

JUMP POINT

ISSUE: 06 06

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FROM THE COCKPIT

GREETINGS, CITIZENS!

This month, the team at **Jump Point** have dug up an extended look at *Star Citizen's* imminent mining mechanic. We talk to a number of the key developers who are working to make the first iteration of mining happen in Alpha 3.2, learn the in-world history of the MISC Prospector, and take a look at the long development of *Star Citizen's* large salvage platform, the Reclaimer. The addition of mining to *Star Citizen* feels especially significant to me as it represents a move from building the world in which the game will live, to the specific gameplay mechanics that will grow within it and define the ultimate experience. As mining and other complex career mechanics come online, our 'verse truly comes together!

As mentioned last month, I'm taking over the editorial duties on **Jump Point**, starting with this issue. So... be gentle! In future issues, I'll use this space to continue to inform your *Star Citizen* journeys... but I feel I would be remiss with this inaugural column if I didn't first thank Mr. David Ladyman for his incredible work with **Jump Point** over the last five years. When I was growing up, I would learn the credits for Origin games the way other kids memorized baseball rosters. As a result, David Ladyman was one of my

game development heroes, the man behind Origin's immersive manuals and expert official guides. I would never have predicted that I would someday get to help him publish a monthly magazine about an even-more-exciting space adventure... so it was the honor of a lifetime to work with him on **Jump Point** and I sincerely hope we will be able to continue to live up to the standard he set.

I'd like to close by reaffirming to subscribers that **Jump Point** is YOUR magazine. Putting these articles together each month is a small thing we can do in return for your decision to go above and beyond in supporting the game. I helped put together the original plan for **Jump Point** back in 2012, where we pitched the idea as a '4-6 page newsletter' with updates about the game. The fact that we quickly exceeded that goal by several multitudes is because of the passion you sent back to us. The excitement and the shared dreaming that made us want to keep doing a little more. As such, my inbox is always open and I would love to hear what you'd like to see as **Jump Point** continues to evolve. From future articles and features to what you'd like to see us change, your feedback will help make this space even better.

Ben

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DEVELOPER INTERVIEW

MINING MECHANIC

Mining is here! *Star Citizen* Alpha 3.2 includes the first public release of the long-awaited mining feature. Development of mining started in late 2014 alongside the Orion concept ship and had advanced significantly alongside the development of *Star Citizen's* virtual worlds. What did it take to integrate the system into an already-complex game and what's still to come? We sat down with several key team members to ask just that!

BEGIN TRANSMISSION →

JUMP POINT (JP): *Howdy and welcome! Let me start by asking everyone to introduce yourselves. What's your name and what do you do on Star Citizen?*

DAN TRUFIN: Hi my name is Dan and I'm an alco ... wait, wrong interview. Hi my name is Dan Trufin and I'm the Lead System Designer in the Frankfurt office.

OLEG BERCEA: I'm Oleg Bercea and I'm a UI designer.

MAXIMILIAN KEILICH: Hey! My name is Max and I'm an artist on the German environment art team.

PAUL BROCKLEHURST: Hi, Paul B and I'm a gameplay coder.

MIKE SNOWDON: I'm Mike Snowdon, VFX Director.

JP: *Again, thank you all very much for taking the time out for this interview. Can you each tell me how you've been involved with developing the mining system for Star Citizen?*

MAX K: Together with our graphics team in the UK, I was responsible for creating the look of mineable rocks, creating the geometry and textures, as well as finding a way to fracture the rock into smaller pieces. I also developed the look of the laser hitting the rock and the rock reacting to it.

DAN T: My involvement with the mining system kinda started with taking the original direction that was outlined by Tony in the Orion/Mining brief from a few years ago and fleshing it out into a working design to fit smaller ships like the Prospector. From there, once a design was approved, I created a small gameplay prototype to prove that the idea was good and played well. After that, it was more a job

of working with all the departments in the mining team to ensure the design gets put into the game in as good a shape as possible for the deadline we were given.

PAUL B: I wrote much of the gameplay code for the feature, including the mineable rock entity and the charging/explosion/extraction mechanics. I also wrote the code for spawning minable rocks on planets, controlling the resource distribution, the mining mode for the vehicle, and for selling your mined material.

OLEG B: As a UI designer, I worked on the visual part of the mining and animation. At the start I had the wireframe and the UX of the HUD so I was challenged to design a nice and simple user interface. After the design was approved, the next step was to create a fully animated HUD to help us see what the final version would look like without the need for coding.

JP: *What was the biggest challenge in going from the initial mining brief to a fleshed-out system?*

DAN T: The main challenge, from my perspective, was time... as there was not much of it. Ideally, I wish we had a bit more to playtest and iterate on the system before it went out to the public, but we did pretty well in the time we had. If we are talking technical challenge, then I would guess it was the fact that mining touched on a lot of other systems like scanning, radar, damage tech, weapons, VFX & graphics, shopping, persistence, procedural planets, etc. I think, planning-wise, it was very hard to foresee how much of a disturbance adding mining would be to those systems and teams.

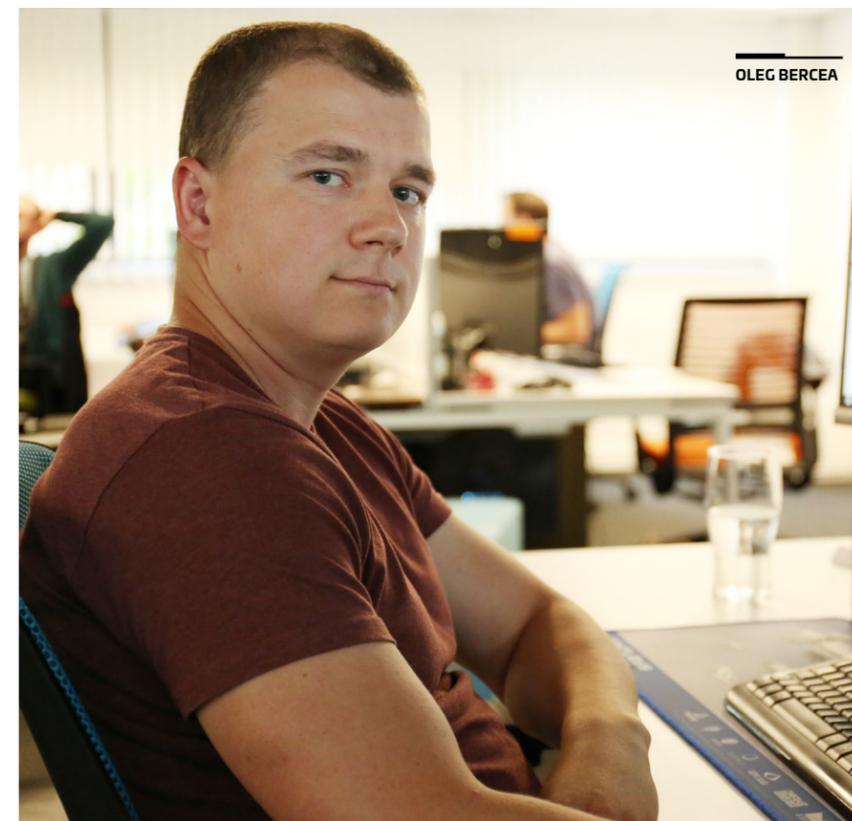
MAX K: Art and tech wise there was a lot of R&D needed to figure out a way to get the mineable rock to look and behave the way we wanted. The biggest challenge was probably keeping the pieces of the rock visually consistent from the big bits all the way down to the last small pieces.

JP: *Can you talk a little bit about that gameplay prototype? How does something like that work broadly, and specifically what did it simulate for mining?*

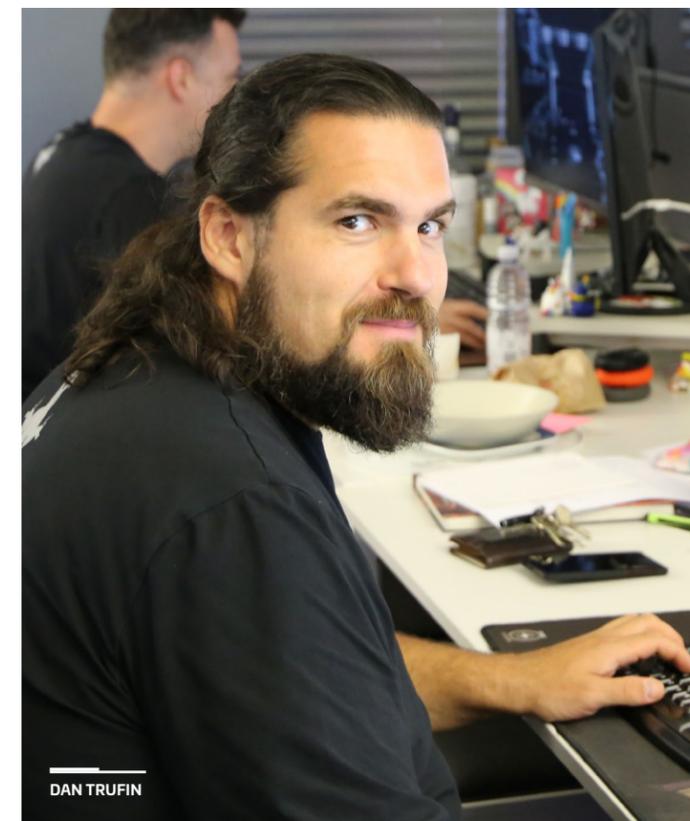
DAN T: We started with a very simple flowgraph that had a fake mining laser throw a badly-made VFX towards a fixed rock. Using a throttle, players were able to control how much energy passed into the rock and, once a certain energy buildup was reached, the rock would blow up. The result of the explosion would be different based on how well you did in the energy transfer. Using too much energy would be detrimental and cause the player to lose material, while using just



MIKE SNOWDON



OLEG BERCEA



DAN TRUFIN

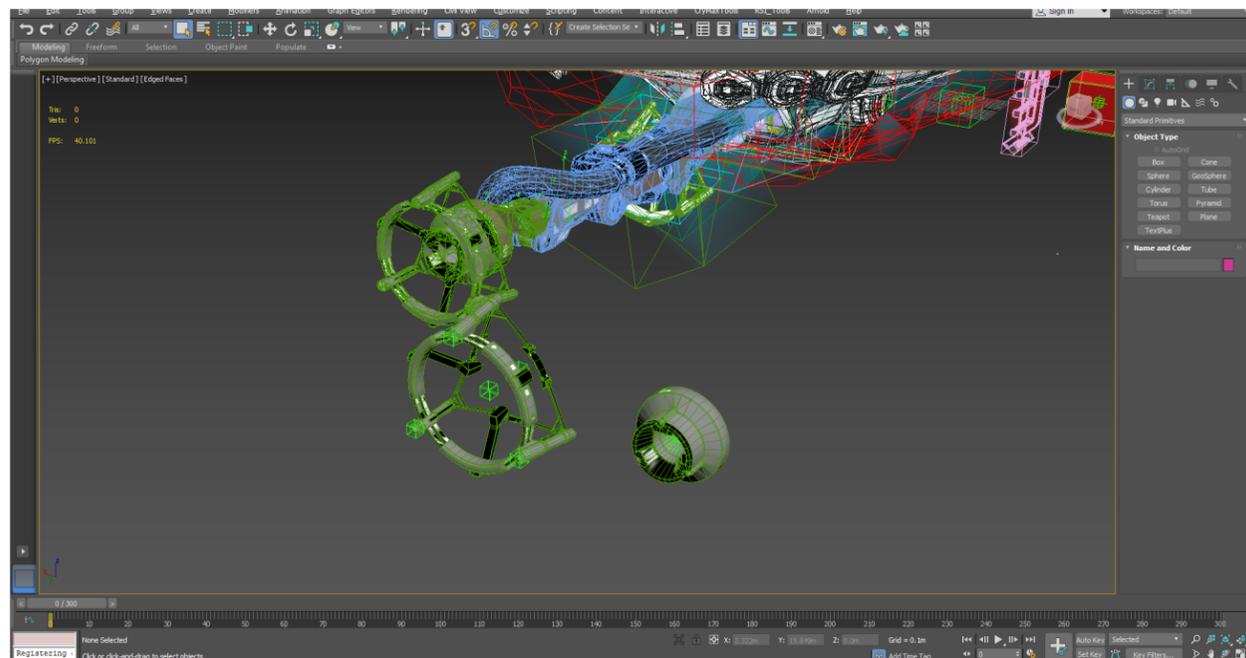
In February 2015, Tony Zurovec completed the broad design document for mining that the teams interviewed here worked from to make the system a reality. Here's a document summary that explains the overall goals for the mining system:

Mining presents players with a variety of challenges requiring skill and intelligence, whereas mindless repetition of a task and idle drudgery are explicitly avoided. There are no aspects of mining that allow a player to simply press a button and wait without concern for a result, or that require players to perform an action repeatedly without some element of thought and/or dexterity coming into play.

