

# JUMP POINT

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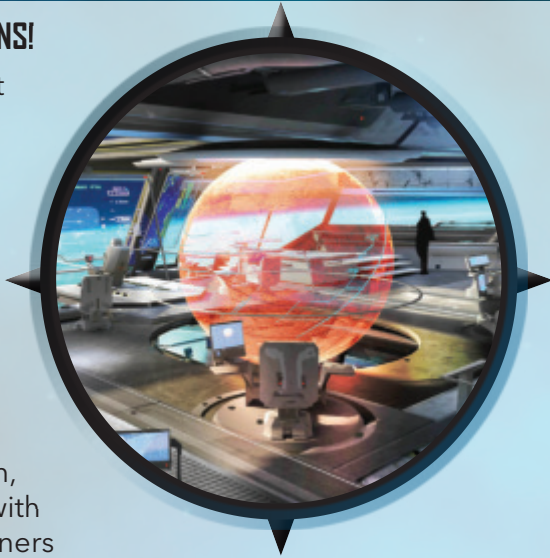
## GREETINGS, CITIZENS!

I knew we hadn't covered at least one major department at CIG; I just hadn't realized it would take three sessions to discuss everything that CIG Audio does. This month, we spend time with the sound designers who create the wide range of sound effects that you hear in *Star Citizen* – footsteps, weapons, explosions, control panels, and a whole lot more. In a couple of months, we'll sit down with the guys who are composing and recording the musical score – the themes, the mood music, and so forth – and at some point following that we'll talk with the team that translates scripts into spoken reality.

Meanwhile, who would you like to hear from? Don't tell me that you want the ship designers so that you can get specific details on specific ships. That happens with our Work In Progress articles, and you won't see a ship here any sooner just because you stamp your feet and hold your breath till your face turns blue – believe me, I've tried.

Instead, tell me who you want to talk to about what they do, and how they do it. We've covered a lot of departments and a lot of teams over the last few years, but I realize we still have quite a few that we haven't gotten to. Let me know which teams you want to hear from, and I'll see what we can do.

Our title is "The Sound and the Fury" this month. By this point, I would hope that the Sound part is obvious. The Fury is delivered by the first and last articles – first, the



Defender, the Banu light fighter that can open a can of Trouble on you without hardly trying, and then the usual suspects in the concluding episode of Dave Haddock's "Drifters." As I told him when it first arrived on my desk this week, I was afraid to open it to find out who (if anyone) survived this final chapter for the crew of the *Harlequin*.

While the Portfolio article on Basilisk falls short of telling us exactly how a mythological basilisk can be killed – perhaps that can be an extra credit assignment for those of you who are really too involved in this game – it does give you everything else you might want to know about the birth and development of Basilisk hull plating.

And the Galactic Guide reveals Hadrian to us, with its iconic Kedsu Reef (sorta like Cathcart's Spider, only much friendlier). I sense that all of Hadrian's mines (in both meanings) will play a significant role in an upcoming adventure or two.

For those who are curious, **Jump Point** Volume 3, the Printed Magnificence, is proceeding at a much faster pace than Volumes 1 or 2. Ben tells me that pre-orders will begin soon. I will enjoy getting my hands on it when it comes.

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

*David*

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**COVER, PAGE 49: GARY SANCHEZ**

**PAGE 50: CLINT SCHULTZ**

**PAGE 55: SIAN CREWE**

**PAGE 65: MARCEL VAN VUUREN**



FROM THE HIGHPI

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# Banu Defender (Minuteman)



## Design Doc

### AIMS

- Banu combat ship, nimble fighter
- Designed as a multi-crew escort fighter/interceptor for the Banu Merchantman

### AESTHETIC

Banu design with cobbled-together parts from other alien races. Should be using Tevarin shields, for example

### MINUTEMAN OR DEFENDER?

**Ben Lesnick, Director of Ship Concepts:** I originally pitched the Defender as the "Banu Minuteman," with the idea that it was intended specifically to protect Merchantmen (and larger trade ships) at a moment's notice. I will also confess that I enjoyed how confusing it was next to the similar "Merchantman"; I was very happy when a blurry ship concept production schedule leaked in the background of one of our videos ... and backers just assumed it said Merchantman! (I further reasoned that perhaps all Banu ships might have a -man suffix.) We ultimately changed the name because "Minuteman" is such a specifically American historical reference that it wouldn't really make sense for an alien race ... but I'm glad the name still managed to confuse someone who was trying too hard to get information before it was replaced!

WORK IN PROGRESS

## APPROXIMATE STATISTICS

**Length:** 28 Meters

Longer than the Gladius, but sleeker and has to fit two crew and a small interior.

**Mass:** 18,000kg

Larger than the Gladius (16,000kg) but lightly armoured.

**Crew:** 2

Seats a dedicated pilot and a support seat. The Banu specialise in their roles, so one usually takes on the role of firing the weapons or managing power/shields, while the other concentrates on flying.

**Engines:** 1 (Medium)

One medium engine which powers four main nozzles, using Xi'an engine technology.

**Thrusters:** 12 x Fixed Thrusters

4 on top, 4 on the sides and 4 on the bottom to cover all angles of movement. Uses fixed thrusters to improve ship agility.

**Power Plants:** 2 x Small

Enough to power all ship systems. It uses one more than most light fighters as it has an interior, additional seat and a larger shield.

**Weapon Hardpoints:**

4 x Size 2 Weapons (Gimbal - Nose)

2 x S3 Missile Hardpoint (4 x S2 Missiles)

Gimballed weapons on the nose for the co-pilot to more easily control (if co-pilot is controlling weapons) while the pilot is flying. Weapons on the nose have fixed gimbal mounts, fixed mounts. Weapons of larger sizes cannot be equipped.

**Shield:** 1 x Medium

Large ship for a light fighter. Uses advanced Tevarin shields as a unique feature of the ship, so these need to be powerful.

**Armour:** Light

Very nimble fighter. More defensive focus is on the advanced Tevarin shields to keep it light and fast.

## METRICS & TEMPLATES

A list of all components, templates and measurements that the concept artist needs to adhere to.

### Animation Templates

- *Seat template:* Gladius (low tech, static ejection seat).
- *Enter/exit animation for the seat:* New (entering from the rear, might require a new anim to get in and out of the seat).
- *Enter/exit animation for the ship:* None, transport-style entrance via ramp.

### Ship Components

Components that need to be accessible behind walls or floor panels, or have the interior built around them:

**Power Plants:** 2 Small (0.5m\*0.75m\*0.5m)

**Shield Generator:** 1 Medium (0.5m\*1.5m\*0.5m)

**Avionics:** 1 Small (0.75m\*0.5m\*0.375m)

**Coolers:** 2 Small (0.5m\*0.75m\*0.25m)

**Gravity Generator:** 1 Small (0.5m\*0.5m\*0.5m)

**Jump Drive:** 1 Small (0.5m\*0.75m\*0.75m)

**Life Support:** 1 Small (0.5m\*0.5m\*0.25m)

**Radar:** 1 Small (0.5m\*0.5m\*0.25m)

Components that don't need to be accessed but are somewhere on/inside the ship:

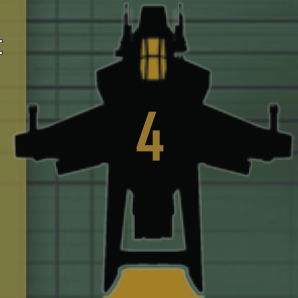
**Fuel Tanks:** 2 Medium (1.0m\*2.0m\*1.0m)

### Interior Spaces

Basic interior space for a crew of 2 to enter, walk around in, access components and access the cockpits.

### Cargo

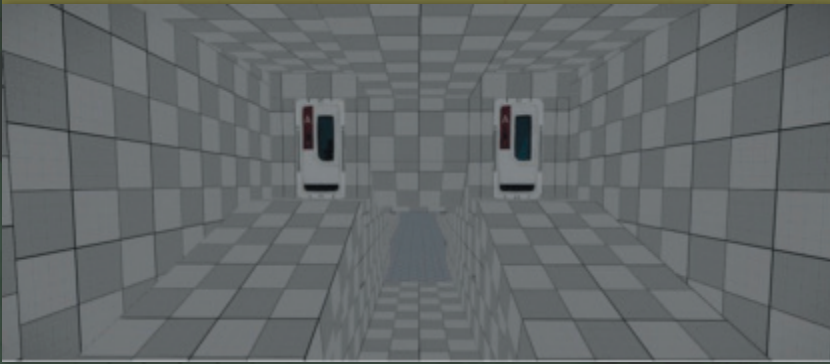
No cargo requirements.



# Requirements

## *Separate Cockpits & Ejection*

- Cockpits need to be doored off from the rest of the interior, so crew aren't exposed to depressurisation when the ramp is opened.
- This also prevents the entire interior from depressurising when a crew member ejects from the ship.
- Keeping the cockpits separate means each crew member may choose when to eject, rather than being ejected when the other crew member is.



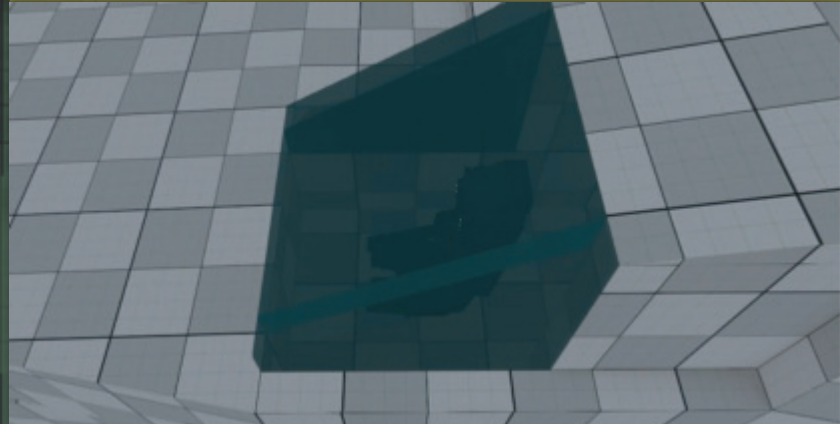
## *Cockpit View - Suggestion*

- Banu crew work closely together to merge their specialised roles. It would be nice to keep crew members in view of each other from either cockpit.



## *Ejection Capable Cockpit/Seat*

- Banu seat needs to be capable of ejecting.
- Cockpit needs quick release/open capability.
- Clearance for the seat to eject without colliding with the ship.



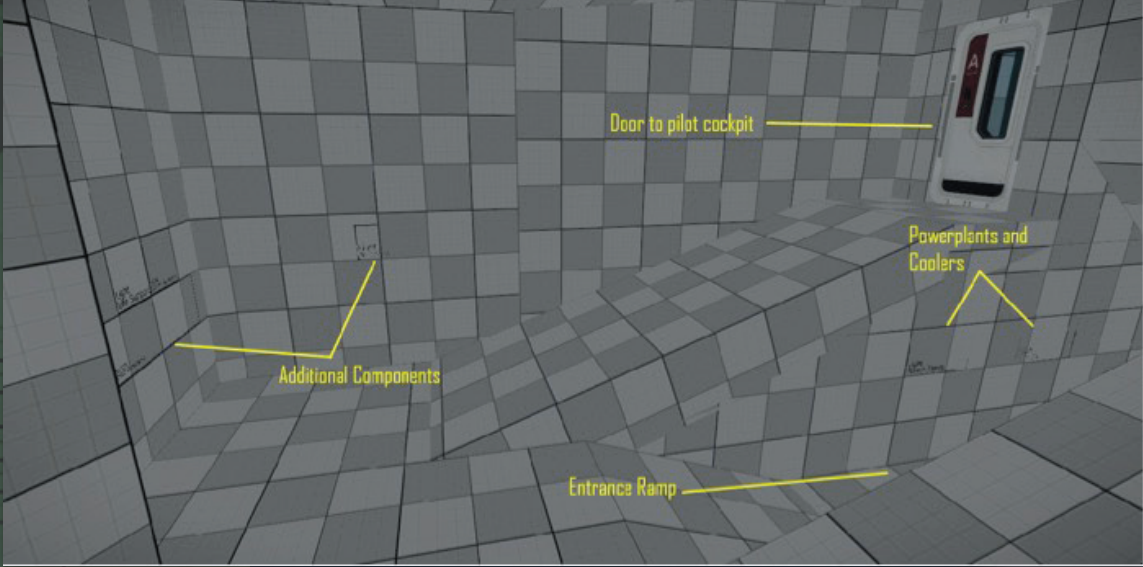
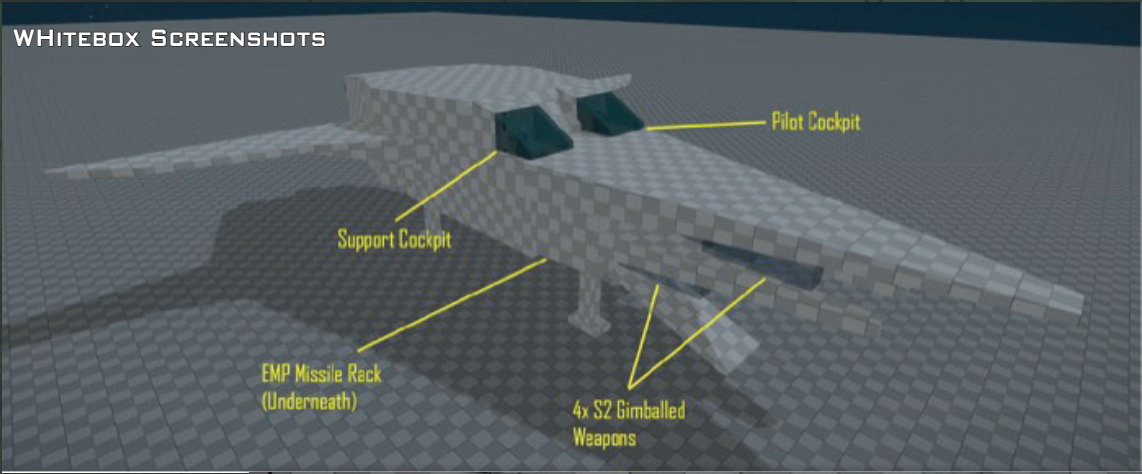
## *Support Cockpit & Controls*

- This cockpit needs to be nearly identical to the pilot's in terms of screen and UI layout.
- It needs a joystick for controlling ship weapons. No throttle required.

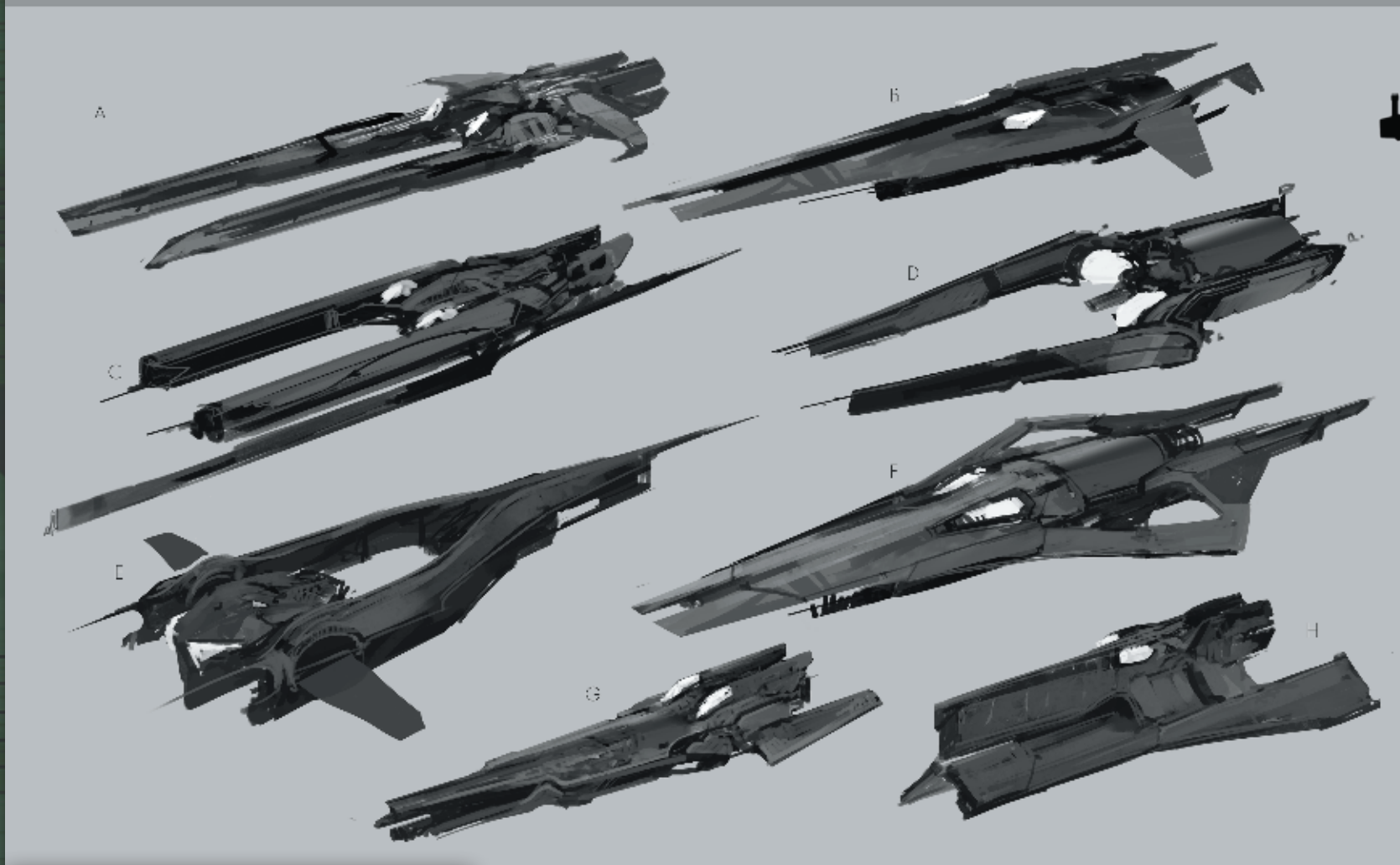


WORKING IN PROGRESS

WHITEBOX SCREENSHOTS

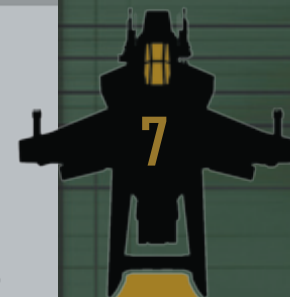


WORK IN PROGRESS



**Jan Urschel, Concept Artist:** I just uploaded the first couple of sketches. Let me know what you think! Tried to keep it somewhat familiar to the Merchantman and overall sleek and fast.

**Paul Jones, Art Director:** Sweet stuff. Uploading for CR but my pick would be F then B – will see if Chris agrees.



**Paul J:** Jan, while we are waiting for CR's response, can you go ahead and give me some more options.

Essentially we can break it down to this:

1. Has two cockpits
2. Has space for components
3. Pilot and co-pilot must be able to enter cockpits

That leaves us with quite some options ... we could essentially do configurations like this if we can find a way for the crew to enter. The components could be accessed only while out of the ship rather than having a separate room.

The whitebox model that we receive from Design is somewhere to start, but at this stage let's think outside the box some more. These are just some rough shapes I put together; add some more of your own. :D Could be the pilots are in the outriggers or in the main body. Open to ideas – keep 'em coming!

[+][Perspective][Realistic]

**Paul J, posting on review board and referring to sketches on previous page:** Banu Minuteman two-man fighter craft. My pick would be F, then B from these shapes. Will need to check the length before going further. Concept by contractor Jan Urschel.

I'm going to try to get a few more ideas that are less conventional and we can make a call.

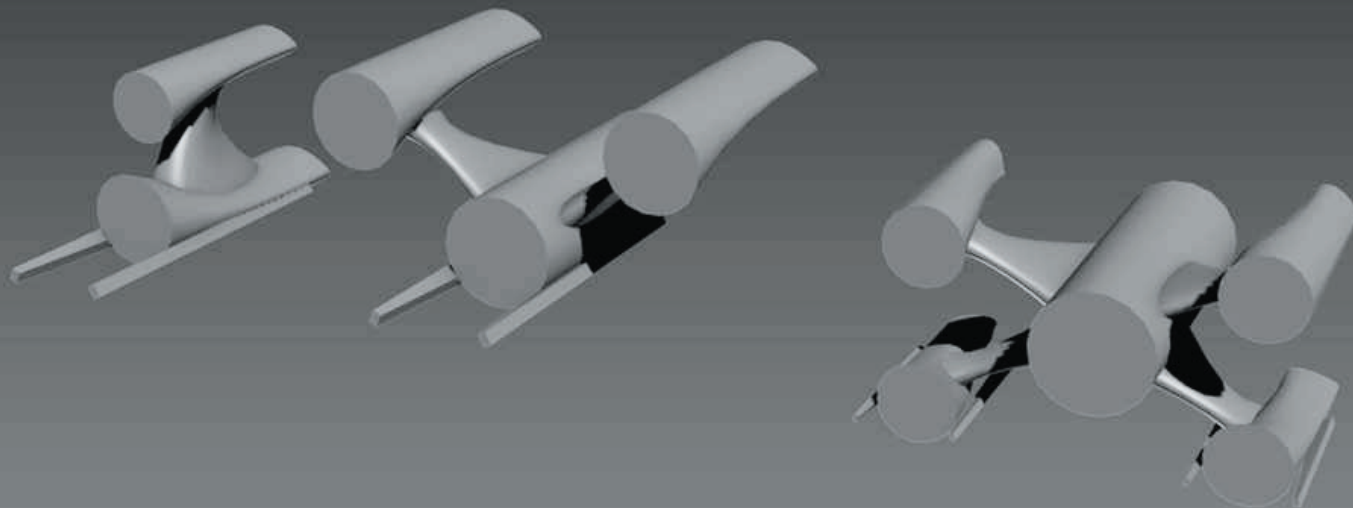
**Chris Roberts:** The Merchantman feels less angular and more organic / curved ... I feel we need some of that here ...

