JUMP P◆INT

STORAGE

IN THIS ISSUE

GREETINGS, CITIZENS!

Based on the response to last month's **JP**, you want details about the things you'll use every-day, not body models or hand weapons. (Also ham.) I know that basically means ships, ships, and more ships, but judging from the number of forum posts about the hangars, I think you'll be interested in seeing what we have to show you on the three that were released yesterday. Oh, and one thing I noticed — our artists tried all sorts of ships in all of the hangars, so the Work In Progress shows some combinations that are unlikely. :)
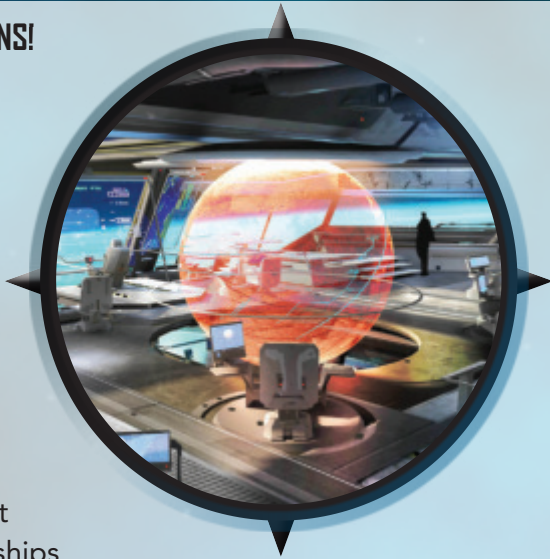
Meanwhile, have you ever tried to get monthly material when everyone around you is solely focused on, say, creating and polishing hangars? As the messages piled up last week between Cologne and the stateside CIG offices, I realized (a) I was unlikely to get the scheduled interview done with the hangar designers and (b) the messages themselves give an interesting look behind the scenes. We'll plan on that interview at some point in the future, but for this issue, we've got about 20 pages of the pell-mell rush to get the hangars ready to show the world. (Gamescom is perhaps the largest game convention in the world, and *Star Citizen* was by far the most popular game presented there. That's not just me bloviating — the poll numbers are out there to prove it.)

Despite what you might conclude from the contents of last month's and this month's **JP**, we really are working on creating and completing new ships. We can't give you a new ship each month, because it just doesn't happen that fast (especially when hangars are rising from the mist), but we plan on delivering the finishing strokes of the ... no, I try not to give you specifics (because they might change and because so many of you enjoy the speculation before each issue) ... but we'll polish off one ship next month, plus we plan on starting a new series of Work In Process that we think you'll find thoroughly acceptable.

Back to this issue: Robert Waters gives us the second part of *The Cup*, for your reading entertainment, while the Galactic Guide describes Ellis, where the race takes place. But other than that, it's hangars, hangars and more hangars. In addition to the hangar WIP and Behind the Scenes thread, Portfolio focuses on the three main hangar manufacturers. But wait, there's more! We actually do have a vehicle in this issue — the hangar *buggy*, in all its four-wheeled glory.

Hold on, it's gonna be a wild ride!

David

David.Ladyman@cloudimperiumgames.com
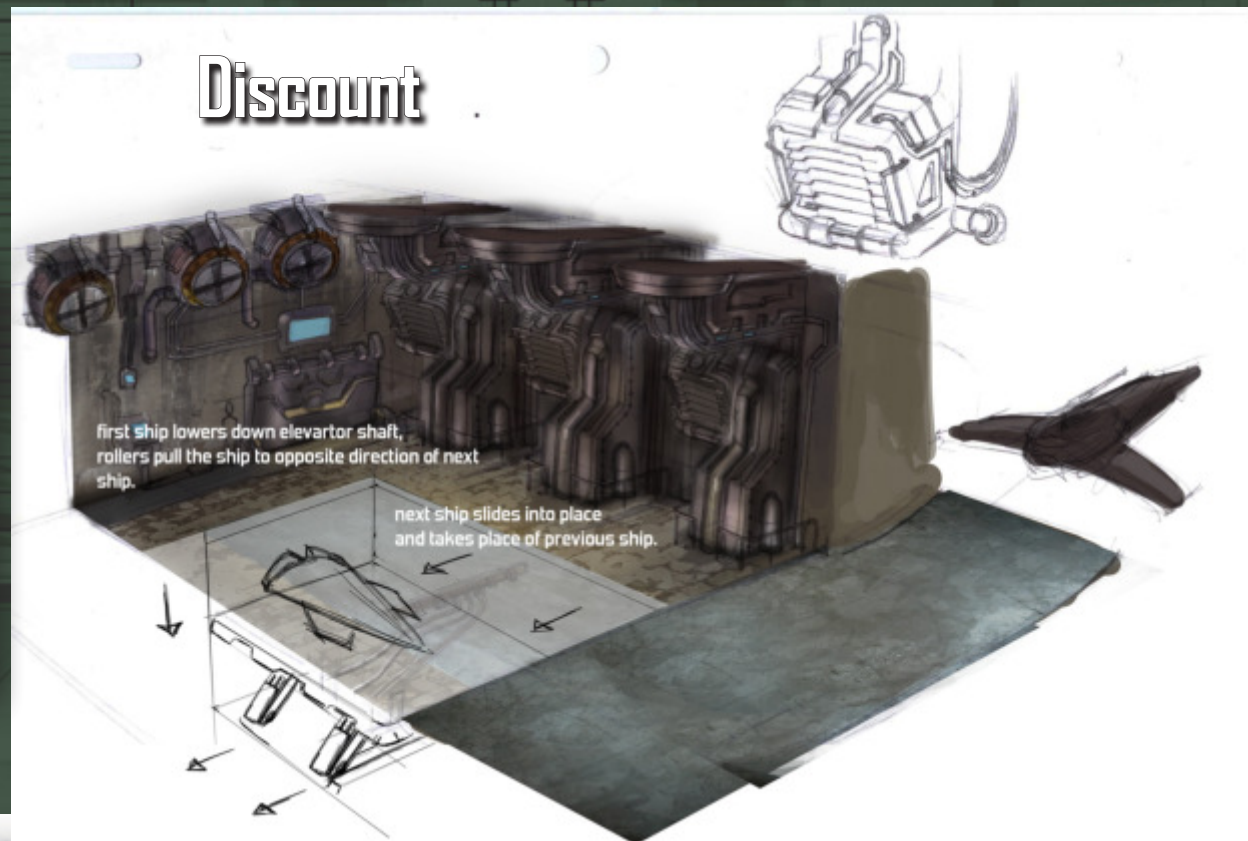
Hangars

We promised the initial hangars by the end of August, and the crew at CIG has been working feverishly to make that happen. It did (just barely), and we've got the pics and notes to show how it got done.

The hangars were created by a bunch of folks, including Forrest Stephan and Elijah McNeal.

Discount

first ship lowers down elevartor shaft, rollers pull the ship to opposite direction of next ship.

next ship slides into place and takes place of previous ship.

Elevator raises out of ground, revealing second vehicle.

Original concept art.

They also were created "modularly," meaning that (for example) one artist worked on lights while another constructed walls. That means that there isn't a smooth progression from concept to completion, and the work on the three hangars doesn't fall into three neat divisions. This WIP review follows the same path — it starts with concepts and ends with the final released versions, and it starts with the Discount Hangar (which was where the work began), but you'll find images for all three hangars mixed together from time to time in the following pages.

As usual, "CR" notes Chris Roberts' comments, while "CO" is Chris Olivia. "FS" is Forrest Stephan, and "EM" is Elijah McNeal.

After the hangars, we've got a bonus section beginning on page 44, covering Nathan Dearsley's (ND) work on the hangar buggy.
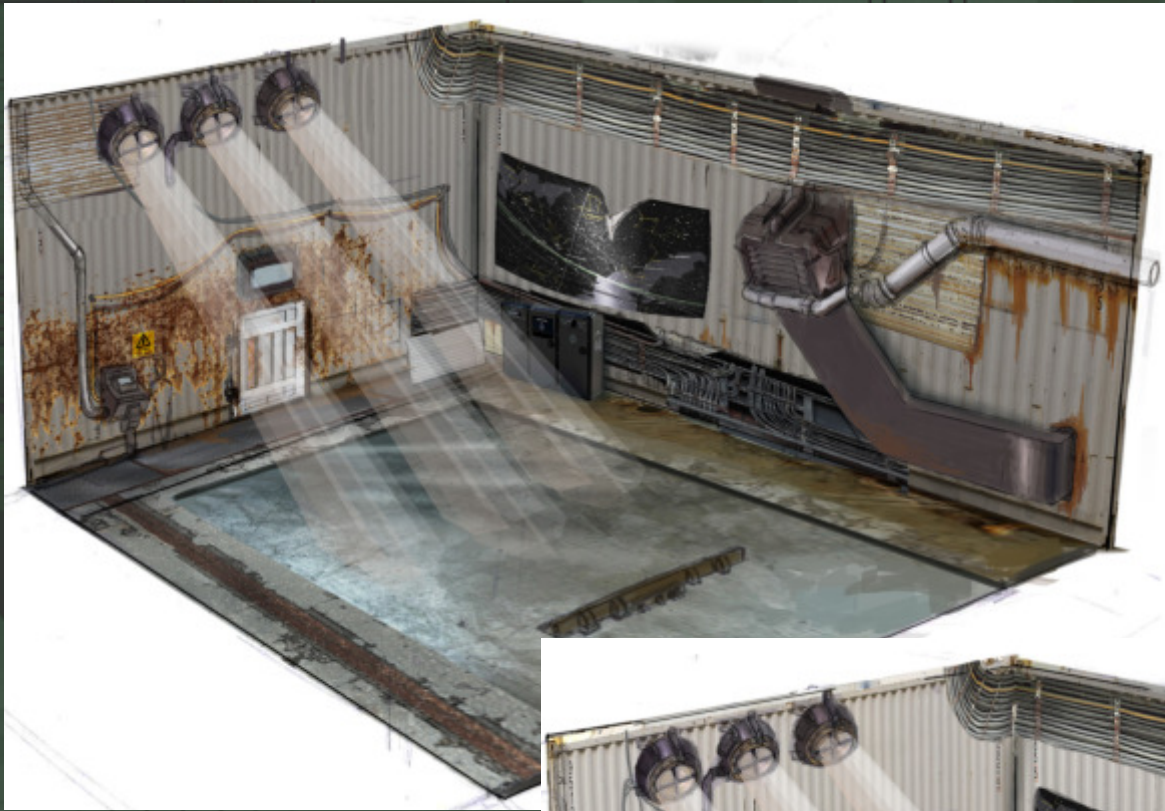
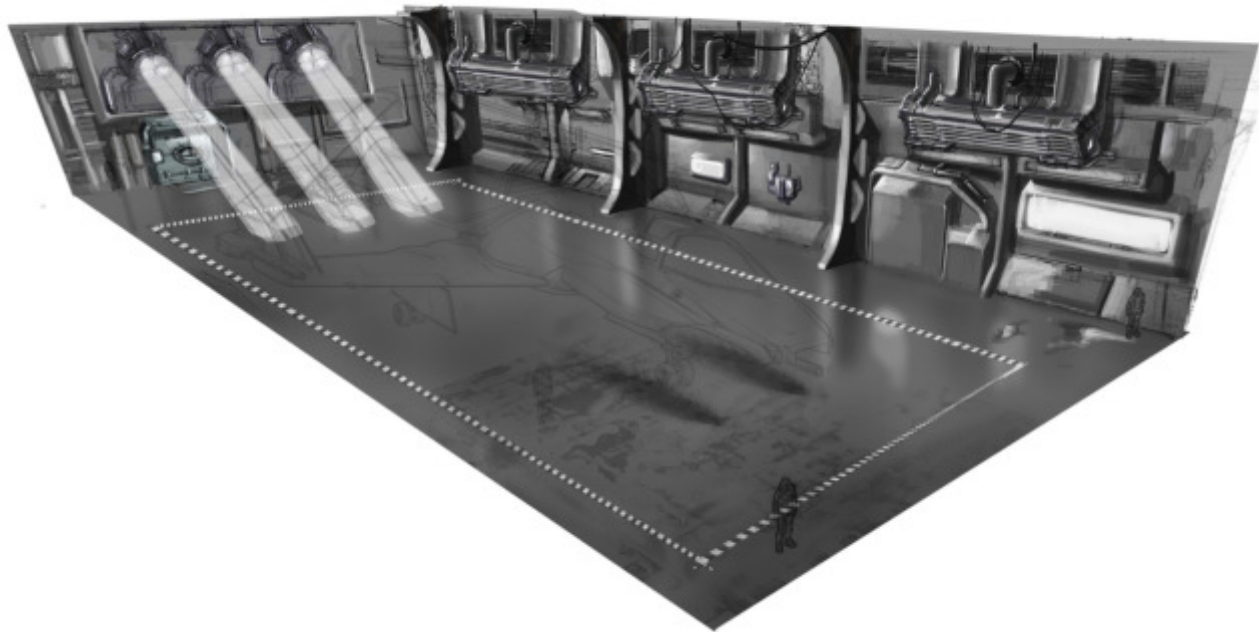Early concepts and scaling

Another concept drawing, and the first "props" (all the bits and pieces that make a hangar more than simply four walls.

BIG ASS LIGHT

GUARDED LIGHT FIXTURE

LIGHT

LEVER

WAVE MONITOR

BREAKER BOX

MONITOR

GIANT FUSE
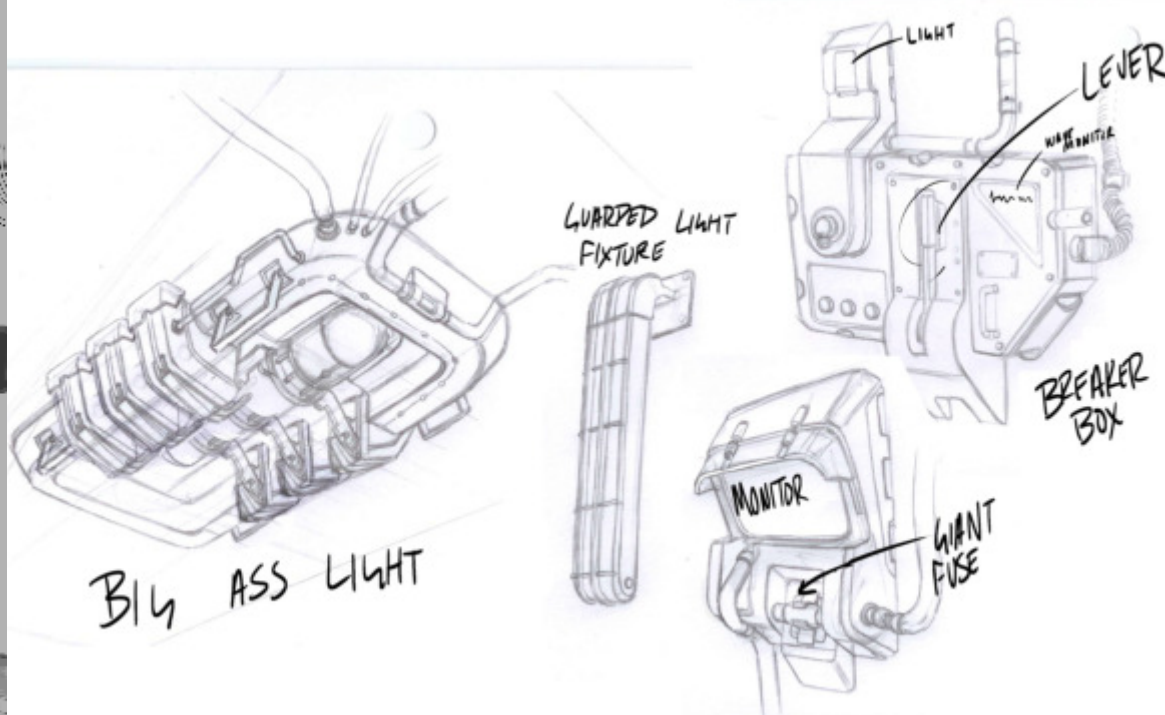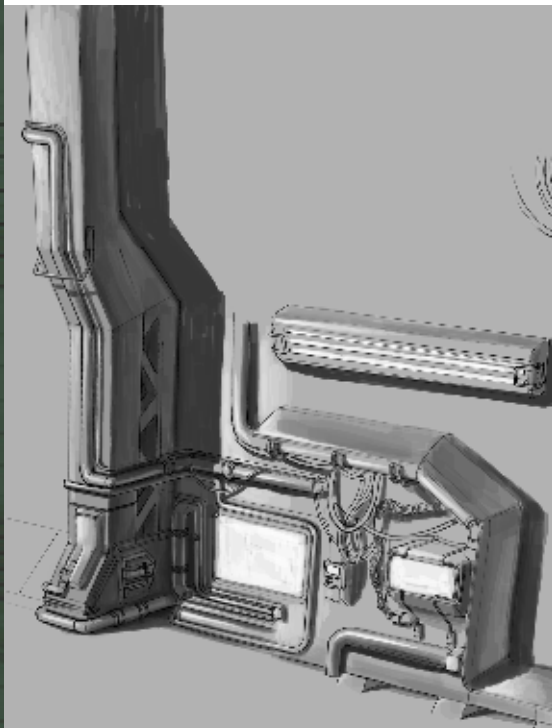
Door lighting test. In-engine.

Ship Hangar door look variants.

CO: Eliminate the visible chain mechanism in #1. Simplify the hydraulic system in #4 (not so busy).

Hangar second look, with temp lights and WIP materials

Lights for multiple hangars.

CO: I like 9, 10, 17, 19, 15.

Detailing out the walls first look.

Personnel door variants for hangars
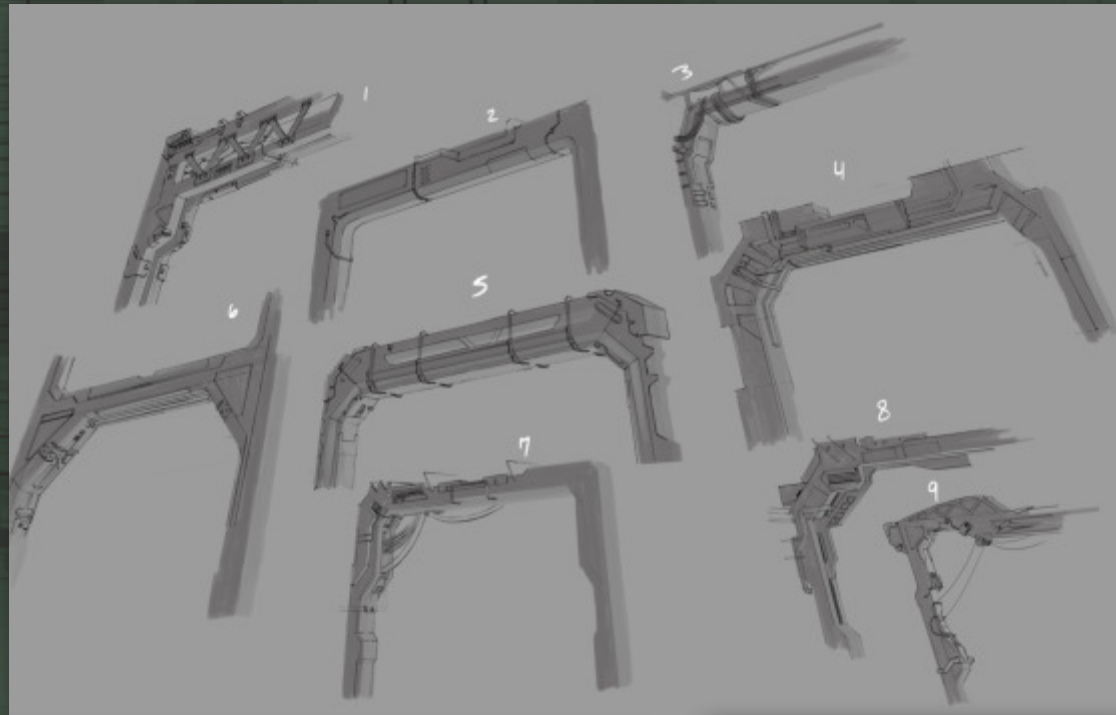
Trusses/stanchions/girders/etc. for multiple hangars

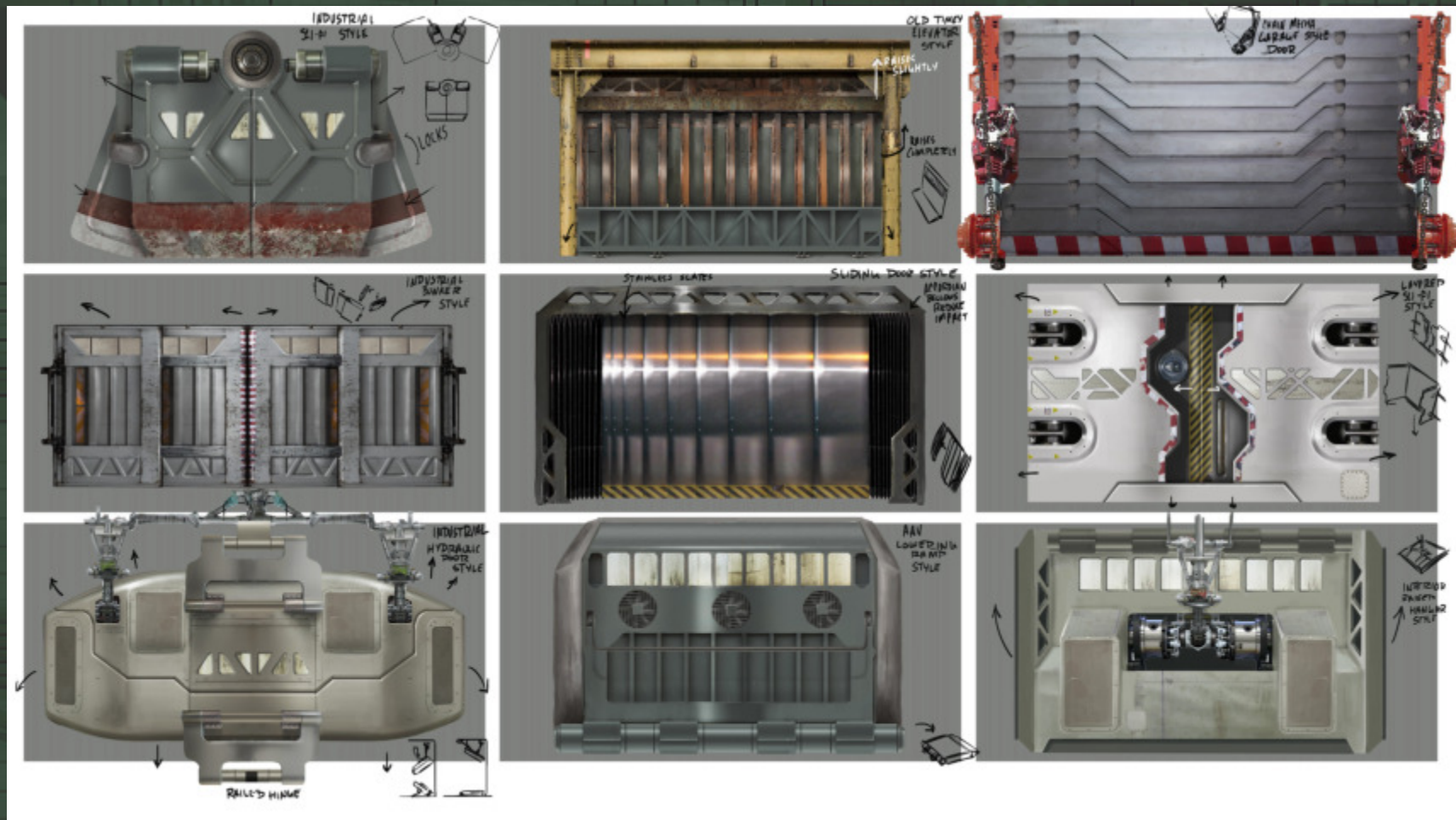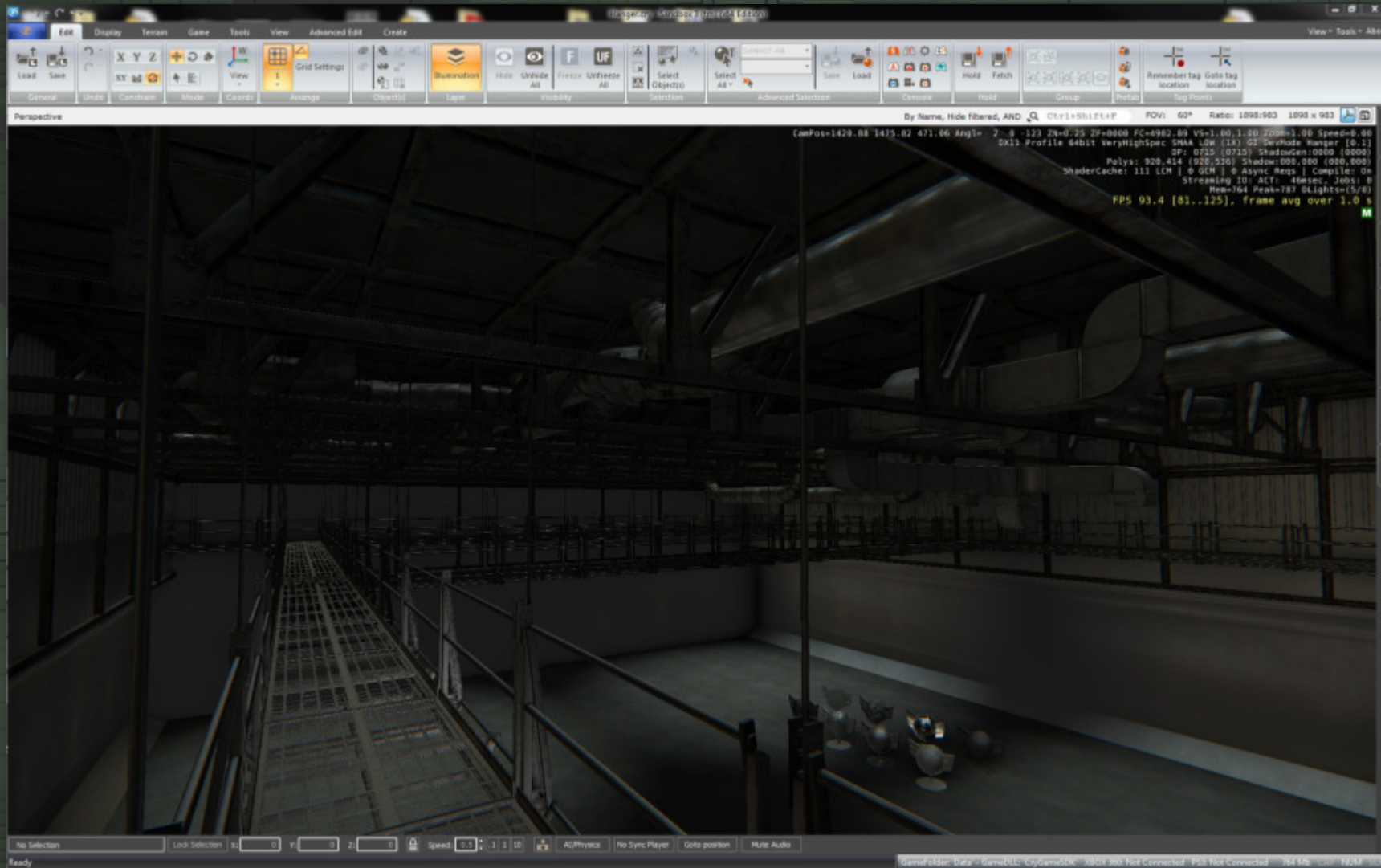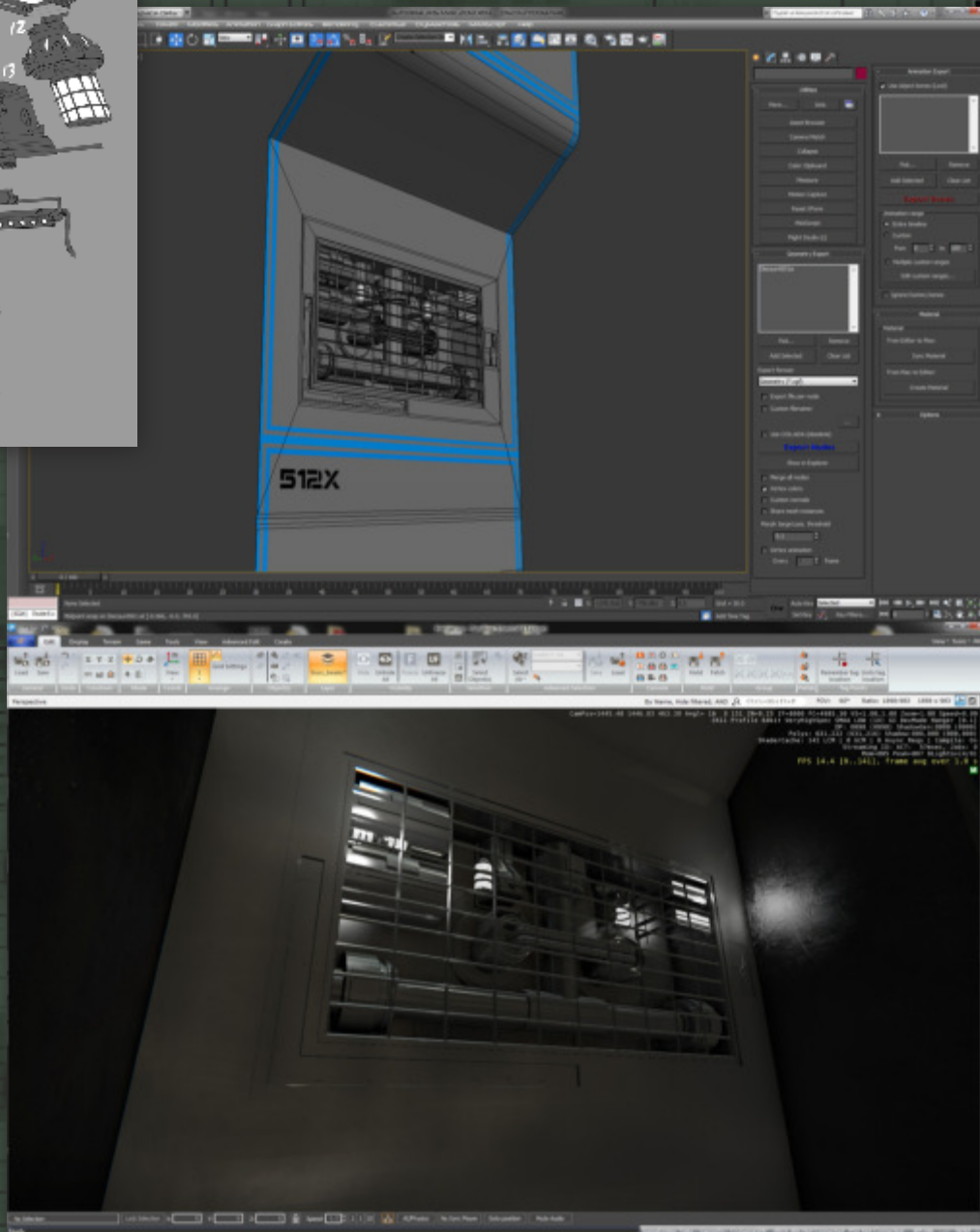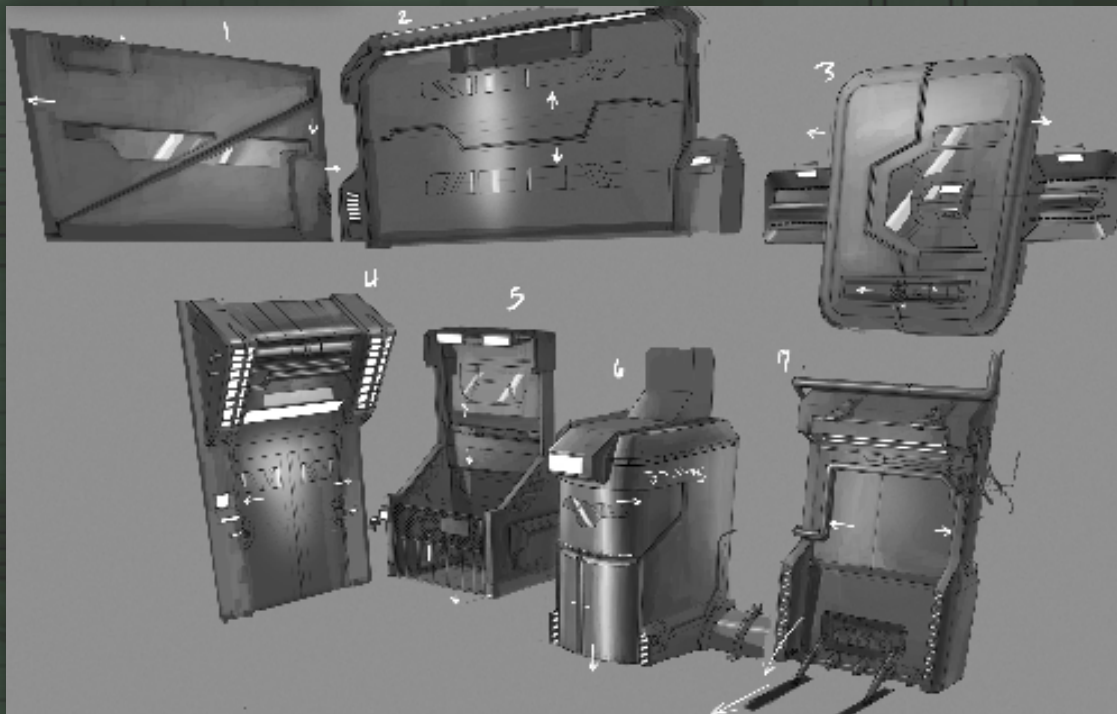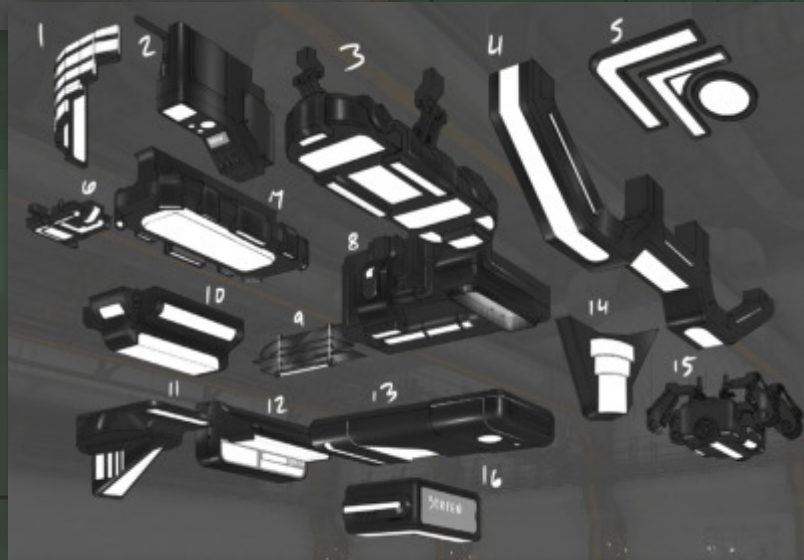## Hangar Key Lights

