Elite 'Space Traders Flight Training Manual', and are constructed mostly from cardboard and some other odds and ends. I've held onto them for over twenty years. I knew I had to work on Elite someday.

Simon Brewer
Team Lead Technical Artist

“I KNEW I HAD TO WORK ON ELITE SOMEDAY”

THE ART OF ELITE DANGEROUS

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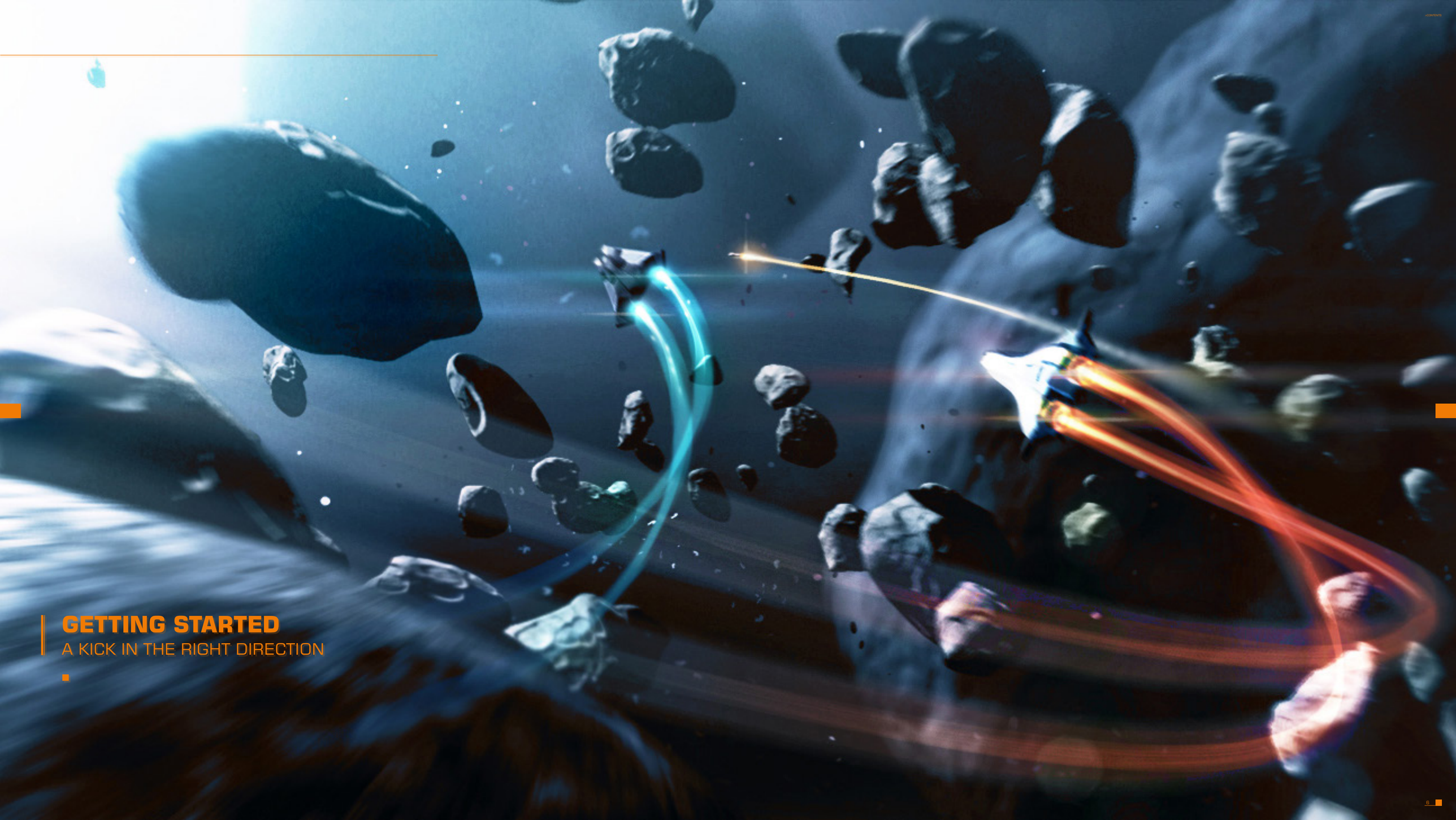


GETTING STARTED

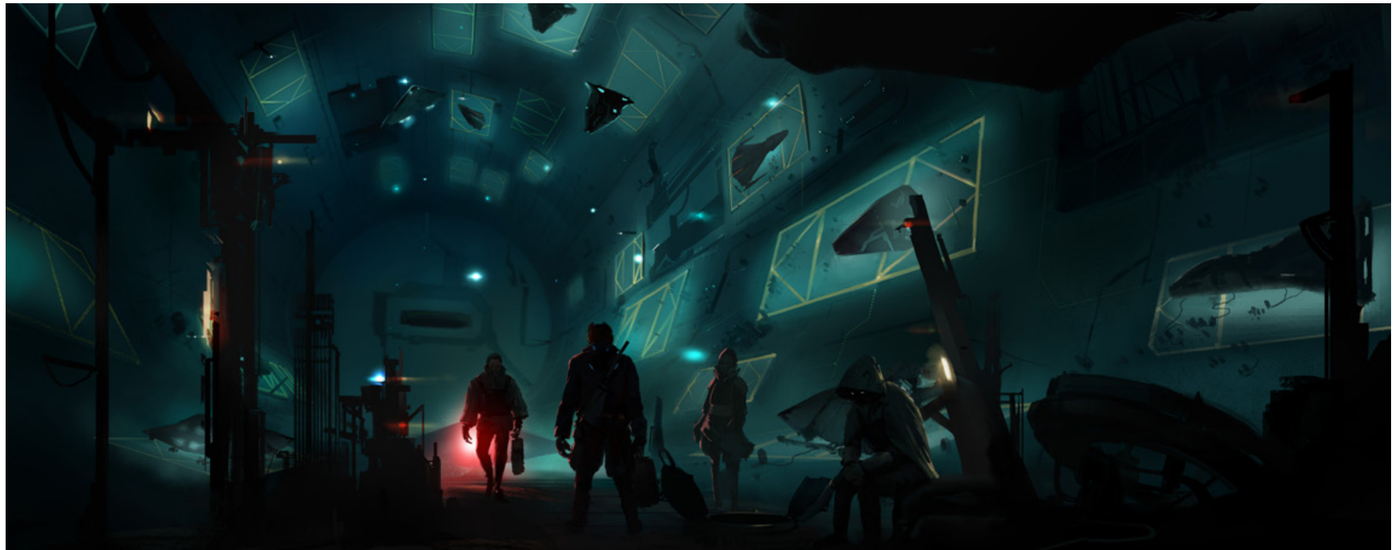
A KICK IN THE RIGHT DIRECTION

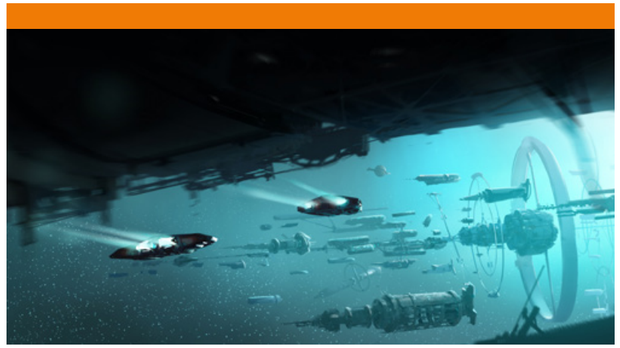
THE KICKSTART

While 'Elite 4' had existed as a concept at Frontier for some time, publishers weren't inclined to invest in space games. After almost twenty years working with publishers, we turned to Kickstarter to bring the game to life.

Potential backers were shown concept images illustrating aspects of the game that were still far from entering development, fleshing out Elite Dangerous' mood and style very early in the development process.

Those early concepts presented a look at how a new game in the Elite series might look, but game development is an evolving process and later art would feature more detail and finalized designs as the game advanced towards Alpha.

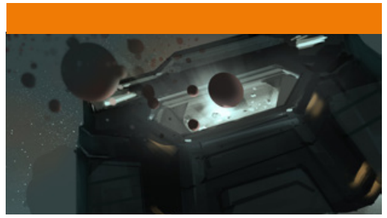




The earliest concepts lack the scale and detail of later work, but are rich with mood and style. Later art would be more reflective of gameplay realities, such as the need for ship silhouettes to be 'readable' against the darkness of space.

For all the elements and ideas that made it there were others that were reconsidered. As development progressed we started to get a better idea of how the galaxy of the 3300s would appear, and we gradually built a cohesive look and style for the game.

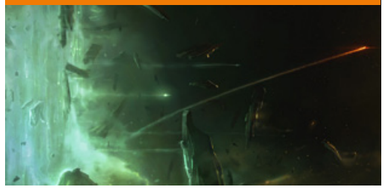
The early concepts helped potential backers see the ambitious scope we had in mind, and they became a key resource for the art team to build on.



Holographic screens were present in the earliest imagery and remained throughout development. We had already done work in VR and AR and we knew holographic displays worked especially well in immersive first-person games.

As we progressed we were able to give the Elite Dangerous Kickstarter a boost with the first in-game footage. Behind the scenes, work continued on concepts fleshing out how people might live in the 3300s.

We knew our galaxy would grow, and understanding how people would exist in this futuristic world was essential to inform the design of our ships and starports. We looked to real solutions used on the International Space Station, and surmised how technology would advance.



The idea of a starport carved into a massive asteroid was an appealing notion, and one we hope to return to someday.

Artist Josh Atack produced our first piece of key art towards the end of the funding process using a palette and style similar to our earlier concepts.

Josh's piece is a more polished work with some elements that closely resemble the game we ended up making. The Cobra Mk III, while not the final design, is getting closer to the in-game model, and the cargo pods actually appear as they do in-game. Those pods became one of the first designs we finalized.

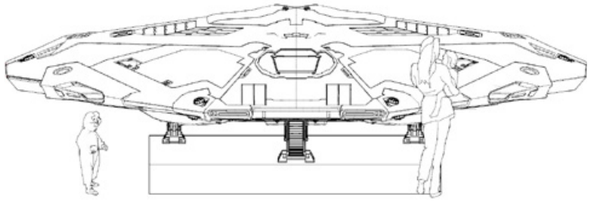
PRE-ALPHA KEY ART

This finished piece was used on our Kickstarter and was printed on banners which still hang in our studio today.

It was quickly retired from public use once the game's final appearance began to emerge, but was another essential step on the road to the game we would launch just under two years later.

BETWEEN THE LINES

DESIGNING THE COBRA MKIII



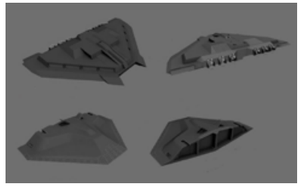
FOUNDATIONS

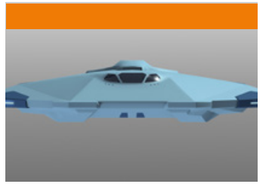
The Cobra Mk III was the first of our new generation spacecraft to be implemented in game. We began all our exploratory work with this iconic and much-loved design from the classic games. It's a ship so good it appeared on the box.

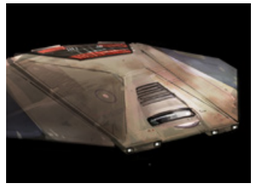
We took great care to preserve the Cobra's few lines from the earlier games while adding details and interest. Much was left to the player's imagination even in 1995's Frontier: First Encounters, so we had an almost blank slate to interpret those classic vector shapes.

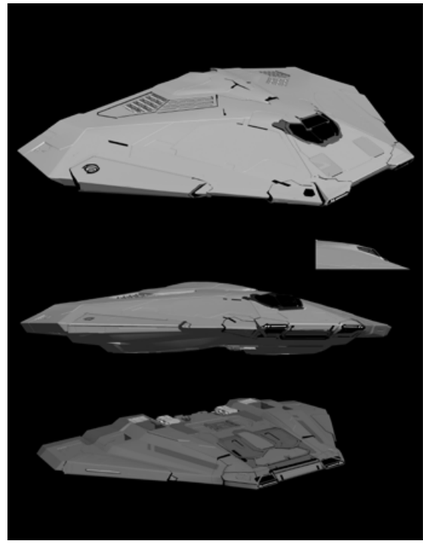
The Cobra Mk III wound up informing all of our design throughout the Elite Dangerous galaxy. In between the lines we had to make a functional and realistic spacecraft with landing gear, cargo hatches, heat vents and hardpoints, and all of them had to work in-game with animation and VFX.

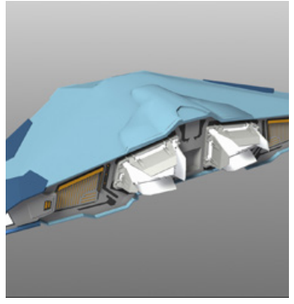
Across this page you'll find some early exploratory work-ups of the Mk III, from the days before we finalized what spacecraft could look like in a modern Elite game.



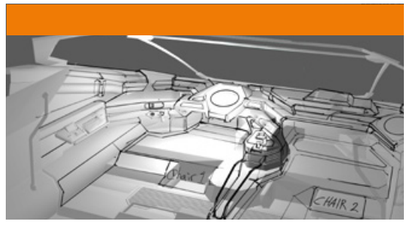








“THE PLAYER’S EXPERIENCE IS THE KEY”

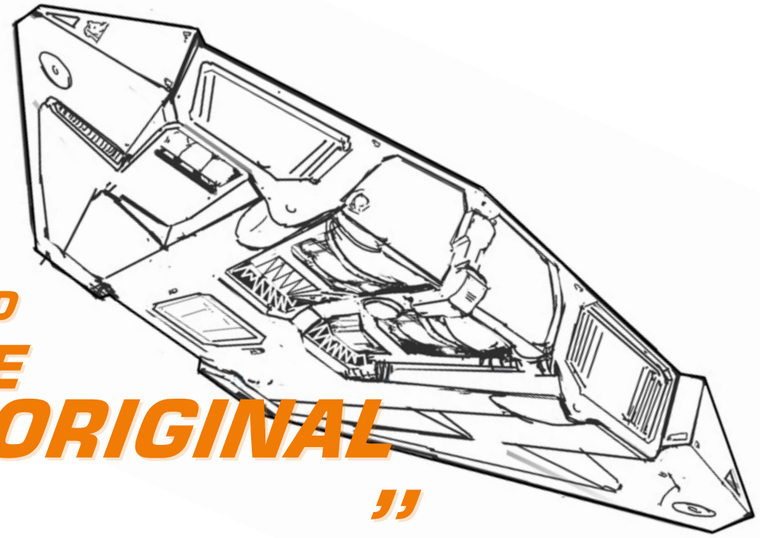


IN THE DRIVING SEAT

The cockpit had to be considered at an early stage to ensure the pilot has the necessary visibility when playing the game. The player’s experience is the key to the final shape of the MK III’s modified hull.

Early designs struggled with the position of the cockpit, placing style ahead of practicality, and it took on a number of forms in our exploratory sketches. The final design is a raised ‘blister’ offering clear visibility to the left and right. To incorporate the curved cockpit, the edges of the ship were chamfered and the spine of the ship was softened.

The Cobra has a two-seater cockpit with an offset pilot’s view. The co-pilot seat opens up interesting possibilities for future releases.



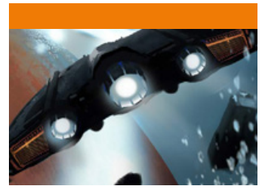
“WE NEEDED TO EVOKE THE ORIGINAL”

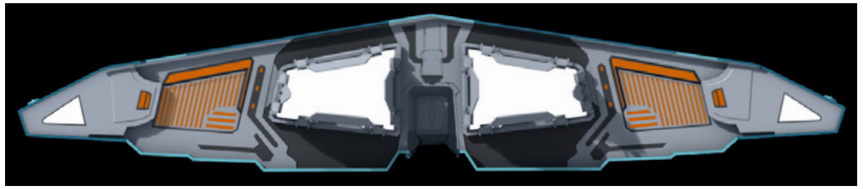
ENGINE ROOM

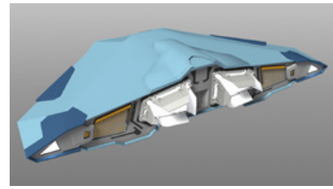
The 1984 Cobra Mk III is perhaps at its most recognizable from behind. It’s the view players see when they chase down rival Commanders, after all.

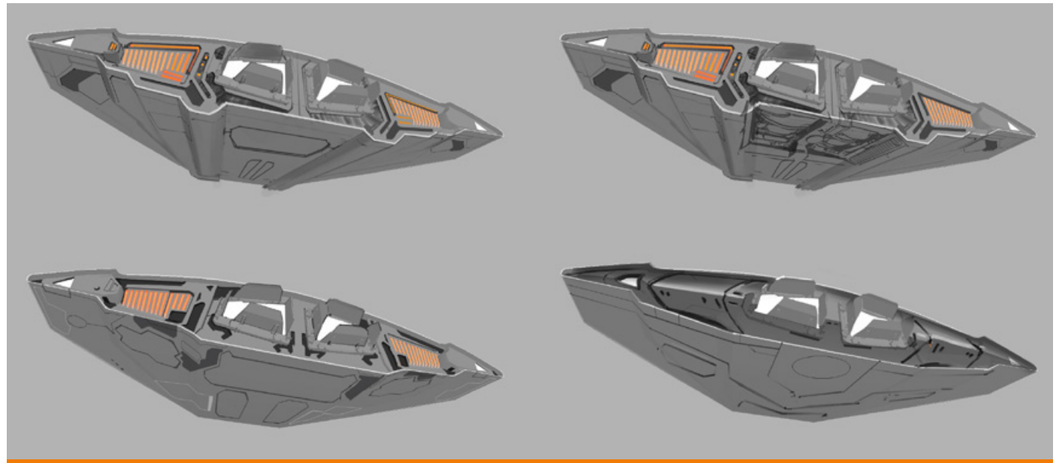
We needed the rear view of the Cobra to evoke the original so we retained almost identical proportions and position for the engines in the final design. We clad the back of the ship in a more industrial look, with exposed mechanical parts for access and service.

We stressed the same level of detail across the whole ship, including features that were not visible in the original 1984 game and only roughly shown in later games such as the cargo scoop and weapons. All of them must hold up to viewing in extreme detail on VR headsets, 4K displays and beyond.









Engine trails feature in some of the earliest concepts for Elite Dangerous. There was some debate about the scientific credibility of an engine leaving a trail in space. In the end we found they were good for gameplay and were a good callback to Frontier: Elite II, so they remained.

TOUCHDOWN

In 1984's Elite, docking ended the moment you guided your ship through the starport's slot. In 1993's Frontier, there was a short elevator sequence. We decided for Elite Dangerous we would have a full docking sequence and a chance to see your ship in detail from the outside.

We knew Elite Dangerous would be a platform to build upon and that meant it would be safest to think about Elite Dangerous as a real, working galaxy. If we built our ships for 'real world' use from the start we would never have to worry about later refitting.

Landing means landing gear, but it also means the pilot needs a boarding point. We borrowed a human-sized avatar from another of Frontier's projects for consistency of scale. Fans would quickly notice a too-large doorway or too-small cockpit in the game. The small player avatar would keep our designs 'honest'.

We continue to work with huge spacecraft, but we always keep that 'tiny' player avatar in mind. In a galaxy where everything is enormous, small visual signifiers on the ship's exterior help give a clearer sense of scale.

This is a still from our December 2014 pre-rendered trailer by the RealtimeUK animation studio, based on art and assets provided by Frontier. After a year of regular use online, the trailer would be seen in cinemas before Star Wars: The Force Awakens.

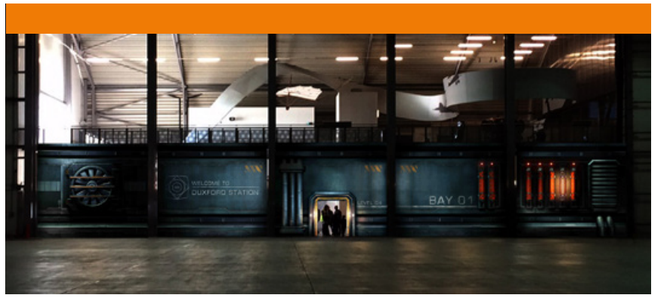
A BLANK SLATE

Ship damage is something most would consider a 'nice-to-have' feature rather than an essential. Wear and tear is rarely visible out in the galaxy, and is only occasionally seen on the player's own ship.

Still, we persevered with 'battle damage,' because we consider it an important part of telling your ship's story. Those small details became more important as soon as we offered players the chance to leave their ships in Elite Dangerous: Horizons. We always wanted players to feel bonded with their ship, even if it's an old wreck.