Of these, only E and G could be considered in this direction.

**Paul J:** Oh yeah, 100%, but adding curves at this stage is simple. I was looking more at the general silhouette, negative space and cockpit. I'll get these updated with curves. :)



WORK IN PROGRESS





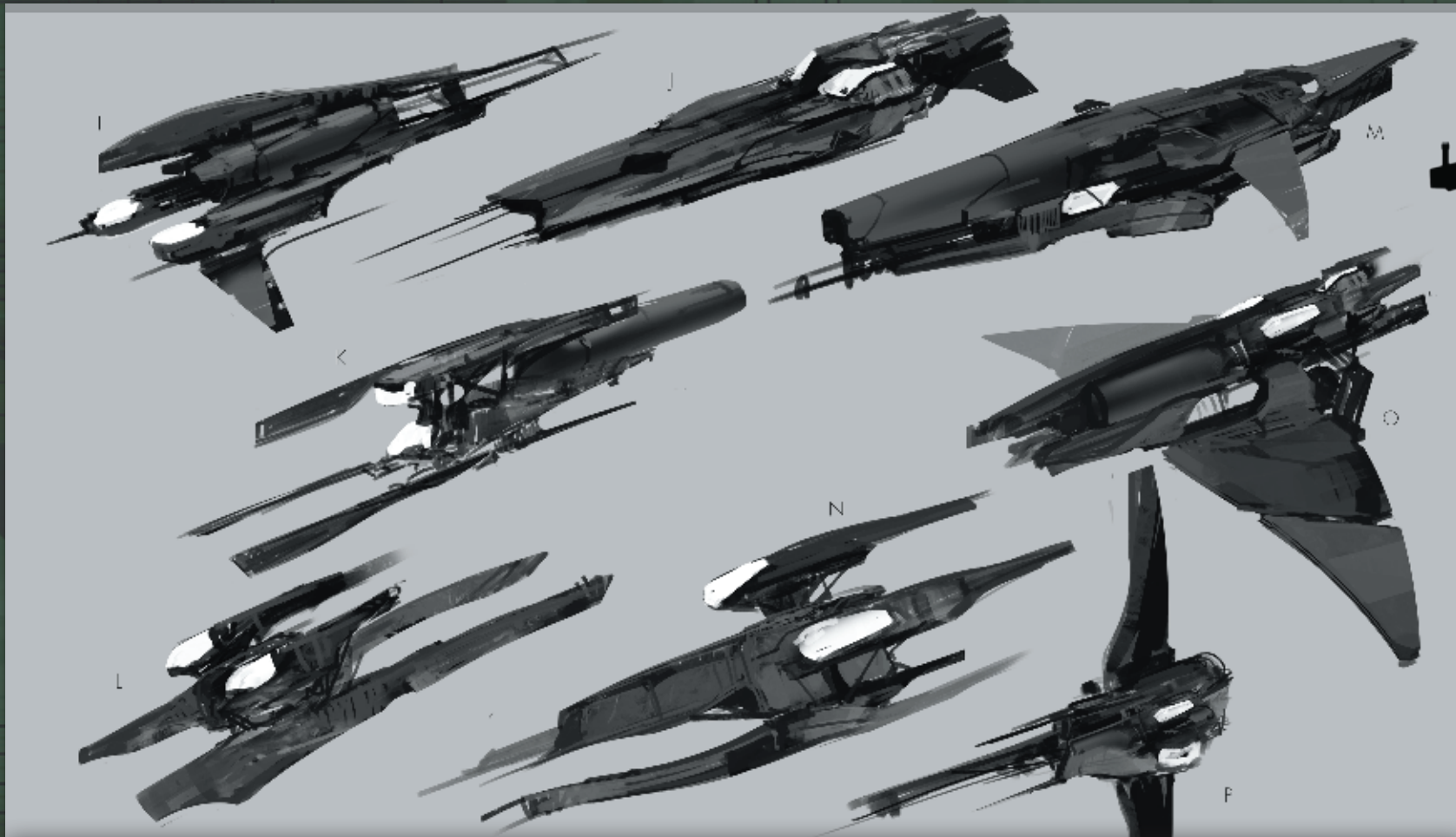
**Paul J:** The first sheet you did, can you update it so that it follows with having more of the Banu curves? I like the overall shapes but CR wants fewer straight edges.

**Jan U:** Just uploaded the new sketches [this page and next]. I made the ones from yesterday a bit more "curvy". Hope those work. Also had some straight lines in today's sketches and tried to quickly reduce them a bit.

BANU MINUTEMAN SKETCHES



WORK IN PROGRESS



WORK IN PROGRESS

**Paul J, posting on review board:** Updated 'curved' version from yesterday, plus some other designs. Talking to Nate, C, D, I and K are the current favourites and have the most potential for animation opportunities and creating a more unique Banu-shape language. F and B are still appealing, but are a more conventional shape.

**Chris R:** Is it meant to be a 2- or 1-person ship?

I like C and F, I but am concerned about the double cockpit on C and I. Also, the Banu will be taller than a Human so we may need to think about how that would affect the cockpit setup (as right now all the cockpits seems very sleek / swept back).

**Dave Haddock, Lead Writer:** It was intended as a 2-person ship, but (John Crewe, correct me if I'm wrong) part of the idea was that the 'true Banu' way to fly it would mean that the two seats would divide responsibilities/functions (i.e., they would have a trained pilot and a trained gunner/second), but their accommodation for Human sale was that a single pilot could potentially fly it (because we seem to like that).

Also, just wanted to say, there are some really cool shapes here (personally love E, F, I, K). Also like P (feels like a swarm fighter) but it's probably too similar to the Xi'an aesthetic). Just to throw this out there, my only concern about C is that its silhouette feels very similar to the Glaive.

**Paul J:** Ok, gathered feedback and thoughts. :D

1. C, F and I were the top 3.
2. The Banu are about 6' 6". CR had a concern about the fact the cockpits look swept back and them fitting – just something to have in the back of your mind.

*Next steps:*

1. Can you add a character for scale and work up these 3 loosely? It's important that the ship isn't too long – we do have leeway in the dimensions from the brief, but we should try to keep it close to that and see what the ramifications are.
2. Looking for animation opportunities: would like to see ideas for landed poses, where the ship alters its shape. For example on C, Nate thought this knuckle joint felt like it could be something that rotated on landing, come up with some options for each one. Things could split, rotate, whatever you think is cool at this point.
3. Would still look for them to be entered via a ramp into a central room which all of these highlighted designs could achieve.

*For future:* Here's a list of things that will need to be solved by the time the ship is complete

1. Overall shape, design language, colour and materials, lighting (ships need spotlights and running lights)
2. Landed position, length of ramp, max angle of 30° if it's a ramp. If it's steps, then 25cm rise and 50cm run.
3. Main thrusters and manoeuvring thruster positions (generally best if placed in an equal and opposite position).
4. Landing gear – front and rear often different.
5. Position of weapons. Designers always like it if you can see your weapons firing, but not a deal breaker.
6. Ship has space for components and locations defined.
7. Cockpits: need to provide a rough blockout of cockpit interior, proving that the pilot/co-pilot can see clearly or clear enough with a 55 FOV lens.
8. Cockpits need interior definition with an idea of shape, design, colour, materials, lighting, buttons within reach.
9. Promo images: In flight cruising, landed, in action, cockpit interior (and co-pilot cockpit if different), central hub room, schematic sheet showing landed/in flight and any special features.

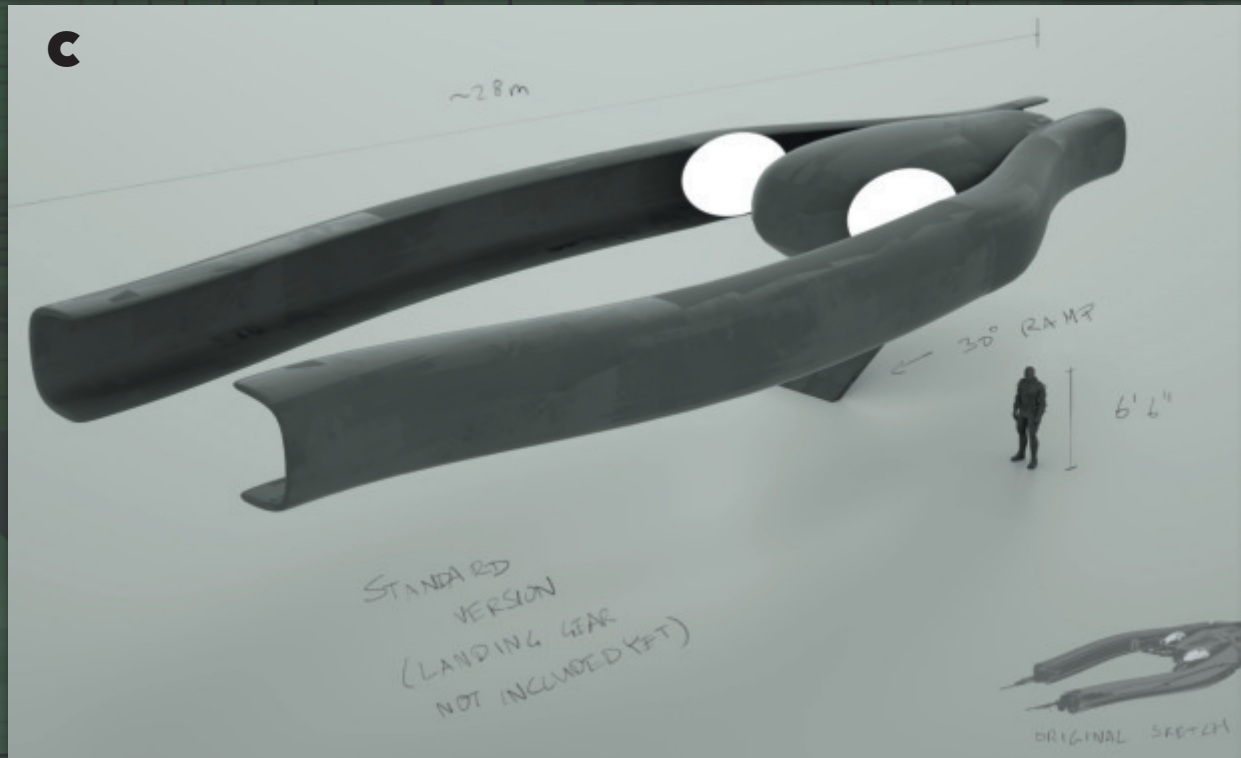
Holler if you have any issues/questions.



WORK IN PROGRESS



WORK IN PROGRESS

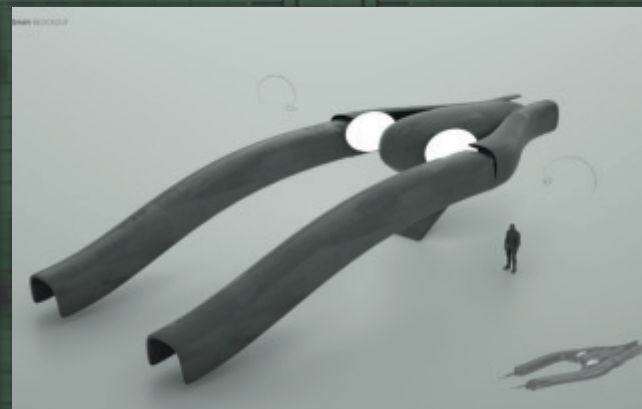


**Jan U:** I decided to take the 3 ships and block them out to figure out the essential shapes and volumes, taking into account the measurements you provided. I simplified them to get to the essence so to speak. Hope that is ok. I adjusted the proportions quite a bit to improve the overall look. The white orbs are the cockpits. I made sure the pilot in sitting position will fit inside.

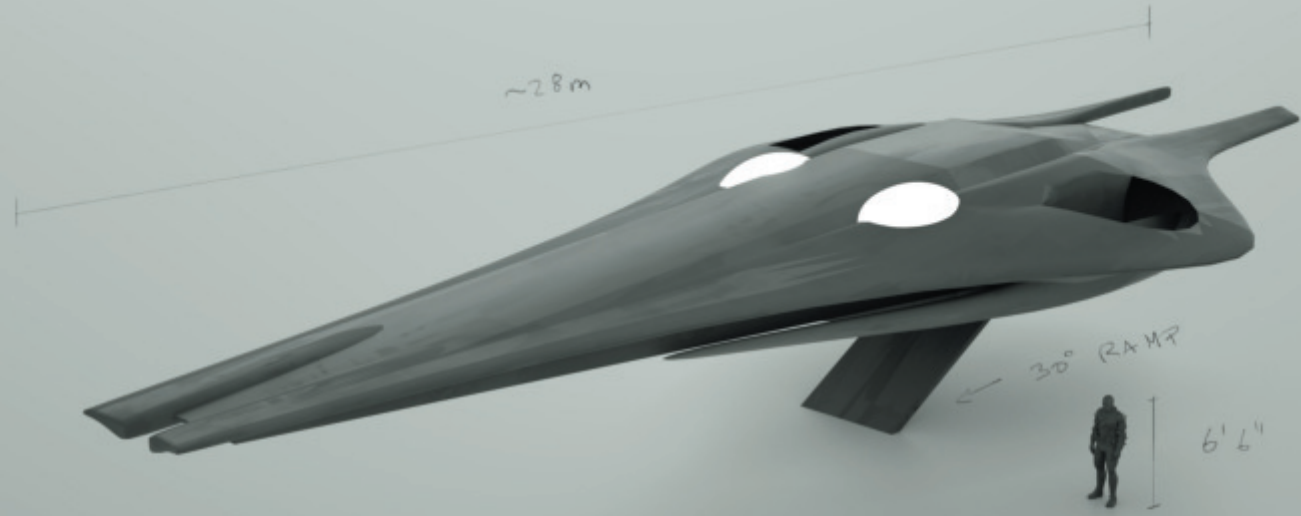
Did some quick variations for possible landing scenarios as requested. I scribbled some notes where necessary. None of these include landing gear yet, btw.

After blocking them out I do think C and F would work pretty well and also look quite sleek and nice. Not so sure about I. It gets bonus points for strangeness I guess, but overall might not be as pleasing and functional as the other ones. Also I think making it shorter to fit within the boundaries of the requirements made it lose some appeal. Internally it might also be a challenge to accommodate everything we need.

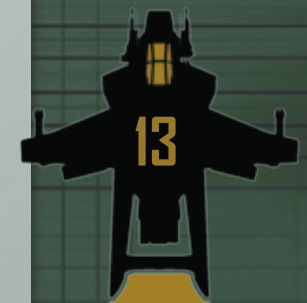
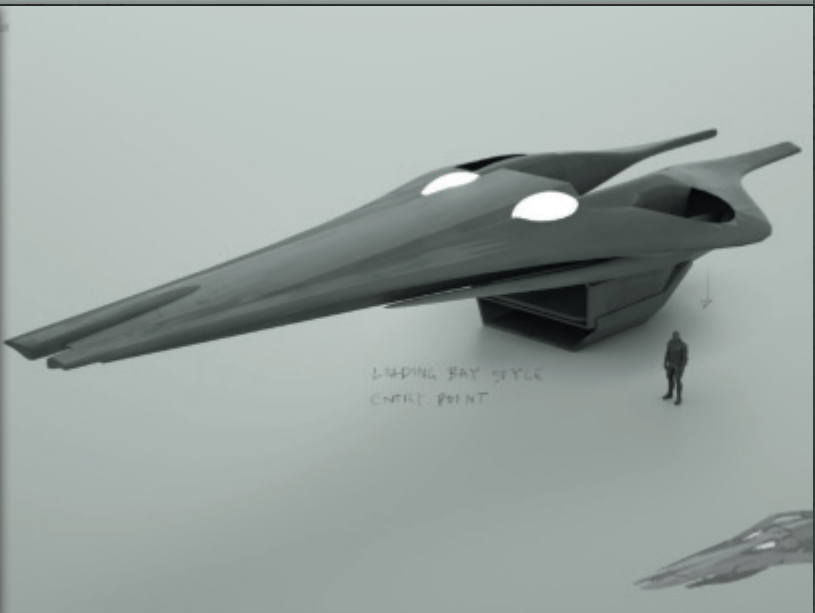
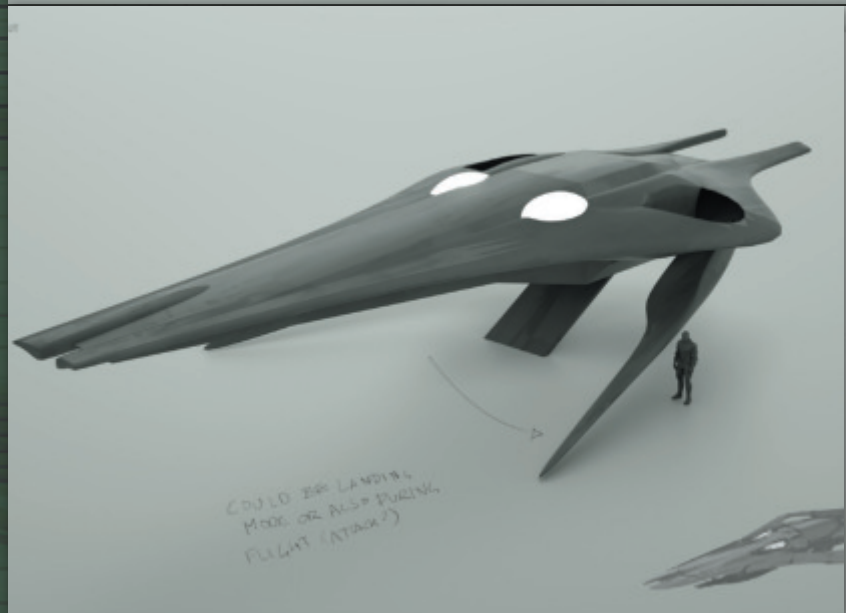
In the end I do prefer the simplicity of the other two designs.



