JUMP POINT

A ROBERTS SPACE INDUSTRIES PUBLICATION   ISSUE 01.02

GREETINGS, CITIZENS!

This month we've got another issue crammed with all the Bengal and other goodies you could ask for — this month's 16-page installment runs over 40 pages, and 30 pages of that is an extensive step-by-step display of the development of the Bengal-class carrier (stats to the right).
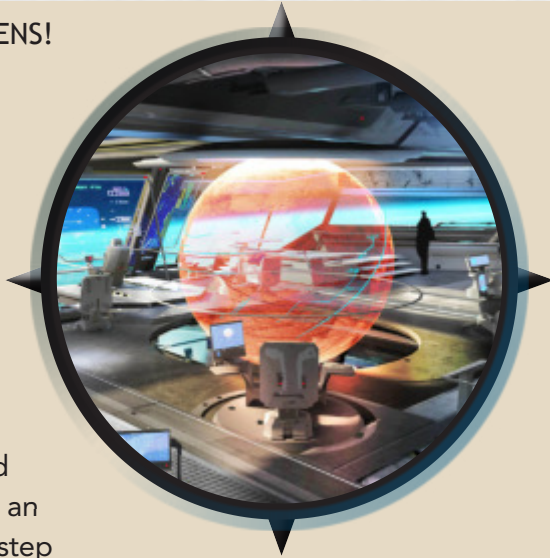
We've also got a behind-the-scenes interview with fellow traveller (and Roberts sibling) Erin, the start of another great story by Dave Haddock, and a new feature — Merchant's Galactic Guide, with the low-down on a new planet, corps, locale or other interesting feature of our brave new world, written specifically for those planning to adventure out into the *Star Citizen* universe. This month, Ben Lesnick introduces us to the Kellog system.

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

David

BENGAL-CLASS CARRIER KEY STATISTICS

Builder: Roberts Space Industries
Length: 1000 meters
Crew (max): 755
Mass (empty): 113,000 tonnes
Focus: Battlegroup fighter and bomber support platform
Range: Unlimited 20+ years

The Bengal-class is the UEE's "tip of the sword." The iconic Bengal is the most powerful warship available to the UEE Navy and its imposing presence has held off raiders and the Vanduul throughout the outer colonies, allowing humanity to spread unchallenged.

Bengals carry multiple squadrons of fighters, bombers and support craft. Their massive armaments and extremely heavy shielding make it nearly impossible for any individual craft to threaten them. Only a combined effort could ever hope to destroy or capture one.

STRUCTURE STATS

Cargo Capacity: 15000 tonnes
Engines: Classified
Modifiers: 10
Max. Class: Antimatter
Main Thrusters: 6 x TR10, 4 x TR8, 4 x TR7
Maneuvering Thrusters: 16 x TR6

ARMAMENT

1 x Behring Turret with 4 x 130m "Ship Buster" Railguns

18 x ASD Ship to Ship Turrets with dual Ion cannons

40 x MaxOx AA Turrets with dual Heavy Duty Laser Cannons

16 x K&W Rolling Space Frame (with 21 missiles each)

4 x Talon 'Sweeper' Mine Dispensers (aft)
    (Ammunition Types: HE, EMP, Web, Nuclear, Anti-Matter)

DEFENSES

14 x Phalanx point defense Laser Gatling

36.4" Icarus Armor Plating

14 x Phoenix-class Shield Generators

6 x HT-2000 Burst Shield Generators (back-up non-sustainable shields) (2 fore, 2 mid, 2 aft)
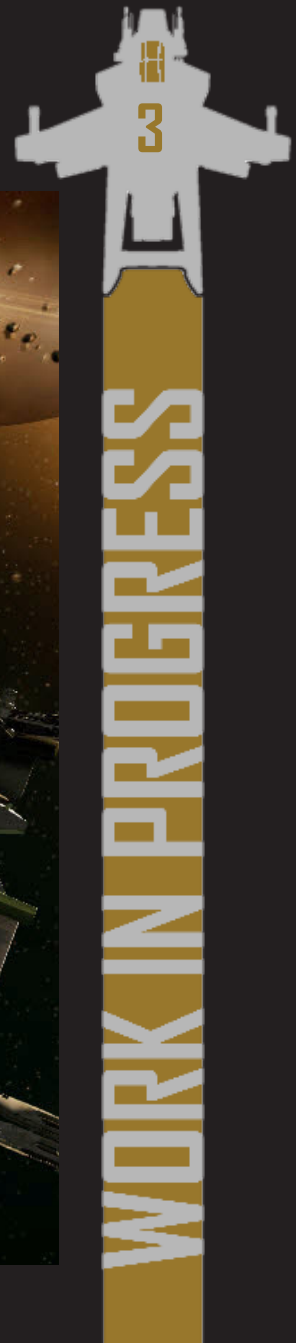
FROM THE COCKPIT

Bengal-class Carrier

It takes more than one artist to create a capital ship as large as *Star Citizen's* Bengal-class carrier. Ryan Church created the original design, and then handed it off to a crew of artists (including Sergio Rosas) at CGBot, who converted the original conception into its current incarnation.

This month's Work In Progress spotlights the development of this massive carrier, along with commentary from Ryan and Sergio. Enjoy!
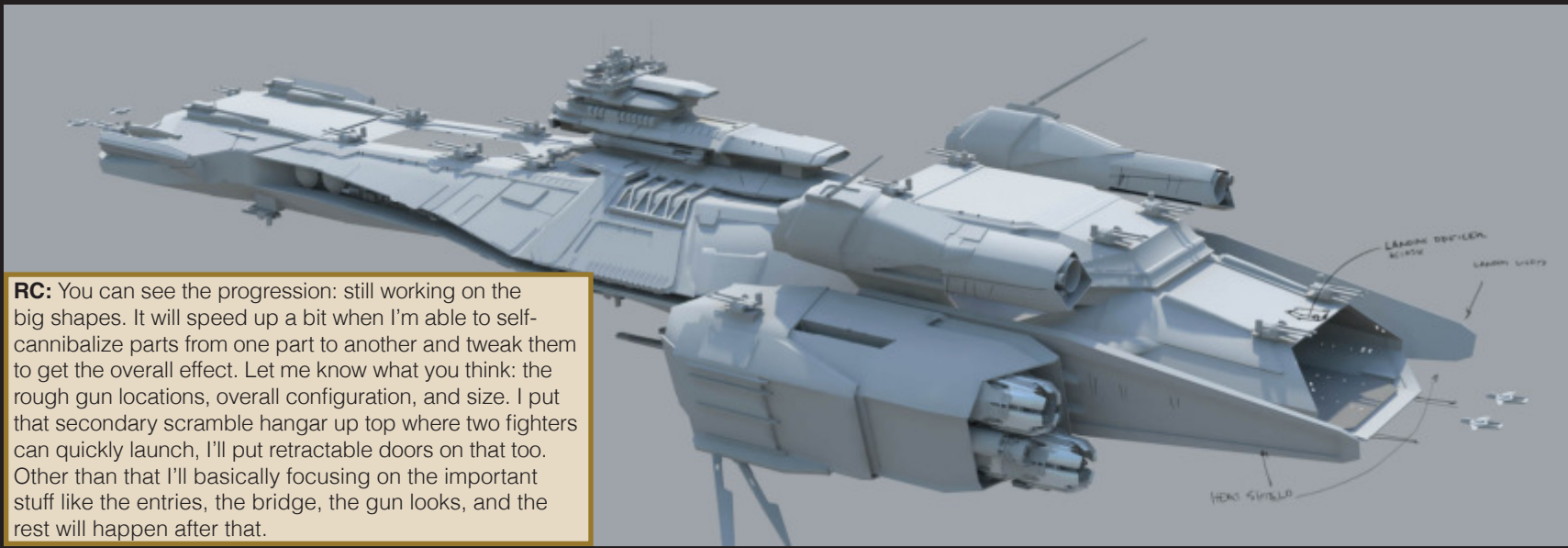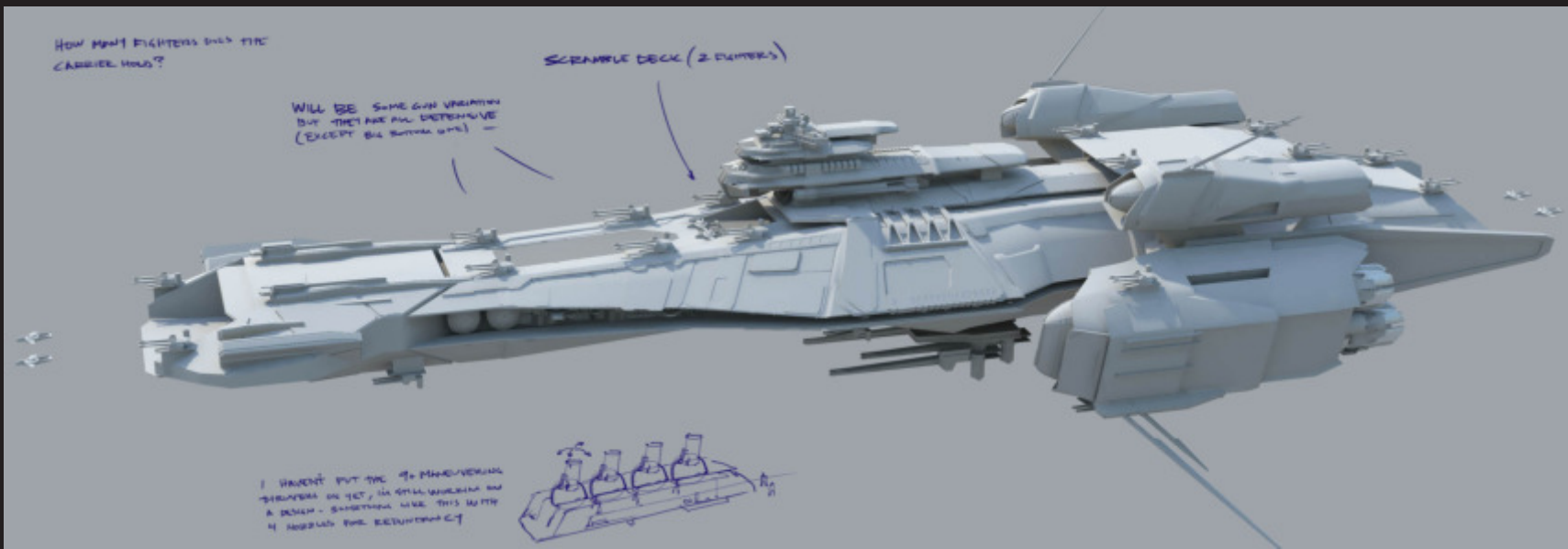
CARRIER : 5 HOURS

GUNS

DOORS

COOL INTAKE
RAMPS/SHROUDS

BRIDGE

GUNS

VERTICAL MISSILE
LAUNCHERS!

GUNS

BIG DOORS CAN CLOSE

COOL SHROUDED THRUSTERS

4
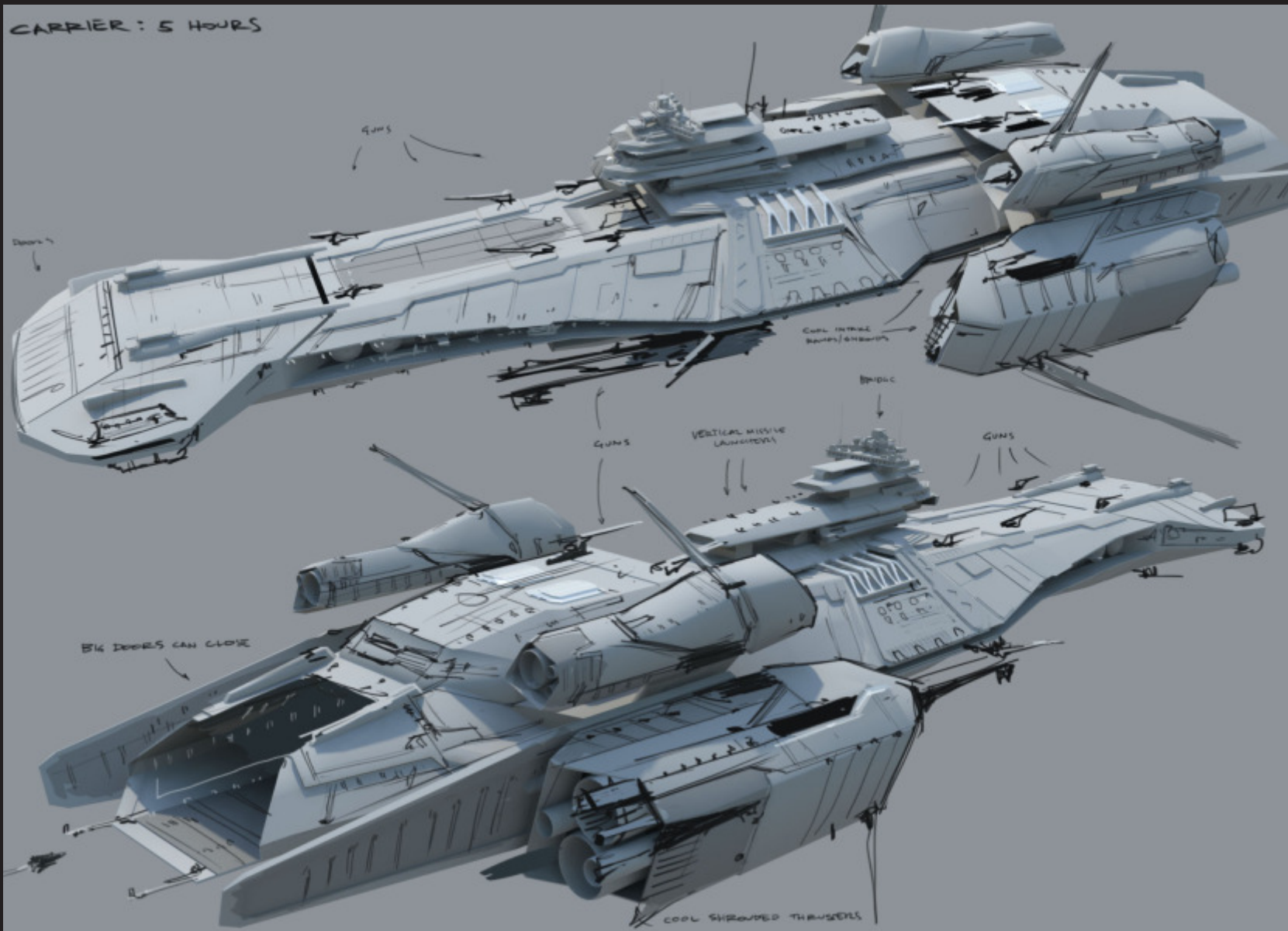
We've included some of Ryan's comments (and a few responses from Chris Roberts, in red) to help describe the development process for the Bengal. These aren't all the pics and discussion, but what's here gives you a good idea of how they got it done.

RC: You can see the render of the model I'm working on and then I've sketched over it to indicate what I'm thinking in terms of gun placement, large details, etc. This is of course super rough but really early so let me know if this is the direction you'd like to go, big shapes only. I'll get to the small details that cover the entire ship — doors, panels, hatches, ribs, etc. — after the large ones are approved and refined.

Handwritten notes (top image):
- HOW MANY FIGHTERS DOES THE CARRIER HOLD?
- WILL BE SOME GUN VARIATION BUT THEY ARE ALL DEFENSIVE (EXCEPT BIG BOTTOM GUN) —
- SCRAMBLE DECK (2 FIGHTERS)
- I HAVENT PUT THE 90+ MANEUVERING THRUSTERS ON YET, I'M STILL WORKING ON A DESIGN – SOMETHING LIKE THIS WITH 4 NODULES FOR REDUNDANCY

Handwritten notes (bottom image):
- LANDING DEFLECTOR
- LANDING LIGHTS
- HEAT SHIELD

RC: You can see the progression: still working on the big shapes. It will speed up a bit when I'm able to self-cannibalize parts from one part to another and tweak them to get the overall effect. Let me know what you think: the rough gun locations, overall configuration, and size. I put that secondary scramble hangar up top where two fighters can quickly launch, I'll put retractable doors on that too. Other than that I'll basically focusing on the important stuff like the entries, the bridge, the gun looks, and the rest will happen after that.

JP: What were your inspirations while designing the Bengal carrier?

RC: As always, my first 'inspiration' comes from a discussion with Chris about the basics: the function, crew complement, armament, etc. After we get all of that out of the way, there's usually a discussion of the fun part: the intangibles. How bad ass or utilitarian, how iconic, how nimble, how imposing, etc. One of the things that's important is that the design should look like what it is, too. In that sense we are playing into motifs and silhouettes and trying to touch a chord with the player and viewer. In other words, someone seeing it for the first time should think "Damn, that's a cool looking spacefaring aircraft carrier!" So I try to incorporate some of the visual cues that will reach deep down inside the viewer and elicit that emotional response and, hopefully, attachment.

CONTROL THRUSTERS (AT CENTER OF GRAVITY AND FARTHEST FROM)

SHIP TO SHIP GUNS

AAA GUNS
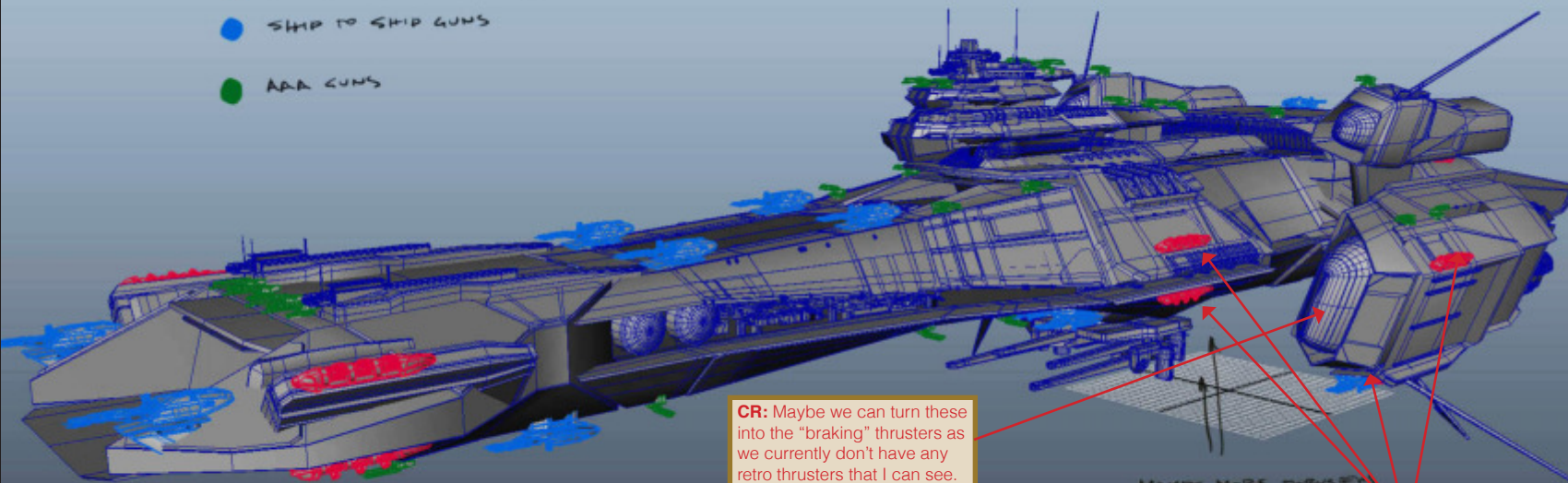
CR: Maybe we can turn these into the "braking" thrusters as we currently don't have any retro thrusters that I can see.