Ample amounts of dangerous situations are afforded, despite the fact that combat isn't inherent in any fundamental aspect of the effort. The most valuable materials will often reside deep within a dense field, the result of less experienced pilots being unable to extricate them without suffering serious damage to their ship. Compressed pockets of gas, volatile materials that can explode in the presence of excessive energy (which is required in some capacity in order to liberate the ore from its parent asteroid), and elements that can explode when subjected to seismic vibrations as caused by repeated fragmentation operations all present their own unique types of jeopardy. While most miners will seek to actively avoid armed conflict, the reality is that any ship carrying a cargo of valuable ore will present a tempting target to less scrupulous types, rewarding those players that formulate contingency plans in advance, whether that be the hiring of an NPC crew member extremely talented with a defense turret, or investing a portion of the expected profits into hiring an armed escort or two.

Finally, multiple roles of substance are presented, each of which is referred to as a specialist. Every role can occupy the full attention of a player and present sufficient challenge to keep them engaged, or assigned to an NPC whose skills are commensurate with their monthly cost.

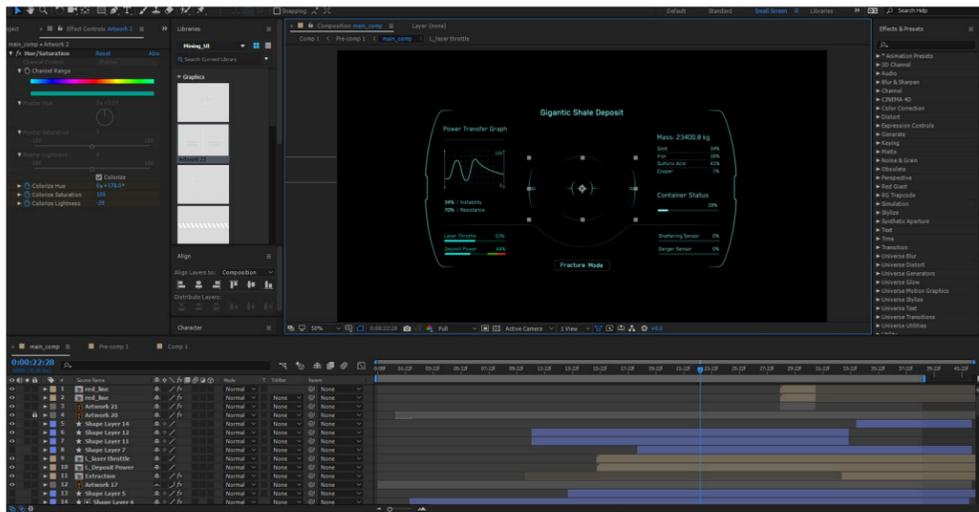
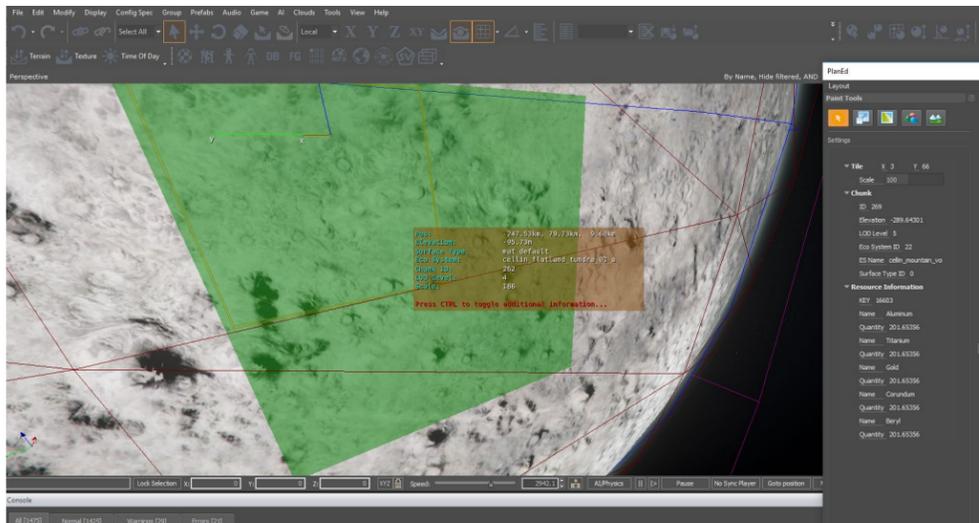
You can find the entire design post archived on the Roberts Space Industries website at <https://robertsspaceindustries.com/comm-link/transmission/14522-Star-Citizen-Careers-Mining>



the right amount would give the player a nice controlled shattering, resulting in smaller rock pieces that they could just extract. At this point, the entire UI was text-based and not very accurate, but it kinda gave players enough information to get through the prototype. Once we figured out that the version of the prototype was good enough and showed promise (even with the badly-drawn-designer-art) we involved our art and VFX departments to try to make the process readable just by looking at the rock. Readability was a key factor early on. Once that was proven and we were happy with it we moved into full development. Funnily enough, that while the result looks so much better and visually a million miles from where it started, the original gameplay idea has stayed fairly similar.

JP: Tell me a little bit about the timeline. You created these incredible procedural planets that went into the game last year, was mining something you considered during that process? Did it develop naturally from that work?

MAX K: There is a lot of work that goes into the creation of a new planet, so back when we started work on the moons and Delamar, etc.,



mining was not something us artists thought about. Now however, we do have to make sure that mining rocks fits in with the planets that we created, so there is some work needed to make that happen.

JP: You mentioned needing to integrate mining with a number of existing systems. Did that mean making mining fit those systems as they were, or were you free to alter them? It also seems like mining must impact a number of systems that are still in development, especially the economy. I'm interested in what kind of thought goes into that side.

DANT: There were systems that were already established, like the procedural planets, and also systems that were in development, like radar and scanning. We basically tried, as much as possible, to not bend those systems to what we wanted, but to use what they were already providing and make good use of it. As I said, time was of the essence and having to change a lot meant that we would not deliver on time. Also, those systems are working in a certain way for very good reasons and having us change them just because we want something different is not helping anyone. It was always a matter of discussing

things with the owners of those systems and trying as much as possible to find the path of least resistance that still gave us what we needed to ensure the mining system plays well.

Regarding the economy part, I don't think that we have foreseen all the implications mining will have on our game. We mostly focused on the mining process and while we have our own estimations of how this will play out, once it goes live, I am sure we will see something completely different. This is something where we will have to work very closely with our economy designers in Austin and slowly tweak the parameters until we get it to that sweet spot. Any new system that heavily impacts economy will require one of these rethinking processes to happen. Mining is one of the heaviest as it is our, for now, only resource gathering profession. As more come online and resource processing comes online, things will get really hard to keep under control, but we'll manage somehow.

JP: We always do! Continuing to look forward on the design: what's next for mining? Is the system intended to expand in planned ways, or is

it more of an 'as-it's-needed' thing?

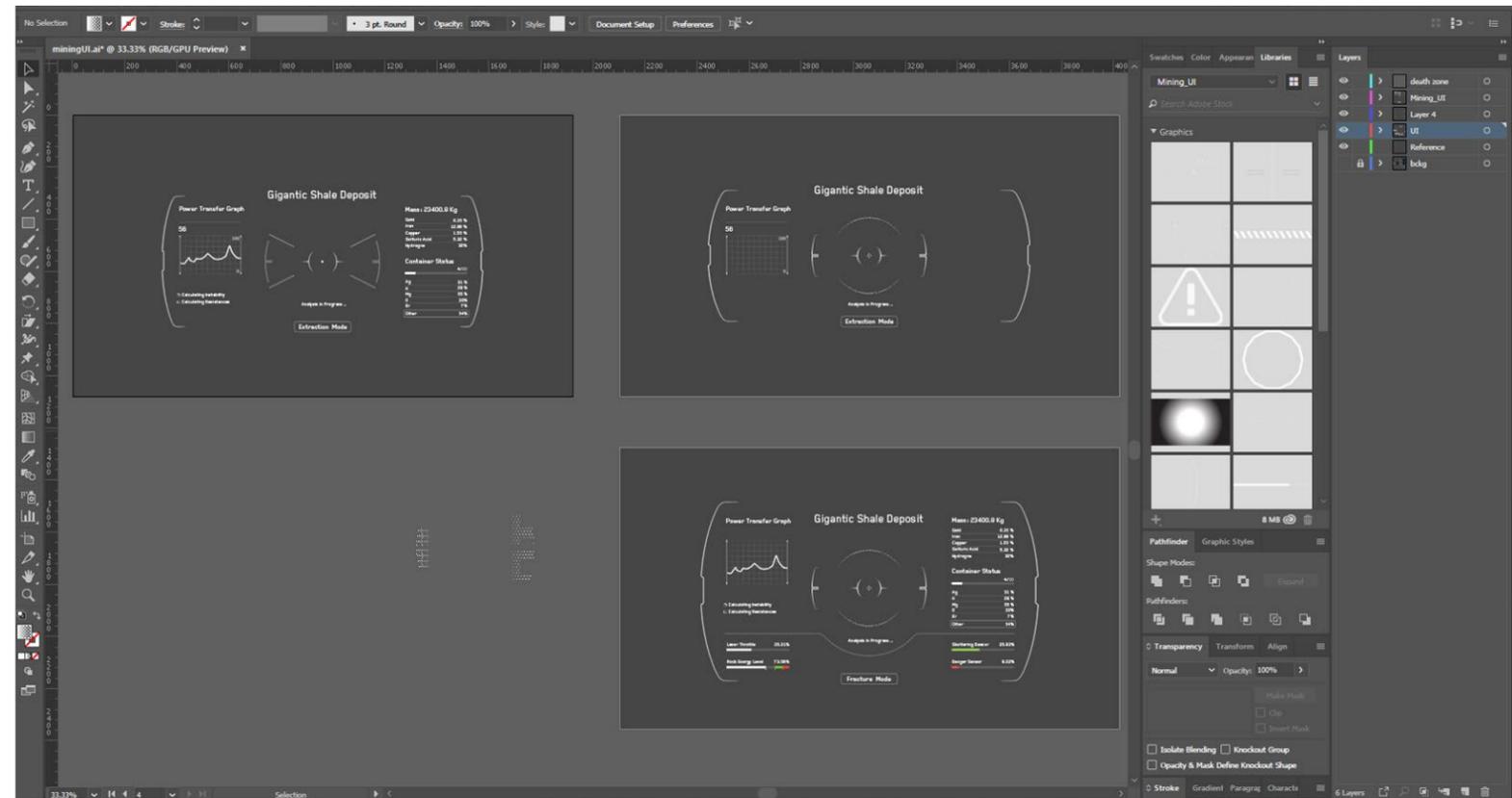
DANT: There is a plan! And it's a mighty plan! That being said, there is still a long way to go till we achieve that plan. The first things we are looking into is improving the gameplay experience after our Alpha 3.2 release. Mining asteroid fields has always been on our list, it just happened that we started with mining on planets for Alpha 3.2. After that we need to look into how we refine the ore we mine. There are big refining stations in the works and a refining system that will allow players to get more money out of their ore by eliminating impurities. This will cost them time but will be more profitable in the end. Post refining, we definitely wanna look into getting the Orion functional, so basically having multi-crew mining and refining in one single ship. Beyond that we still have stuff to work on, from gas and ice mining to liquid extraction and even sub-surface mining with the use of player owned outposts.