For many players Paint Jobs became an important part of that bond. Our early mockups were a chance to explore what could be possible. Based on our community's response to Paint Jobs, we've made personalization and customization a key part of our plans for the future of Elite Dangerous, from dashboard Bobbleheads to Ship Kits to our loot and crafting systems.

Paint Jobs were a great addition to the Elite Dangerous ships, allowing players to customize their spacecraft and creating a more varied and believable universe where Commanders express themselves through their ships.



> “A SURREAL BUT THRILLING EXPERIENCE”

THE REAL THING
BUILDING THE COBRA

It was decided to exhibit a scale version of the Cobra Mk III for Elite Dangerous' launch event in 2014 at the Imperial War Museum's historic Duxford airfield.

Schematics and references for the ship were sent to prop makers Codsteaks in the late summer of 2014. Codsteaks' team had just five weeks to produce the detailed model, complete with internal and external lighting, and they succeeded in spectacular fashion. Seeing one of our ships touching down on the hangar floor and placed alongside the airfield's collection of classic aircraft was a surreal but thrilling experience. The finished model was the star of the event, revealed amid a cloud of dry ice as the hangar doors were opened to let in the crowds.

The scale Cobra Mk III has since been exhibited once more, on the public show floor at Gamescom 2015 in Germany, where is was seen and photographed by thousands of visitors to our booth, proving the model wasn't just accurate; it was built to last, too.

IWM Duxford was rebranded as an Elite Dangerous starport for our launch event. Today the 'Welcome to Duxford Station' sign hangs in our Cambridge studio.

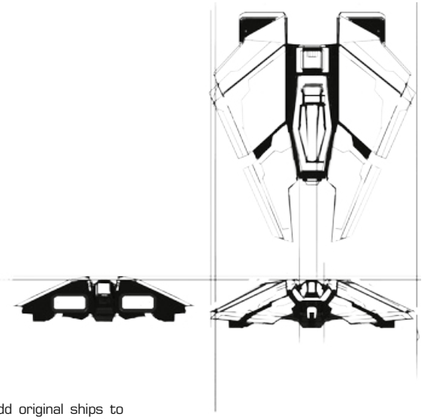
SIZE MATTERS

Our model Cobra Mk III measures eight meters across and weighs in at close to two and a half tons. At 1/6 scale the model still looked imposing even parked alongside Duxford's Eurofighter Typhoon; at full scale its 48 meter wingspan would have dwarfed Duxford's largest plane – a 26 meter-wide Concorde passenger jet.

The ship was detailed with engine lights and a lit cockpit, but with just five weeks of construction time we secretly cut one corner. Nobody would know we had left the underside of the Cobra only partially detailed and absent its landing gear without sliding beneath it for a close look. Well, until now…

SHIPS IN THE NIGHT

FILLING IN THE BLANKS



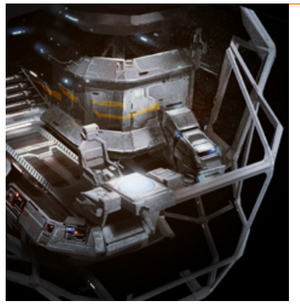
FILLING IN THE BLANKS

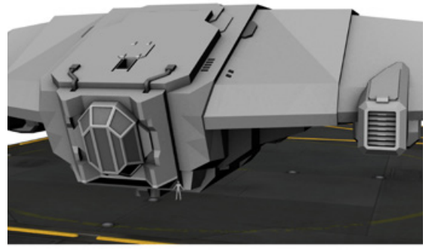
The ships are true characters, with different personalities and roles that inform their appearance. Some were updated from the classic vector shapes of the earlier games while others were all-new for Elite Dangerous.

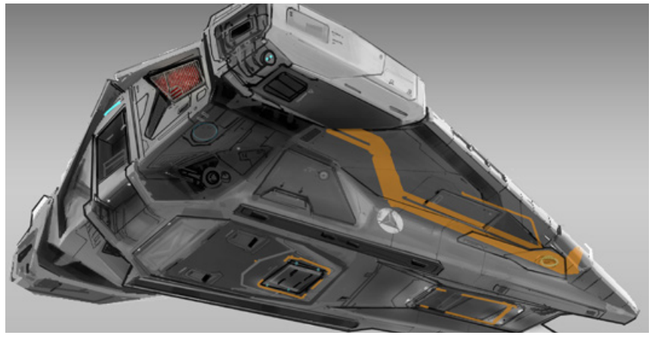
As the most iconic Elite spacecraft, the Cobra is perhaps the closest to the original shape, but for ships like the Fer-de-Lance, Anaconda and Viper we still used them as inspiration. The idea is to be informed by the legacy of Elite, but not beholden to it.

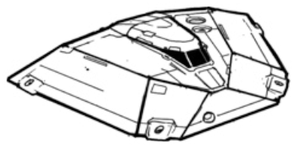
We knew we wanted to add original ships to the lineup. As always, we start with the ship's function. Is it designed for combat, exploration, haulage or passenger transport?

Our game straddles the divide between science fact and fiction so we try to balance those two, occasionally contradictory concerns. We aim for designs that nod to the practical challenges of space flight while respecting the eighties' and nineties' visions of the future.









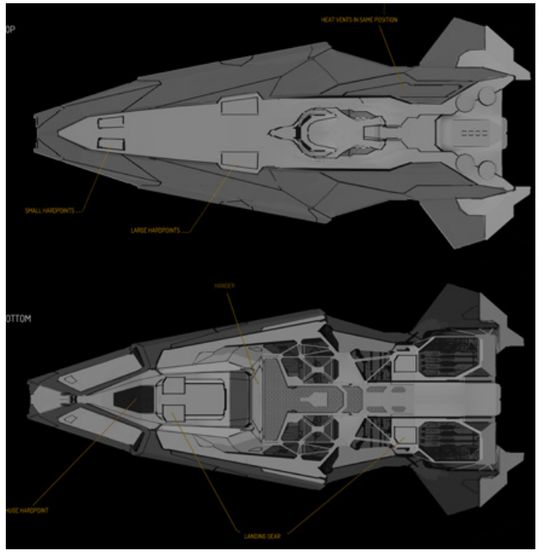
“FUNCTION ALWAYS DRIVES FORM”

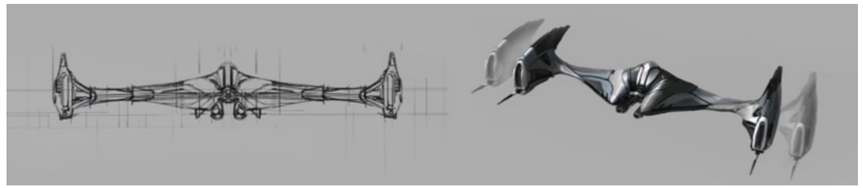
Every ship design starts with utility. It's easy for a talented artist to design a beautiful ship, but hard to design one that feels as though it might actually work for the purpose it was intended.

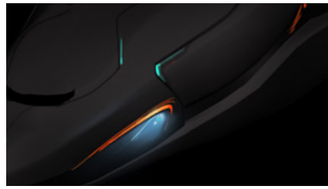
By starting from a place where function always drives form, a number of decisions are made for us before the first pencil lines are even drawn.

Just to navigate the void of space a ship will need thrusters, a cockpit, engines, heat vents, cargo hatches, a landing gear, access ramps and — to survive in a dangerous galaxy — weapon hardpoints.

Early designs for the Federal Fighter were 'boxier' than the hard-angled final design, with clean lines and an almost Imperial sleekness.

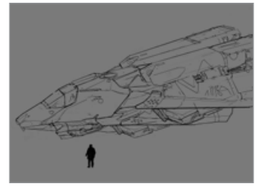


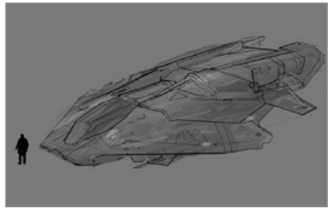


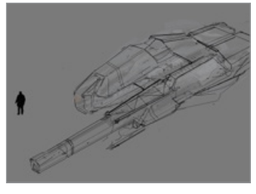


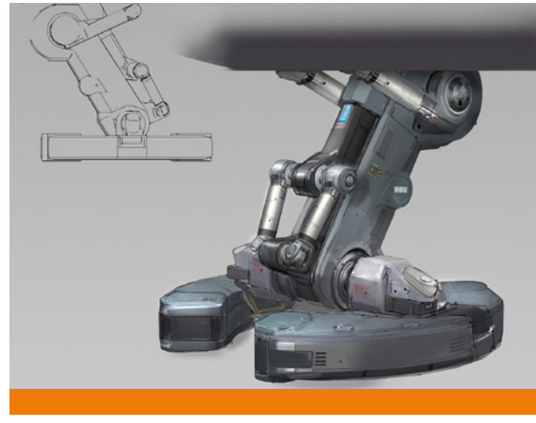
Designing ships involves a good deal of experimentation, with lots of work ending up on the cutting room floor, or making it into the game in a slightly different form. Some of this exploratory work is saved for later use.

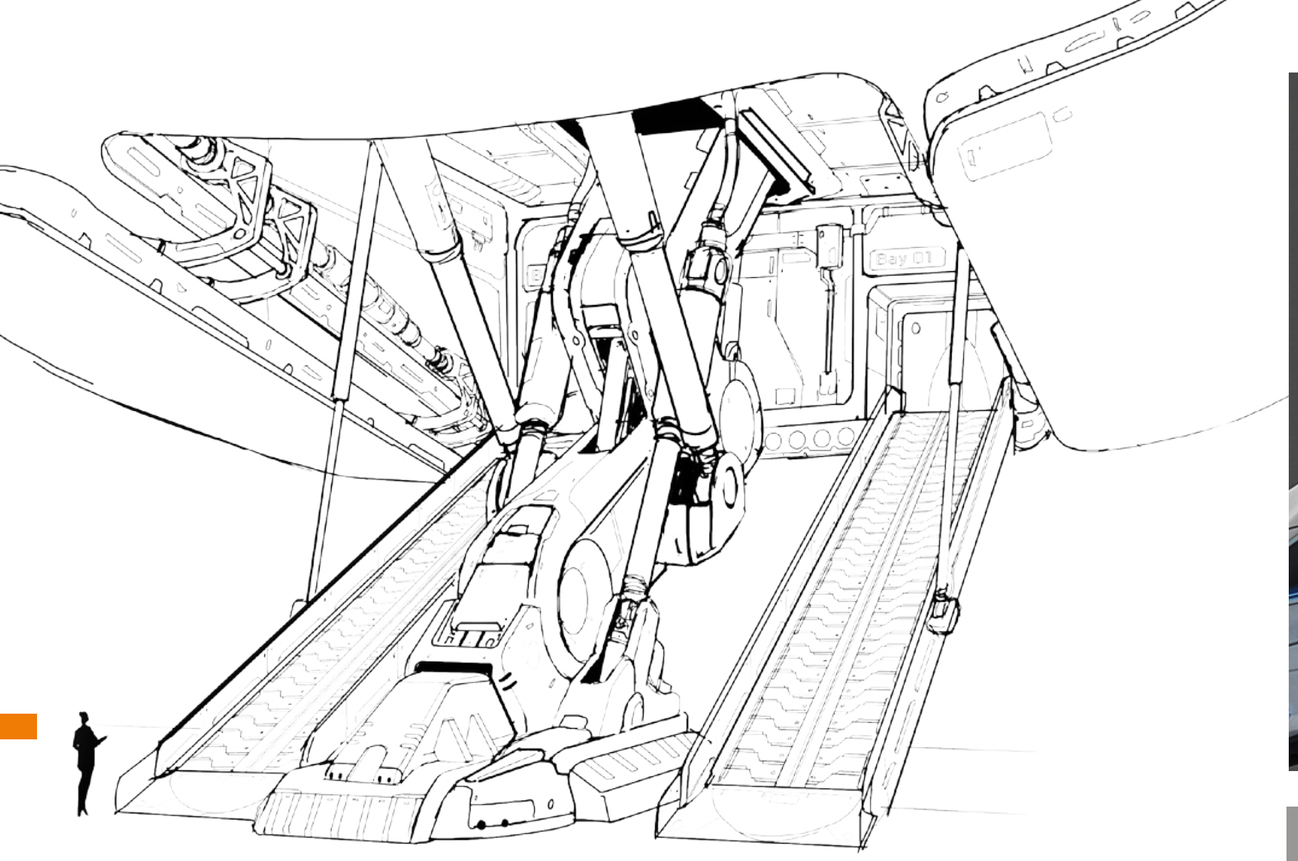
We have to consider the functions of hardpoints, thrusters, heat vents, cargo hatches, landing gear, access ramps and cockpit visibility. Ships have to work in the game's fiction, but must also work for gameplay. If the pilot can't see clearly from their cockpit or other pilots can't see those weak spots, the design is no good. The most important factor is always that each ship has a distinct character.



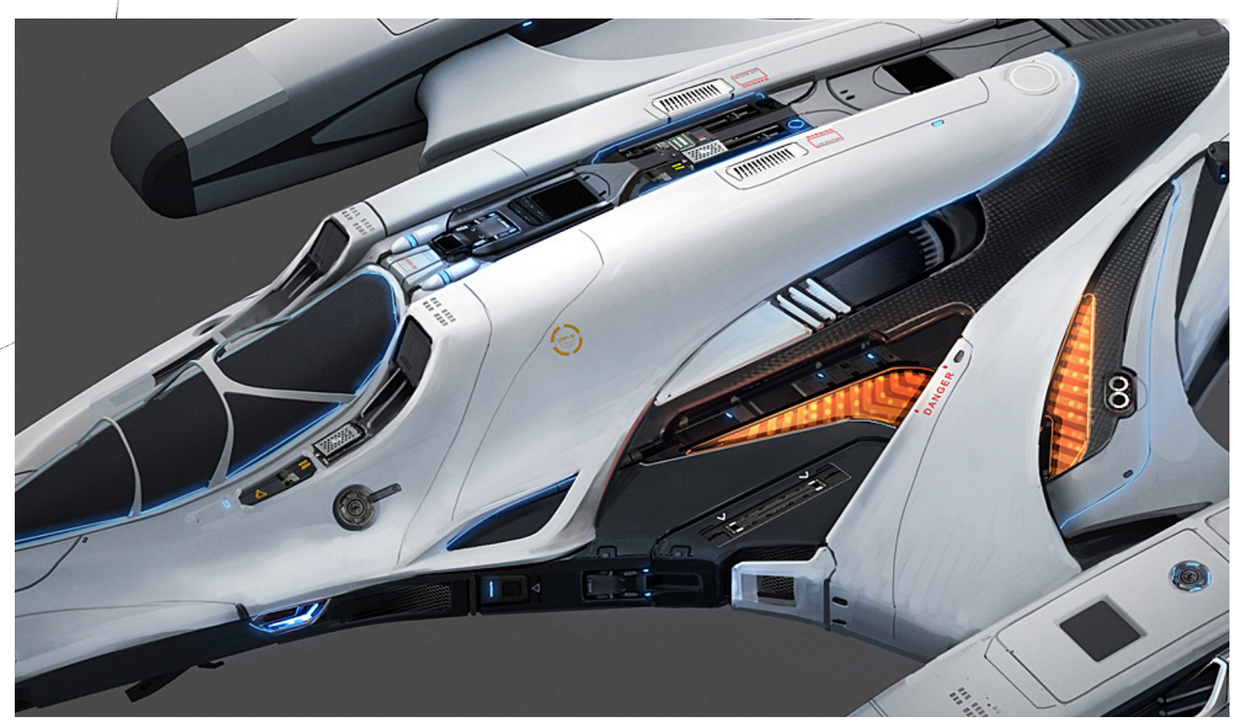


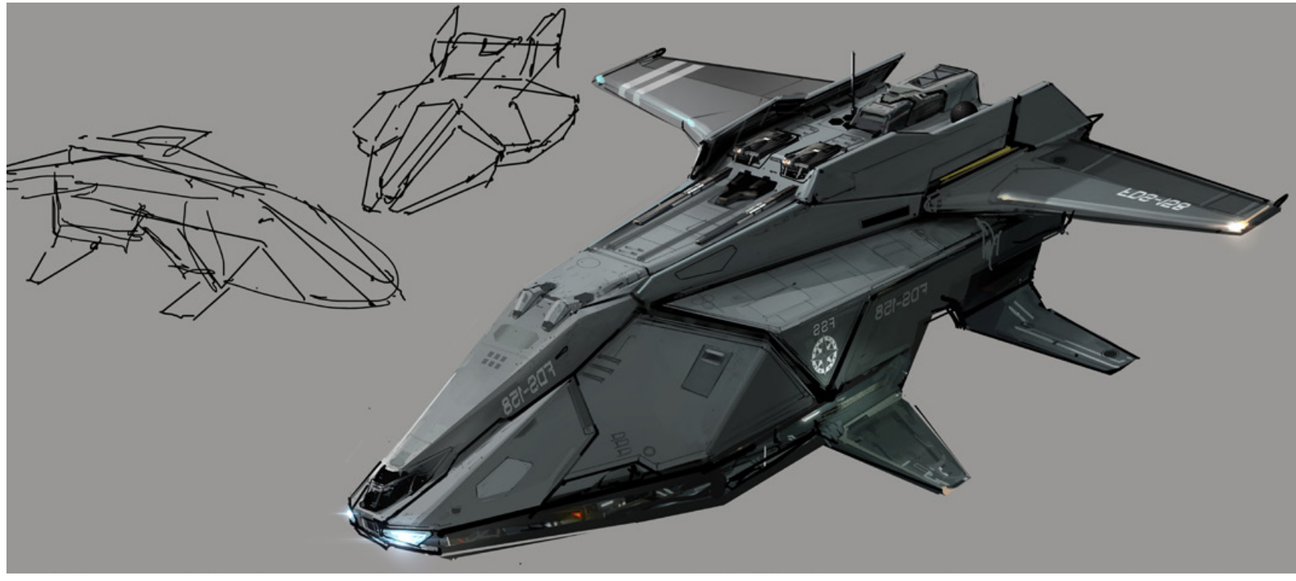


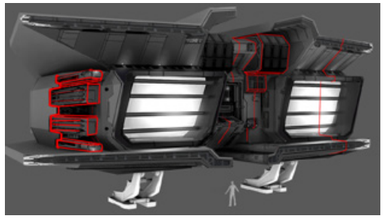




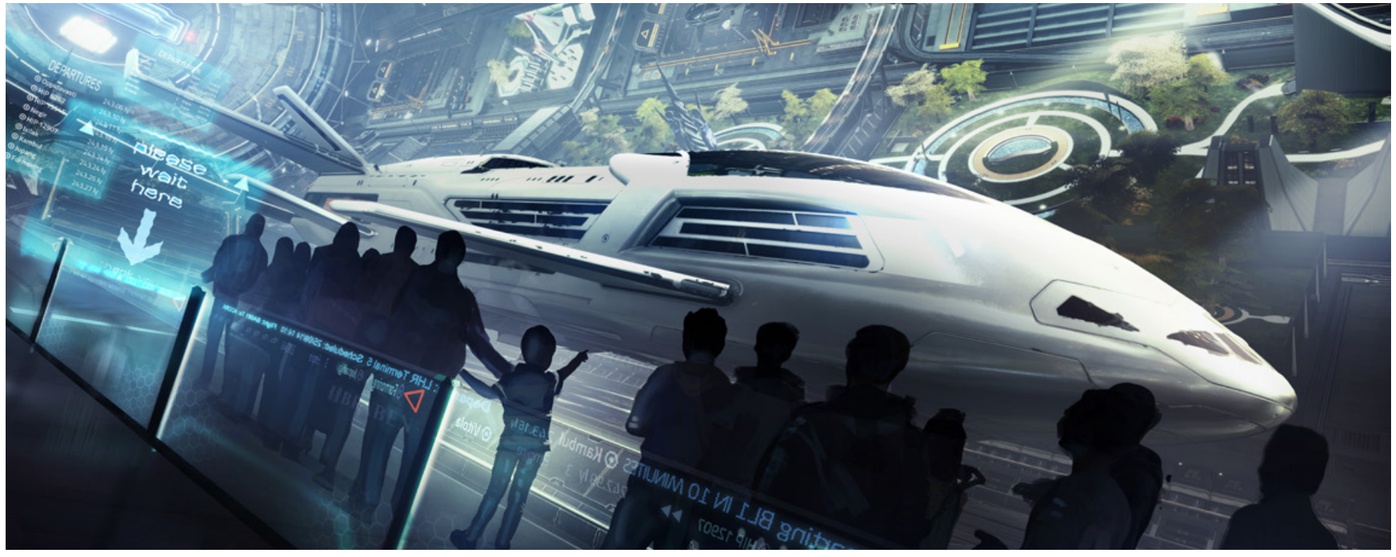
Scale is something we consider at each step, particularly in how the ships work on a human scale. Some ships are truly huge, and addressing practical issues like how a crew might board the ship on a planet's surface or in a station's gravity are important, and also help convey that scale







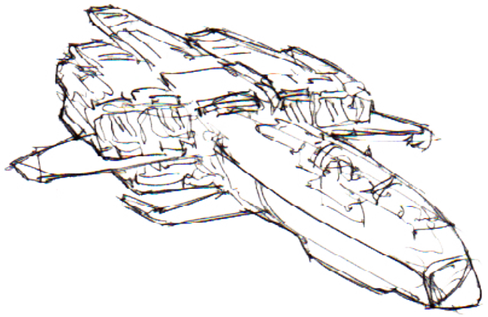
More recent ships like the Independent Fighter and Beluga went through much the same process, from concept, to block-out, to fully working in-game model. There are even more considerations for the larger ships, like fighter launch bays or passenger entrances.