CR: I think we will be ok without.

MAYBE MORE THRUSTERS AT CENTER OF GRAVITY?

CR: I don't think you need these here. The thruster set on the back combined with the one on the front would probably do the trick. I assume they are the same size thrusters as the ones on the front — they just look smaller because of the perspective.
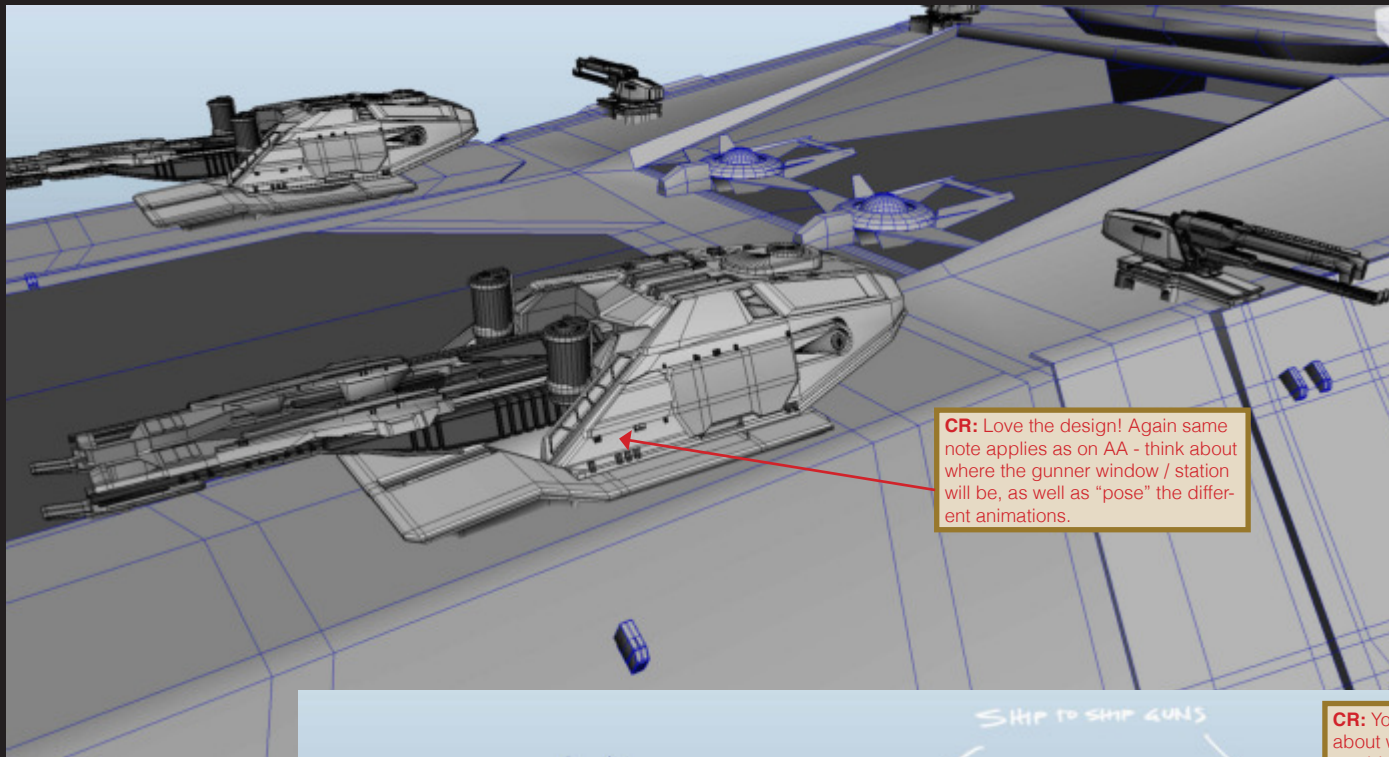
RC: Wide shots of the ship with the color coded locations called out.
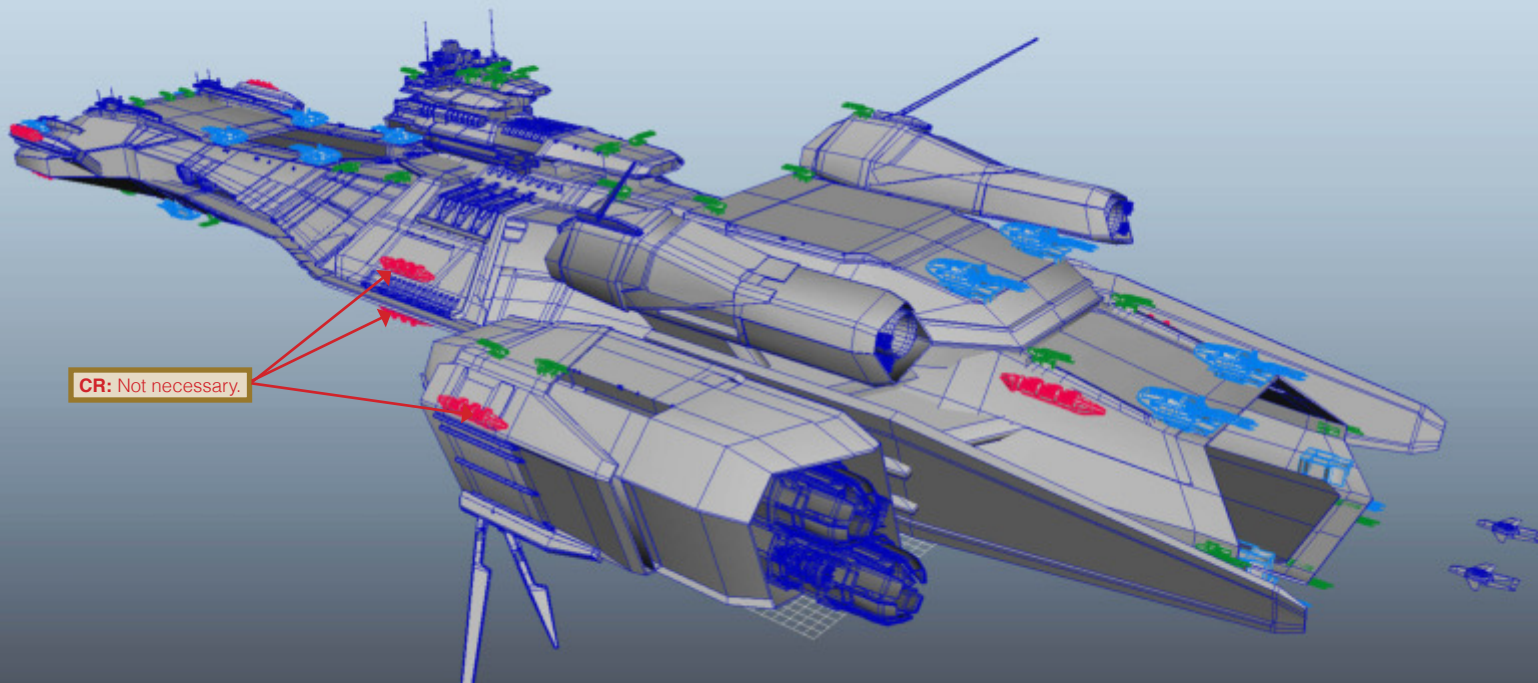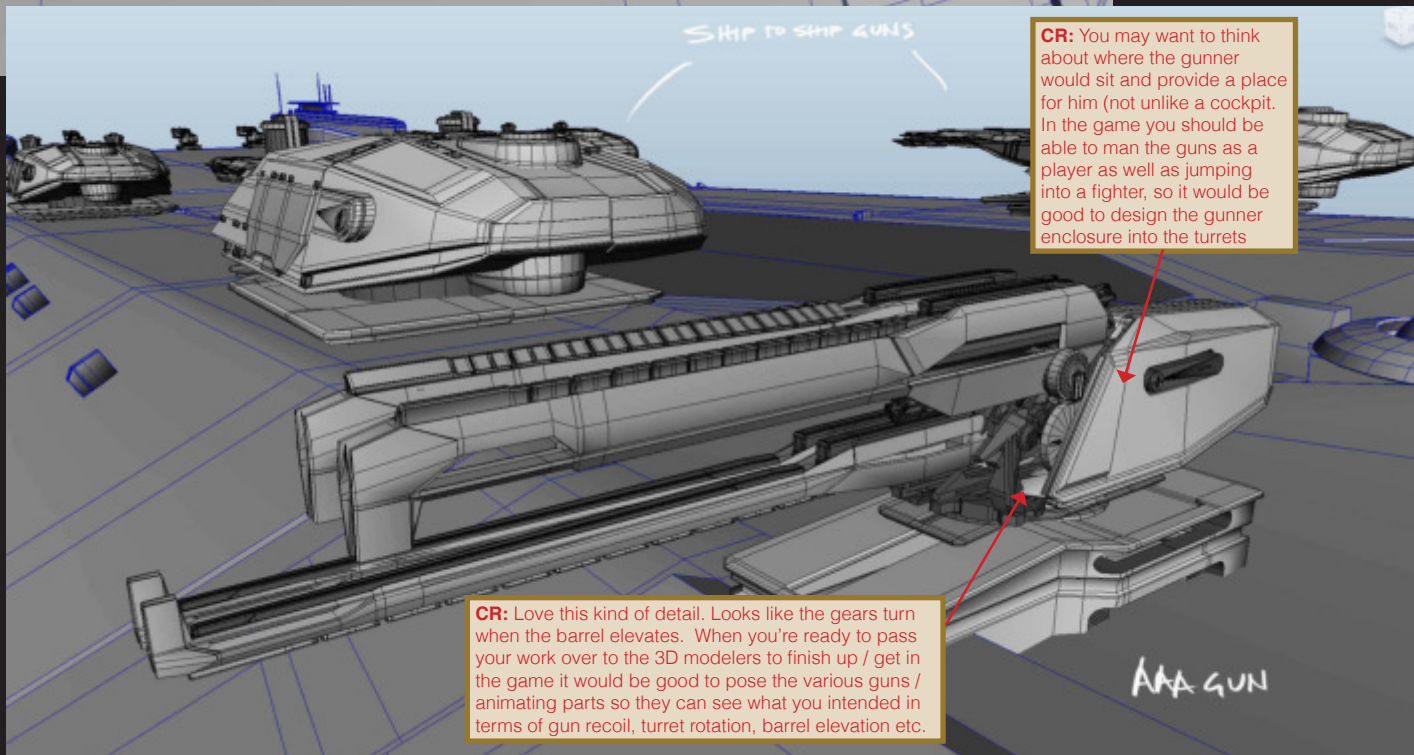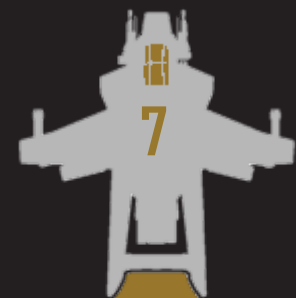
CR: Not necessary.

WORK IN PROGRESS

CR: Love the design! Again same note applies as on AA - think about where the gunner window / station will be, as well as "pose" the different animations.

RC: I would consider the level of detail on the guns as 'almost finished,' the maneuvering thrusters as '70% finished and ready for notes'.

SHIP TO SHIP GUNS

CR: You may want to think about where the gunner would sit and provide a place for him (not unlike a cockpit. In the game you should be able to man the guns as a player as well as jumping into a fighter, so it would be good to design the gunner enclosure into the turrets
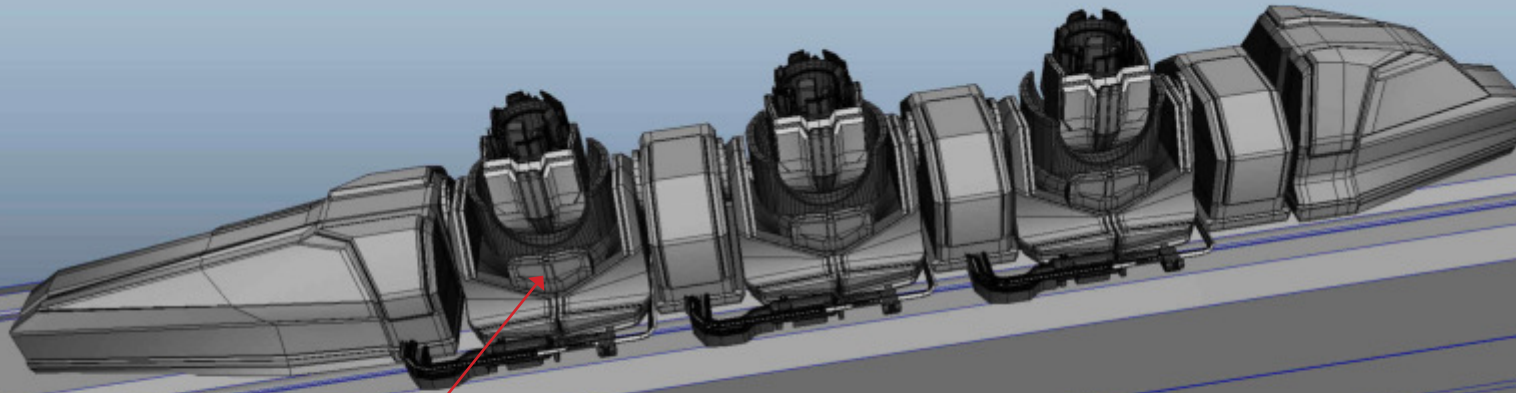
CR: Love this kind of detail. Looks like the gears turn when the barrel elevates. When you're ready to pass your work over to the 3D modelers to finish up / get in the game it would be good to pose the various guns / animating parts so they can see what you intended in terms of gun recoil, turret rotation, barrel elevation etc.

AAA GUN

MANEUVERING THRUSTER UNIT

CR: Looks good to me! I assume that these can gimbal up and down and the range of motion is at least 90 degrees on the horizontal axis.
Perhaps the nozzle flaps can open up depending on the amount of thrust?

CR: Per the other note, if these can gimbal enough to point straight up (so about +45 degrees) and straight out (-45 degrees) then these thrusters would cover their area of responsibility. Combined with thrusters on the other quadrants we would cover all the needs of the ship.

These are all things I think about in the first 5 or 10 minutes — as I scribble some silhouettes down in my sketchbook. Then I take those first rough ideas and immediately get them into 3D — block them out and really think about where things go in terms of 'packaging' — where does the flight deck go, where does the command bridge go in relation to the flight deck for best visibility and flight direction, where should the engines go so they're out of the way and don't fry part of the structure when they go into full thrust, and so forth. Bit by bit, the pieces start to accrete and I send Chris what I think are my top four or seven ideas, each with their own functional pros and cons but each with their own aesthetic as well.

Once the overall silhouette is blocked in, there comes the really fun part for me, what I call the 'intermediate engineering design' stage. This is when the overall shape is blocked out, it's looking cool, then I go in and start building things and getting the camera in the space — 'sitting' in where the captain's chair would be and asking myself what I would really need if I were sitting there directing combat. Do I want to bias the design for top or bottom visual situational awareness? Where would the best place be on the flight deck for a large elevator that services multiple decks but stays clear of the landing and takeoff axis? In other words, this is the part where the compromises and choices are made, where the design starts talking back to me and suggesting cool ideas for functionality and aesthetics.

In fact one of the most challenging parts of designing these ships is keeping them 'realistic' and firmly grounded in the universe Chris is creating.

RC: There is additional detail all over but you can see that I concentrated on finishing up the control thrusters, added the missile pods, and spent time on the bridge(s).

I didn't get to the Phalanx style close-in gun defense, that's still on the list — but the other guns/missiles are there and you can see their placement.

You can see in some of the images I've put the full res Hornet model in there for comparison and detail check.

The detailing rate accelerates as I'm able to migrate modified finished parts out. In the renders overall it's looking a little 'low relief' so I'll be chunking some parts out a bit I think to break up the forms more, just here and there.