JP: What was involved in adding mining to Star Citizen's existing user interface (UI)?

OLEG B: First of all, I had the mock-up for the UI with all the required info and details that should be on the HUD. I started with designing the shape, always making sure to keep it clean and not overload it with too many shapes or details, as it's important for the user to read it easily and quickly. Once it was approved (after a few slight changes), I worked on the animation for the entire flow; from before you fire the laser to bringing your ore onboard. It's a good thing to have a visual animated version of the UI so that you can discuss what works well and what may need to be tweaked in-game.

JP: On the graphics side, it's safe to say we've come a long way since those first asteroids in Arena Commander. The material looks great and it's impressive how it breaks down smaller and smaller as you go. If you'll forgive a very broad question, how did you pull that off?

MAX K: It took a group of talented and smart people to pull that off. The UK graphics team worked their magic, expanding existing shaders to give me the opportunity to use additional textures to mask out areas of intense glow. My colleague, Sebastian Schröder, built a procedural



system in Houdini to make my life easier when it came to fracturing the rock into natural-looking pieces. A lot of code support was also necessary to make sure the rock breaks down correctly in the engine when it's damaged.

JP: What is Houdini?

MAX K: Houdini is software we use that covers all the major areas of 3D production and is especially useful for us due to its procedural nature.

JP: Will the work on mining assist what's being planned for salvaging?

DAN T: The short answer to that question is... YES! But I can't give any details or I would have to kill you. I am sure more of the goodies will start showing once the salvaging team gets closer to their goal.

JP: What kind of visual effects elements went into mining?

MIKE S: So, we have the mining and tractor beams, which are the first effects in our game to make use of the new 'emitter splines' tech given to us recently by Simon Bratel in the Graphics Team. Essentially, it allows us to fire particles along a controlled spline. We also have

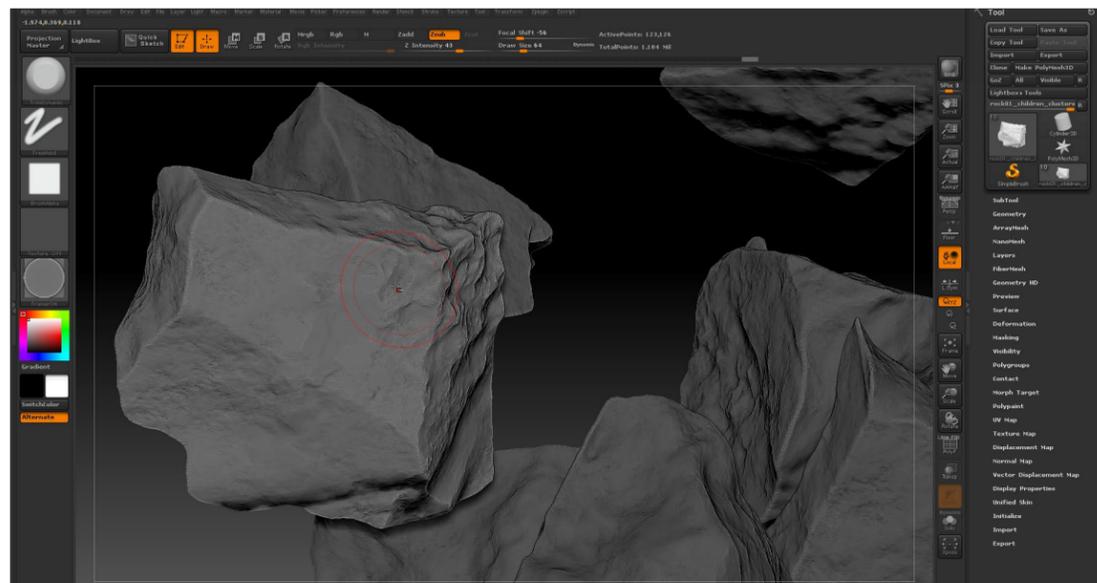
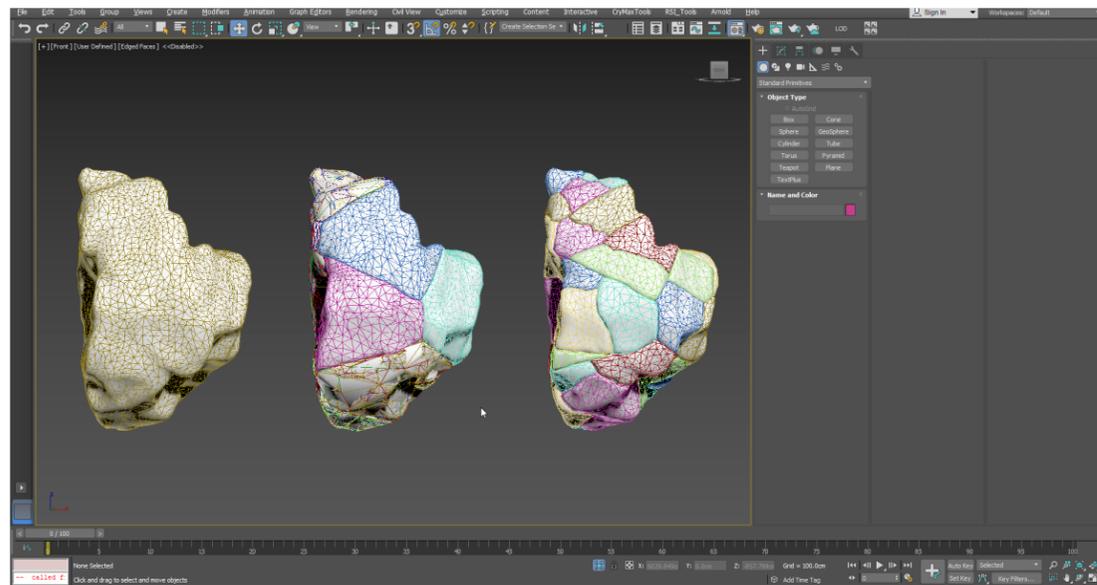
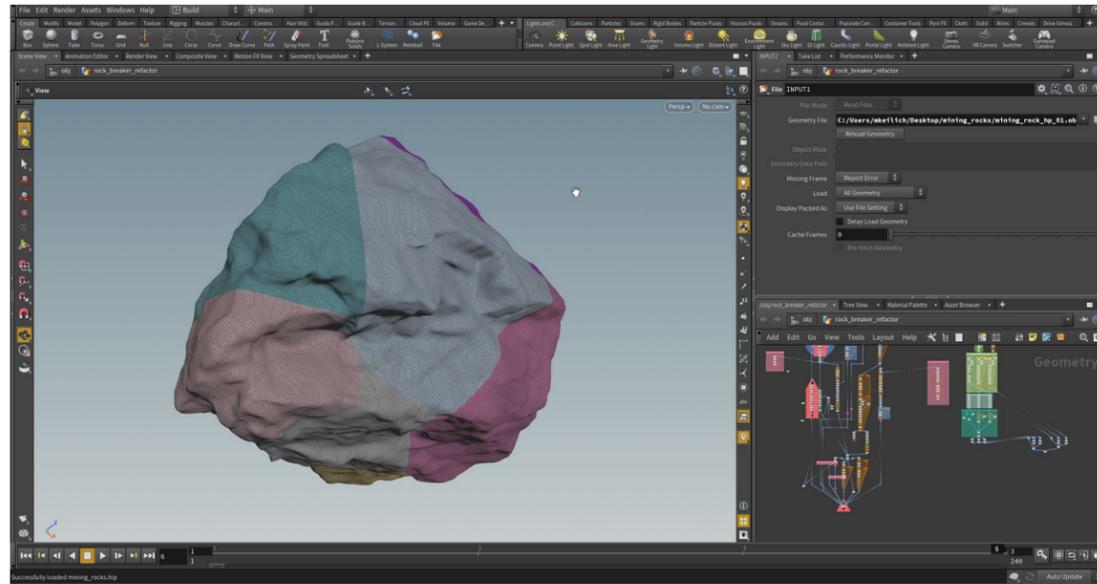
the impact effects themselves - however this is where it becomes a real collaboration with other teams. As Max has already mentioned, we also have particle effects emitting from the growing cracks which increase in strength the more unstable the rock becomes. I feel like I've oversimplified this. We couldn't get these effects working in situ without the support of our Game Code engineers. It's these guys that provide us with the necessary 'hooks' that allow us to plug in our effects.

JP: I usually ask if you've surveyed player reaction, but we aren't quite there at the time of this interview. What do YOU want to see when mining releases?

DAN T: Ideally, I would like to see more people who spend time playing the game rather than just being in the game as a social platform. We need more gameplay and mining is, I think, a good step forward to getting the players cool things to do.

MAX K: I want to see players enjoy the mining gameplay, because it was a lot of work for a lot of people!

MIKE S: Likewise, I'm really looking forward to people putting mining through its paces. I can envisage multiple Prospectors all huddled



around the same rock, frantically trying to mine its resources. Of course, the rock won't be able to handle the multiple mining beams, so inevitably it's going to explode in a frenzy of shards and debris.

MAX K: Mike just wants to see the world burn.

DAN T: Hey, if you do it properly, it definitely won't explode into a frenzy of shards and debris! That is reserved for lazy people who can't shatter a rock properly!

JP: You've all mentioned folks from around the company who contributed - if there's anyone else on your teams or elsewhere you'd like to highlight for their work on mining, please do so!

MAX K: I wanna thank my family, Ali Brown, Geoff Birch, Leo Vansteenkiste, Kiyavash Kandar...