CR: Not a fan of these. Maybe top left and middle far right.

FS: Okay, let's get another set drawn. Do you have any images you can think of from movies or real world that could help point the concept in the right direction?

CO: (second set) Looks pretty cool. Try something more singular and like a spotlight; also try a few more minimalistic. That could be good for the better hangars.

CO: (third set) Again for this, I think simpler is better. 7, 8 or 10

These are my selections for the overhead lights, Forrest. Go with whichever one of these you prefer.

Hangar Corner Lights

CO: I like 8, 9 or 11. I think in the discount hangar, the simpler the better. A few of the others could be used for the upgraded hangars.

CO: Maybe number 9 for flood lights on the floor?

FS: Can you do a quick xsi mockup for how you imagine it being positioned on the ground?

CO: Just jammed into the floor, rotated 45 degrees up toward ship.

THESE ARE Y RAYS!
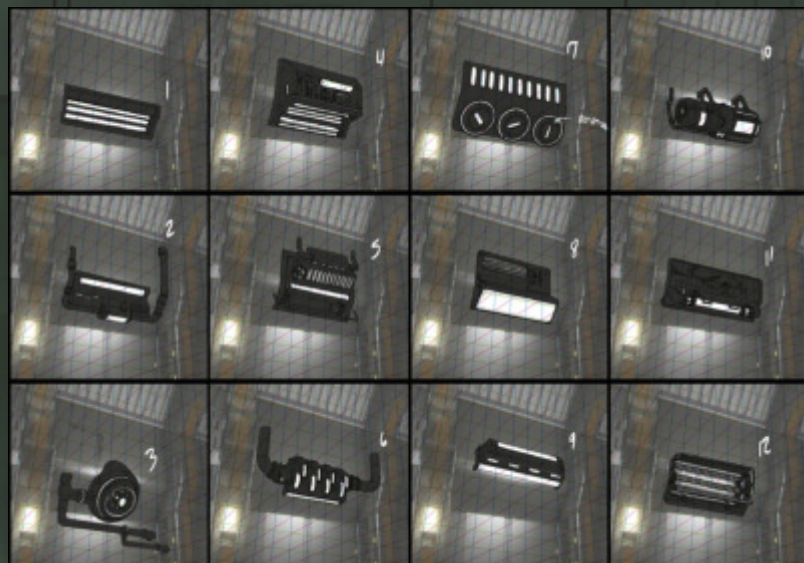
FS: Catwalk has been revamped to give the visual feel a much more futuristic style. Additional geometry has been built on top of the existing mesh. Animated screens are being added in addition, as well as small lights.

CR: Yes, more sci-fi, which is good. There should also be a sleeker / simpler catwalk — maybe for the higher levels — that would have less grating. Maybe hand rails with higher tech self-illuminated sections and a bit more substance.

FS: Sounds good!
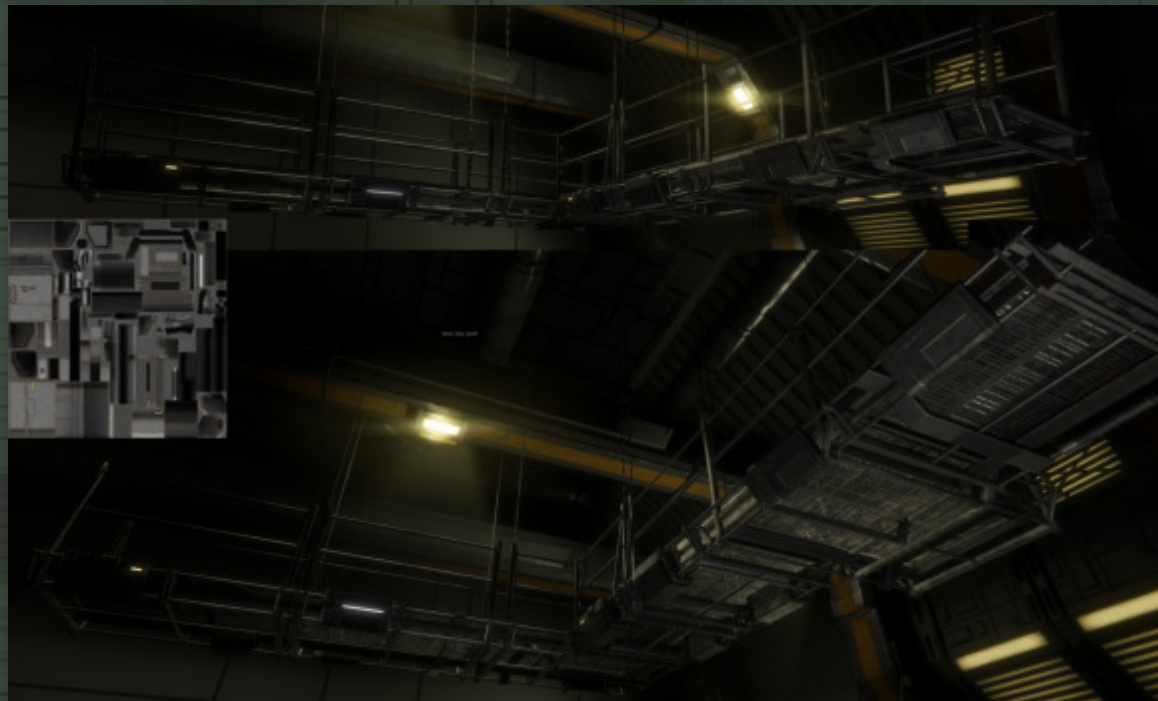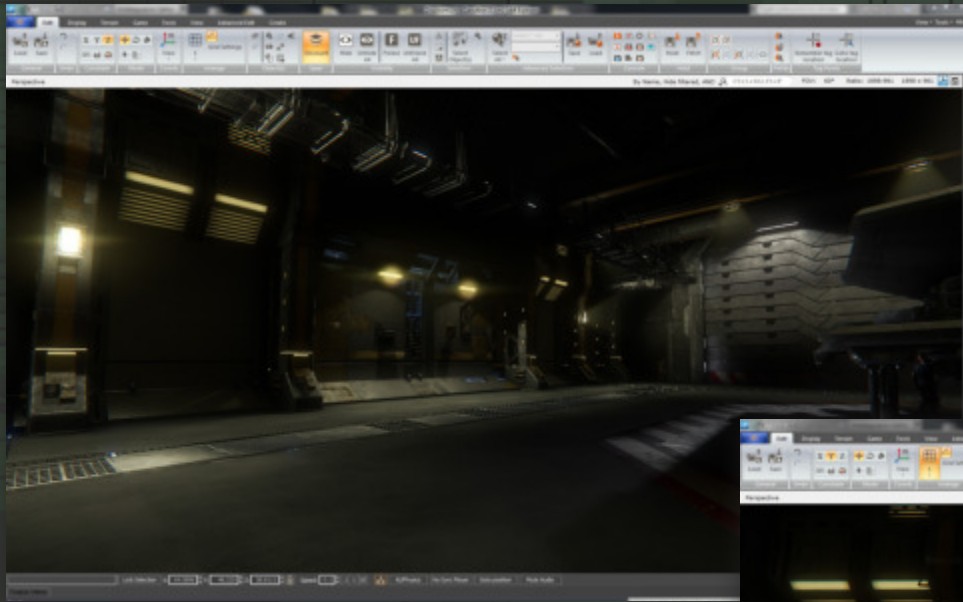
Built out the side wall.

CR: Starting to shape up nicely!

FS: It's getting there. :)
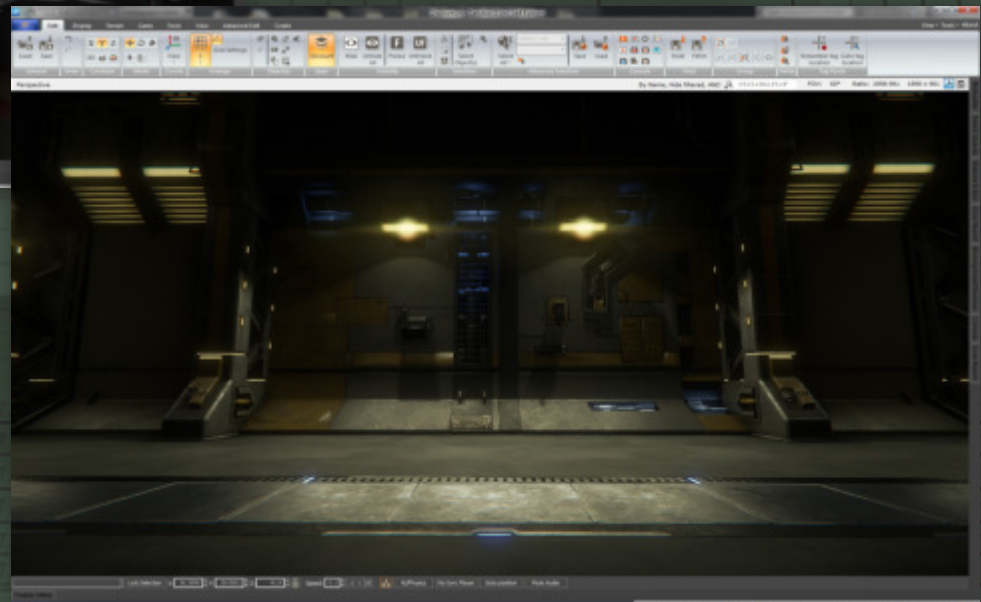
Overhead fans
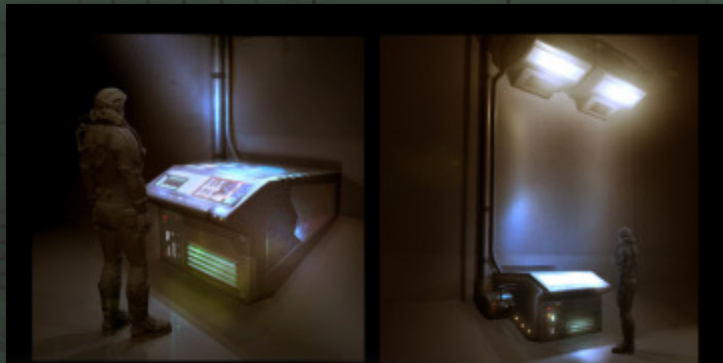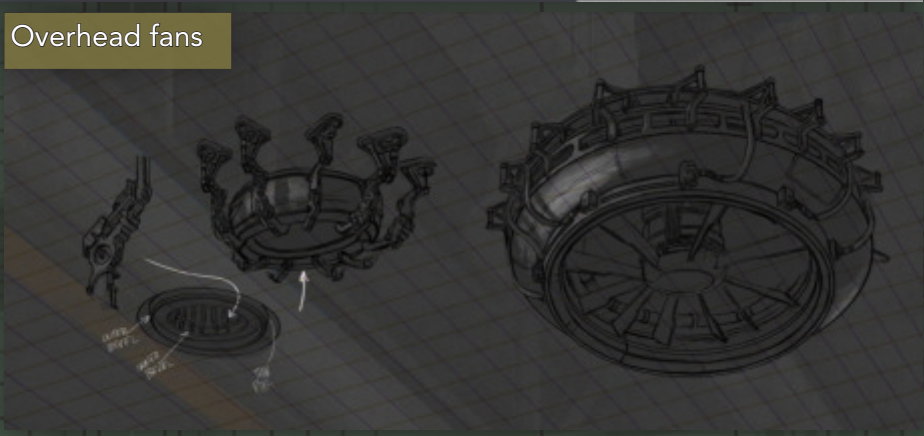
Lights & control panel paintovers
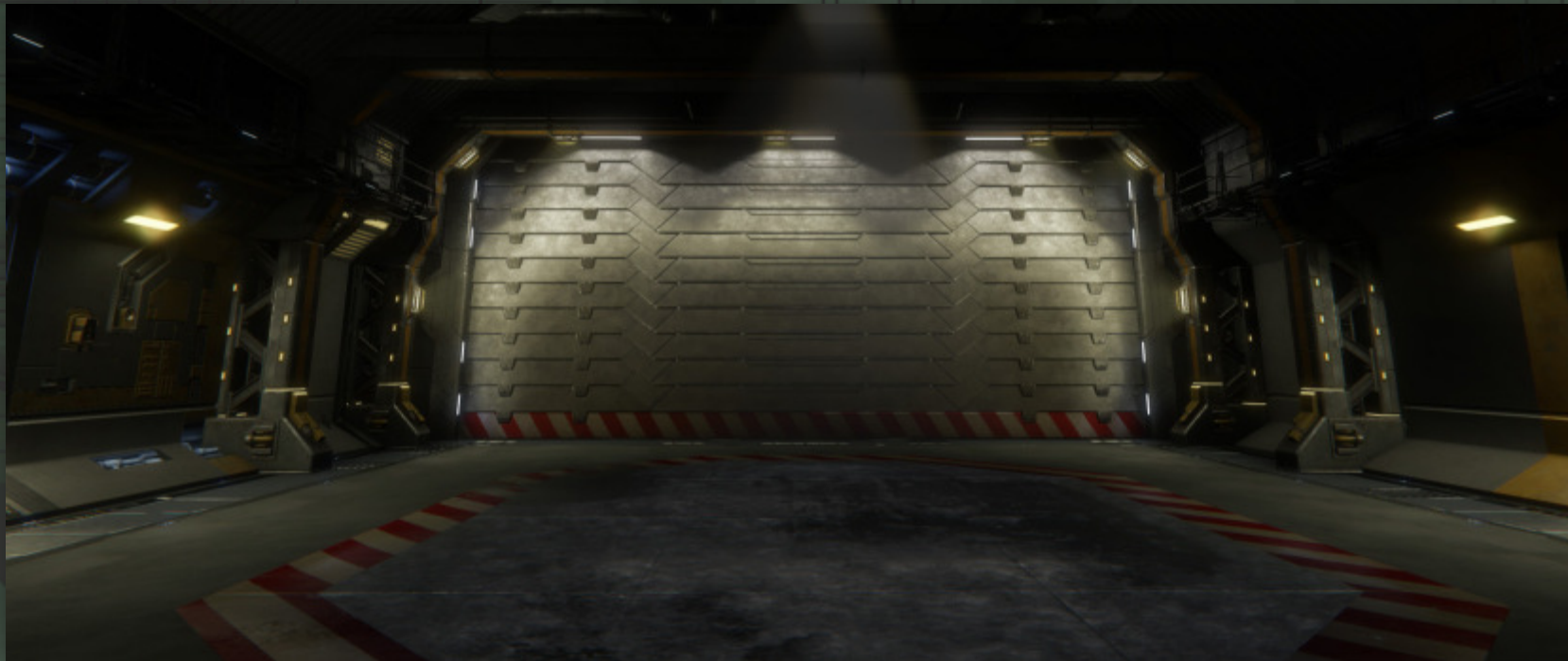
I've removed 600 square meters from the Discount Hangar, as it was too big for an entry level hangar.

Finished back wall geometry. In-game and world building with the side wall prop set. Glimpse of the wall.
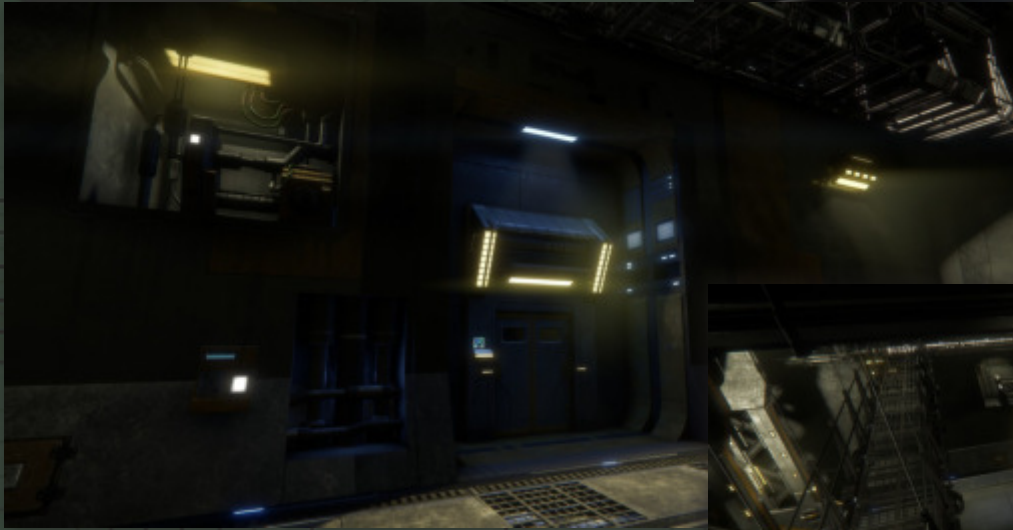
Discount Hangar update — 90 percent completed. Finish line is in sight! :)

Workbench concept for the hangar

CO: Smokin'!

CR: NICE!!!! Corentin, stop sucking please. :-)

EM: The overall layout is nice, but I would say that it looks primitive even for the Discount Hangar. With this being so far in the future, I think it should have some form of gravity suspension or at least a more advanced visual for how the tools are placed on the backing. Everything else looks nice. It fits the style well.

A sample of tools that could fit on the workbench. We probably have to create some slicker / brand new tools for more advance workbenches.

Discount Hangar storage shelf

Weapons Cradle (Grav Pallet)

FS: Followed chosen concept, although once modelled it looked a bit too much like an 8-ball table. Added some subtle line changes down the side profile, etc., to help get away from this. Not shown here as max's viewport shaders are limited is the thick glass screen over the top. I plan on getting some subtle refraction going on with this in engine, distorting underlying details and lights and so on.

CR: Looks really good to me! This in engine yet?

FS: Just to tidy up my max file, add collisions and make nice should someone want to work / grab anything from it, uploading to p4 in a few minutes. Here you go, ingame, done, etc.. Put a placeholder old school animated layer effect within the glass (crushed uv's, then scroll along a small emmisive fractal pattern) until such time as we have a proper shader done for this kinda stuff.

CR: Looks great!

DISCOUNT FUEL CONTAINERS
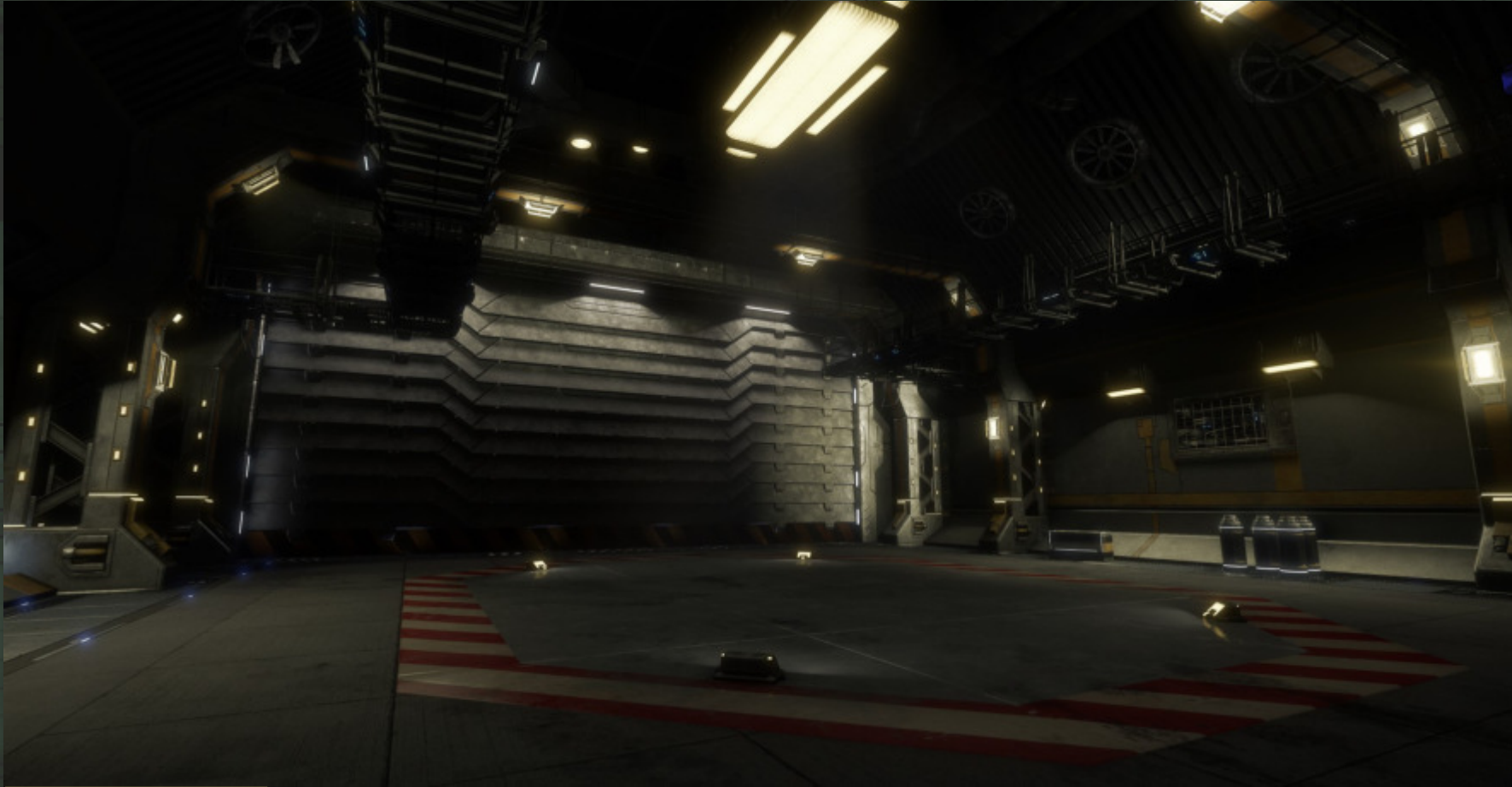
The Discount Hangar
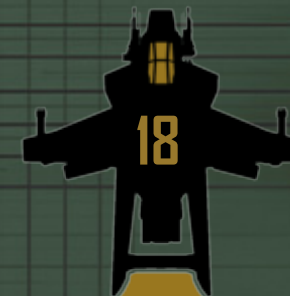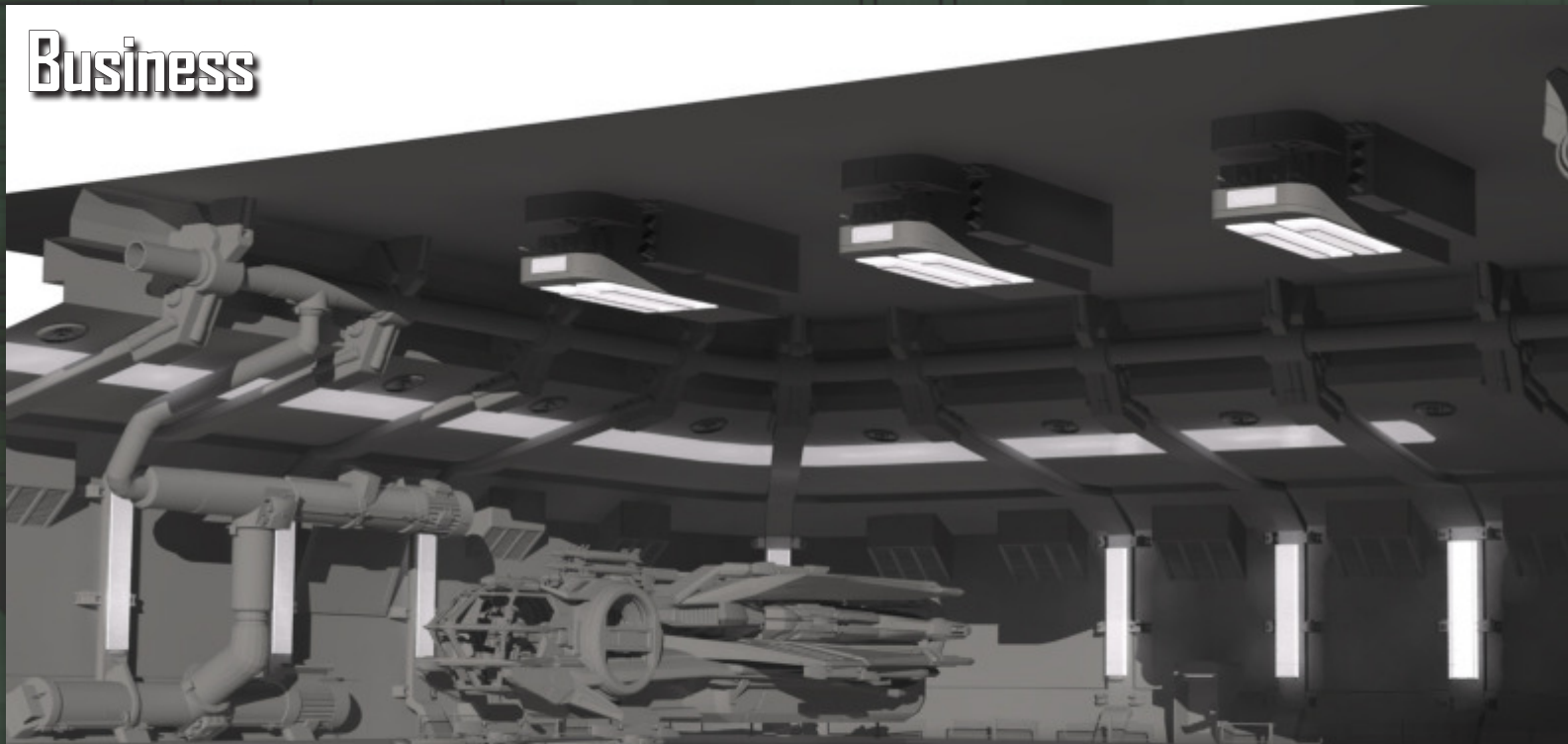
Business

CR: Looks good! Definitely a suitable home!