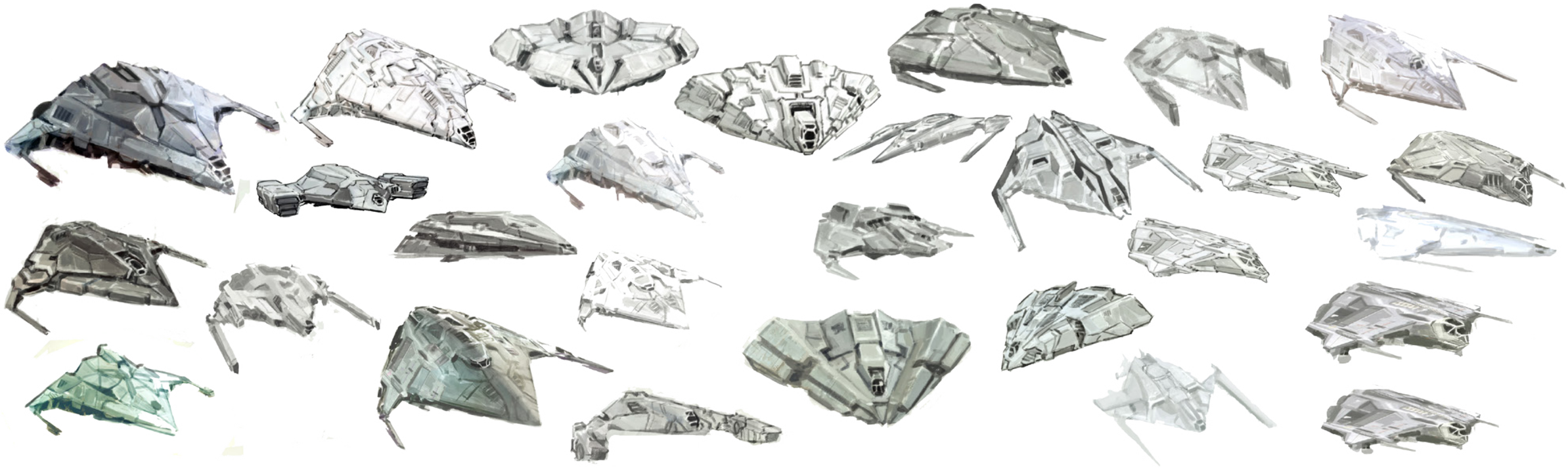


We figured out early on how the 'functional' components of each ship might work, both for design and for gameplay. Making a ship's heat vents clearly visible has a tangible effect on combat, and on the art team's work too.

The essentials are given their shape by the ship's roles and by its manufacturer. Gutamaya ships are Imperial-leaning and are prone to include unnecessary aesthetic flourishes, expensive-to-produce compound curves, and a degree of luxury. They make a stark contrast to the workmanlike, easily serviceable Lakon designs or the sharp brutal lines of the Federal navy.

All these factors are considered, but our chief concern is to give each ship a distinct character and a silhouette as distinctive as any in the original Elite titles. Even for a player who knows almost nothing about the game, each ship's character should be evident at a glance; that glance might save you from a deadly encounter, after all.





Concept sketches of designs that have yet to find their way into the game.

WINDOW ON THE UNIVERSE

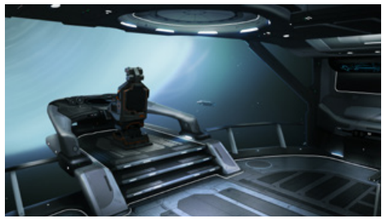
DESIGNING THE COCKPIT

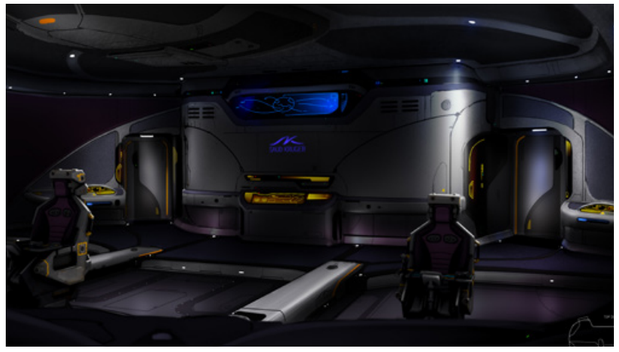
THE HOTSEAT

Back in 1984, Elite's 3D scanner, dashboard and white-edged display offered players a sense of their ship's cockpit. Your beige monitor became a viewscreen and your room became the flight deck of your Cobra Mk III.

Early Elite Dangerous cockpit mockups were crude, but the prototype clearly showed that a 'pilot's-eye view' of the cockpit was superior to the simple window of the earlier games. The view gave greater presence to your ship, and allowed us to mimic head movement to emphasize turn rates and acceleration. We knew it would also be better for virtual reality, which was yet to be implemented at the time.

Even in its most basic implementation our prototype suddenly felt much more like we were piloting a spacecraft rather than playing a game.

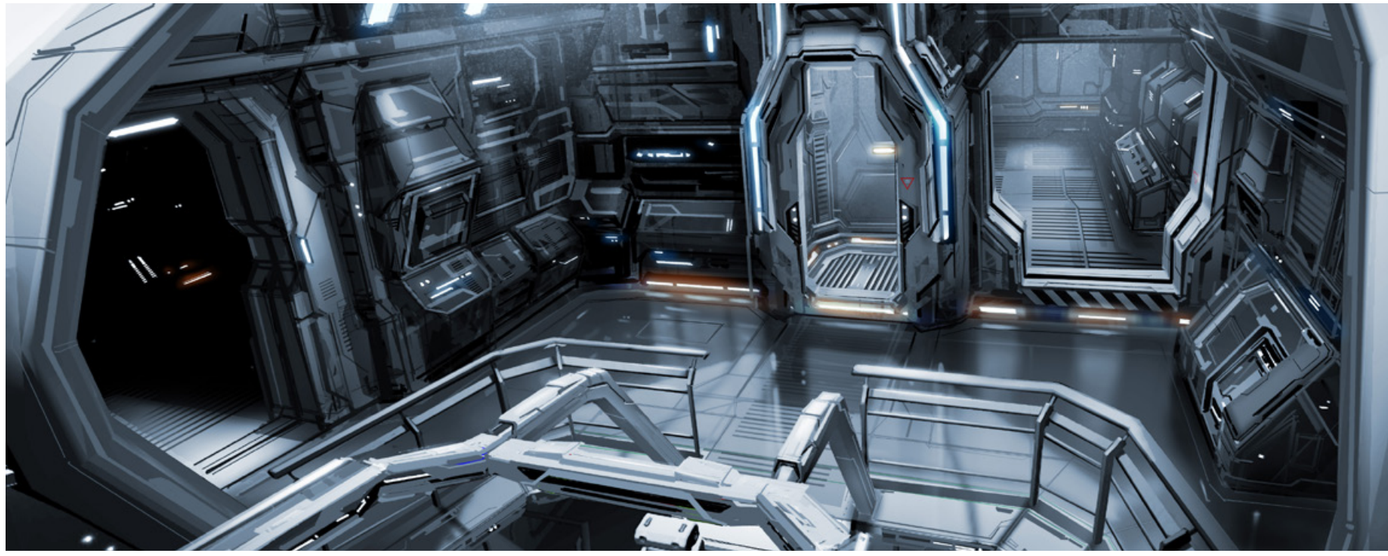


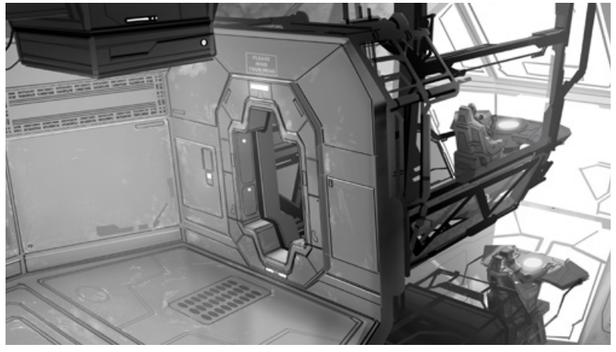


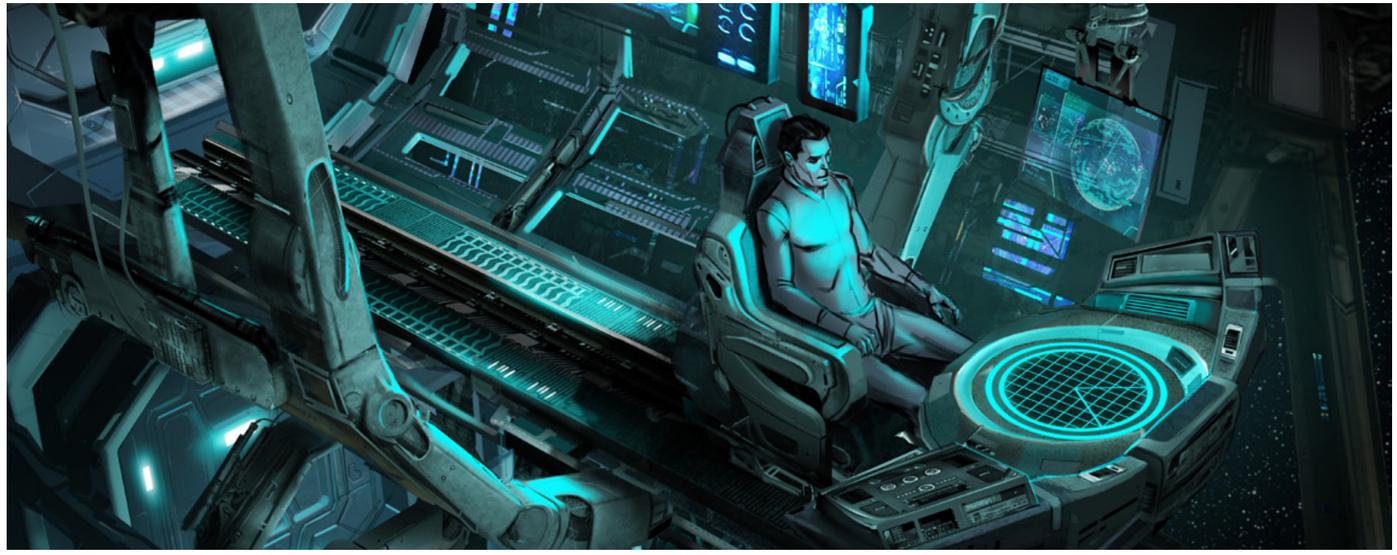
The decision to have a physical cockpit opened up a world of possibilities. Damage effects, atmospherics, lighting and sound design all work together to make the cockpit feel like a real place.

We decided to go with a holographic head-up display for a number of reasons. It feels like a logical progression from today's glass cockpits and augmented reality devices, and of course works naturally in VR.

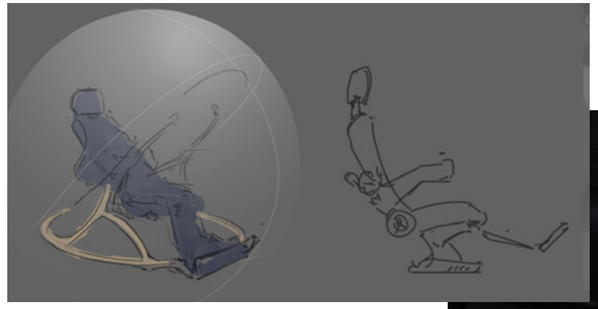
It has practical benefits for designers, too. Panels can easily be resized to fit content, and data can be intelligently placed anywhere on top of the image in the game world. A holographic display also lets us open and close panels dynamically to prevent the screen space from becoming cluttered. Having the information positioned in 3D space around the player really came into its own when we added headlook to the first-person view.

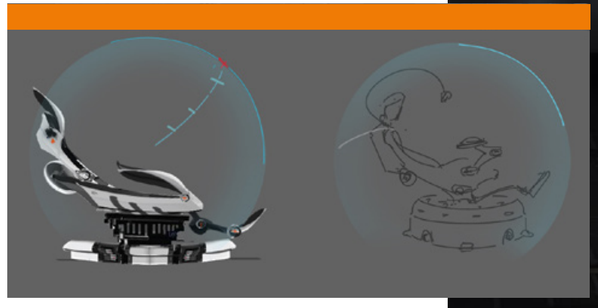






The holographic imagery is common across ships, following the pilot as they progress through the ship roster, subtly adapting to each new ship purchase. The HUD gives continuity without players having to learn entirely new display layouts.





Exterior lights such as stars and explosions cast light into the cockpit, and the ship lights its own surroundings. Look carefully and you'll see a fighter's engines illuminating the launch bay as it emerges.

BRINGING OUT THE BIG GUNS

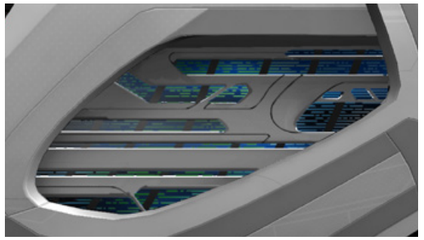
CAPITAL SHIPS

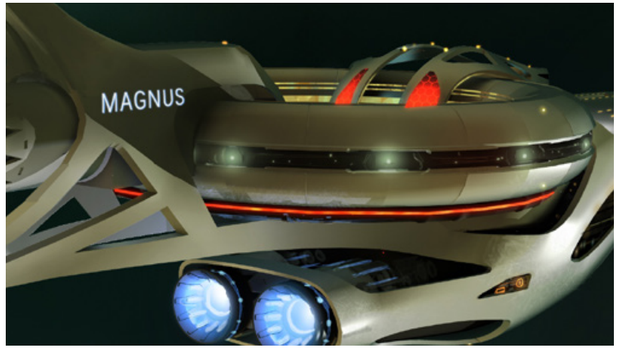
MAJESTIC CLASS INTERDICTOR

The Empire has always gone for opulence, style and quality with no expense spared.

Their capital ships are not just warships, but also serve as roving embassies or giant yachts for their wealthy and powerful owners. Internally they are luxurious, at least in those parts used for entertaining, with the internal rotating ring providing comfortable artificial gravity for ambassadorial dinner parties. Guests would have little indication they were in space, let alone aboard a powerful warship.

We looked at a lot of modern architecture when designing this ship. The blending of artful forms with practical functionality informed the design. Though beautiful, it is also a ship of war and is more than capable of defending its self. Weapons were designed to be elegant but deadly.



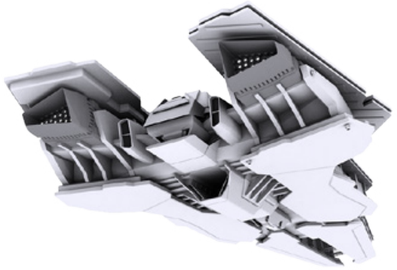


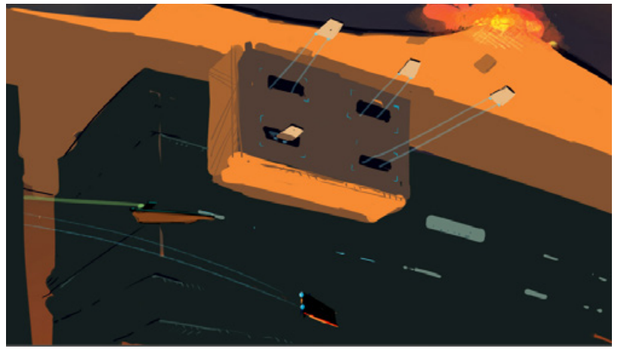
The imperial aesthetic developed here can be seen in all the Imperial and Imperial-leaning ships we have designed and is also present in the clothing and fashion of the imperial characters we recently added to the game.

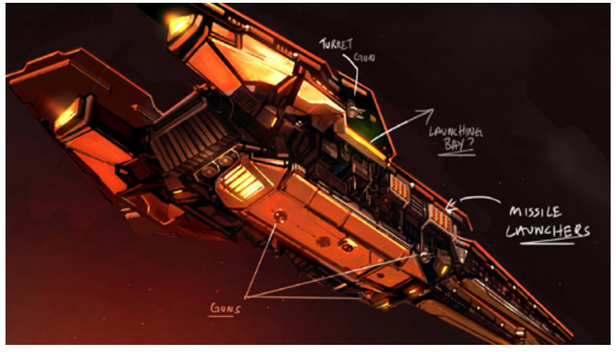
FARRAGUT BATTLE CRUISER

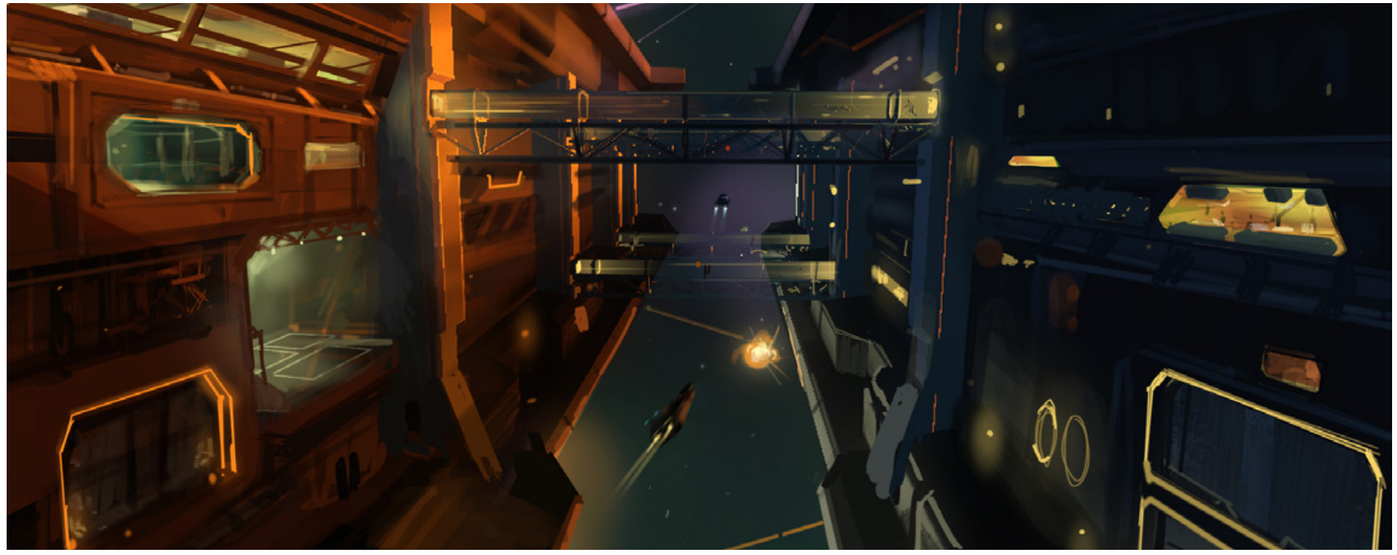
In contrast to the opulence of the Empire's Majestic Class Interdictor, the Federation's capital ships are brutal, practical war machines inside and out.

Airtight doors split the interior into many separate compartments. Grab-handles abound, as do access panels and all the paraphernalia of a military vessel. There would be no mistaking a Federal ship's interior with an Imperial one.









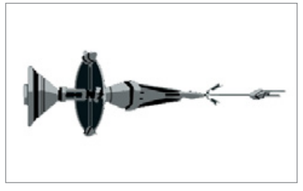
CHANGING THE STATION

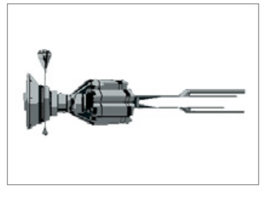
REIMAGINING STARPORTS

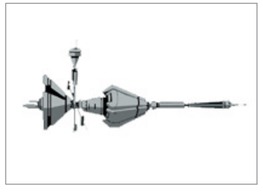
THE ORBIS

The Coriolis starport has appeared in every Elite game, and is considered in the in-game fiction to be the oldest of the starport designs. The time-tested Coriolis design is the easiest and cheapest starport to manufacture, and tends to appear in locations where speed and cost are important factors.