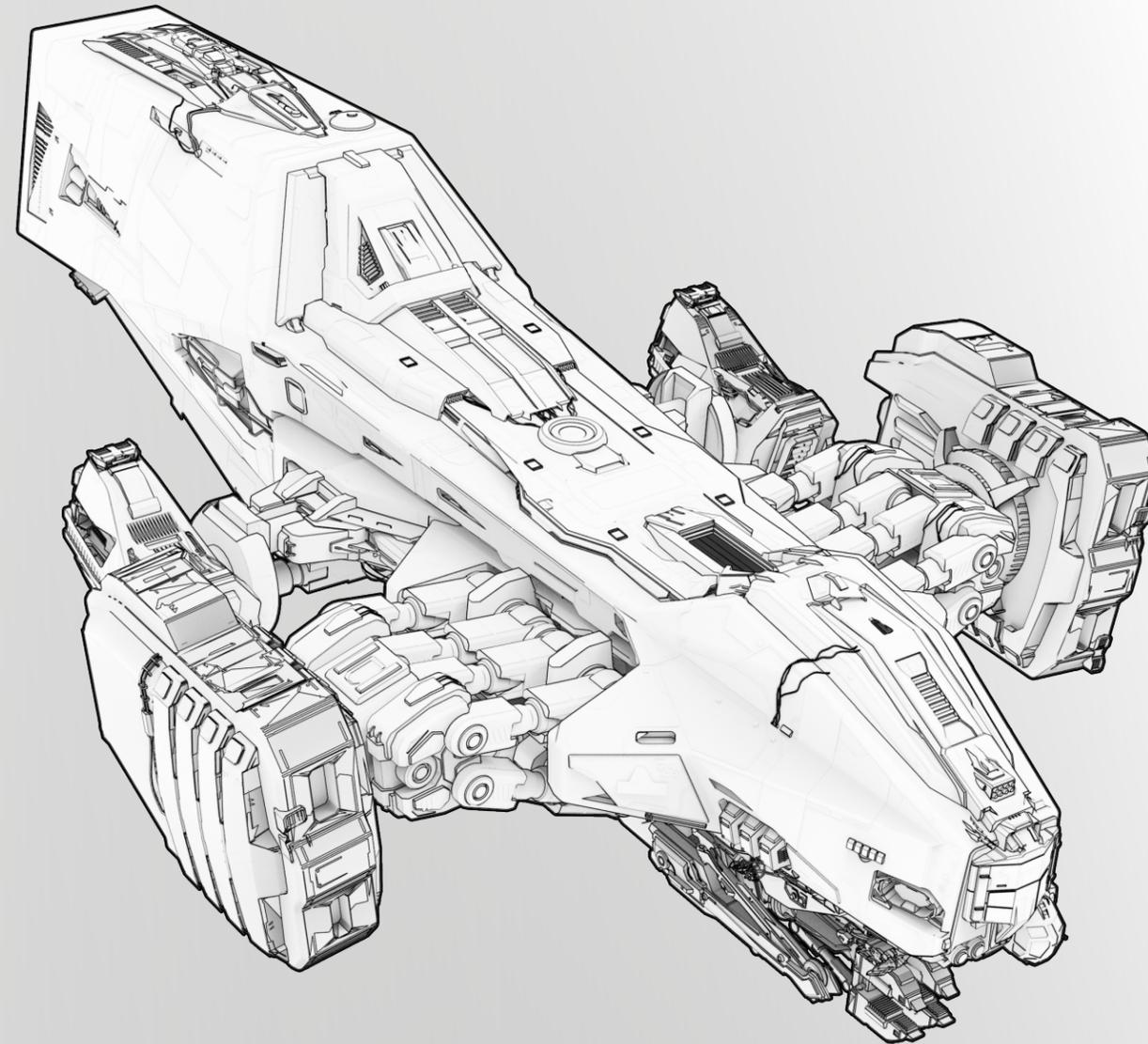
MIKE S: Caleb Essex, the Principal VFX Artist. He has worked on all the effects for mining. Leo Vansteenkiste and Kiyavash Kandar are the Game Code engineers, and obviously Ali and Geoff in the Graphics Team. Should we mention our production team?

JP: My producer is telling me we can't make a game without producers.

MIKE S: Ben Parr and Matt Lightfoot both helped coordinate the whole feature. Not as easy as it sounds! Ben focused on the VFX side of things, Matt is the mining features' producer.

JP: Mining is certainly a big jump forward in terms of gameplay, you should all be very proud. We're all looking forward to how the system evolves and ties in with the rest of the Star Citizen experience... and of course we're eager to see what you come up with for salvaging! Thank you all so much for your time and hard work.

WORK IN PROGRESS... AEGIS RECLAIMER



AIMS

- Large scale salvaging ship
- Salvage "claw" used to chop up derelict ships, which the tractor beams can then bring in for processing

AESTHETIC

- Heavy, industrial, basic and mechanical

Length	155m
Width	108m
Height	50m
Mass	9,500,158kg
Speed	100.0 m/s
Crew	4-5
Powerplants	1x Small
Shield	1x Large 2x Medium
Armour	Large

Weapon Turrets	6 x AI/Remote Turrets 1 x Manned Turret
Thrusters	2 x Large 2 x VTOL 12 x Fixed 6 x Retro
Utility Items	Salvage arm Tractor Beam
Cargo Capacity	360 SCU

The vehicle depicted herein is undergoing concept and design as of the release of this publication. Specifications and appearance are subject to revision during development.

KEY CONTRIBUTORS :

LEAD DESIGNER: JOHN CREWE
SHIP DESIGNER: STEVEN TUBERFIELD, CORENTIN BILLEMONT
CONCEPT ART: GEORGE HULL
ART DIRECTOR: NATHAN DEARSLEY
ART: CALVIN WILLIAMS, PHI HOWLETT, THOMAS MORGAN AND DANIEL GREBBY



THE SALVAGE LEADER

Good ships come to those who wait, or so the old saying goes. And there's no question that the Aegis Reclaimer is one starship that has been a long time coming! The Reclaimer concept was initially developed in late 2013 as part of a wave of ships that would represent possible careers in the *Star Citizen* universe: the 890 Jump luxury ship, the Orion mining platform, the Herald info runner, and others. Each of these concepts was more than just another ship design, it was a commitment to building out another different gameplay experience that would take *Star Citizen* beyond a platform for space combat (then being unveiled for the first time as part of *Arena Commander*).

The ship was, at the time, known as the MISC Surveyor, named after NASA's famed series of lunar probes that helped prepare for the Apollo moon landing missions. The initial idea was to build a smaller Constellation-sized ship with high-tech scanning options to locate and identify valuable salvage. The actual salvage process, in this early imagining, would be

performed by an independent launch. The associated concept was very broad and, at this point, there was no assurance that the MISC Surveyor would ever be part of the game. At this point in time, the team's designers weren't sure such a specific role would ever catch on. After all, it's easy to explain the fun of deep space dogfighting or exploring strange new world... but a ship to clean up after other players' messes?

Surveying the situation (pun intended), Chris Roberts made the sort of decision that would come to define *Star Citizen's* unorthodox development process: why not just ask the community what roles they wanted to see in the game? Starting with the \$28 million stretch goal, the community team began polling the community to see what they would be most interested in adding to the game. Instead of pitching specific ships, the options were broad and specified only roles. Choices included existing favorites such as adding more combat and racing ships alongside introducing new systems like salvage or mining. Would players double down on the game

they already loved or would they support the deeper development of additional types of ships? In the first wave, over 25,000 backers voted with 20% of the poll going to the development of a salvage ship. By the second round of the poll, salvaging's future was assured with over 10,000 players choosing for the team to pursue development of a salvage ship.

The future Reclaimer, now considered more of an industrial design and assigned to Aegis Dynamics instead of MISC, was announced in the \$30 million Letter from the Chairman:

'The Surveyor, from noted military contractor Aegis, is an industrial-quality salvage ship. Equipped with a reinforced cargo bay, a long-range jump drive and launch pods for unmanned drones, the Surveyor is an ideal ship for taking advantage of deep space wrecks. Tractor beams, floodlights, scanner options and docking ports round out the tool chest on this capable, utilitarian spacecraft.'



THE NAME'S THE GAME

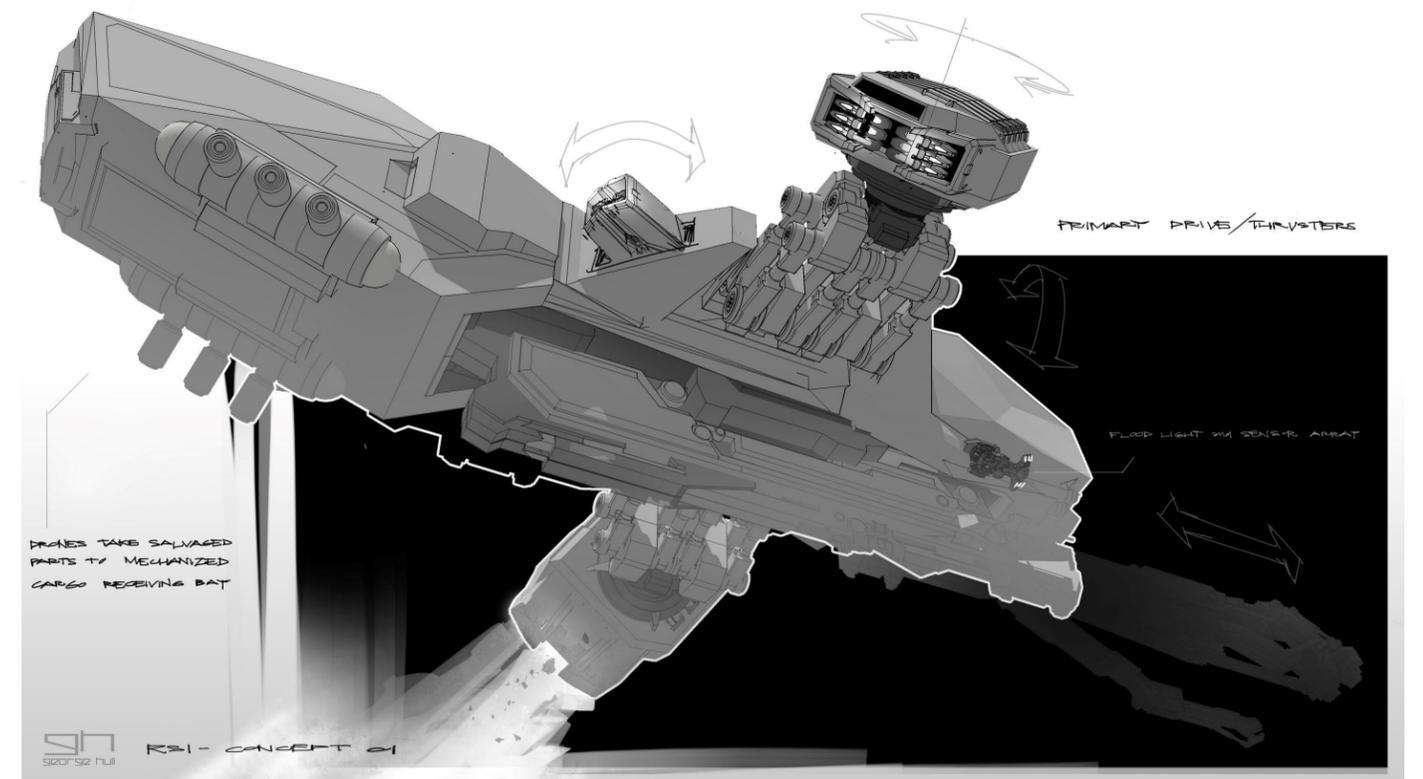
With the overall direction decided and the rough beats for the ship itself chosen, the next step was for the design team to refine the concept of salvage, while the ship team began work on the overall look and feel of the ship. As design drilled down into just what salvage in *Star Citizen* would mean, they made decisions that would greatly impact the concept work. For one, the early placeholder idea of an independent launch that would have players EVA and cut valuable pieces out of a hull became deprecated in favor of developing the Surveyor as a single piece solution. Instead of simply scanning and locating salvage, it would instead be called on to locate and then process material itself. Smaller salvage ships might use the EVA option, but the strong feeling was that these 'class leader' career ships should define the largest scale version of their respective jobs. Just as the Orion would slough and refine vast quantities of ore and the 890 Jump would offer the maximum level of luxury possible, the Reclaimer would now take in spaceborne salvage itself using a claw or similar mechanism.

This was exciting news for *Star Citizen* and future salvage crews... but it was bad news for the Surveyor's current name, which was no longer remotely accurate. Since the ship was no longer surveying salvage sites and instead capturing them itself, it needed a new moniker. Internally,

it first became the 'Collector' before it was decided that this seemed too much like a threatening alien design rather than something from a military or industrial-focused human designer. A spirited debate began and ran for several days until a meeting of lore, community, production, and design representatives provided Chris Roberts' with a series of options and reasoning, reproduced verbatim:

- Wyrn (hoards treasure)
- Crusader (traveling off to distant lands in search of the holy grail - plus a nod to Tony Zurovec's famous game series)
- Leviathan (huge ship, great word)
- Beholder (collects things in its massive maw and the eye is similar to the crane)
- Magpie ('producer who would prefer to remain anonymous' will quit if we go with this)

Just as it seemed *Star Citizen's* next concept ship might actually be called the Magpie, Chris Roberts came up with a much more simple option: Reclaimer, as it would be reclaiming salvage from destroyed spacecraft. All agreed that this made the most sense and the once-MISC Surveyor was quietly changed to the Aegis Reclaimer.