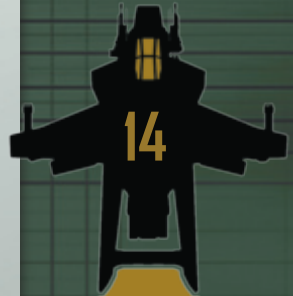
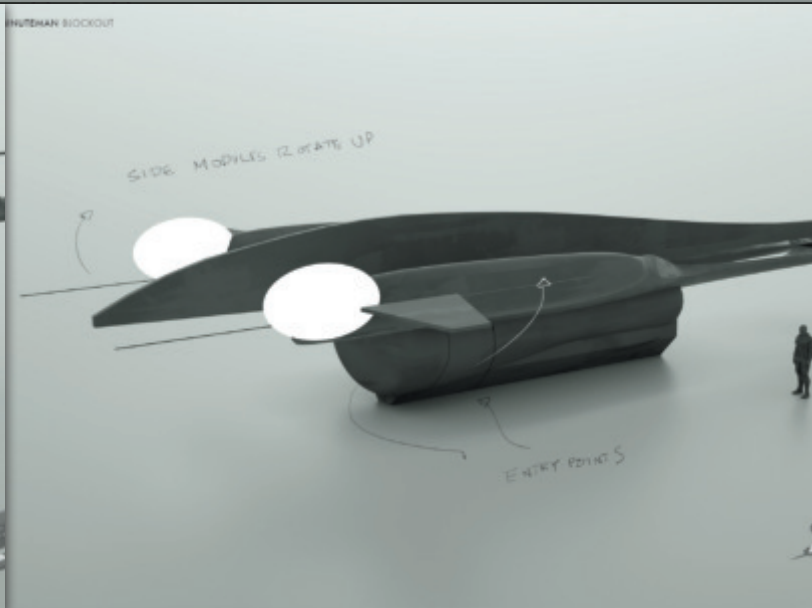
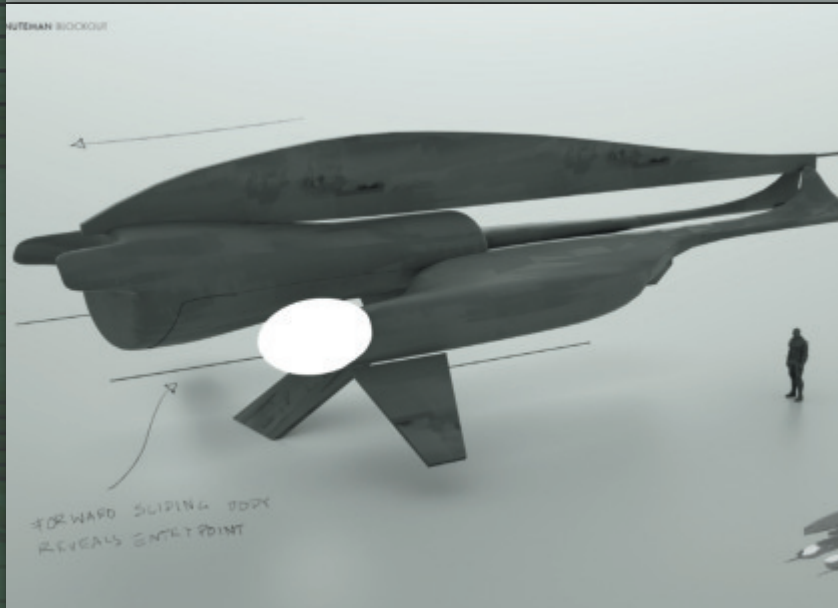
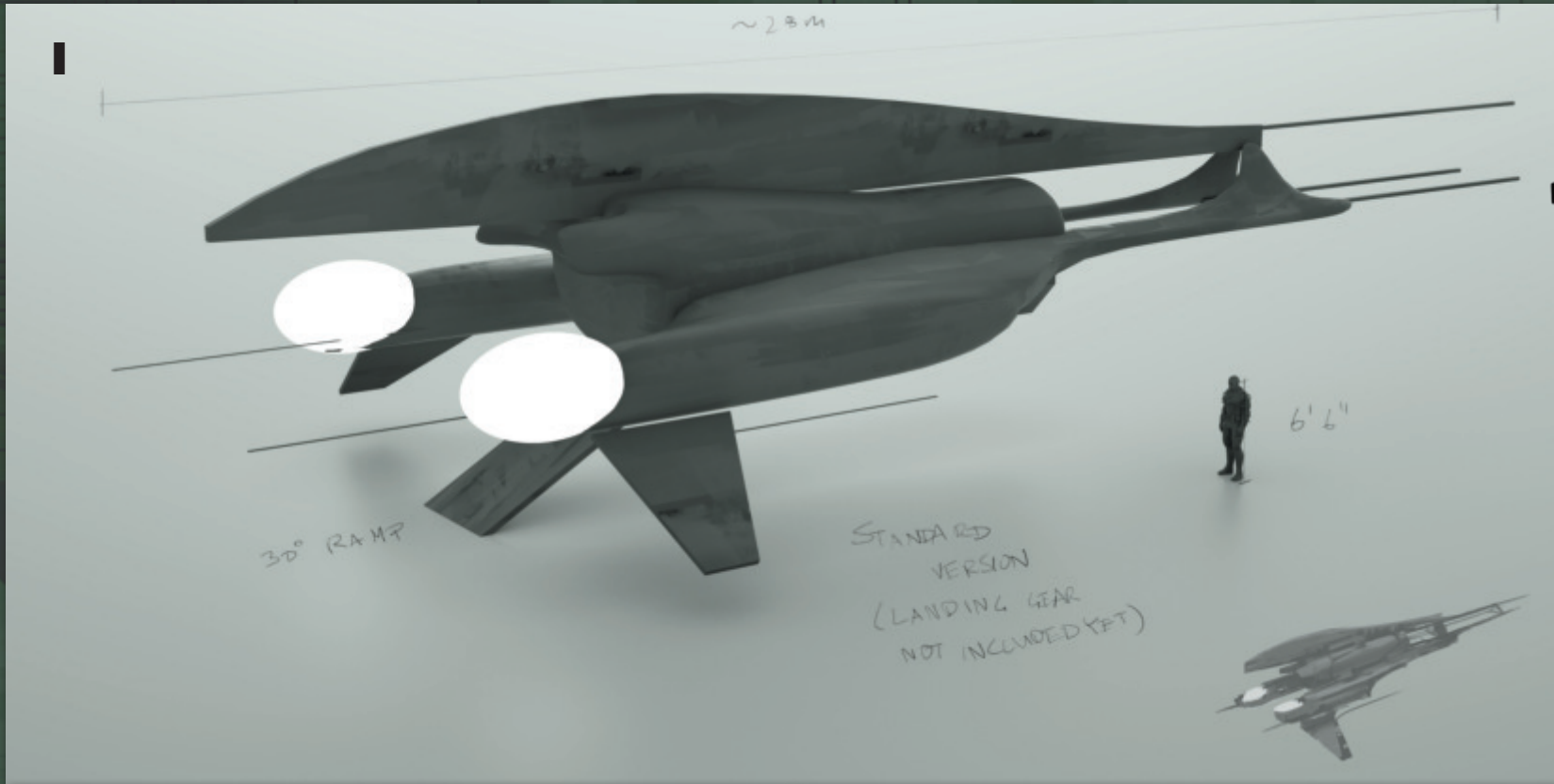
F



STANDARD  
VERSION  
(LANDING GEAR  
NOT INCLUDED YET)



WORK IN PROGRESS



WORK IN PROGRESS

**Paul J:** Yes, have to agree with you there, C and F are the main contenders. :)

I think F is almost a no-brainer and a good fallback, but would like to have both pushed some more, especially C so we can figure out if we go with it or F.

### OPTION C

I like this ship, but currently it isn't speaking Banu to me. I'd like to get more of almost art deco curves to it; the basic 1st read shape is quite distinct but placed next to the Merchantman, I don't feel it's quite fitting. I wouldn't want it to go all crazy and over the top, just some more dev to the arms and how we can make them sit better with the Banu styling.

The arms look good with the line work that was in the initial sketch, but when that is taken off them, the funda-

mental shape is not elegant enough. The cowlings over tech feel is good; it's the shape of the cowlings that I'd like more sketches of.

Also would like to see if can have a visual representation of the Banu crest. The Merchantman has one. :)

Guns or tech that folds out are also something to take into account. The traders like to appear innocent, but can fully deploy weapons if the need arises.

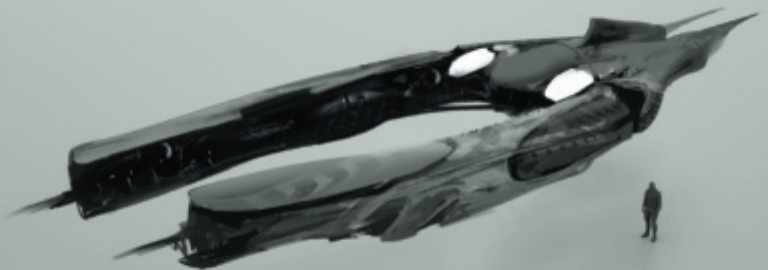
See what you come up with. If this is all confusing let me know and I can talk through it.

**Jan U:** Sure, I'll push them both a bit more, with focus mostly on exploration of C if I understood that correctly. :)



WORK IN PROGRESS

S&B W&P/THAN 8/20/07



**C1**

**Jan U:** Just uploaded some further sketches. Hope there's something you and CR both like (and hopefully it's the same :)).

S&B W&P/THAN 8/20/07



**C2**

S&B W&P/THAN 8/20/07



**C3**

S&B W&P/THAN 8/20/07



**C4**



**F1**



**F2**



**F3**



WORK IN PROGRESS





**Paul J:** Ah, great stuff!

Typical though, after seeing some of the wilder stuff, we prefer the cleaner look. C3 and C4 seem the best blend to us; just waiting on direction from CR once he reviews them.

The biggest issue will be cockpit visibility and checking that it all works. They might have to be raised up a bit.

The second issue will be stability when landed and making sure the ship can balance – I've attached the preferred landing stance at the moment. It will be interesting to see how you make it sit. :D

**Paul J, posting on review board:** We'd like to push in this direction if we can, Chris. It's got an iconic shape, integrates the softer art deco shapes and lines that we'd like to push onto the Merchantman too, and the exposed areas of tech under the crafted bodywork (two quite similar versions, one with more exposed tech). Also an interesting landing pose that we could do a lot with. Cockpits will need to be well thought out so that visibility isn't a major issue, but after this we'll start blocking it out more in 3D.

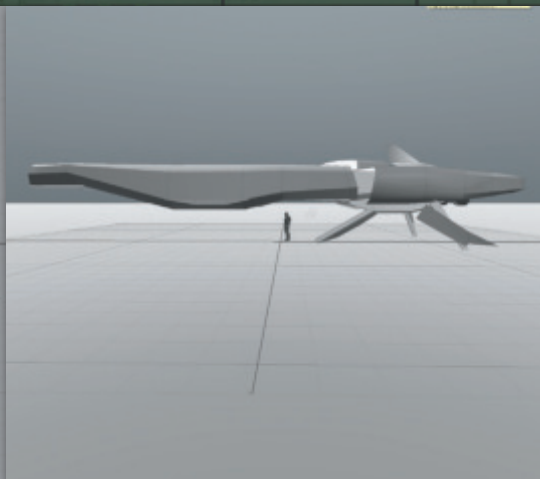
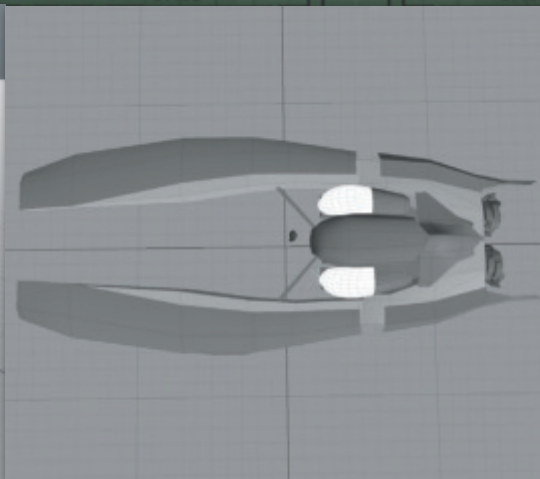
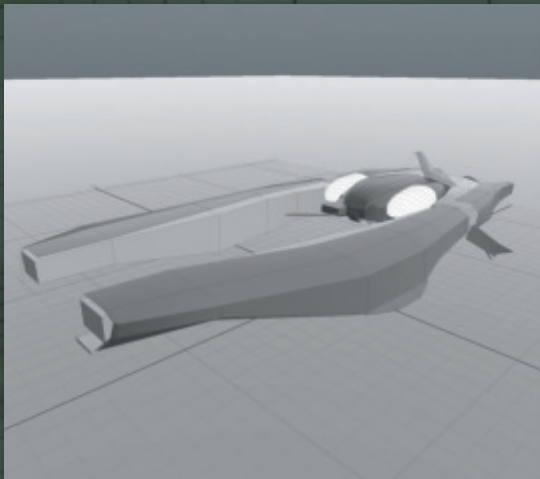
**Chris R:** I think C4 is my pick.

**Paul J:** Roger that.

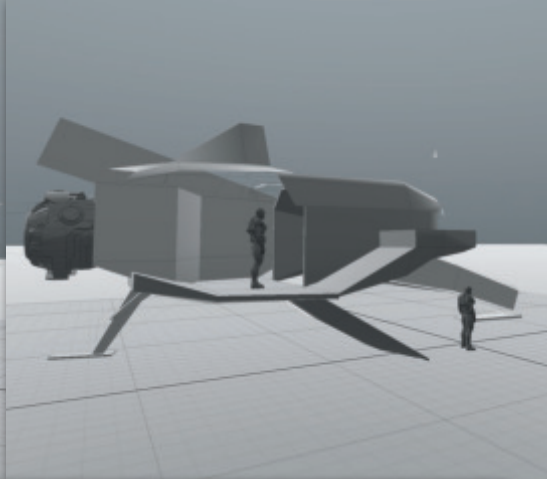
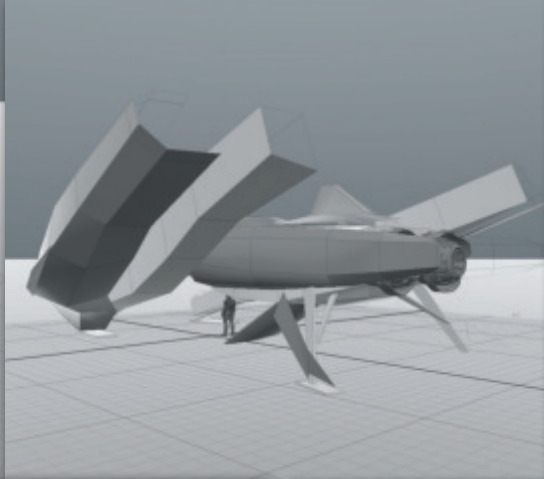
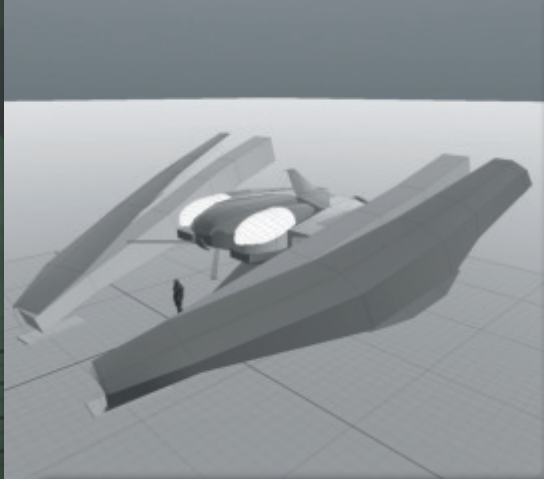
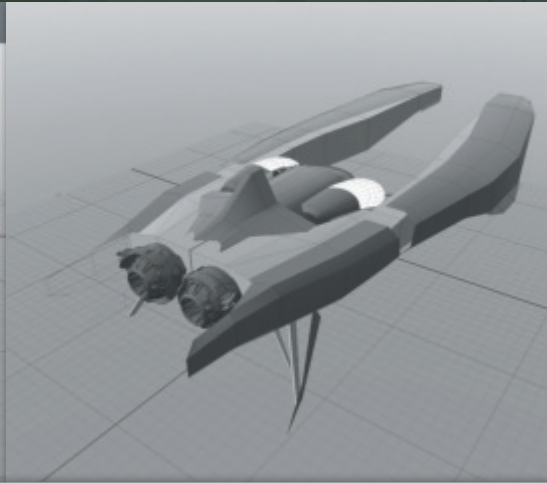
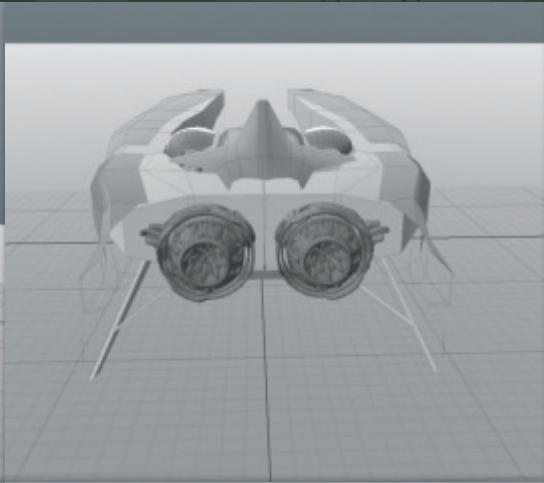
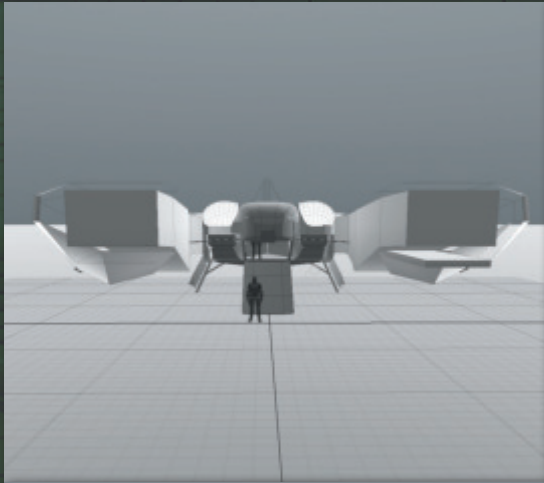
**Jan U:** Thank you for the notes.

I started the blockout for the ship and uploaded a variety of exterior and interior shots. Mostly exterior since it's the focus for now, but of course we need to make sure everything fits inside. :)

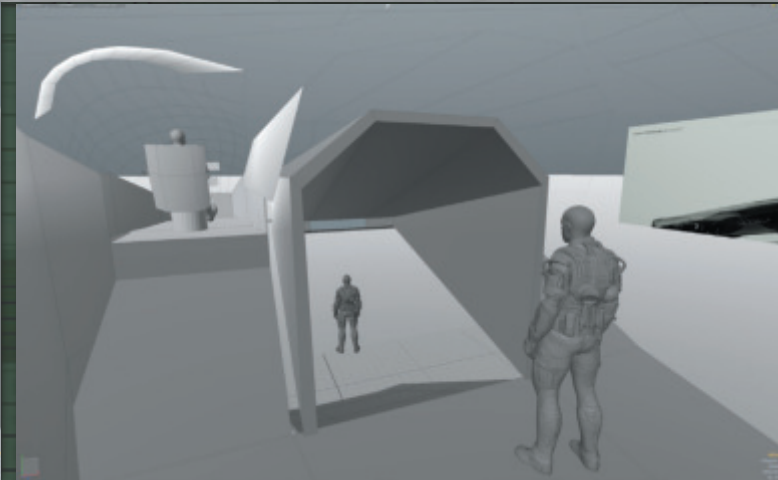
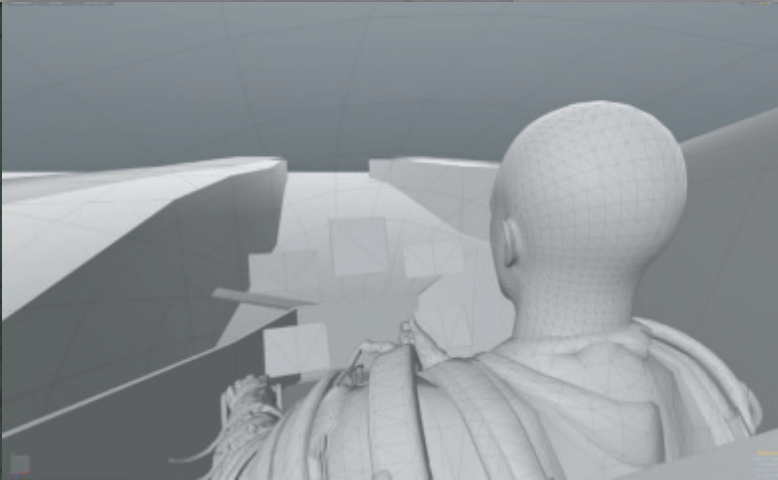
Let me know if you have any notes on the current stage in terms of shapes and proportions. *[this page and next]*



WORK IN PROGRESS



WORK IN PROGRESS



**Paul J:** Looking cool, like the split arms in the landed pose.

Can you also provide an image from the pilot and co-pilot's line of sight to see how much they can see of each other, as that's something we'd like to achieve.

Can you do a quick placement on the guns too?

Otherwise, crack on until I hear more from Nate.

**Jan U:** Just a quick update today. Worked mainly on smoothing everything out and adding some major cutlines. Not as much progress as I'd hoped. I added the gun and missile models you sent me. I was a bit confused about the size of the missiles, as the imported model seemed very small (about 1m in length). I thought I had found something

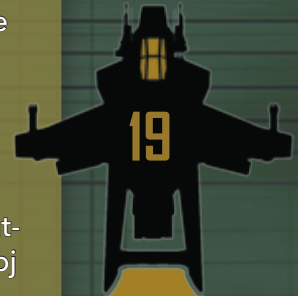
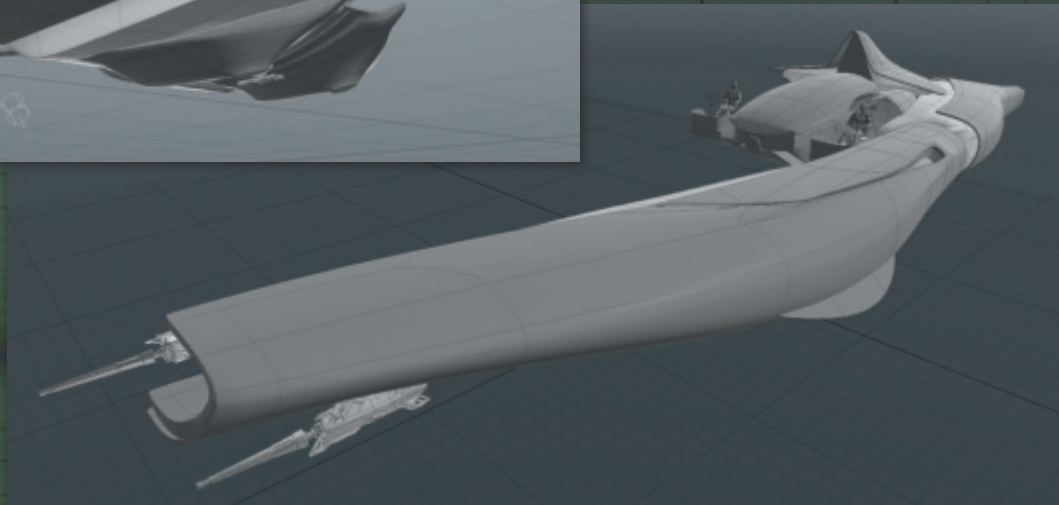
online that stated the S1 missiles are indeed this small, but it looks a bit comical on the underbelly of the ship. Maybe you could advise.