One thing I think is key is to always do a version with just one ship in it (as this will be the most frequent case). This one potentially could feel claustrophobic with those big pipes on the side, if it is only big enough to hold one ship versus the multiple ones this looks like it can do. Maybe some dressing / greeble only gets added when the hangar is above a certain floor area size.

FS: I understand. I wanted to add some content in here. As with the first hangar, I'll be going through these once the last one is done and you've found the feel that you like. I will make suitable props for the environment, especially since this one likely has some options for social and store facilities. I'll likely scale down the fire main so that it doesn't make the ship feel small, etc.

CR: Is this where the ship would VTOL through?

FS: Yes. As far as I know the Aurora doesn't have a VTOL system, does it? I wanted to use a more expensive vehicle in this iteration over the Aurora as I had before. It's a classier hangar. We could also use a mechanical elevator or some sort of mag-lev field.

SEMI GLOSS WHITE

PLASTIC OR GLASS

ELEVATOR

POLISHED OR BRUSHED METAL

GLASS

MATTE SURFACE / CHARCOAL

WOOD

HEALTH & AUGMENTATION

BUSINESS AREA

LEATHER

SOCIALIZATION / RECREATION

PRIVATE SECURITY CENTER / HOT SECRETARY

CR: Like it!!!

ENCLOSED ELEVATOR

COORIDOR WRAP AROUND

WINDOWS

HALL TO STORE, STORAGE, PRIVATE FACILITIES, ETC.

COORIDOR WRAPS AROUND HANLAR OPPOSITE END HOUSES ANOTHER ROOM
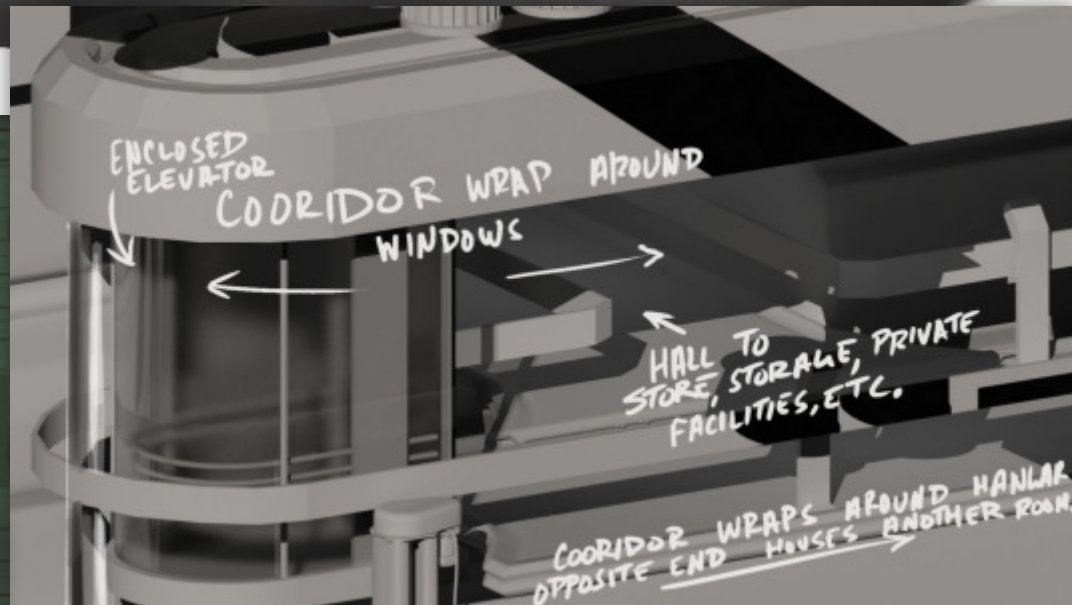
Corridor

Business Hangar first look. Base modular level-one objects are modeled and working. Colors do not represent the color scheme, only the color coding that represents materials.
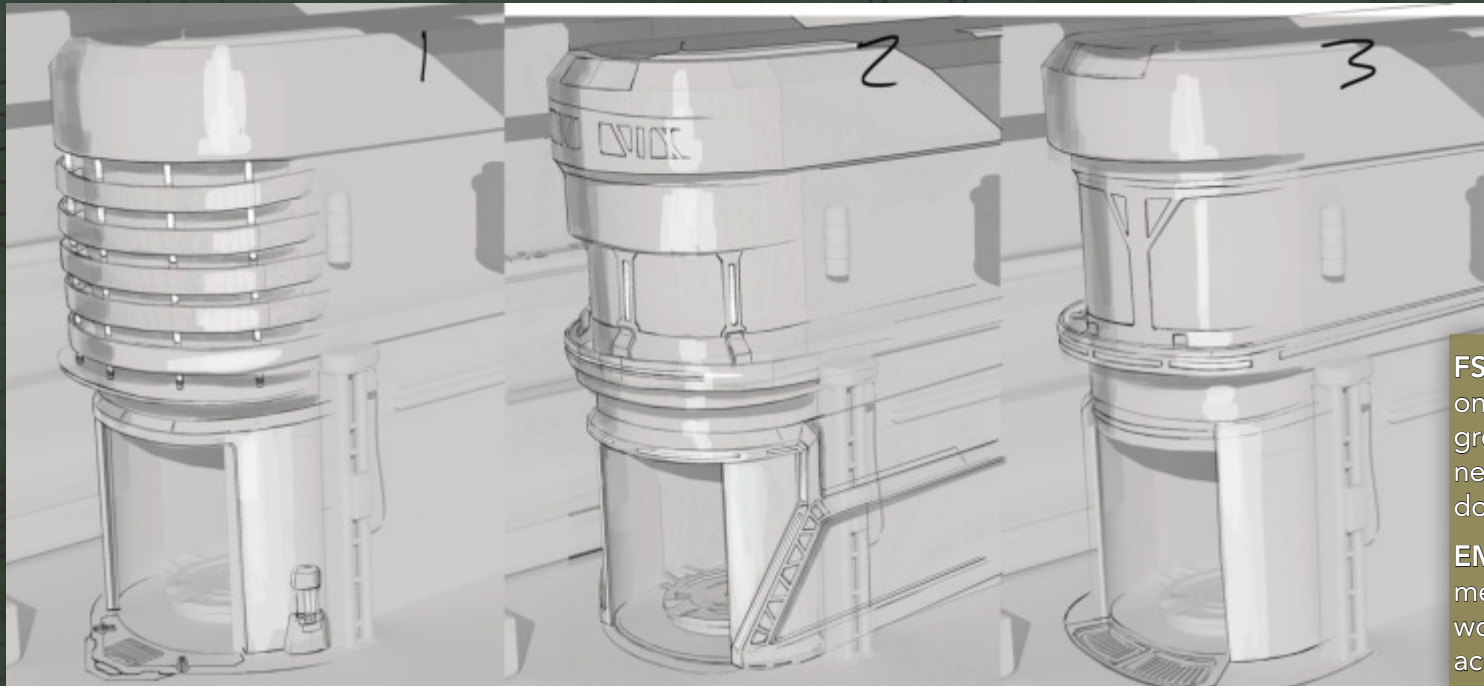
WORK IN PROGRESS

FS: Sweet...That one look will look great in the Business Hangar. Well done, Elijah!

EM: BTW, I recommend the slats be wood with metal accents.
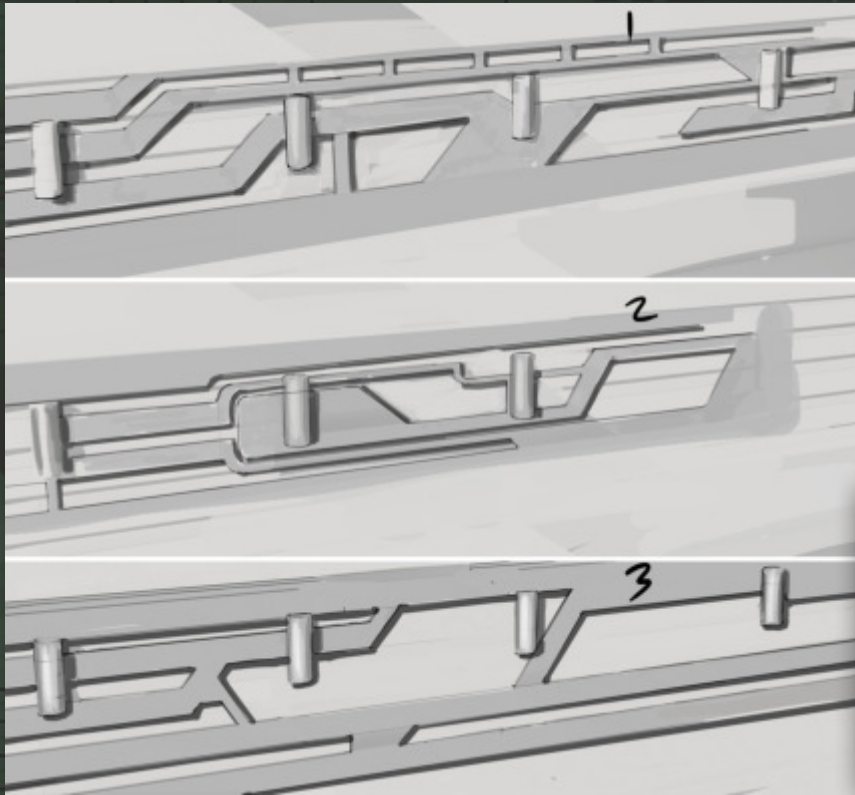
Corridor slats. Lights are not final ideas, just indicators of external lighting placement.

CO: I like 2 the best, then 1 second best.

Elevator platforms

CO: I like 3 or 4.
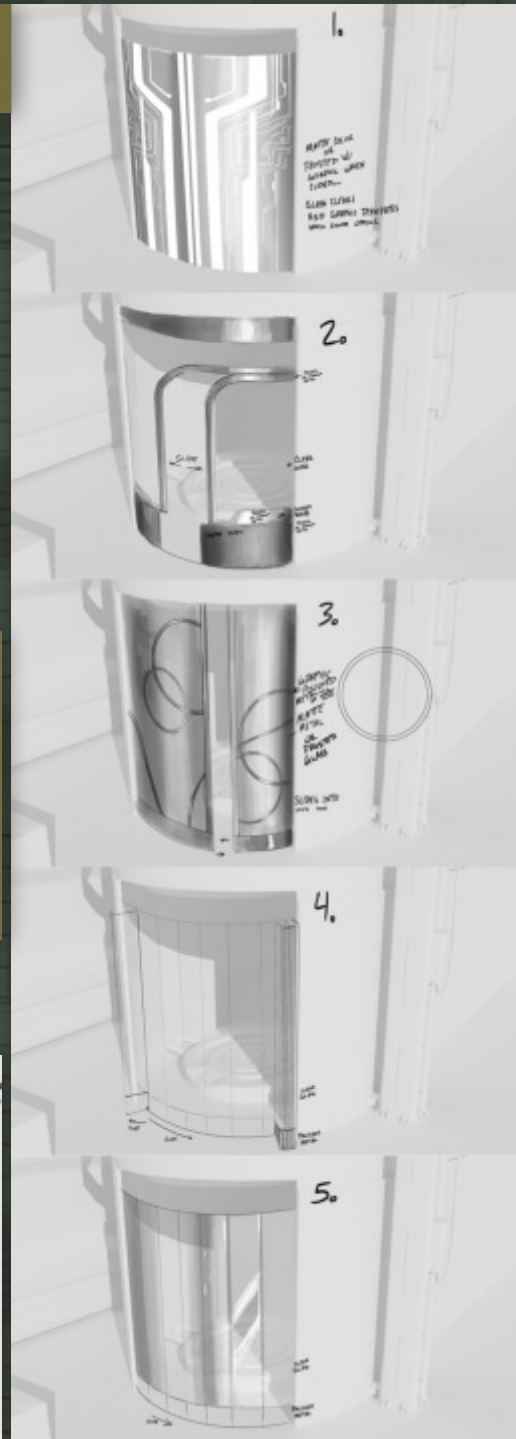
Various props. Can be used inside and outside of the elevator. Comms, controls, A/C, stores, etc.

Ceiling and/or Bulkhead lights
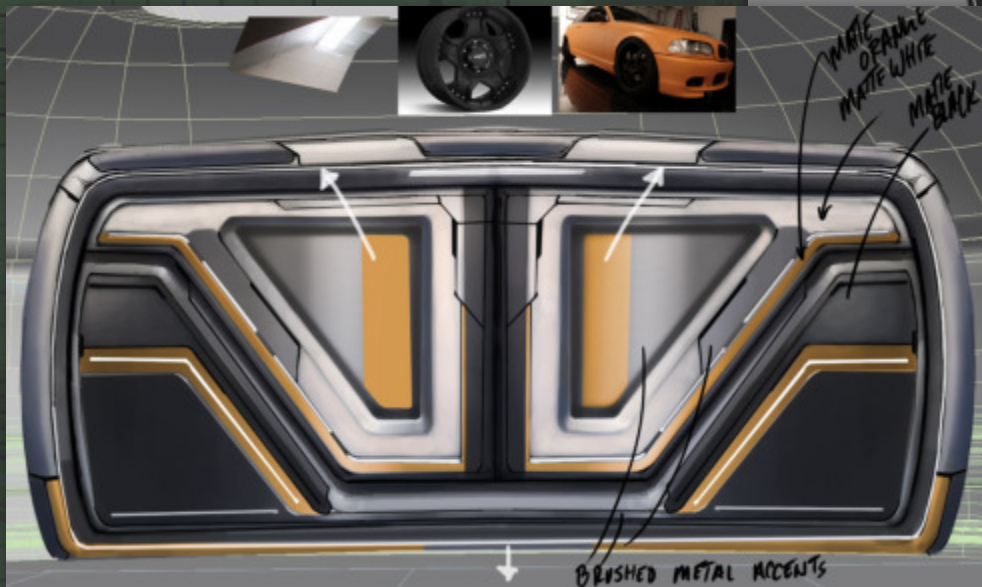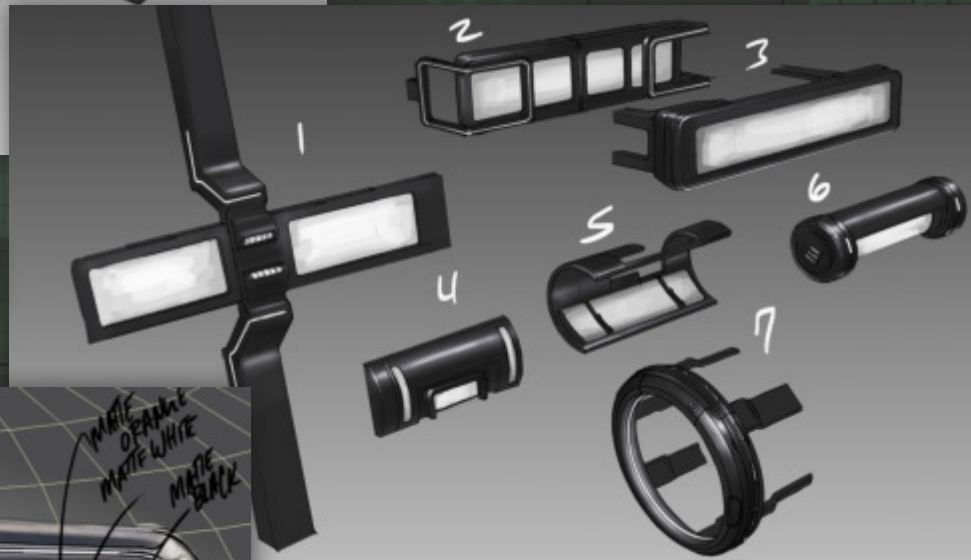
Hangar door with color and material code.

MATTE ORANGE
MATTE WHITE
MATTE BLACK

BRUSHED METAL ACCENTS

Business Hangar Color Sketches

Business Hangar color sketches.

FS: The color scheme is too 70's in my opinion. This should be clean, simple yet futuristic, looking as it fits the Hornet. The luxury will be very plush, like the interior of a private jet, with wood paneling.

FS: I really like the shape and the structure of the hangar.

Business Hangar color sketch, version 2

Business Hangar floor pattern/layout
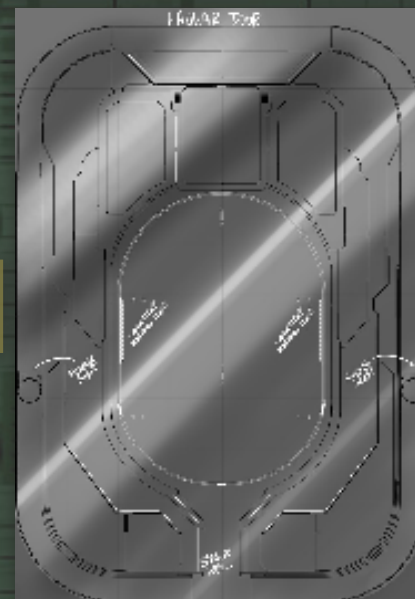
WORK IN PROGRESS
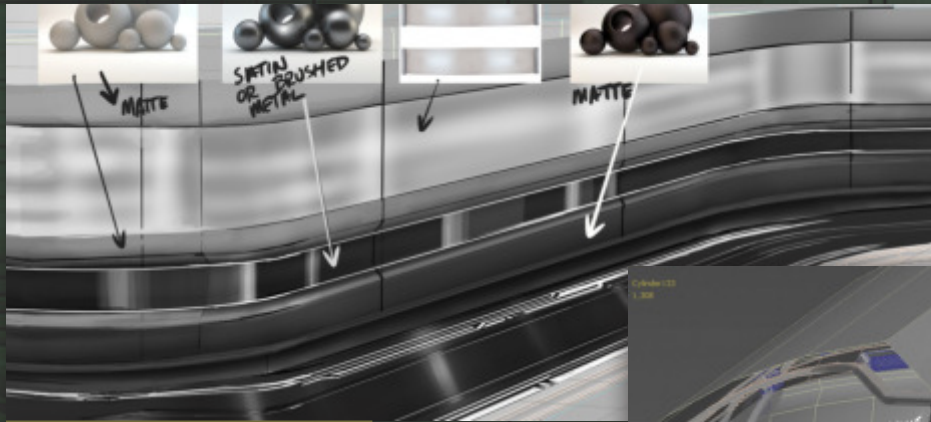
Revised corridor bulkhead
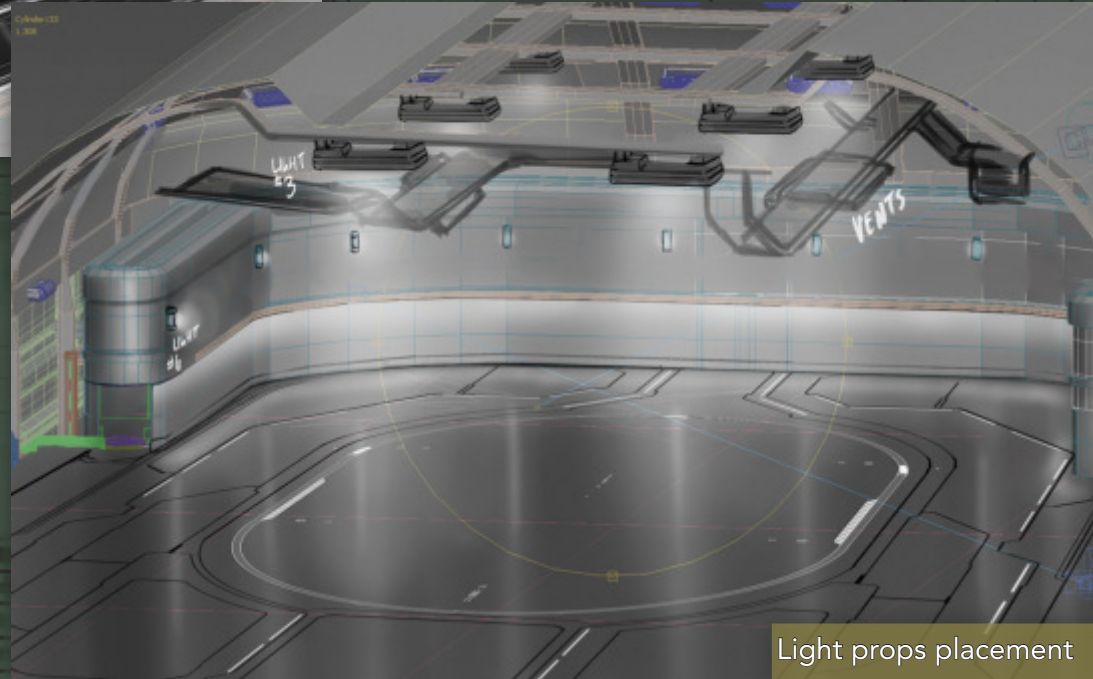
Light props placement
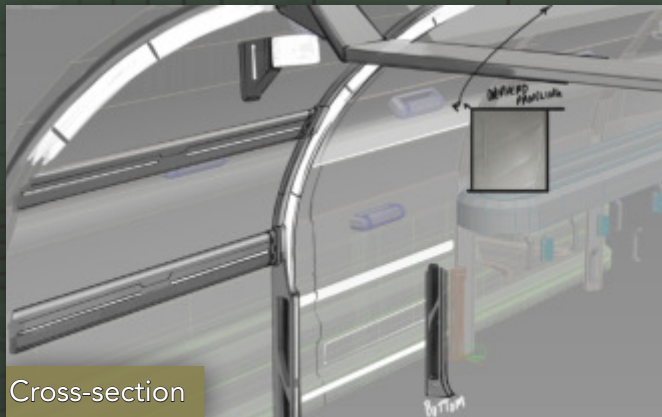
Cross-section
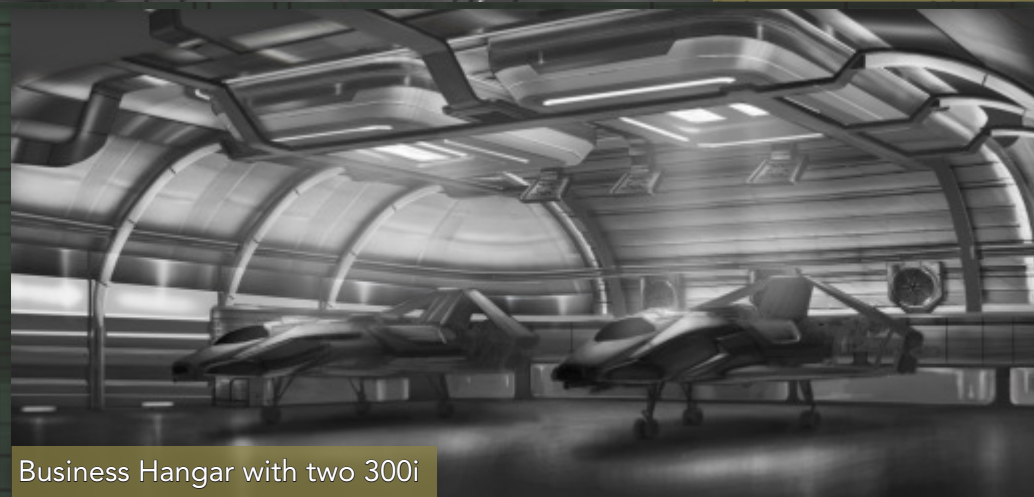
Business Hangar with two 300i

WORKINPROGRESS

PRIMARY 1

PRIMARY 2

SPLASH

DECO/PROPS

GLOW 1

GLOW 2

Color scheme for the Business Hangar. Subject to change if initial prototypes do not give desired look.
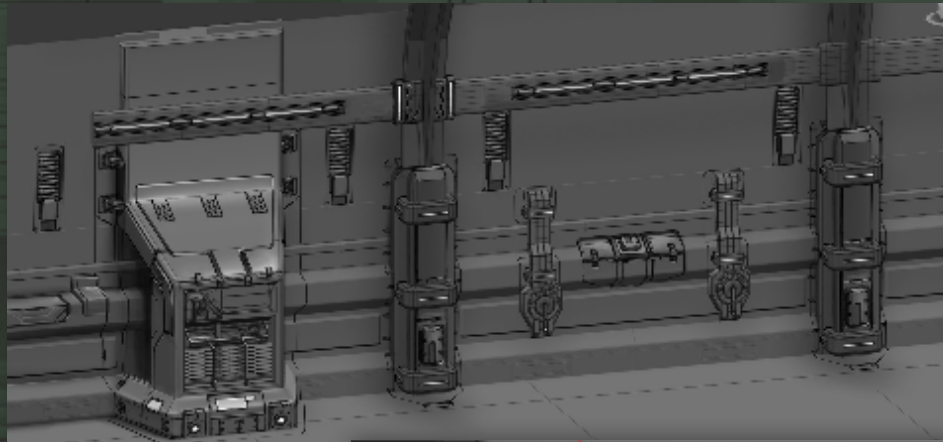
Bulkhead detailing.

Business Hangar door.
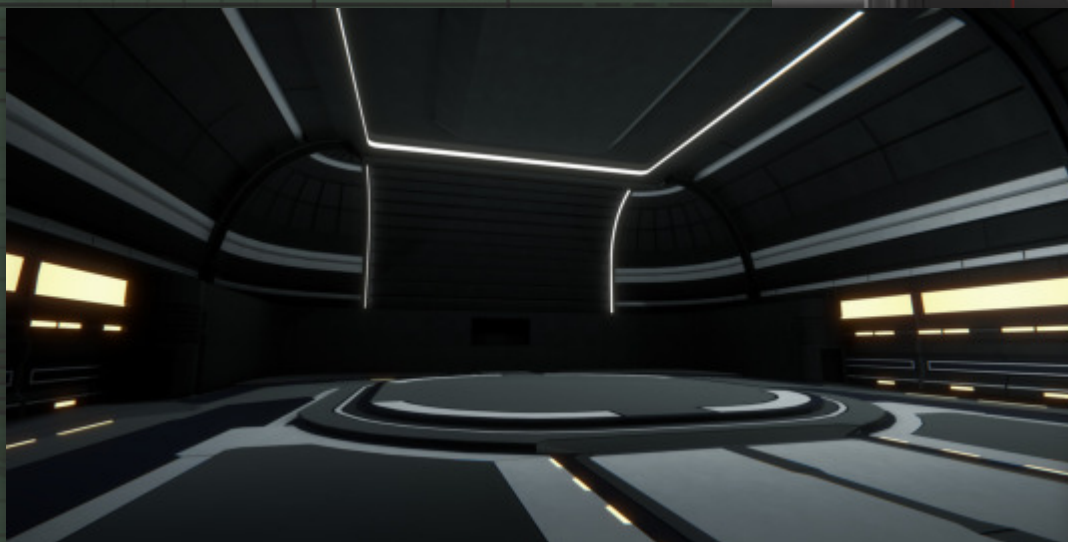
First look of Business Hangar progress shot.
CR: Looks good (as a WIP).

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WORK IN PROGRESS

Corridor details

Monitor corner

HOLO-PLANT
could be projected into 3D space, or could be a lenticular image.

WATER-GLASS
could also be a hologram, or just water on glass with an inset drain surrounding the glass base.

DOOR ENTRY PANEL

ASSET CONTROL PANEL

Lounge callouts

DDN

DISPL

DIFF

SPEC

POM on

POM off
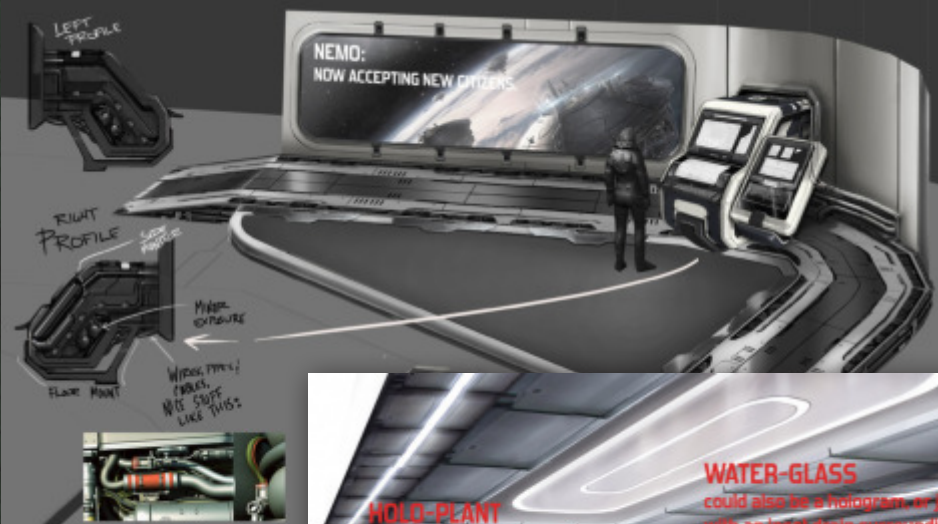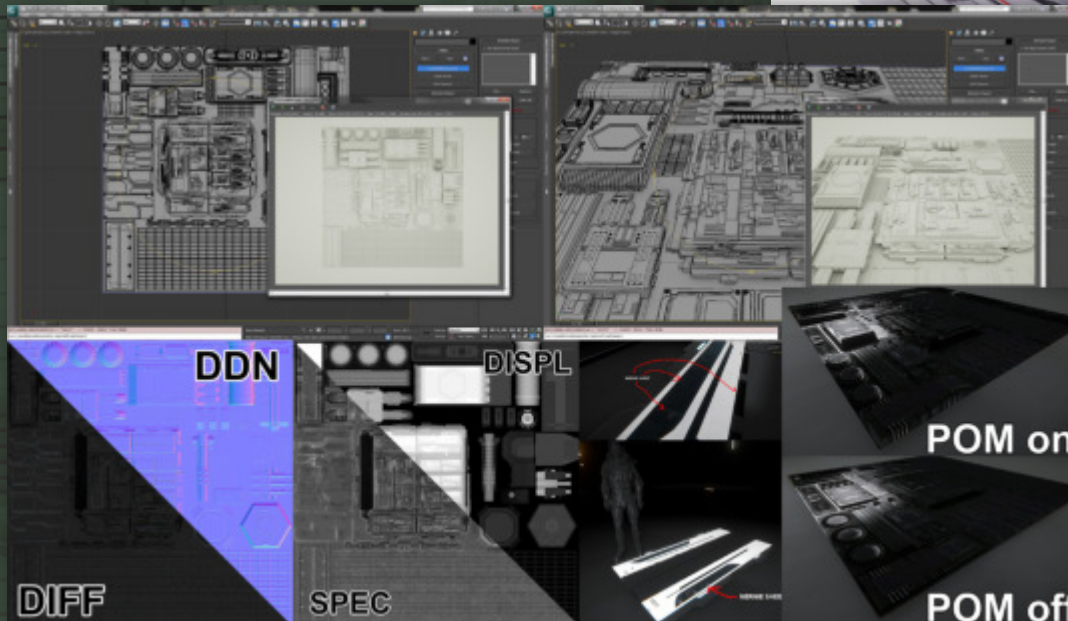
I put together a quick nernie sheet for the Business Hangar (with the greeble kits we purchased). The design calls for a handful of plexiglass and I wanted to have some cool greebles underneath the glass. Also included in the image is the floor for the east and west ramp, using the greeble nernie sheet as an in-game example. POM comparisons are also in-game.