The Orbis starport is more expensive but more modular. First introduced in 1993's Frontier: Elite II, the Orbis was used as a starting point for the wide range of Orbis starports now present in Elite Dangerous. We blocked out a set of modules that could be reconfigured to create variety, around a central rotational point. We figured this made sense from a fictional viewpoint, as stations could be pre-fabricated and modular so they might grow as they sprawled over time.



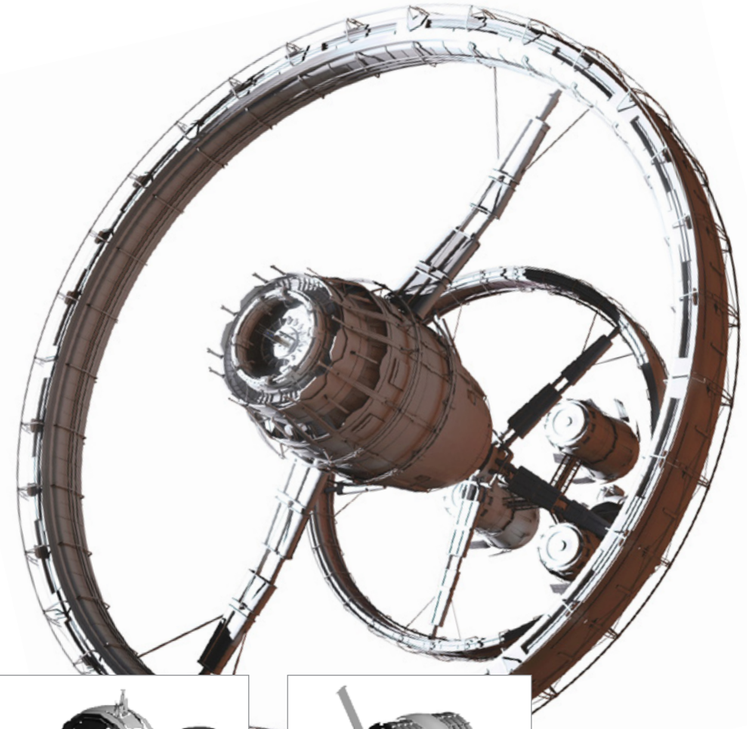


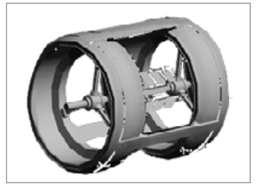


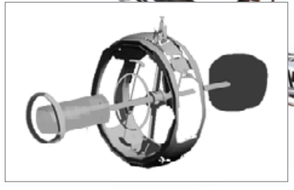
THE OCELLUS

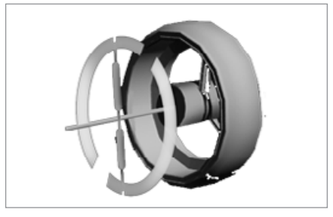
We have already had a number of Community Goals featuring the smaller Ocellus starports being constructed by players, and so we built an 'engine block' similar to the one seen in the Kickstarter key art, to allow it to be mobile. We figured the massive central hub containing the docking slot and landing pads could be delivered into position by a ship that would be little more than enormous thrusters, and new modules could be added or built around that base.

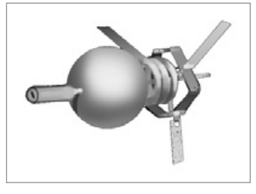
There are several sizes of ring on the Orbis-like stations and each one has a radius and rate of spin to produce different levels of artificial gravity. Not everyone will want gravity to equal that of Earth. Lower gravity levels are very comfortable for physical work, and in the 0.1g of the docking bay a fit human could lift a one ton mass.











THE CORIOLIS

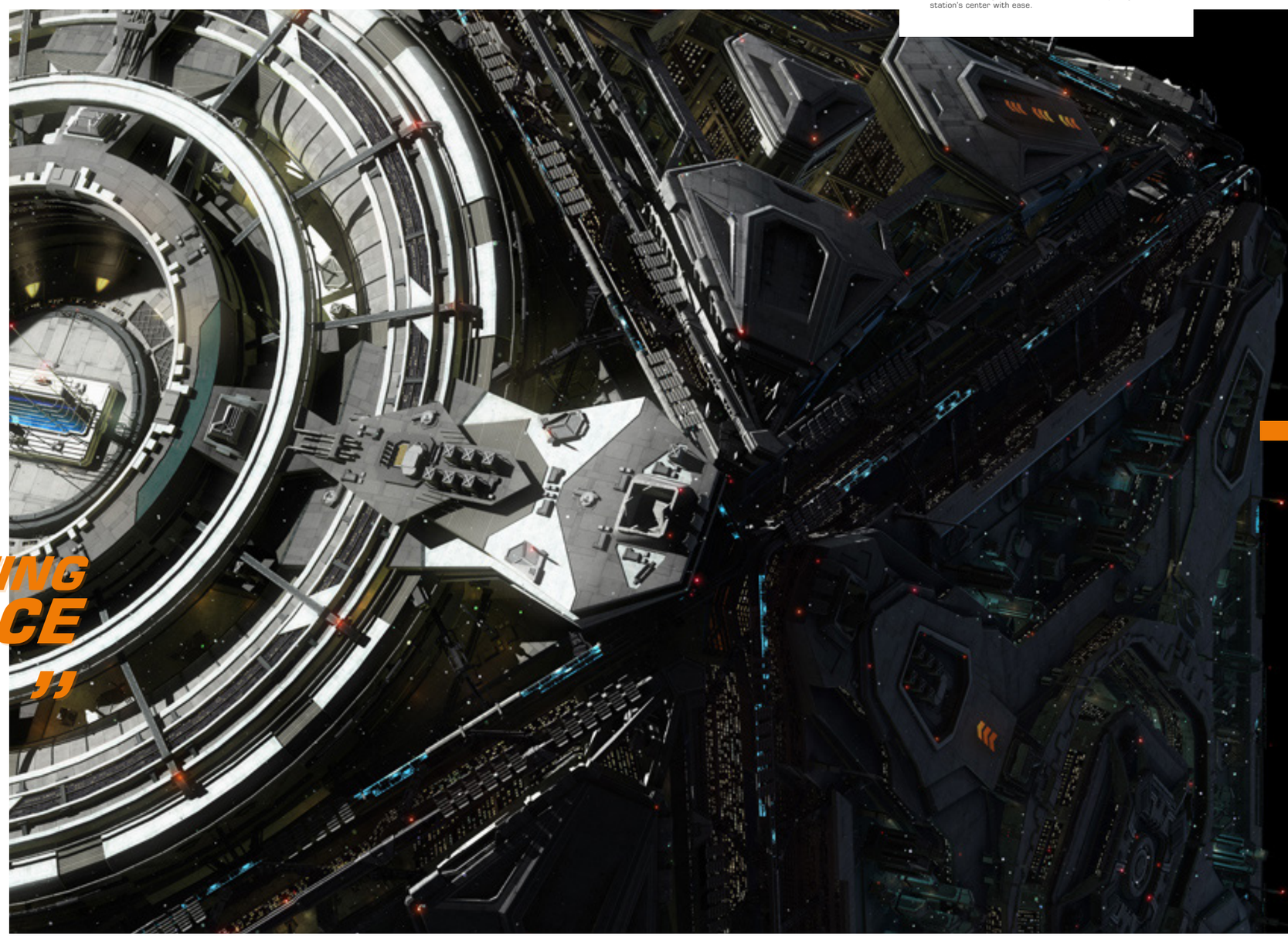
Starports are a safe haven for pilots amid the vastness of space. They're also very big; an entire city floating in space and slowly rotating to create artificial gravity for the traders, pilots, tourists and citizens aboard.

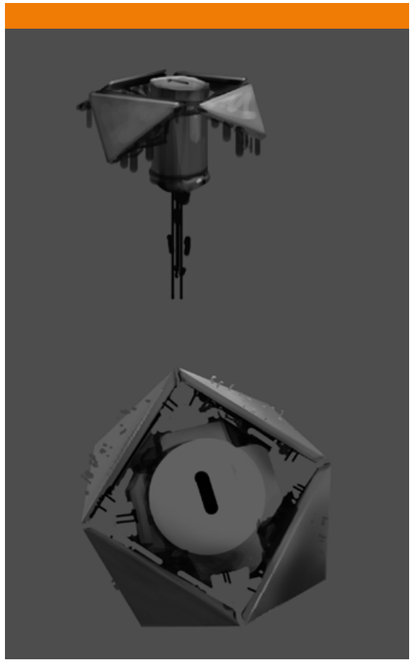
The Coriolis starport was the first station updated for Elite Dangerous' modern visual character, and like the ships we started with our original polygonal shape from the earlier games. We had debated whether or not to include the Coriolis as it could certainly be argued there are more practical and plausible ways to design a space station, but we're pleased we kept it.

The Coriolis is iconic and classic in the same way as the Cobra Mk III, and the work we invested updating it became almost a statement of intent for our approach to the rest of the game.

"AN ENTIRE CITY FLOATING IN SPACE"

The Coriolis is arguably impractical but is the densest of Elite Dangerous' starports. Each is a city in its own right, springing from a central core. The force of gravity would increase as residents traveled to the station's furthest reaches, allowing starport staff to handle heavy cargo at the station's center with ease.



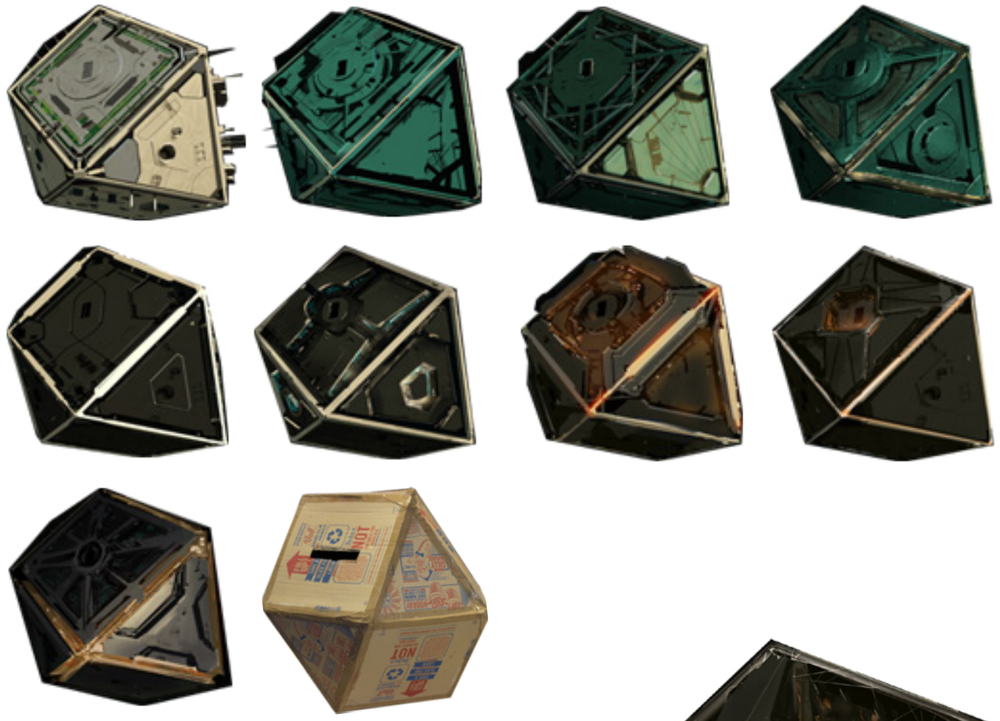


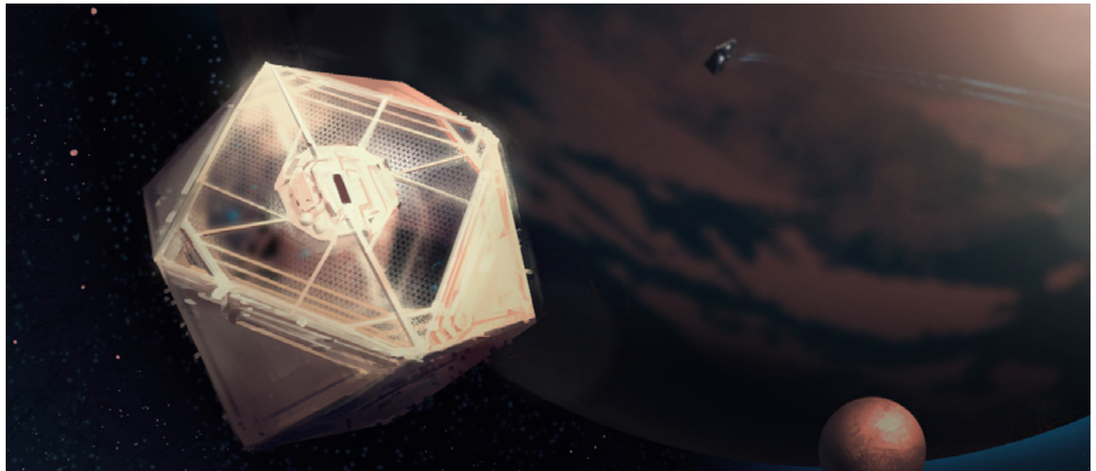
THROWING SHAPES

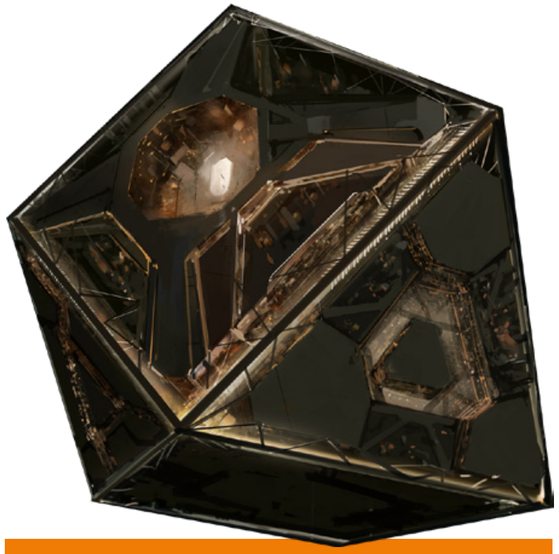
Keeping the silhouette intact we added depth and detail with careful consideration given to the scientific realities of the station's rotation and internal gravity.

For inspiration we looked at megastructures: some of the largest examples of architecture on our planet. In huge stadiums, bridges and towers we found patterns and motifs that were included in our designs. Airports, dockyards and aircraft carriers were also researched and added to the mix.

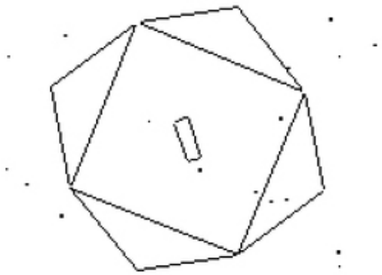
These familiar elements help ground the design in reality and give the player a sense of scale.







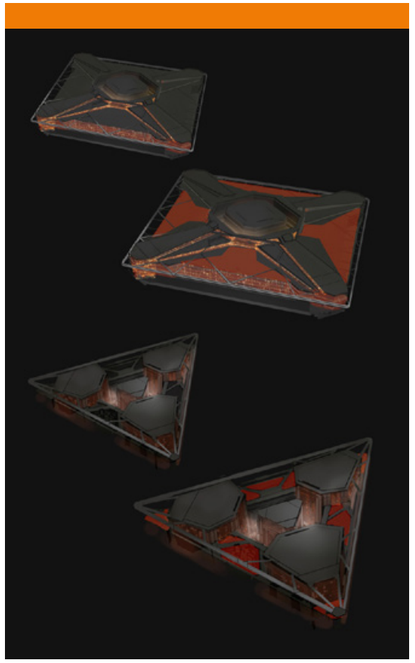
Depth was an element we were keen to add to the new version of the Coriolis. Early designs took their cue from the original and featured flat sides with elements built on the surface, but we decided to expose the inner structure which gave a greater sense of scale and allowed for more complex lighting. 'Tower blocks' can be seen on the outer surface. These are effectively inverted for residents, as the artificial gravity pulls the occupants outwards.

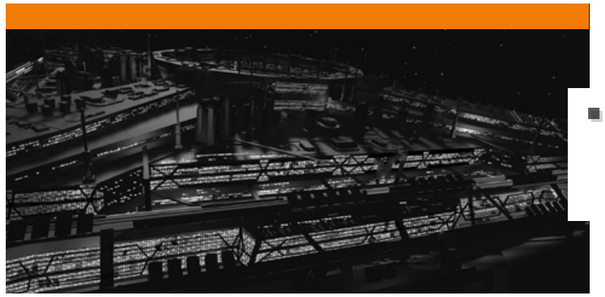


Viewed from the outside the Coriolis is like an explosion of skyscrapers emerging from a single core, but most players will spend more time on the inside than flying beside the exterior. Beyond the inner docking cylinder, the interior is an open, terraced space with buildings, trees, artificial daylight and even flowing water in the more opulent stations.

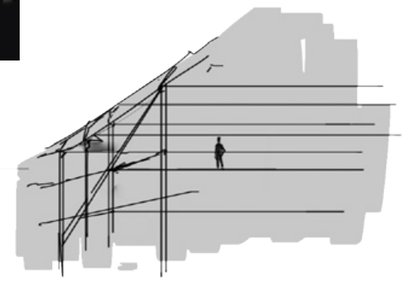
It was important to consider the view, not just from the cockpit but also from the deck of the landing pad to make room for possible expansions.

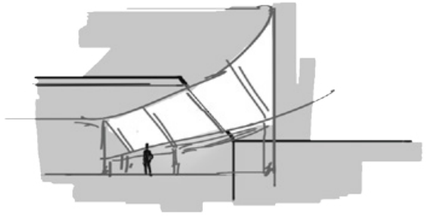
As with everything in Elite Dangerous, we try think about how our designs will work when we are out of the ship and walking around in these spaces. It's a walk players may get to take some day.

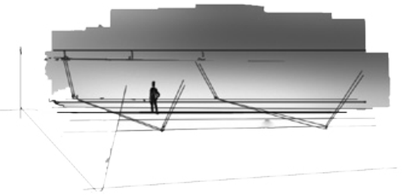


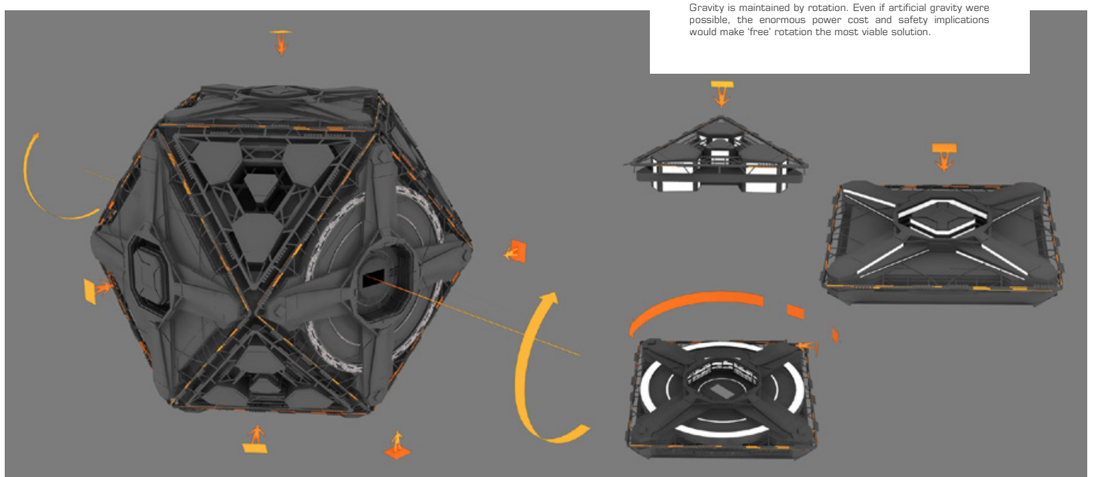


Floor windows starports would be one of the few places in a starport that would offer a good sense of space around you. We assumed they would be commonly found in higher gravity areas, and authorities would suggest taking a walk along these daily to maintain muscle.

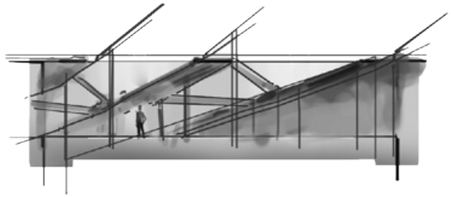








Gravity is maintained by rotation. Even if artificial gravity were possible, the enormous power cost and safety implications would make 'free' rotation the most viable solution.