Also added a shot from the pilot's eye level. What focal length do you use in game? I can adjust it to that and send you a more accurate screenshot.

**Paul J:** So as it turns out the missile sizes have been updated. I've updated the design doc and also uploaded an .obj of the new missiles with racks.

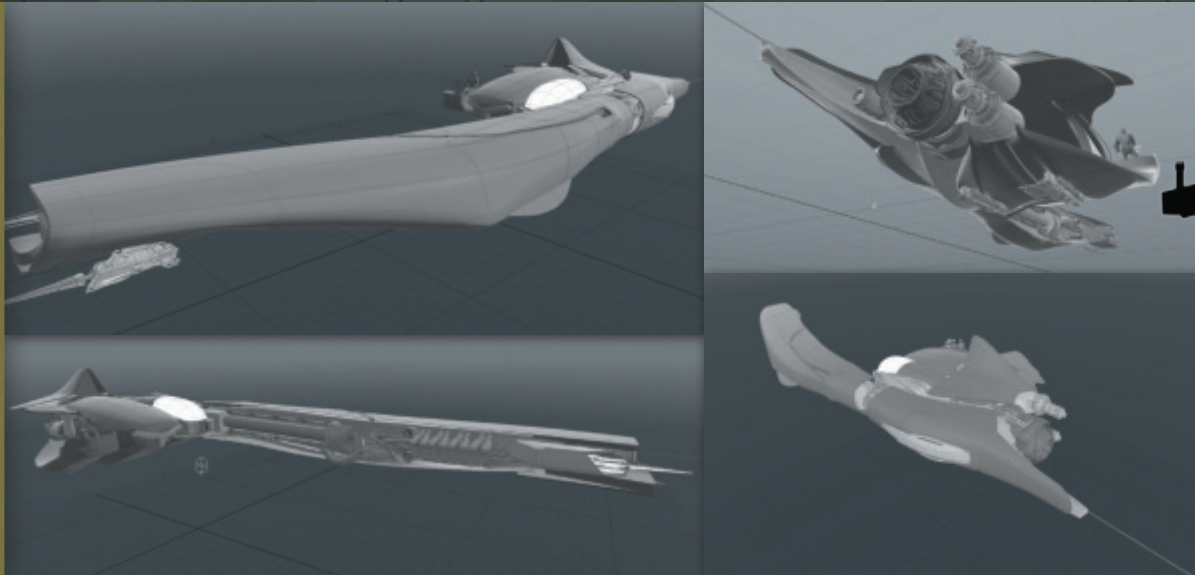
So it's now 2xS3 racks with 2xS2 missiles. The spacing in the .obj between the two units can be altered to suit the ship.

FOV I believe is now 55.

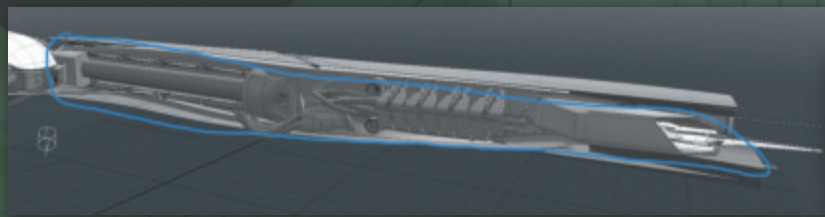


WORK IN PROGRESS

**Jan U:** Thank you for the updated info. I did a first detail pass today. I will expand a bit on that tomorrow and then provide a bit more complete update, with the full ship in flight and landed and also a first quick stab at a material render. Is there any info so far in terms of materials and color scheme from the Merchantman or otherwise that would be good as a starting point?

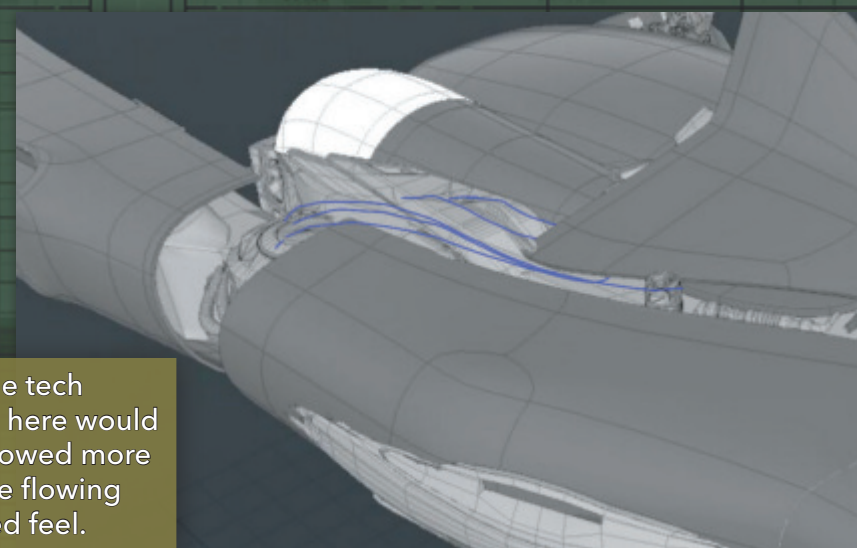


WORK IN PROGRESS



**Paul J:** I feel the 'tech' could do with a bit of shape work, so that it's a little less junky and mismatched. For example, the pod the weapon is in is a heavy box with chunky bits around it, etc. I know it's WIP, but wanted to point that out.

**Paul J:** Also, thinking that since this area will very much be in the player's face so to speak, it would be good to have a structure (dark so that it matches your concept sketch) so that there is a more multi-layered feel and also help to integrate the tech.

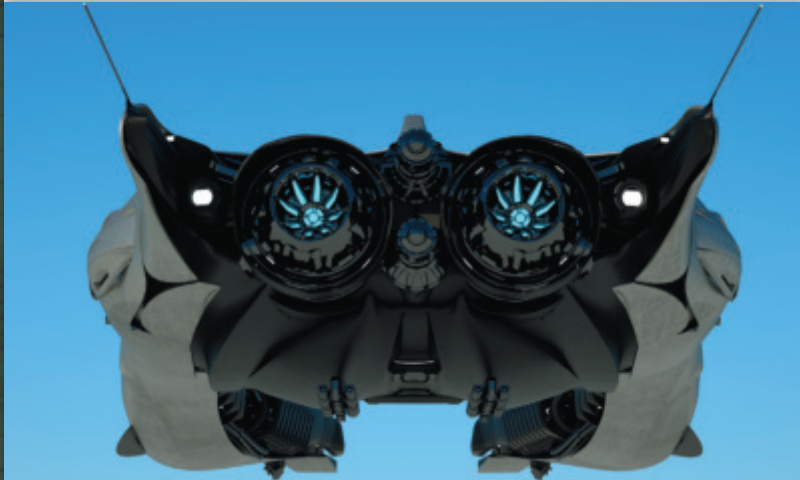
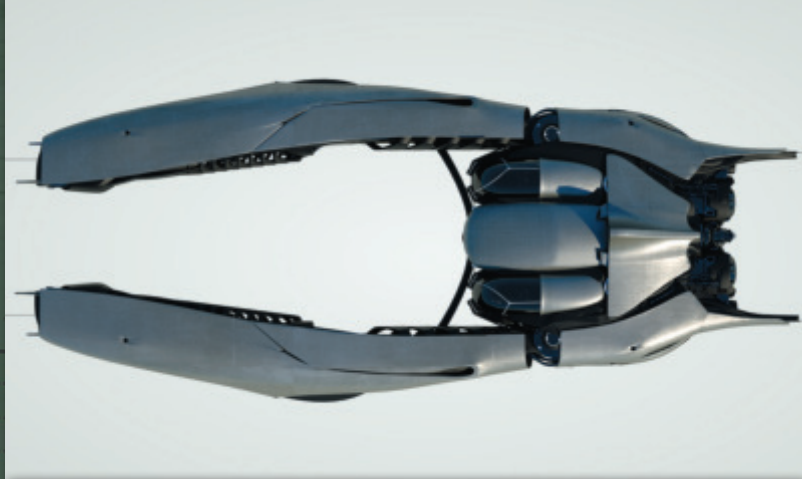


**Paul J:** Thinking this kind of colour for the outer skin.

**Paul J:** Also the tech under the skin here would be good if it flowed more to reinforce the flowing nature/sculpted feel.



Jan U: Those were some great pointers, thank you!



WORKING PROGRESS



**Jan U:** I added a few more details today, but mainly worked on the shaders, did some nice renders and added the landing pose.



WORKING ON THE

**Paul J:** Looking good, waiting on CR's feedback.

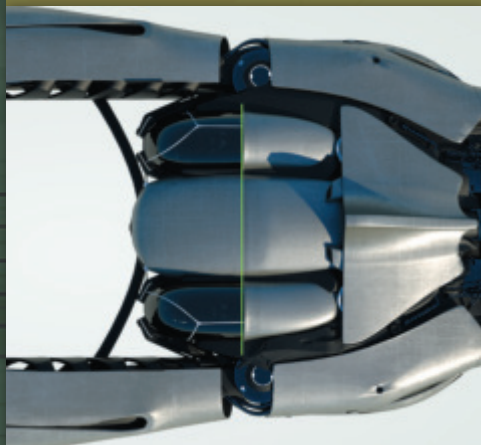
Can you provide some orthos, please, so it's clear the exact angles of everything?

Also can you try a more gold version and also work on selling the art Nouveau panel lines? Mine reads a little sporty, but you get the drift. :D

And need a shot from the underside (in flight and landed).



**Paul J:** This area – they feel like they could do with a more interesting shape, rather than a hard line.



**Paul J:** Maybe a slight curve here.



**Paul J:** Like these defining lines, but material and lines I feel are too early to really make a judgement call. Would like to accentuate that crafted feel (see top image).



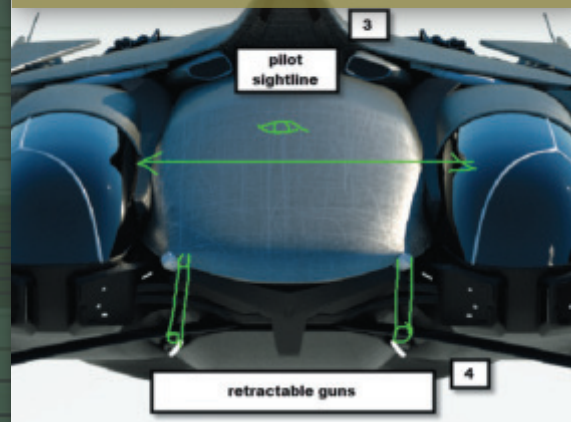
1. Maybe we can have a slightly wider and more ornate glass structure that leads onto the central body? Depends on the lines it makes, will let you explore.

2. Sight lines: designers are still bothered that you can't see your buddy enough.



3. Same as 2.

4. This would be a good area to put two of the guns, then the pilots will see them blasting.

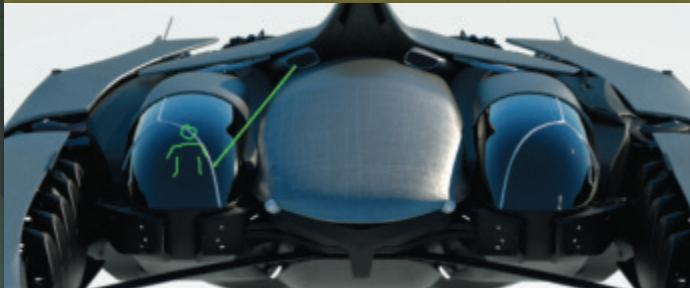


WORKING PROGRESS

**Paul J:** Suggest we move the pair in this location.



**Paul J:** Just noticed – this canopy line will interfere with the pilot's sight. It will need relocating.



**Jan U:** I adjusted the lines that you mentioned and did a redesign of the cockpit and hood, with more curvy lines and lowered front so the pilots can see each other better and to fit the more art nouveau lines. It also has a continued canopy glass in the middle now.

Furthermore, I adjusted the color a bit, added a bit more detail, fixed some geometry and added little color accents (tiny ones) here and there.

I uploaded some orthos and a few new shots. I didn't get around to transferring the changes into the landed pose, so I'll do that next and we can probably expect some notes from CR, I assume. *[this page and next]*

**Paul J:** Ok, cool stuff!

I would say that the finish reads more like paint than a metallic surface, which is what I'd prefer. Also, the art nouveau lines feel like camo rather than accentuating the lines of the ship, if you can fix those too, please. :D

Shaping up good!



WORK IN PROGRESS

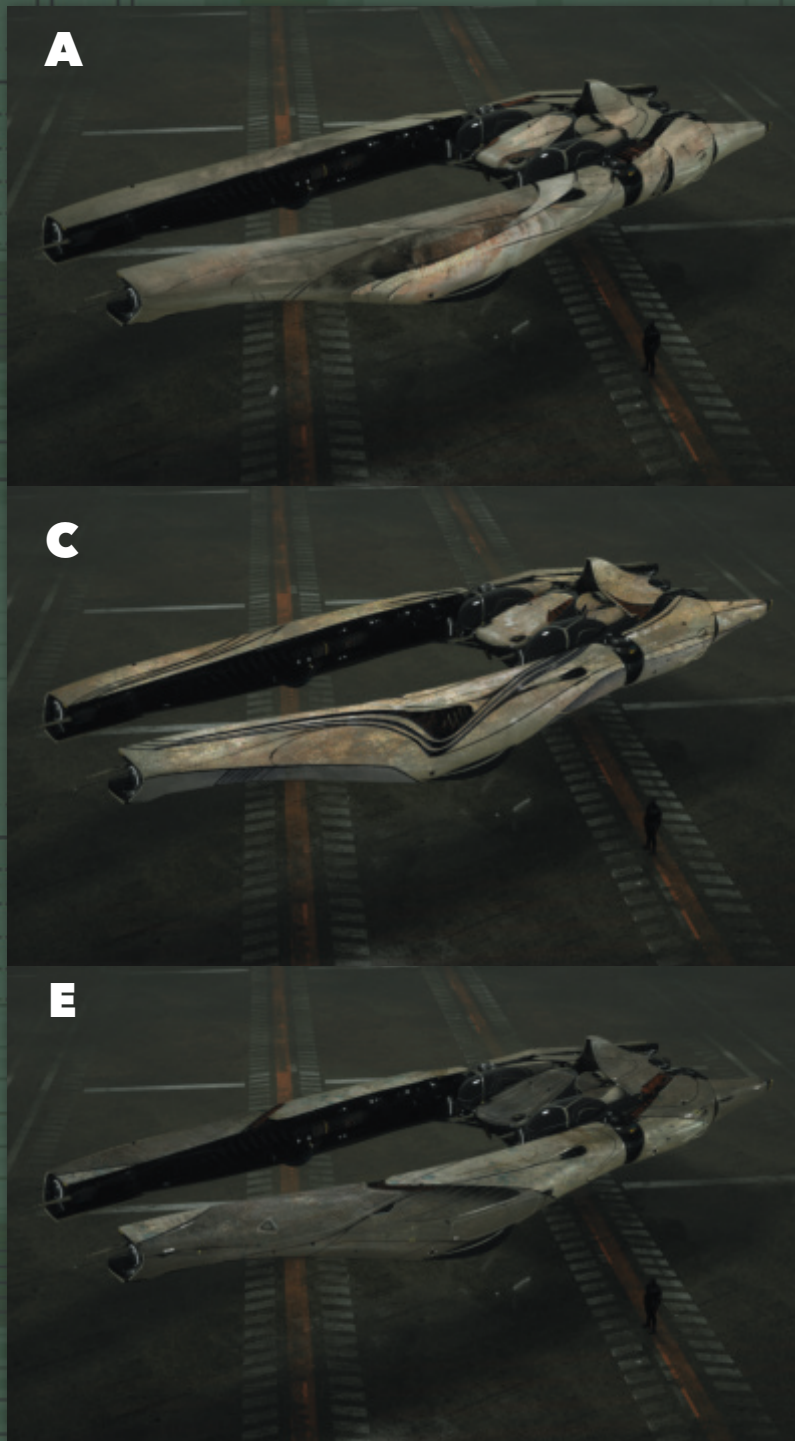




WORK IN PROGRESS

**Paul J, posting on review board:** Chris, some loose options from Jan based off the Merchantman, though we are both a little unclear on what the Merchantman materials are. It looks to have a scale/hex/polymer for the lighter areas and some material that's darker. Anyway, i think some of the lines are cool from C, but the patina and aging have gone too far. We also added a clean base version that I would say is the right colour for Banu. Anyway, let me know.

**Chris R:** I would say A or C for me.



WORK IN PROGRESS

**Jan U:** I dropped a few new images. Tried different materials. Also uploaded a top and bottom ortho from the landed pose.

Let me know if you'd like to continue with the cockpit next.

**Paul J:** Yep - move onto the cockpit for now, we'll cycle back on the exterior finish. :D

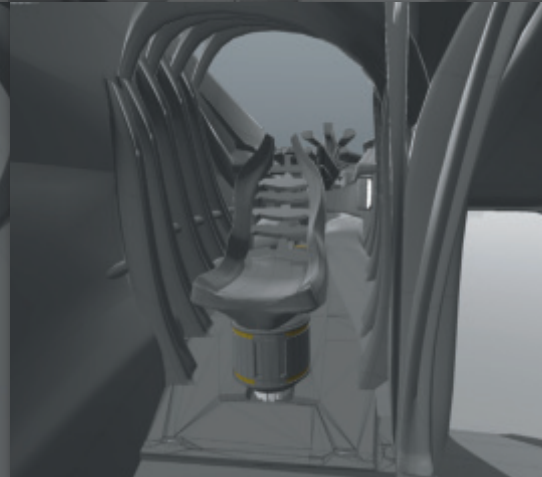
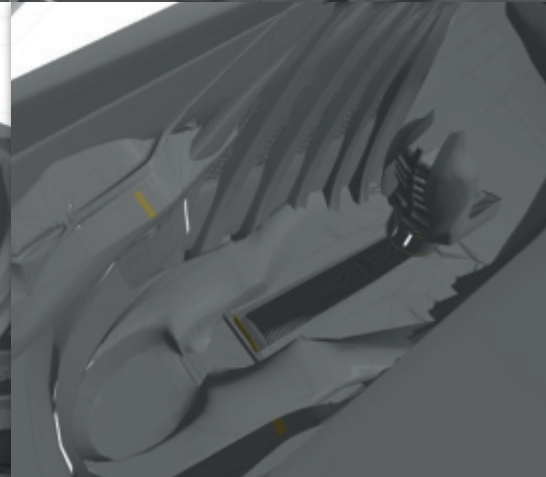
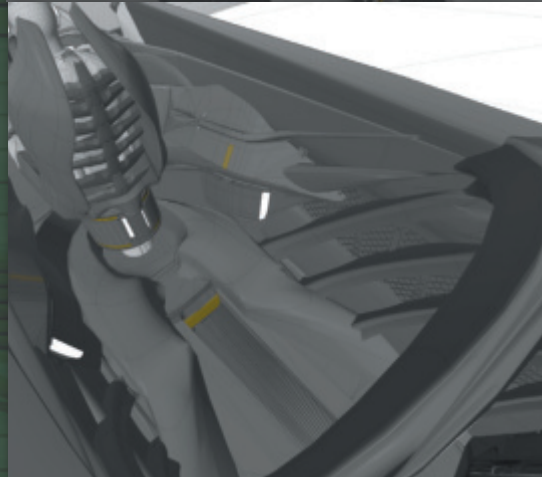
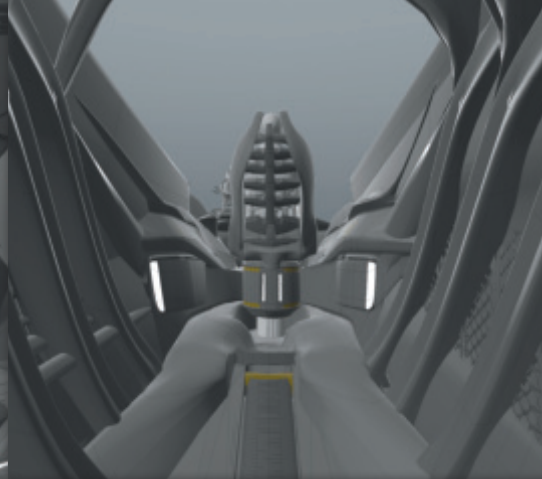
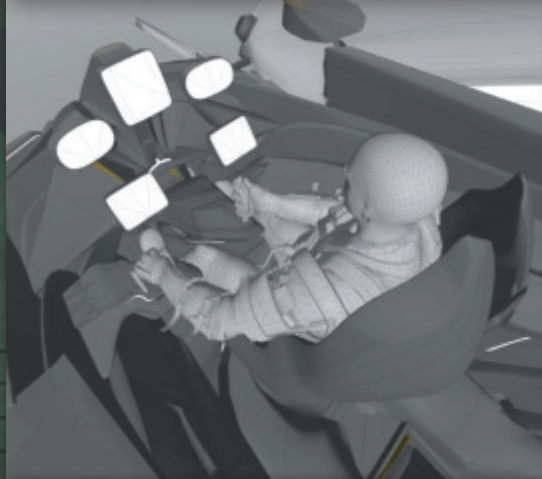
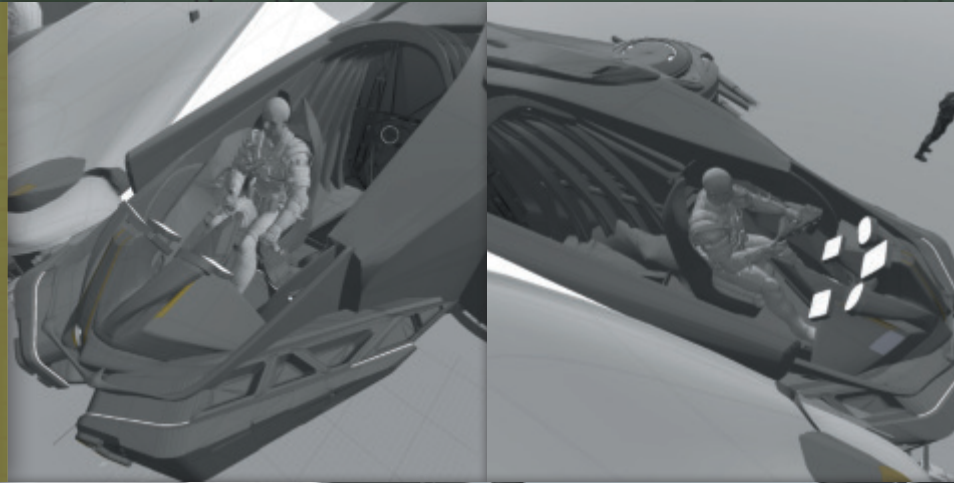


WORKING ON THE

**Jan U:** I started a cockpit blockout, trying to get the sculpted + mechanical look translated into the interior.

For the entry mechanic I thought since the interior is quite narrow that the seat rotates and moves down to the pressure door where the pilots can sit down. Once they sit, the seat moves through the "neck" and puts them right in front of the controls. The last two screenshots show the seat in the lowered position.