WORK IN PROGRESS

Elevator interior
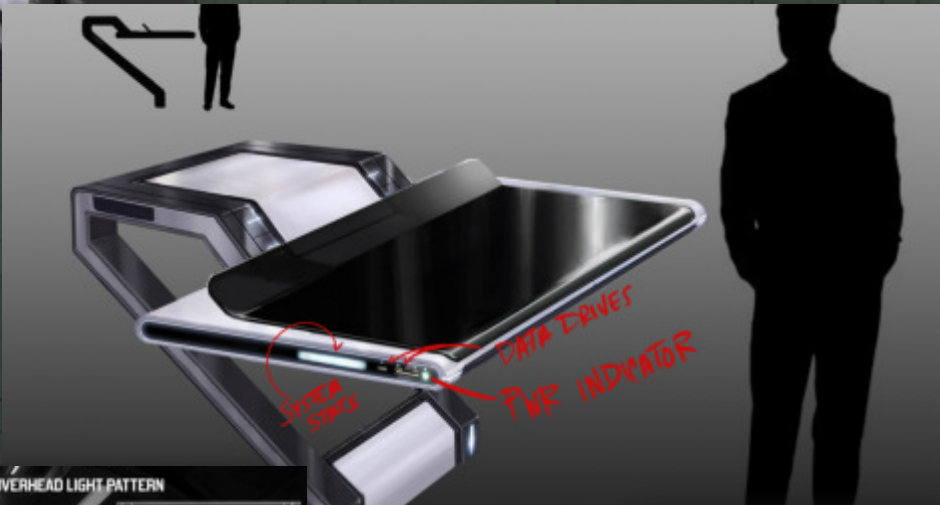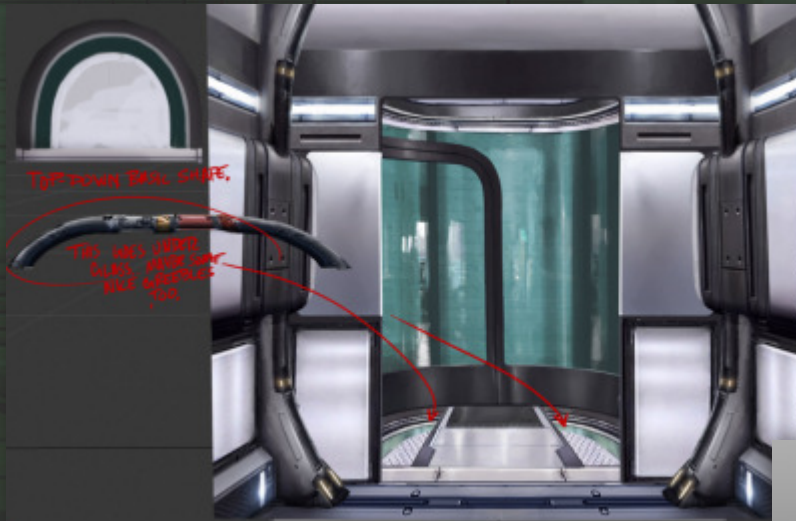
Mobi-Glas Notes

CO: Retractable?

CR: Retractable would be cool!

simple geometry shelf.
Like an iphone, with the
overhead light under it.

Slide on a vertical track system.

OVERHEAD LIGHT PATTERN

TRACK DETAILS

Business storage shelving

FS: That's perfect!

27

WORKINPROGRESS
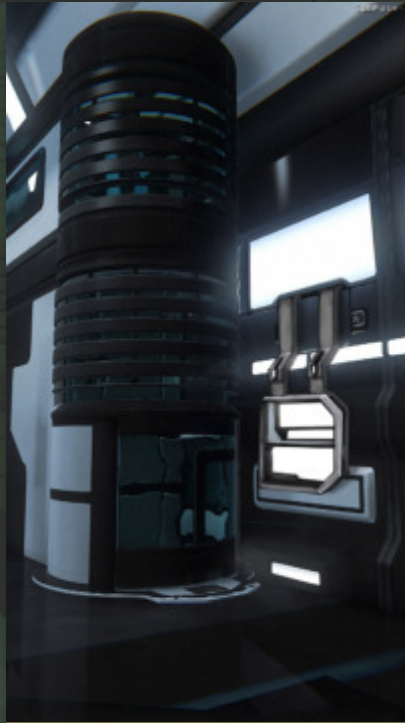
Elevator revision.
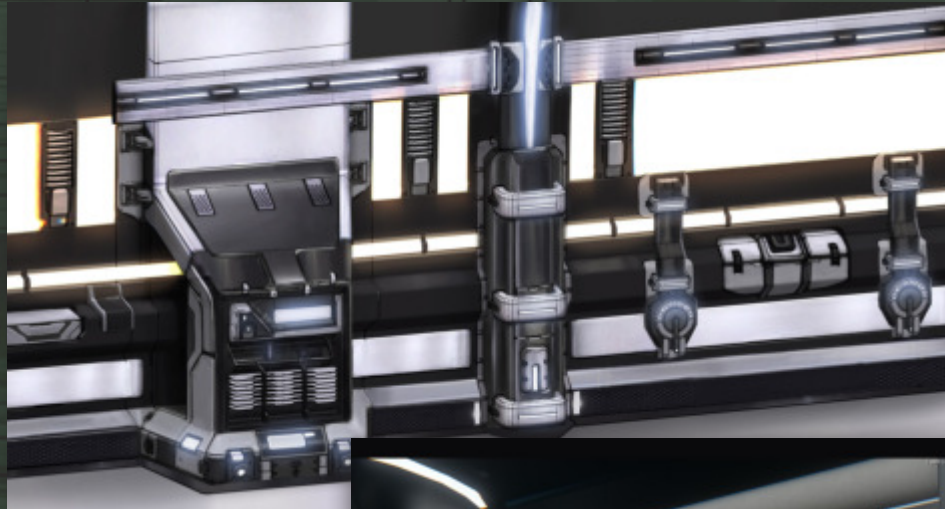
Bulkhead revision.
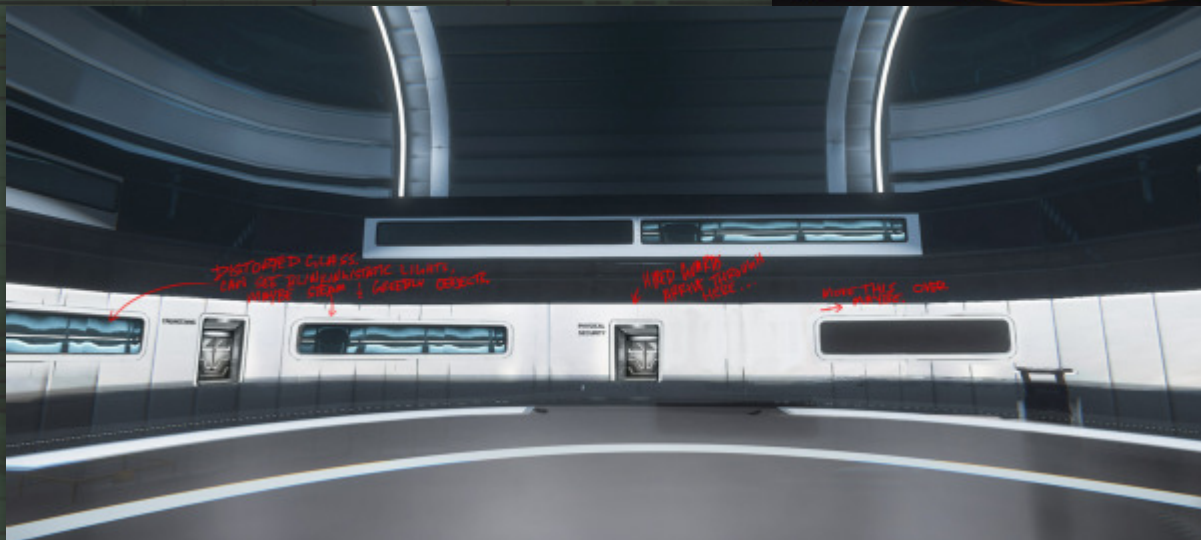
Fan placement ideas. Sleeker than the hanging ones; mo' better.

CR: I like the right side options.

Back wall paintover.

Columns for duplication support.

COLUMNS
GO INTO
OVERHEAD
NOT VENTILATION

BUSINESS FUEL CONTAINERS
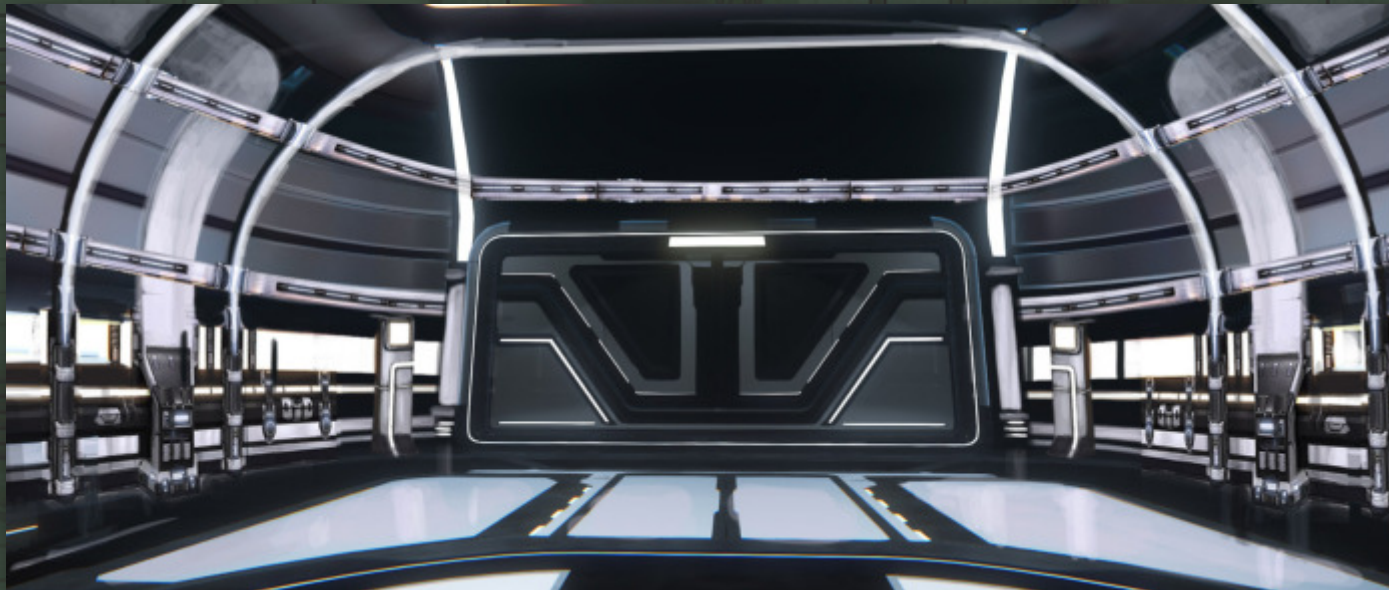
Front wall paintover
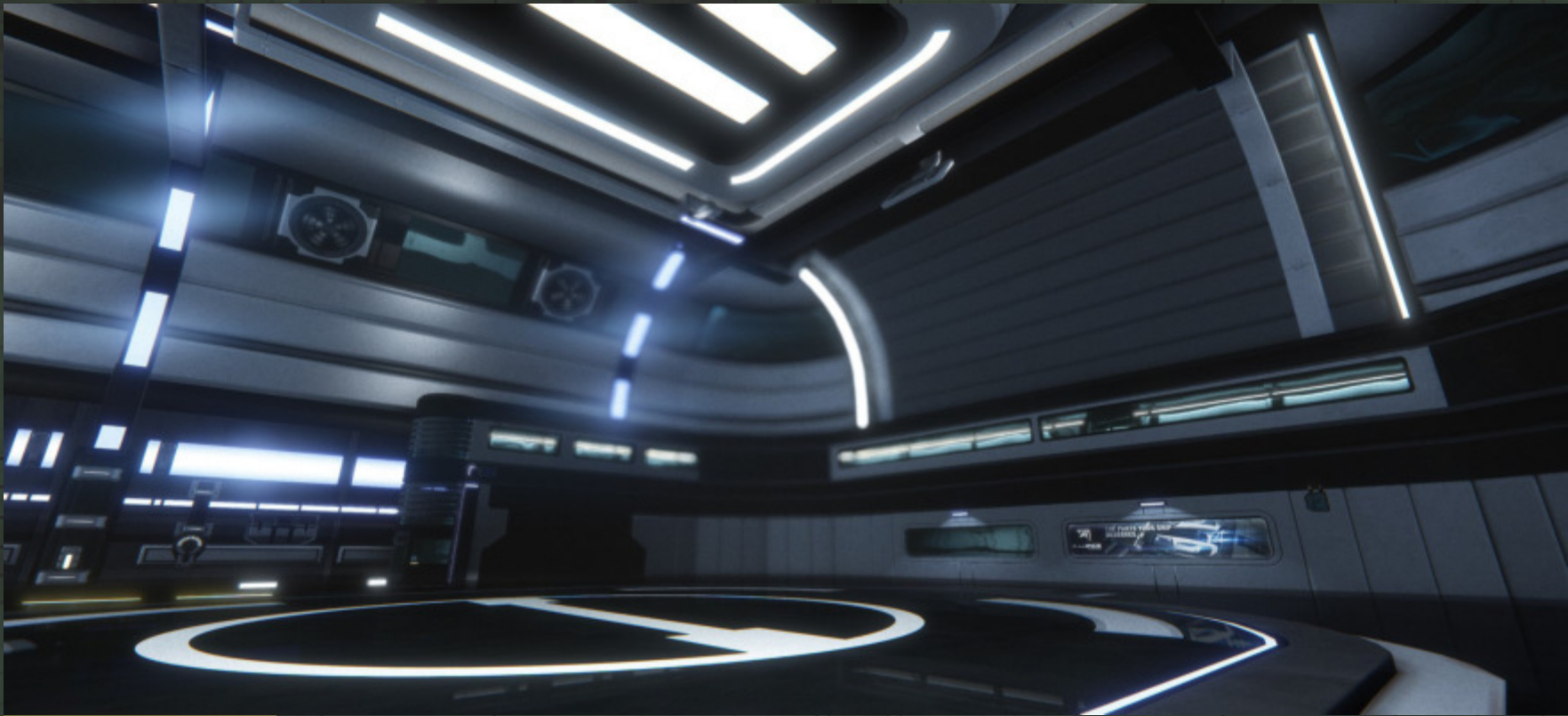
The Business Hangar

Deluxe

Deluxe Hangar concept
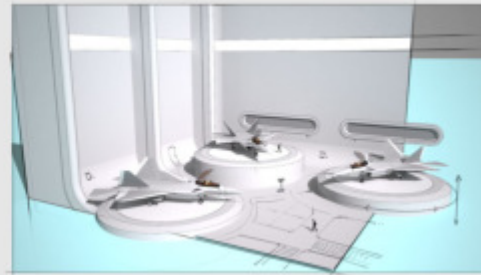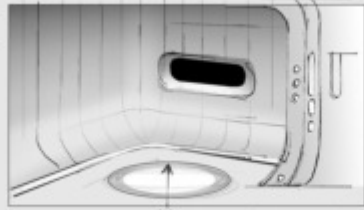
REF: MINIMALISM   NEOMODERN ?

→ BRIGHT + CLEAN
→ BRUSHED ALUMINIUM
→ SCIFI PORCELAIN
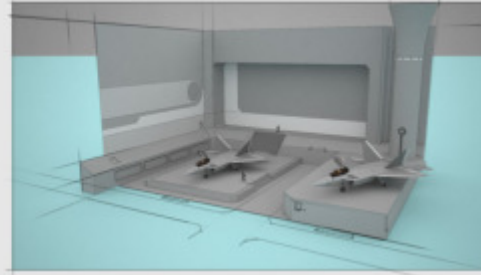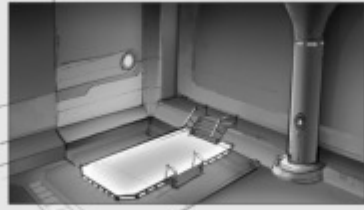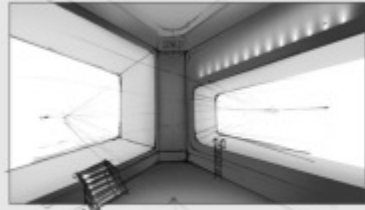
REF: LATE MODERNISM ?
     STRUCTURAL EXPRESSIONISM ?
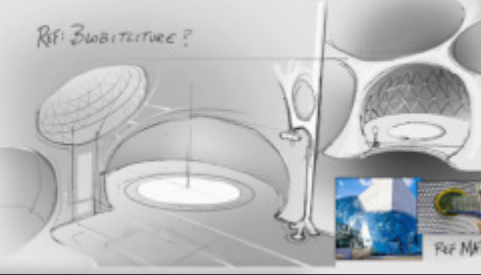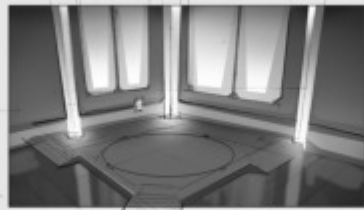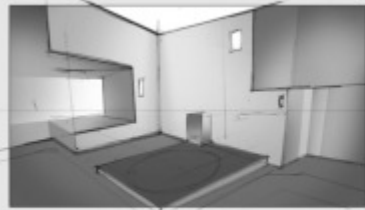
REF: NATURAL BUILDING ? (SUSTAINABILITY)

• RAW MATERIALS
• EXPOSED + UNTREATED
• CONTRAST to SHIPS

REF: BLOBITECTURE ?

REF MAT

Hangar - Deluxe - Exploration

HANGAR DELUXE - DOORS - BLAST DOORS!

OPENING → PULSING LIGHTS
          PA SYSTEM
          SIREN
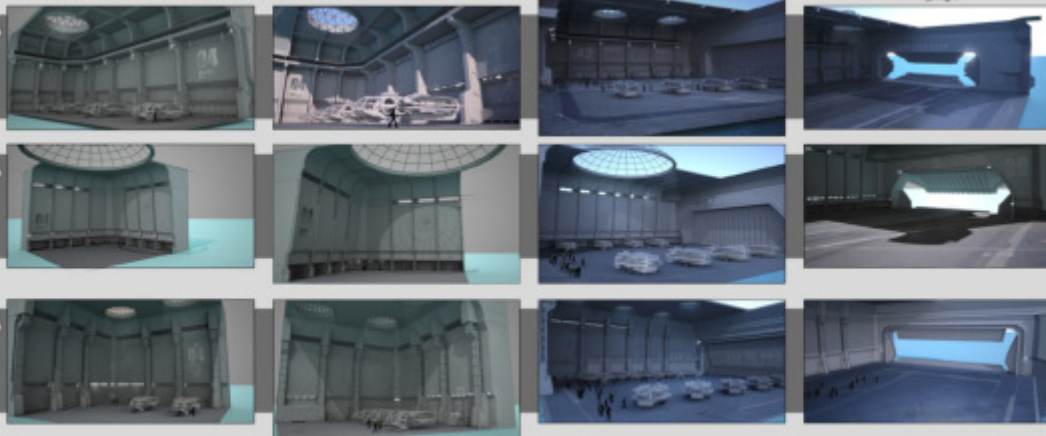
Hangar Deluxe Exploration. Added some new thumbs showing what the doors might look like, as well as how they might open.
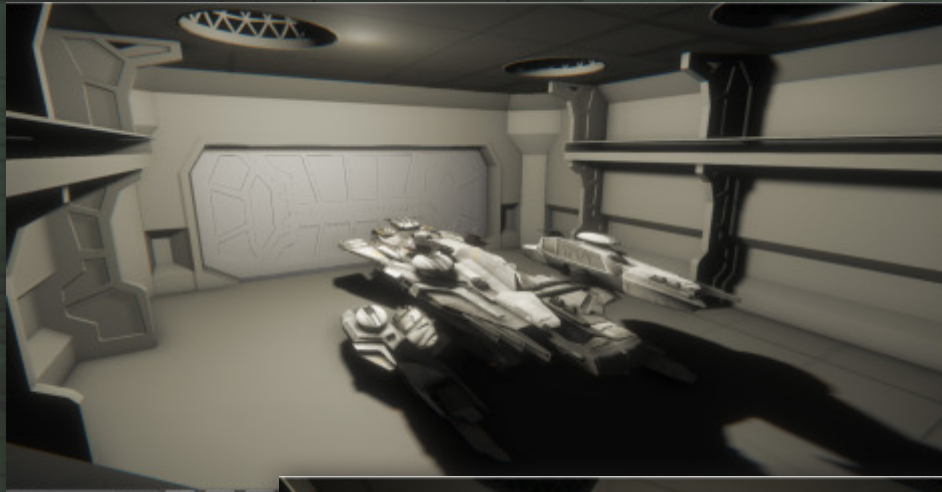
WORKINPROGRESS

First look at the in-engine prototype for the Deluxe Hangar.

Deluxe Hangar base painting.

Deluxe Hangar color sketches.
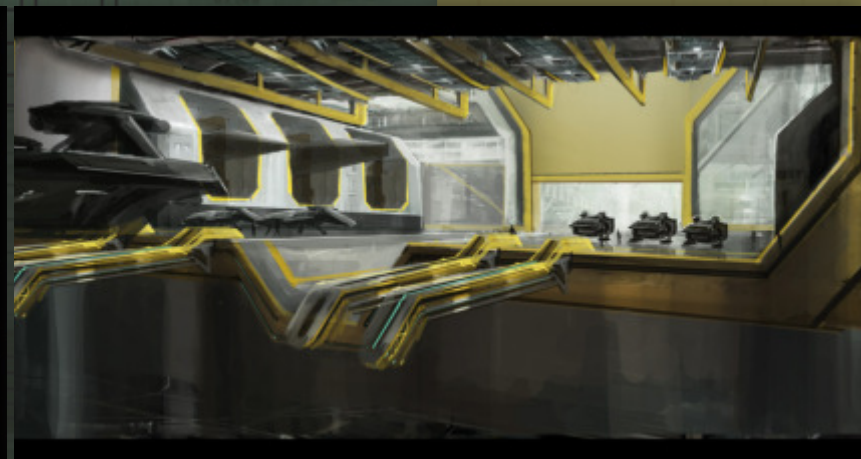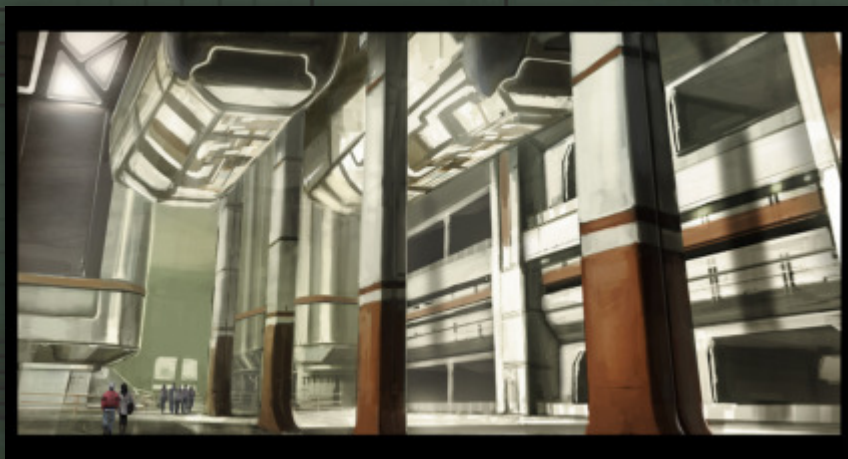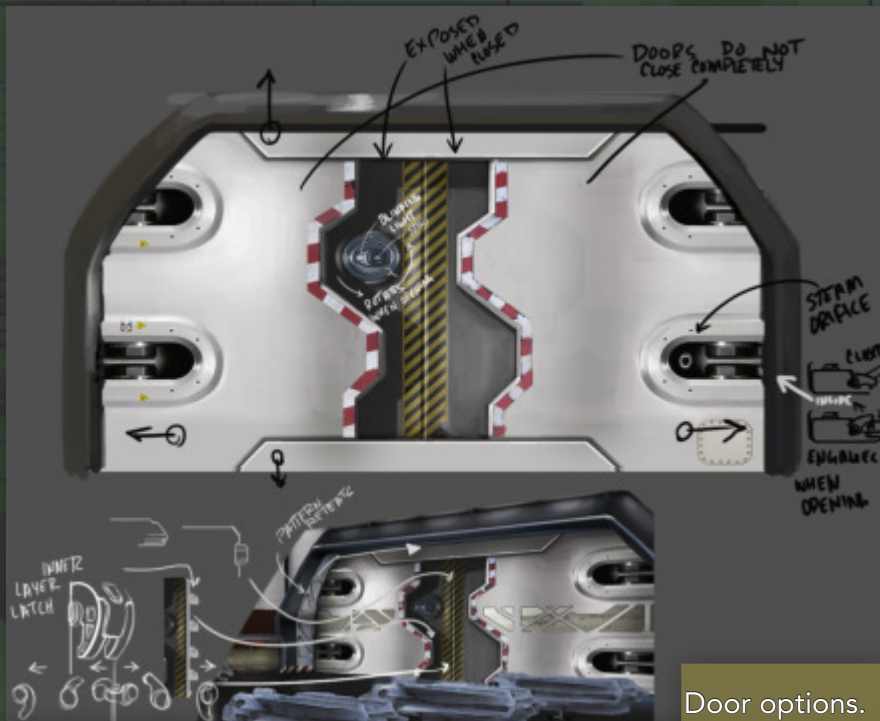
Door options.
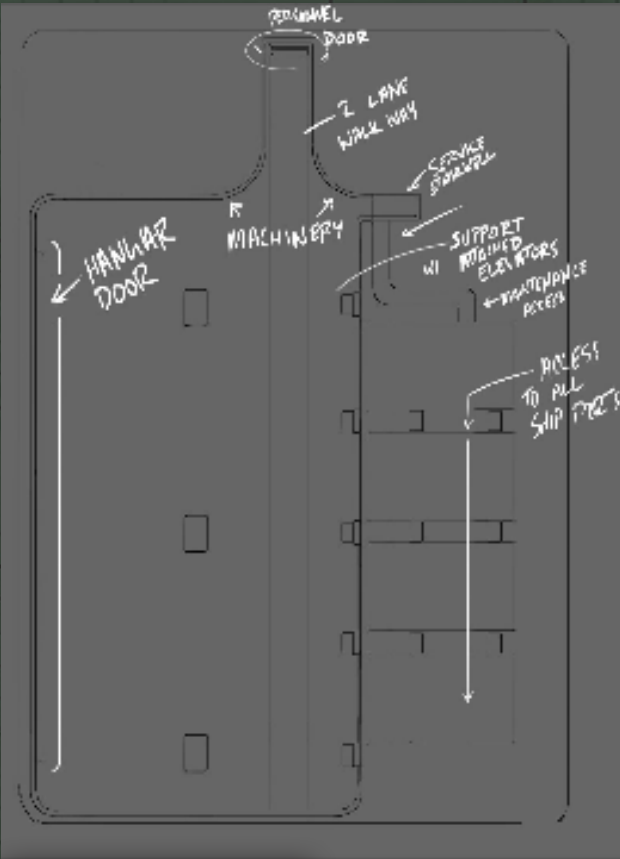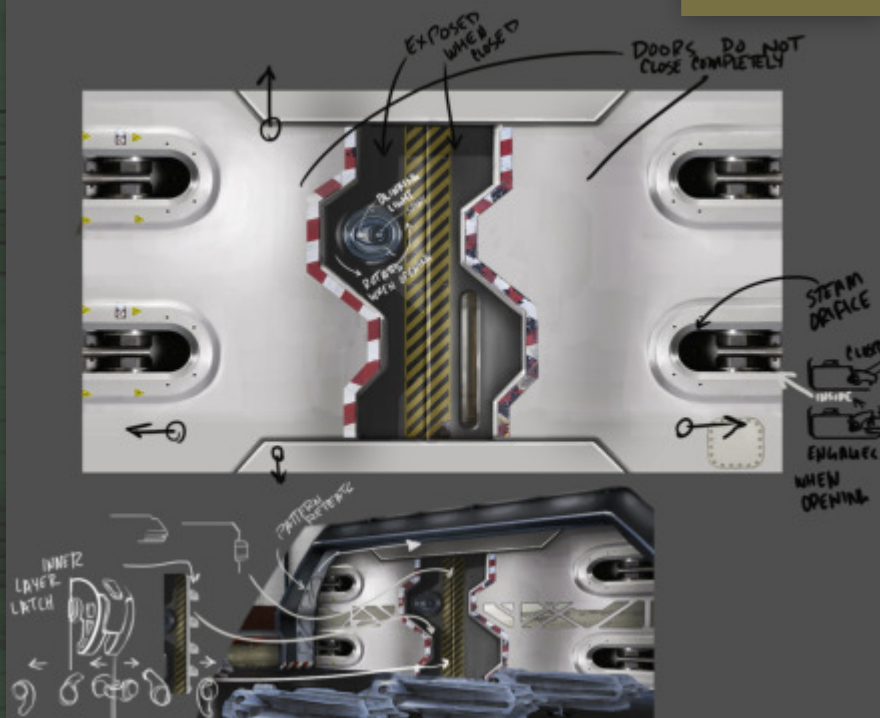
Basic floor layout

FS: Can you break this into the modular system how you see it duplicating itself. Thanks!
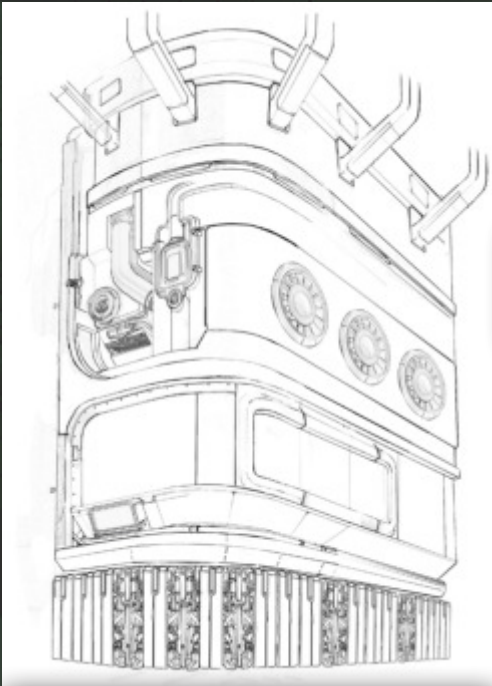
Machinery complex sketch and paintover
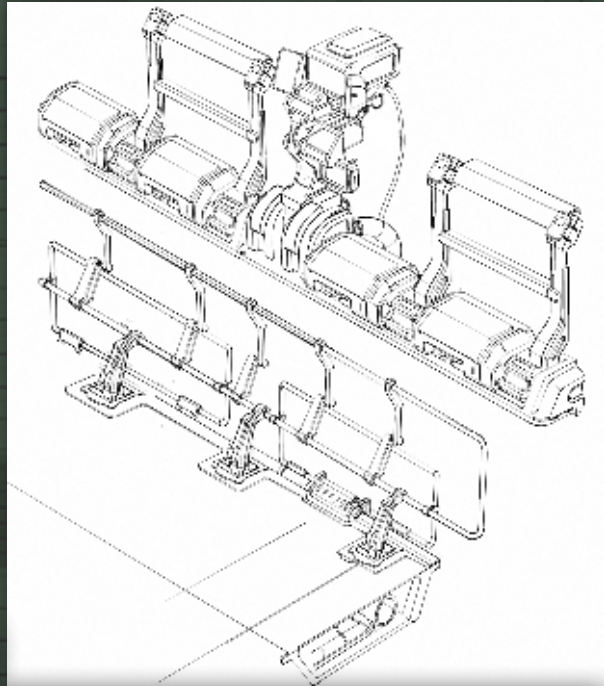
Guardrail sketch and paintover

REPEATS, WRAPS AROUND ENTRY WALLS AS A GUARD RAIL.