So I'm planning on continuing out and starting detailing the openings to the interior, more work on the bridge, more windows, get the Phalanx guns in there, etc. …
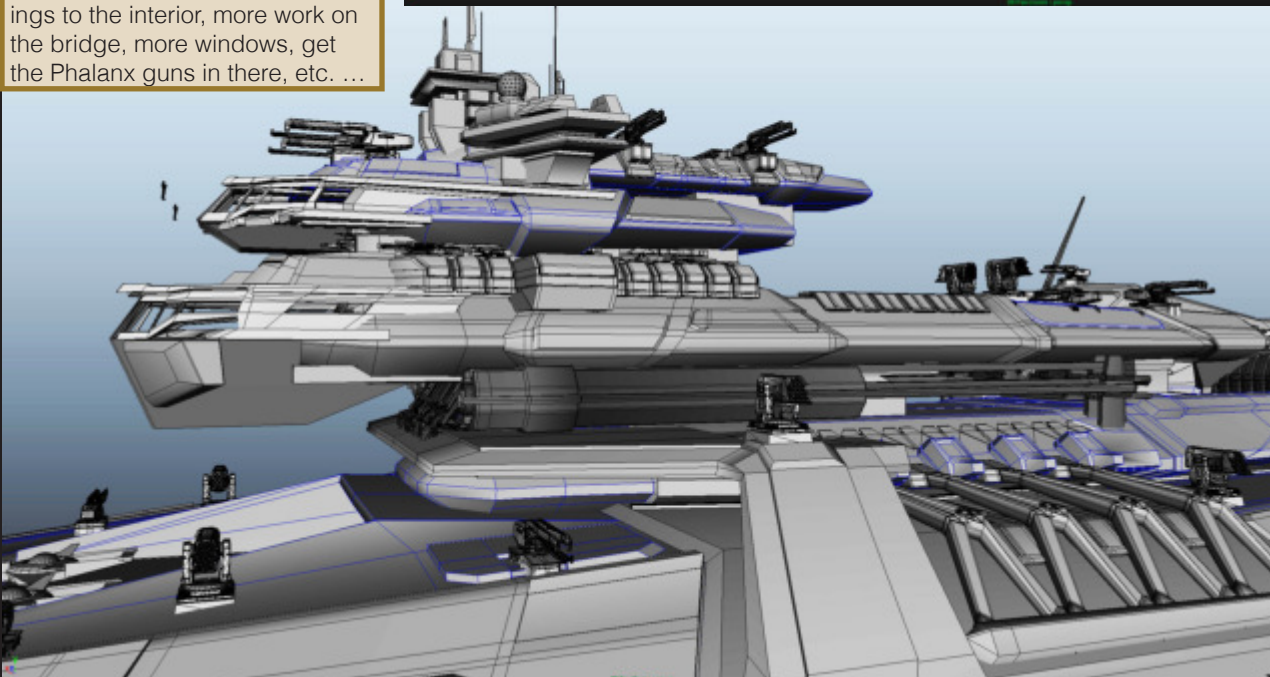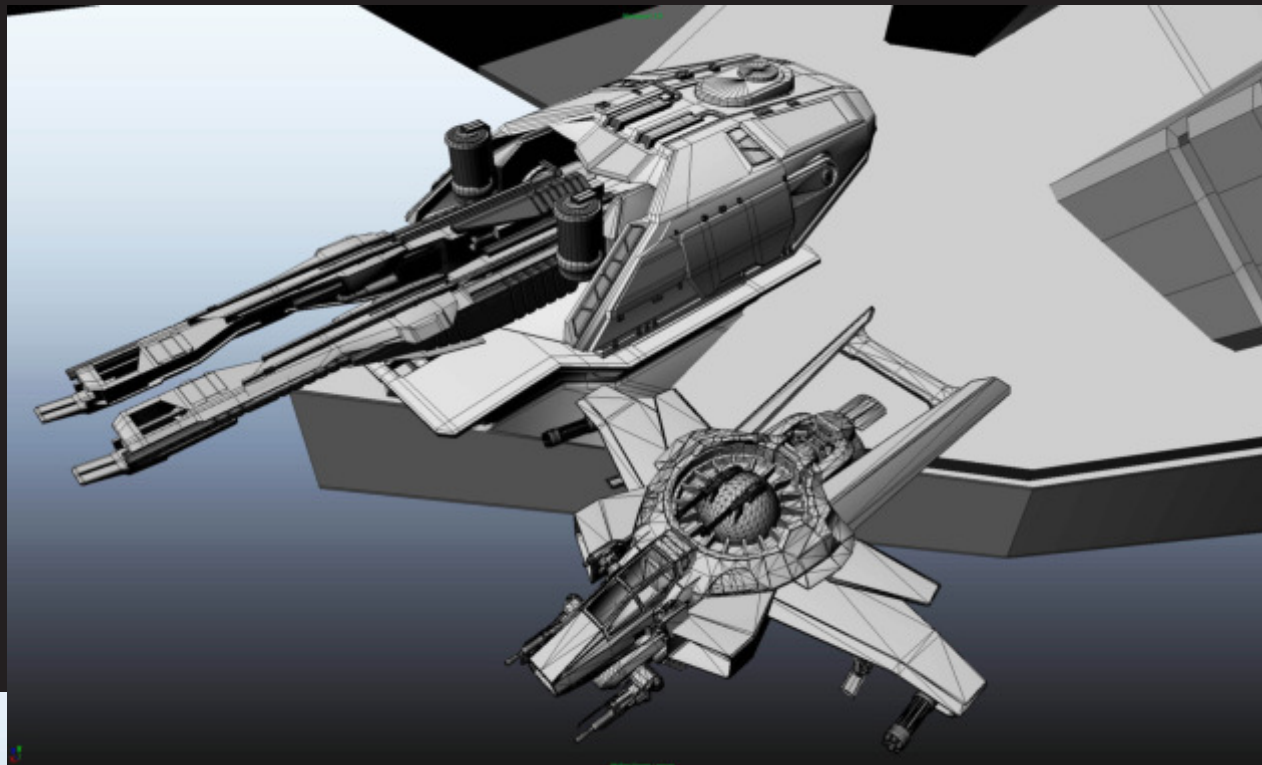
CR: For the hangar (as opposed to the flight deck) I think you want to make it between the scramble deck and the main flight deck — so maybe you would need / want to lower that floor a little (give slightly less headroom to the main flight deck). It would make sense being in the middle, as that way you could deploy ships up or down in about the same time. I would assume there would be fairly large lifts to do this (similar to what is used on a modern day carrier). The lift bases would probably stay on their respective flight decks (otherwise there would be a hole!) until some new ships are needed for launch, etc.
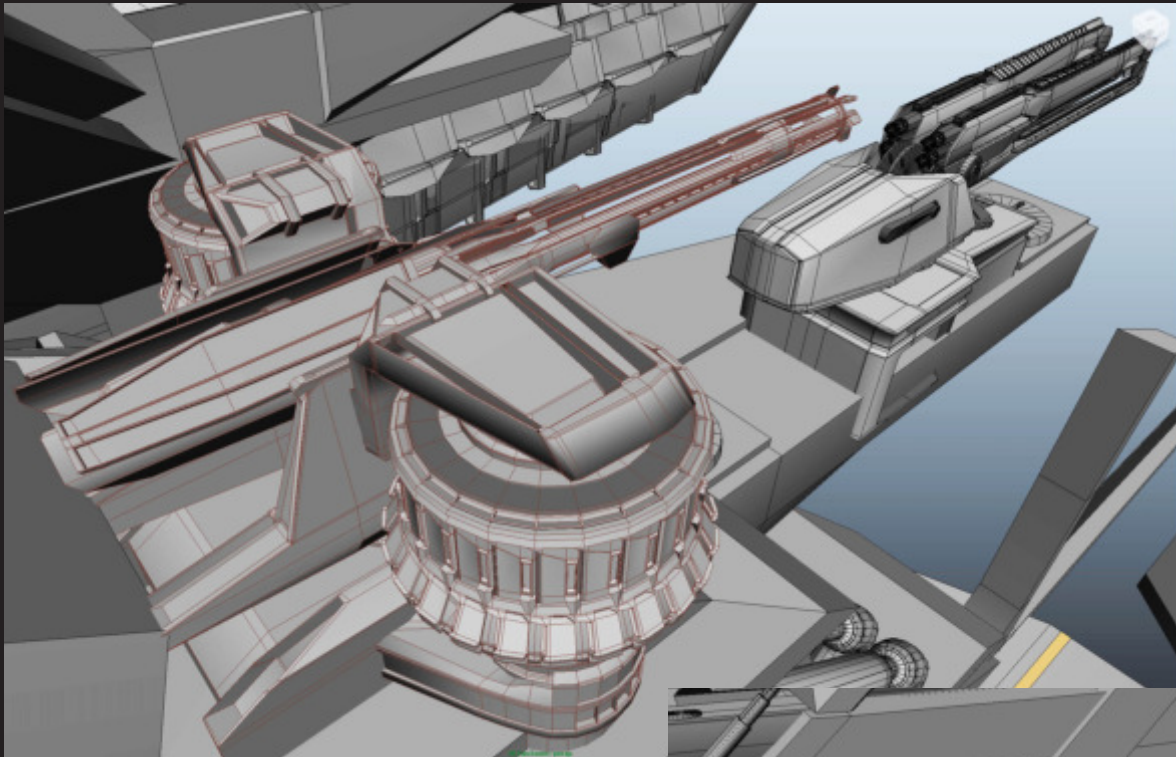
RC: Otherwise I may be getting to the point where I start doing some illustration work in the next few days. Adding geometrical detail in 3D is very time-effective, but it's up to you when you need me to shift and start doing the 2D work which is good 'cause it gets into the small and repetitive details and panels but it also kind of freezes the 'big shape design' unless we want to go back into the 3D … and then things don't match up. Something to think about, but the model is still small enough that I can continue to detail it out in 3D for a while, with several more layers of overall detail.

RC: Chris- here's another day of detailing: concentrating mostly on the aft and area around the landing deck and engines. The idea is that there is some structure that extends when the door opens, with lighting and the 'meatball' and all the landing aids and stuff with small 'control towers' flanking. Haven't gotten to the moving engine louvers we talked about last time yet.

Also redid the doors, less agricultural/Mayan looking. Added details to the Phalanx gun per last notes. Continuing to arrange the interior.

For the next time I'll work on the bottom huge gun, the interior of the landing bay front and back, moving parts around the engine and general detailing concentrating on more for the bridge and other important areas.

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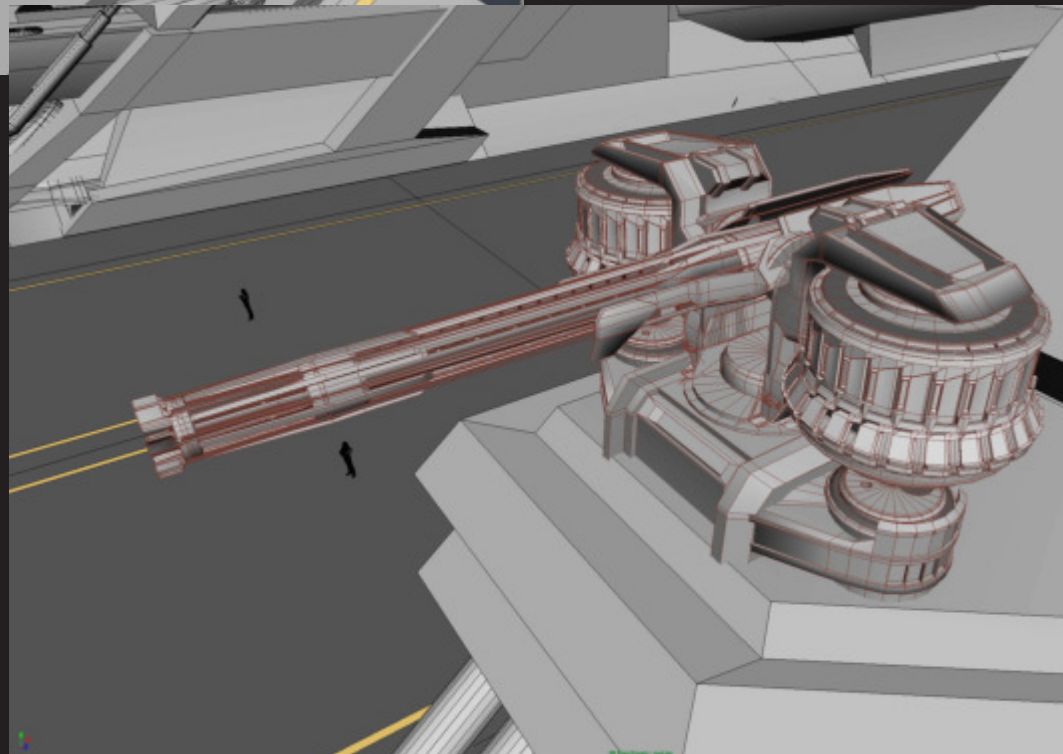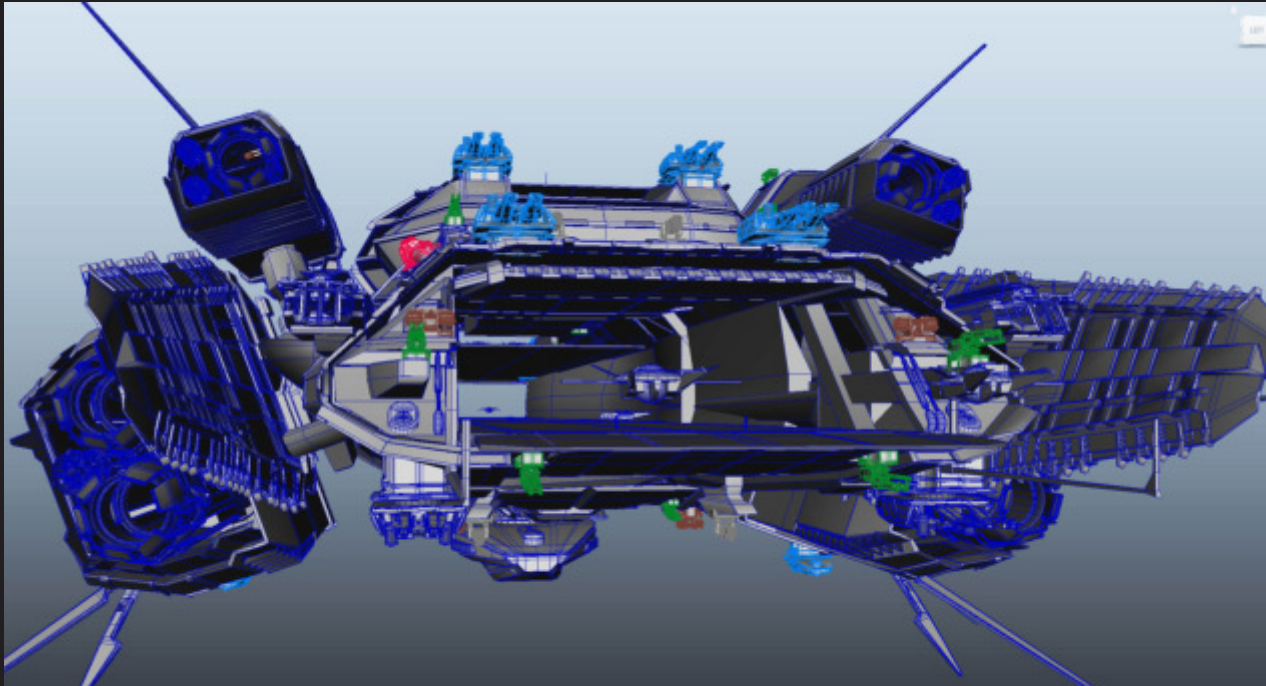
RC: I think this exterior is looking pretty done, maybe ready to get on to the 2D orthos with all the window, panel, marking, etc. detail. Let me know if I've missed anything.

Detailed out the main gun
Revised 'heat shield/radiators' near engines
Added detail overall concentrating on underside, bridge, front and back door areas.

Let me know if there's anything else you'd like to see before I move on to the renderings: as I said before, I think those should be orthos: straight side and top views with no lighting and with all true dimensions. If you want in-game looking illustrations later, we can project all the details right on to the geo and everything will line up accurately.

WORK IN PROGRESS

without engine

CARRIER
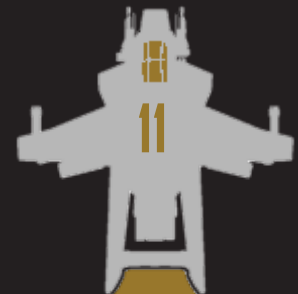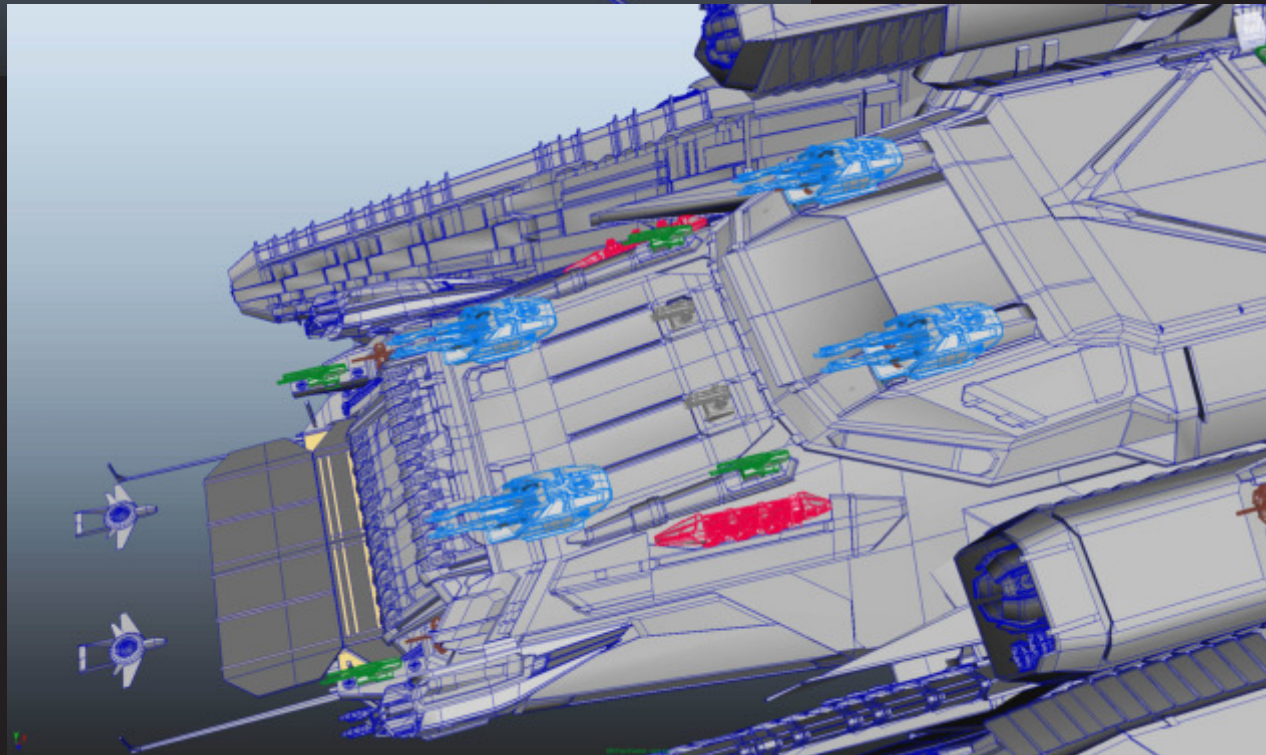
RC: Attached is a detailed side view (with and without engine). I've gotten as far as the main panel lines and some color and dirt and such; let me know if there are any special numbers or names, I will just riff off of t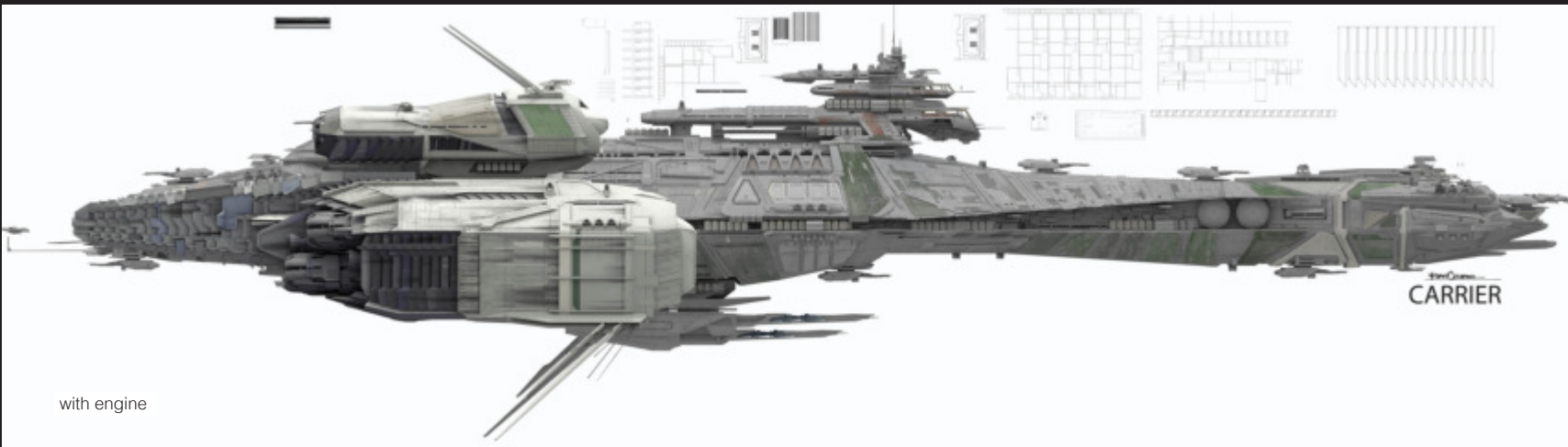he US Navy/aircraft carrier look other than that, very monochromatic, dirty and battle scarred with different colored panels, painted and unpainted sections, graphics, etc. … I think this image is about 70% done, assuming there aren't any huge changes. Then the plan is to do the engine, some of the top and bottom parts that this view doesn't illustrate, etc.

with engine

CARRIER

JP: The carrier is huge! How does it compare to other ships you've created?