I have a joystick, throttle and the 5 screens. I think that's all this cockpit is required to have.



WORKING IN PROGRESS

**Paul J:** Looking cool. I have some feedback.

On the exterior CR had a comment: "Surfacing wise this is feeling too metallic / clean compared to the look of the Merchantman."

Would suggest you do a paintover on one of the angles to bring it a little more into line and try a few new ideas. 2D is certainly faster than 3D. :D

**Jan U:** Yeah, I also feel that some secondary surface break-up would help to bring it a bit closer to the other ship. :) So we're stepping away from the metal material? It's kind of hard to tell what really is going on material-wise with the Merchantman.

**Paul J:** From what I gather, it's this:

- Make less glossy, so more of a matte/satin finish
- Some patina/ageing

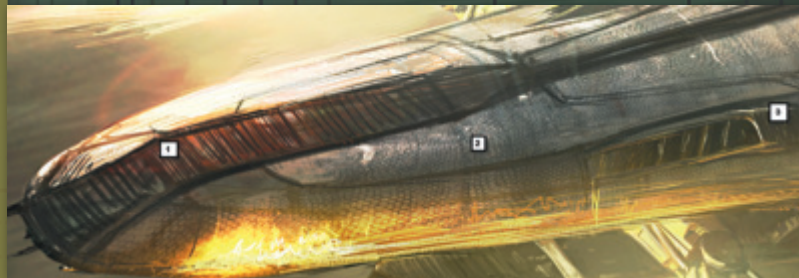
Needs some more nods to the styling of the Merchantman. By that I mean a few key things at this stage:

1. Ribbing
2. Patina (subtle though)
3. Vents

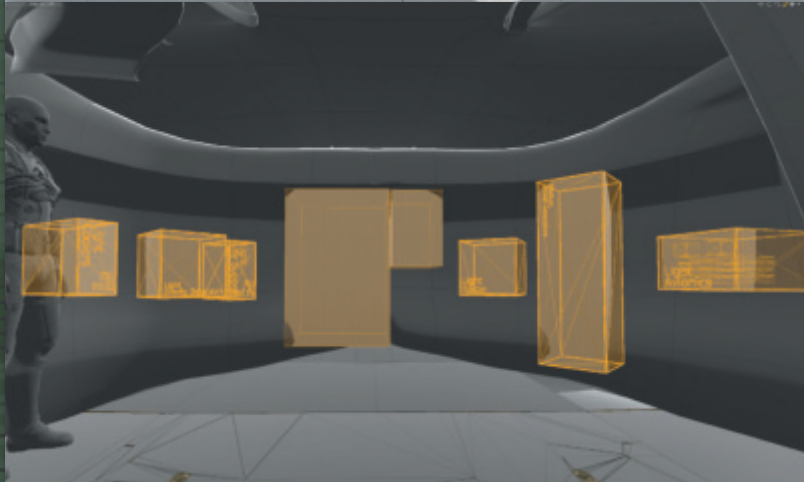
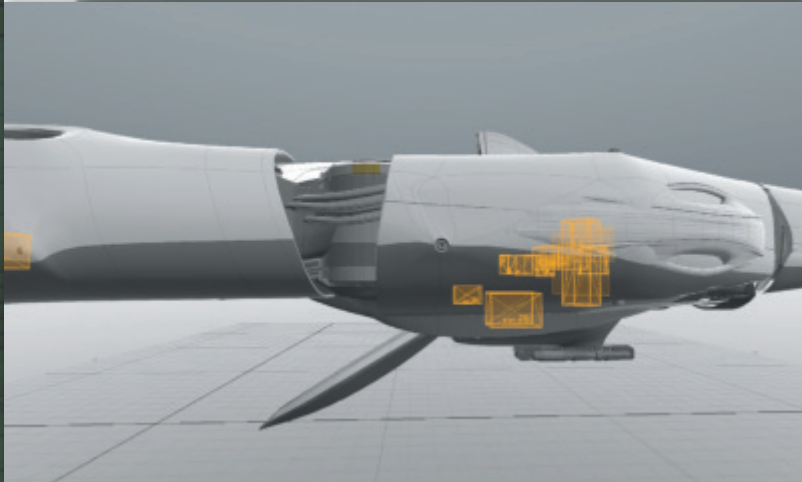
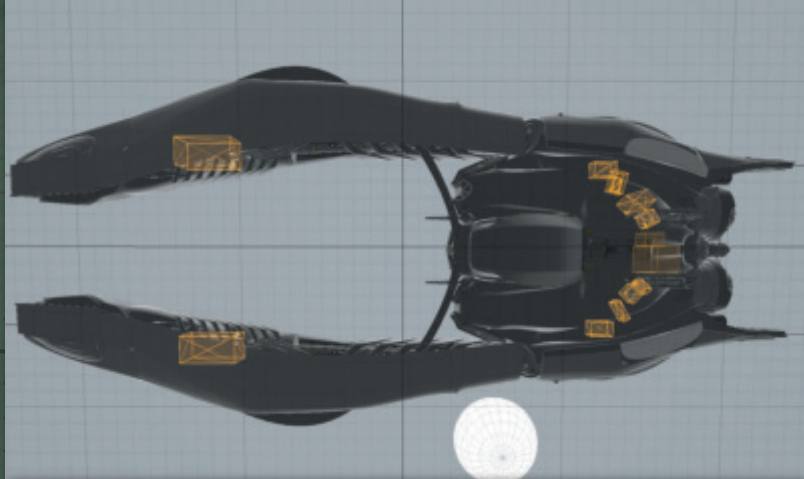
Then lets see where we are at.

**Jan U:** I did some work on the exterior shader and the cut-lines/material breakup. Please have a look at the renders. I wanted to give the cockpit something more tangible and less clean and thought it would be interesting to have a go with the reptile fish skin to get something more alien looking.

I also did a placement of all the components we talked about Friday. The all fit in very easily, as you can see in the screenshots [*this page and next*]. The fuel tanks are in the wings, the power plants slightly lower in the back (either accessible from outside or inside) and the rest of the items are in the main interior hallway.



WORK IN PROGRESS

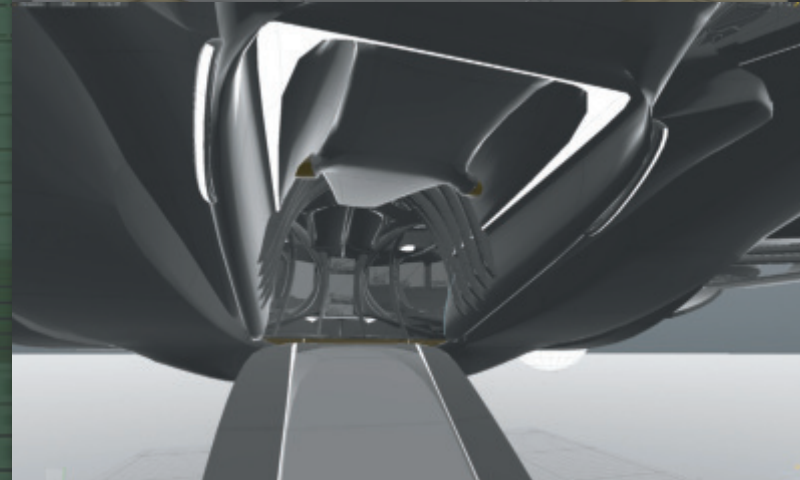
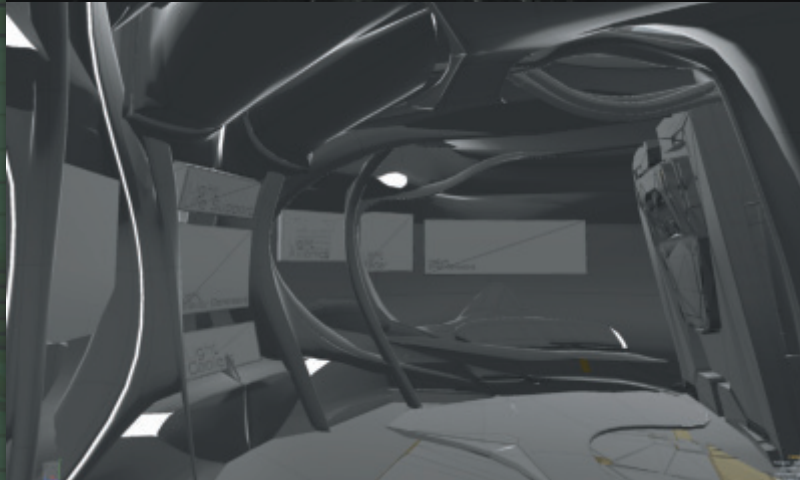
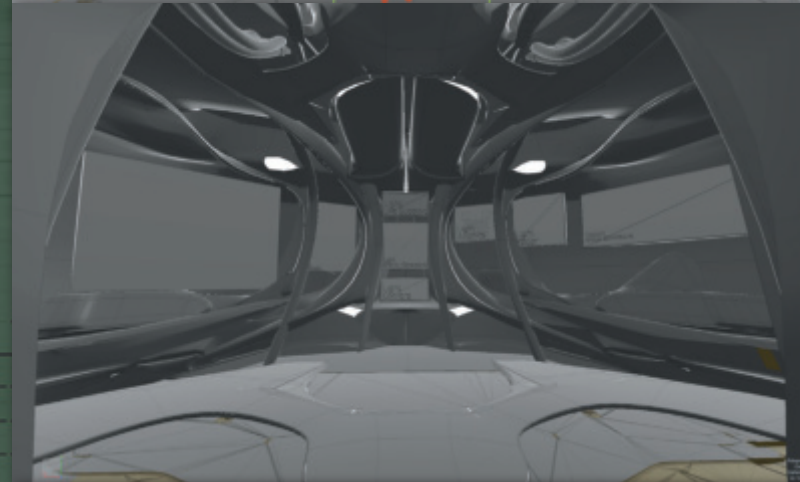
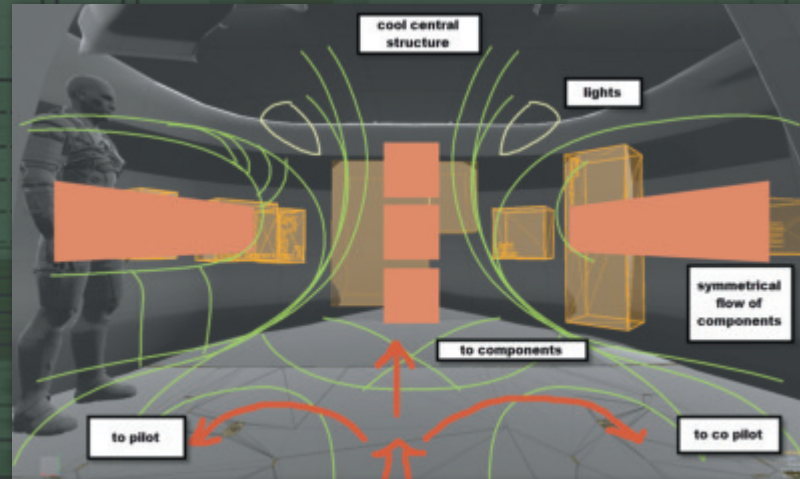


WORKING PRIORITIES

**Paul J:** Ok, cool stuff. Banging it around with Nate and trying to get CR feedback on the last work.

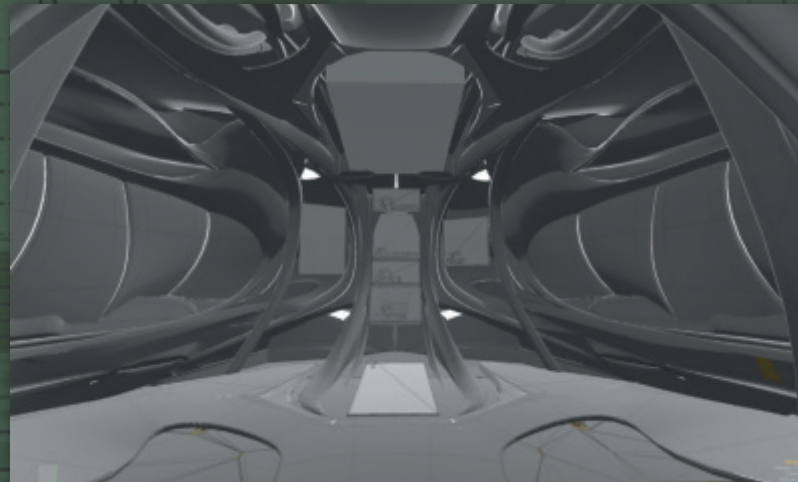
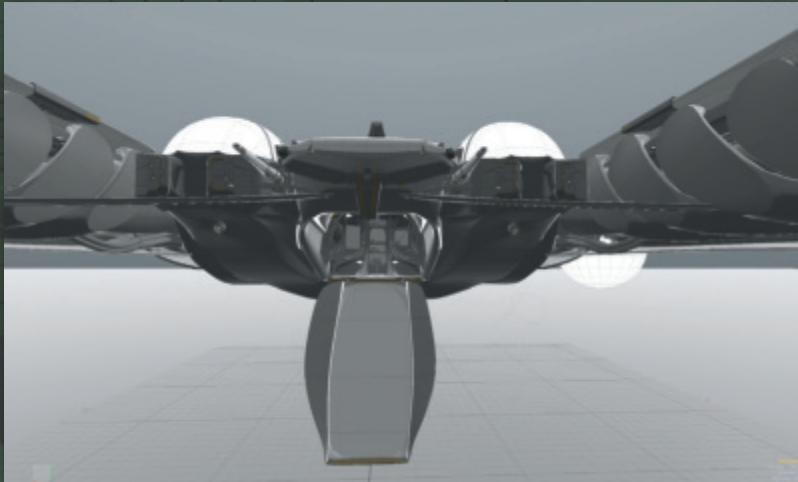
It's good that the components fit. I would like to see more order to them, something that is more sympathetic to the shapes we are working with and some more flowing internal structure that is essentially almost a flow of energy. *[image at right]*

**Jan U:** I have some screenshots for the interior room. Also a quick render just to get an idea how the place could look (just preliminary materials from other parts of the ship). *[four images below]*



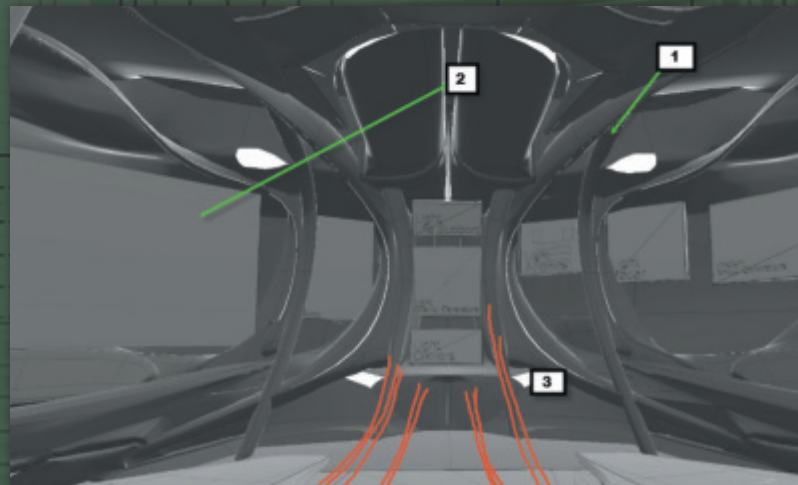
WORKING IN PROGRESS

**Jan U:** Just uploaded another couple screenshots of the exterior and interior entrance area. I like the idea of getting the feeling of being swallowed by a fish. :)



**Paul J:** Jan, some more feedback for you. I think we can achieve something quite special.

1. Think this support will have to go. The components will be behind hatches of some sort and will need to freely open.
2. This big guy looks like to could nicely fit in the hatch up here, want to keep this stuff behind a screen (see further below).
3. Would like more ingress of the supports here.



**Paul J:** A quick attempt at folded metal, before I did the sketch on the next page.



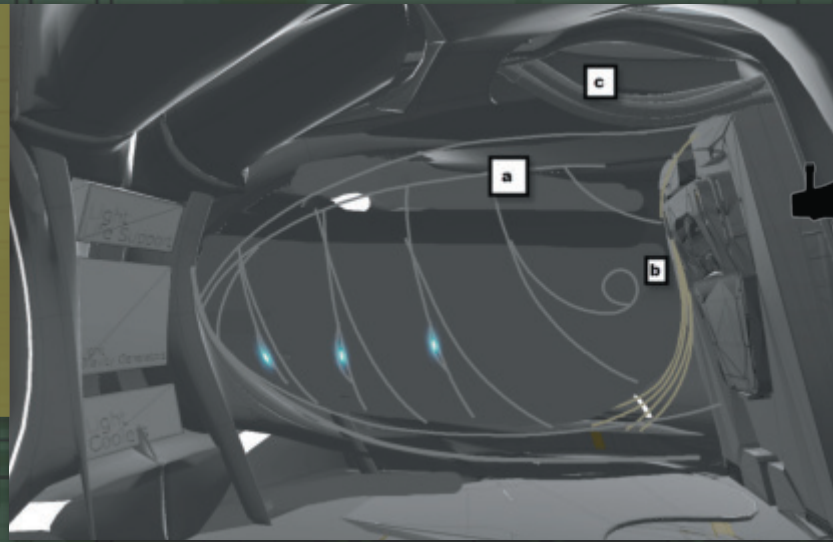
WORK IN PROGRESS



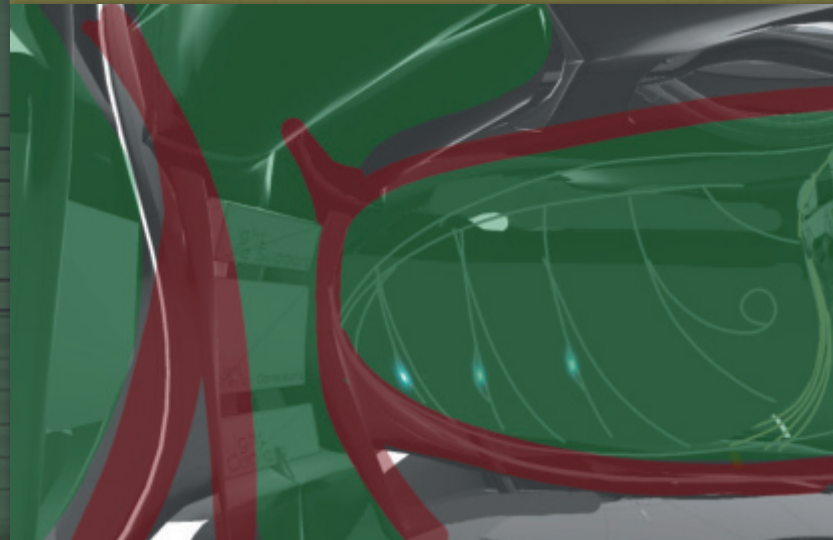
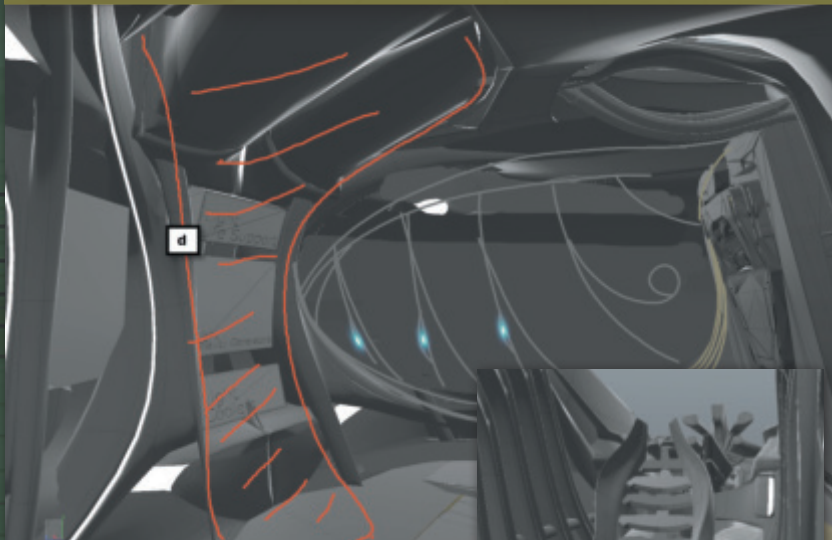
**Paul J:** Would like to see if we can make these changes, would like to keep the interior while graceful and sculptural, crafted – so did a bit of thinking..