Great consideration was given to the scientific reality of using a force field as the entrance of the docking slot. Doors proved impractical given the traffic, so it was decided that series of force fields was more plausible and would look better as the ship moves through the slot.

The landing hub is pressurized and this allows us to play with some different effects to give the interior of the station atmosphere. Fog formed from engine exhausts and outlets clings to the surface of the hub and this is illuminated by floodlights around the docking pads.

The docking hub is a safe zone for players, with no weapons fire allowed. We wondered if the rules could be enforced by security drones. In the end we added defensive turrets instead.

The final Coriolis starport is at home wherever it is used throughout the galaxy. Its dense architecture makes it resistant to damage and its design is easily refreshed with a lick of paint and a new lighting setup to match the stylistic themes Elite Dangerous' civilizations hold dear.

Millions of people can live and work aboard a Coriolis starport, though living wouldn't be easy. Gravity would differ between each tower's floors, and for many residents real daylight would be considered a rare privilege.

400 BILLION STAR SYSTEMS

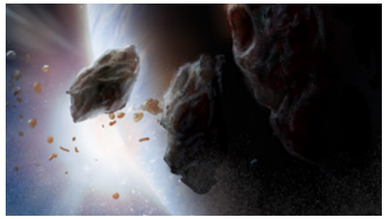
RE-CREATING THE MILKY WAY

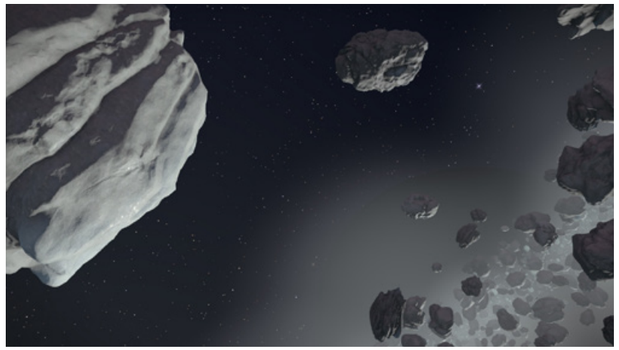
ROCK AND ROLL

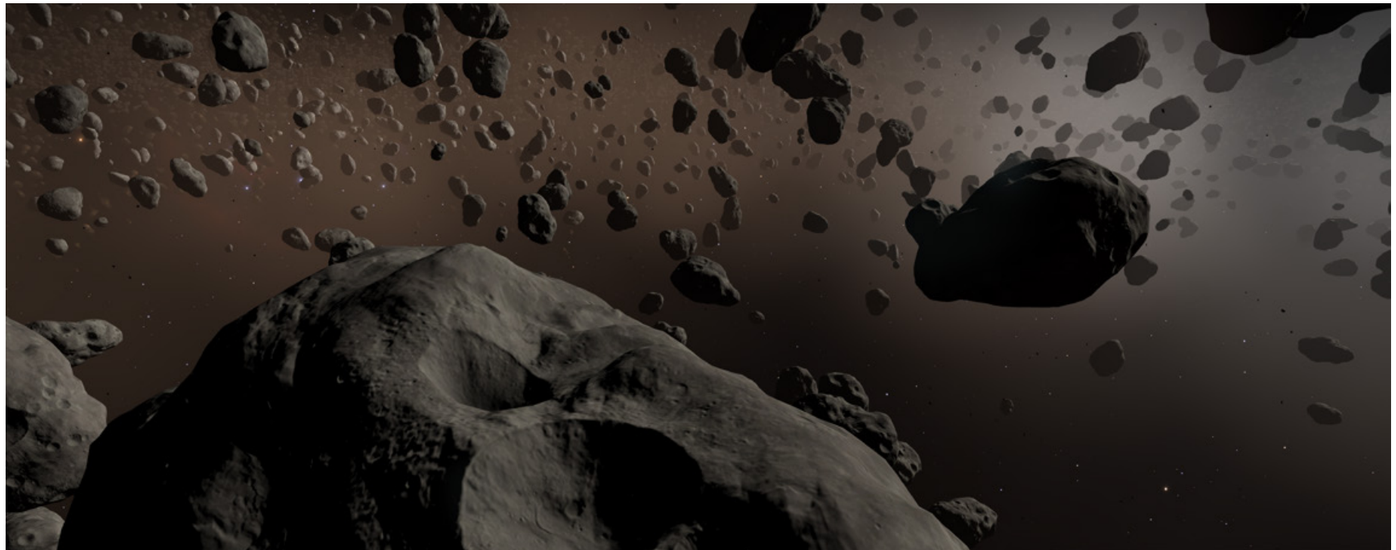
The earliest combat prototype shown during Elite Dangerous' Kickstarter featured asteroids. We knew they would become an integral part of the experience. Everyone who loves sci-fi has dreamed of piloting their fighter through an asteroid field in a cat and mouse game as hunter or prey.

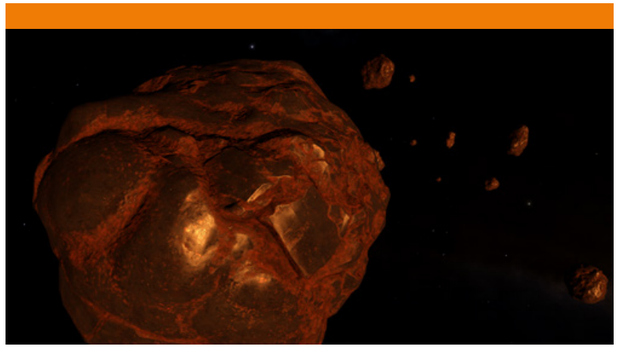
Our asteroid fields come in a number of flavors: icy, rocky or dusty. The distinct visuals help not only give a sense of place, but help with exploration and mining.

That 'misty morning' feel as you glide through a particularly dense field which obscures all but the brightest of stars represents a volume so large it would take a lifetime to explore, and yet asteroid fields are among the smallest elements of our galaxy.









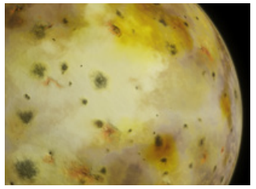
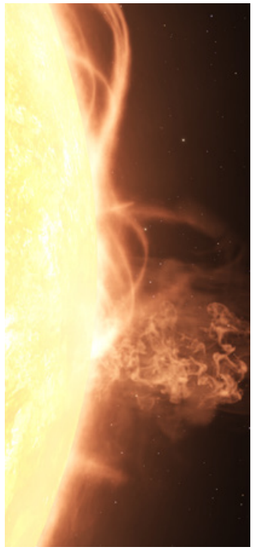
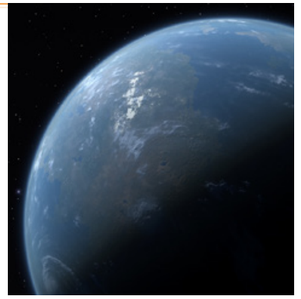
We use the term 'asteroid' to describe both actual asteroids and the contents of ring systems around planets. Though technically incorrect, it's useful shorthand for the art and design teams.

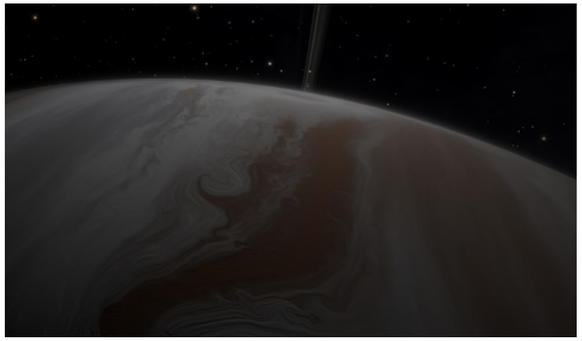
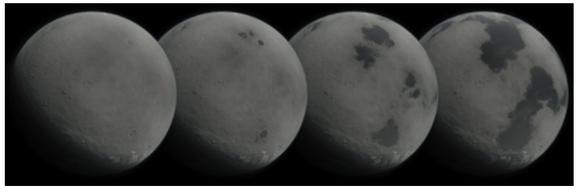
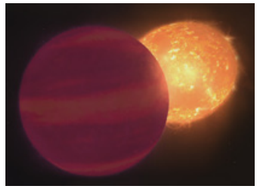
CREATING PLANETS

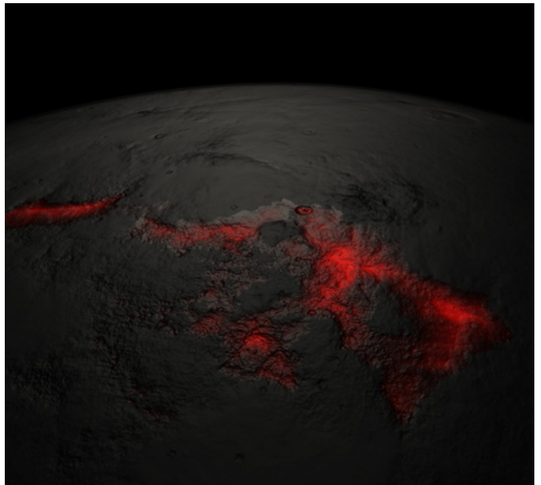
When we first began work on planets we did so knowing the core of the game had to be designed to grow. Landing on planet surfaces was always one of the big goals, and the incredible size of these objects created technical and artistic challenges, so we planned for the work early in development.

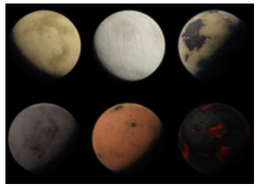
Planets have continued to improve since launch in December 2014 and are based on real science as far as is possible. We use scientific studies and known data on planet formation to help build realistic worlds. Understanding tectonics leads to mountain ranges and fissures, formation of basins and many other geological elements. Meteor impacts will scar the faces of the worlds. Geologically active areas have fewer craters based on their age, tidally locked worlds will have faces shielded from the harshness of space, and so on.

We've worked hard to remain as accurate as possible. Part of Elite Dangerous' beauty is in exploring 'real' worlds none of us will ever be able to visit otherwise.



THE NIGHT SKY

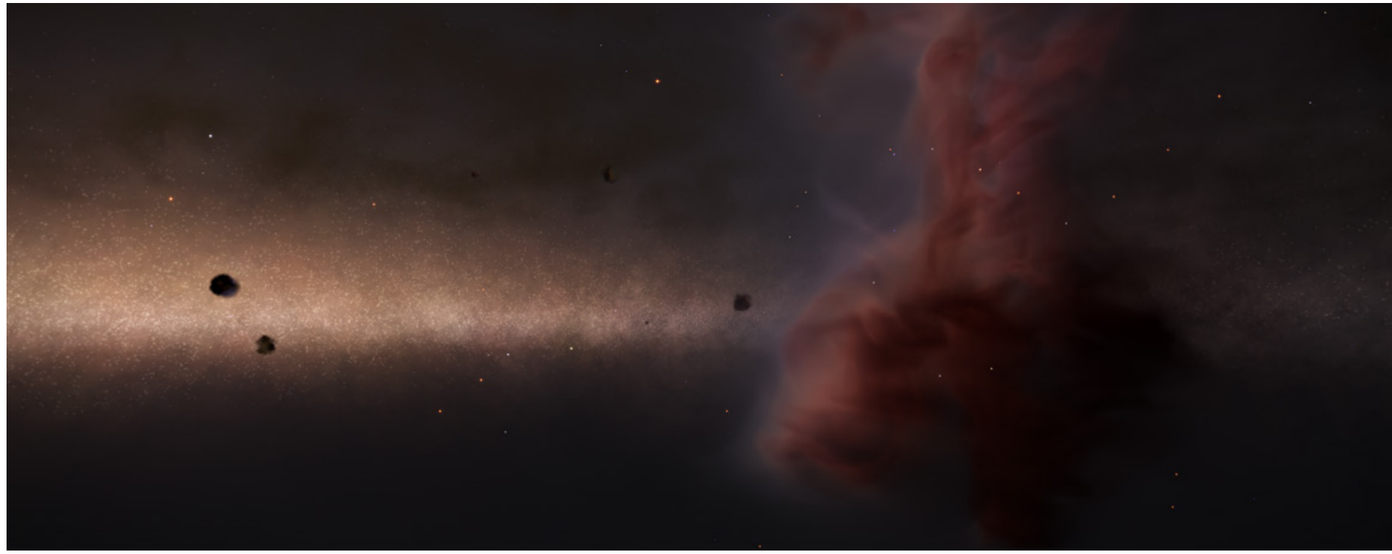
Constructing an environment consisting of 400 billion star systems is literally a task of galactic proportions.

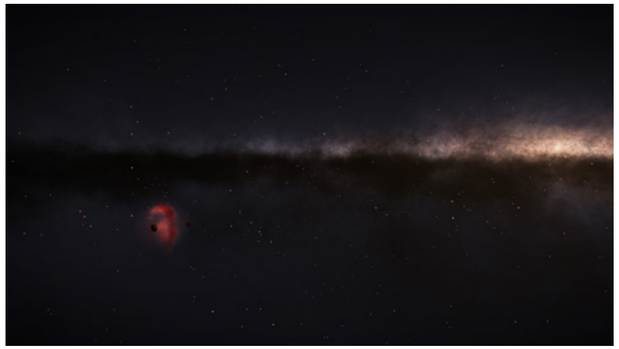
Elite Dangerous isn't set in a galaxy far, far away. This is our galaxy, as real as anyone could make it. Previous Elite titles have been set in interpretations of the Milky Way, but never before has a game created our entire galaxy to this accuracy.

The map is as much at the heart of the game as anything else. It's a visualization of the pure data so when you navigate around the map screen, you're effectively traveling around our galaxy.

From a tech standpoint, being able to seamlessly shift and zoom anywhere in the galaxy was a colossal challenge. As players move around different systems they'll see distant stellar geography and 'landmarks' shifting, which helps convey the sheer scale of our galactic playground.

As a player you can see the gradual change as you jump towards the burning galactic core with its billions of stars, or away towards the darkness of the outer rim where you can start to make out our nearest galactic neighbors.





A LITTLE BUGGY

CREATING THE SRV

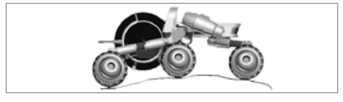
LEARNING TO DRIVE

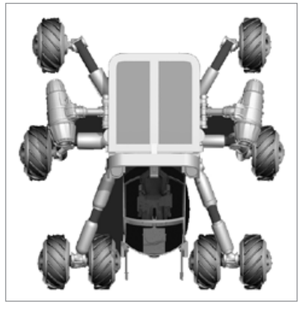
The arrival of Elite Dangerous: Horizons brought with it the chance to land on planets. Our first prototypes proved planetary landings on fully-simulated worlds were possible and exciting, but navigating those surfaces required a new kind of vehicle.

We looked at NASA landers but quickly realized they weren't comparable. We needed a vehicle that could fit inside any ship, handle any gravity, cope with any surface temperature, tackle rugged terrain and hit a top speed of 100 miles per hour.

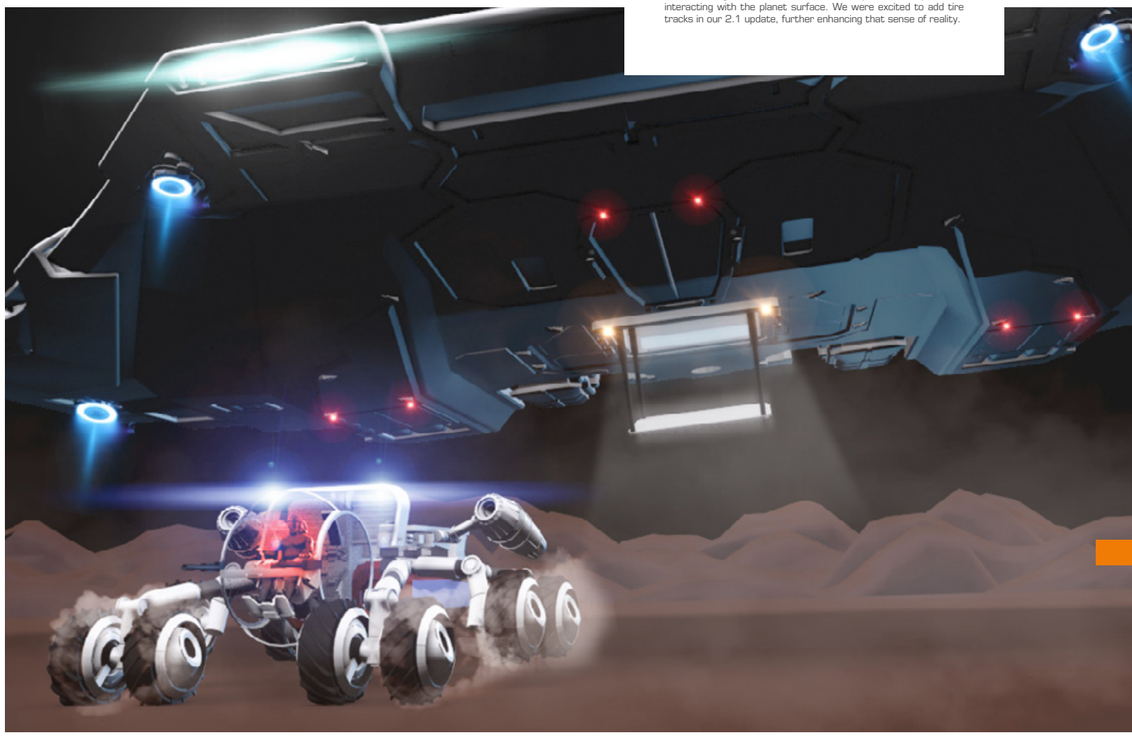
Designing the Surface Recon Vehicle turned out to as complex as designing any ship, if not more so. We had worked out the 'essentials' for a ship long ago, but a wheeled vehicle presented all-new challenges for the art team.

During development our land vehicle was known only as 'the buggy' by the development team. It was decided a few weeks before we revealed Elite Dangerous: Horizons at Gamescom 2015 to make 'the buggy' an 'SRV', or Surface Recon Vehicle.





This early concept features dust trails. We always knew those trails would ground the vehicle and make you feel like you were interacting with the planet surface. We were excited to add tire tracks in our 2.1 update, further enhancing that sense of reality.

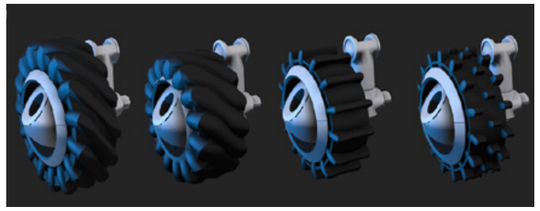


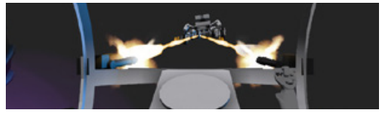
THE SCARAB

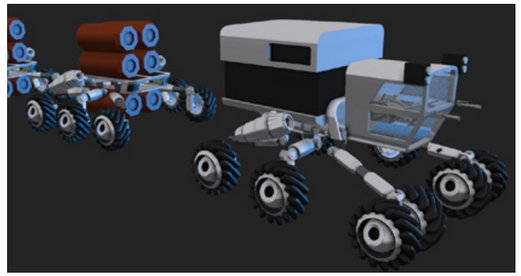
We designated our first in-game SRV the 'Scarab' and imagined that other SRVs might have insect names.

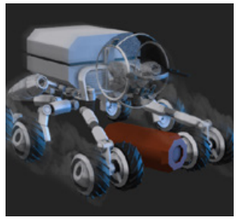
We looked at some SRV variation while working on the Scarab, including trailers and missile racks.

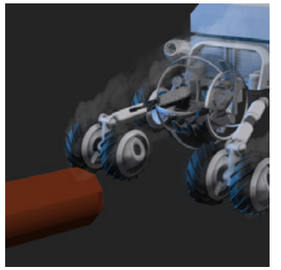
There were many requirements to consider, even before looking at whether the design would be fun to drive, but in the end it was those requirements that would give the Scarab SRV its rugged and credible feel.