FINE HULLS AROUND

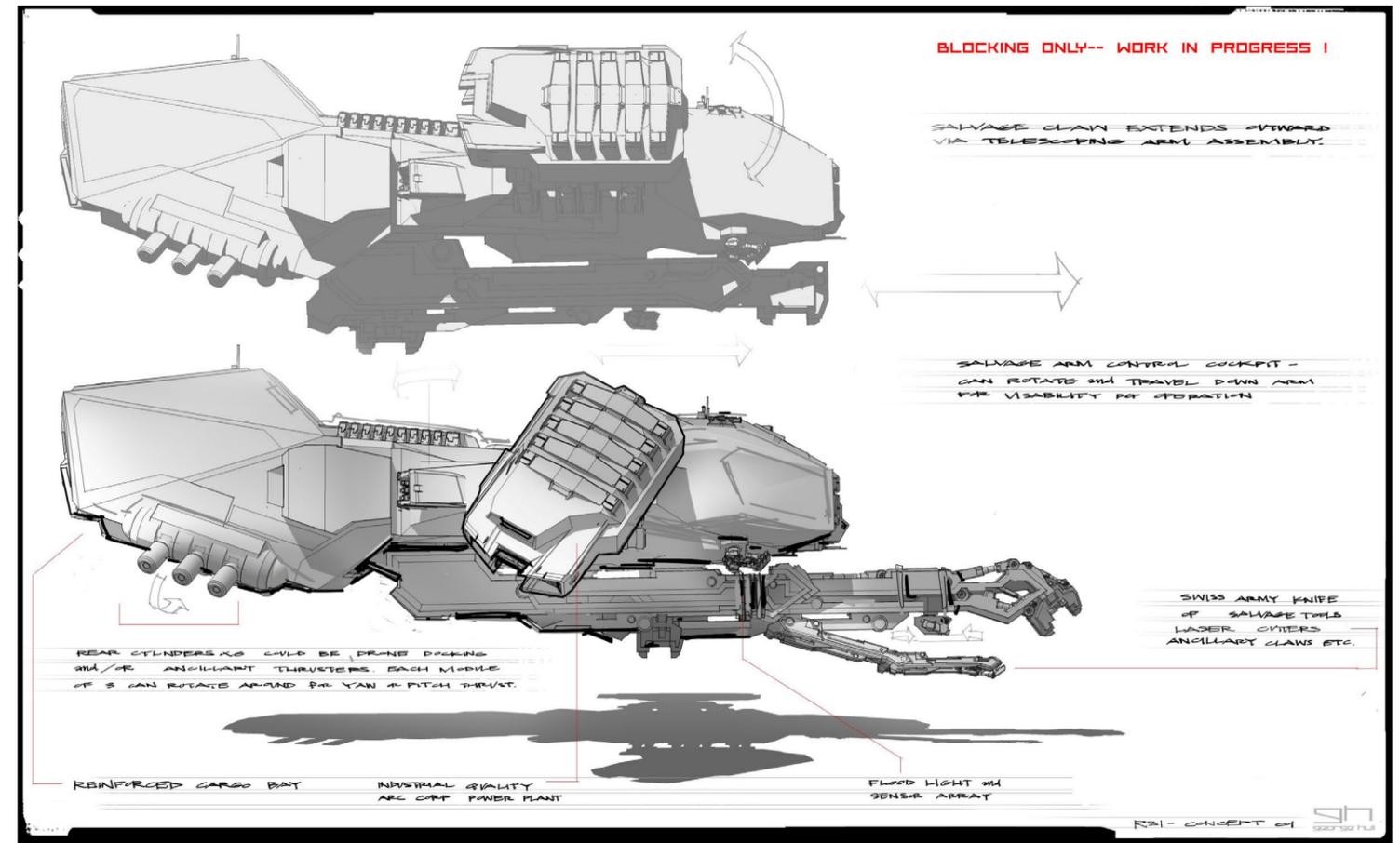
The task of designing the Reclaimer concept ship went to outsource artist George Hull, known for an extensive film career designing spacecraft and other concepts for movies like *Cloud Atlas*, *Star Wars: The Last Jedi*, and *Blade Runner 2049*. At the time, George was putting the finishing touches on an entire fleet of spacecraft for The Wachowski's *Jupiter Ascending*. Like many outsource artists, he was eager to work on a project that lacked many of the limitations that came with designing spacecraft for films. Instead of a ship that needs to look good from a particular angle for one brief special effects shot, *Star Citizen* ships are fully formed and explorable, part of an interconnected universe of designs that need to work together. In short, an appealing challenge for a world-class starship builder!

Work on the Reclaimer concept art began in early 2014 and continued through a number of iterations. The first version of the ship seems small in retrospect, initially intended to be a sort of Constellation-sized ship with an ungainly claw attachment for salvage work. As the design was developed further, the hull became larger and what was then called the 'grabber', became less overpowering.

George Hull, on his first pass concept from May 2014:

"Overall, I wanted the theme of the ship to look very functional, so I didn't hide all of the crane arm, etc. completely. Kind of like real-world crane vehicles. A bit on the ugly side, asymmetrical cockpit, and auxiliary driver cockpit for the claw operator. This thing should be very cool to see animated and in motion. Not only the swiss army knife toolkit of the salvage claw (laser cutters, welding, tractor beam perhaps) but also the engine assembly has lots of rotation axis and hydraulic arm pistons. Because the claw is so heavy on the front I like the cylinders on the rear - makes it a bit unusual I think. But I don't know what purpose it could be for at this point. Maybe part of a mechanized cargo bay, or docking valves for drones."

As concept development continued, the look and feel of one of Aegis' first large ships came together. Unlike later ships, there was no Aegis style guide at this point, so George was covering new ground with every pass. He ended up defining the ship's look and feel through a gritty, industrial style that would go on to inform the eventual design guide for the manufacturer.



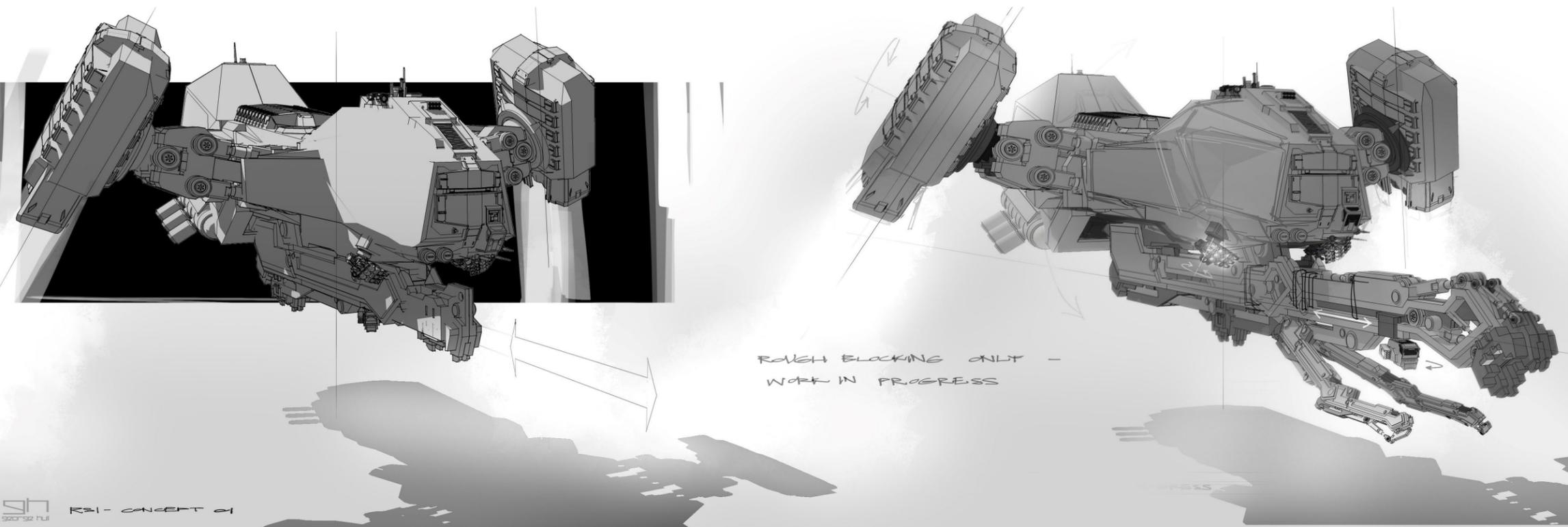
UP IN ARMS

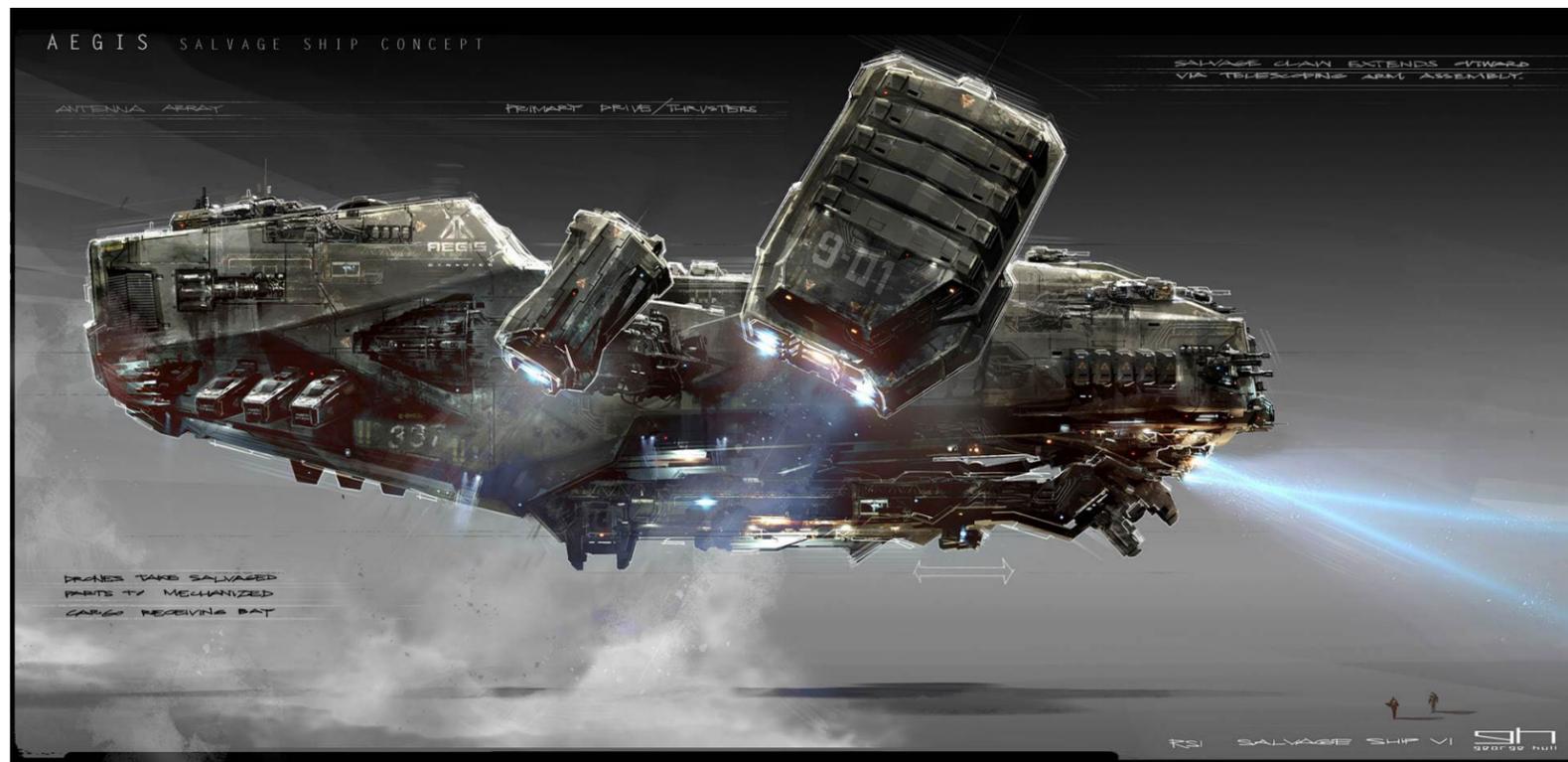
At this point in *Star Citizen*'s development, concept artists did not map out the entire interior of ships. The first-person shooter elements of the game were only just coming together and the pipeline for constructing the interiors of more massive capital-sized ships had not yet come together. Instead, concept artists were asked to focus on particular features and elements that would premiere with a particular ship type. In the case of the Reclaimer, that meant the remote manipulator. As George continued to develop the look of the Reclaimer, he paid special attention to the salvage design aspects. Working with designers at the time who were then developing a rough idea of how the game would support salvage, he developed an initial look and functionality for the ship's massive claw:

1. Player controls main claw to telescope out and grab/rip away desired part
2. Arm retracts back with part in claw
3. Player uses HUD and tractor beam to grab part, rotate it from front to back and into cargo hold (option: drones move the part and player guides drones via HUD)

He went on to add:

"This could be via a player controlled tractor beam that is mounted on a rotating cockpit under the arm. I think it would be awesome to sit under the ship and have that POV-cockpit and tractor beam rotate together and move from front to back!"