RC: I've worked on a lot of ships for movies — *Avatar's Valkyrie*, *Star Trek's Enterprise* redesign, lots of stuff from the *Star Wars* prequels, and the carrier is certainly one of the largest! It's also one of the most realistically thought-out designs, in that it really has to work in the game rather than simply appear in a few shots in a movie. That's one of the parts I really love about designing for the *Star Citizen* universe: players are going to be spending a lot of time in these ships, and they have to look great and be easy and effective to use. In a movie ship there's the exterior design, which is cool, and then there's usually an interior that has to kind of maybe match up and which usually gets scaled up and down based on the set size the production can afford to build. Any discontinuities are covered up by clever editing! Not so with the ships of the *Star Citizen* universe — I know that if you're on the bridge during a battle, the location of the escape pods or the elevator to the flight deck are *not* minor details!

ESCAPE POD DETAILS

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CARRIER - BRIDGE DETAILS

JP: How does building such a large ship compare to developing your smaller designs, like the Constellation?

RC: There's a lot more work! Because of the level of detail per square inch that Chris is putting into the universe, the amount of work is much higher for a ship of the carrier's size. For instance, because of the scale, some of the big exterior guns took almost as much time to work out as some of the smaller ships. There are many rooms and interior spaces, most of them interlinked and in relation to all the other rooms and equipment.

RC: I'm calling them done but let me know if you think anything more is needed with the orthos or rough details.

I have all the stuff on layers — panel lines, colors, etc. — if anybody needs 'em.

CR: Looks AWESOME!

Very happy. I've passed them onto the 3D modeling team – can't wait to fly around it!

WORK IN PROGRESS
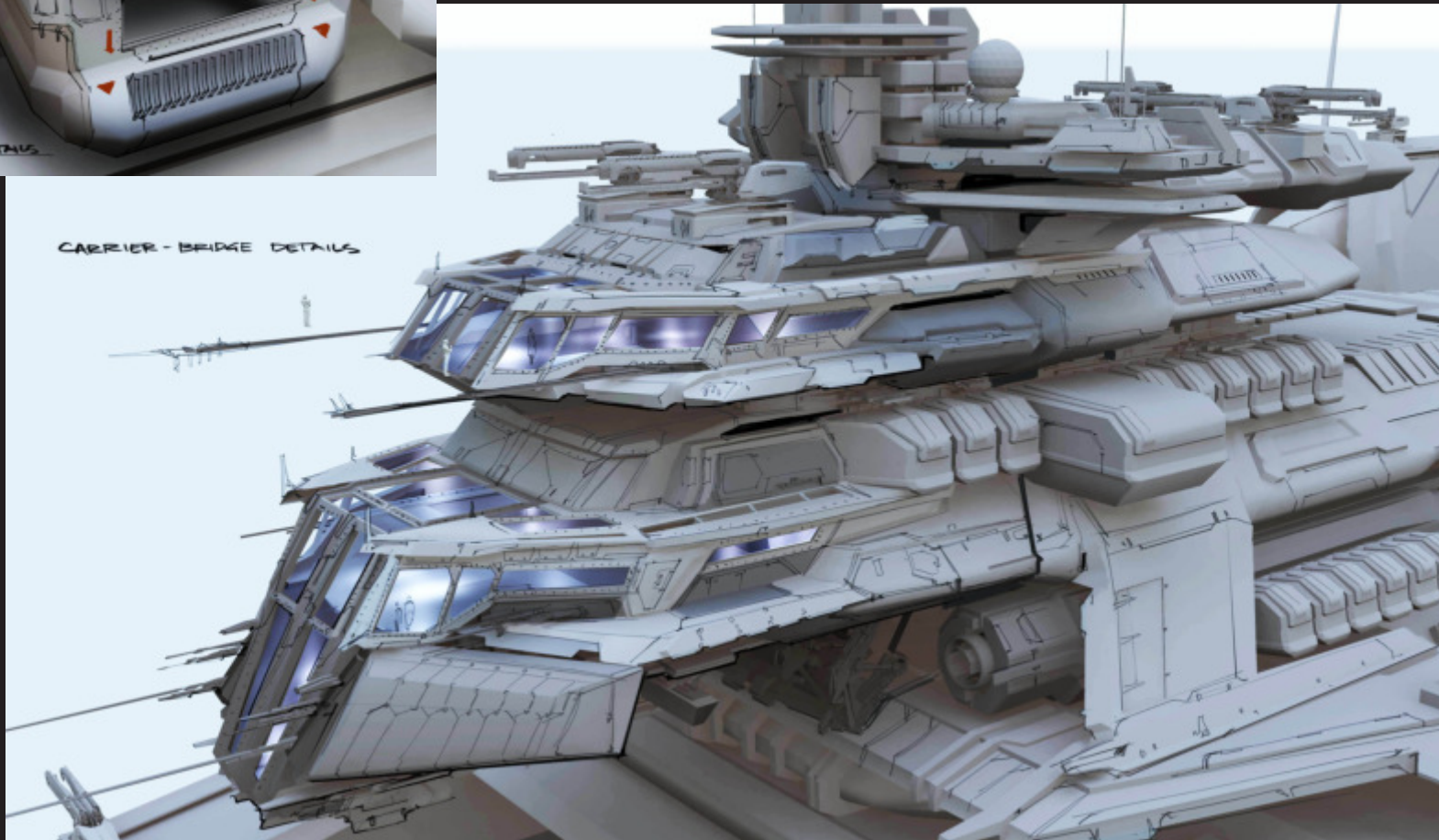
JP: *How do you go about developing the interiors of the ship? What comes first, the hull or the contents?*

RC: There's definitely a give and take between the interior and exterior, but the exterior is usually what I will put in front of Chris for early direction approval. Wherever the interior and exterior meet — in the case of the carrier this is mainly the bridge and flight deck entry and exit — those are areas that I try to tackle first and take priority over where I put some less important area like the mess hall.

JP: *How much of the Bengal's internals are designed? Is there more than we saw in the trailer?*

RC: A lot of the interior is designed; I'll be interested to see how much of it gets put into the game and is accessible by players. There are mess halls, engine rooms, several subdecks and so forth, with lots of hallways and elevators to connect it all. I love checking out old historical planes and ships — the USS *Midway* is an aircraft carrier turned museum in San Diego I've been visiting for years, and I made another trip down there specifically for inspiration for the Bengal Class Carrier. It's amazing to walk the decks and see how engineers have solved a thousand issues, how different spaces serve multiple functions, how intrusive watertight doors and hatches are, how huge the hangars are, and how every nook and cranny is used for storage or some obscure mechanical device. All this inspires me when blocking out a ship and looking for the little (and big) things that add authenticity and functionality.

RC: Attached is an illustration for the interior hangar deck, in the middle looking towards the front.
Going for that military look, with grays and greens. In this image you can see that the zones are subtly color coded with lighting — we are in the middle elevator hub with default spotlighting, but to the left is the launch area that has more light and is cooler in color. On the upper left you can peek in to the hangar deck and it has red lighting. Might be something to consider — it adds interest and helps orient you and it keeps it from starting to feel all the same.

RC: This room is about 35 feet up in the center of the hangar with the elevators, in between the landing and launching areas. It's just blocked in so it looks pretty basic, but enough to get notes from. So there's a wall of windows/doors overlooking the hangar and three other walls, each with a different doorway/hallway shape. As you enter to the right is a raised platform with some work terminals facing out.
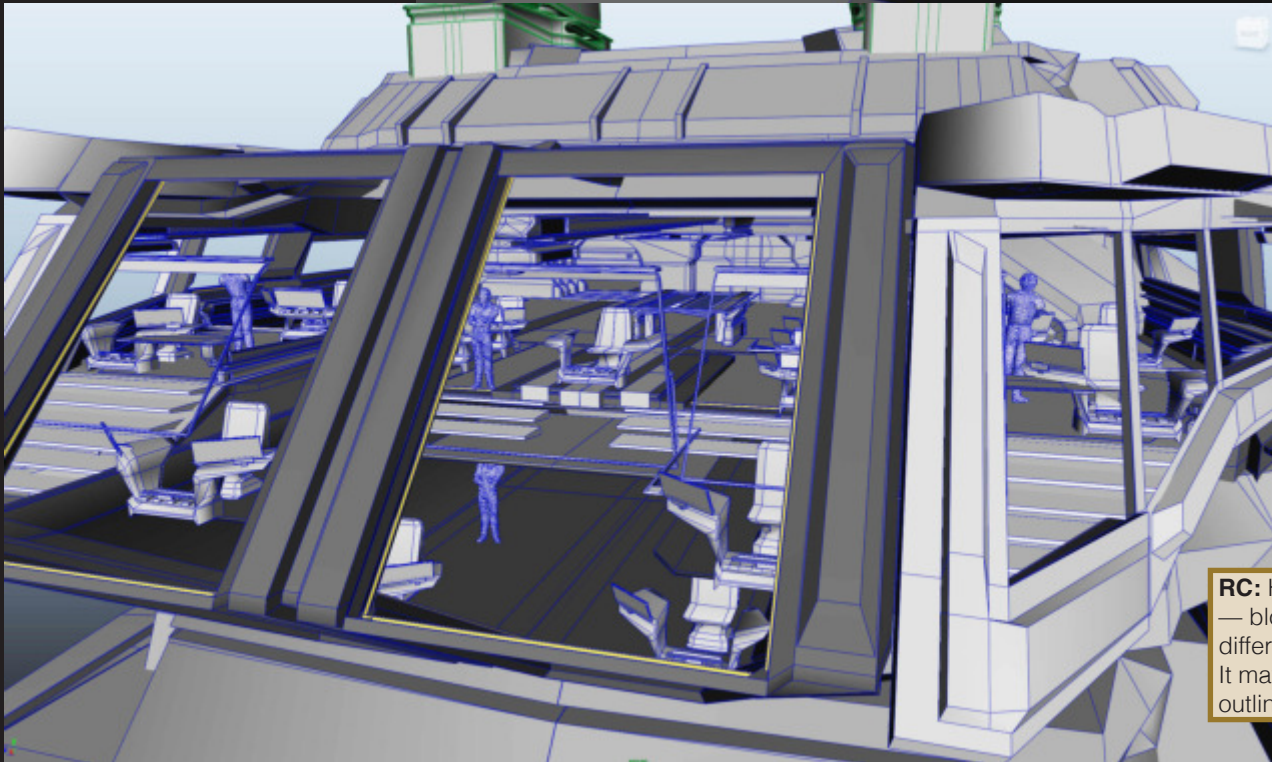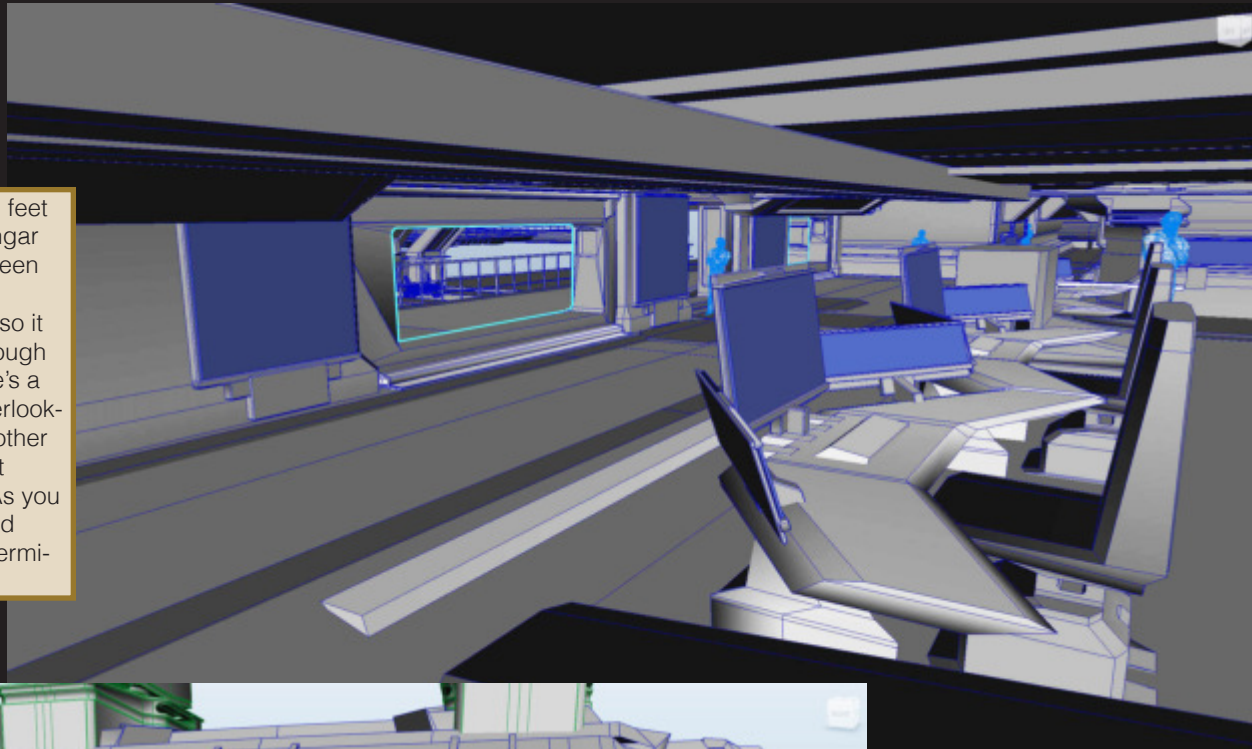
RC: Here is the 'overlook room' — blocking stuff out, trying different hallway shapes, etc. It may be hard to read so I've outlined the windows.
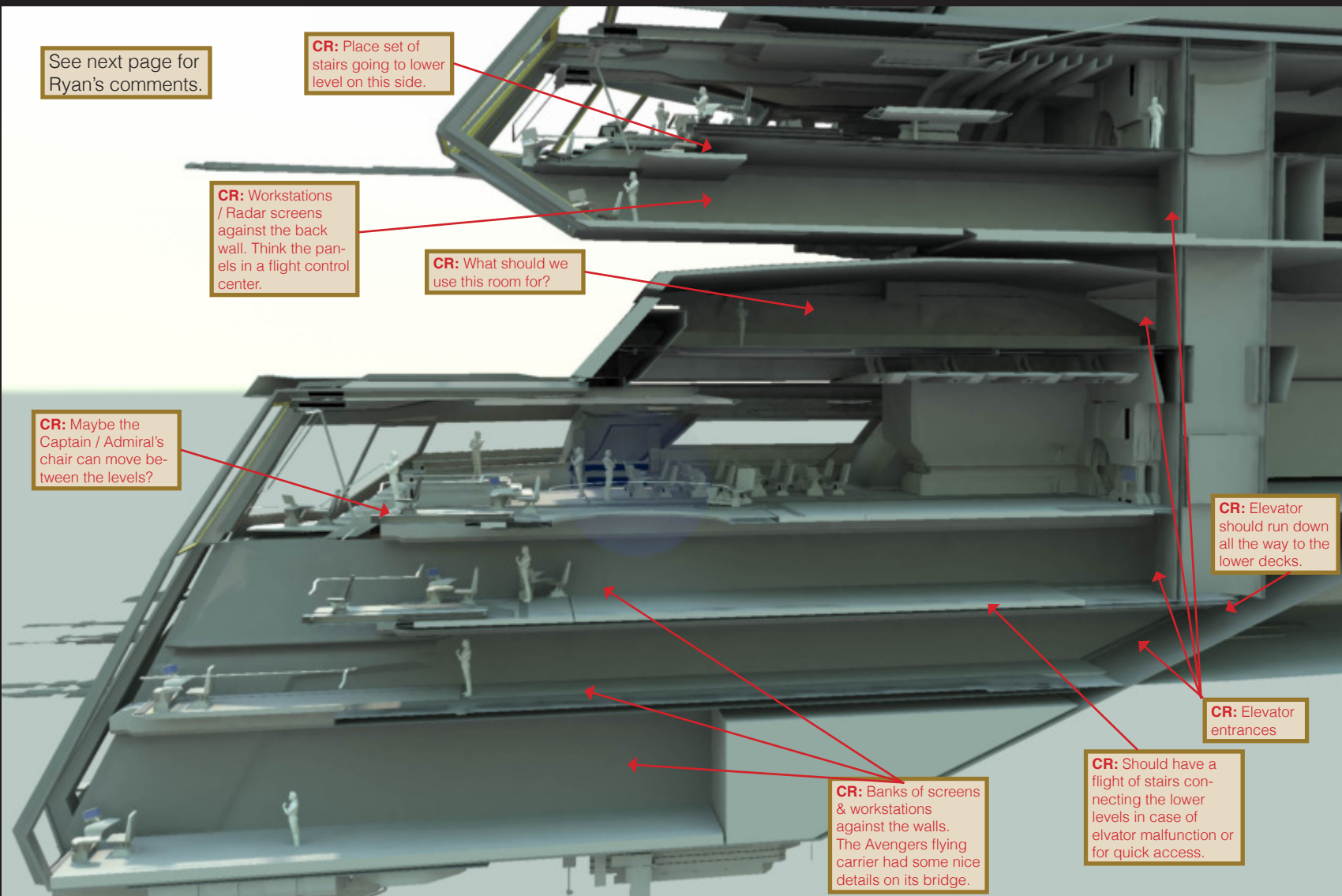
WORK IN PROGRESS

CR: Place set of stairs going to lower level on this side.

CR: Workstations / Radar screens against the back wall. Think the panels in a flight control center.

CR: What should we use this room for?

CR: Maybe the Captain / Admiral's chair can move between the levels?

CR: Elevator should run down all the way to the lower decks.

CR: Elevator entrances

CR: Should have a flight of stairs connecting the lower levels in case of elvator malfunction or for quick access.

CR: Banks of screens & workstations against the walls. The Avengers flying carrier had some nice details on its bridge.