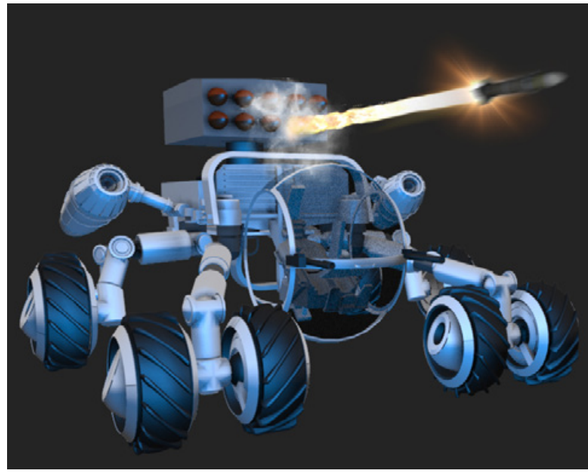








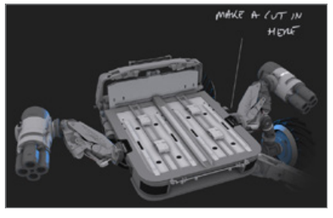


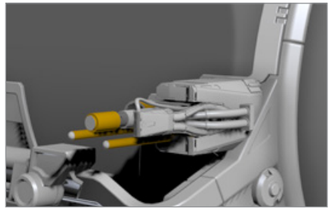


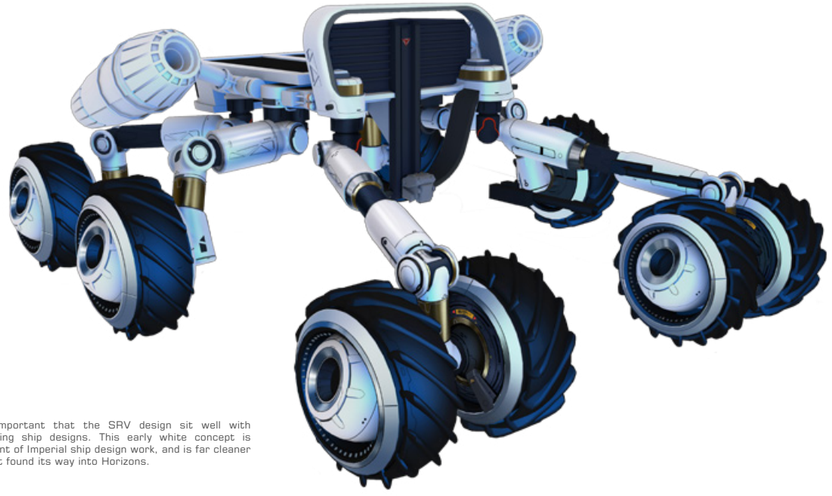
We wanted to make the SRV work with all ships, from the Sidewinder to the Anaconda. The challenge was to come up with a design that could fit through the six-by-six meter cargo aperture, common to all ships.

For inspiration we looked at the Lunar Rover which was designed to stow away in the Apollo module. This suggested the folding design of the Scarab, but the craft itself looked too flimsy to be used in combat or for crossing rugged terrain at 100mph.

We experimented with different designs, but ultimately the insect-like footprint seemed the best. We added a further pair of wheels to the front legs to protect the chassis when hitting a steep upturn in the terrain and help prevent the vehicle getting stuck.







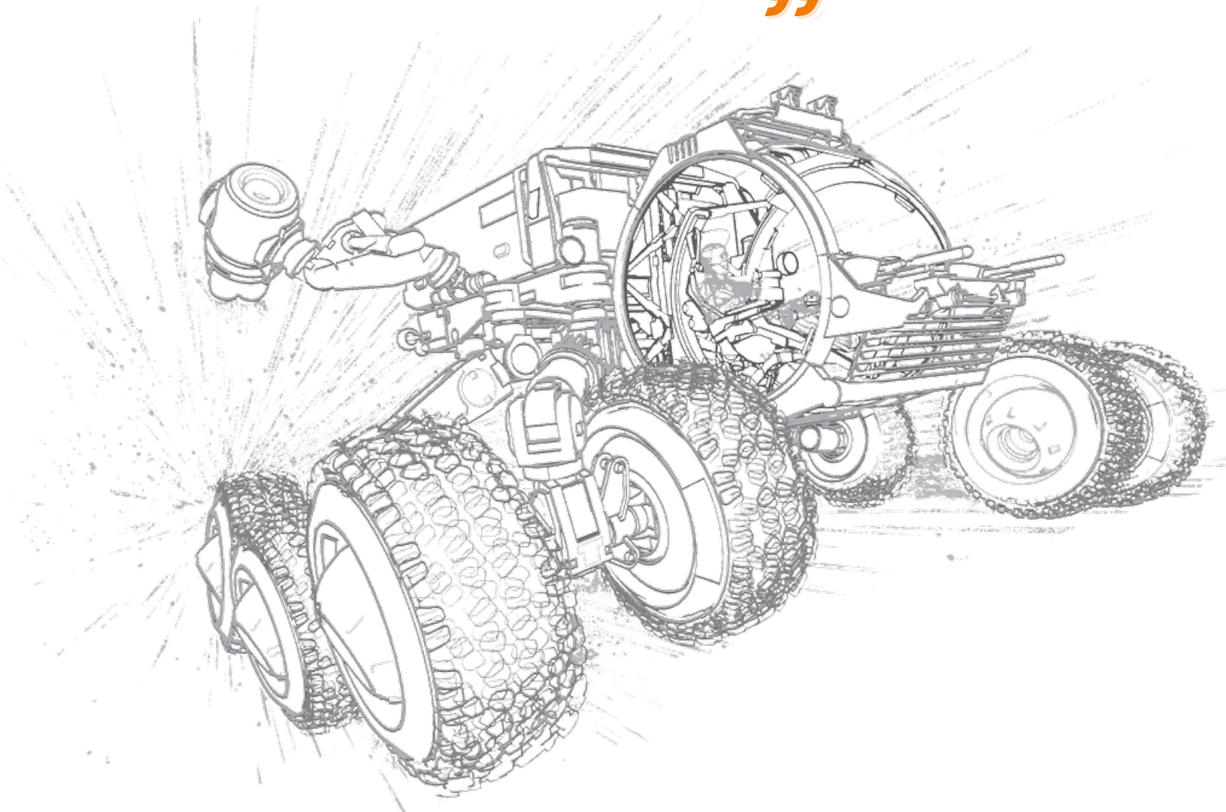
It was important that the SRV design sit well with our existing ship designs. This early white concept is reminiscent of Imperial ship design work, and is far cleaner than what found its way into Horizons.

Knowing the planet team were creating some stunning locations we wanted to keep the view as clear as possible.

The earliest concepts considered seating the player on the exterior of the vehicle with only their space suit to protect them, much like the Moon rover. But Elite Dangerous' galaxy is often hostile and the glass bubble seemed like a good compromise of protection and visibility. Players can even look down and see the soil beneath their canopy.

The SRV quickly took on an aggressive, insectoid appearance almost purely down to the constraints real science and functionality imposed upon us: six legs for stability, a clear canopy for visibility and protection, and a folding design for transportation.

"THE SRV TOOK ON AN INSECTOID APPEARANCE"



The flexibility of the Scarab's six 'legs' had gameplay implications that were tackled by our designers, creating a bouncy, rugged vehicle that feels as at home leaping from the edge of a crater at 100mph as it does carefully prospecting for loot at a crash site.

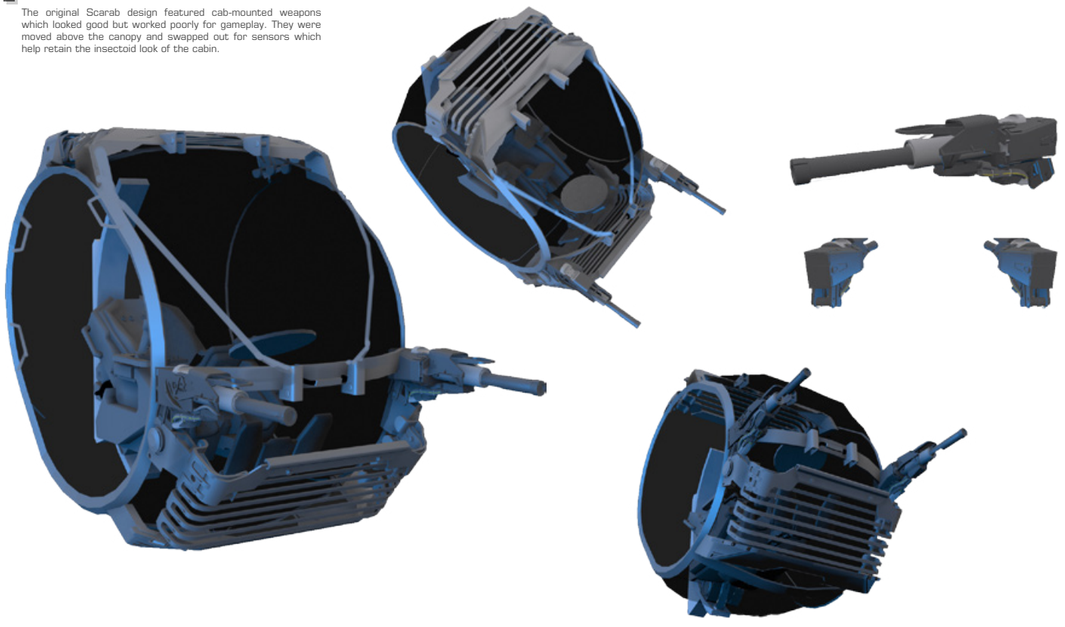
REALITY CHECK

For gameplay, the SRV had to be able to handle worlds where gravity would dramatically affect traction, and it would need to be self-righting should it ever roll over.

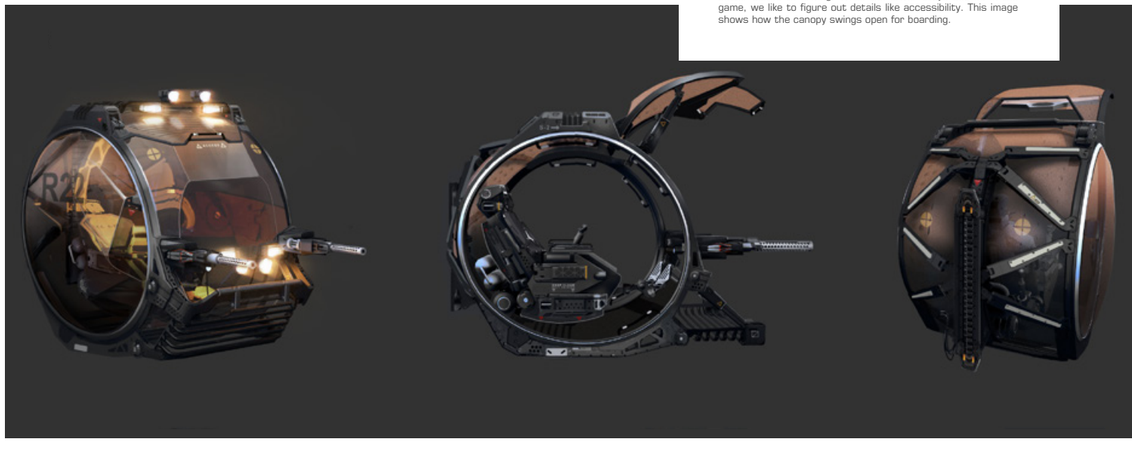
One early idea which stuck was the idea of thrusters mounted in the wheels that would angle up or down depending on the gravity of the world, giving downforce to increase grip, or allowing short bursts of flight. It was a feature that even appeared in the early 'ride-on' version of the SRV, and it remained in the final designs.

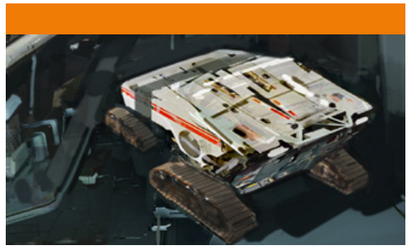
In the end those thrusters were mounted to the vehicle's rear and wheels for aesthetic and practical reasons. They're a functional feature that give the SRV a unique look.

The original Scarab design featured cab-mounted weapons which looked good but worked poorly for gameplay. They were moved above the canopy and swapped out for sensors which help retain the insectoid look of the cabin.



Though smaller than our ship cockpits, the SRV's cockpit is no less detailed and features a new chair and a seated position better suited to driving. While the driver stays seated in the game, we like to figure out details like accessibility. This image shows how the canopy swings open for boarding.

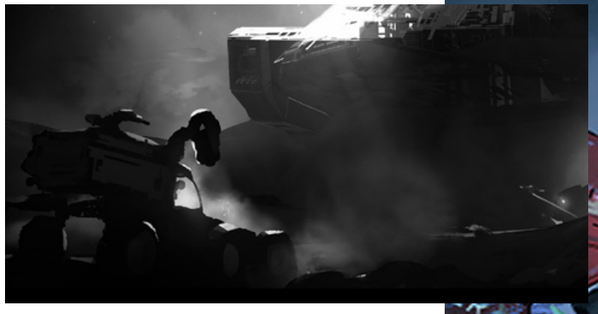




ALTERNATE DESIGNS

Working up concepts for alternative SRVs and other ground-based vehicles with their own character and specialist roles was a valuable exercise that informed the simple skeletal design of the 'basic' Scarab.

Vehicles ranged from heavyweight industrial SRVs, all the way up to colossal articulated vehicles and even an entire city on tracks.

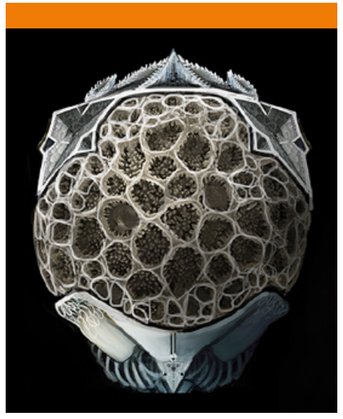


We wanted a ground level image to show the SRV in a non-combative setting. Artists tried a few compositions that show the vehicle discovering a flight data record from a crashed ship before producing the final image you see here.

INTO THE UNKNOWN

A MYSTERY TO UNRAVEL

“BEAUTIFUL BUT DISTURBING”

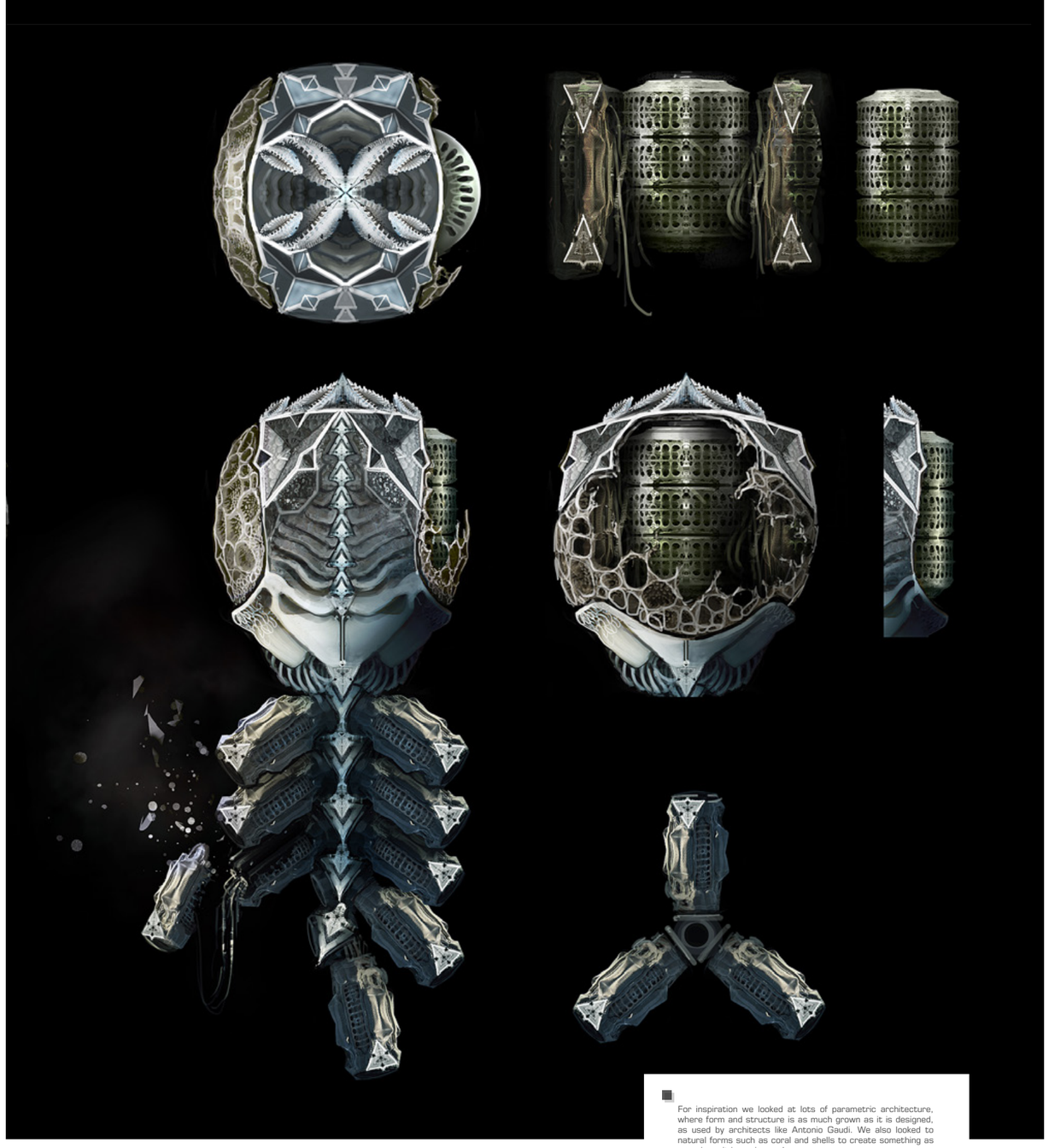


AN UNKNOWN ARTEFACT

The ‘Unknown Artefact’ was one of Elite Dangerous’ first great mysteries discovered by players and an object many players considered the first proof we are not alone in the galaxy.

For this artefact we wanted to come up with an object that felt very different to the usual ships and stations. It needed to show a different technology and construction method that was wholly inhuman. It was an interesting to design an object that had to be so ambiguous in it intent. The intent was to provoke a lot of speculation among players who found them as to where they might originate from and what purpose they might serve.

This is definitely a style you will see more of in the future.



For inspiration we looked at lots of parametric architecture, where form and structure is as much grown as it is designed, as used by architects like Antonio Gaudi. We also looked to natural forms such as coral and shells to create something as organic as it is engineered.

THE HERO IMAGE

THE KEY ART OF ELITE DANGEROUS

WHAT IS KEY ART?

Key art is intended to sum up the game and encapsulate the content in one striking image. It should be a perfect moment that speaks of the game's values. It could be a single action shot, a classic character pose or a simple iconic image.

Elite Dangerous was Frontier's first major self-published game. Past key art for Frontier's earlier titles was largely handled by publishers, but for Elite Dangerous the task fell to Frontier to produce those assets in-house.

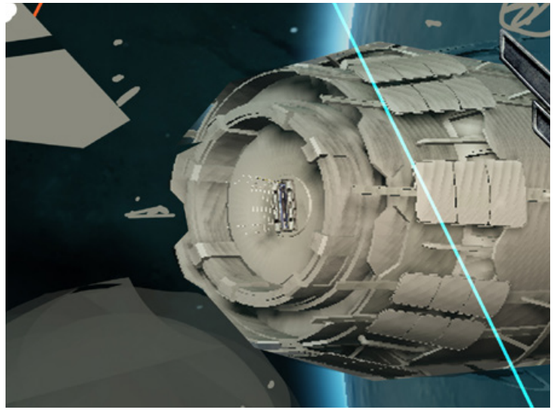
The art team worked with the fledgling marketing team to produce key art that would be published on banners, web pages and in magazines.

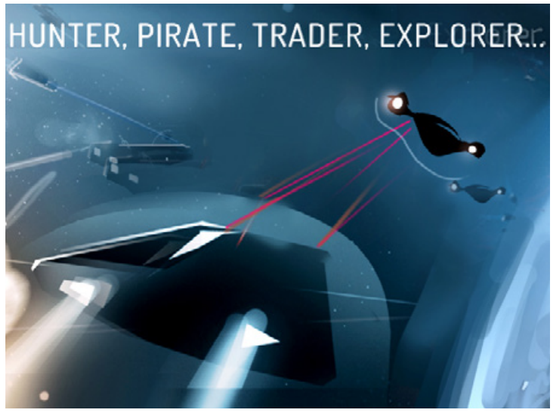
E3 BANNER ‘14

For Elite Dangerous’ first appearance at E3 we designed a 10 meter-wide banner to hang above the LA Convention Center’s west hall.

Today we are able to use in-engine assets as a base for our promotional artwork, but at the time the lighting engine and shaders were still early in development. Instead we worked with pre-rendered 3D assets and painted over them in Photoshop.

Working with artwork this large can be a huge drain on system resources so we split the image into parts, working-up elements like the main explosion, the Cobra and the starport separately before compiling them into one image.