- a. Keep these walls sculpted: folded metal something like this, it's all about flowing you to the cockpits. Components: try and relocate them to the central column.
- b. This shape here could be an info panel that opens the door (we need to address the door shape and how it opens).
- c. I like having the tech and wires open up here.

d. Would like to see all the components hidden behind multi-shutter doors. They would split in the middle, revealing all the components at once so it is less of an animation/rigging hit than if each component had its own magic shutter.



**Paul J:** Highlighting the superstructure that's more foreground element and decorative that's setback, creating more depth.



**Paul J:** Not sure about this base, feels too much of a contrast/shocking shape.



WORKING IN PROGRESS

**Paul J:** Also added some info on the thrusters for when we get to the outside again.

Top-down shot of where the thrusters should be placed. This should be mirrored on the bottom side (apart from the retro thrusters).

Problem is, we can't really rely on putting thrusters on the arms because they're landing gear and will move (so can't really be used in landing mode) and are also easily blown off. I've tried to put enough on the main chunk of body to allow the ship to fly even when in landed mode (the fixed thrusters will be disabled in that state), or when the arms are damaged and break off. In flight mode, the front thrusters can be used to give the ship better rotation speeds and manoeuvrability.



**Paul J:** A better view of where the retro thrusters could be placed on the front. This one also illustrates the 90+ degree angle that the joint thrusters will need to rotate (as mentioned above, this will need to be mirrored on the underside).



**Jan U:** I have further blocked out the interior [next page], trying to get the flow more cohesive – adding side panels, shutters for the components and some new doors. For the animation of the shutters I think we have a few options based on what I blocked in. I can imagine them splitting in the middle, either one after the other like a zipper or all at once. They could also close like actual shutters and roll up into the ceiling or floor. The ones on the side open like a fan.

The door I think can fold inwards at the yellow triangular cutlines. The large top part can fold to the ceiling.

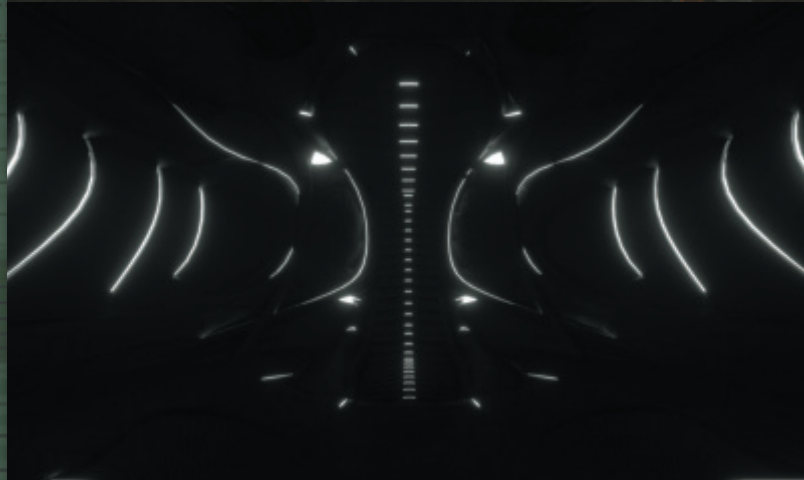
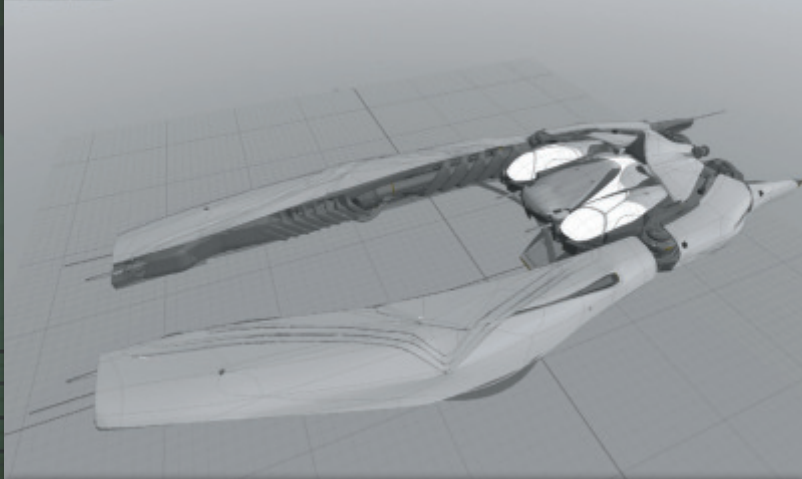
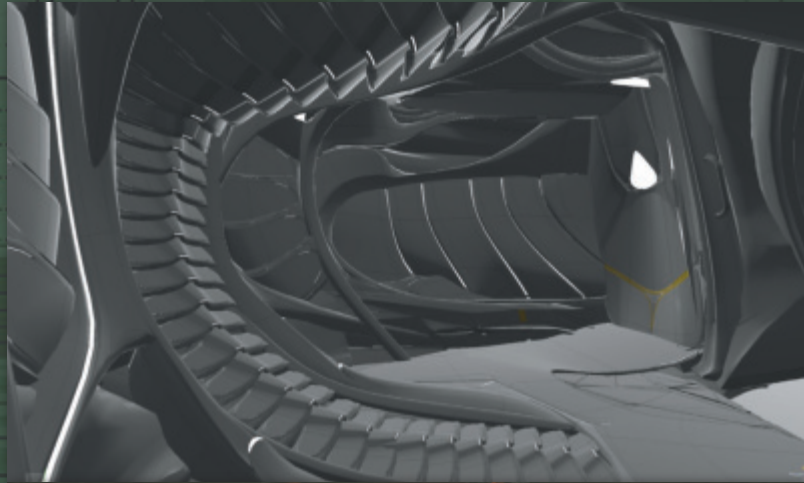
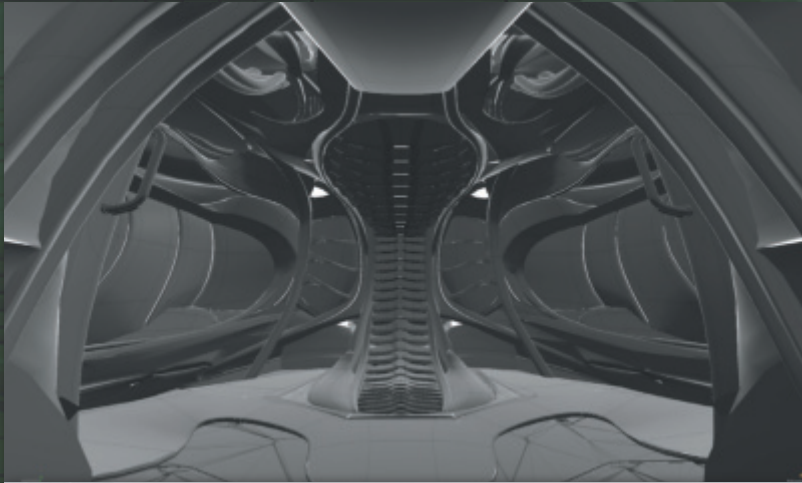
As for the exterior I added the folds to the wings based on the previous cutlines. I added little details and new material breakups here and there. I took away almost all the rustiness from certain parts of the ship. I also changed the red part into something more of a simple texture with some micro surface details. I think that could nicely add to the high-tech, decorative feel of the ship. It's like a perforation that I think will also look good in the interior (not visible on the distance shot but you can kinda see it at the bottom of the interior render).

The last image is a quick render of the interior. Still too dark but it shows the graphical breakup and patterns of the lights very well.

Let me know if you have any notes. Otherwise I will try to add some proper interior materials and also do some work for the cockpit including the chair, so that we can start some paint-overs for all the interiors next.



WORK IN PROGRESS

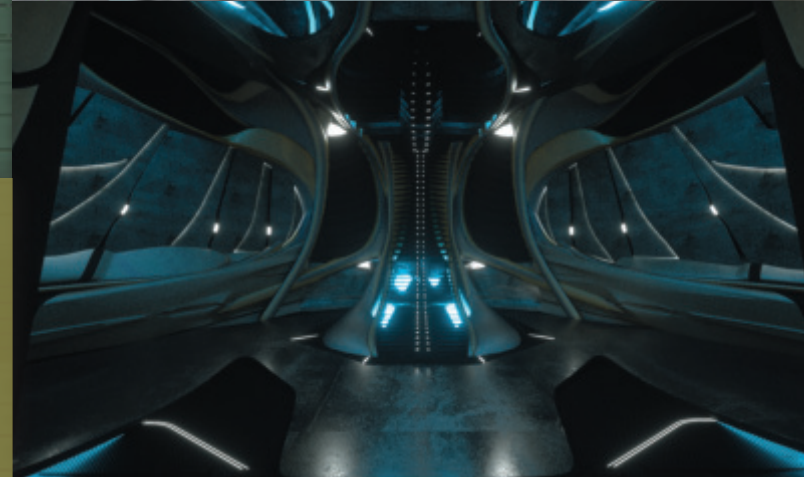
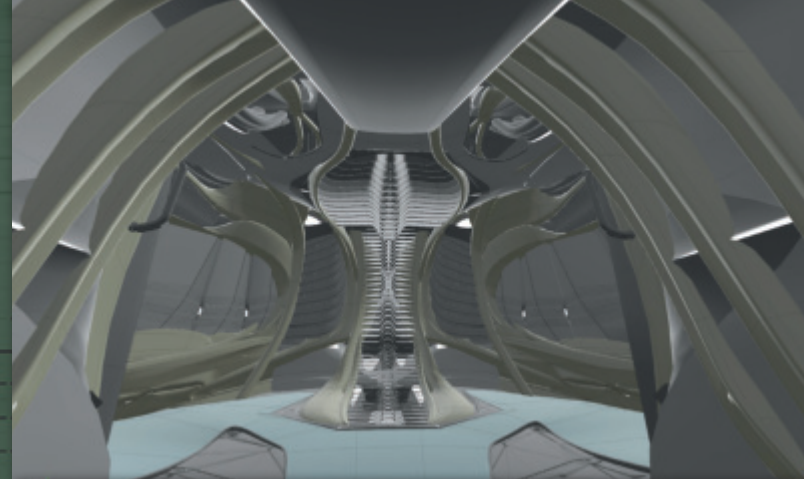
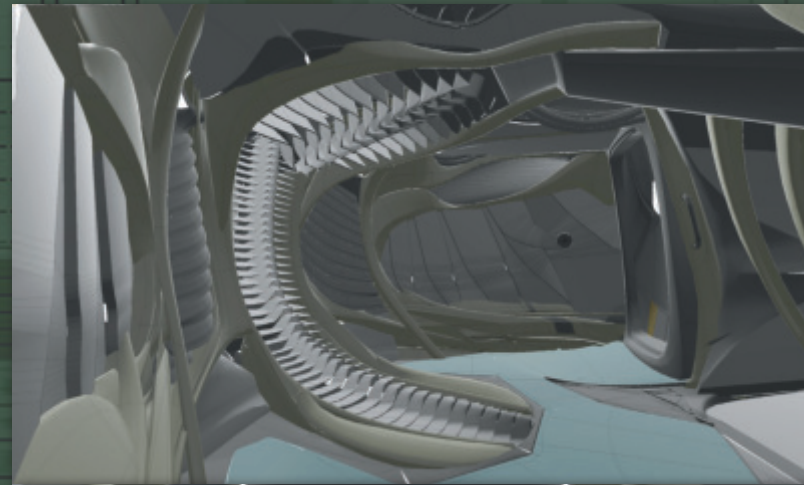
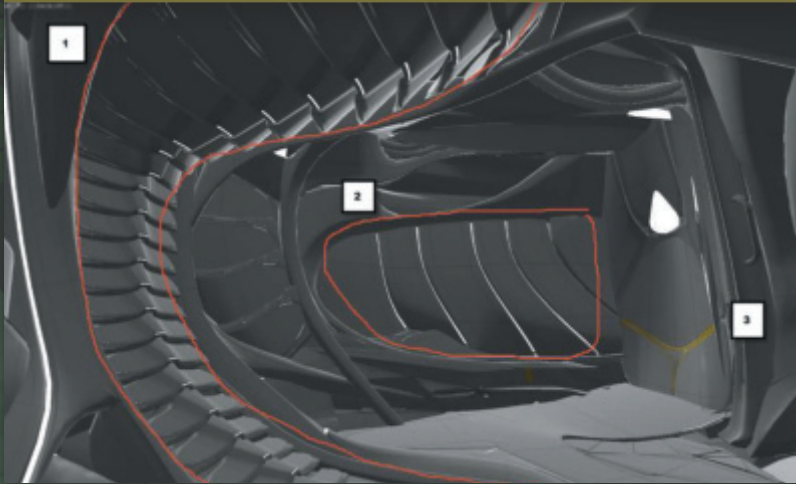


WORK IN PROGRESS

**Paul J:** Ok, taking shape!

1. Make these more delicate, they feel too chunky to me.
2. Would prefer the shape from the sketch (see second image) if possible. They don't need to move.
3. You have made a thong, will need to work on that shape!

Also: Lighting looks cool.



**Jan U:** I mainly worked on your notes [*three images at right*]. Didn't get to jump to the cockpit, but I started some material exploration for the interior space, but didn't get very far. I included a quick render nonetheless. I started adding some indirect blue lighting to brighten the space up in addition to the white highlights. (I added some lighting stripes to the wall panels left and right but will remove those as they are not working that well).



WORK IN PROGRESS

**Paul J:** Yep, the center section is looking much better, delicate and intricate.

The side wall panels are reading a bit wobbly and with the recessed lighting, it's reading as a Photoshop bevel filter (don't hit me – sorry!). I know that's not the case, but it's reading a little off.

Colour scheme, lighting: we would be looking to create a similar theme to the Merchantman. See what you can come up with, might take a few tries.

Also, see what you think – I did a version of the sidearms today. It's a little more sculptural, in this shader it looks pretty cool.



**Jan U:** Couple of updates for today. *[this page and next]*

I replaced the wing shell with your version and broke up and applied my materials to it.

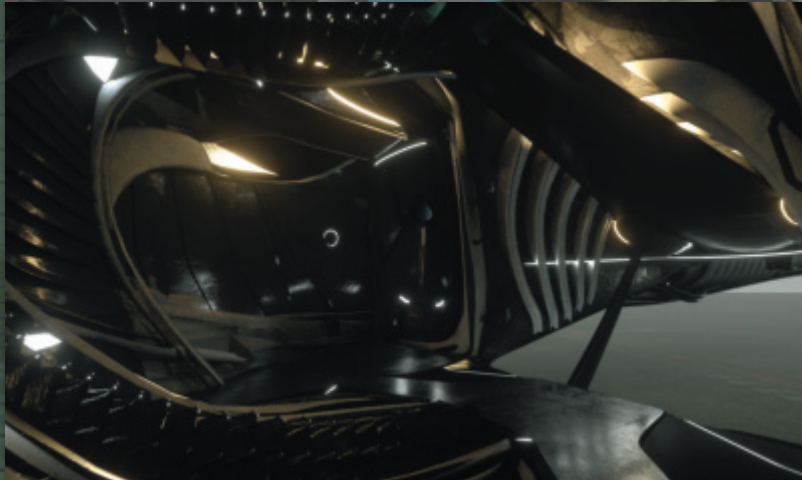
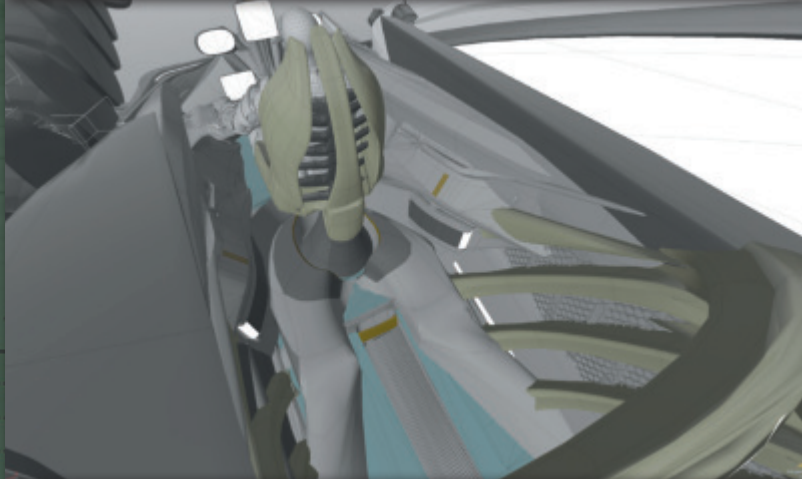
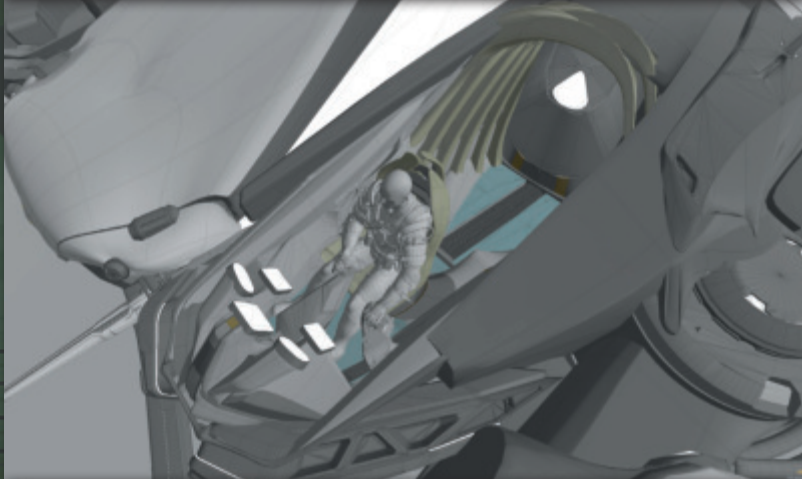
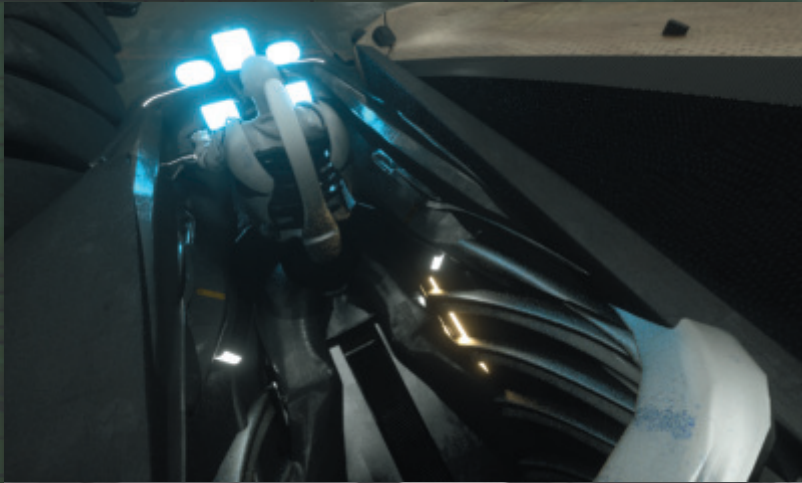
For the interior I changed the side panels a bit and changed the materials and color scheme to the Banu Merchantman interior style. I mostly went with orange to really get away from anything blue. A few turquoise accents here and there. I haven't really added any of the more intricate paneling that the Merchantman concepts have, but I think we should add those in Photoshop anyway.

For the cockpit I started adding materials and a bit of geometry, changed the chair a bit.