JP: To what degree do you take into account future gameplay when building a ship like the Bengal? Did you know about boarding combat when building the hangar and decks?

RC: I knew in general what the gameplay requirements were and where we needed to be with that. But the very cool thing about these ships and this world is that to me gameplay and reality are the same. The way I approach it is to try to de-sign something that's as real as possible — from realistic hull thicknesses based on flight direction and likely engagement angles, to the number of toilets and beds per ship, that the airlocks always work and have some redundancy, and stuff like docking collars and door control panel design. In that way the design is ready for whatever realistic gameplay, physics, AI or simulation fidelity it is called on to handle.
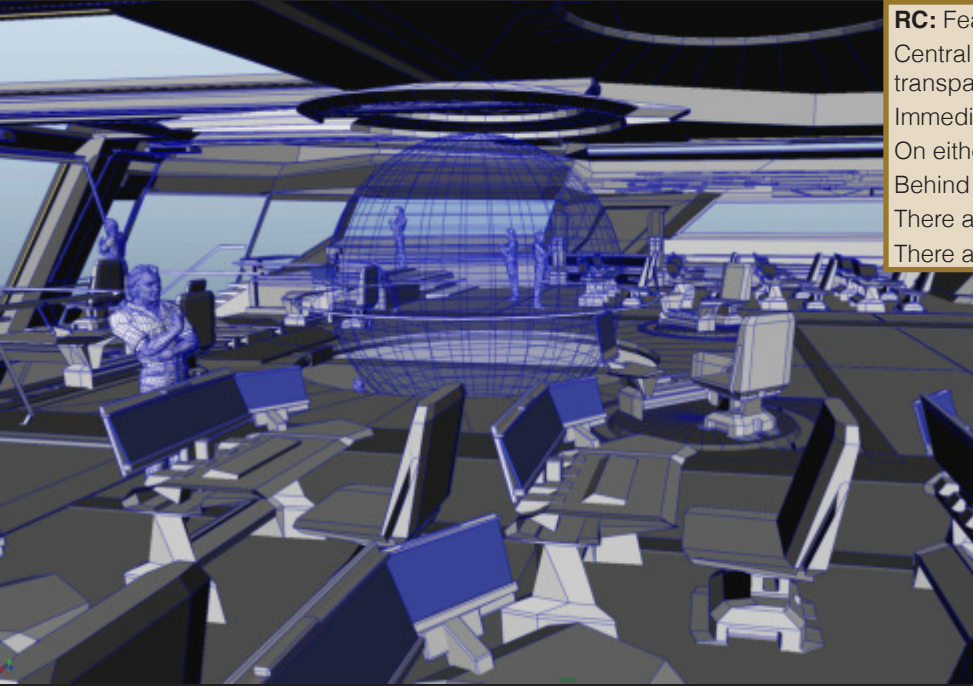
RC: Features:

Central captain's chair cantilevered out over windows and large transparent display.

Immediately behind the captain's chair is a big hologram table.

On either side of the captain immediately are six chairs with displays.

Behind are hallways leading out, one on each side.

There are a couple of large transparent displays facing forward.

There are some split level stairs out to forward stations.
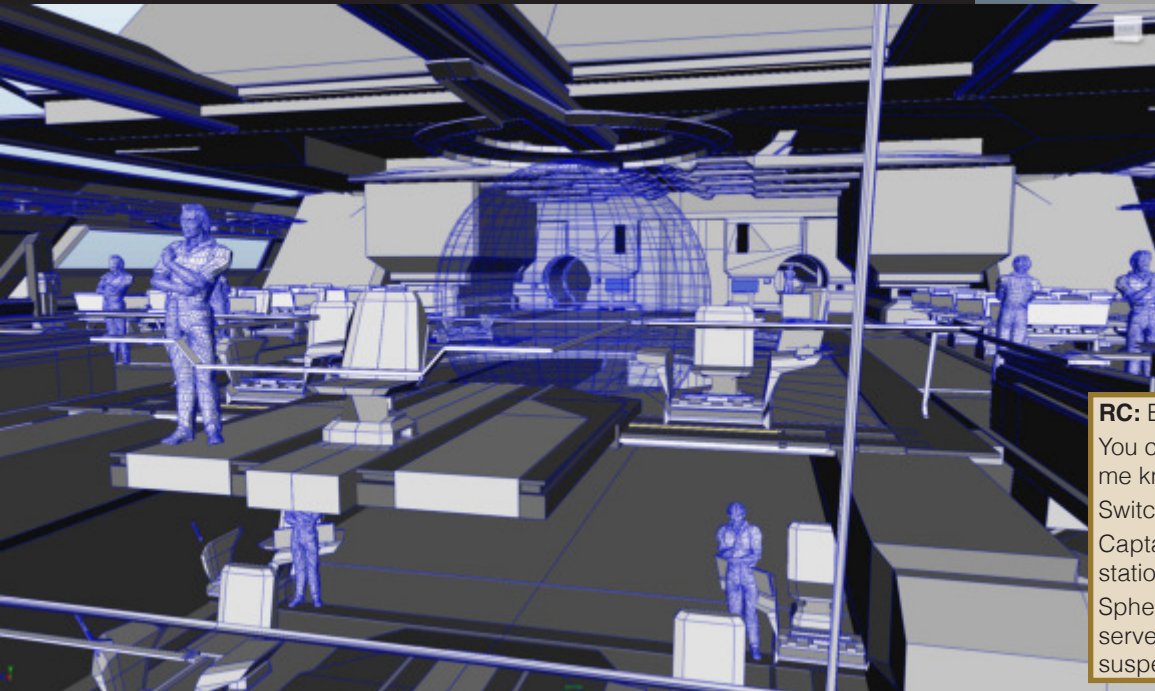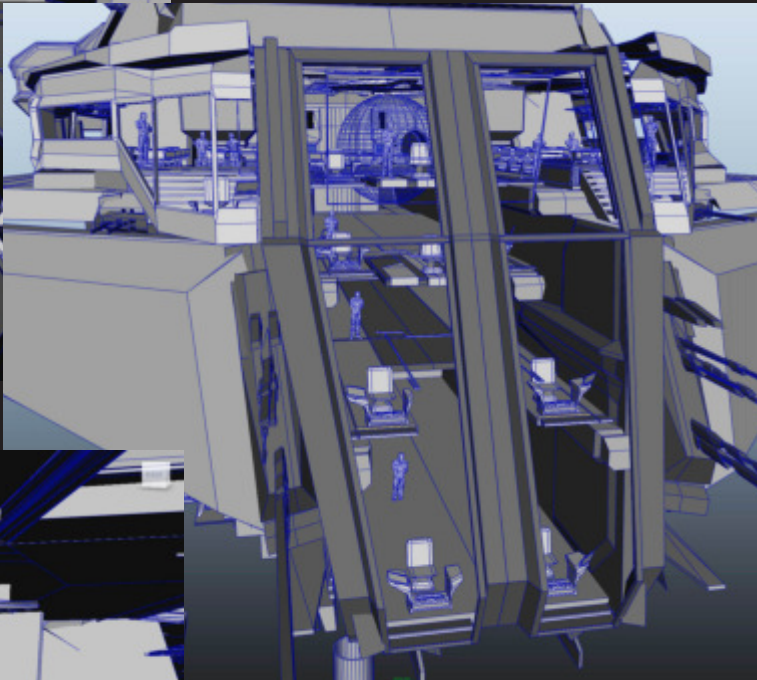
RC: Elevator in center of rear wall, connects bridge to C&C

You can switch the Bridge and C&C locations no prob, let me know if there is any missing functionality or anything.

Switched to the smaller doors, snug for two passing.

Captain's chair cantilevered out over vertical window with stations looking out.

Spherical hologram projection right in back of captain, serves as secondary display behind large HUD panes suspended in front of windows

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WORK IN PROGRESS

ROOM 1A

ROOM 1B

GUMMERY ROOM ?

THIS COULD BE AN (1C?)
'ALL ESCAPE POD' ROOM
(THERE ARE ESCAPE PODS ON THE EXTERIOR)

ROOM 2A

" 2B

2C

" 2D

NEW HALLWAY

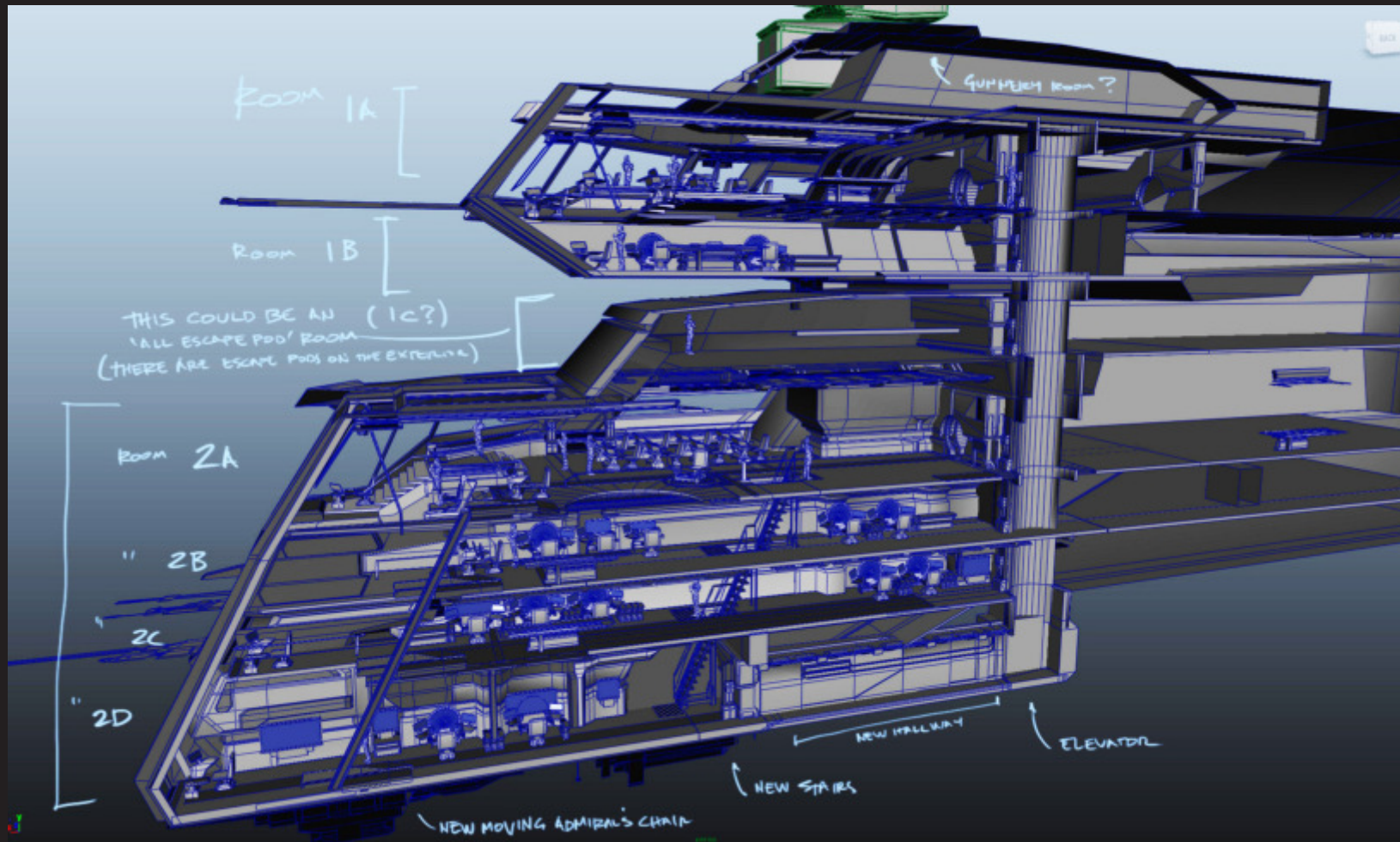ELEVATOR

NEW STAIRS

NEW MOVING ADMIRAL'S CHAIR

ROOM 2D AFT

WORK IN PROGRESS
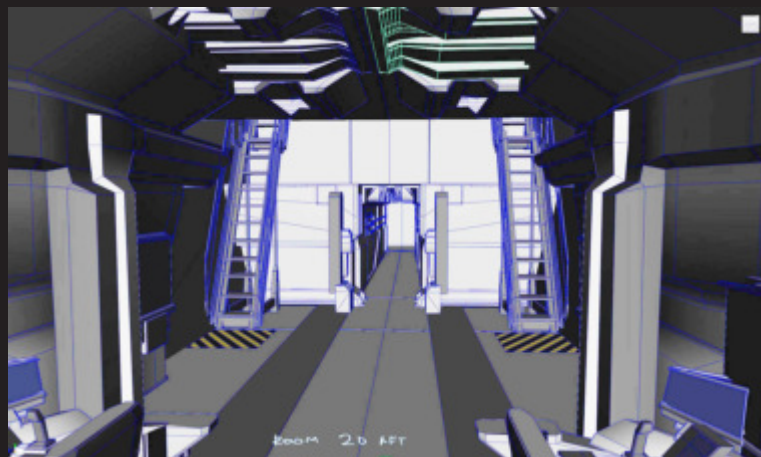
RC: For clarity I've given the rooms names: 1A, 1B, 2A, 2B etc. …

I didn't yet get to the stairs connecting rooms 1A and 1B.

Added stairs to 2A-2D, very steep stairs but something like the stairs in real current aircraft carriers.

Added moving captain's chair with rail connecting rooms 2A-2D.

Completed elevator travel and added detail.

Added side display screens and workstations to sides of rooms.

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RC: Two shots: one of the main bridge and one of the side hallway that is on the outside of the ship (in from the room that overlooks the hangar bay).

I went for pretty upscale in the bridge and pretty utilitarian for the corridor.

JP: Was the Bengal's functionality planned in advanced? Did you know how many turrets it has or how many fighters it carries? How many crew?

RC: Chris did come to me first thing with the crew complement, numbers, and types of fighters and defensive armament. These stayed through for the most part, but the exact number was determined when placing missiles and guns on the exterior and looking for the best combination of field of fire issues, visibility, access, etc.
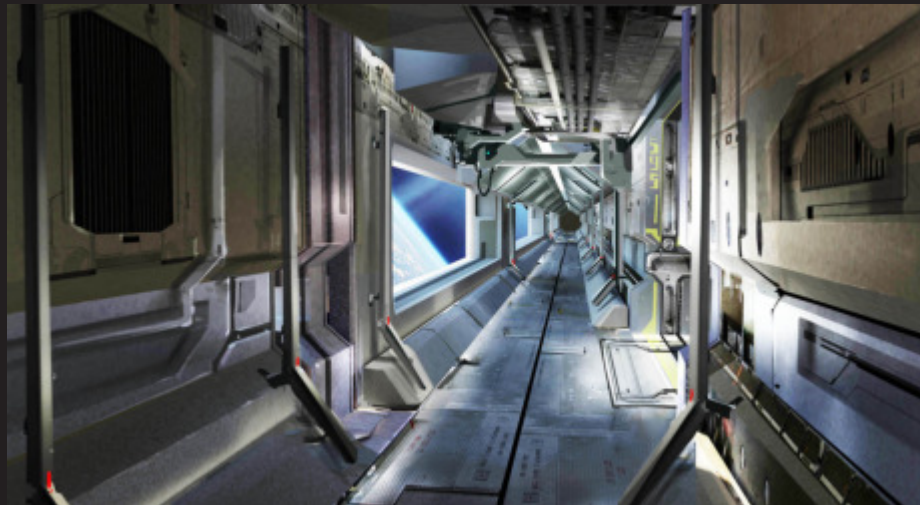
Alpha Test

CamPos=48.55 59.44 49.26 Angl= 5 0 132 ZN=0.02 ZF=8000 FG=2.20 Zoom=1.00 Speed=0.00
DX11 Profile 64bit VeryHighSpec DevMode my_level [0.3697]
DP: 87 (87) ShadowGen: 0 (0)
Polys: 220,239 (220,242) Shadow: 0,000 (0,000)
Streaming IO: ACT: 208msec, Jobs: 0
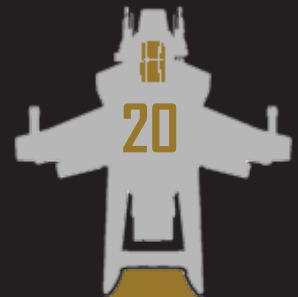Mem=524 Peak=542 DLights=(0/0/0/4)
FPS 58.7 (50.. 69)

corridor_door_pass2

Testing with alpha modes and values to get a good integration between the different elements on the corridors walls.

CGBot's Sergio Rosas:

Chris Roberts enlisted Ryan Church to create an initial concept 3D model base for the massive Bengal-class carrier. Ryan's base model and high-resolution paint-overs were utilized by CGBot when it came time to generate the mammoth ship in-game. Starting with a 3D concept model allowed us to preserve all the feeling, proportions and many details that made Ryan's initial carrier design such a solid fit for the *Star Citizen* universe. Working from a 3D concept model rather than just a 2D concept also saved a generous amount of work, allowing the CGBot team time to focus on bringing Ryan's vision to life.

The first step was to clean up and optimize Ryan's concept geometry to make it more usable in-game. The team then used the high-res paint-overs to model out many details throughout the carrier. Pattern guides smoothed out the geometry of the original high-poly paneling. The original concept mesh was meant to serve just as a guide for Ryan's paint-overs, with CGBot building the actual in-game model. Therefore, the initial geometry was not optimized — there were millions of polys that had to be reduced to create the final model. However, the Bengal carrier required such a level of detail that the final in-game model ended up having even more geometry than the original mesh. Having about 12 millions polys in a single ship gives it an impressive level of detail not seen in many games today. Working with the powerful CryEngine 3 made the process of creating such an impressive ship flow exceptionally well.
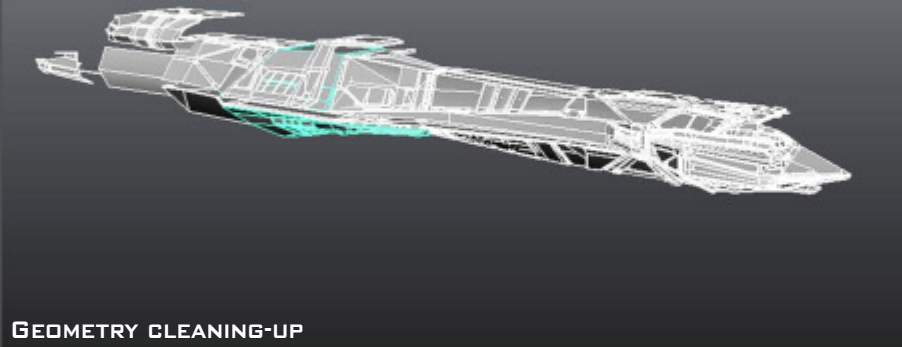
Geometry cleaning-up process at an early phase.