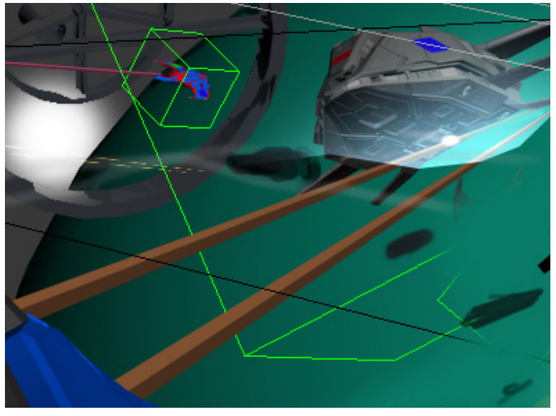
A lot of our early sketches show different starports, but we finally decided to go with the Coriolis which was recognizable from the original games for many of E3's visitors.

E3 BANNER ‘15

Elite Dangerous’ key art is traditionally drawn from scratch, though we have the advantage of our in-game assets being optimized for 4K, 8K and 16K resolutions. We generally use elements captured in-game at very high resolution to create montages and paint over them where necessary to create our key art.

We treat our key art almost as our version of a movie poster. This non-literal approach lets us pack in a variety of elements from the game, sometimes playing fast and loose with scale and realism in favor of a pleasing composition. We’re sorry to all the scientists we offend along the way.

By far the biggest project was our banner for the 2015 E3 gaming show in Los Angeles. Lead Artist Xavier Henry worked up an image featuring classic and then-new ship designs.

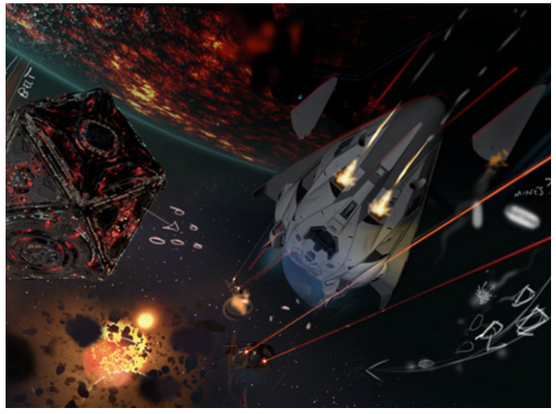


This art was printed as a 10 meter-wide banner and was suspended above the entrance to the west hall of the LA Convention Center for the three days of E3 2015.

We decided upon a simple faceoff: Independent ships in conflict with a Federal fleet. We had recently added visible pilot characters to the game and we wanted to showcase this so initial sketches placed the 'camera' very close to the ship, a Federal Fighter.

With the main direction established we blocked out several scenes in 3D. The shape of the real ships turned out to be quite different from our sketches and didn't fit as well. We finally settled on the Asp as our main craft. The large canopy would let us clearly show the pilot and the top-mounted hardpoints would allow us to show the ship's weapons firing.

The final art was 35,000 pixels wide and many layers deep. Artist Xavier Henry received a RAM upgrade for his studio PC to accommodate the massive image.



XBOX ONE KEY ART

Our Xbox One key art was prepared for the May 2015 issue of Xbox: The Official Magazine.

Early designs toyed with the idea of using the Coriolis starport in the background, introducing the console audience to the Elite galaxy's most iconic starport shape. The final design used the more 'open' ringed starport to meet the needs of the magazine's layout and give the left-hand side more breathing room on the opening double-page spread.

It has since been replicated on banners and in other magazines, and even became the dashboard icon for the initial release of Elite Dangerous on Xbox One.

We planned to make an image of two halves, with action on the right and a calmer left to allow room for text and magazine page furniture. The Fer-de-Lance was brand new at the time and its dynamic arrowhead shape was a perfect fit for the job.

The Adder was another recent addition to Elite Dangerous and made visual sense. The image pitted the angular Core Dynamics ships against the sleek new Zorgon ship. The warm tones of the ship, explosions and projectiles were contrasted efficiently by a cool background and blue trails.

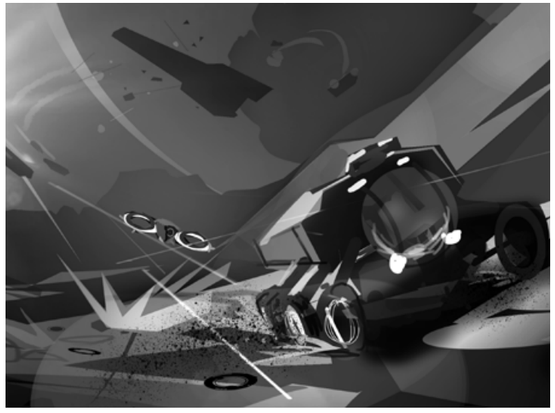
HORIZONS KEY ART

With Horizons, Elite Dangerous' scope exploded. For this Hero image we were after a horizontal panorama that would showcase as much gameplay as possible and give a sense of the tremendous range of scale a player can experience in Elite Dangerous: Horizons.

We needed to represent the game from planetary settlements to monumental Coriolis starports, and from combat with a small skimmer to a battles between massive ships.

Finding a way to represent all these different scales in one picture was challenging but exhilarating, with each new black and white sketch we tried to top the previous one, to make it even more impressive.

Most of the art pictured here was captured in-game then merged and painted over where necessary, but the Horizons key art was completed before some of the gameplay was implemented and even before some 3D assets were finished. For this reason the settlements are concept art and not the final in-game 3D models.



This image was first used in December 2015 for the launch of Elite Dangerous: Horizons. It has been used on websites, in print and on banners at live events, and has been modified many times depending on the constraints of the space in which it was used.

ENGINEERS KEY ART

This image was used to promote Elite Dangerous: Horizons' The Engineers update in May 2016.

With the introduction of The Engineers, showcasing them was an easy decision. The first version of our key art had a neutral planetary background but it lacked a link to Horizons and The Engineers' bases, so a second background was created for alternate use.

CQC KEY ART

This image was included in the E3 2015 press kit to promote the upcoming CQC game mode, and was later reworked for the launch of Elite Dangerous: Arena.

FACES OF THE GALAXY

THE CHARACTERS OF POWERPLAY

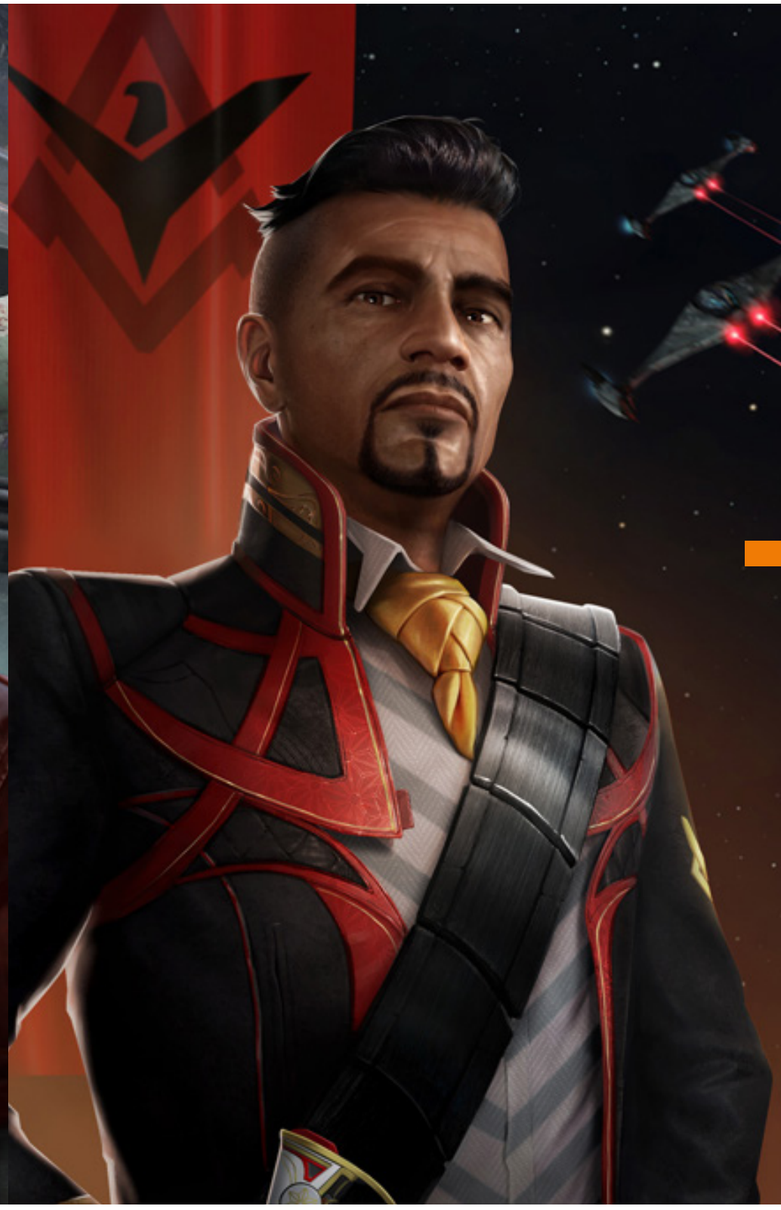
POWERPLAY

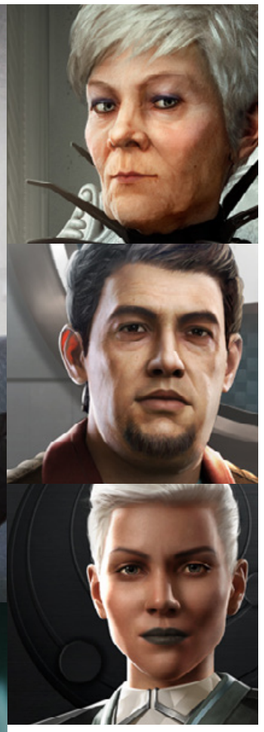
Powerplay was a major update for Elite Dangerous, allowing players to side with the galaxy's most influential figures and help them expand their territory and influence.

It was important to put a face to these figures, which led to us creating our first 'official' character art for Elite Dangerous.

The starting point for each character was an outline of their personalities, politics and attitudes from David Braben and Executive Producer Michael Brookes. From this outline our concept team developed each character's look, pose and backdrop.

Faces were generated using our work in progress Commander Creator. Clothing and hair were created by our concept artists in 2D, and designed to fit the already established aesthetics of the Empire, Federation and Alliance.





PUT IT ON THE BOX

PACKAGING AND PROMOTION

BOX ART

Although Elite Dangerous was delivered to most players digitally, we were lucky to be able to make a special boxed edition for some Kickstarter backers and for the Frontier Store.

The artwork was once again designed with flexibility in mind. While the art was intended for the box, it has been used on EliteDangerous.com, in banner advertising and at events.

OST

With multiple folds and a very wide format, the soundtrack CD inlay presents an interesting design challenge. We made the challenge greater for ourselves by insisting the entire CD inlay should work as a single piece of art on front and back when unfolded, as well as incorporating the track listing into the imagery.

Artists Sam Piper, Xavier Henry and Paul Worster worked with Frontier's Head of Audio, Jim Croft, to capture the spirit of Elite Dangerous' audio in an image. The composition the team came up with is intended to represent the sound and essence of Elite Dangerous.

PREMIUM BOX

As part of the Kickstarter rewards some backers received a physical boxed set including a copy of the game, novel, polo shirt, pin badge, original soundtrack and more.

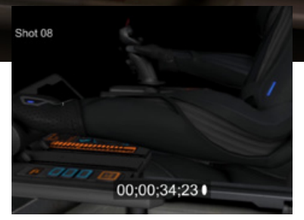
The package was designed with unboxing in mind. We wanted owners to feel they had received something special. The boxed set was nominated and 'Highly Commended' in the 2015 British Luxury Packaging Design Awards.

LAUNCH TRAILER

For the release of Elite Dangerous we needed a cinematic trailer to complement our previously released gameplay trailers. While most of our trailers are created in-house and rendered from the game engine, the Elite Dangerous launch trailer was outsourced to allow the game team to concentrate on finalizing the game.

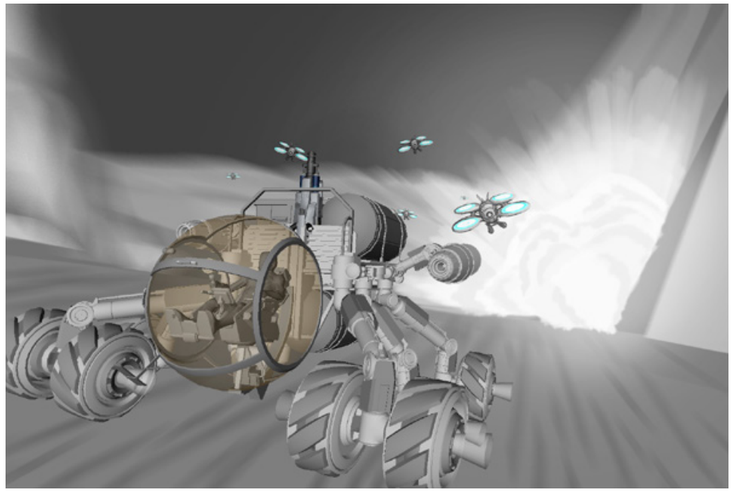
Frontier provided visual FX house RealtimeUK with a rough animation and storyboards, as well as providing total access to in-game assets and art.

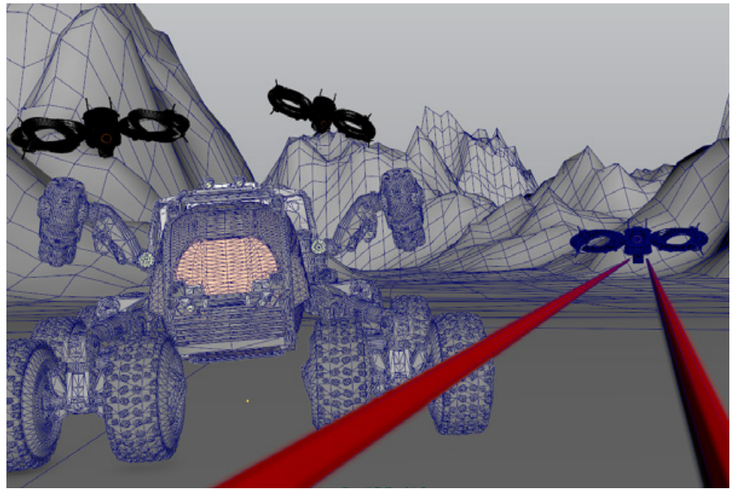
The concept was to put the emphasis on our pilots and convey to potential players the role they would assume in-game, illustrating mining, frameshift travel and combat, all compressed into a brief trailer. Though we took some liberties with how things linked together, the trailer was successful in capturing the mood and the spirit of the game.

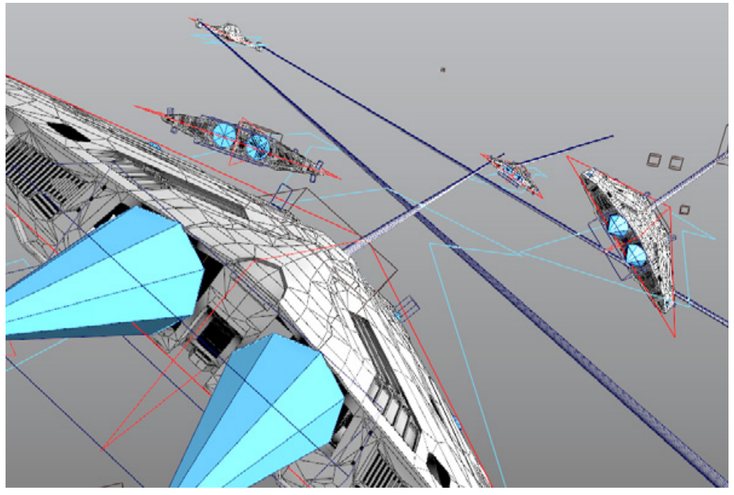


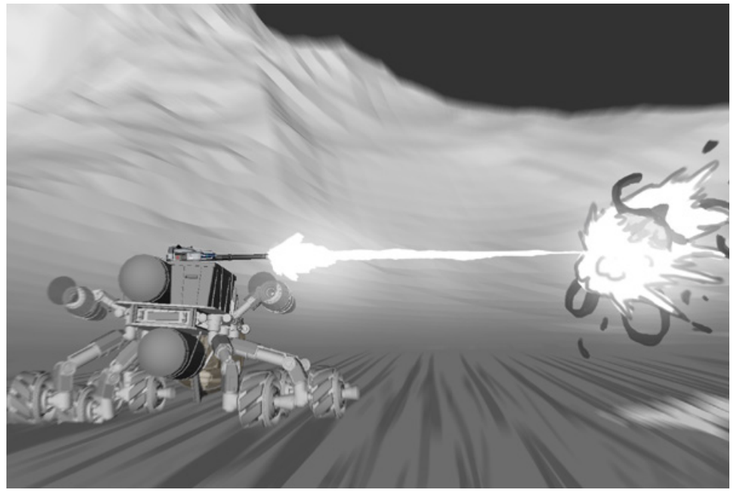
The cinematic launch trailer was used in December 2014 for the launch of Elite Dangerous.

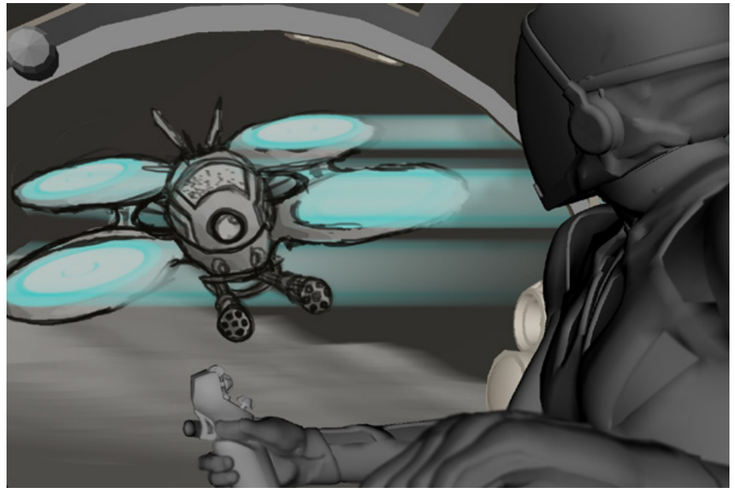
Frontier worked on key frames of the trailer which were sent to RealtimeUK as reference. Trailer assets and the environment were recreated by RealtimeUK using in-game assets as a base.







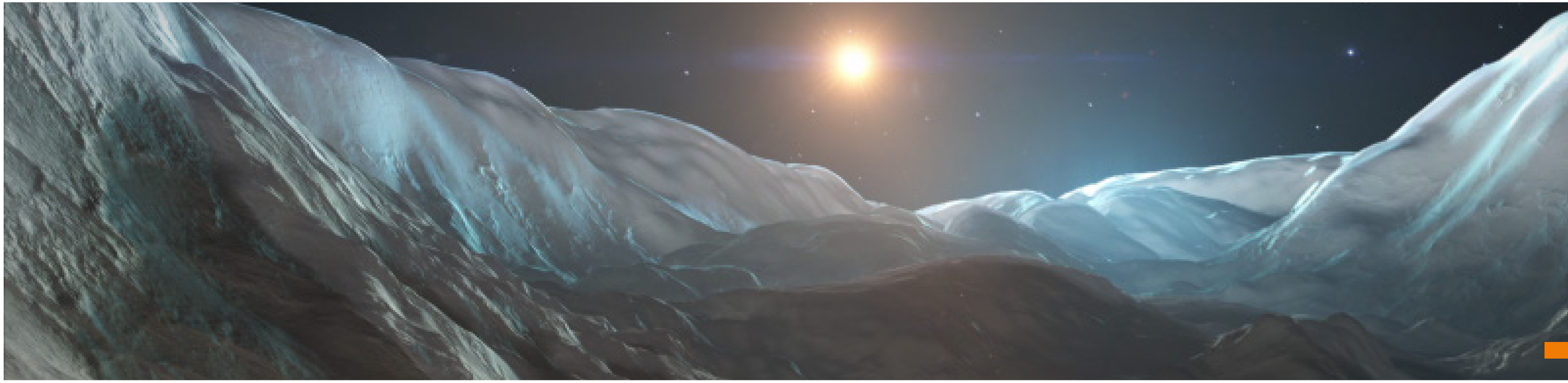


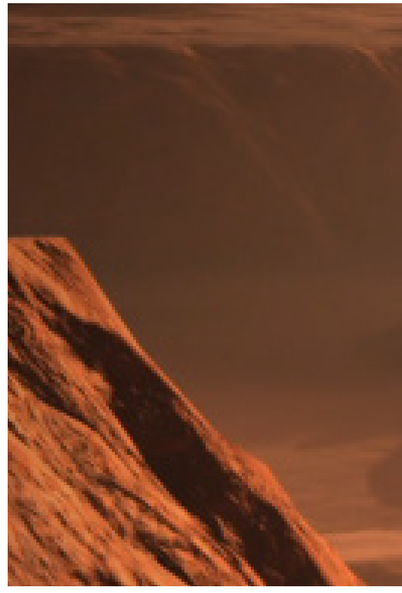


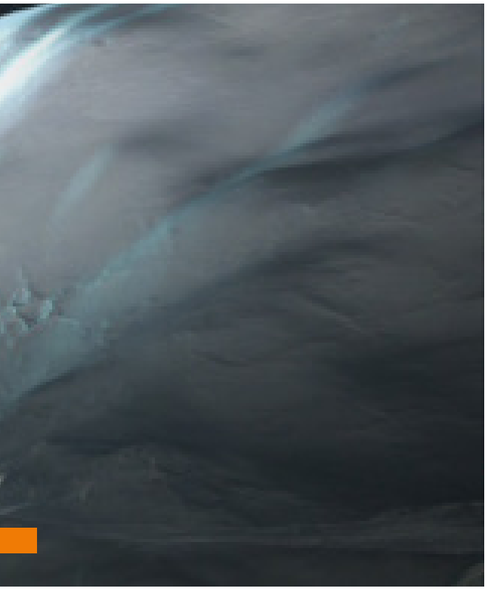
Each trailer is designed to do more than simply showcase the new features we're adding to Elite Dangerous. We aim to evoke how we hope players feel when playing Elite Dangerous, and to capture players' imaginations.