ON BOTH SIDES OF ENTRY WAY, FACING MECHANICAL WALLS.

THIS MIRRORS THIS

MIRROR THIS. SHOULD BE (INVERTED.)
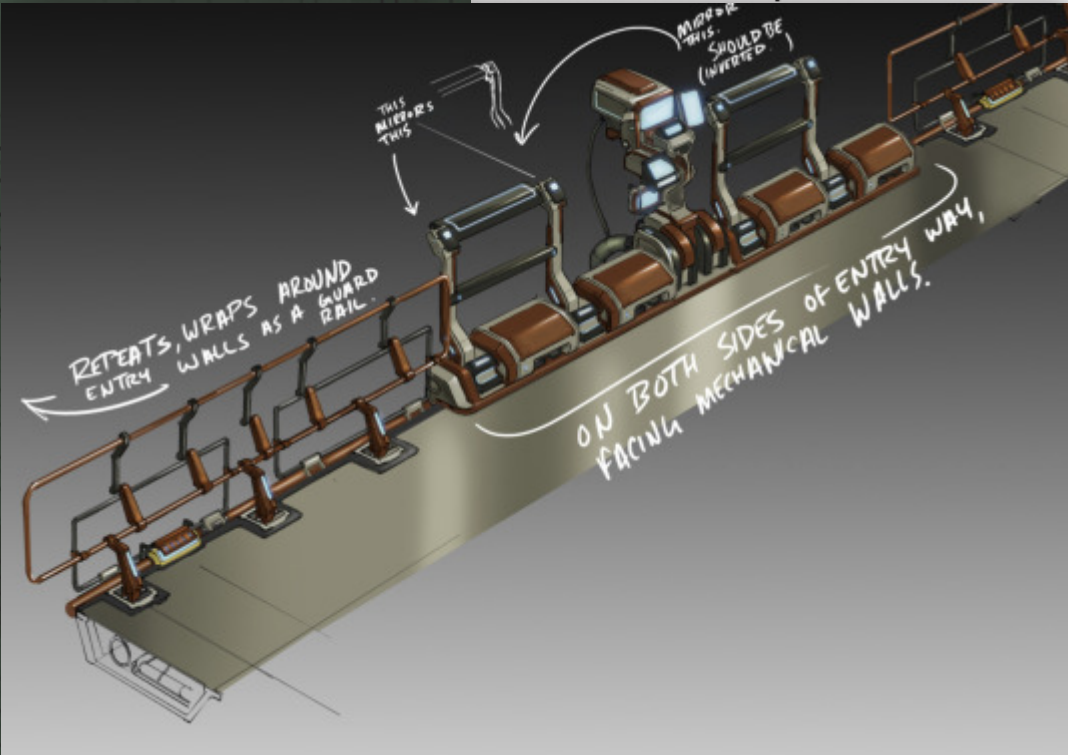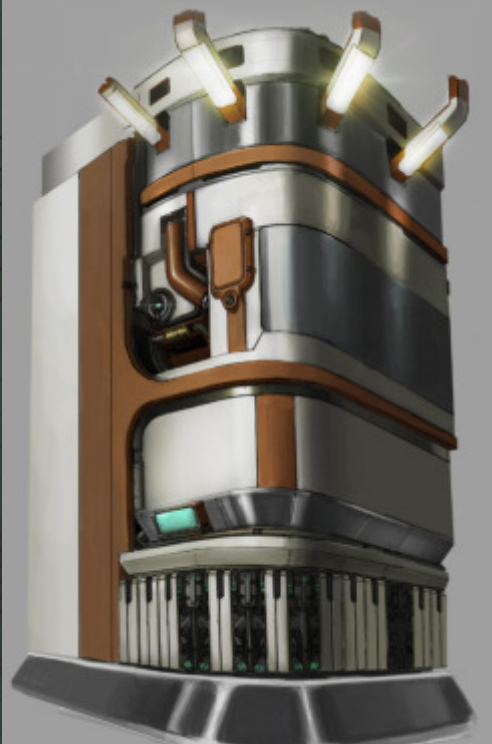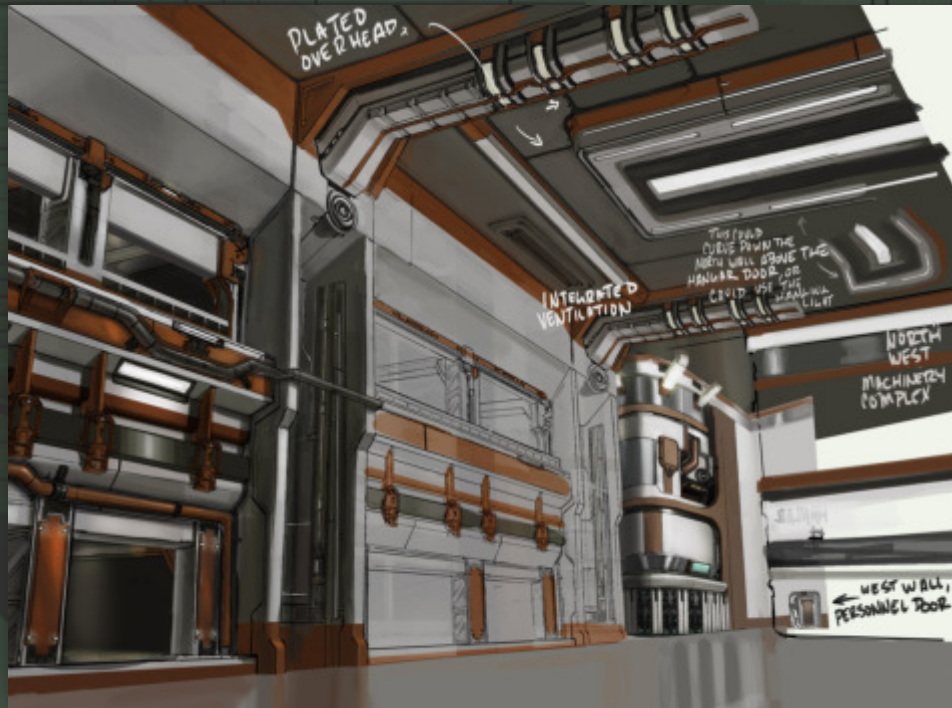
Overhead, girders, key light and layout refinement.

South end wall sketch and detailing.
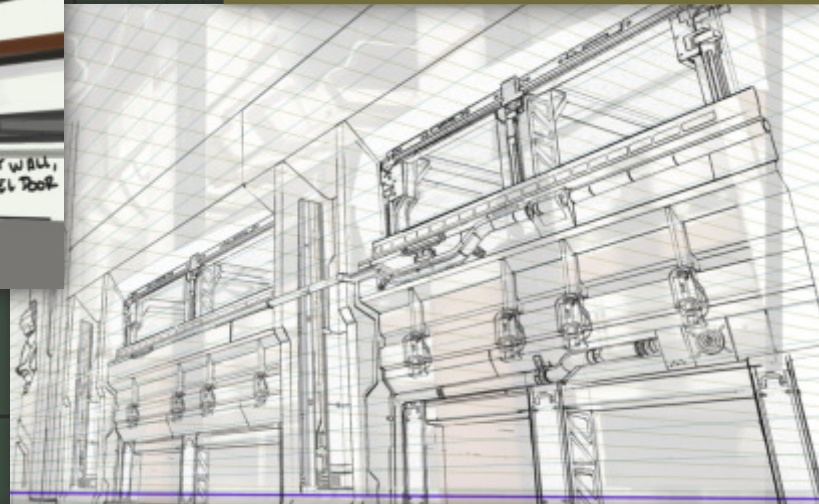
Elevator.
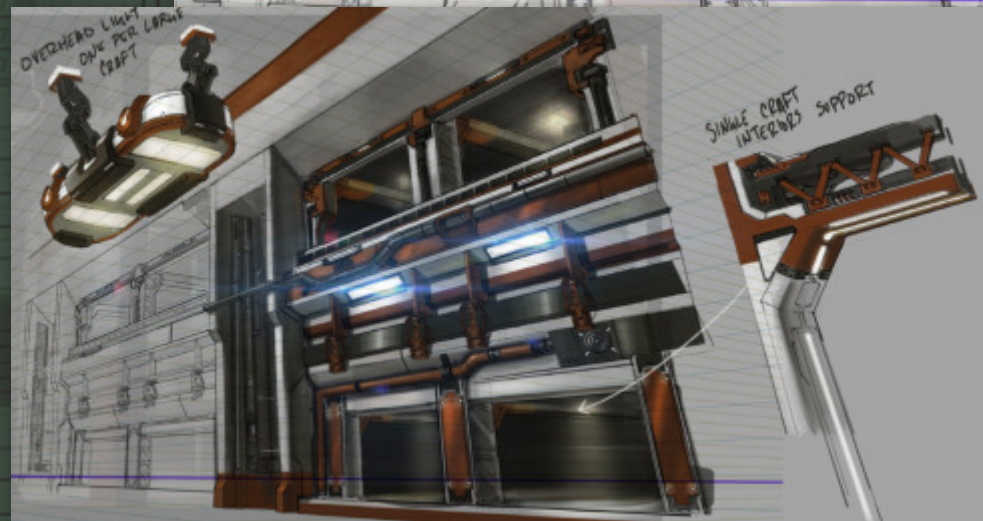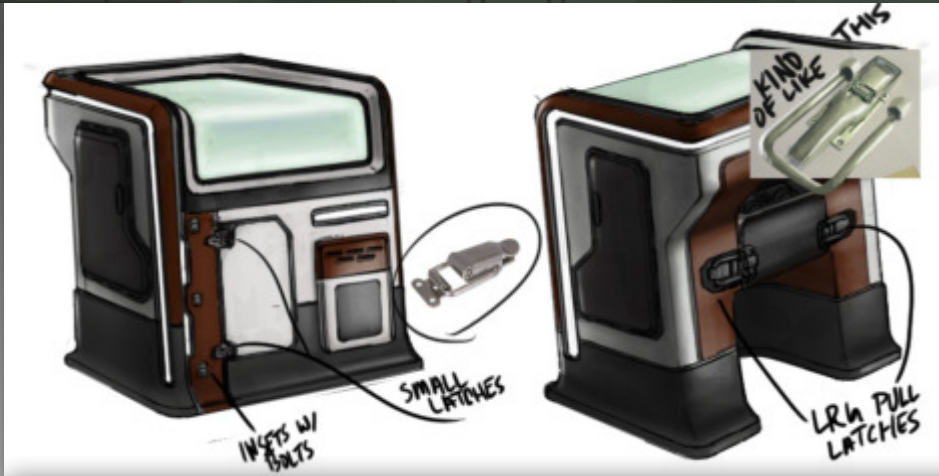
Wall/support mounted control panel.

FS: Looks cool. We also need a control panel that projects the hologram of the ship components, for swapping hardpoints and buttons for the character to interact with.

EM: That's what this is for. There aren't any buttons because the hologram would be interactive, as I understood.

Harry Jarvis: I think that the idea is to have an on/off kind of button, which triggers a holo projection where all the interaction would take place. If we want non-interactive button art to busy it up, that's a different story.

CO: Just make the area that projects it some sort of black hexagonal flat screen or something, and a recessed light or something that looks like it would activate something where the smaller circle is — a touch-sensitive button or LED.

Deluxe Hanger floorplan
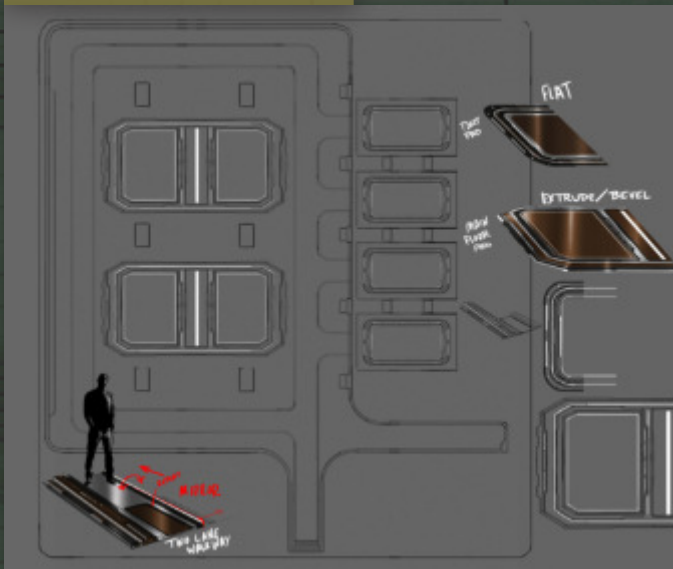
East bulkhead. Possible storage pods.

WORK IN PROGRESS
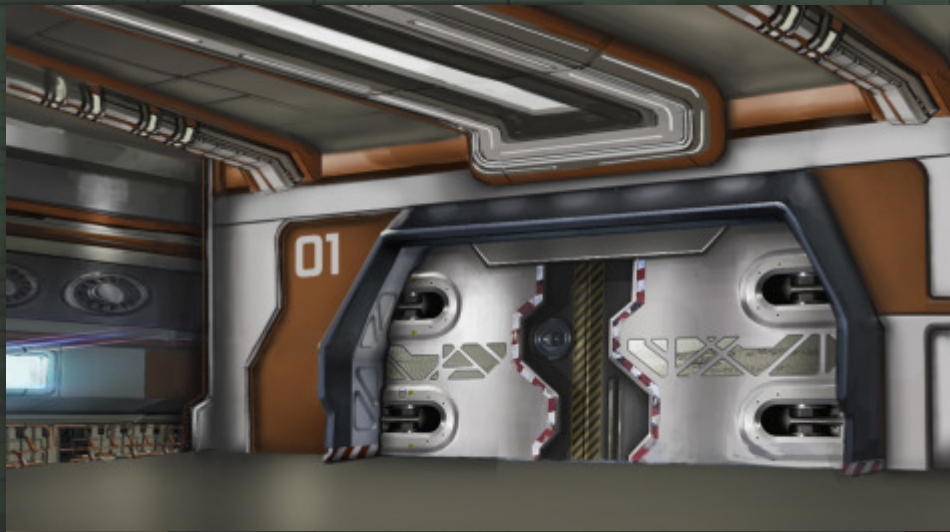
North wall.

West wall notes.
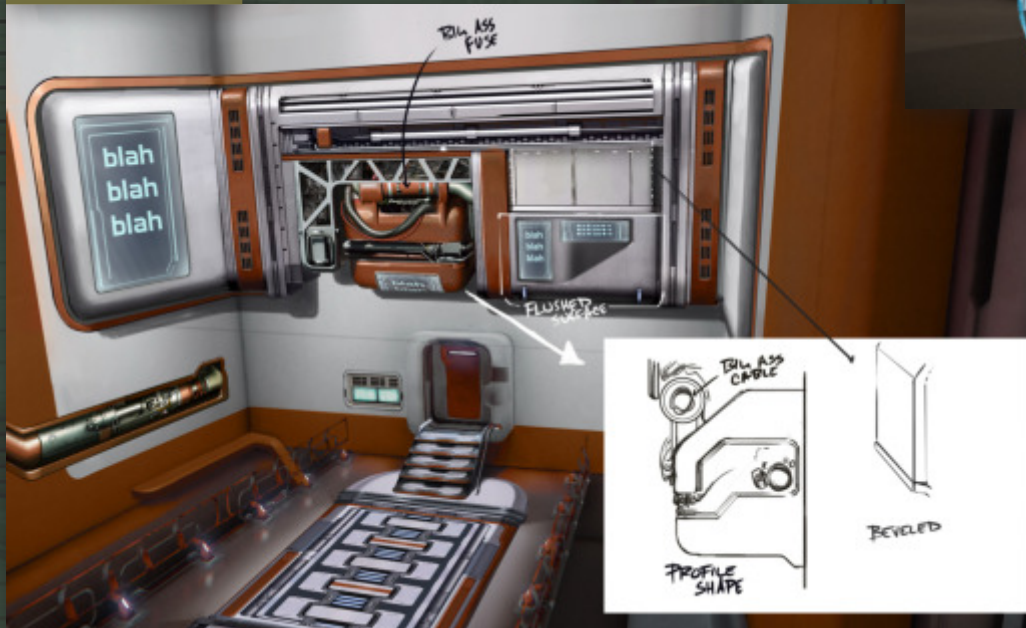
West/south wall corner.

WORK IN PROGRESS
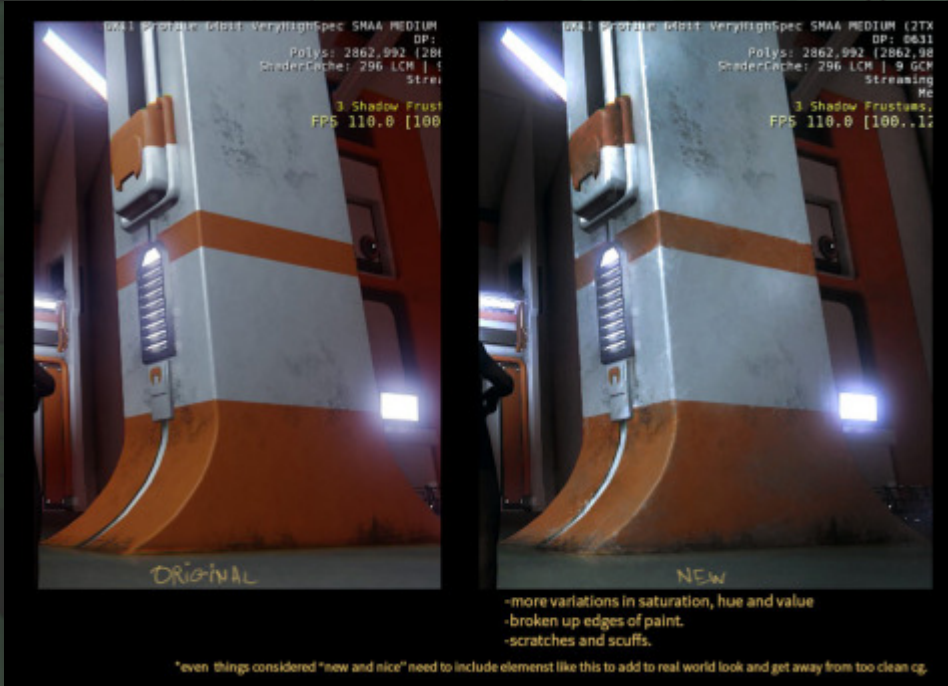
Paintover on right shows better real world "non per-fect" surface wear and tear and subtle aging.

Mobi-Glas notes.

Landing pad.

Garage notes.

open shaft. wire, pipes, repeated extrusions, etc.

Vents

piping, breaker, and wiring cluster.

put some exposed pipes and hoses under here, maybe.

Large pipes tap into the wall through a hole. Put a cut border around it.

space for flair crap

lift mechanism. Shelves move up and down based on storage capacity necessary for an item. Perhaps larger items go on the bottom. Could have more shelves per unit. This is just viz dev.
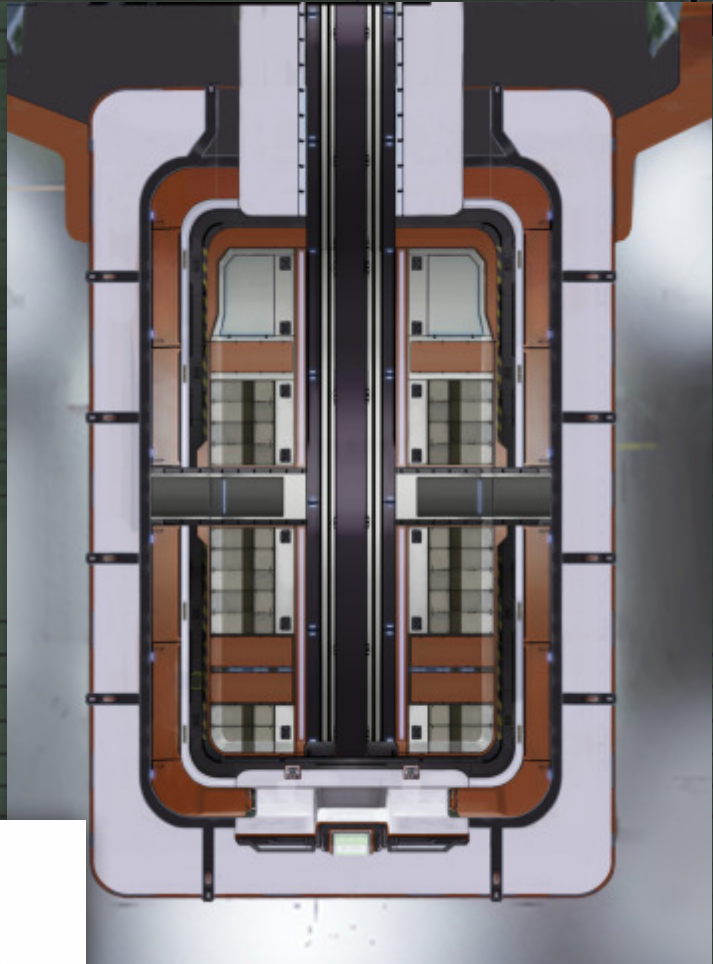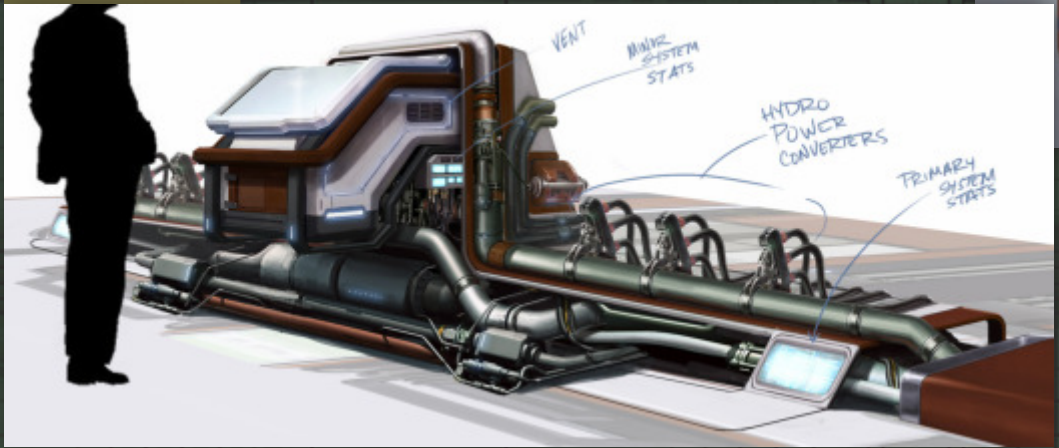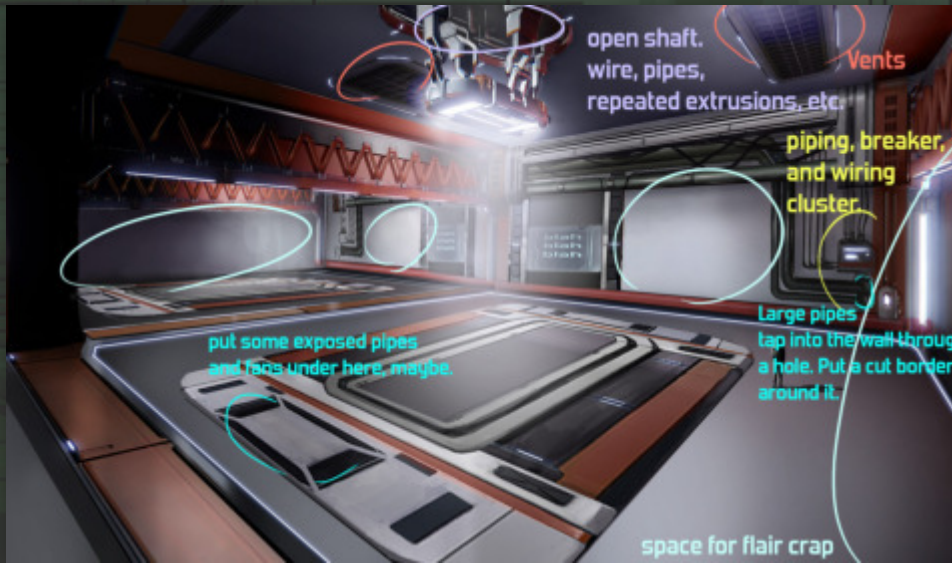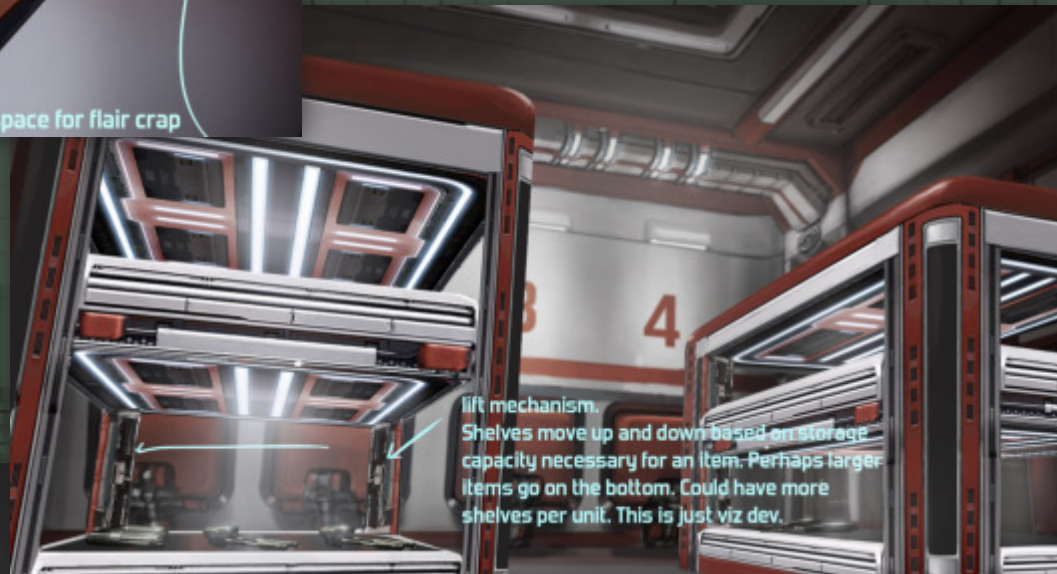
Deluxe storage notes.