**Paul J:** Sounds good to me. Let's get one room locked down so we know what materials we are working with.



WORK IN PROGRESS



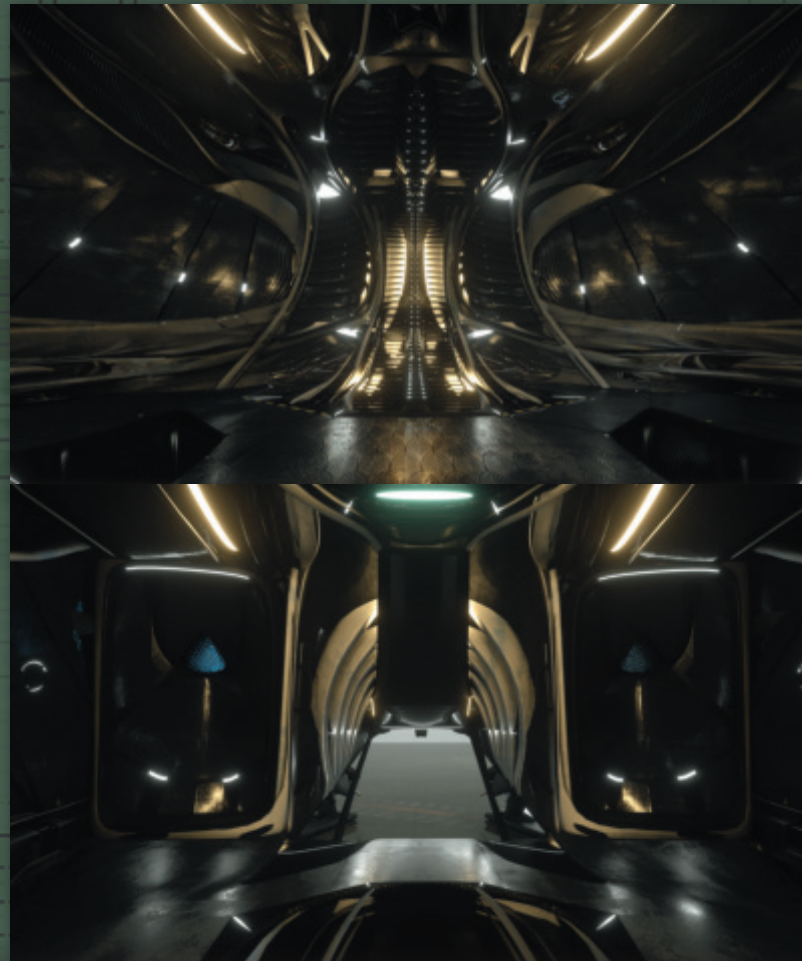
WORKING PRIORITIES

**Jan U:** I updated the landed pose and did a quick render, just to bring this along a bit. I started a paint-over for the main interior view. Trying to add little details, define materials, improve the flow of the lines a bit. Nothing major, just subtle details here and there.



**Paul J:** Hey Jan, another good drop of work, gave me plenty to think about and feedback on. :)

The angle of the legs from this view feels chicken-legged. Is there an angle that will work from this view but also the side?



**Paul J:** This view will need more fundamental work, Jan, It's just not flowing.

- After talking with Nate, we should try for a fan-style door like we have in the center console that hides the components. It could be that it's multi-stage, parts move horizontal, then parts move vertical. I'm open to ideas. I did a rough comp, maybe it's all vertical. We can remove the window.
- I also took out some of the lighting. The linear lines were affecting the shot and this also clears up the scene.
- The floor angles need to not be linear either. I think with the decorative info, this would solve that problem.

Meanwhile, the contrast between light ribs and dark walls in the center of this image looks harsh. I would prefer something more cohesive.



WORK IN PROGRESS



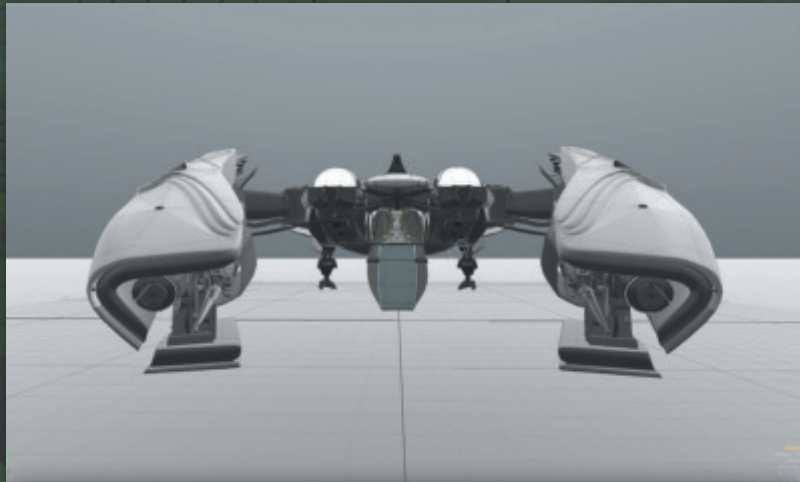
WORK IN PROGRESS

**Paul J:** Lighting: I would like more of this type of colour scheme for the lighting, I feel the current version is too gold.

1. No hazards. Better to have some sort of trim.
2. Floor pattern: I like what you've done, but it's not what we're after. Needs to be less gloss and a more deliberate pattern – a one-off floor design.
3. Liking this, will work well. (There's lots of good stuff, I just didn't pick it out!)

4. Lines really need to curve like this to make it flow. Also the walls, less gloss too, closer to the flowing bone material feel.
5. Too shiny shiny. The lighting is making it hard to read, I'm not sure what's in the foreground, what's behind. Looks to be spotlights intersecting the mesh??
6. Lines like this need to be linear thickness – not wobbly. I know, easy fix. :D





**Jan U:** I adjusted the leg angle a bit. Not sure it's necessarily the angle that makes the chicken leg look, maybe it's the all-over silhouette of the landing gear that I lifted from the Merchantman?



**Jan U:** For the first interior shot I tried to address all your notes in the update.



**Jan U:** For the second interior, I did a paint-over addressing your points. It's a bit rougher, as I wanted to get all the main parts in there first.



WORK IN PROGRESS



**Paul J:** Hey Jan, thanks for the fast turnaround. I'm really digging this a lot, that view of the cockpit door/ship exit is vastly improved!

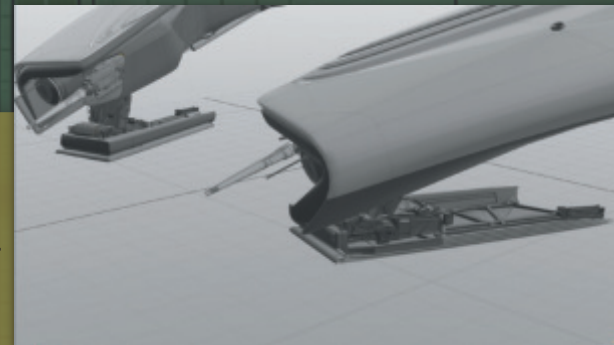
A few more things ... :)

1. Can you double the weight of these vertical lines, so that it becomes the primary line?
2. In my last comp, I'd covered over the lights by accident. Can you add them back in but with a little more shape? Also, give it slight hue differences akin to an opal, subtle but a nod to the traders.
3. With this surface being so glossy, it's creating a lot of noise from reflections. I'd dial it way back so that we get a clearer read of the form.
4. Looks great overall. Definitely going in the right direction, floor is good too.
5. Might be the angle, but try angling the 'feet' so that they are more 'toe out' (I did a quick comp).
6. Can you turn this ramp into the slats like the door and component pillar? It can be either a ramp or steps.
7. Will need more info here as they are super basic.

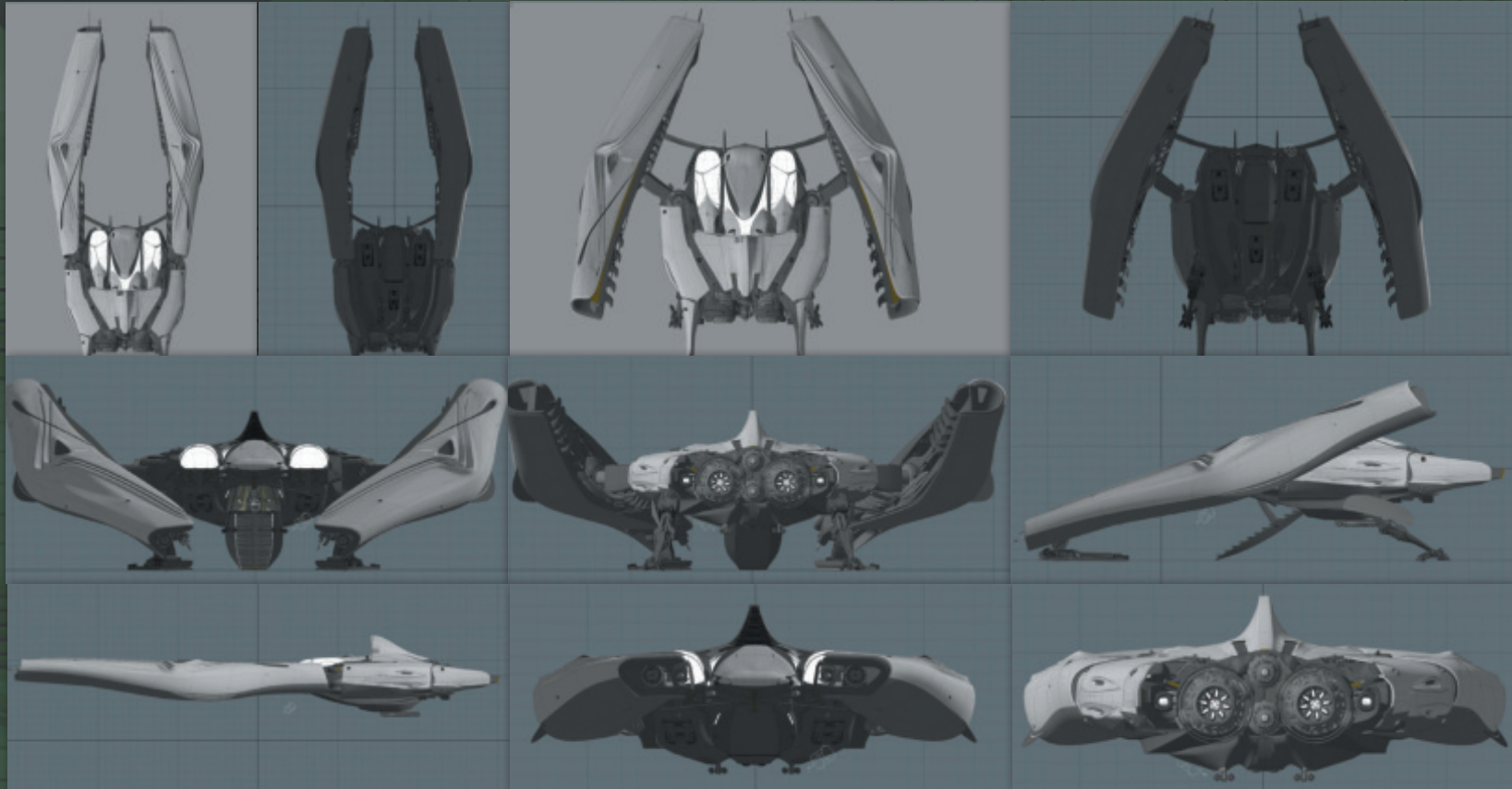
Also, I have a concept review meeting tomorrow with various team leaders. Can you provide me with updated orthos of the exterior landed and in flight?

**Jan U:** I did the adjustments on the first interior shot, and also the ones in the exterior blockout (steps, landing pads front and back). Did some renders for those and a lot of orthos landed and in flight (those are of the shaded wireframe, hope that's ok).

I'm currently doing some more work on the second interior shot. *[this page and next]*



WORK IN PROGRESS



WORK IN PROGRESS



**Paul J:** Thanks Jan, appreciate it. While I was looking at the pixs, there are a few things we'll need to address before we finish.

1. Looking at the in-flight side profile, the arms could do with an angle tweak.
2. This space I feel could be more elegant and also capture a similar ornateness from a tweaked 3.
3. I think this line could be more sympathetic to the surrounding shapes and create an elegant line.
4. Landing gear has to be revealed, i.e., it has to live behind a hatch so that we can cull the mesh in flight and

save performance. Also, the underside will need further development (or at least I'm unclear on what the plan is to finish its lines).

5. This section plus areas underneath the cockpits are unclear (we have a lot of interesting meshes and some things half clipped). Could do with these being clear as to what they actually are.

Loving the new interior, would be good to add a hint of depth via steam/gas and also some investigation into markings – the equivalent of Human stuff but maybe not as abstracted – open to rough ideas.

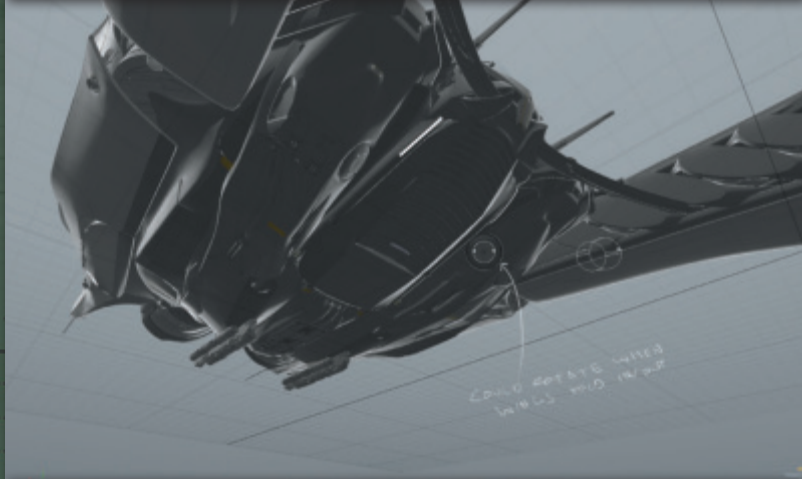
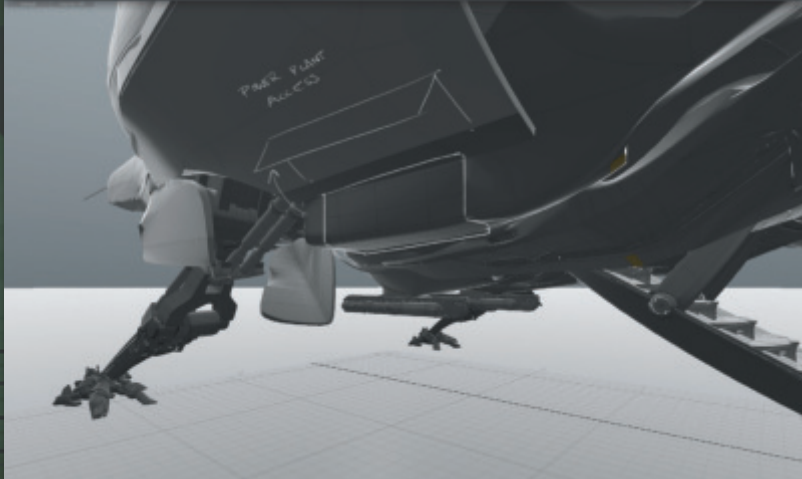
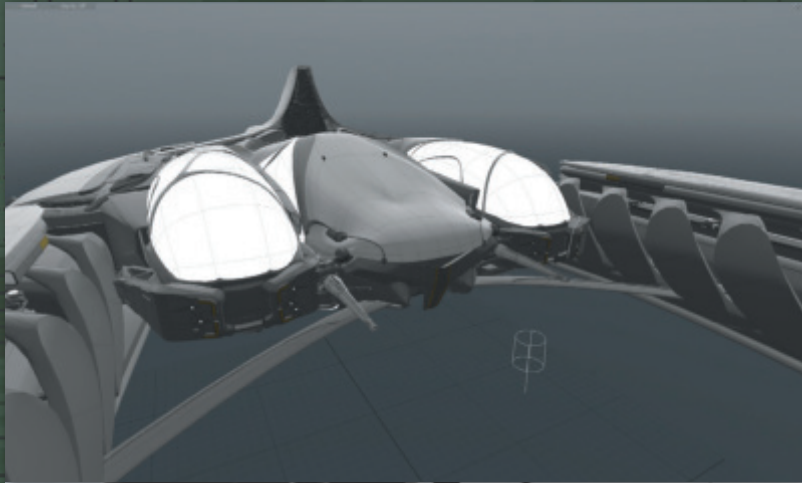


**Jan U:** I did the changes for the first interior paint-over and also added an update to the second one. *[images on this page and the next]*

Besides the atmosphere effects I tried adding some graphics. I split it in two. The smaller infographics are more generic, but maybe they can have some bigger graphics to more follow the flowing lines of the architecture and set little accents here and there. I kept it very subtle.

For the exterior I reworked the bottom of the ship and changed some of the parts near the cockpit. However, the latter one not too much, as I wanted to maintain the shapes and I wasn't 100% sure what area you were referring to under your point 5 "this section." I added a closer screenshot. It would be great if you could indicate a bit more specifically which area it is.

For the bottom, the changes are mostly cosmetic. I'm trying to break up the big empty shapes with intermediary ones, adding some different materials, etc. I tried adding some parts that could maybe be animated like the big round disks near the ramp as indicated. On the sides, I reworked the landing gear covers and added the compartments to access the power plants from the outside.



WORKING IN PROGRESS

**Jan U:** I just dropped some files for the cockpit. I started a paint-over and did a version without the chair and a few that have chair design variations.



WORK IN PROGRESS

**Paul J:** Hey Jan, cool stuff, some things to think about as per usual. :D

0. Would like to flow more of the bone/gold in.
1. Added some other areas of blue; I think it would be good to introduce about this amount.
2. Maybe some kind of organic mesh covering some of the pipes? Too much? I kinda like that it slowly introduces us into the cockpit, but I'm not entirely sure.
- 2b. Not marked but just to the right: I overlaid another hint of material that's worth thinking about.
3. I like the balance of the gold light, but its position is odd and it's intersecting the support.
4. Will need a bank of buttons.
5. An accent light here in the same opal style would be good.
6. Chair needs a handle for ejection.
7. This screen may chance to be a holographic ball – bear it

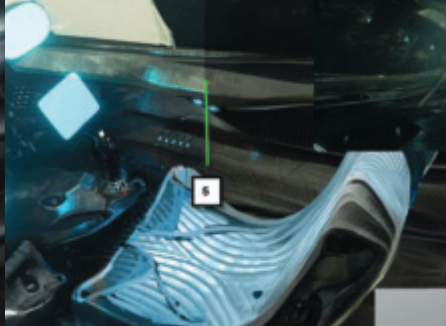
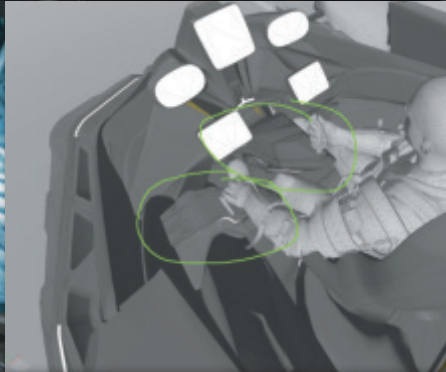
in mind so that it's easily swappable.

8. Where the cockpit canopy fits into the body, we want a good clear line with inner and outer materials defines, maybe some venting as well to keep the glass clear.
9. Design seems a little odd to me. Are you contrasting the curving lines by having a hard-edged mechanical feel?
10. Same.

**Jan U:** Tried to address all your points. For your point 2B, I actually already applied that same texture on that area, just subtly. :)



WORK IN PROGRESS



**Paul J:** Ok, another round for you!

1. Let's remove this texture. We don't have it on the main entrance chamber; keep it to the floors.
2. Preferred this older version in the sense that it's (a) grey and (b) a more technical element/styling. I think we can do something that is both more sympathetic to the art nouveau but also more technical. The current elements are hard to read their direction, yet in your previs scene, it's really clear.
3. Seat: I would reduce the values, it's popping out much too much.
- 3b. Let's keep this section grey, so we're reducing the amount of gold as we transition from the entrance chamber to the cockpit.
4. Preferred this more harsh technical feel rather than the latest soft sculpt.
5. The bone/gold on the right is a bit dark/murky. I prefer the lighter value to the left.
6. Ejection handle: let's make it the burnt orange colour that's used as markings in the entrance chamber. It also feels like dirty plastic. :(
7. New lighting is good.



WORKING DRAFTS



**Jan U:** Thanks again for all the notes. Here's the final update (for now).



WORK IN PROGRESS





## Company History

In 2535, High-General Volder toured the facilities of an upstart hull plating manufacturer that, to the shock of many industry insiders, had recently landed a major UPE military contract. Simone Visconti, the company's chief engineer and CEO, nervously followed along, carrying her research data. She was ready and willing to answer any questions about how her revolutionary techniques had created some of the most damage-resistant hull plating in the Empire. Yet according to legend, High-General Volder had only one question for her. "Why the hell did you name it Basilisk?"

"Because they're extremely hard to kill," responded Visconti. Before she could elaborate on the few ways this mythological creature could reputedly be killed, High-General Volder strode off, indifferent to the details. Historians agree that Volder was focused on the big picture. Simone Visconti, on the other hand, obsessed over every last little factor. This unwavering dedication to detail birthed Basilisk's reputation as the producer of high quality armor, a distinction that still sticks, even though some claim the company's product quality has eroded over the years.