CR / SPACE CARRIER / LP / Poly Count 25492 / CGBot
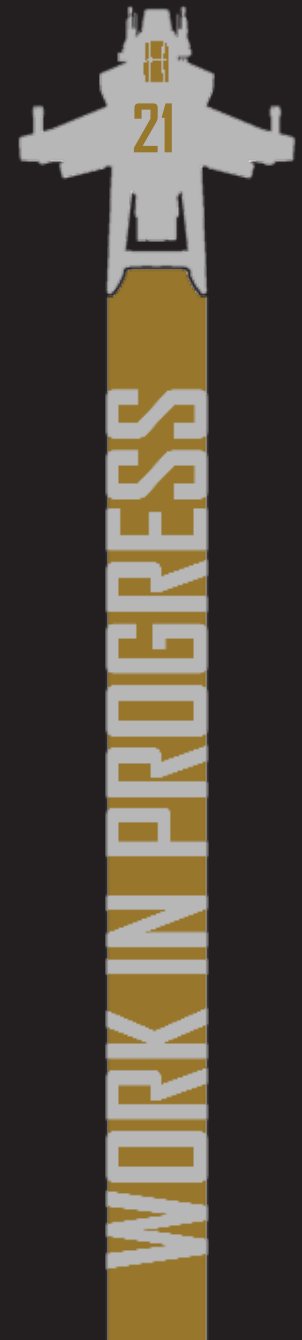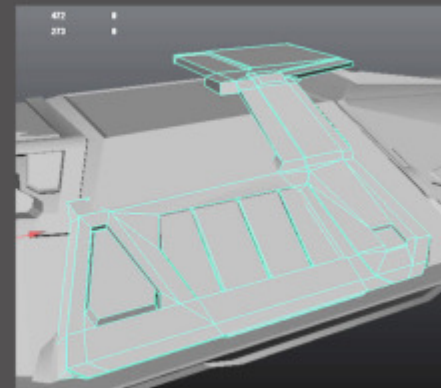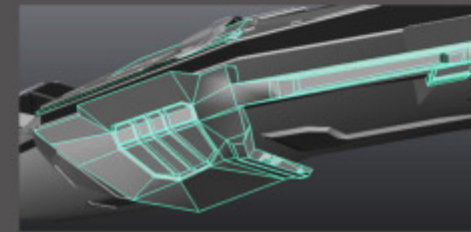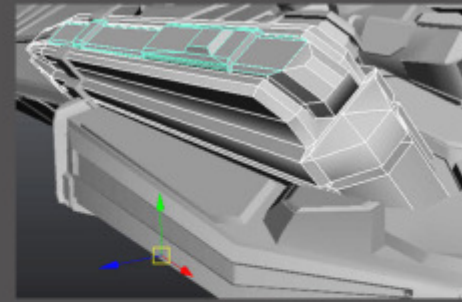
Another cool aspect of the Bengal-class carrier is that the interior has the the same level of detail as the exterior. The hangar, rooms and corridors are all built in a realistic way, meaning that no part of the interior of this ship is a separated, independent environment (which many games use to save processing power and memory). This eliminates the loading times between levels, and makes sure that all room proportions fit realistically within the frame of the ship. In the carrier (as in real life) it was a challenge to fit every corridor, room and elevator, and connect everything in a functional way. CryEngine allowed us to load this massive level of detail in real time — sometimes loading over a million polygons without slowing, even when working simultaneously with Max and Photoshop. Impressive.
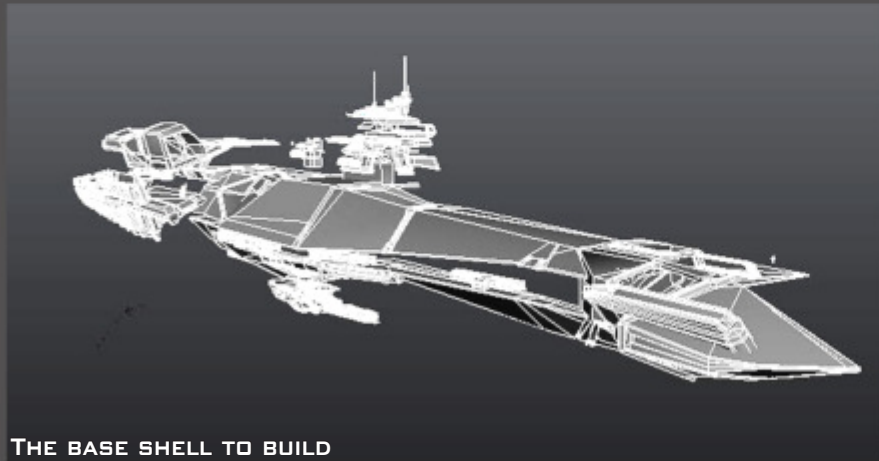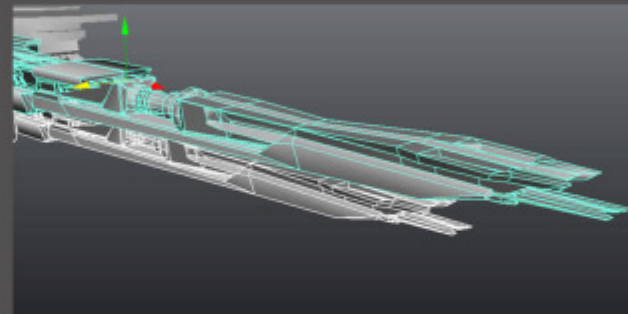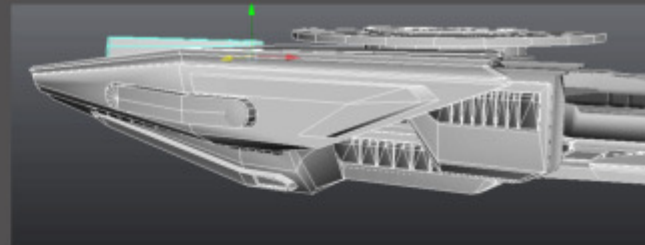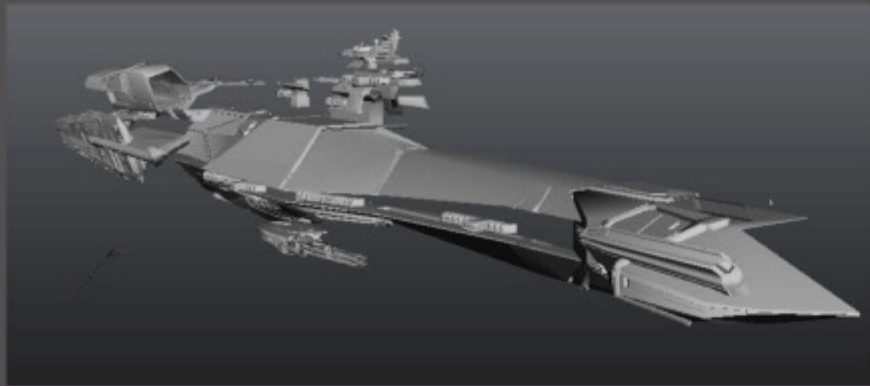
The base shell to build up all the geometry detail layers on it.
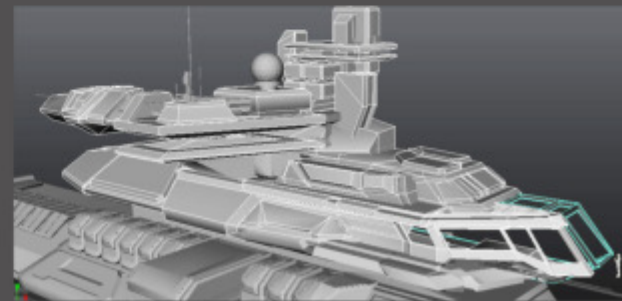
CR / SPACE CARRIER / LP / Poly Count 217246 / CGBot

After the geometry was cleaned up, the texturing and material tweaking process began. As the carrier needed the same pixel density as *Star Citizen's* Hornet fighter, texture systems for the exterior were used that allowed more definition than usual with a low number of textures. This is really noticeable if you fly close to the surface, subtle variations and scratches on the painted metal areas can be seen. CryEngine's material/ shader in-engine tweaking process allowed the texture maps to work together for a very realistic look on each desired material: metal, painted metal, plastic, etc. Tweaking the materials in CryEngine also makes it faster to work with textures, as you can easily save your progress in Photoshop, watch the results instantly in-engine, and make sure that all the texture maps work together with the lighting you have built. Even when loading many objects in a scene, we were able to load-test objects with 4096x4096 texture sets and as many as five sub-materials. Nice.
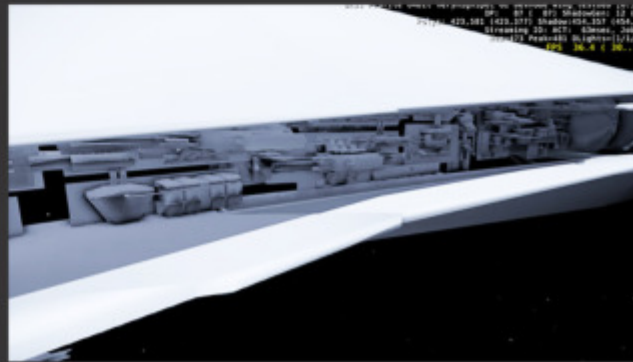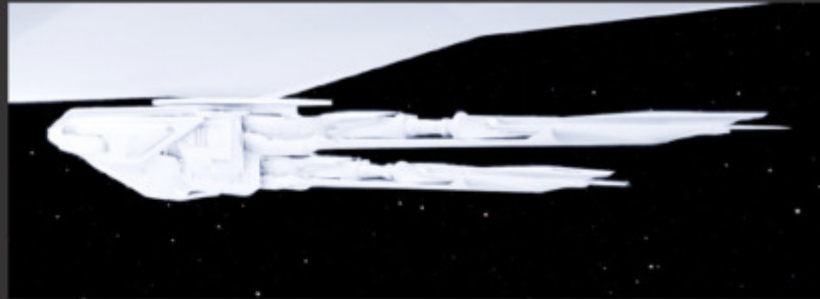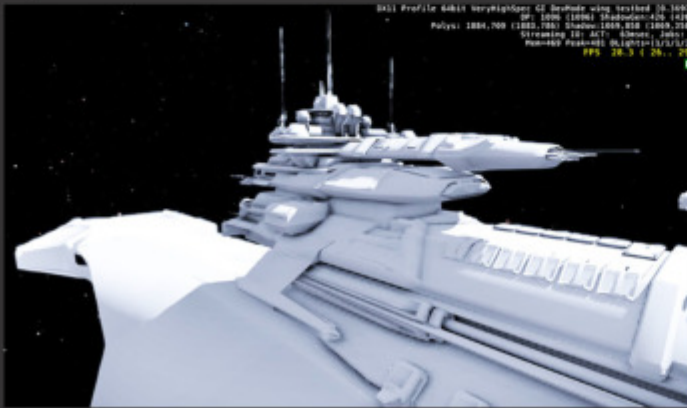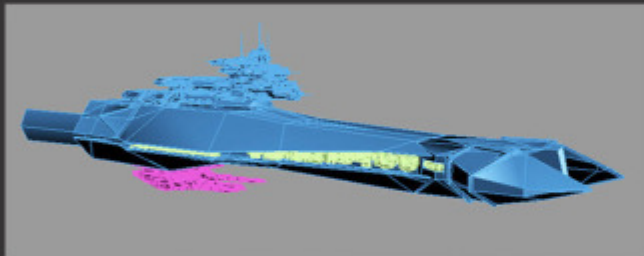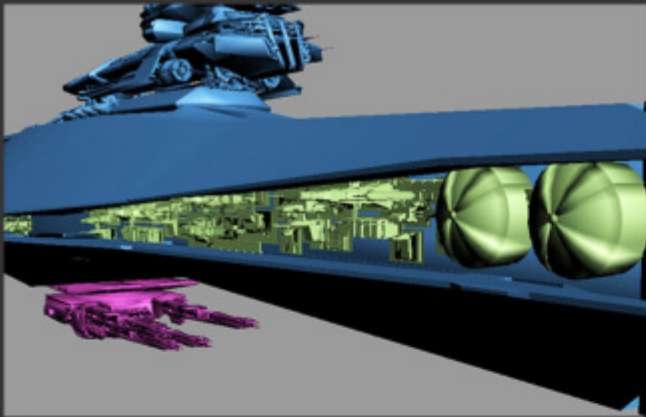
CR / SPACE CARRIER / LP / 124 321 PoliCount

First in-engine geometry and scale tests.
Only white base material, real time AO
and global lighthing.

FULL GEOMETRY AND MATERIAL TESTS.

DX11 Profile 64bit VeryHighSpec MT GI DevMode Wing_Testbed [1.4418]
DP: 8783 (8781) ShadowGen:6661 (6661)
Polys: 12982,140 (12986,162) Shadow:21510,332 (21510,989)
Streaming IO: ACT: 46msec, Jobs: 0
Mem=769 Peak=775 DLights=(1/1/1/84)
FPS 7.8 [6..9], frame avg over 1.0 s
M

Overall, the current Bengal carrier is impressive not only in design and inspiration, but also in technological advancement. It took an enormous amount of sweat and determination to get a ship of its standing useable in-game. But start- ing with a great 3D concept model and inspiring paint-overs made CGBot's job of getting *Star Citizen's* behemoth ship into CryEngine almost easy.

WIP material and texture work on the Carrier's Hangar. You can freely get in and move about this highly detailed interior without transitions or loading time.

Corridors system geometry, global lighting and SSAO tests.

Early WIP corridor materials and interior lighting tests.

int_corridors_system | WIP

CGBOT | CR_WC_M2 | int_corridors_system | WIP

26
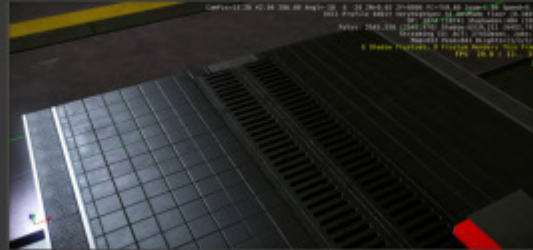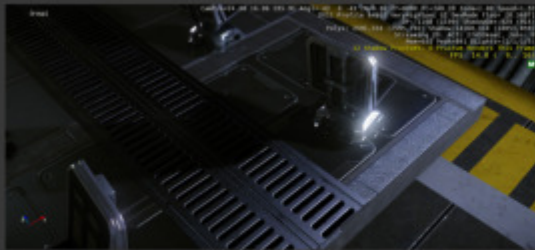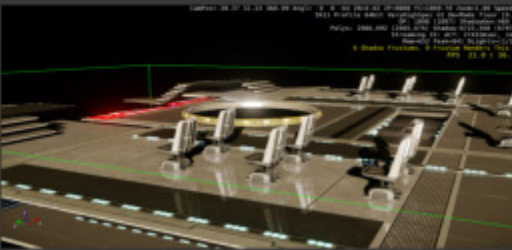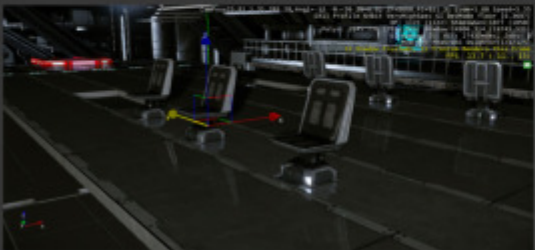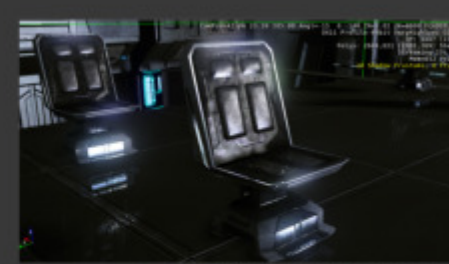
WORK IN PROGRESS

CR_WC_M2 |Space Carrier Interior | CGBOT |WIP

WIP Interior materials.
HDR Lighting settings and Screen Space
Reflections work together with specular
maps to get a more dynamic, realistic look.

SSR gives a better integration to environments as it reflects in real-time what is happening on the screen.
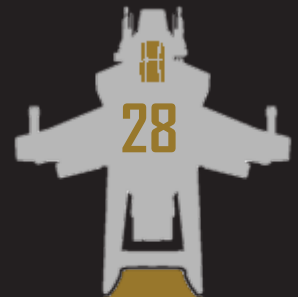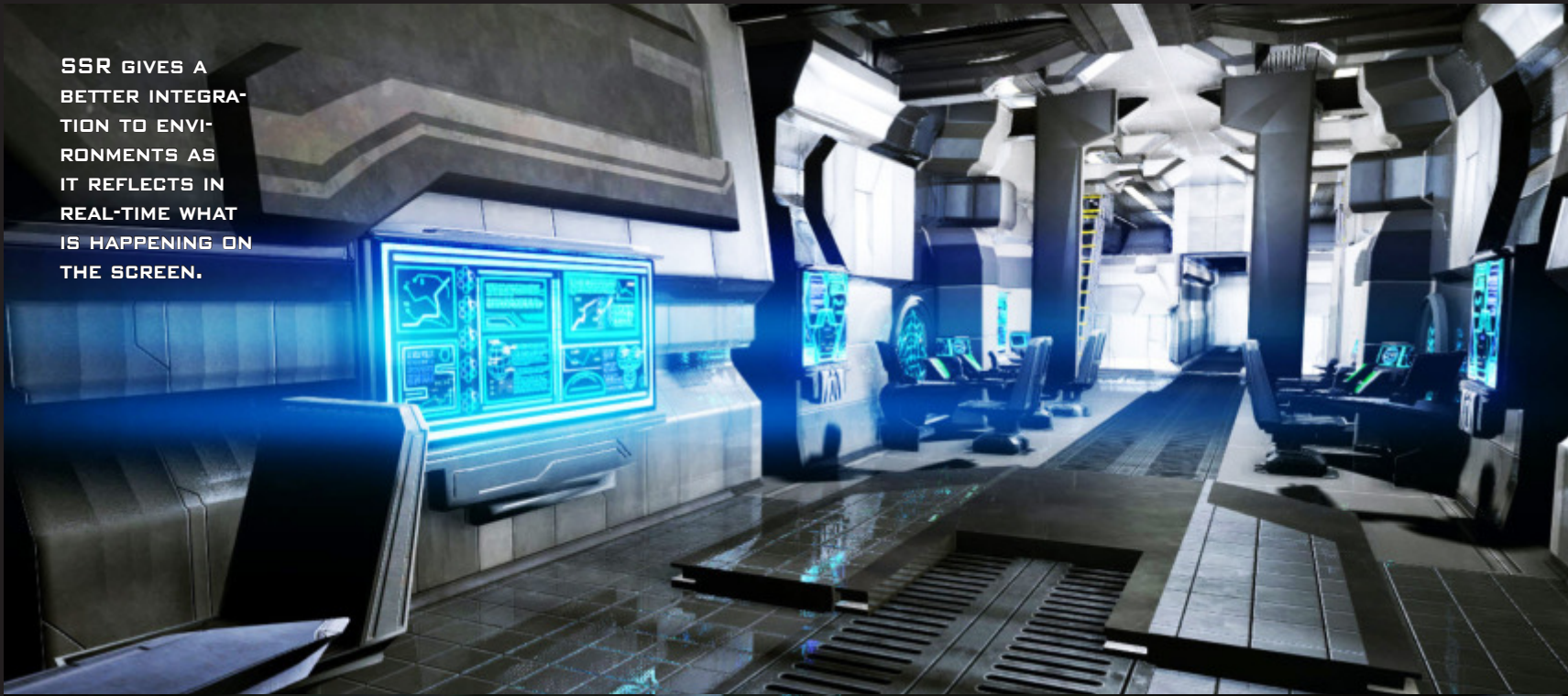
WORK IN PROGRESS