DELUXE FUEL CONTAINERS

WORK IN PROGRESS

Various CC looks

CR: I think I dig CC3.

raw
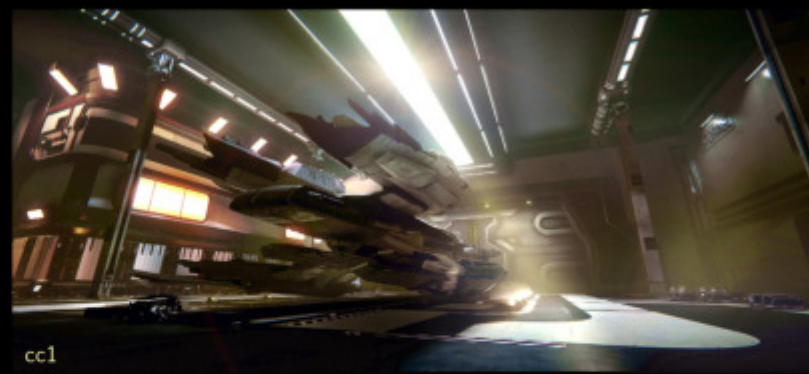
cc1

cc2

cc3

WORKINPROGRESS

The Deluxe Hangar

Buggy

Hangar Transport Blockouts / High Level Ideas

Proposal A - Front

Proposal A - Rear

Proposal B - Front

Proposal B - Rear

Proposal C - Front

Proposal C - Rear

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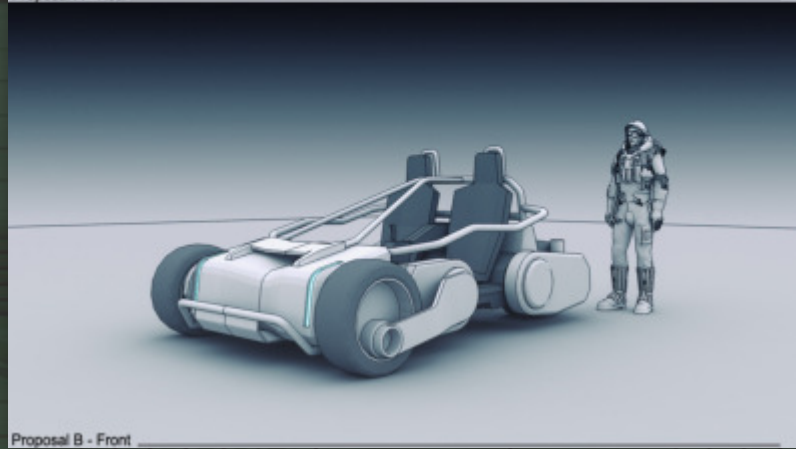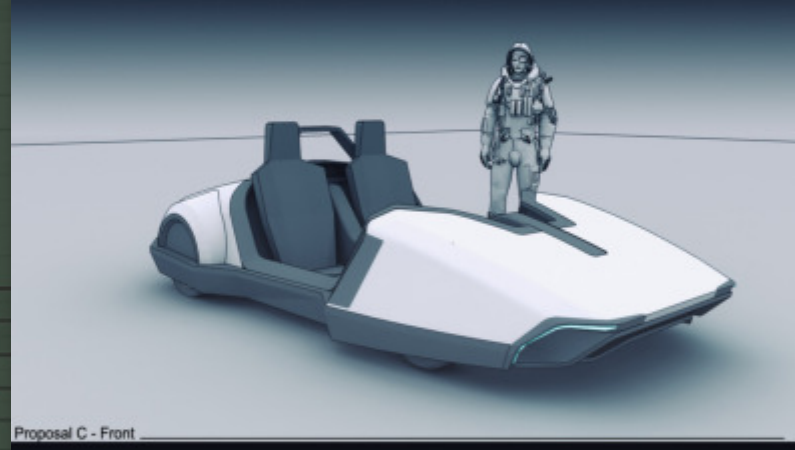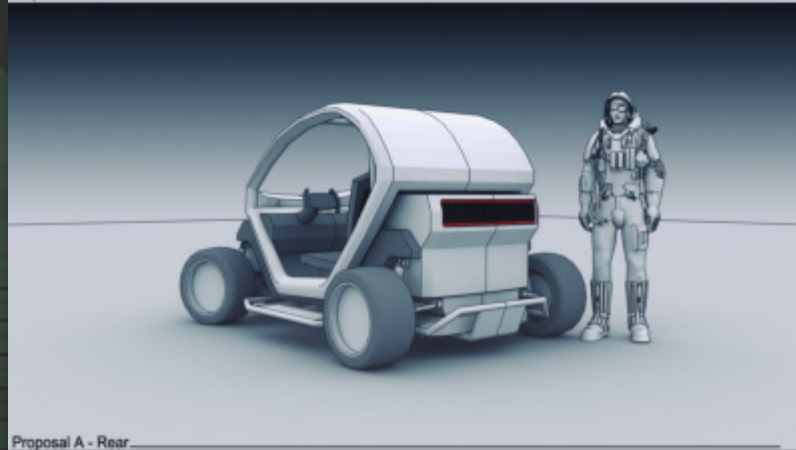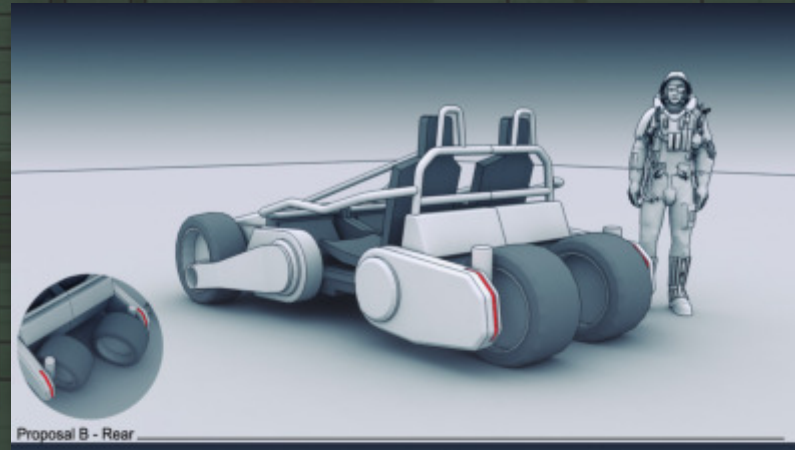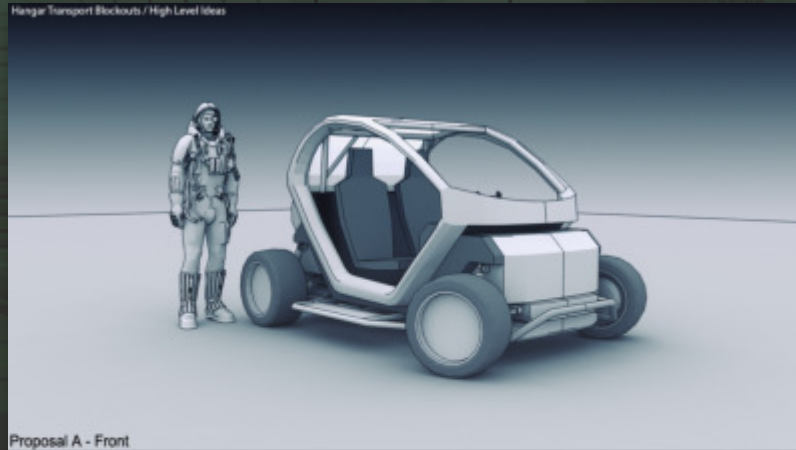
WORK IN PROGRESS

As people decided to buy more and more ships to add to their hangars, we realized that to walk from one ship to another one at the opposite end could take too long, resulting in boredom for the player. We needed a transport vehicle — the high level brief being something along the scale of a golf cart, that you and your buddy could jump into and go cruising down your hangar while showing off all your hardware.

I was assigned this task. The first thing I do is gather useful reference. Naturally the Internet is your friend here — I gathered all kinds of reference ranging from golf carts, small city cars, forklift trucks, airport luggage vehicles and so on. I generally digest these for a while, taking note of scale, driver seating posture , materials used, mechanical construction and so on.

The next task is inspiration. Many artists get these two confused. Reference and inspiration are two totally different things in my world — the reference is kinda boring, the normal stuff shall we say; the inspiration is looking at crazy awesome creations and concepts and applying your 'reference' to this. My inspiration on this generally came from some small city car concepts shown at recent motor shows, mixed with dune buggy designs. In addition, I love the shapes and forms used in the recent Tron movie and I try and mimic this wherever I can: clean strong bold lines, less is more!

I put all this inspiration and reference together, dropped it into a folder and set my screen saver to play through these on my third monitor. It's now time to jump into 3ds max and flesh some shapes out.

During this process the modelling is very loose. I couldn't care less about topology loops , knots in my mesh and so on; it's all about the shape and form to pitch an idea to Chris Roberts and the team. A good lesson I taught myself during this stage is never ever zoom into my model. The minute you do this it's game over, you're no longer thinking about the overall design if you do this. I try to keep the camera in 3ds at a distance and make big changes, like crayon drawing in 3D you could say.

I normally put 3 or 4 variations together for Chris R to look at and give feedback on. With the designs on this I tried to be a bit bold and go for three very different approaches, with the idea that we might end up with different designs to go into different classes of hangar.

Here is a shot of the blockout to show proof of concept — not very pretty at this stage, but it serves its purpose. Remember, never zoom in. ;)
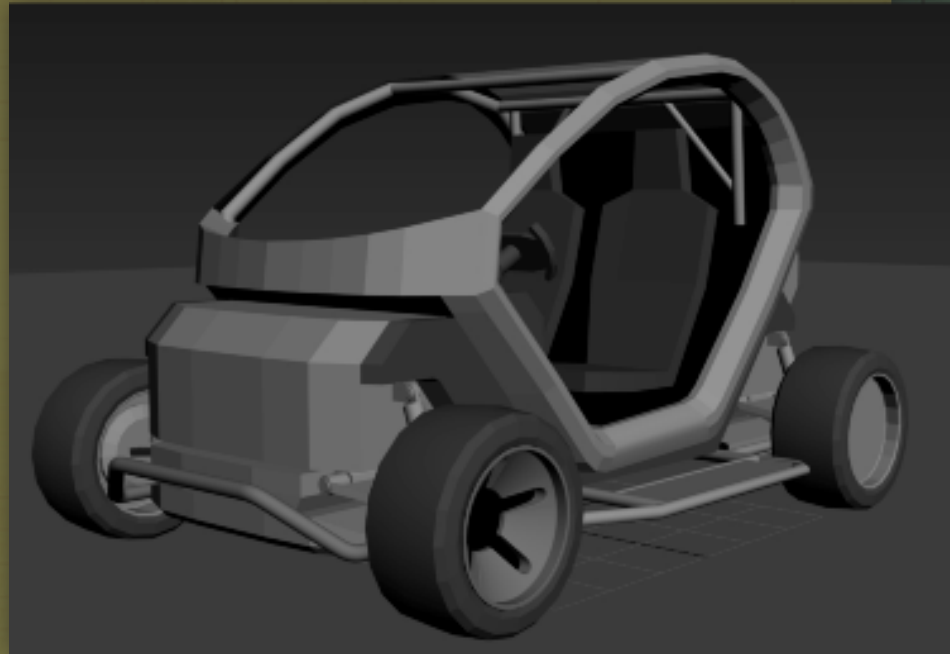
As you can see, it's very crude, but gets the point across. With this blockout I know things are roughly to scale, as we have a player scale-reference model to work with.

I gather feedback from Chris at this stage and now is generally a good time to get design and animation involved with the task. Design will be setting the buggy up in engine for things like the suspension to work correctly, player entrance points and so on, while animation needs to pose the player in the buggy and so on.

From here it's time to get to work on a final high-res model. This involves lots of sub-d hard surface modelling, I generally don't care about my low-res stuff at this stage, I'm completely focused on creating a cool looking subject. However, there are some things that play in the back of my head to make life a little easier for myself and for design later on. For example, the suspension and steering assembly should be able to be instanced to each wheel. I also try to find places on the model where I can mirror/flip parts of the mesh to save texture space. After a couple of days of getting my sub d on I arrive here.

You'll notice some drastic changes overall. During the last process I felt there needed to be far more exposed chassis detail. The roof has now gone, again trying to push a slightly more buggy and less car feel. There's a lot of trust in this team — at any other of the many studios I've worked at, to make changes like this you'd have to have a meeting with someone, who'd then need to have a meeting with someone else, and you'd wait for days to get an answer by which time you could probably have modelled three buggies high res ….

These shots and sometimes a turntable are sent to Chris R for final approval. Naturally I run this stuff past Chris S, our lead vehicle guy, to discuss best methods for getting this in engine. With a lot of our assets we aren't baking but pushing tiled textures over more detailed geometry, but we agree this would look better and probably be more efficient if it had its own texture page in memory.

On the next page is the suspension setup broken away from the model. It gets instanced four times and hopefully this will show the level of detail we like to push on *Star Citizen* — everything must function, make sense and have purpose!
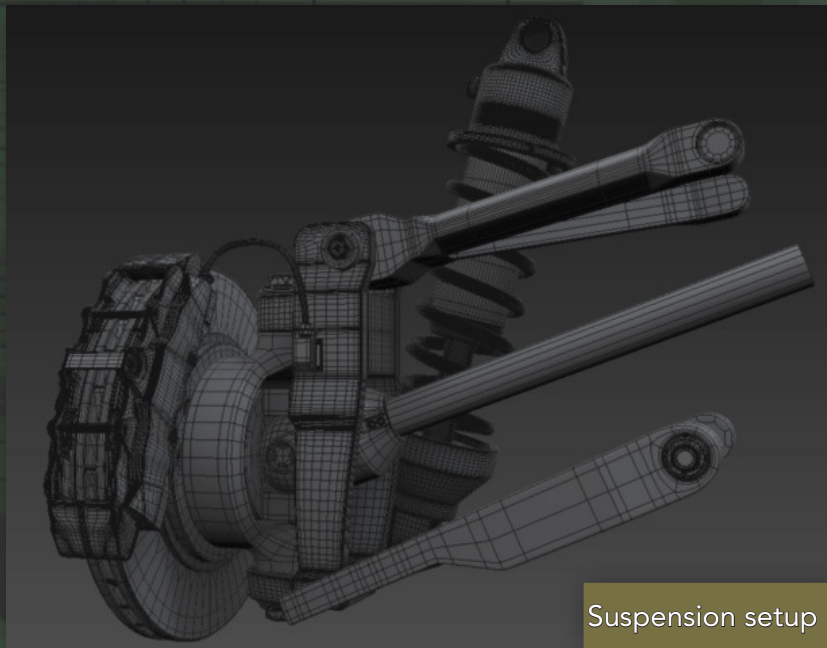
Suspension setup

ND: High-res pass of option A from previous submit. Changed it to make it feel a little less like a 'city car.' Chopped the roof to expose more of the interior, as well as changed quite a bit of geometry around the wheel areas to expose more mechanical working stuff around the front and the rear, more like a buggy, I thought. Wanted it to feel like these things can be constructed easily (bolted together, you can follow the main chassis line and see that i all makes sense and has weight), should handle likes its on rails with wheel as far to the corners of the vehicle as possible. :)

CR: Very cool! Looks like we can use the suspension buggy setup from C3! Gives them something to do while waiting to fly their spaceships! I would say texture and rig for CryEngine.

ND: Sure thing, glad you like it, Chris. I've gotta get Dan Tracy a kind of proxy rig to get the setup tested and working on a skeleton file. I'll then hop onto baking/texturing the proper version so it should then update seamlessly with all springs compressing and so on. :)
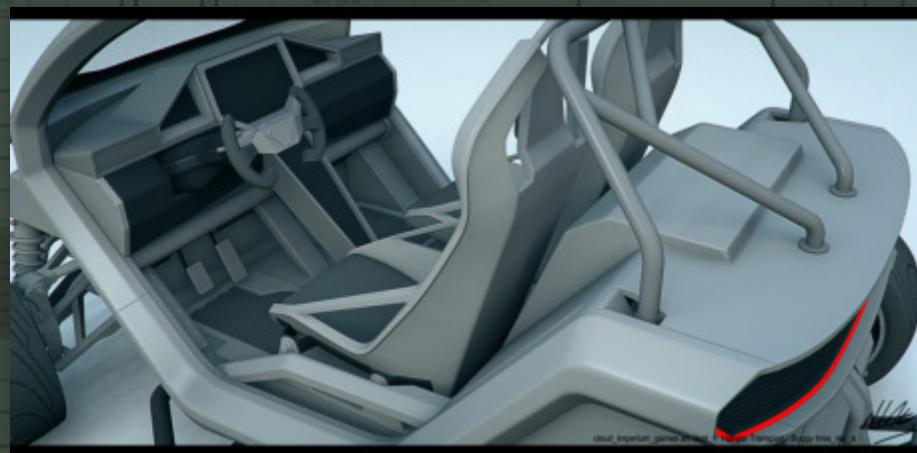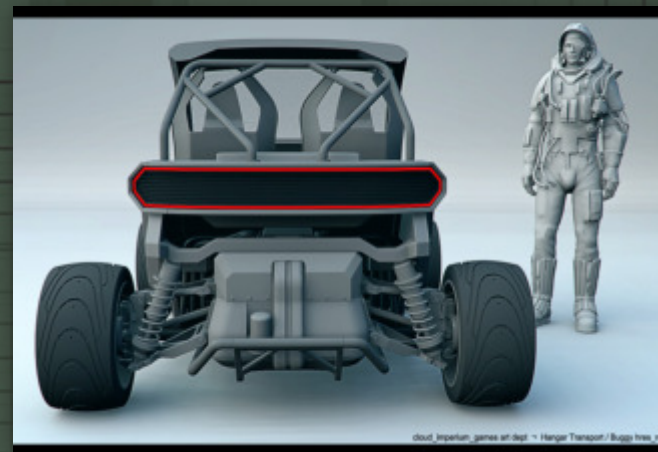
It's time to create the 'game' res asset; this is when I go into what I term 'closed' mode.

The term comes from a lecture by John Cleese on creativity (http://vimeo.com/18913413). He explains that a creative process goes through two modes: 'open' and 'closed.' My open mode was essentailly getting to this point; I've been experimenting and being as creative as I can, not stressing.

In closed mode, no more play time. It's time to focus and get the model into game. You create a much lower poly model of this high-res asset that the game engine will like, then you have to bake all the information from the high-res asset over to the low-res. This takes several technical steps and involves 'exploding your model to get a good clean 'bake,' making your model look almost like a plastic kit model.

From this part of the process I extract all the info I need from the high-res model, including raw diffuse maps, normal maps and ambient occlusion maps, through functions within 3ds max.

These are all compiled together inside of Photoshop. Then it's time to step back into open mode to start texturing, which can be great fun. Early on in this process I had a high-level idea of how I was going to shade this asset from all the reference I had studied: plenty of exposed metals around the chassis area, with some bold whites to push the shape and form of the 'shell' of the buggy. The texturing and shading process can become quite complex as we are trying to push more physically correct shaders. For example, chrome in the real world is actually black! It's completely defined by its reflection values. It's very much a two-way process, not at all like the old days of painting your textures in Photoshop and barely checking ingame. Rendering tech back then was so predictable, but now as technology moves forward you have to keep on top of it and adjust your work methods to suit.

Once this process is done, shots are sent of of the buggy ingame for approval, the asset is split into parts for design to set it up, and then you wait to see the team hooning it around the game and making race tracks out of several Aurora's.
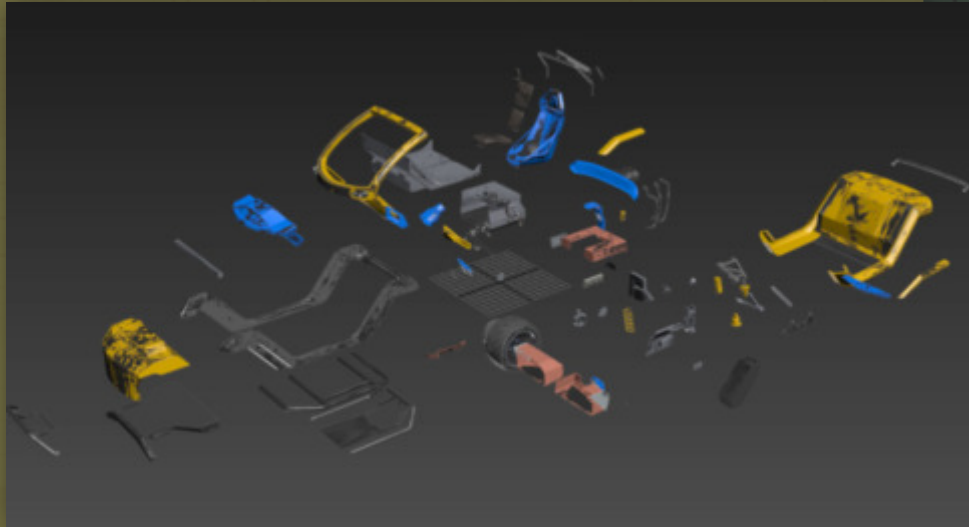
ND: Collisions to do before I forward back to Dan tomorrow to get sorted in the vehicle editor, along with texture high pass sharpens and jpeg compression removal pass, edge dialation etc.

CR: LOVE IT! Nice work, Nathan! Going to be a nice surprise for people when the hangar debuts!

PVT-GREYCAT

PVT-GREYCAT

cloud_imperium_art_dept

SELF-LAND

R&Y

REVEL & YORK

AEROVIEW HANGARS

EST. 2687

Unparalleled Comfort

In the generations since Roberts Space Industries institutionalized personal space travel, countless supporting industries have sprung up to improve the lives of interstellar pilots. From shield manufacturers to deep space repair services to refueling stations orbiting distant stars, the infrastructure which has grown up to support civilian space travel has become ubiquitous. This development has no better case study than the rise of modular, user-configurable ship hangars.

The system of self-maintained hangars arose out of the very simple logic that if you have a spacecraft you also need a place to put it. With the massive increase in individually owned civilian spacecraft and the resulting decline in government-regulated space travel lines, the model for ship housing quickly transitioned. Many once-thriving spaceports were parceled out for individual sale, with the hangars that once maintained thousand-person transports divided into dozens of makeshift spacecraft compartments and made available to the highest bidders.

The formalized hangar industry soon followed, with investors purchasing massive tracts of land wherever possible to erect garaging space. On some rapidly developing worlds, territory claims around landing points have become so expensive or contested that urban construction often takes place outside a hundred-kilometer ring of 'future hangars.' On some worlds, hangars are constructed deep into the ground or straight up in massive skyscrapers: anything to provide ship owners the piece of mind that comes with a permanent home for their craft. In recent years, three hangar designers/manufacturers have come to define the industry as a whole, with their base appearances being a familiar sight across the galaxy.

SELF-LAND

Incorporated by Peter Weathermen, a wealthy guild-licensed shipper who made his living on the active spacelanes, SELF-LAND hangars have become an ever-present reminder of just how easy it is for Humans to travel the stars. The corporation was founded on the philosophy that the temporary hangars available to transiting pilots were inaccessible, inaffordable and most importantly unsafe. (Weathermen began developing the company after he was jumped by a gang of dock-thugs who stripped his Starfarer to the hull plating.)

Starting in the mid-29th century, SELF-LAND began a franchising-based expansion across the Human-inhabited galaxy. The first SELF-LAND was established by Weathermen on Vann in the Croshaw System. Seemingly overnight, the company had expanded to a dozen worlds … and then a hundred. Today, the SELF-LAND corporation boasts that they maintain at least one facility on every world in the UEE, with some planets (Terra chief among them) having as many as sixty different complexes.

SELF-LAND hangars are fully modular and environmentally controlled. Prefabricated out of the most available common metals, they aren't necessarily attractive to look at … but they are comfortable and familiar. The SELF-LAND experience on a colony world near Vanduul space is exactly the same as that available to a pilot berthing on Earth. The SELF-LAND corporation takes care of everything, from structure design to land titles. Because of their design, the same hangar type can be used in configurations ranging from skyscraping heights, to the breadth of a plain, to stacked underground, or to honeycombed deep within asteroids.

Aeroview Hangars

Aeroview proudly claims to be the oldest established hangar manufacturer in Human space. Their design and construction of hangars goes back more than 300 years. In the 27th century, Arthur Nassir formed the company around a rigid code of business ethics focusing largely on design quality, a dedication to ergonomics, and an extreme respect for client confidentiality. Aeroview also famously reserves the right to refuse service to any non-Citizens. While hangar design and housing is tangential, at best, to piracy, Nassir's outspoken contempt for those who fly outside

the law led to the company's code. When Aeroview was purchased by Shubin Interstellar, the conditions of the sale insisted that the code be adhered to in perpetuity.

While the code remains intact, Aeroview's original business model does not. The Aeroview hangars of the 28th century were palatial affairs built on a case-by-case basis to the specifications of the social elite capable of owning their own spacecraft. In recent years, Aeroview has adapted their tactics to follow in SELF-LAND's footsteps (although they would never admit it). Instead of custom-building high-class hangars on an individual basis, they now produce a line of modular "business hangars" priced to sell to suc-

cessful businessmen and other executive-level clients. Unlike other modular hangar companies, Aeroview does not lease the property on which their hangars are established. This is left up to the individual consumer to determine; the Aeroview hangar can be erected at any point in the UEE given 48-hours notification (24 hours, for a steep rush construction fee).

Of special note, Aeroview has found particular success in developing hangars for larger scale craft or craft that require additional space for support equipment. Pilots of ships like Freelancers, with multiple crew housings, or Hornets, with weapons racks and a need for more intensive hull repair facilities, generally find it more cost effective to purchase a single Aeroview hangar rather than multiple SELF-LANDs.

Revel & York

When the Revel & York engineering corporation set about designing its first hangar some thirty years ago, the reaction was laughter. The company, known best for excessively expensive and visibly uncomfortable furniture, was entering a field dominated by aerospace giants. The laughter ceased quickly as the Revel & York "deluxe" line of hangars became the de-facto spacecraft garage of the rich and powerful. The company's cavernous hangars, established on ideal landing spaces in top-dollar land agreements, earned their standing reputation for excellence and quality.

Revel & York designers work directly with pilots to develop a hangar experience like no other. R&Y is the only company currently constructing modular hangars designed to support merchantman-class spacecraft like the Constellation and Caterpillar, locking them into a valuable if small segment of the population. Their hangar designs have earned their reputation: between interlocking catwalks (with motorized lifts!) to allow pilots to supervise their spacecraft from overhead, to specially designed Greycat PV buggies for transporting ship crews from module to module, everything is designed for not just the elite pilots' usability but also their overall enjoyment. SELF-LAND and competitors make a place to put your ship; Revel & York makes a place for you to take it in.

Those who survived (in Austin)

Rather than an interview this month, we're taking you behind the scenes to show you just a small part of the message traffic between Cologne, Austin and Los Angeles to get the Gamescom hangar premiere ready to go. (Not all of the timestamps are in chronological order. Some messages are together because they're related, and some of the timestamps are a little … confused … by the cross-timezone traffic.) Please note that the people quoted here aren't the only ones who worked on getting the demo ready — in fact, everyone at CIG contributed, and some of the heaviest hitters aren't mentioned here.

We pick things up on Wednesday, three days before the demo, and already several days into an intense schedule …

The Beginning: Ron LaJoie, Production Manager

As you know, Chris is revealing the Hangar this Saturday at Gamescom. During the week he will also be doing press demos, and then next Thursday we will release the Hangar.

We are correlating all the remaining tasks and when we need them by here: <link>

Please keep in mind that this does not include bugs and we are still updating it constantly. If you are working on stuff that isn't on that list and you aren't sure when it is needed by please see your lead. If you have questions or concerns about anything you are working on see your lead or producer immediately.

Chris Roberts, Wednesday, 12:22 PM

Gamescom Hangar module issues to be polished:

1) Not all collision materials are hooked up / have a proper effect (Dan + Artists to look at). White squares when on an undefined material (run around the Discount Hangar – the striped areas, on parts of the Aurora (if you jump on it)). Everyone should do a material pass and make sure that all materials have the type set and NOT undefined. Same on Business and Deluxe.

2) Ladder needs work. Animations look wonky – it doesn't always mount in line, and it thinks you want to climb it when you've dismounted and are trying to move away.

3) Aurora left airlock animation is missing the inner part of the airlock opening (when saved out I think the sob objects for this are in a different part of the hierarchy and so were missed out in the bones list on the export dialog).

4) Pilot animation for sitting down and standing up doesn't play in Aurora (Dan & Paul to look at).

5) We need to disable ship startup on entering. (Can be done from the vehicle xml in the SteatActionMovement section – The Hornet doesn't turn on (the animevent for the entering animation triggers the HUD turn on and engine fire up).)

6) 300i landing gear is up, not down on default (this is specified in the vehicle xml in the animation side – the initial state of the landing gear should be "Deployed").

7) 300i door sequence is off – it opens, then closes and animation is way off the mark when you enter (you end up on the roof!).

8) We need some exterior lights on the ships! They're very dark, especially in the Deluxe Hangar.

9) Are the interior lights working?

10) Deluxe Hangar elevator isn't working!

11) Business Hangar most unpolished / missing detailed geometry. What's the timeline on this?

12) Business Hangar elevator doesn't work! Also no collision geometry on it – I can walk out the back of it!

13) Let's get the enter / exit / sit down animations for the Freelancer hooked up (Dan – help from Paul). I'll upload my WIP mannequin setup and vehicle xml for Dan / Paul to get working.

14) Where's my BUGGY? Need to show that off!

15) We need to hook up the Constellation enter / exit sit down animations – Bryan – have you done the animations? Enter/exit should not need animations as it's via an elevator, but sit down animations are needed.

16) Hornet cockpit ladder & canopy don't open for entrance!

17) Let's hook up a gamepad button for the "G" third person look as well – Maybe use the stick Hat push for this (which is what the ship orbit does).

Probably more to come but initial notes – lots to do for Saturday! (and tomorrow!)

(later) Also –

a) Need the ability to log out and then log in to the launcher.

b) Business Hangar has a shader shadow issue – there is smudging across the screen from wall elements – it's similar to something I had happening in the original prototype for a time – I think it had something to do with SSAO and shadows - don't know why it only shows up in the Business Hangar though.

c) Seems like 300i (maybe other ships) is only physicalizing after you "use" it – as the 300i doesn't have landing gear but if I enter (which is hard to find the enter part - and what happened to Zane's cool graphic element for this?), outside of the fact the door opens, then closes and you climb up onto the roof, the ship then drops to the floor – which is a sure sign that it was only physicalized after I entered. Obviously the landing gear should already be deployed (see note 6) but the update is different in launcher / game than in the editor – Paul can you look at this is an engine issue?

Ron LaJoie

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BEHIND THE SCENES

Mark Skelton

Mark Skelton, Art Director, Wednesday, 9:32 AM

I would like to personally thank everyone that has killed themselves over the last couple of nights. We went from "there's no way this is gonna happen!" To, "we can actually do this!" In just a few short days. You guys rock!

Harry Jarvis, Art Producer, Wednesday, 8:59 AM

Hear, hear!

Last night was rough, but a lot of progress got made in a few hours. Great work!

Chris Roberts, Wednesday, 11:13 AM

Yes, thank you all – I realize that everyone has been killing themselves and doing a vast amount of work, making huge progress and generally being rock stars.

My notes below were terse as I've been giving demos nonstop since 9 am my time until just now and so I was writing down issues as I came across them and had no time to focus on anything else and wanted to get you the notes sooner than later.

So thank you all! Now give me a damn buggy!

Paul Reindell, Lead Engine Programmer, Wednesday, 1:36 PM

Yea first of all also great respect to all of you guys!!!

Just crazy how much we all achieved in that short amount of time with an engine that most of you never used before.

That goes especially to all artists and programmer who needed to learn the tech very fast … awesome job!

Now about the points (I will take care of all non-red points):

c)   Physics. Ships are physicalized, they are just in "resting"

state. Once you enter, they get "awaked". I can change the code to awake them from the beginning, but I don't think that is needed, so I'm leaving it for now. With my other fixes it should not be an issue.

Deploy anim. I am currently looking into fixing the issue in the launcher. FIXED IN CL 5544

The "use" image. I updated it, it's in P4. Fix is in CL 5556

"which is hard to find the enter part"

I made a Hax in the interactor which will use the ship BB to allow interaction with the different parts. This makes it easier to enter if the ladder is not deployed (as it was doing a phys ray cast previously and if the ladder is not deployed it would not hit anything). FIXED IN CL 5550

4)   I will look into that right now.