With the exception of our pre-rendered launch trailer, all our footage is generated in our own engine, but we take the opportunity to show the game from outside the cockpit in a more cinematic framework. We push our engine to its limits with carefully designed lighting and compositions.

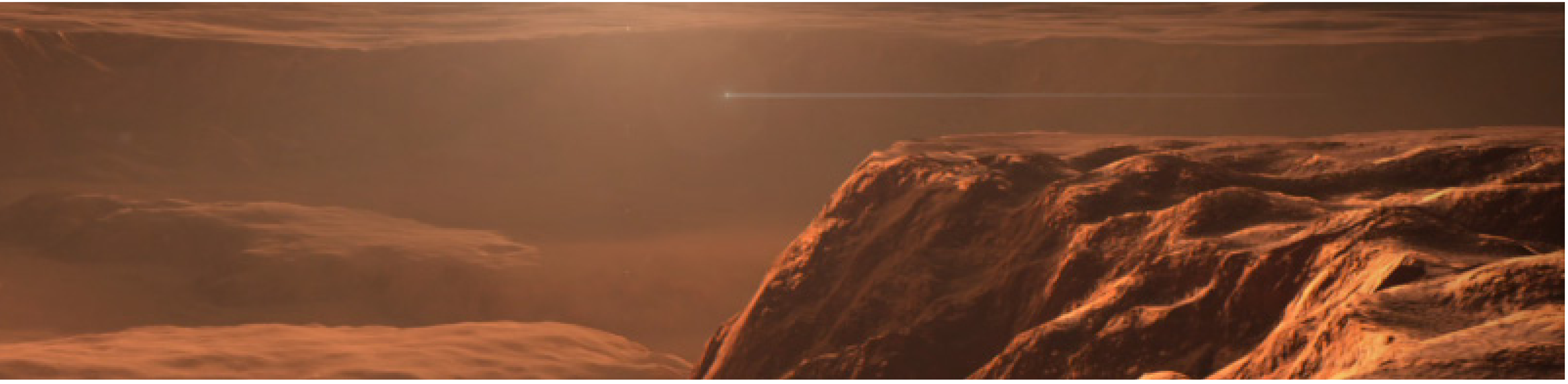
On these pages you'll find a selection of images from our trailer production pipeline, from storyboards to images captured in our animation package.







These landscapes are the planetary terrain from our Horizons launch trailer. The image to the left shows our subsurface scattering shaders used on ice worlds, illustrating the luminous effect the sun has as it shines 'through' the ice. The image to the right captures the warm light of the sun hitting the dust in the canyon.



BEYOND 3302

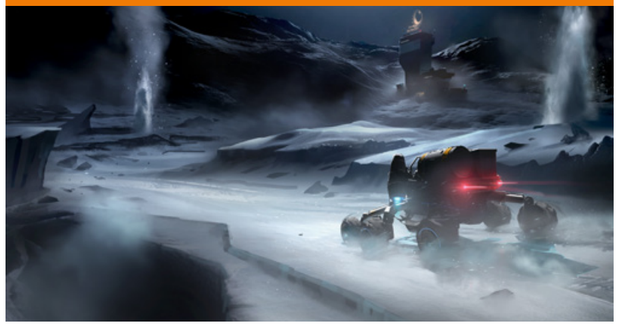
THE FUTURE OF THE ELITE GALAXY

INTO THE FUTURE

We're always looking to the future. That focus on what comes next has influenced every design you've seen in this book, from a working landing gear with a boarding ramp, to starport walkways built for standing on.

Some of the designs developed early in development have been added in recent updates and some concepts will come to fruition in future releases. Inevitably, some concepts will fall by the wayside as plans change and the game design evolves.

But we're prepared for the future. We've prepared for Elite Dangerous, for Elite Dangerous: Horizons and beyond. We hope you'll journey with us as we build the Elite Dangerous galaxy together.

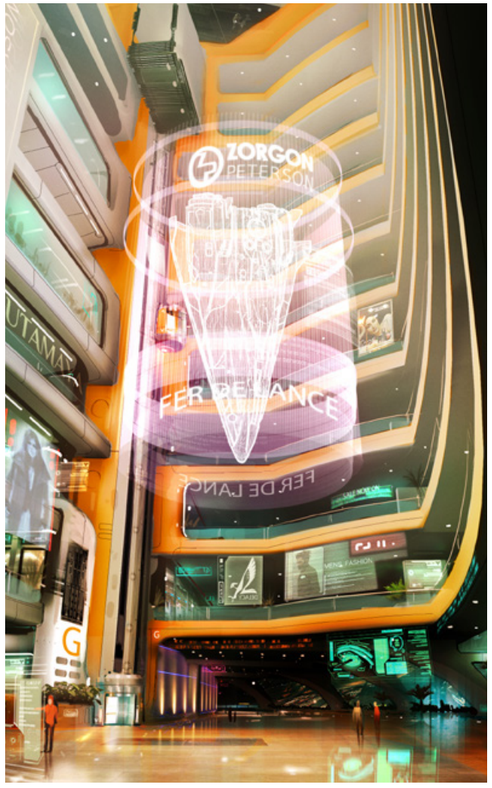


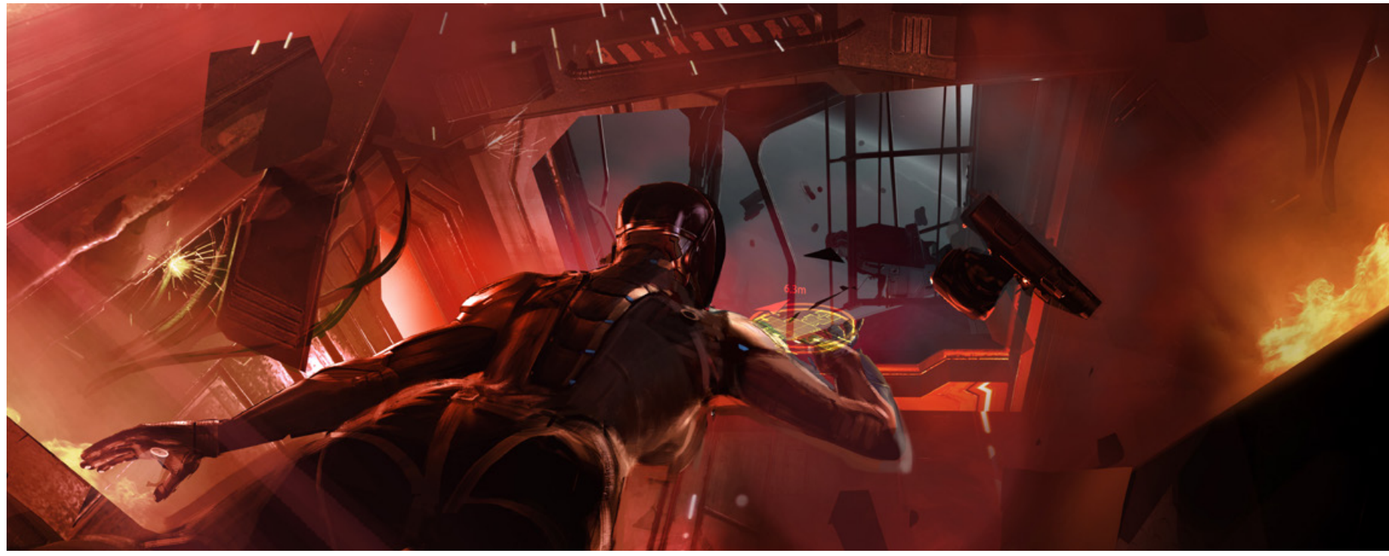
Many designs focus on livable spaces. While those concepts are built with distant future gameplay in mind, they all inform designs created for the present. Early costume designs for the citizens of the 3300s have already found a use on the bodies of our Powerplay figureheads and our mission avatars.

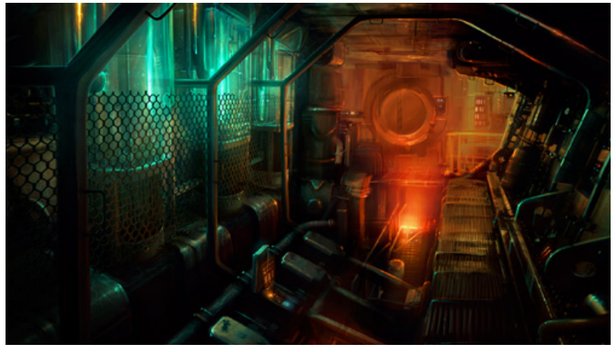
We think a great deal about the spaces our citizens inhabit. The way people live in space would certainly be unlike living on a planet surface, but familiar structures and 'natural' features would go a long way to make humans feel at home among the stars.

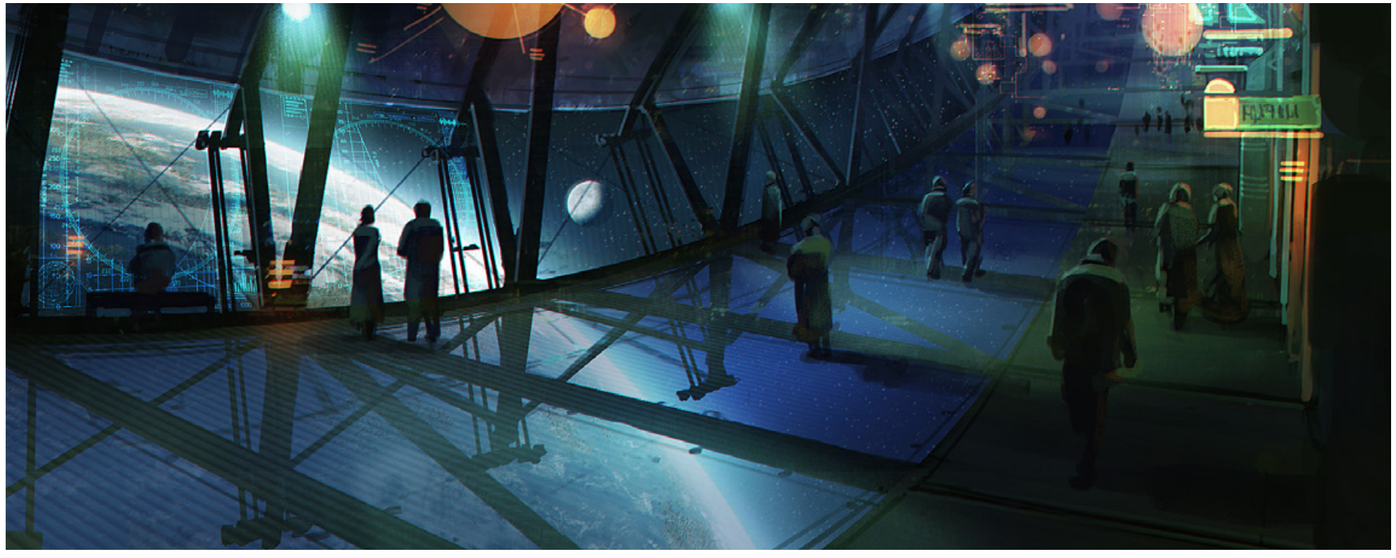
Like our ships, living spaces start with utility. Whether a space is meant to be navigated with or without gravity changes every aspect of our design work, as does its practical day-to-day use.

Regardless of how they're eventually used, images of the Elite Dangerous galaxy like these are useful for the art team to maintain a cohesive vision and make the world feel real.









A good deal of thought has gone into the human spaces. The work can be seen in a number of places inside and outside stations, through windows and through the glass covering habitation rings.

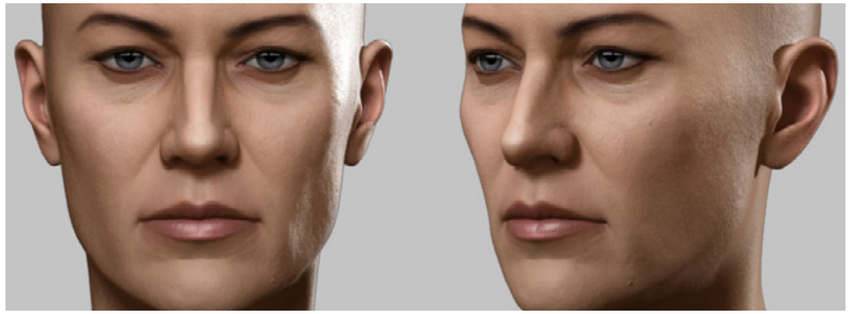
Exploring a stormy nebula is an experience that has always appealed to us, and is a concept we would like to revisit.

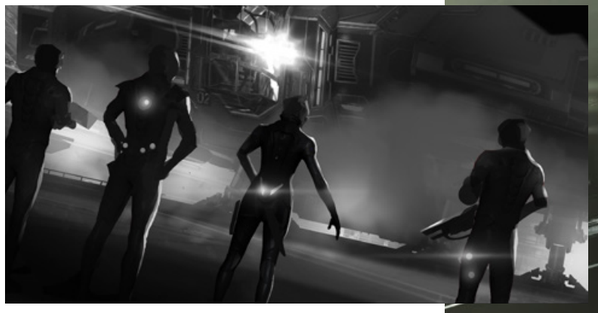
AVATARS

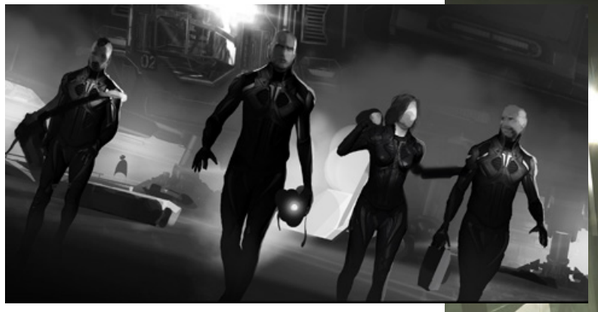
Elite Dangerous players have seen avatars of a sort since the first release of the game. Look down in the cockpit and you will see virtual representation of your torso and legs wearing the standard issue flight suit.

So far players have been limited in their ability to customize their avatar, only choosing the gender of the body they want to see in-game. That will change when the Commander Creator arrives, allowing you to design a face for your character that will be visible to other players.

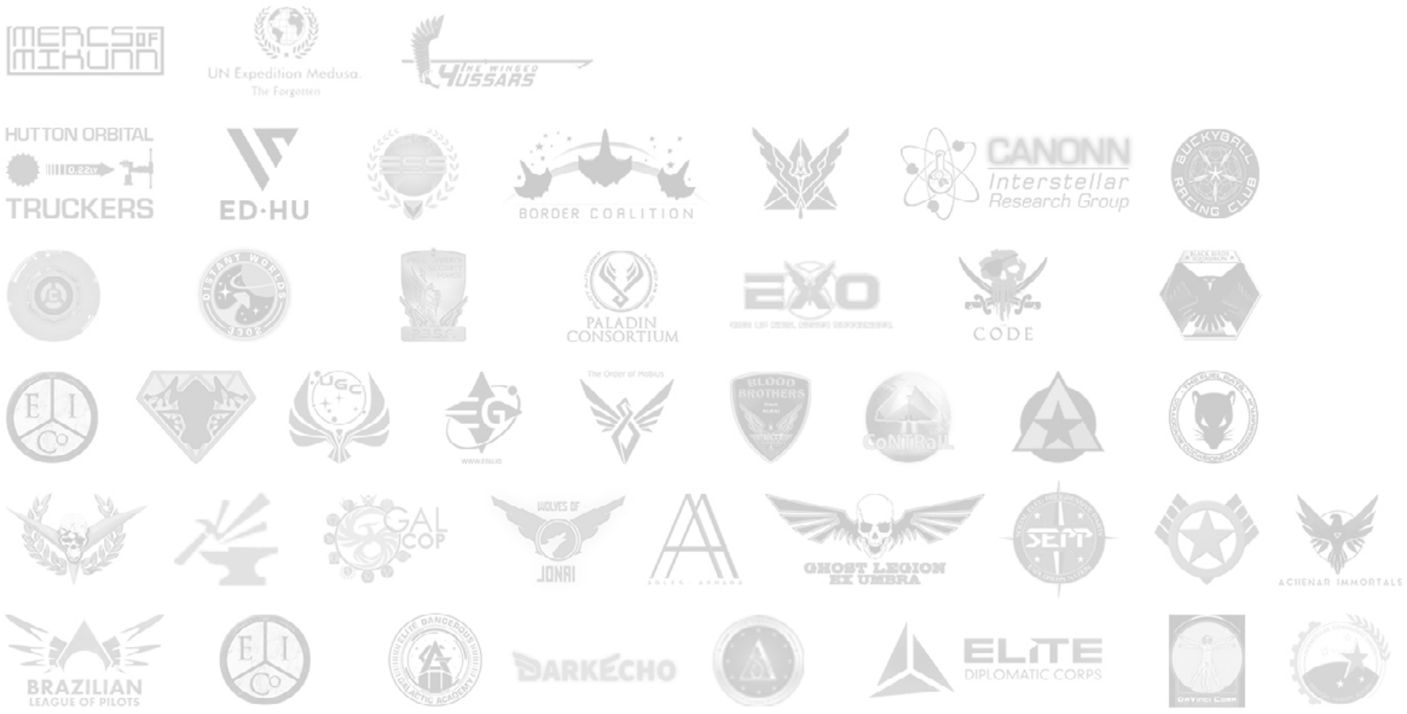
It's an exciting addition to the game that will make friends recognizable at a glance across the bridge of your multicrewed ship.







A crew returns from a successful mission. Images like this help define the world of Elite Dangerous beyond the cockpit, and point the way to upcoming features like multicrew, Commander creation and costume customization.



RIGHT ON, COMMANDER

The community is what makes the Elite Dangerous galaxy so vibrant, exciting, dramatic and engaging. We are captivated by the heroic, bold and often hilarious activities that you, as individuals and within player groups have become synonymous with.

As sure as all the suns across the galaxy will set, as sure as the planets will keep turning, as sure as Elite Dangerous' Commanders will trade, fight and explore, we know we will be astonished by your inspiring dedication and creativity.

Thank you for playing in our galaxy.
The Elite Dangerous team

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Music system design &
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Empire Station Voices
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Anisa Sanusi

Alliance Station Voices
Laura Bibard
Matthew Florianz
Johannes Klatt
Radek Walachnia

Anarchy Station Voices
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Kobna Holdbrook
Tjaart Kruger

Jaques Station Voice
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Federation Flight Control
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Alliance Flight Control
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Anarchy Flight Control
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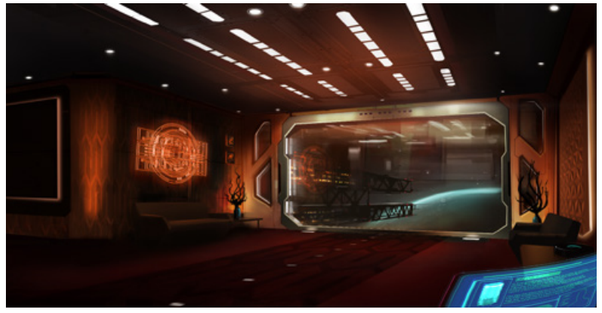


542 APTS 0700-0750
SECTOR 42


FLOOR
4
RECEPTION

THE ART OF ELITE DANGEROUS

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