IN THE SPOTLIGHT

The design of the Reclaimer was unveiled to the world in a concept sale launched in September 2014 that featured George Hull's concept renders of the ship in action. An updated design description moved the focus away from high-tech drones and instead towards the power of the giant manipulator arm:

'Aegis has built the perfect ship for those that want to write their own Star Citizen story. Equipped with a massive multi-tool arm, the Reclaimer can grab spaceborne salvage and then carry it aboard for processing. In addition to a large cargo hold, the hull is packed with reclamation equipment capable of processing and storing up to a Constellation worth of salvage!'

Complete with a beautiful concept page by the team at Turbulent, the *Star Citizen* community jumped on this large new ship. Of special interest was the large cargo capacity planned by the Design Team, which was considered necessary to allow the ship to carry home the remains of large wrecks. The Reclaimer was much discussed during *Star Citizen's* second holiday livestream, with backers speculating that it might be as useful as a cargo ship as it was a salvage platform. The Reclaimer looked to be an extremely promising addition to the game... now the team just had to build it!



AND THEN WHAT HAPPENED?

With the Reclaimer's design and the initial plan for the salvage mechanic revealed to the world in late 2014, the ship took its place in the ship pipeline's queue. As the core development team focused on *Arena Commander* and then *Star Marine*, large ships like the Reclaimer, Orion, and 890 Jump were set to be built out later in the schedule to match up with their respective mechanics, so the Reclaimer waited patiently for the next stage of the game's development. A stage that would begin in late 2017 as designers at Foundry 42 moved from building procedural environments to drilling down on specific mechanics like the recently-launched mining system.

This meant that the Reclaimer had at least one more first in it: the first large concept ship to be awoken from cryo-sleep and integrated into *Star Citizen's* much more advanced form. With the designers looking at the mechanics behind salvage and programmers looking at how to integrate them into the game's giant new world, a team of ship artists at Foundry 42



took custody of George Hull's original designs and began the process of creating them in *Star Citizen's* game engine. Calvin Williams (working with Phi Howlett, Thomas Morgan, and Daniel Grebby under the expert art direction of Nathan Dearsley), set about the task of feeding an early concept through the now-perfected ship pipeline.

Starting with George Hull's high-poly display model, Calvin and the team dove into the task of reconstructing the ship in-engine and building out her interior. Working from the original design and a new, yet-to-be-released plan for the salvage mechanic, the team worked tirelessly to make the Reclaimer something special inside and out. One part of this work was aided by the Aegis toolkit, developed in the time since the Reclaimer was originally conceived. With access to shorthand for Aegis-styled interiors and other parts, the team could integrate shared design elements into one of the ships that had once lead to their creation in the first place! The result was a handsome, lumbering ship that feels like a perfect mix of fantasy spacecraft and rough-hewn working environment.



Externally, the landing gear was a major effort. In 2014, animation and other metrics relating to landing gear had not yet been set, so the concept design left plenty of room for interpretation. Instead of going with a default kit, the artists and designers decided to develop a new type of landing gear that works on an arm system (similar to the claw itself.) The landing gear went through a number of iterations to get the look just right, followed by a great deal of back and forth between the Art and Animation teams to get them functional in-game. The effort was worth it; Calvin notes that the team was especially proud that the Reclaimer lands unlike any other ship in the game.

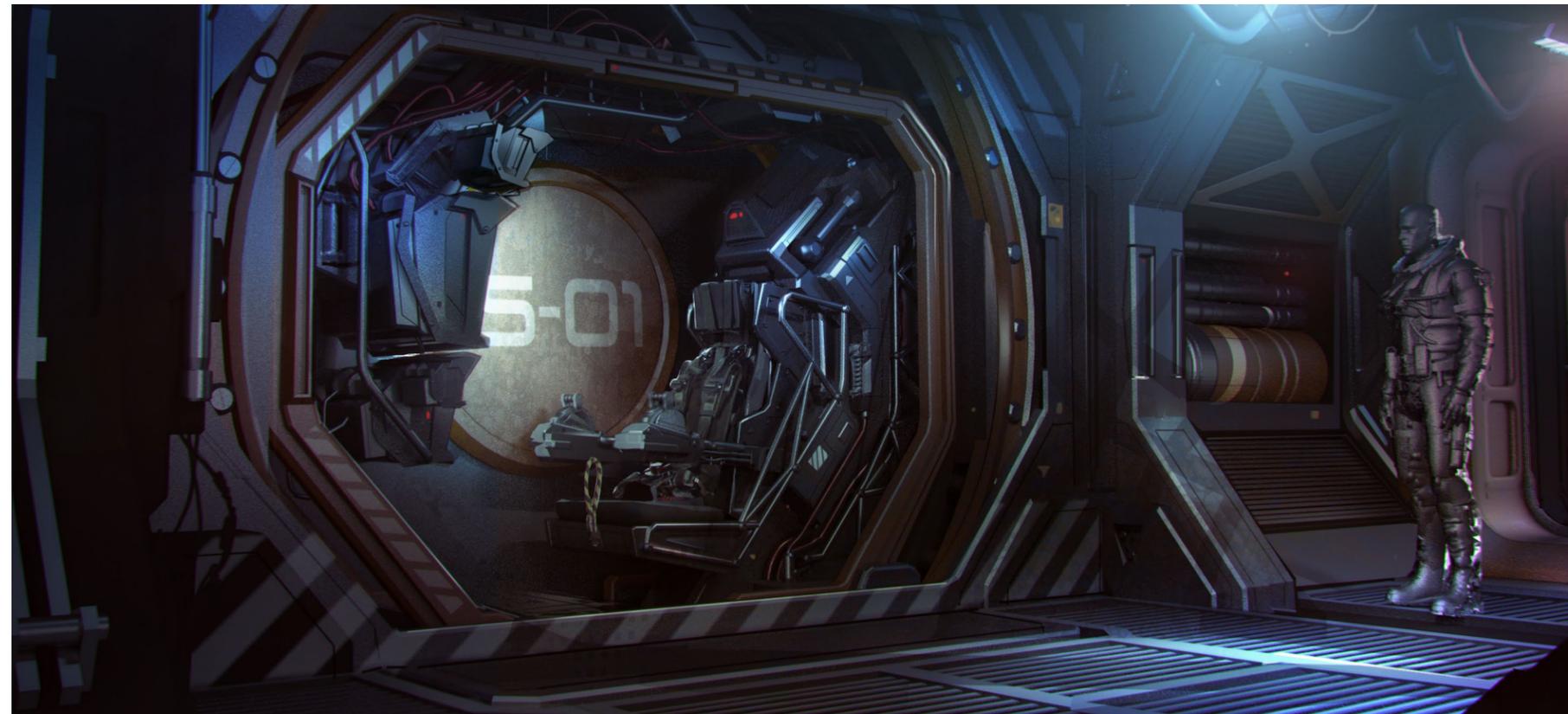
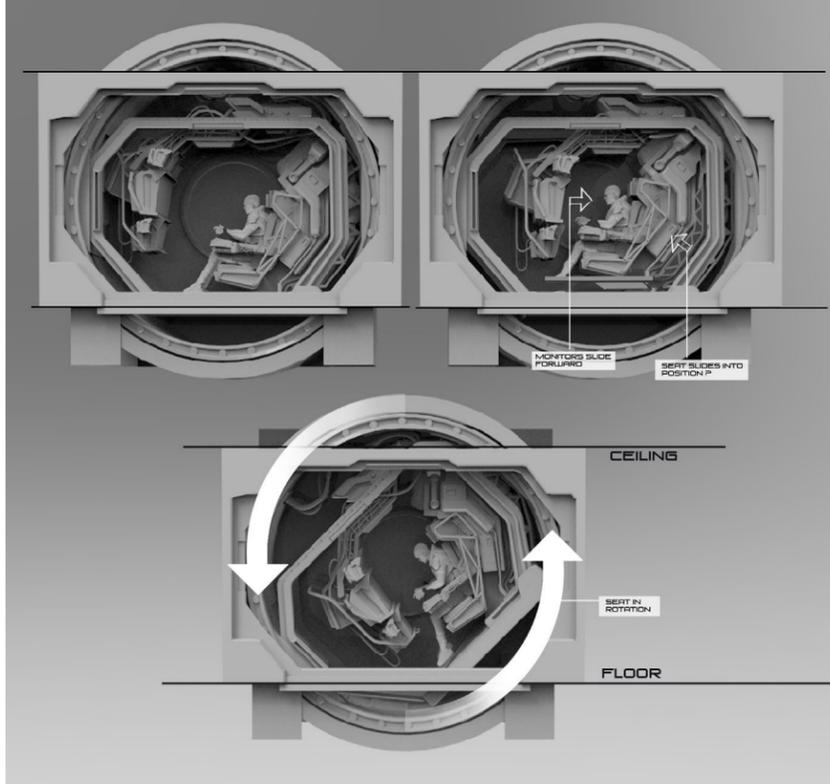