5)   right after 4)

6)   = c

7)   The issue with the enter animation for the 300i. For me locally it works fine in Profile build (from P4). I can enter the ship without problems (waiting for door to open, then play the normal enter anim).

BUT it seems like the "left_door_exit_pos" and "right_door_exit_pos" helper bones are missing from the CGA. So exit will not work properly (can't be used and animation will not adjust correctly).

14) Someone should simply put the buggy onto the "don't duplicate" layer of the Deluxe Hangar, so it's there for your demo.

16) I will add the same logic for the enter 300i thing; first time you want to enter it would play the deploy ladder state. Right after 5)

Paul Reindell

Harry Jarvis, Wednesday, 1:40 PM

14) Someone should simply put the buggy onto the "don't duplicate" layer of the Deluxe Hangar, so It's there for your demo.

Dan Tracy, will you do that, or should we do that here? Needs to happen ASAP.

Forrest Stephan, Tech Artist, Wed, 1:41 PM

I'll get with David, as he has the Deluxe checked out right now, and we will put it in there.

Harry Jarvis, Wednesday, 1:41 PM

Jeff C looking into #7 right now.

Jeff Cavitt, 3D Modeler, Wednesday, 1:46 PM

I spoke with Bryan on #7. Those are helper objects that he is going to add. He's on it.

Bryan Brewer, Animator, Wednesday, 12:35 PM

The nodes for hooking up the animations are in and Jeff is re-exporting all the 300i ships.

> pilot_exit_pos_left
>
> pilot_exit_pos_right

I also quickly created exit animations for the character to get out.

> 300i_exitship_left.caf
>
> 300i_exitship_right.caf

Chris Roberts, Wednesday, 1:44 PM

As a note for 7, I think we need to make sure that all the enter / exit / sit down / seat helpers are in the various ships.

Jeff Cavitt

Bryan Brewer

Joshua Alway

Harry Jarvis, Wednesday, 11:49 AM

We'll do a double-check pass on them all today.

Paul Reindell, Wednesday, 2:23 PM

16) Hornet cockpit ladder & canopy don't open for entrance!

I added the possibility to have the seat wait for states before it allows entering (like the doors do). CL 5570

The default Hornet works with that; you can also look into the XML how-to setup.

I also change the default Hornet to start with ladder retracted and canopy closed.

While it works fine for the default Hornet, it is not working on the F7C.

Looks like the canopy open and ladder deploy anim are not set up correctly for the F7C, as I can not trigger them via FlowNode as well.

Joshua Alway, Graphics Programmer, Wednesday, 12:41 PM

Looking into 1 now.

For issue b, I suspect that may be due to a missing wall in the Business Hangar, as I recall we noticed one of those last night. That smearing effect tends to occur when they are missing, while also not looking too out of place in the Business Hangar because much of it is black anyway. I'm not sure if that particular missing wall issue got fixed last night or not though.
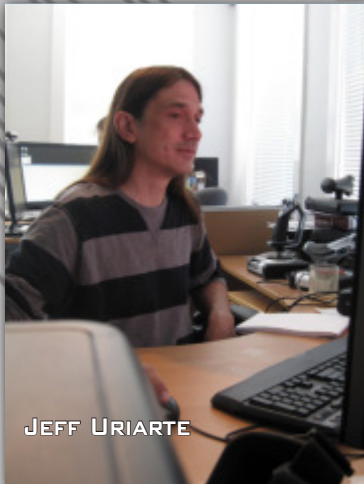
Nathaniel Blaisdell, Senior Designer, Wednesday, 2:12 PM

Buggy is now in Deluxe Hangar.

Jeff Uriarte, Programmer, Wednesday, 12:46 PM

Nate put this in so the buggy was usable ASAP. I need to rejank some stuff on vehicle spawns to create it properly, but should have that in today.

Jeff Uriarte

Jason Spangler, Chief Technical Officer, Wednesday, 12:51 PM

b) Business Hangar has a shader shadow issue – there is smudging across the screen from wall elements – it's similar to something I had happening in the original prototype for a time – I think it had something to do with SSAO and shadows - don't know why it only shows up in the Business Hangar though.

Josh thought this might be due to the missing geometry on the Business Hangar walls – can someone confirm?

Forrest Stephan, Wednesday, 1:00 PM

If we are using SSAO, that needs to be changed as we should be using SSDO. SSAO is mostly for consoles, and SSDO is for PC. If you do a new sync, the walls are in place in the Business.

Jeff Cavitt, Wednesday, 1:14 PM

I have all four 300i/variant cgas updated with the nodes as well as a fix for the cowling collision. It was fixed before, but somehow got broken again. It's fixed now. I am now also tracking down why the collision isn't showing up/working on the 300i engines.

Dan Tracy, Technical Designer, Wed, 9:17 PM

I'm looking at 13) and 15) right now.

I thought the elevators were sorted? Nate/Bryan?

Chris Roberts, Wednesday, 2:39 PM

So I just submitted my fleshing out of the vehicle xml and mannequin files for the Freelancer – FULL DISCLAIMER – they have not been tested yet and probably need significant work but I wanted to get them in your hands, Dan, as I'm likely to pass out soon and I don't know how long my P4 sync will be at the hotel – internet is horrible, as everyone is probably on it and it probably wasn't very fast to begin with.

Once I've synced (and am still alive) I will look at some of the stuff that I can add info / help out with.

Dan Tracy, Wednesday, 2:40 PM

Hahaha, I was just working on this. Ok I'll make sure this is all up and running.

Btw, I fixed the Aurora seat anims too.

Chris Roberts, Wednesday, 2:50 PM

Awesome! You can probably do a simple merge or just take what makes sense! I was actually setting up the files for not just the pilot and copilot but also the gunner (rear turret), kitchen seat and bunk beds - be amazing if Bryan got some climb-in / climb-out animations going for the turret in the Freelancer and even more amazing if we got it going on the Constellation. :-)

Harry Jarvis, Wednesday, 2:52 PM

Trying to get the basic set of get in / get out, sit down / stand up for all ships working right and basic locomotion issues first, then on to things like beds and turrets.

Chris Roberts, Wednesday, 2:57 PM

Wasn't talking about today! Just some extra awesome sauce for next week (but I won't lie, it would be a cool show-stopper in the Constellation for Saturday night!)

Also we should consider recording some high quality video of the hangar in action that we can give David S to give out to press to use to cut into their video interviews.

Harry Jarvis, Wednesday, 3:01 PM

We'll look at getting a video tonight when Forrest sets up the screenshots for David.

Chris Roberts, Wednesday, 3:13 PM

Tonight isn't necessary as we're embargoing hangar video until Saturday night - by EOD Friday will probably be fine. (Dave S can weigh in.)

Nathaniel Blaisdell, Wednesday, 4:57 PM

Deluxe elevator works. CL 5636 (plus some earlier CLs from Dave and Bryan)

Nathaniel Blaisdell, Wednesday, 5:03 PM

Errr … almost. Sorry about that.

Nathaniel Blaisdell, Wednesday, 5:32 PM

Ok, for real this time. CL 5645

David Swofford, PR Manager, Thurs, 12:01 AM

Tomorrow (Friday) is fine for the video. Just about 1 minute is all that these guys will need. If I know it's coming, I can give them all a heads up ....

But I think the plan was to embargo until after the event on Saturday night so we won't get ahead of the fan event.

David Swofford, Friday, 6:29 AM

Chris and I are walking through the final demo for the press and noticed that some of the accounts have changed. Gamescom1 and Gamescom3 seem to have some additions that weren't there before. They both went into a basic Hangar with the Aurora and 300i along with some weapons. And one of them had a buggie ... not sure which one. Did you all send out a patch we weren't aware of? Just noticed some changes too in the Deluxe Hangar.

No biggie ... just checking as we weren't prepared for it.

Also just wanted to check on the status of new hangar screens with ships for Business and Deluxe Hangars ....

Also any progress on a video of gameplay?

Thanks!

Jason Spangler, Friday, 7:01 AM

No patch was released, but the contents of those Gamescom accounts can change without a patch (the account data comes live from the Tycoon/HEAP DB used by the website and ecommerce).

The offline hangars (those special shortcuts on the desktop) only change with patches though.

Jason Spangler

Chris Roberts, Friday, 7:07 AM

Freelancer went missing from the Deluxe Hangar reveal offline setup. I wonder if the batch files got messed up (and there was a green texture on the Constellation suddenly!).

Chris Roberts, Thursday, 4:04 AM

First of all, great work! Big progress since yesterday!

Here are my notes –

1) Business and Deluxe elevators still don't work – doors / gates open but when I step inside nothing happens.

2) Can we place the buggy in the Gamescom4 and Gamescom5 online profiles (where I tend to log in for my demos)?

3) Some of the crates, etc. don't seem to have any collision geometry (I can drive through them). They should be set up as simple rigid body objects.

4) Some of the floor geometry doesn't have correct collision geometry or there are issues with the buggy wheel collision calculations, as the wheels clip through the floor of the Deluxe Hangar.

5) Clipping plane needs to be brought in – when you sit down in the Hornet, Aurora or 300i in FP mode you clip through your arms and on some of the exit animations

your whole body – maybe needs a combination of a clipping plane being made much closer to the camera and the placement of the camera bone in the animation.

6) Hornet F7C ladder and canopy don't deploy.

7) Hornet has a "replace me" red ball under its nose – perhaps geometry that hasn't been exported (although I think the default Hornet F7C should not have a nose turret).

8) Hornet F7C needs to have the Stor-All cargo module on it for the default loadout.

9) Sit down & stand up animation for Aurora and the controls deploying / retracting need to sync better.

10) Exit position for Aurora is off – you climb out into the center of the ship!

11) 300i sit down & controls deploying animations are out of sync. Stand up is even more out of sync.

12) There doesn't seem to be any exit helper or trigger for leaving the 300i.

13) Can you exit the ships (like jumping) without exiting? (Paul I believe this was a feature you were hooking up?)

14) It would be good to disable the movement but not the input part of the movement so players can wiggle the controls / joysticks when sitting down (that is, moving the engine disable check lower into spaceship movement so the control input stuff is still being read).

15) I assume the Freelancer & Constellation enter / exit / sit down stuff is in progress. Be also good to be able to "use" the Freelancer from the rear door and have it open and then have the "inside the vehicle" state be triggered when you pass the threshold of the cargo hold after walking up the ramp.

16) Interior lighting still missing, as are some spots on the ships in the Deluxe.

17) When will I be able to preview the weapons / items holo table to Press? (Will we have it for Saturday?)

18) Will there be some of the flair items in the hangar soon?

19) Is there any progress on the item grav pallets – will there be some animation for the "floaty" effect? (Also, the grav pads should be rigid bodies you can push around with inertia – may be a bit much short term, but longer term pretty simple!) There's even some code that could be taken right out of VehicleMovementHovercraft for the floaty bit!

20) I assume more detail is coming in on the Business Hangar – maybe more environment effects and hopefully some detail pieces of geometry. (Floor also feels kind of low poly next to Discount & Deluxe.)

It's getting there! Great stuff, everyone! People love it!

Pete Mackay, Designer, Thursday, 8:41 AM

I'm looking into these two this morning, in addition to a missing missile rack on the right hand side of the F7C. All should be resolved soon.
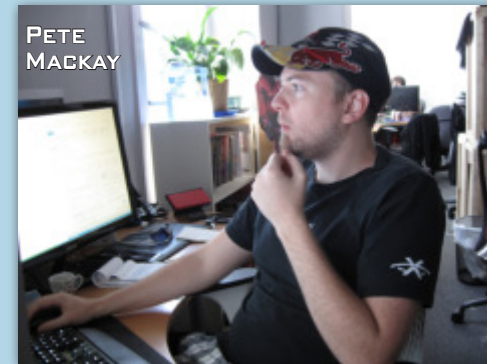
7) Hornet has a "replace me" red ball under its nose – perhaps geometry that hasn't been exported (although I think the default Hornet F7C should not have a nose turret).

8) Hornet F7C needs to have the Stor-All cargo module on it for the default loadout.

Harry Jarvis, Thursday, 8:43 AM

7) The Hornet should have the nose turret available as an upgrade, though, right (even if we aren't making it available yet)? I.e., needs a hardpoint there?

Pete Mackay, Thursday, 8:46 AM

The 'replace me' ball is a missing class-1 neutron gun. The canard turret is not installed on the current loadout, but it does have an empty hardpoint.

Chris Roberts, Thursday, 10:19 AM

Couple of follow up notes –

1) One of the press folks had a 300i package and we logged on his account, but the 300i was clipped into some of the hangar geometry and so started shaking violently once physics was enabled. When I tried getting into the ship, my avatar was shaken to death and turned into a rag doll!

2) Ladder climbing is still wonky / broken. Also there seems to be a bug with entering the ladder state in first person and then switching to 3rd person – you're in a default T pose and can zoom around the hangar in the x, y and z axis like some kind of possessed Linda Blair!

Dan Tracy, Thursday, 11:00 AM

5) I changed over the cvar "cl_camera_nearz" from 0.25 to 0.02 to help with this issue (especially for the Hornet animations) inside the game.cfg. In the short term I think we need to modify the animation to properly resolve this.

15) Freelancer seat(s) enter/idle/exit are all in. I didn't do one for the enter of the ship since I didn't see any "boarding" animation. Also with regard to this whole "interior/exterior" bit, I think if we're going to force the player to use these animations to board the vehicle, then we should close off the proxies of the vehicle to not let them use the normal movement of the player to get inside. Otherwise, as we can see now, we're running into the state issue of the player performing an "enter" animation when the player is already inside.

Constellation is WIP.

David Opreska, Environment Artist, Thursday, 11:10 AM

I'm not sure if anybody is aware, but the Constellations do the same thing in the Hangar app – they topple over on their backsides once the physics kick in ….

Harry Jarvis, Thursday, 11:13 AM

Couple of issues with that – one, the landing skids aren't extended properly (their animations haven't been called), and when the ship physicalizes, it rocks back on its collision.

Now, if skids ARE extended, the elevator may no longer reach the ground; not sure. Will have to see if it's an issue.

Chris Roberts, Thursday, 11:27 AM

Paul - I think we need to physicalize the vehicles on hangar start-up, otherwise you get a wobble of most the ships when you first "use" them – better to have this right at the start.

Chris Roberts, Thursday, 11:30 AM

Don't we have an enter animation up the stairs of the Freelancer? I thought I saw one? If not we need one!

Harry Jarvis, Thursday, 11:44 AM

Have one, just not hooked up yet.

David Opreska

Dan Tracy

Mark Skelton, Thursday, 12:05 PM

The only thing about this is that you can hit and push the ships around with the buggy once they physicalize. We probably need to correct this.

Dan Tracy, Thursday, 12:07 PM

On it. The buggy is using the old massbox of the Crysis 3 buggy which = 84 tons!

Paul Reindell, Thursday, 12:20 PM

Ok, will do.

Dan Tracy, Thursday, 12:20 PM

5753 !B Tweaked Greycat_PTV Massbox to not be over 80 tons! Is now 500kg instead. Try that.

Jeff Uriarte, Thursday, 1:25 PM

Business elevator will work next build.

Forrest Stephan, Thursday, 1:28 PM

Awesome!

Pete Mackay, Thursday, 2:23 PM

Missing F7C right missile door is fixed. (And as a bonus, Chris S. fixed a missing left wing weapon attachment puck.)

Stor-All Big Box is in as a temporary 'duct tape' fix. I believe this will need CR's VehicleItemContainer code to implement the real fix. For now the container is showing up on the F7C, but I had to use a weapon datafile to do it.

Missing Class 1 Nose Left weapon is still unresolved. Art checked the asset and I checked both the DefaultAnvil-Hornet_F7C.xml and the Anvil_Hornet_F7C.xml. I didn't see any obvious reason it would show up in the editor but not the app. The temporary fix is that I removed both of the nose weapons from the F7C so the 'replace me' ball would disappear (no nose guns are probably better than an ugly red ball). Will need further support on this to get a resolution.

Eric Peterson, Studio Head, Thurs, 2:59 PM

You guys are killing it!

And the press and fans are blown away.

Thank you all.

David Swofford, Thursday, 3:35 PM

And how. Thanks for all the hard work

back in Austin and LA. Hangar is looking excellent and as Eric says ... the press is really liking it.

Harry Jarvis, Thursday, 7:43 PM

Good news is that the build server is back up and running.

However, not having it all day, with a lot of areas being touched by many people, meant that the aggregate of all-day's worth of changes broke as much as it fixed.

Honestly, the things that are broken are not that many, but they are very visually wrong, and cover a lot of little improvements.

Main things wrong:

1) Sit/stand into cockpit chair sequences send the camera flying out into space, sometimes still inside the hangar, sometimes outside the walls. That in itself is reason enough not to push this.

2) The attempts to fix the 300i/315p collision issues with the floor have seemed to make them worse, not better.

3) Elevator in Business Hangar isn't working.

4) Elevator in Deluxe works, but the player or the camera lag behind the elevator as it rises, sinking through the floor before catching up.

Good things:

1) The Freelancer is accessible now.

2) Buggy physics is better.

3) Elevator in Deluxe works.

4) Dust/square particles are gone, seemingly.

There is more good and bad, but those are the key impressions. Sorry. For those who want to get a newer build regardless, it is available through the Nightly channel in the patcher. Build 74.

ERIC PETERSON

Harry Jarvis, Thursday, 7:46 PM

PS: After re-reading my email, in case it wasn't totally clear, we are NOT publishing a public build tonight due to issues mentioned above.

Dan Tracy, Thursday, 7:52 PM

In regards to the elevators, physics is always a bad thing to rely on when moving the player around (elevator or floating platform). This is why elevators were mostly abandoned for Crysis 2 and 3. The elevators that were there for Crysis moved really slow so physics could be given enough time to move the player. However, this is not a good solution, IMO. What we really should be doing (since we're doing it anyway with entering in the vehicles) is to have an animation sequence that's played on the player when the player goes up/down in relation to the speed of the elevator (basically animated driven movement and locking out player control during this time). This will make using elevators kinda difficult in MP, but we'll cross that bridge when we get there.

Chris Roberts, Thursday, 9:18 PM

That's probably not the best "non-physics" solution (as it's way too hacky and too animation intensive). It would be better to know that the player is on an elevator platform and constrain the player to not be below the Z position of an elevator "helper" that is placed on the surface of the elevator floor. You could probably use the mat system (for the feet) to know where you were standing on an elevator.

BUT I'm willing to bet there is also a solution that can work inside physics that would fix this – it just requires some fix-up code in the physics call back and would be along the lines of what I wrote to fix up the projectile starting position for spaceships (as you have to fix up the visual lag between where physics is and where the render object is, which is super apparent on fast moving vehicles).

Forrest Stephan, Thursday, 9:29 PM

I wonder if we could just use a solid for now and make it invisible? I bet you get more responsive physics that way? I tried linking a solid to the elevator and for some reason when the animation triggers the link is lost. Dan, any ideas?

Forrest Stephan, Thursday, 9:37 PM

Also I made an elevator for the Bengal carrier to access the different floors, but instead of keyframed animation I used the "MoveEntityTo" in flowgraph. I was going up and down to different floors without a hitch and it moved pretty fast from what I remember. Perhaps we can modify the flowgraph to use some of Brian's keyframes, but when the elevator actually begins, just move the entity via flowgraph translations.

Nathaniel Blaisdell, Friday, 7:32 AM

The elevator entity isn't actually moving, which is why the linked physics object isn't moving.

Nathaniel Blaisdell, Friday, 9:20 AM

Nathaniel Blaisdell

I have a fix ready to go that switches the up/down movement to be done through entity movement rather than animation.

Attached video. Shall I check this change in?

Harry Jarvis, Friday, 9:26 AM

Go for it.

Harry Jarvis, Friday, 9:52 AM

We don't want to be hardasses about things, but we really need people to check with leads before checking in fixes today. How Nate did it with video is awesome. Buddy checks are even better. If it's code, it probably needs to be buddy checked. I'll let Jason rule on that.

Major features HAVE to be buddy checked here in Austin before going in.

Dan Tracy, Friday, 11:16 AM

Cool, but again, using either the animation method or the moveEntityTo performs the same physics interaction with the player. You will notice on slower machines that if the physics thread doesn't catch up, then you have the same problem all over again. Also please note that you won't have as much fine-tuned control over what the elevator does because it's a hell of a lot more work to properly time anything more complicated with the elevator …

Harry Jarvis, Friday, 9:02 AM

Here's a first pass at a list to target for EOD Friday to get to Germany for the big reveal event. This isn't everything, just the big stuff. This is from Builds 74 and 75. Feel free to report fixes. If you wish to add fixes, please ask Ron and me first.

HANGARS GENERAL

Major Issues	Upgrades on grav pallets not showing up
Minor Issues	No VFX on grav pallets
	No animation on grav pallets

DISCOUNT HANGAR

No Issues

BUSINESS HANGAR

Major Issues	Assets not compiling properly
	Fix elevator
Minor Issues	Cylindrical containers have no textures
	One cylindrical container has no collision/physics

DELUXE HANGAR

Major Issues	Improve elevator
	Flickering Geo in bays
	Flickering light in storage duplicate layer
	Lighting on ships too dark
Minor Issues	No collision on overhangs on upper balconies
	Player can jump off upper balcony
	Visual gaps in railings – looks like player could jump in ravine
	Flair items need to be placed on a shelf

LAUNCHER / PATCHER / GAME

Major Issues	Splash screen – old art
	Black screen after splash screen
	Pause screen – old art

SHIPS GENERAL

Major Issues	Sit-down animation / sequence sends camera outside ship (except Hornet)

CONSTELLATION

Major Issues	Landing skids not deployed
	Enter / elevator not working
	Green vertex color on top of ship exterior
	Animations not properly zeroed

FREELANCER

Minor Issues	Interior lighting – pixelated lighting inside, maybe bleeding through from outside
	Interior collision – camera clips through frequently
	Interior door to back cargo bay
	Exterior door to back cargo bay
	Cargo not separated from ship geo

300 SERIES SHIPS

Major Issues	Landing gear collision not working

Engine collision not working

Enter animation in 1st person – hands don't grab ladder

Minor Issues   Too much bloom on interior white fixtures

Blue screen too bright

Panel lighting wraps around and reflects on pilot seat surfaces

300i

Major Issues   Still coming in with collision through the floor in Discount Hangar

HORNET F7C

Major Issues   Enter animation in 1st person – camera looks back at rear of ship and clips player body

Cockpit screen animations not hooked up properly

Camera clips through character and cockpit

Canopy not opening (CR may have fixed already)

Minor Issues   Engine nozzle has no collision

Right landing skid has inverted mesh – likely mirrored incorrectly

AURORA

Major Issues   Exit animation sends player through geo

CUTLASS

Major Issues   Toy model not yet made or hooked up

UPGRADES

Major Issues   Not set up properly

Forrest Stephan, Friday, 9:17 AM

Hangars General: I would like to add a volumetric temp proc beam shader so the floating objects look like they should be floating. Where are we at with animations for the floating objects, minor bob? Can I have a dummy attached to the grav pallets please, so I can set up a particle effect for the grav pallets. Would look a lot better in conjunction with the beam shader. I can use a modified version of the particle I made for the holotable.

Discount Hangar: floor bug when you drive buggy; will get with David as I believe he has already run into this problem.

Business Hangar: To clarify for the Business Hangar, BHVR assets not compiling properly. Then yes, Business elevator, today is the day we beat you!

Deluxe Hangar: collision issue in elevator has already been fixed. Discussed geo flicker with David, Lighting on ships too dark. Please specify, where are we at with the lighting rigs I made? We need to fix railing heights; that is on the agenda today for both the Discount and the Deluxe. Nate is working on placing the flair items. Does this need to be done in all three hangars by tomorrow? Seems like if it's in one hangar that should be fine for tomorrow?

Constellation: Has CGBot been made aware of all of the problems? If so, they are probably working on it and I noticed Dan is also working on it. Is there a line of communication between Dan's changes and CGBot's fixes and how they will be combined so there isn't lost work? More specifically, are we aware what exactly Dan is working on and what exactly CGBot is working on?

Ships: I will do a mat pass to turn down the blur on the glass. I think eventually we really should have an exterior glass and interior glass as the material should be fairly different.

Forrest Stephan
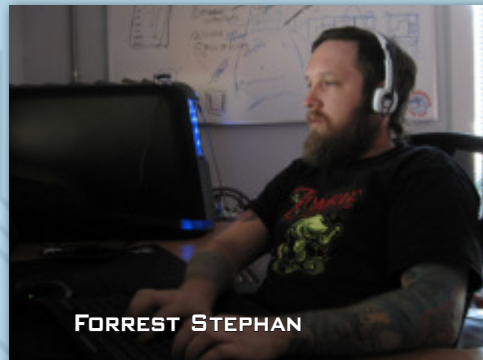
Harry Jarvis, Friday, 9:32 AM

Clarification – Ship exteriors in Deluxe Hangar look way too dark – Mark Skelton to look at.

Saw Nate's fix on Deluxe Hangar, looks great. Will that work in Business?

With flair, if it is set up in one hangar properly and any improperly placed flair is ripped out of the other Hangars, that's fine for today. Just didn't want lamp, trophy and ship model sitting on a ledge in the Deluxe Hangar, too far away to be investigated, but clearly visible and oddly placed. If posters are OK, leave them be.

As to Dan and CGBot on the Connie, no, we don't know who is doing what, and need to clarify ASAP.

Ron Lajoie, Friday, 10:22 AM

Also, just so everyone is aware of the schedule today:

Today (times CST):

2:30pm - Leads eval, followed by walk-arounds to gather current status

5:30pm (or whatever time a build is ready near then) Leads eval, followed by walk-arounds to gather current status

8:30-9 - Leads eval – first candidate for Gamescom reveal

11pm - 2nd candidate for Gamescom reveal

12am - absolute final cutoff for check-ins, build and eval

As mentioned previously, please have everything reviewed before check-in by either your lead and/or myself/Harry.

Dave Opreska, Friday, 11:30 AM

Deluxe: Lighting on ships too dark.

Do you guys plan on putting lighting on the exterior of the ships?

I was assuming this so I kept the lighting a bit dark to help bring that out.

Deluxe: We need to fix railing heights.

Do you guys want me to put fake collisions at the top of the hangar catwalk to prevent players from jumping off?

Mark Skelton, Friday, 11:35 AM

I really like the way the Discount is lit with lights on the ground illuminating the ships from below. That's probably how we should approach this, I would think.

Chris Roberts, Friday, 3:21 PM

Hi-yield demo features for Saturday (in priority)

1) Having sit down / standup / fiddle with controls (without character position or animation being out of sync) is the #1 feature I would like. Freelancer would be great. Constellation super bonus. This should be the focus of polish and testing.

2) Paul's equipment display / system to show off

3) Hangar flair

4) Ship lighting

5) Elevators

Also lets make sure we don't have any "replace me" objects / textures

Nathaniel Blaisdell, Friday, 1:29 PM

3) Done. Just in Discount and Deluxe.

5) Data work is done. Still waiting on new build to test the code fix. So in theory done.

Dan Tracy, Friday, 1:35 PM

Freelancer is ready (even the co-pilot seating) except for the IK controls. Gonna start that now. Waiting on the fixes I need from CGBot for the Constellation, then I'll get it ready.

Harry Jarvis, Friday, 1:36 PM

Awesome - CGBot said a couple of hours on the Connie.

Chris Roberts, Friday, 1:36 PM

I'll be on stage at 9 pm tomorrow for the presentation, so we can probably patch up until 7 pm (at the latest) Cologne time Saturday - just an FYI.

John Erskine, Director of Studio Services, Friday, 1:39 PM

By the way, 7 pm in Cologne is noon in Austin.

Dan Tracy, Friday, 6:40 PM

Freelancer is fully functional now. You can play with the yoke in the driver seat and all the arms IK is up and running. However there's a code bug with the copilot seat - you can't control the yoke since the copilot isn't the driver of the vehicle. Paul is already aware of this bug.

I don't know where CGBot is with the Constellation. I'm still waiting on that.

Dan Tracy, Friday, 6:48 PM

Oh yeah I forgot to mention. Sean and I stepped through the IK system today and we found a Cvar to constantly force the update on the FootIK! So we now have FootIK working properly!

Harry Jarvis, Friday, 6:53 PM

Martin (CGBot) is about to check in Connie fixes.

Harry Jarvis, Friday, 6:56 PM

This is what Martin is checking in:

- green vertex paint

- chair animations revised

- landing skids animations revised

- elevator animations/geo revised

Martin is done checking in the Constellation with those fixes – all yours, Dan.

Harry Jarvis

Ron LaJoie, Friday, 2013 5:42 PM

DISCOUNT HANGAR

Flair not showing up in correct placement, gamelayer needs to be re-exported (Pete) FIXED

Aurora dismount is completely broke (Bryan) FIXED

Replace me balls on weapons still (Pete) FIXED

300i crashes when mounting cockpit (ZHU)

DELUXE HANGAR

Green still showing up on ship (CGBOT)

Skids not deployed (CGBOT)

Radar turns on when right-clicking (Paul) FIXED

Hornet landing gear is inverted (Chris S) PUNT

BUSINESS HANGAR

Billboard is not working (Zane, Forrest?) Low priority

Upper inside hallway is not tiling properly (Forrest) In progress

ALL HANGARS

Ship lighting – some ships fixed, environment lighting bleeding through

Camera goes off into space when mounting – FIXED

Change default graphic settings to very high (Jason) not fixed

All 300 series ships spawn in below floor collision now (Jeff U)

300 exit animation plays on the wrong side of the ship (Bryan)

Elevator broken in Business & Deluxe now (Dan) still broken.

Foot IK is causing issues, feet are janky and look bad in 3rd person (DAN) please revert for demo

Chris Roberts, Saturday, 12:38 AM

What is the inverted landing gear on the Hornet about? It was completely fine when I tested / checked in Friday. Also why would sitting down in a cockpit cause a crash? Can't someone see how that could happen in the debugger? Sitting down has been working fine on my demos at the show – just position and animation timing has been off. Animation timing should be a simple Bryan fix (300i cockpit animations need to be re-exported to match the pilot animation). Position would be a code thing.

JEFFREY ZHU

Jeffery Zhu, Gameplay Programmer, Saturday, 7:39 AM

The crash was due to a VehicleItem (the 315p tractor beam) being set on a SharedWeapon hardpoint.