Lighting, thousands of geometry, texture maps and materials, working together to bring to life Ryan'sbBridge interior concepts and designs.
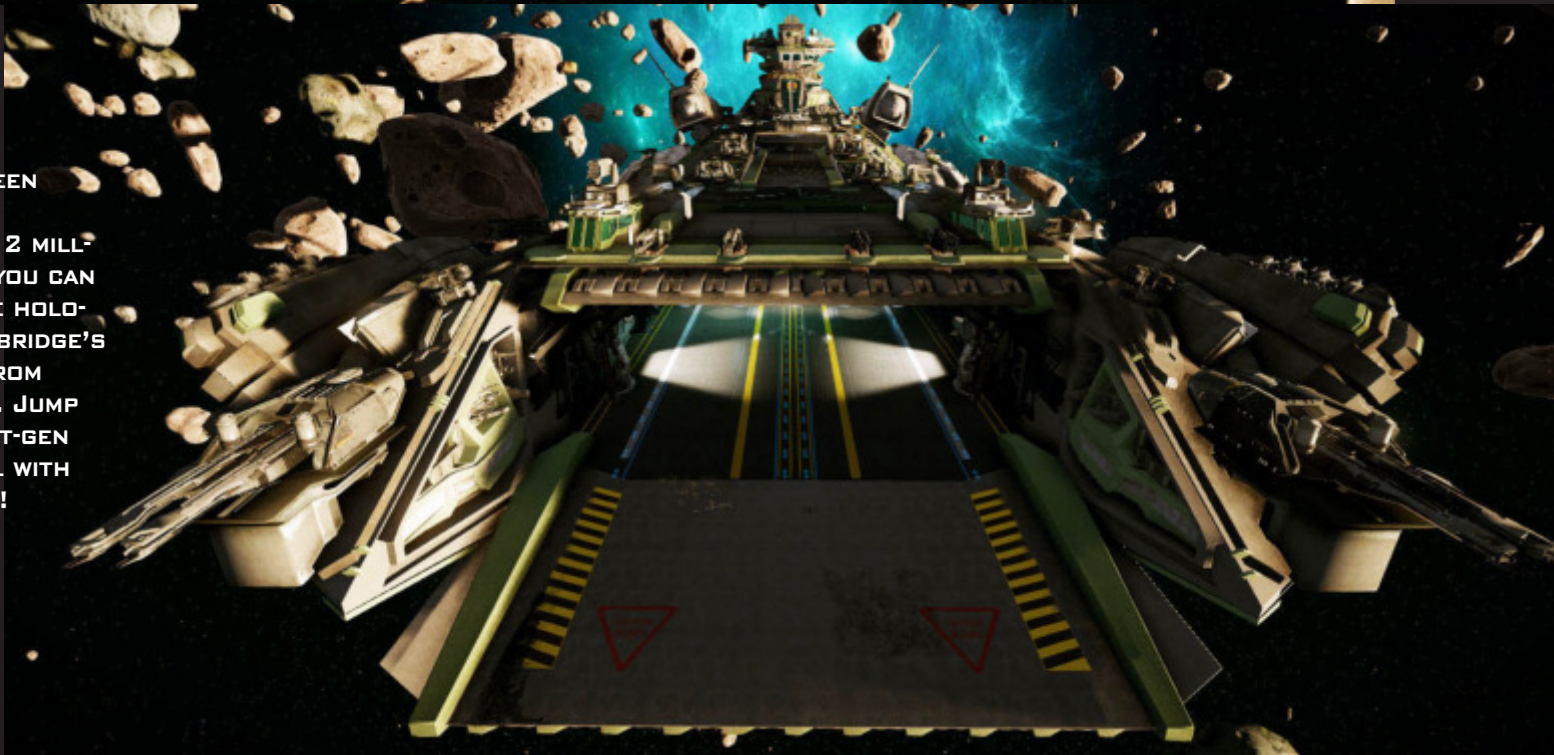
In-game Screen captures. More than 12 million tris — you can even see the hologram in the bridge's main room from outer space. Jump into the next-gen gaming level with CryEngine 3!
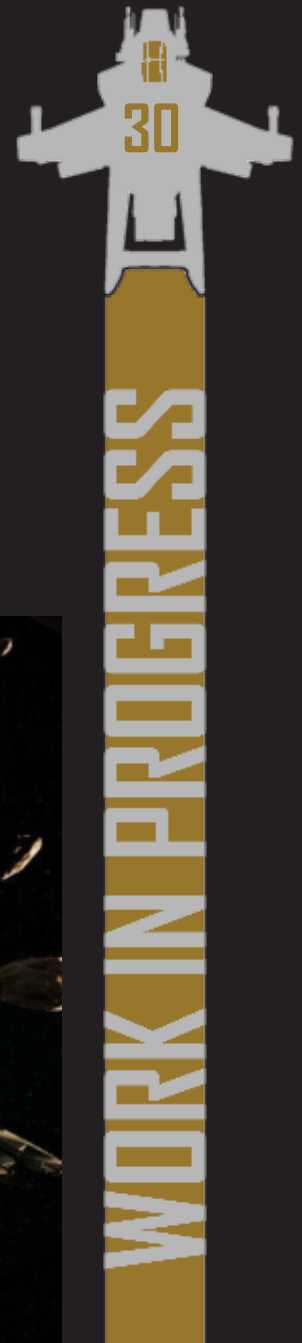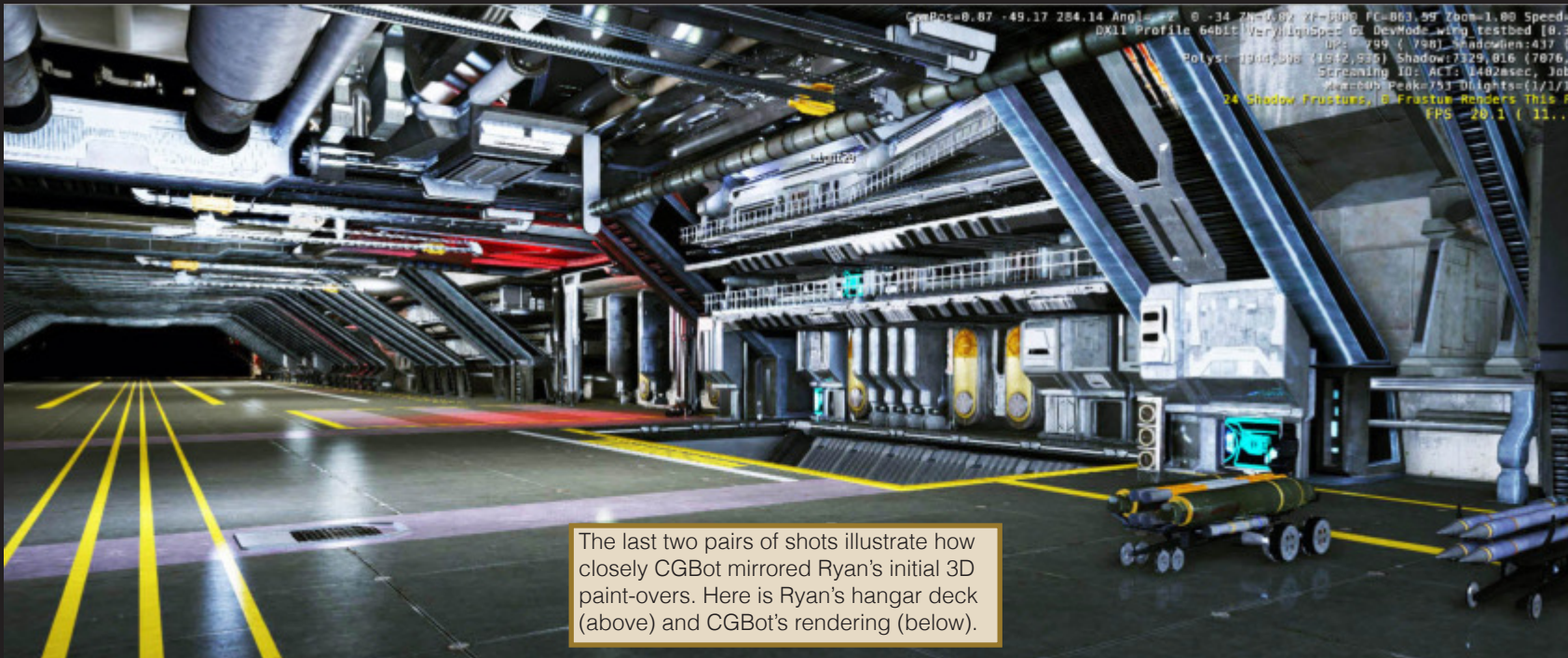
WORK IN PROGRESS

The last two pairs of shots illustrate how closely CGBot mirrored Ryan's initial 3D paint-overs. Here is Ryan's hangar deck (above) and CGBot's rendering (below).
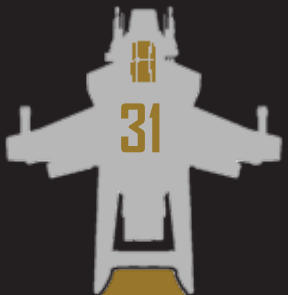
Just as impressive is the match between Ryan's bridge (above) and the CGBot rendering (below).

An Interview with Erin Roberts

Erin Roberts visited our Los Angeles studio a few weeks back, and we pinned him down to get the story on where he started and what he's been up to since Privateer 2.

JP: How did you get your start in the industry? Did you follow your brother into games, or vice versa? Have you always collaborated?

ER: I followed Chris into games. My first job was bringing Chris tea and biscuits (cookies) when I was much younger, while he was making games on the BBC Micro back in Manchester, England (for a game credit of course). My first real development work was on the original *Wing Commander* at Origin Systems in 1990, where I designed and tested the AI flight moves for the game. In the early days at Origin I worked for Chris, learning the ropes, and although I enjoy and prefer the creative process of making games, my first couple of years were spent mainly organising / scheduling and doing general production work to get the games out on time and on budget. (Sometimes successfully, sometimes not ….)
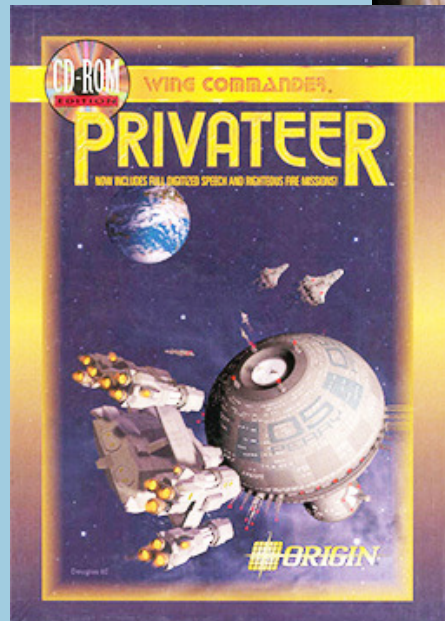
JP: You worked on Wing *and* Strike Commander *at Origin in the 1990s. What was Austin like in those early days? What advice do you have for Cloud Imperium's younger team members?*

ER: Austin was, and still is, a great place to work and live. It has a really relaxed culture and has kept its identity through the years. The main difference for me is how the city centre has really been transformed, from a place no one went to — except for a night out on 6th Street — to a living place with a huge amount of new shops, restaurants, bars and accommodation …. And when it comes to BBQ, nowhere beats Austin.

The main advice I give to anyone who wants to get into the industry, or who is just starting out, is to stay passionate about what you do, and never settle for 'good enough.' Great games are made by people who do not settle for second best, always push one step more, question if it is not good enough, and at the end of the day, would pay $50-$60 or more for the resulting game. If not, then do better ...

JP: *To* Wing Commander *fans, you're probably best known for your work on the original* Privateer. *What did you do on that project? Were you involved with the talkie CD-ROM version?*

ER: When *Privateer* started I was working on *Strike Commander*, so I didn't move onto *Privateer* until it was halfway through. I basically came on to help get it finished, taking over as the Producer on the project. Most of the design had been decided and was being implemented. I really just tweaked design issues with the Lead Designer Joel Manners, and helped see it through to completion. I helped design and began work on *Righteous Fire* and the CD version, but transferred to the UK to work at EA before it was finished.

JP: *How did* Privateer 2 *come about? How did you manage such an impressive slate of actors for the video shoot? And what's the real story behind the name change?*

ER: After I transferred back to the UK from Origin (which was now part of Electronic Arts), I started working with a bunch of friends who had worked with both Chris and me in the past, setting up a small studio in Manchester, England. We started working on a concept called "The Darkening" which was set in a new universe, but had all the aspects of *Privateer* (trading, exploration, etc.). A the same time, we wanted to push a much stronger storyline, attempting to give a much more immersive atmosphere. There was a group at Origin working on a *Privateer 2* concept, but a decision was made to turn "The Darkening" into *Privateer 2* when our UK development was put under the same umbrella as Origin and parts of EA San Mateo, with a shared management organisation. So *Privateer 2* was born in the UK, and the project by the same name was killed at Origin. I think it was mainly due to the fact that we were further along in development, and close to shipping the game and (if I'm cynical), Marketing felt that if we attached the *Privateer* name to the game it would sell more units. To be honest, if I had known we were working on *Privateer 2* from the beginning, the universe and story would have probably been very different. When it came to filming the story in Pinewood Studios, we were very fortunate to be hitting the beginning of the wave, when a lot of actors were interested in the new "Interactive Movie" medium. I'm not sure that we would be able to get the calibre of

actors now that we got then, but it was a great experience, as not only did we get to work with some really fantastic acting talent, but also the crew and production guys were top notch. The six-weeks shoot we did at Pinewood goes down as one of my most memorable and fun experiences in the industry.

JP: *Much of the team you're working on LEGO games with today have been together through* Privateer, Starlancer *and other titles. Tell us about that group of people. How did you find each other and what has kept you together?*

ER: I've worked with the core set of people in some cases for over 20 years. Two of the guys, Nick Elms and Phil Meller, worked with Chris on his early games in the UK, and Phil went on to work at Origin on *Times of Lore* and *Bad Blood*, before the *Wing Commander* days. It seemed natural to start working with them again when I came back to the UK from Austin in 1993. It grew from there — the team got bigger, and those people at EA Manchester formed the basis of who I'd work with in England in the future.

When we started Digital Anvil back in Austin after shipping *Privateer 2* in 1996, the same guys started a games company called Warthog in Manchester, where they were working on a space flight simulator. We wanted to work together again, and that is how *Starlancer* was born. After I left Digital Anvil in 2005, and moved back to the UK (where I have been since) it just made sense to start working with the guys I had worked with and trusted for all those years.

JP: *Have you pledged for* Star Citizen? *Are you hoping to be involved in the development process?*

ER: Oh yeah, I've pledged, I tried to pledge on the first day like everyone else, and probably like most people couldn't give money as hard as I tried, as the servers were always down. I had plenty of fun winding my brother up over that ... I don't think he really saw the funny side at the time.

JP: *Folks would call you a Captain of Industry — how does that make you feel?*

ER: (Laughs) … I'm not sure about that …. What's important to me and what I really enjoy is making games for a living. Even on my worst day when I'm feeling really down or really stressed, all I have to say to myself is "come on, you make games for a living," get up and get on with it. I feel lucky to be doing what I do, and because of that I feel a sense of responsibility to make sure I do the best I can. I enjoy the work, I enjoy the people I work with and see every day, and there is no better feeling than when we do something right and it is appreciated by the people that play our games.

JP: *Who's the better* Risk *player, you, your brother or Eric?*

ER: No competition … They both usually cheat, and still lose, so you'll find them skulking off to hide in Australasia before being hunted down and destroyed. So I think I have to take that accolade.

Kellog System

TRAVEL WARNING The Kellog System is located near what is generally considered Vanduul territory. Although the organization of Vanduul "tribes" is still not well understood, it seems that none have claimed Kellog as their own … yet. Although no enemy raiders have yet been spotted in-system, travelers are advised to take extreme precaution in the region.

The Kellog System consists of six planets orbiting a G2V yellow dwarf extremely similar to Earth's own Sun. Two of these worlds are inhabited and offer attractive trading opportunities to the interested trader: **Kellog II**, known as **Xis**, is slightly closer to the star than Earth, creating a lush tropical paradise world. **Kellog VI** is at the outer edge of the system's green band, a barely inhabitable rock which the UEE has converted into a prison world.

A visit to Kellog is not for the faint of heart. The system is ranked **SIX** on the galactic insurance chart, meaning that should loss-of-vehicle occur there, there is no repayment of cargo fees and upgrade replacement would be available only at a slight loss. There is nothing necessarily dangerous in the system itself, particularly for law-abiding pilots, and the rating instead reflects a simple truth: there are limited reasons an honest person should be there in the first place.

Kellog II

Xis is the reason for the Kellog system's unusually high insurance rating (for a system with a distinct UEE presence). The planet is dotted with deep, multi-canopied jungles with a biodiversity that rivals anywhere in the galaxy. From a warm sea that is home to ten-foot crab monsters to rainforests that play host to millions of insects, primates and, most famously, Flo-Pets.

Few can forget the Flo-Pet craze of the previous decade: the unusual animal best described as a cross between a housecat and a jellyfish was all the rage on Earth, with the rich and powerful desperate to collect and breed them to show off their bejeweled internals. Kellog II was their point of origin, where the first of their kind was captured by an intrepid privateer who initially believed they might be as delicious as they look. (Further study has definitively established that Flo-Pets are not edible.) Interest in the creatures has fallen off, and the offspring of those initial creatures can now be found inhabiting the sewers of every significantly developed world.

Visiting Xis is also strictly forbidden: the UEE Subcomittee for Development & Expansion (SDE) has identified the planet as a Developing World, citing the existence of the Orms, a primitive hominid-like species centered near the planet's north polar regions. Orms have, in the past three hundred years, begun to develop more complex social interaction schema and extremely primitive stone age tool use. Although

Market Deals — Kellog II

BUY:	COPPER (UNREFINED)	+1
BUY:	LUXURY GOODS	+2
BUY:	BIOLOGICAL GOODS (ILLEGAL)	+7
SELL:	PRESERVED FOOD	+1
SELL:	LUXURY GOODS	+1

their culture is of interest to scientists (who sometimes buy equipment and preserved food depending on the season — aim for "winter") the Orms themselves are not worthy of note for traders: they produce nothing valuable and they, themselves, are not civilized enough for use as labor.