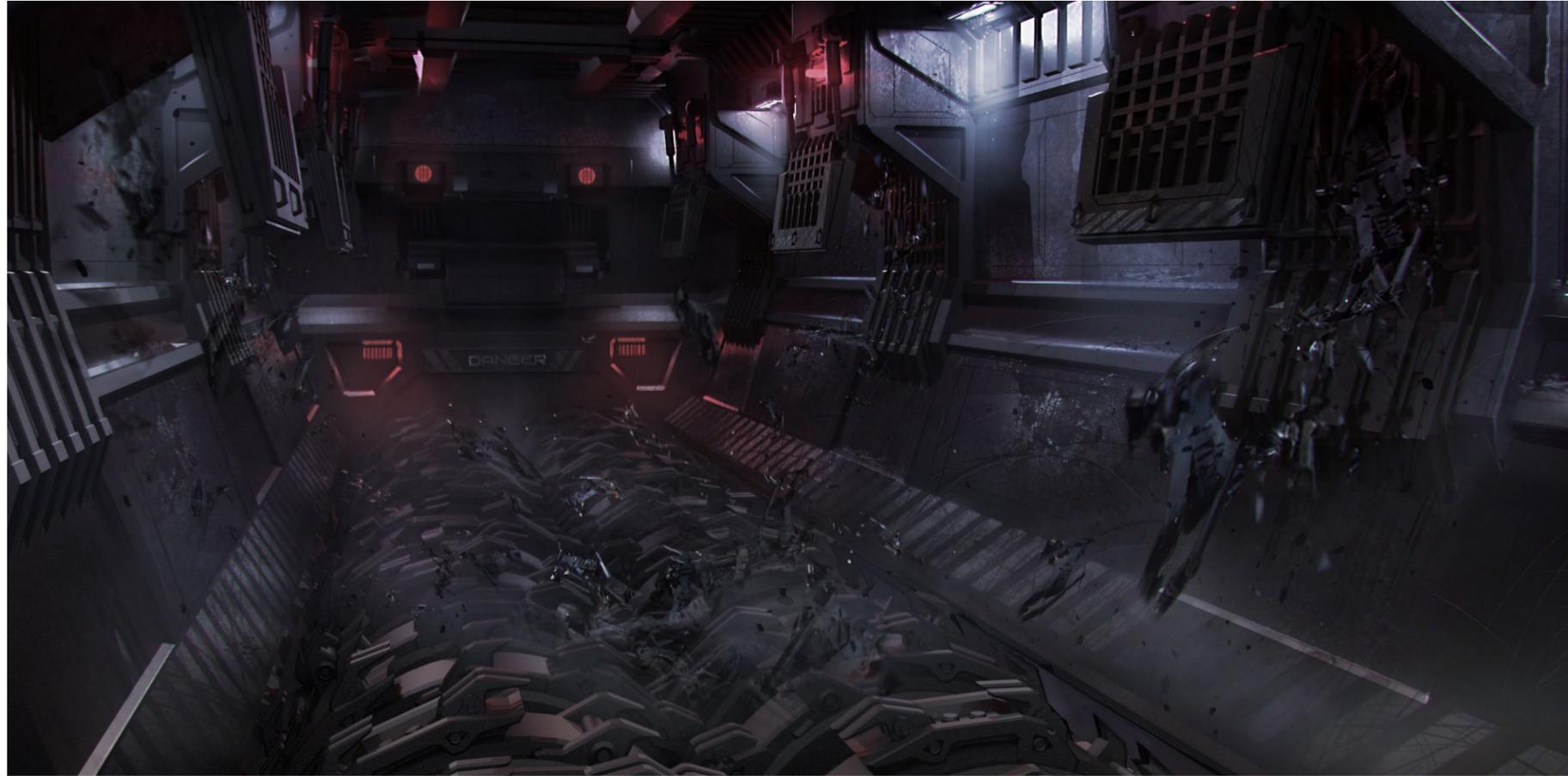


The biggest challenge came from the interior. As noted, George Hull provided only concept art relevant to the ship's planned 2014 mechanic, which meant that there was only limited modeling of the salvage room, engineering console, and tractor beam seats to work from. Rooms like corridors, crew areas, and even the bridge had not yet been touched. This gave the team a great deal of freedom to detail the design and to expand it to match the now-established Aegis brand. The massive shift in components was also a working point, as countless new systems have premiered since the initial version of the Reclaimer was seen by the public. Designers assisted in identifying where items like communications systems, shield generators, and countermeasures could be placed within the existing ship shape.

Working in parallel with Design, the team also built an interior system that would mirror the still-in-progress salvage mechanic, which is currently scheduled to premiere after mining launches in *Star Citizen* Alpha 3.2. The process involved a great deal of research studying industrial ships, both real and fictional. Calvin notes that the team snuck a nod or two to Alien's famous *Nostromo*, so eagle-eyed Citizens should keep an eye out when exploring their Reclaimers. The process involved multiple distinct iterations for the Salvage Room, Processing Room, Claw Operator Seat, and of course the Claw itself. Thanks to extensive cross-disciplinary work, the Reclaimer team feels confident that there won't be much additional work needed to finally bring the salvage features online in an upcoming patch.

RECLAIMER SEAT





Another one of the art team's major challenges was the Reclaimer's processing room, the area in the ship where large salvage is chewed apart by spinning blades for reclamation. Since *Star Citizen* aims to simulate resources such as raw salvage metals, the artists had to pay special attention to how the metal was brought into the room and then how it would exit again once processed. In short, there was no magic button, the reclamation process actually had to work! The team studied several different designs, with one even adding a series of tubes that fed the metal out to the hold. That concept didn't work well, though, and

the final version of the ship has the metal leaving through a door at the room's rear.

With that work completed, the Reclaimer was ready for its closeup. Although the salvage mechanic itself is slated for a patch later in 2018, the Reclaimer herself premiered in Alpha 3.1. Backers who had supported the ship and the mechanic it would allow early in the process got their first look at a Reclaimer built to today's standards and the overwhelming reaction was that Foundry 42 had gotten it right once again.

AEGIS RECLAIMER RESOURCES:

LETTER FROM THE CHAIRMAN:

<https://robertsspaceindustries.com/comm-link/transmission/13391-Letter-From-The-Chairman-30-Million>

AEGIS RECLAIMER SHIP PAGE:

<https://robertsspaceindustries.com/pledge/ships/reclaimer/Reclaimer>

SHIP ANNOUNCEMENT:

<https://robertsspaceindustries.com/comm-link/transmission/14171-Concept-Sale-Unveiling-The-Aegis-Reclaimer>



THE
MISC
PROSPECTOR

SERVICE HISTORY



**PROSPECTOR-CLASS MINER -
DEVELOPMENT HISTORY**

The MISC Prospector is the most famous (and possibly most tortured) project to come out of MISC High Industrial's infamous Project Cold Boot, an engineering team organized to develop additional revenue streams from existing MISC assets using limited resources. Development of the Prospector began in 2910 as an outgrowth of a review of the Freelancer light transport project. Having already seen success modifying the base Freelancer for both survey and fire suppression missions, MISC was keen to study even more unlikely uses for the chassis. To that end, MISC's management reluctantly agreed to write off nine Freelancers which were transferred to the Cold Boot team. Three were complete and space tested, while the others were left in various stages of construction and shipped alongside their intended components.

The Cold Boot team began by spit-balling potential roles for a purpose-built Freelancer variant, which ranged from ordinary combat support drones to fire suppression spacecraft. From nearly three hundred rough concepts,

the team voted to divide into three design groups to pursue more advanced physical development of the top three options. The first was a business-oriented design dubbed the 'Freeminder,' which was to be a secure data relay 'brain ship'. The second project opted to angle for a military contract with an armored space-to-ground reconnaissance vehicle called the Observer. The third, and considered the most unlikely to go forward, was to be a dedicated mining ship nicknamed simply 'The Miner'.

The mining ship was least likely to go forward for a very simple reason: in 2910 there were very few small mining ships. This was not for lack of technology, but rather both terrestrial and asteroid mining were simply considered to be large-scale propositions which could only be profitable when funded by major corporations. In a world where 400-meter mining platforms could strip small asteroids in a matter of hours, there was simply no thought that an individual operator would ever pursue mining. MISC was, essentially, co-opting the Roberts Space Industries 'common man' approach to ship sales with a ship that had no proven audience.

By 2914, the first two conversion attempts had petered out entirely. The Freeminder team proved unable to produce an effective prototype, with

SERVICE HISTORY



the Freelancer's internal space unsuited to shielding the number of system blades needed for the project. The Observer concept had proven spaceworthy in simulations and a great deal of work had been done constructing the alternative, transparent nose cone for the physical build when word that the rumored ground reconnaissance contract had been withdrawn due to a shifting military budget. The incomplete prototype remained on display at MISC's Los Arenas laboratory for years and was eventually scrapped.

Although the Miner had proceeded to the physical prototype stage, its situation seemed equally dire. The first prototype, retroactively designated 'Prospector Proof of Concept Demonstrator A-1', was an unpleasant and ungainly beast. The team found themselves unable to budget for custom-manufactured mining equipment and was instead forced to adopt an off-the-shelf solution: the smallest size of a Daylan-Kruz laser-head emitter, a component roughly the size of a Freelancer's entire cockpit. Rather than being integrated into the design, the emitter was nano-welded tandem to the cockpit and attached via four metal booms. This created an unwieldy spacecraft without the aerodynamics necessary to function predictably in an atmosphere. Initial test flights were conducted via carrier spacecraft, with the prototype miner being dropped into space close to asteroid targets.

What the A-1 technology demonstrator lacked in looks or handling, it made up for in functionality. Over the course of twenty-six flights conducted by MISC test pilots, the A-1 racked up success in a number of areas considered necessary for the program to continue. These flights proved that the

Freelancer's stock drive could power a mining apparatus, that the hull could be modified to load ore and other materials while in flight and that, with some practice, a trained pilot could very effectively conduct more delicate, high-value mining operations using the ship's thrusters. The prototype program continued with four of the Freelancer chassis ultimately being converted into increasingly advanced demonstrators (designated A-2, A-3, and B-1). By the space trials for the final demonstrator, the B-1, the mining attachment had instead been integrated into a large sheath astride the underside of the cockpit. The result was a mechanism that the pilot could very effectively maneuver, giving him the ability to make the kind of delicate mining maneuvers for which larger ships had to deploy specialized surface craft.

The management at MISC-HI was elated at the prospect of joining the ranks of spacecraft manufacturers producing lucrative mining ships and saw the potential for the ship to create a new market for independent mining crews (many of whom would lease these ships at extremely positive corporate rates of return). The board was ultimately so convinced that they removed the effort from Cold Boot entirely, funding the project and assigning a team of top engineers to develop it into a distinct design rather than a Freelancer conversion.

Over the next eight years, MISC-HI internal teams worked together on two projects: The prime design team focused on developing a unique Freelancer-inspired spacecraft hull that, while using many off-the-shelf parts, would be constructed ground up and organized to best support how they envisioned small-scale mining would be most effective. Meanwhile,



a handsomely funded research and development team focused on the biggest technological hurdle to the project: miniaturizing a mining array to the point that it could be stored within a small ship's fuselage while still giving it an effective energy output. To meet this task, MISC licensed the Daylan-Kruz design and relentlessly cut down and miniaturized components in a painstaking, multi-year process.

The ship, now named the Prospector, began proper space trials in 2923 after an extended time in jump tunnel simulations. Live testing went extremely well with only limited teething difficulties resulting from a late-in-process software update. The base ship was ready for flight some six months before the first version of the drill was completed, so the initial test flights focused on handling and were flown with only a weighted simulation. Late in the year, the first mining assembly came off the line and delighted thousands of aerospace engineers by slotting into place aboard a Prospector hull and then immediately humming to life.

MISC unveiled the Prospector to the galaxy in what it called a 'special preview showing' at the 2924 Intergalactic Aerospace Expo. The crowd reaction was harsh, with reviewers praising the design but strongly (and often cruelly) criticizing the existence of the ship in the first place. No one, went the refrain, would ever need such a specialist spacecraft. As a result, there was almost no interest from buyers at the show and pre-orders for the next Freelancer immediately outshone the Prospector.