A fix has been submitted. In the future we should implement a check to prevent this issue when the xml is loaded.

Chris Roberts, Saturday, 12:44 AM

So only on the 315p? The tractor beam should have been a VehicleWeapon, btw, but I agree we need this defensive code check as it sounds like a problem that Paul and I caught on Monday about weapons type being set incorrectly by design (VehicleItem vs VehicleWeapon).

Ron LaJoie, Saturday, 7:47 AM

The ladder issue is not going to get fixed unfortunately, it was low priority compared to everything else. You will need to do ladders in 1st person if anything.

The landing gear on the Hornet Brian claimed fixed, but has not come through yet. We are waiting on a new build to review, once we do we will make sure there are no show stoppers and upload to CDN for you to grab.

Chris Roberts, Saturday, 12:51 AM

1st person has ALWAYS been broken for me (I climb in T-Pose, can't dismount, fly around instead of dismounting) in the demos. 3rd person was the only one that worked (even if it looked bad).

What is the landing gear issue? Did someone change / break something? It's been fine forever – the only issue I saw was someone created unnecessary collision geometry which I removed.

Where do we stand on the priority list that I emailed yesterday?

Ron LaJoie & Chris Roberts, Sat, 8:05 AM

1) *Having sit down / standup / fiddle with controls (without character position or animation being out of sync) are the #1 feature I would like. Freelancer would be great. Constellation super bonus.*

    This should be the focus of polish and testing.

RL – This is working in all ships currently (about to review to verify), they are not perfectly in sync in some ships though.

CR – This is in current pushed build – can I test? (I don't plan to sit down in all ships – probably start the Aurora, then do 300i and finish with Freelancer entrance, sit down and then just need to walk around inside Connie)

RL – You should be good here.

2) *Paul's equipment display / system to show off*

RL – This is in the Business Hangar, although it has not made it through a build yet.

CR – will this be in the Deluxe too? Or Just Business? My demo path has been – start in basic with Aurora, walk around it, get inside, sit down, fiddle with controls (or hope to), get out, go up ladder, look down. Then go to either bigger Discount (show auto-scaling) or jump to Business, show different look, enter 300i, look at the Freelancer (but not get in as we couldn't), try elevator. (Tell journalists that this along with other previous glitches is an example of little polish details that normally a dev team wouldn't clean up until close to

full alpha but the iterative development philosophy is forcing us to "tidy" house as we go, so all these little glitches will be fixed for next Thursday and are a good example of why we think this approach will yield a better, more polished final product than is normally the case with big games as we have to do our chores as we go.) Then I go into the Deluxe Hangar, switch to 3rd person and walk around the Constellation, noting the relative size and scale of the various ships you can fly and the hangars. I walk up to the entrance elevator and say "hopefully by Saturday I can enter here!" then I go over to the elevator, note again this is a clean / up polish item, walk around a few bays, then reveal the buggy, get in and drive around (this is always a crowd pleaser – hopefully wheels don't clip through the floor anymore). I end up at the weapon pallets, dismount the buggy, say you'll be able to buy a limited amount of guns etc. with the game store that will come online next week, and do some "playing" with your ship equipment loadout on an IronMan holotable that will project from the table at the end of the bay.

RL – As of now, just the Business Hangar for the holotable. You should be good on the elevators, fixes were checked in to get them working. Buggy wheels don't clip anymore! The problem with the buggy is no ramp, and the objects you would want to run into have physics issues that we have been unable to fix so far.

3)   Hangar flair

RL – In and good.

4)   Ship lighting

RL – In, but we have issues with environment lighting bleeding through the ships.

CR – I think this is fine. I would rather have lighting and bleed than no lighting, as the ship interiors look pretty bad / over-lit otherwise.

5)   Elevators

RL – Fixed.

Also let's make sure we don't have any "replace me" objects / textures.

RL – Fixed.

Chris Roberts, Saturday, 1:21 AM

Thanks.

What about the "reveal" hangar with buggy, maybe a ramp and a few things to ram into (this will be a crowd pleaser, I guarantee).

Also when I did my demos I tended to use actual online accounts (Gamescom1, Gamescom2, etc.) as I think that's more effective, so with the internet connection at the event that would be the plan.

Chris Roberts, Saturday, 1:34 AM

I'll need a Business Hangar account with some guns / items on a grav pallets so I can demo Paul's holotable. Is there a run-on animation? (I seem to recall discussion about a simple one.)

Harry Jarvis, Saturday, 8:36 AM

If you mean the grav pallet animations, it is on the list, but down the list of priorities, as Jeff U is working on elevator problems.

Chris Roberts, Saturday, 1:39 AM

No, but that would be a cool bonus. Just that the Business Hangar would need some items in it so I would swap loadouts in the demo – the current Gamescom3 profile has none.

Also can we really not have a ramp and a few small rigid items? That's been working for ever… I'm not talking about physicalizing ships – just doing something goofy / fun that I guarantee will be a crowd pleaser – the crates / cans could easily be made to do this as items.

Harry Jarvis, Saturday, 8:42 AM

For whatever reasons, we have had great difficulty turning the crates into physics objects that react to being hit by the buggy (or anything). I have seen them rock on occasion, but that's about it.

At this point, it would entail pulling people off of things like elevators and Hornet entry and Constellation and holotables to even try to make that work, with no guarantees.

Chris Roberts, Saturday, 1:45 AM

That's usually just either their density or mass – it needs to be set realistically. It's a five-minute thing. Dan would be the man here. They also need to be set to RIGID not STATIC (which is the default for an item if not specified in its lua or definitely a GEOMENTITY).

Jeff Uriarte, Saturday, 1:48 AM

No, it's an issue with how they are being created in the hangar app from the exported layer file. I looked at it last night and we're creating them identically to how the engine would create them, but they are not reacting. They behave correctly if the base layer file is loaded as a map, but not when the hanger app recreates them as an entity. The script is firing correctly and they get physicalized as rigid objects. A piece is missing and I haven't had the time to track it down.

Justin Binford, QA/CS, Saturday, 8:56 AM

The online accounts currently do not map weapon items on gravpads. They currently are only shown in the offline demo hangars.

Justin Binford

Chris Roberts, Saturday, 1:57 AM

Is this difficult to change?

Ron LaJoie, Saturday, 9:29 AM

This is not something that is going to happen tonight. We made those offline hangar builds based on what we were told the scripted demos were going to be, so we will have to use that for Gamescom.

This clearly has to be fixed for release, but there is no way we can change it for the demos.

Chris Roberts, Saturday, 4:27 AM

How do I enter the Constellation? I don't see any entrance action.

Also did we ever set an action for the rear cargo door of the Freelancer or the interior cargo door?

Also (this is all from my testbed) the 300i sit down / stand up animations were out of alignment between the ship animation and the pilot animation. (And it still has the same issue of the character being way off where he should be – all these animations with the position adjust in the mannequin file should be set to a blend time of ZERO. Right now they are all non-zero, which is why we have the big discrepancies.)

I can fix (blend times – animations is not something I can do) in P4 if people don't know where to look, but I obviously can't integrate it into the build.

Harry Jarvis, Saturday, 12:08 PM

Sorry, no Constellation enter, no back cargo door on Freelancer.

Just pushed Build 93, there may be one more later.

AND THEN, IT WAS TIME FOR THE DEMO.

You can see it here: http://www.twitch.tv/roberts_space_ind_ch_1/c/2809927

Eric Peterson, Saturday, 1:40 PM

The demo was amazing.

Thanks for killing it, this effort was amazing.

The people here LOVED your work.

Thank you!

Nathaniel Blaisdell, Saturday, 7:02 PM

Just finished watching the recording of the live event. Just wow!

Demo went great, and the fans are awesome!

Great job everyone!

Paul Reindell, Saturday, 7:10 PM

Yea, also watched the stream, really awesome how everything ended up working so well and just in time!

Great job, guys!!!

… Indeed.

ELLIS SYSTEM

If speed could, paradoxically, be represented by a fixed point in space, then that point is unquestionably the Ellis System. Home of the Murray Cup, the most famous racing event in the galaxy, Ellis is a star system that plays off its reputation to any tourists or other visitors who pass within a light-year of the outer worlds. Despite this, Ellis is actually a very interesting star system on its own merits: from hordes of indigenous life forms that are unlike anything present anywhere else in known space, to an economy based on something other than ship part construction, to the sheer number and variety of planets present in the system, Ellis is worth at least one voyage.

Cosmologically, Ellis is an F3V Yellow star with an especially thick green band, allowing an unusually high amount of human habitation. The system is located in a highly developed region of UEE space with strong jump ties to Nexus and Kilian. Politically, it is a corporate-owned star system, although this is more trivia than an actual issue of governance. Despite its association with space racing, Ellis has never been a manufacturing powerhouse; instead, it exports unrefined minerals and seafood to other populated systems in the local star cluster.

INNER PLANETS

Ellis I and II are typical inner-system uninhabitable worlds. Ellis I is a protoplanet that orbits so close to the star that it is frequently caught within solar flares. Miners consider Ellis I the ultimate tease: advanced scanners have revealed that the bubbling magma surface hides a fortune in rare minerals … but there is no shielding technology yet available that would allow a mining crew to access them. Dozens of pilots and crews have been killed in the attempt. Ellis II is shrouded in a thick, smoggy atmosphere. The surface is barren and otherwise uninteresting, although the constant severe storms are an attractive diversion for observers.

GALACTIC GUIDE

Inhabitable Band: Green, Kampos & Noble

Green, Ellis' third planet, is the most recent to be terraformed. Located on the edge of the system's inhabitable green zone (hence the imaginative name), the world was purpose-constructed as a resort world to cater to visitors interested in the Murray Cup. A terraformed ocean world, the planet is dotted with luxury towers and mega-resorts. To preserve the world's elaborate underwater reefs, only a single landing zone is allowed, in the coastal city of Aydo. Due to the fact that Green was terraformed, it has no native sea life. Attempts to transport species from Kampos and Earth have met with abject failure.

Market Deals — Green

BUY:	WATER	+1
SELL:	SHIELD TECH	+2
SELL:	LUXURY GOODS	+1

Ellis IV was the first world settled in the system and it remains the most populated planet. It is also the only planet in the Ellis System with an economy that revolves around anything but racing. **Kampos** is a high-gravity ocean world stocked with all manner of sealife. The planet itself is named after a particularly large sea creature (though not one of the many whose harvested meat is available for export). Kampos' high gravity also gave rise to the evolution of flatcats, which formed the basis of a brief fad in the UEE core worlds. The world is frequently called Seahorse by the locals, so-named for the appearance of some of the high-gravity sea monsters harvested by native fishermen.

Market Deals — Kampos

BUY:	SEAFOOD	+4
BUY:	SALT	+2
BUY:	WATER	+1
SELL:	LUXURY FOOD	+1

The third of Ellis' populated planets, **Noble** (Ellis V) is a mid-sized forest world. The planet is largely unremarkable, with corporate dictates requiring that most of the surface be preserved as-is. A single spaceport near the south polar region allows visitors to explore a beautiful landscape reminiscent of an undeveloped Earth. Two moons make for an especially beautiful landscape at night, although there is a consistent fear that urban development will spread on the world to support the ever-increasing number of race fans traveling to the system.

Market Deals — Noble

BUY:	LUMBER	+2
SELL:	LUXURY GOODS	+1
SELL:	ELECTRONICS	+1

Undeveloped Worlds

Ellis VI sits just outside the green band, a rocky terrestrial world that is currently being used by the UEE for research into human habitation. The hope is that terraforming techniques will expand to the point that planets farther and farther from a star will be able to someday support a human biosphere. A small science station is in geostationary orbit for this purpose and the population

of scientists are always eager to purchase luxury goods to while away the time spent at their thankless tasks. Ellis VII and VIII are similarly uninhabitable worlds. VII features a highly corrosive atmosphere that can be damaging to ships entering local orbit. Ellis VIII is the smallest full world in the system, an uninteresting rock with a limited atmosphere.

Gas Giants

The Ellis system features two gas giants: Ellis IX, aka Walleye, and Ellis X. Walleye is the largest of the two and has been completely commercialized as a fueling world. While Walleye is most famously recognized as a pit stop for racers, most of the time it is the site of impressive queues of freighters and warships waiting to take on fuel. Long-haul transports making the Earth-Pinecone run frequently begin at Walleye, and a variety of 'rest stop' facilities have grown up in orbit. Ellis X, Bombora, is a smaller gas giant with an extremely turbulent atmosphere. Scooping fuel can be extremely dangerous, and

pilots are advised to avoid any such attempt. On the other hand, it is a chance to skip the wait at Walleye and refuel your ship at no cost!

Outer Planets

The eleventh planet in the Ellis system was famously destroyed recently in a collision with its moon. The world was uninhabitable and astrophysicists had long been charging its apparent demise. Nevertheless, the impact resulted in an extremely dense debris field which pilots are advised to avoid at all costs. Outlying regions are a reasonable source for minerals, though, with gravity having already begun the refining process! Ellis XII, named **Judecca**, is a small frozen ball in space, the site of the occasional ice-mining expedition and little else. The outermost planet in the system, Ellis XIII, is known locally as **Pinecone** due to its strange shattered rock surface. Pinecone is rich in heavy minerals and is a popular destination for long-haul miners, many of whom transport ores all the way back to Earth itself for resale.

The Cup

by Robert Waters

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CHRONICLES

PART Two

At the end of the first stage in the Murray Cup race through the Ellis system, Ykonde Remisk edged out Hypatia Darring with an exhaust flare that, while technically legal, was definitely dangerous. Both of these two Human racers finished ahead of their main competition, the veteran Tevarin Zogat Guul and the wily Xi'An Shoo-ur Motak. Darring reacts to Remisk's maneuver . . .

Darring jumped out of her racer, sped across the carrier bay floor, found Remisk in the middle of a media gang, and drove her fist toward his cheery face.

He ducked just in time.

One of Remisk's crew grabbed Darring and held her back as she hurled accusations. "You son of a bitch! You could have killed me!"

Remisk recovered from the assault and tried to seem cool about it in front of the crowd, adjusting his collar and giving a weak smile. "I don't know what you're talking about, Darring. I ran a clean race."

"You tried to burn me alive!"

Shock and dismay spread among the faces of those gathered.

Out of the corner of her eye, Darring could see an MCR rules official coming their way with a concerned look on his face, but she didn't care. She fought her way out of the crewman's grasp and took another swing. Remisk caught her arm and held it tightly.

"Back off, Darring," he said, "or I'll file a complaint."

"The only complaint worthy of filing is one I will submit requesting your dismissal, you cheap —"

"People, come now, let's remain civil."

Motak pushed his way through the crowd and stood beside Remisk. He waited until the MCR rules official arrived, then continued. "Ladies and gentlemen, I can assure you that from my perspective, Mr. Remisk violated no MCR rules. In fact, not only was his move brilliant in its simplicity, but it showed a deep dedication to the integrity of the sport. Remisk never once touched his ship to Ms. Darring's. He showed incredible care in the maneuver. I can attest to that."

"You can attest to kissing my —"

Guul stepped in and peeled Remisk's fingers from Darring's arm. He whispered into her ear. "Come on, let's go. Not here, not this way."

Motak chuckled. "You should listen to him, young lady. Guul is an old, wise soul."

Guul ignored Motak and pulled Darring through the crowd. "I said, let's go."

She relented, and they made their way out of the carrier bay and into a long narrow corridor that led to a small atrium with chairs and tables that looked out over Ellis III. The planet's orbit was alive with the race as it continued with the remaining racer groups down list. It was a beautiful display, the rings of the course pulsing their light, and the blur of racecraft rushing through them at marvelous speeds.

Darring looked out at it, and her anger began to subside.

"Take a seat, Hypatia," Guul said as he pulled one chair away from a table.

Darring sat, crossed her arms, and kept looking out at the race.

Guul sat down across from her, his long body almost comical in the Human-sized chair. "Now tell me . . . what was that all about?"

Darring did not respond at first, but she met Guul's stern gaze with her own. Then she blinked, sighed, and said, "He cheated. He cut me off and blew fire into my face."

"It is not a violation of the rules, and you know it."

"Well, damn, it should be."

"You know," Guul said, shaking his head and leaning back, "I would not expect a loose cannon like yourself to be such a slave to the rules."

Darring finally smiled. "A residual from my father's parenting. 'Play by the rules, Hypatia'," she said, imitating a deep manly voice, " 'win by the rules, and they can never have cause to take your victories away'."

"It is a noble statement," Guul said, "but, in racing, a touch naive. There are rules, and then there are rules. But you pull something like that again, especially with witnesses, and *you're* the one that will be expelled, not Remisk."

Darring sloughed off his warning. "He's a jackass, and so is Motak."

"That is true, but there's nothing you can do about it right now. They will do what they have to do to win, and you must keep your cool. Besides," Guul said, his gaze growing more serious, his face cast down toward the racers rushing past, "I want my last race to be against the best. And if you are expelled, then it will be against cookie-cutters and has-beens."

Darring wrinkled her brow with concern. "Why is this your last? You have many years ahead."

Guul nodded. "Many years perhaps, but not as a racer. Every joint aches, every bone brittle, and my eyes are failing. It is time."

Darring sat in quiet, not wanting to speak, not wanting to accept that her hero was near the end. And she had just met him. How could he be leaving now, when she had so much to speak to him about, so much to learn? Afterwards, he would likely return home (wherever that may be), and she'd never see him again, and time would be so precious during the race. When would she have another opportunity to talk to him, to learn from him? *If this is his last Cup,* she thought, *then perhaps I should back off a bit, let him have a course or two, let him take the lead when —*

"What is that look?"

She turned to him, shrugged innocently. "What look?"

Guul leaned forward. "You're thinking about throwing the race for me, aren't you? You're thinking, 'Give the old Tevarin one more victory.' Well, forget such nonsense. My people are warriors, Hypatia, and we have a saying: 'Honor your enemy, praise him if you must, but never lose a chance to kill him.' Here, you and I are friends. Out there," he said, pointing to the race, "we are foe. Promise me, that if we find ourselves neck and neck on the final lap, and you have an opportunity to win, that you will. That you will show me no mercy, no quarter, and then at least I will know that if I lose, I have lost against the best. Promise me."

His face was so serious, yet so pleasant in its bland color. His cheeks had darkened somewhat which left a nice contrast against the paler skin of his brow. He was blushing, she figured, perhaps on the verge of tears. A crying Tevarin was almost a contradiction in terms, but there was no doubt of his seriousness at this moment. Darring knew

that he would not let her leave the room until she promised and did so sincerely.

She nodded. "I promise."

Guul smiled, and his color returned to normal. He stood. "Excellent. Now, I owe you a dinner. Hungry?"

"Famished!"

They walked together through the corridor, took a turn toward the carrier's mess. It was a good idea to get a full meal before the mini-jump to Ellis IV, and some rack time as well. The next several legs of the race would be tough, and Darring would have to face her crew chief soon and figure out if any serious damage had been done to her engine. It was not a conversation she was looking forward to.

"Have your crew chief speak to mine," Guul said. "He's an old M50 pilot."

Darring pinched his arm. "Now *that* is against the rules."

Guul laughed. "But there is nothing in the rules that says that a crew chief can't accidentally sit back to back with another crew chief in the mess and accidentally hear said crew chief talking about engine repair."

She pushed him playfully. "You are so bad."

"Tricks of the trade, my dear. When you've been around as long as I —"

Guul did not finish his words. They had turned a corner and there stood three Humans wrapped in dark clothing to match the faint light of the corridor. The three did not hesitate.

One pulled a knife and slashed towards Darring's throat. She leaned back instinctively and felt the wind of the man's brutal attack across her chin. The blade did not find flesh, however, and she tumbled back against the wall.

The other two were on Guul immediately, but despite the Tevarin's confession of joint pain, he moved quickly, subduing one in a head lock and guarding off the fists of the other. Darring tried to get to him, but her assailant was not finished. He slashed again with his blade, this time toward her stomach. She knocked his arm back with a move she had learned in Basic, then drove her fist into his kidney.

As the man lurched back, trying to recover from the blow, Darring recognized his face. He was from Motak's entourage, the one who had shielded his boss and nodded to her as the Xi'An had walked away. She gnashed her teeth, scowled, and drove her boot into his crotch, knocking him to his knees. She continued her assault against his face, striking him twice before he managed to turn, kick out his leg, and swipe her feet from beneath her. Darring fell hard, her hip reeling from its concussion against the corridor floor.

He was on her again, but this time she was ready. She timed her move, brought her knees up quickly and flung him up the corridor. She tried rising to pursue, but the body of another assailant flew over her and hit the wall. She looked toward Guul and found him making mincemeat of the third man's face. His companions, bloody, beaten and clearly not wishing further punishment, collected themselves quickly and dashed away.

Guul released the third man, pushed him back against the wall. Darring tried moving against him, but despite his mangled face, he got away from her grasp, grabbed his blade and shot away down the corridor in the opposite direction of his accomplices.

Darring went to Guul's side. He had slipped down the wall and was holding a bloody gash across his stomach. Darring moved his hand away to look at it. "Bastards," she said, trying to help him to his feet. "Bloody bastards. Come on, let's get you to the hospital."

Guul shook his head and pushed her away. "No. Just get me to my crew. It's not that bad. I've had worse."

"But we have to tell someone about this. Tell them it's Remisk and Motak."

"How do you know that?"

"One of the men . . . I saw him in Motak's gang the other day."

He nodded. "But you can't prove it."

"Come on, Guul," she said, letting her anger rise again. "Don't play stupid. You know who ordered this."

"And if you're wrong, then it will reflect badly on you, especially after your unprovoked assault against Remisk. No, you may be right, but they are far too smart to leave evidence lying around. Motak has too many friends among MCR officials. This will go away as quickly as it was attempted." He pointed down the corridor, toward the atrium and out to space. "We'll beat them out there."

Reluctantly, Darring nodded. She did not like the plan, but let it rest. The most important thing now was to get him to someone, *anyone*, who could help.

She hugged his waist and helped him back to his crew.

*   *   *

"You're late," Motak said, sitting quietly in the dark of the room while Remisk expressed his agitation in short, sharp barks. "It's got to stop, Motak. It's gone too far."

"How so?"

"They could have been killed. Both of them. That's not what I signed up for."

"What did you sign up for?"

"Sabotage is fine. Damaging an engine, clogging a fuel line, denting a wing, forcing a racer back with an illegal move. These are all fine. Win or no, succeed or fail, it's all part of the unspoken game. But trying to kill people is another matter entirely."

Motak chuckled. "What would you rather do? Race the final course with only me to contend with, or with Guul and Darring as well? The Tevarin is a beast, and that bitch is far better than anyone gives her credit for. If they remain in the race, you'll go down in history as the man who had a chance, but failed, to win the Triple Crown."

You will fail regardless, Motak said to himself. *Once I've dealt with Guul and Darring.*

"It's over, Motak," Remisk said, waving his arms in the darkness as if he were slicing bread. "I'm not doing your dirty work anymore."

Motak turned on an overhead lamp resting on a table at his side. Beneath the cast light lay a small, gold-colored box, which he carefully opened. A small syringe with a green liquid lay in its center. He picked up the syringe and held it as if he were going to give someone a shot. "Oh, I think you will. You still have things to do for me. And if you don't, I will share with the MCR rules committee what is contained in this needle."

"What is it?"

Motak shrugged. "The very thing that has given you an almost inhuman energy, an ability to anticipate moves three, four turns ahead."

"That's a lie! I've never taken drugs in my life."

"I've been planning this for a long, long time, Remisk. So let me lay it out for you. A young, successful pilot wants to make a name for himself. He wins the Goss Invitational by a nose and begins to think he really has a shot at winning the Triple Crown. He goes to a small- time dealer and asks,

"What can you give me that can't be detected by scanners?' The dealer gives him this, which I gave the dealer — an inert liquid that contains a Xi'An enzyme that, in a Xi'An, is meaningless. But when introduced into Human brain chemistry, it creates an almost extrasensory perception that only activates under extreme stress and excitement — feeding off adrenaline — like during racing. It deactivates and hides itself once your adrenaline subsides. MCR scanners at their current settings cannot detect it. And you have been taking this for months."

"You're a liar!"

Motak ignored the accusation. "And here's the catch. This is your last dose. There's enough in here to keep you vital to the end of the race. Take it, and you'll be fine. If not, somewhere around Ellis IX, as your ship is being pulled by the gravitational forces of that giant gas ball, you will fall into a deep sleep and be crushed by the tidal forces of its wild weather." Motak held up the syringe for Remisk to see, letting a few drops squirt from the needle tip. "What will it be, my friend? Life or death?"

Remisk stood there in the darkness for a long time. Then finally, he fell to his knees and crawled over to Motak, rolled up his sleeve, and offered his forearm. "You bastard!"

Motak punched the needle into a vein. "No, Remisk. I'm not. I'm just a businessman, protecting his investment."

He pushed the entire dose into Remisk's arm, then laid the empty syringe in the golden box. Remisk got up and rolled down his sleeve. He turned to leave, but Motak stopped him.

"Oh," he said, reaching into a pocket and producing a silver capsule. He pitched it to Remisk. "Make sure our man on Darring's crew gets this. Make sure he puts it where we have discussed. We want to make sure the sweet girl has a pleasant ride through the Bone Yard."

Remisk left. Motak lingered in the dark, chewing the inside of his left cheek, considering the future. He sighed. He should never have relied on Remisk, on a Human, to do the work. They could never be trusted. He'd never had one pleasant experience with them in all his life. Not as a racer, not as a young adult, and certainly not as a child, when Human pirates had scattered his family and killed his mother. There wasn't one in the bunch worth a damn.

But Remisk . . . could he be trusted to finish the job against Darring? Motak shrugged. It hardly mattered anyway. Whether he did or did not, Remisk's time in the race was coming to a close. *With the dose I gave him*, Motak thought, getting up and leaving the room, *he won't survive the Bone Yard either.*

*   *   *

Hello again, and welcome to another broadcast of GSN Spectrum's continuing coverage of the Murray Cup Race. After a rough start that saw Hypatia Darring warned and reprimanded for her assault of Ykonde Remisk, things have calmed down. Ms. Darring has kept her cool and has fought her way back to contention with a stunning head-to-head struggle around Ellis V against veteran Zogat Guul. Though these two are reported to be the best of friends, no love is lost between them as they make their way through these dangerous courses. But now the most contentious portion of the race is upon us. The Sorrow Sea, or as most of the racers call it, the Bone Yard, looms large in the cockpit window. Can anyone brave the shattered hulls and sharp asteroids that hazard this course? Let's find out . . .

Motak was on her left, Guul on her right, and somewhere behind her, Remisk waited to pounce. It had been like this for a long time, shifting back and forth through broken hulls of previous racers and multi-ton asteroids, some so large that their gravity tugged on her hull as she passed. Her navcomp displayed the Bone Yard in all its glory, and there were many paths to take through the obstacles; some shorter, some longer. This was a timed course, but the lanes were sometimes so narrow as to force racers to poke and prod one another, thus making it one of the deadliest in the race. The broken hulls of the hollow racecraft around her confirmed its danger.

She shifted left and took one of the shorter paths. Doing so would put her closer to the finish line, but the obstacles here were ridiculous in their distribution. She turned left, barreled tightly through a wide hole of a Destroyer's ancient hull. The racer right behind her broke formation and flew down another path. At her speed, Darring could not tell if it had been Remisk or not, but one less bee in her bonnet was okay by her.

Motak was still on her left, however. Guul had broken formation as well and had chosen a longer path, but one less constricted with debris. She could see his little red blip on her navcomp, and several others training in on him from all angles. He was in deep shit, she knew, if any of those other racers worked in silent unison to push him off course. His modified Hornet would have trouble with excessive obstacles, but then that's why he took the longer route. He was no idiot.

Motak turned his 350r sharply and shot above her. Images of Remisk's scorching exhaust flooded her mind, but this time, she ignored her impulse and kept course.

Speed is life.

A Banu racer in its heavily upgraded Avenger slipped in alongside her. There were a few Banu in the race, and Darring could not remember the name of this one, but she remembered the distinct green-and-black striping of its hull. It tried forcing her into the craterous side of the asteroid ahead of them. Darring took her thumb off the

thrust, acting as if she were going to slow and allow the Banu to take position, but at the last moment, she gunned her engine, shifted sharply up so that the belly of her M50 skimmed mere inches from the crater floor, kicking up dust from its ejecta blanket, and blowing it back into the cockpit of the Avenger on her tail. The Banu had to turn sharply to the left, giving advantage once again to Darring.

I can play dirty too, bitches!

Darring laughed into the ear of her crew chief who was warning her to take it slow and not risk getting her hydrogen scoops clogged. He was worried about her engine, which had been refitted after its over-exertion around Green. There was still so much race left, and he was especially concerned with Ellis IX, the gas giant that would place serious pressure on her hull. He didn't want her engine to go down a second time as well. But she was enjoying herself. She was enjoying the Sorrow Sea, the Bone Yard, in all its wondrous danger.

Only Motak annoyed her now. The rest of her competition had fallen behind or had taken different routes. The route ahead of her was still tricky, but it was hers. She commanded it now, and she leaned back in her restraints and let her engine run.

And now Motak fell back, and his blip on her navcomp stopped flashing red in danger. She was free, and the finish line was close.

A warning light suddenly flashed on her cooling monitors. She looked down and saw that her engine's heat dissipation, which would normally be at one to one, had fallen sharply to one to two, and now one to three. She pressed controls, tapped panels, and now other warning lights were flashing.

Something was wrong with her fuel. It was rising in temperature, too fast, too hot, and the cooling system could not dissipate the excess heat fast enough. It was burning her engine, and her hull shifted and sputtered, pressing her forward against her restraints.

She tapped her comm link. "Something's wrong here! Engine reaching critical heat."

"Check your heat release override valve on the —"

She tried doing as her crew chief advised, but before she could move her arm, fire exploded into her cockpit, engulfing her torso and helmet. She screamed, panicked, tried patting the fire out with her gloves. But that did nothing, as the flames grew larger and larger, working their way under her jumpsuit, piercing the protective lining at her neck, and burning her face and shoulders.

"Power plant breach imminent!" screamed the safety system in her ear. *"Power plant breach imminent!"*

Through searing pain, Hypatia Darring reached beneath her cockpit seat, tapped the eject pad, and blew her cockpit window into space. Thrusters beneath her seat erupted, and she tumbled after the cockpit, still strapped into her chair, gasping for air.

Five seconds later, before she lost consciousness, Darring watched her M50 explode into a thousand pieces.

To be continued . . .

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