The black market, however, is rampant. Although the planet is protected by a web of reconnaissance satellites, the UEE generally lacks the ability or the interest in properly policing the orbit. Incursions made without the proper amount of stealth are recorded and can harm a pilot's citizen rating in the long run … but there is little danger of running afoul of orbital batteries or encountering a stray destroyer squadron.

Kellog VI

Kellog VI is home to the UEE's massive QuarterDeck Prison-World, a maximum security penal facility that incarcerates hundreds of thousands of hardened criminals. QuarterDeck is a full-process antimatter refinery, which means that the extremely valuable fuel is available more cheaply here than it is anywhere else in the galaxy. Antimatter processing is an incredibly dangerous affair and it kills dozens of prisoners a day … but reduced sentences are given to those willing to perform the work, helping to ensure that the UEE navy and the merchant marine are fully fueled.

However, interested merchants should note that transporting antimatter is extremely dangerous. A fully upgraded cargo hold is necessary, and anyone attempting the run needs to broadcast in the clear their manifest: no pirate wants to tangle with an antimatter transport because the simplest engagement will quickly lead to an explosion killing all parties involved.

The UEE has also developed a system by which wanted criminals can be delivered directly to QuarterDeck by properly bonded bounty hunters. A Class VI JusticeStar satellite sits at the planet's closest Lagrange Point, allowing processing, trial and sentencing to take place swiftly and efficiently. Booking officers on QuarterDeck frequently pay a premium for wanted men, reflecting the reduced cost to the UEE that comes with having prisoners delivered directly to the system.

As on any prison world, there is also an active black market. Merchants who can deliver luxury entertainments to the planet without attracting the attention of UEE wardens are handsomely rewarded. Of special value on QuarterDeck are narcotics, which much of the population prizes as the sole escape from the danger and dreariness of forced antimatter mining.

MARKET DEALS — KELLOG VI	
BUY: WEAPONS (MilSpec)	+2
BUY: IRON ORE	+2
BUY: ANTIMATTER	+5
SELL: LUXURY GOODS	+4
SELL: NARCOTICS (ILLEGAL)	+6

Final Tips

Kellog is a system with an immense opportunity for profit … but it is one that inexperienced merchants should avoid at all costs. Hundreds of interested newbies have noted the profit margins and afterburnered straight to the system — only to find themselves the target of the UEE forces guarding QuarterDeck or a tasty dinner for a Xisian seacrab. Don't make their mistakes: equip your ship properly, focus on stealth when dealing with any black market shipping … and tread lightly, wherever possible.

Last Flight of the Seraphim

by David Haddock

PART ONE

The refinement station on Garron III started as a dream. Tom Harroway was born with a curious mind. At ten, his attempt to rewire the HomeSystem's CPU resulted in overloaded circuits, a singed dog, and some angry parents. He came to realize that science was the language of the universe and all he wanted was to be fluent.

A full scholarship at Terra University led to an internship with ArcCorp's R&D department. Six years later, he was a free-lance field scientist specializing in metallurgy for some of the UEE's biggest terraforming and mining Corps. All the while, he had one thing in mind: put in his time so he could build a lab of his own.

Twenty SE-years later, he had it. Earning money on the side as a consultant and independent processing facility, he was able to piece together a top-of-the-line facility for precious metal refinement. As the station grew over the next decade, a community began to form around it. Harroway had come here for a lab, but ended up building a town.

At his core, he was still that little boy basking in the magic of science in action. His experiments only got bigger. Now Harroway watched the unprocessed metals churn in the hydrolysis bath. Pieces began to break off and dissolve in the bubbling liquid. Harroway checked the monitor to confirm which minerals and elements the process unlocked.

A perimeter alert popped up.

Strange, he thought and looked around. The cameras outside didn't show anything unusual. Harroway was about to turn back to the hydrolysis when he realized something. He didn't see any people on the monitors, either.

Harroway set the hydrolysis on auto, pulled on his coat, and headed for the door. He punched the exit code. The door hissed as heavy locks unbolted. He reached for the handle and opened.

Sunlight spilled into the dark lab. Harroway's eyes took a moment to adjust as he stepped outside. When they did, they regretted it.

Six ships hovered in a loose attack perimeter. The rest had landed. Harroway could immediately tell they weren't Vanduul. From the shoddy construction and awkward repairs, they looked like raiders.

It was the Scourge, a roving band of marauders, pirates and occasional slavers. About a dozen pirates corralled his employees and other townspeople outside of the refinery.

A gun hummed against Harroway's ear. He put his hands up and turned. It was the Scourge leader, Oren Vik, a massive mountain of criminality condemned three times to the Quarterdeck PrisonWorld, with three successful escapes. Tattoos covered almost every inch of his exposed skin up to his hairless head. Harroway's first thought was of the old stories of the golem, although he thought better of voicing the comparison.

"We's dropped for metals and such," Vik slurred in a thick Cathcart accent. His tiny eyes looked over Harroway. "What you have?"

"We don't have anything." The pirate didn't like that answer.

"Scrum don't chaw with the beddewan. Other we gon' spatter fon." Vik pressed the gun against Harroway's skull.

"I'm sorry, I don't understand," Harroway stuttered. His legs started shaking. Vik nodded to a rabid mohawked thug with facial tattoos. He grabbed Milson, a promising young geologist trainee, and dragged him away from the others. The rest screamed and shouted, but the mass of weapons kept them in place.

Mohawk forced Milson to his knees and jammed a scattergun against his head. He looked to his boss, eager for confirmation.

"I'm telling you the truth. There's nothing here," Harroway pleaded. Vik watched him for a moment then nodded to his thug. The thug grinned. His finger squeezed the trigger.

Click. Harroway flinched. Vik leaned in.

"Nex' one gon' be real fire." Mohawk racked a round into his gun and aimed again.

"Here, I'll show you." Harroway stepped forward, putting himself between the pirate and Mohawk. "Just don't. Please, don't."

Vik took Harroway inside the refinery. A couple of the pirates followed, just in case. Mohawk brought his hostage. They all stared at the line of machines as if they were alien tech.

"See, we're in the process of refining, which means there's nothing here. All of the metal is being worked on."

Oren Vik stared at one of the monitors.

"You will."

"What?" Harroway stammered for a second. He knew he just got caught.

"No metal here. But soon. When?"

"I . . . there's really no telling . . ."

"When?" Vik repeated, stepping close.

"If you promise to leave us unharmed right now. I'll tell you." Harroway tried to stand tall. Vik was unmoved.

"When?"

"Three months."

The Scourge left. Houses and stores were looted but nobody was seriously hurt. Harroway was grateful for that, but he knew they would come back. He had three months to come up with a plan.

* * *

Missile lock. The monitor flashed as the scanners isolated the new missile. Armitage glanced back to see it with his own eyes. Thirty years in the UEE Navy kept his nerves cool and his head level. He maintained course and speed, biding his time for it to get closer. He flashed his engines, putting his ship into a roll as he dropped a spread of countermeasures.

They did the trick. The missile's momentary confusion turned it straight into an asteroid.

Armitage gave the ship on his six a jink while he reassessed the situation. The client was still on course, untouched thus far by the squad of six assassin ships who ambushed them. At this rate the client, an executive from MaxOx, would hit the jump-point in twenty minutes and bounce out of the rival Corp's territory and into safety.

Twenty minutes was still a long time. Time to get serious.

"How's everyone doing?" Armitage said into his comm.

"Doing great, sir," Shen replied. He twisted through space, weaving his ship between the rapid shots of a pair of assassins. He cut his engines to spin and sprayed some fire of his own. One assassin managed to dodge. The shots peppered the other. Its shields flared up, diffusing the blasts. They flickered afterwards, indicating that they were either depleted or dangerously low.

The vulnerable assassin peeled off to get some distance and recharge. It turned right into a 35mm round and disappeared in a flash of flame. Lott swooped through the debris. His shields deflected the bits of ship.

"Pretty low, man. You snaked my mark," Shen said, glancing back at his wingman who had attracted two pursuers of his own.

"Shields recharge. It's all about the kill." Lott checked his monitor's tactical assessment of the assassins on his tail when he noticed something. The last assassin was making a run for the client. "Charge up, Clark. You got company."

"I got him," Clark's sonorous voice said over the comms. His modified Connie was perched, powered down, by a cluster of asteroids, tracking the assassin with the turreted Mass Driver cannon on his roof. He set the detonation distance and fired. Heavy rounds sailed across the void. The assassin never knew what hit him as balls of shrapnel suddenly exploded around him. In a matter of seconds, the ship was eviscerated.

The engine was still lit and sailed wildly off into space.

There were only four left. One was still chasing Armitage, another on Shen, two on Lott. The assassins decided they clearly needed a new plan. They broke off and reformed.

"They're regrouping. Lott, shadow the client. Clark, cover. Shen, you're with me."

"Aye, sir," Shen and Clark said in quick succession.

"We should form up and hit them at once," Lott chimed in.

"No. Get on the client. You're our contingency," Armitage replied. He looked out his ship. Lott hesitated for a few moments, then finally broke off and headed toward the client.

"Shen, Clark, we're going to go for a scoop-shoot, okay?"

"You got it, sir." Shen fell into position above and behind Armitage. Clark launched an IR beacon at a gap of space. Remote-thrusters fired to hold it in place. Shen and Armitage saw the beacon appear on their scanners.

Armitage swept wide to move in behind the four assassin ships who were making a push for the client. Once in position, his squad maxxed their thrust and launched forward for a strafing run. Armitage and Shen quickly closed the distance to the assassins and fired a volley. Before the assassins' shields faded, Armitage and Shen blasted past them, looking like prime targets.

The assassins took the bait. They broke off and pursued, figuring they'd easily knock out their opponents then hit their target. Armitage adjusted course toward the beacon while Shen swiveled his turret back and popped off shots, more for aesthetics than damage.

"Now!" Armitage said. Clark unleashed a full spread of cannon-fire and rockets, all aimed at the beacon. Armitage and Shen passed the beacon, separated, and flipped their ships. It was a plan they'd pulled dozens of times, since their days back in Seraphim Squadron. The great thing about it was if the enemy took the bait, they were sunk.

The four assassin ships flew right into the trap. With the beacon as ground zero, all of Clark's arty rounds and dumbfire rockets exploded in a brilliant flash of flame, force and shrapnel. Armitage and Shen opened fire at any ship still moving.

The assassins dug in to slug it out despite the sheer barrage of ordinance. It was going smoothly …

Until one of the assassins afterburned through the killzone, shields and armor intact. Shen watched it head straight for Clark.

"Clark, power up and get out of there," he said over the comms. "Lott, break off and back up Clark."

Lott peeled away from the client and moved to intercept. Shen and Armitage kept up their fire.

Clark dropped down from the turret and fired up the engines. The Constellation slowly started to build up speed. He adjusted his fire to try to hit the charging assassin, but the ship's payload was customized for indirect fire and couldn't keep up with a fast-moving target.

Lott redirected his shields into his engines to give him an extra boost. His ship boomed with the extra thrust.

"Fifteen seconds out," Lott reported over comms. He warmed up his guns and set the targeting computer to acquire the assassin the second he got in range. He muted the comms and yelled, as if he could get more speed out of his ship by cursing at it.

The assassin dodged everything Clark threw at it. He put his shields front and braced himself for fire. That's what he got. The assassin unleashed a stream of plasma, lasers and rockets directly at the cockpit. The shields flashed, completely obscuring Clark's view outside. The ship shook. By the time the shields faded, the assassin had vanished.

Clark looked down at the screen. It was behind him now. He was trying to redirect the shields when the second stream of rockets hit.

Shen heard the explosion over the comm channel. Armitage pulverized the last assassin caught in their trap and turned to see the Constellation drifting apart in four different directions.

Anger raged through Lott's veins. His targeting computer pinged. He took it out on the assassin.

*   *   *

MaxOx's landing park in Stanton was full of security vehicles. Armitage handled the final details with the client's assistant while Shen and Lott waited by their ships. Neither had said a word since they landed.

Lott watched the client stroll into the corp offices, smoothing the creases in his suit. If the battle or Clark's death was affecting him, he was the 'verse's greatest actor in not showing it. No, the executive couldn't care less. Lott shook his head in disgust, then turned to Armitage negotiating with the assistant.

Business concluded, Armitage crossed the park. Shen straightened up, almost at attention, as Armitage approached. A habit he'd never quite broken. Lott folded his arms and waited.

Armitage stood silently for a moment or two.

"I've posted your shares to your accounts," he finally said in his usual measured tone. They were quiet again. The only sound was the hum of distant hovers and the squawk of the deck dispatcher.

"That's it?" Lott said. "Here's your payout. Call you when the next job comes up?"

"Ease up, Lott."

"What do you expect me to say?" Armitage looked at him with the withering gaze of a commander. "That's the job. Accept it, pilot."

"That's the job?" Lott laughed. "Yeah, I get that. Here's my question though, what'd you charge them?"

Armitage was quiet. He hated talking about credits. It became an ugly byproduct of being in charge after their service ended.

"I charged them the rate we agreed upon."

"That's why they call it re-negotiation. We agreed upon the rate for a low-threat escort mission. They were the ones who neglected to mention that there was a hit squad gunning for our client."

"I gave them my word."

"Your word?" Lott looked at Shen, shocked. "You think that executive greaseball cares about your word? I'll bet he's laughing about it. He gave you scraps for pay and you're thanking him for it."

"Lott, let it go." Shen tried to get between them.

"Listen to me, kid." Armitage stepped closer to Lott, staring him down. "Your word is all you've got. Everything else; the money, the ships, the fame, it's all noise. None of it means anything if you aren't dependable."

"Tell that to Clark's wife," Lott said, unflinching. "See if she thinks your word was worth his pitiful share of credits."

Lott stormed off and climbed into his ship. Shen started to go after him.

"Don't," Armitage said. Shen stopped. "Let him cool off."

*   *   *

Shen powered down his engines on the complex's landing pad. He pulled his gear from the storage bay and headed down to his apartment. Dust swirled in the fading sunlight as he pushed open the door. The apartment powered up when his key hit the scan. Lights flickered on, then adjusted to his pre-sets. Pictures appeared in the frames. Aside from a second-hand sofa, a vid-monitor, and a couple mismatched chairs, the apartment was empty. He'd been giving himself ultimatums about decorating the place for nearly three years now.

He dropped his bags by the sofa and headed to the kitchen. A bottle and a glass later, he drifted by one of the frames on the wall. It slowly cycled through photos from the service.

He paused it on a group shot of the Seraphim Squadron. Once fifteen pilots strong, now Armitage, Lott and he were all that remained. Every time he looked at that picture he felt more and more disconnected from that moment. They all looked so young, so proud, so hopeful. Now it was . . . he didn't even know anymore.

Shen went outside to his storage bay. It was getting warmer outside. He pulled open the bay door to reveal the makeshift garage. Underneath the tarp was the racer ship he was trying to rebuild.

He set the bottle on the ground, took a break from his melancholy, and worked.

*   *   *

As the sun dipped behind the horizon, the MegaCity of Titus teemed with life. It was rush hour and the thick lines of hovers illuminated the airways like neon veins.

Lott's apartment was dark, except for the occasional passing headlight. He stared at the floor in total silence, completely ignoring the panorama right outside his window.

Thumping bass music began to seep into the apartment from the floor above. Lott finally looked up, then turned to the window. Outside, everywhere he looked, he saw lives in motion. Hundreds of thousands of people hustling, laughing, stressing . . .

He felt nothing for them.

That was new.

*   *   *

Clark's wife didn't yell or throw things. Something seemed to click off in her. She barely reacted at all, just thanked Armitage for telling her personally and seeing that she got his share. Her voice was hollow, monotone. They sat in silence for a few minutes, then Armitage left. Her eyes never snapped out of their stupor even as he closed the door.

The entire flight home, he tried to put Clark's death out of his mind. Over the years, he'd lost dozens of men and women under his command. In every case, he justified it to himself that their lives hadn't been wasted. They had died for something. They died with honor. Something about this one unsettled him and exposed the cracks in his reasoning.

Armitage reset his course to stop at a shipping hub. The silence and solitude of space had gotten to him and he needed to rest. He quickly set the ship down and dove into the main strand of shops, noise and people. He wove through the various haulers, pickpockets and pushers before finding the local watering hall. According to the customer sites, the Dirty Unicorn served dirty drinks and dirtier food. It would do.

Armitage found a seat at the bar between some armored dreg and what he assumed was a Tevarin drug dealer. The Tevarin turned as Armitage sat down.

"You a cop?" he asked, his mouth twitching. Armitage glared at him. "Got some Neon, you need it?"

Assumption confirmed.

"No. Talk to me again and I'll put you down, clear?" Armitage caught the bartender's attention and got a drink quick. The Tevarin shifted further down the bar.

"Got some fresh dessert too if you want it." The bartender nodded to a display case by the kitchen window.

"Just the drink." Armitage sank into his seat and rested his head on his hand. The cacophony of voices helped. Bathing in civilization chased away his moments of self-doubt.

Three rounds later, he felt restored enough to check his messages. The MobiGlas connected with the Hub's relay system and plugged him into the network; a few personal messages from distant cousins, more than a handful of ad messages, but there were a few hits through the Seraphim Security contact.

One caught his eye.

*   *   *

Two weeks later, Armitage waited on the landing dock. The southern hemisphere of Vega II was just entering into autumn, making the tide pools below especially vibrant. A chilly wind blew across the water.

Shen's custom Hornet raced past, circled and set down. He hopped onto the deck as the engines powered down. Both of them had independently contacted Lott, but neither knew if he was going to show.

"How are you, sir?" Shen asked as he crossed the platform. They shook hands.

"Good. You get some rest?"

"A little," Shen replied. "You?"

"You know me, son. Never had time for it."

Shen nodded. They walked to the edge of the landing dock. Shen took in the view while Armitage scanned the sky. Sure enough, they saw a streak of light break through the planet's atmo and head their way. Lott's ship set down next to Shen's. He got out, his expression still dour, and crossed to them.

"Good to see you, man," Shen said with a grin.

"Yeah, you too." Lott nodded to him, then to Armitage. "So what's the deal?"

"Follow me. We'll go over the details," Armitage said and walked them over to the small lodge that acted as the local hotel and resort. He passed Shen and Lott their room keys, led them upstairs, and went to his door.

Armitage unlocked the door. "Okay, boys. I'd like you to meet Mr. Harroway."

Harroway stood as they stepped inside. He nodded to Shen and Lott.

"Mr. Harroway's got a job for us," Armitage said with a smile. They exchanged a glance, wondering what this bookish ghost of a man could possibly want with them.

TO BE CONTINUED