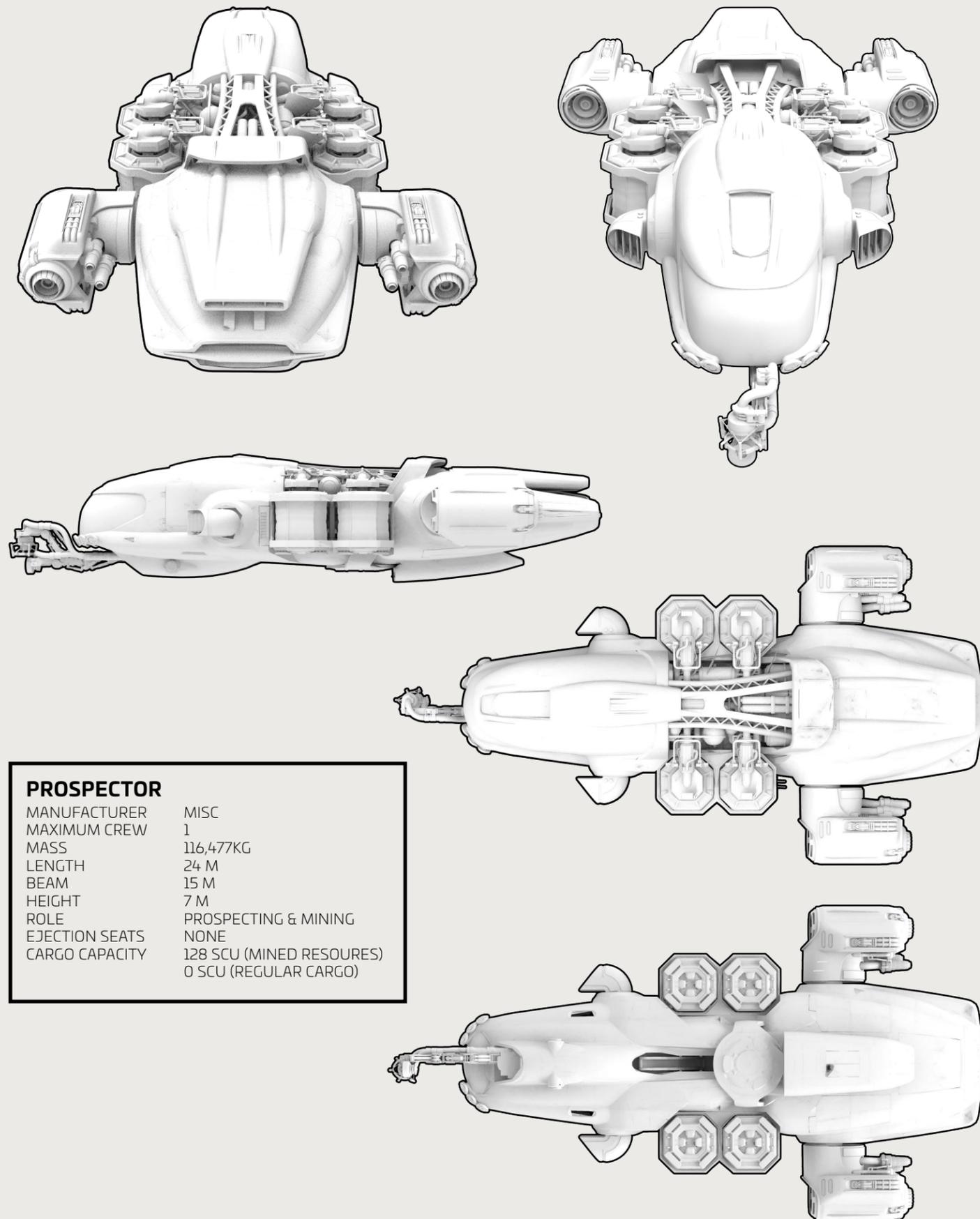
Although MISC's management opted to continue the expensive planned 2925 model year rollout for the commercial model, many employees privately expressed doubts because of the media's reaction. Where Roberts Space Industries was given carte blanche to 'sell the dream' with every new design, it seemed no one was willing to think of MISC in the same way.

Sadly for MISC's stock prices, the media reaction was prophetic; sales of the Prospector hit rock bottom shortly after launch and stayed there for two full years.

Then came the Chessex Lode, a massive discovery of previously ignored raw materials on Ferron II. News reports around the Empire reported on the lode's discovery, the most valuable of the year, which had been made using precision instruments deep in a canyon of a planet that had been effectively ignored for years. Making the story all the more appealing was the fact that it was not Shubin Interstellar or another large mining outfit with the new mineral claim. Instead, it was Chloe Raznick, owner and operator of one of the first 2925 MISC Prospectors off the assembly line. She had made the legal purchase of several hundred parcels of former military ground testing area in the hopes of salvaging expended shells and claiming the small bounties on radioactive debris collection. In the process of surveying her lot, she discovered a deep chasm into which she navigated her Prospector. The rest was history and Raznick was an overnight sensation, charming the Empire and impressing trillions with her graceful entrance into a world of excess riches.

Within days of the discovery, Prospector sales shot through the roof as people rushed to try their hands at this new career. Just as the Cold Boot team once predicted, the Prospector had given rise to a new class of miner; and now their work had equipped those independent miners to take on the galaxy.

Since 2925, MISC has made several iterative updates to the basic Prospector with two models (2929 and 2938) being considered the most significant. The 2947 model is planned to incorporate a completely reworked mining array and a new system for ore storage, which is significantly more efficient than the original.



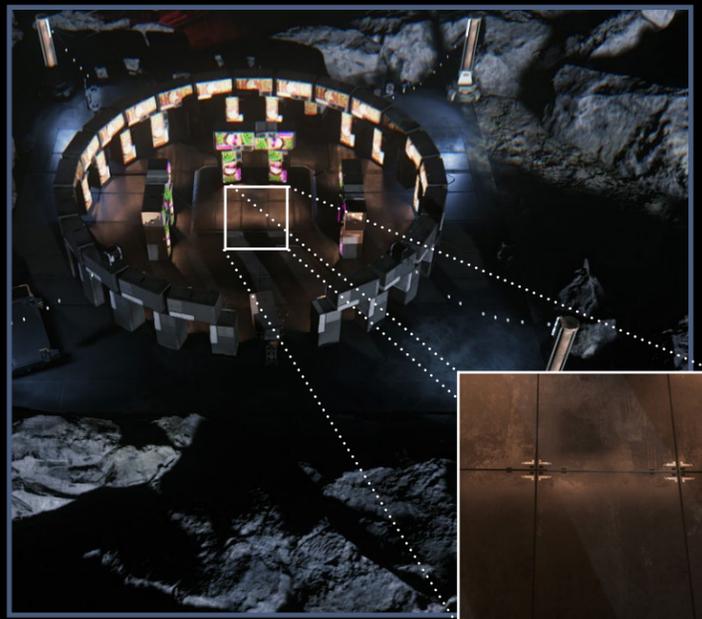
PROSPECTOR	
MANUFACTURER	MISC
MAXIMUM CREW	1
MASS	116,477KG
LENGTH	24 M
BEAM	15 M
HEIGHT	7 M
ROLE	PROSPECTING & MINING
EJECTION SEATS	NONE
CARGO CAPACITY	128 SCU (MINED RESOURCES) 0 SCU (REGULAR CARGO)

WHERE IN THE 'VERSE?

Every month, we post a close-up image of something in the universe. All you need to do is tell us where you think it was taken.

Ben@cloudimperiumgames.com

We'll reveal the answer next month, and share some of the best responses we received. This month's image is courtesy of Ray Warner, our Assistant QA Manager in the UK. Where in the 'Verse did he find it?



Last month's image was also courtesy of Ray. Where in the 'Verse did he find it?

If you can believe it, we didn't get a single correct answer this month.

So, where in the 'verse is it? It's Benny Henge of course! It's still out there somewhere, so head out to Grim HEX to start your pilgrimage...

Please remember to send us a screenshot of what you find, so that I can give partial credit if what you've found is close to the actual image.

ONE QUESTION

We asked the CIG staff to answer one question for us this month. Here's what they had to say.

WHAT'S YOUR FAVORITE SCIENCE FICTION SPACECRAFT?

JASON COBB, SENIOR AUDIO DESIGNER, ATX

The Heart of Gold from Douglas Adam's *Hitchhikers Guide to the Galaxy*.

JACK TONDEUR, ANIMATOR, UK

I have always loved the Y-wing from *Star Wars*. For some reason I find the shape really satisfying.

PHIL WEBSTER, QA MANAGER, UK

Easy, Slave-1! The modified Firespray-31 class patrol and attack craft flown by Boba Fett in *Star Wars*, and to a lesser extent the B-wing. I just love the rotating cockpit (gyroscopic cockpit in the B-wing) aesthetic, how cool the silhouette looks and Slave-1 gave one of the only redeeming parts of Episode 2 – the amazing audio for the seismic charge.

TOLU WINJOBI, JUNIOR FINANCE ASSISTANT, UK

My favourite science fiction spacecraft is the TARDIS from *Doctor Who*. I just love the fact that it doesn't look like a spacecraft so it easily blends in with its surroundings and its bigger on the inside than it is on the outside! Awesome!

RYAN BARKER, QA, UK

CR-90 Corvette from *Star Wars*.

JAMES BALLANTYNE, LEAD TESTER, DE

The Arwing from the *Star Fox* series. I love the design and the compact cockpits. I also always loved it when the ship's wings extended and it went into "all-range mode"

CHRISTIAN A.W. SCHMITT, GAME SUPPORT AGENT,

Star Wars - Star Destroyer. Because when my three-year-old daughter saw one for the very first time, she said "These are the bad guys.", without knowing anything about *Star Wars*.

MARCO PISANU, AI PROGRAMMER, DE

An Imperial Star Destroyer.

MAXIMILIAN KEILICH, ENVIRONMENT ARTIST, DE

My favorite spacecraft is The Derelict from *Alien*. I love how it feels like you are inside of a huge creature, with its skeletal walls and fossilized surfaces. It has such an iconic shape that you would recognize it solely from the silhouette. It feels truly otherworldly and as alien and strange as spacecrafts can get.

ARIANNE GARIN, ASSOCIATE PRODUCER, UK

It's got to be the modified Tilt-A-Whirl car from the 80's Classic, *The Explorers*, starring Ethan Hawke and River Phoenix... How spacious!

ARAN ANDERSON, VFX ARTIST, UK

I think it's a tie between either The Raven VTOL from *Elysium*, the Pelican D77 TC Dropship from *HALO 2 Anniversary*, or the USSCS Prometheus from the *Alien* Prequel *Prometheus*.

MIKE MEADEN, ASSOCIATE PRODUCER, UK

My favourite ship is the HWK-290 "Moldy Crow". It's the ship Kyle Katarn and Jan Ors flew in the *Dark Forces* series of games. It has four rotating wing thrusters with a neat blue effect and a long, angular two-person cockpit. This means it can do VTOL style take-offs and landings and looks amazing when swooping in to pick up the hero. It sports a rotating 360 degree turret on its underside, which it often uses as a deterrent while getting to the "LZ". This ship holds a lot of nostalgia for me and will always be the first thing that springs to mind when I think of sci fi spacecraft...

STEVEN KAM, JUNIOR COUNSEL, LA

So many choices. If I'm really forced into choosing one and only one, it would be the Enterprise Refit (NCC-1701 as re-introduced in *ST:TMP*). If you were to let me list all of my favorite science fiction spaceships and explain why they're my favorites, this issue of Jump Point would be much, much longer.

DANIEL BAKER, DESIGNER, UK

My favourite ship has to be the USS Enterprise E (Sovereign Class). The reveal of the new ship in one of the best *Star Trek* movies ever made was fantastic.

CHERIE HEIBERG, ARCHIVIST, LA

VF-1J Valkyrie Fighter!!!

NICOLAS BARROS, CINEMATICS ANIMATOR, DE

My favorite ship is Moya from the sci-fi series *Farscape*. She's a living ship.

JEFFREY PEASE, DEVOPS ENGINEER, ATX

Kirathi Dreadnought. The first time I saw one, I was terrified.

WILLIAM TURNER, MARKETING ART DIRECTOR, UK

'Gunstar One' from *The Last Starfighter*... Just loved Death Blossom at the end of the film.

MARTIN DRIVER, COPY EDITOR, UK

Red Dwarf! When I saw it for the first time, my knees began to quiver...

Do you have one question you want to ask the staff?

Send it to Ben@cloudimperiumgames.com and we might choose your question for next issue.