THE  
EMPIRE  
IS  
HERE

## Birth of Basilisk

Simone Visconti was born on Asura in 2509. Her parents worked for one of the major mining conglomerates that fueled the planet's economic boom. A constant curiosity and intellectual aptitude were apparent in Visconti from a young age, and they eventually earned her a full scholarship to the University of Persei Analytical Research and Quantification (UPARQ). Visconti spent a little over a year studying physics at the prestigious school before abruptly leaving to finish her education at the considerably less-esteemed University of Tram.

Whenever asked about it, Visconti simply said that "it wasn't for me" – a phrase friends and colleagues grew accustomed to hearing when something didn't interest her. However, biographers later learned from Visconti's UPARQ classmates that by mid-semester of her second year she had become bored with studying physics and wished to switch disciplines to engineering. UPARQ officials denied her request and told her to wait until the following semester to make the adjustment. Instead, Visconti stopped attending classes and spent her time in the library devouring engineering texts. Suddenly, her scholarship was in jeopardy, as the prospect of her failing all her classes became a reality. But rather than return to classes she had no interest in, Visconti simply walked away.

After completing her engineering studies at the University of Tram, Visconti borrowed money from her parents and rented a small research lab where she could lose herself in her work, trying to create photovoltaic hull plating that would simultaneously protect and power ships. Most believed it to be an impossible task, but some who saw her early work were encouraged. Bernard Pak was one of those people. A longtime friend of Visconti's parents who had made a fortune in local real estate, Pak offered to fund Visconti's vision – upgrading

facilities and hiring a small staff – for a significant stake in the company.

As years wore on without a breakthrough, Pak became increasingly impatient. Eventually, he threatened to stop bankrolling Visconti unless he saw concrete progress. Though she hadn't solved the mystery of photovoltaic plating, the experimental manufacturing techniques Visconti developed along the way had other advantages. She organized a field test to show Pak how their hull plating withstood damage better than other manufacturers. When Pak saw the results, he immediately knew what to do.

## Market Force

Pak insisted Visconti bring the current hull plating to market, pitching it as a way to ensure her research stayed funded while also allowing him to receive some return on his investment. Pak poured credits into establishing a manufacturing plant, and soon the first pieces of Basilisk ship armor rolled off a Tram production line. The company smartly targeted local mining consortiums and industrial operations by touting their product's excellent durability. It wasn't long before demand outpaced supply. Asura's booming economy – filled with high-skilled, blue-collar workers – and Pak's real estate prowess allowed them to rapidly expand operations.

Meanwhile, tensions between the UPE and the Xi'an Empire were on the rise. A few years earlier, in 2530, Humanity had stumbled upon this species for the first time in the Pallas System. After the initial diplomatic snafus, mistrust between the two was high. In the face of a possible alien threat, modernizing the military became High-General Volder's primary mission. The UPE significantly increased military spending just as Basilisk's new manufacturing facilities came on line. The timing couldn't have been more perfect. Riding high on their newfound reputation and the



THE  
MILITARY

fact that their competitors hadn't had the time to reverse engineer their plating, Basilisk landed a coveted government contract to supply hull armor for the latest line of destroyer-class capital ships.

In 2541, the UPE's fear of an alien war came to pass, but the new enemy was the Tevarin, rather than the Xi'an. As military spending skyrocketed, Basilisk was one of the major beneficiaries. Soon, lucrative government contracts became the company's bread and butter, making it next to impossible for anyone in the private sector to get their hands on their armor, which in turn only strengthened their reputation in the public's eye. By the time the First Tevarin War came to an end, Basilisk had become one of the UPE's leading military suppliers, having expanded their operations to include personal armor and ship shield generators.

Basilisk was the envy of the defense industry. Yet, over the ensuing decades, Visconti grew uncomfortable with her company's increasing ties to Ivar Messer's regime. Visconti let her objections be known to the board of directors, only to discover her research budget halved. She stormed into Pak's office and threatened to quit if the issue wasn't rectified. Pak claimed the cuts were because her research had failed to produce any further advancements. Supposedly, he said that if she couldn't live with the cuts then maybe Basilisk "wasn't for you" anymore.

Visconti sold her stake in the company and walked away. She used those credits to fund her research; among her many pursuits, she returned to the one that continued to elude her: photovoltaic plating. Sadly, she never achieved the breakthrough that she envisioned.

## Beyond Visconti

When Pak retired in 2586, Francis Kelting, a former advisor to Messer, stepped in and gained control of Basilisk. He signed numerous government contracts that included

options and extensions which solidified the ties between the company and the despotic regime for decades to come. Any board member who opposed Kelting's decisions was quickly unseated or (in one shocking case) convicted of corruption and embezzlement on clearly trumped-up charges.

Kelting held onto the reins of power at Basilisk with an iron fist until he suffered a catastrophic heart attack during a particularly intense board meeting in 2673. Legend has it that one board member quipped, "I take it this meeting's adjourned," then collected her files and left without offering any help to the man many had come to despise. Basilisk executives spent the following decades trying to undo their Gordian knot of connections to the Messer regime without facing retribution. Then once again, the tides of history intervened in their favor.

In the late 28th century, mining conglomerates were fleeing the Ferron System in droves after depleting Asura of its resources. Basilisk followed suit, claiming the skyrocketing crime rate was not conducive to its employees' safety or to beneficial business conditions. The company moved their headquarters and main manufacturing hub to Castra. Internal documents show that board members, eager to disassociate themselves from the growing corruption of the Messer regime, timed the move so that their operations wouldn't be fully functional when the next round of government contracts became available. Citing a lack of manufacturing capacity, Basilisk extricated themselves from over half of the government contracts that they would have been expected, or more accurately pressured, to undertake.

Basilisk also used the move to Castra to shift their business model back toward the private sector. The market was flooded with products of a similar quality, but few had both Basilisk's reputation and name recognition. Though they couldn't avoid their associations with the Messers, ex-military personnel attested to the brand and their initial sales in this new market were encouraging.



After the Messer regime finally toppled, the UEE made sweeping changes to the military budget that reshaped the landscape of government contracts. Basilisk soon found themselves having to undercut competitors to retain the government contracts they had come to rely on while re-establishing their place in the civilian and industrial markets. As profit margins shrank on their government contracts, Basilisk was forced to institute cost-cutting measures.

Today, items destined for the UEE military are produced at different facilities and using cheaper materials than their

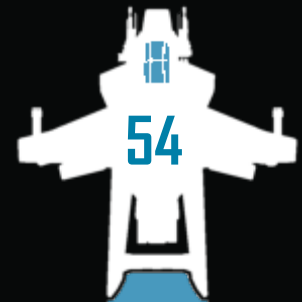
private sector counterparts. Amid accusations of inferior manufacturing, Basilisk insists that all items they produce meet exacting military standards. It is said that Navy pilots often joke that if Basilisk armor is strapped to their ship, then it better have been purchased from their public site.

However, despite any quality concerns, Basilisk remains a preeminent defense industry manufacturer, one that has weathered centuries of turmoil thanks to a revolutionary product made possible only because of Simone Visconti's dedication to the details.



MEMORIAL

# C I G



BEHIND THE SCENES

# AUDIO

## PART ONE: SOUND DESIGN

*Playing a silent game is a lot like watching a silent movie – you can enjoy it, but it’s not nearly as interesting as a game or movie with speech, sound effects and a moving musical score. When people talk about an upcoming game, they’re usually focused on screenshots and videos, but it’s easily arguable that it’s the audio that makes a game feel real, even more than the video – the audio that truly and deeply immerses you in the experience, with warning sirens, echoing shots, conversations, breaths, footsteps ... simply the pulse of life. This month we’re going to begin a three-part series, spread over the next few months, focusing on our sound design team in April, and then speech (Human and alien) and the musical score further down the line. We’re betting that you are more aware of your environment the next time you log in to Star Citizen, once you’ve read this discussion.*

**JP:** *First, to introduce everyone, what’s your job title and what role do you play in CIG sound design?*

**Lee Banyard:** I’m Audio Director at CIG based at F42 UK. I try to make life easier for everyone who works with, and within, CIG Audio, and help to ensure we keep audio quality at the level our community deserves!

**Darren Lambourne:** I’m the Principal Sound Designer in the CIG Audio team. I focus mainly on ship audio (thrusters, moving parts, internal ambiances, etc.). I’m looking at the audio across the whole game though, lending support and guidance where I can.

**Matteo Cerquone:** Sound Designer, mostly working on character movement such as Foley and footsteps, ambiences and UI, and give support and help to others when needed.

**Barney Oram:** I'm the Junior Sound Designer of the team. I've been focusing on weapons at the moment, alongside Luke (Senior Sound Designer), as well as ambience and environmental sound design. I also help out on other aspects as and when I am needed.

**Luke Hatton:** Senior Sound Designer. Since joining CIG in 2014, I've supported most aspects of the game, including ships, UI and environment sound. Recently I've focused on the sound design and pipeline for weapons.

**Jason Cobb:** Senior Audio Designer. I try to help where I'm useful, so I'm not really leading any design work as much as helping with tools and pipeline, and mentorship within specific areas-of-expertise.

**Philip Smallwood:** Sound Designer. I also acted as principle sound mixer (dialog recordist) for most of the PCAP sessions for S42 in 2016. In line with this, I spent most of 2016 supporting the dialog pipeline with editorial and outsource pipelines.

I currently mainly provide audio support for the PU, working on ambiences, UI, sometimes weapons and various audio systems to support features such as the actor status system and procedural planets.

**JP:** *What sort of sounds do the actor status system and procedural planets need?*

**Philip S:** The main sound design element for the Actor Status System is breathing SFX. As a prototype I have recorded myself breathing at different rates and depths for different actions – e.g., idle, jogging, running, sprinting, recovering and pilot AGSM. The audio feedback given by your player character's breathing indicates how tired the character is and gives a sense of your current level of stamina.



BEHIND THE SCENES

JASON COBB



**JP:** Do all characters breathe the same, or will (for example) large men breathe differently from small kids?

**Philip S:** The audio component of the Actor Status System is in the early to mid stages of a solid prototype and for the time being has one set of breathing SFX. However, the intention is to have appropriate breathing SFX for each class, gender and character in the game, as the breathing, grunts and vocal efforts will have to be cohesive to the player character.

For the procedural planets, I have spoken closely to the other departments involved and have involved our audio coders. We will have to implement an audio system to support the procedural planet tech, but the sounds implemented will need to convey atmosphere, weather, ambiances and specific points of interest – e.g., outposts, vegetation, natural features such as waterfalls, etc.

**JP:** When I think of sound effects, I think of Monty Python and the Holy Grail, and knocking two coconuts together for a trotting horse. How accurate is that perception?

**Jason C:** 'It's a fair cop.'

**Lee B:** It's quite accurate if you're looking to create something that sounds like *Monty Python and the Holy Grail!* That's a reference more to Foley, which is only one of the tools in the sound design shed. Or 'two sheds.'

**Barney O:** 'Sound effects' are everything in the game you'd expect to make a sound – the weapons, the ship thrusters, the interactions with terminals, the background hum of environments, the sounds of the character (footsteps, Foley, etc.), and everything in between. Because a lot of those sounds aren't 'real' (in the sense that you couldn't go out and point a microphone at it), we've got to create sounds, often by combining unusual recordings, to create something that'll blend seamlessly into the experience of *Star Citizen*.

**JP:** That's the second time we're mentioned "Foley." What is that?

**Darren L:** Knocking coconut shell halves together (skillfully) is a great way to obtain the sound of a horse's hooves on a hard surface. If you wanted a horse trotting on a gravel surface then you would need not only coconut halves but a gravel pit to 'walk' them in. That's called 'Foley' and it's an art form in and of itself. Foley work gives us things like clothing movement or boot footsteps on metallic surfaces and is an important element in bringing the game world to life in a realistic way. Collecting real-world sounds from weather, water, metal, wood, machines, weapons, musical instruments – pretty much anything that makes

LUKE HATTON



BEHIND THE SCENES



a sound – gives us a palette of sound to work with. We also use synthesisers to create sounds that don't exist in the real world. On top of all of this we use many kinds of effects to alter these sounds, sculpting them into shapes that better fit the application. It's the careful sculpting and blending of real-world and synthesised sounds that produce intricate and complex compound sounds that end up as lasers, gravity drives, giant electrical storms and just about everything you hear in the *Star Citizen* universe.

**Barney O:** So in the sense that we can't go and record an airlock, we had to construct the sound of the airlock in the game by combining lots of different things – all kinds of different sounds with different textures and sonic qualities that add up to the overall sound we want from the object.

**Jason C:** Foley, as in Jack Foley. A person who advanced the performance art of creating (and recording) sound effects live in sync with picture playback. See *The Jazz Singer*.

**Barney O:** We use the term Foley to mainly describe movement – player movement, for example, is the primary Foley element in our game.

**Jason C:** A "Foley element" is basically what you would call an action.

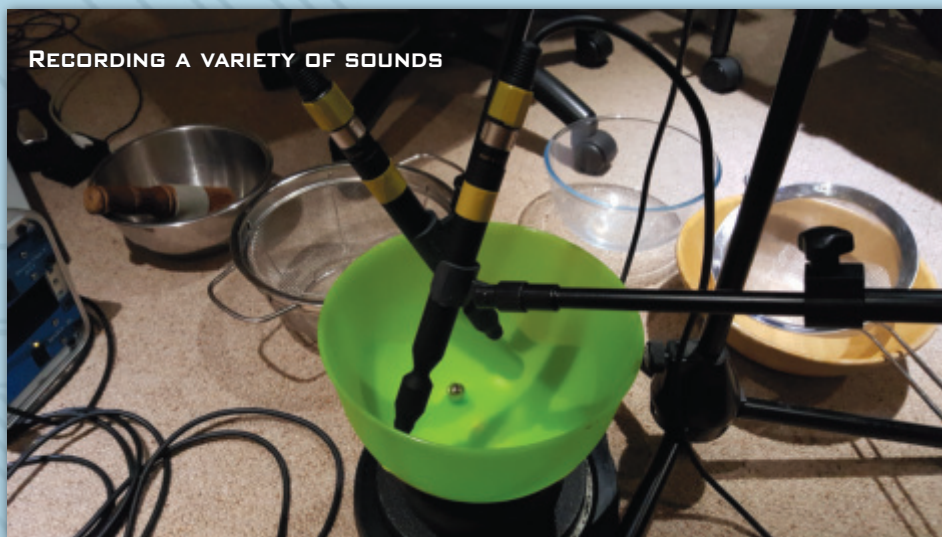
**Matteo C:** "The art of Foley," as some people like to call it, can be described as reproducing and recording sounds that help describe the movements of characters on the screen. A Foley artist would usually look at a silent scene and try to reproduce any cloth motion, footsteps or movements made by the actors (or in the case of Monty Python, a hypothetical horse).

**Barney O:** Right – like running, jumping, picking up ammo, etc. The sound the players' clothing and gear make when they 'do stuff.'

**Darren L:** Yeah. If we were doing the sound of a tarpaulin flapping on the exterior of a desert planet camp, we might record plastic or canvas sheets to make the sounds for that. As with computer animated films, most of the sounds in our game have to be 'made up' because there is nothing 'real' in the first place. It's all imagined, modeled and rendered in silence, and then later, sounds have to be added to give a voice to all that stuff.

And then there would be the particles of sand and dust hitting various surfaces. Even if we don't see that stuff happening in the graphical side of the game, we still want to 'feel it' and so we'd go get a bucket of sand and sprinkle it on various objects and record that, sculpt the recordings with various tools, and then layer the product of that into our ambient sound for the planet.

**Philip S:** Foley is usually considered the sound of a character physically interacting with an object. E.g., footsteps, handling of props, cloth movement.



RECORDING A VARIETY OF SOUNDS



**Lee B:** Foley is technically always performed to the [moving] picture. It is bespoke sound effects performed to a moving image, at its core.

**Jason C:** The thing about traditional Foley is it is live performance to a picture with hopefully as little post editing as necessary. They depend heavily on Foley artists to do good performances to get lots of coverage and save time in editorial later. For film, Foley includes all the physical gadgets and props that people interact with. The props they use to record don't always look the same as what is seen on screen – it is all about what sounds good.

For game development, it is very hard to perform Foley to picture in the traditional sense. Nearly all of our content is post-design work.



**JP:** *What sort of "sound effects facilities" does CIG have? Is there a room with all sorts of sound-producing equipment, or do you do most of your real-world recording out in the world?*

**Darren L:** Presently we don't have a large 'Foley' space to record in, so if we need to do large scale recordings then we have to leave the building. We have plans to build better audio infrastructure here which will, we

hope, incorporate that kind of space.

**Matteo C:** Unfortunately none – this is something we have been discussing but we currently don't have the space for a Foley or prop room. Most of the recordings are outsourced or we do our own recordings on our spare time.

**Lee B:** What you tend to see at world class Foley facilities, where you'd record sound effects of all kinds to provide you with the raw material for sound design, is a huge amount of storage place for props. These are the musical instruments of Foley performance. Devoting that amount of space purely for storage isn't practical unless that's literally all you're doing with your Foley stage, and as only a little time would be devoted to that process here, we don't have plans for an extensive Foley facility in-house. Just wouldn't be practical!

**Darren L:** But we can easily collect smaller sounds right here in our audio rooms.

**JP:** *What does a typical day's work include? Mostly sitting at a desk, or are you frequently out and about, recording sounds? What sort of software do you use?*



BEHIND THE SCENES

**Philip S:** We usually have a quick audio meeting in the morning, a “stand up” where each member of the audio team runs through what tasks they have completed the previous day and what they plan to tackle on that day. This often opens up collaborative discussions and can provide valuable insight and perspectives on issues, methods and best practices.

**Matteo C:** Occasionally we do some recordings. Mostly we manipulate, edit and recombine sounds from libraries to suit our purposes. Most of this process is done through a DAW (a digital audio workstation), and we mostly use Reaper here at CIG.

The next step is usually to import our sounds in to Wwise, which is our middleware tool that allows us to use in-game parameters to trigger, stop and manipulate audio in real time within the game. A big part of our job is talking to programmers and finding solutions for better implementation of specific systems with the audio.

**JP:** *Let’s revisit this morning’s meeting. What (as specifically as possible) are each of you working on today?*

**Darren L:** Right now I’m working on the sounds for the side door and ladder on the MISC Prospector. Also today I put the final touches on the thruster sounds for the Xi’an Nox bike.

SOUND LAYERS FOR A XI'AN SCOUT TAKING OFF (LEFT), LANDING (SECOND LEFT), AND FLYING



BEHIND THE SCENES

**JP:** What's the difference between the sound of a Prospector and a Starfarer door? What's the difference between the hatches of a Hull A, B, C, D and E? I'm not so much asking what the differences are, as I am asking, "How do you decide what the differences are?"

**Darren L:** Generally the way a ship sounds comes down to two main rules. Rule #1 (and most importantly) is how the ship feels to me, what impression I get from it. That determines what kind of character it is in the story of SC and how I should approach strengthening that character through the audio.

Rule #2 is the 'blood line' of the manufacturer. So earlier MISC ships will have a certain feel to them, they will sing in a particular musical key, and so when I approach the audio design for a new ship in the MISC oeuvre I will make sure there is continuity, that the heritage comes across.

**JP:** So you've got to make sure they sound the same, but different?

**Darren L:** Lets take the Drake line, for example. The Drake Herald looks and feels rather unrefined and raw, like a bunch of parts thrown together to produce the best results regardless of how it all looks together. But the Buccaneer feels far more refined and finessed. Both ships need to sound like Drake ships, but they also have very different characters, like brothers.

**Matteo C:** I'm currently working on the UI for ships and Front End menu – MISC ships at the moment. The idea is to unify a UI language that is shared across all different ships manufacturers so that players can recognize what a specific UI sound relates to even if it sounds different for another ship.

Pretty much, they need to sound the same in terms of language so that it is recognizable for the user, but each manufacture can have his own distinctive sound. For example, an incoming missile message warning can have a specific pitch and timing signature (like 3 fast bips). Those bips can sound different for each ship, but the pitch and timing needs to be the same for all ships so that players can have sonic feedback that is easy to remember even when changing ship.

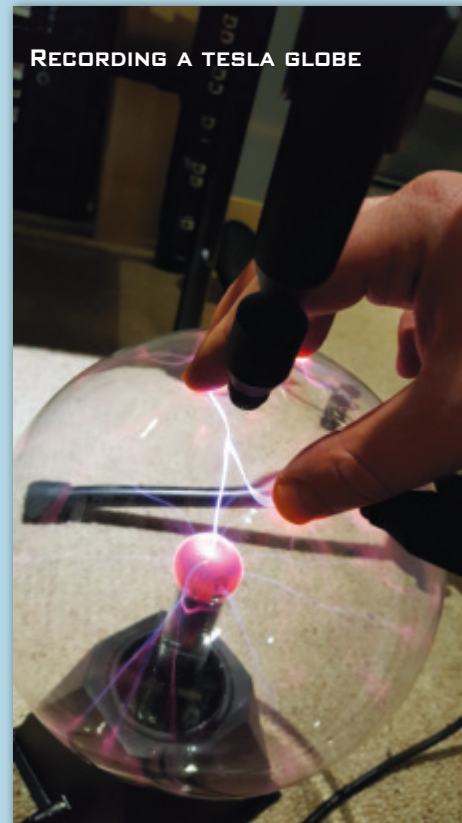
**Philip S:** I'm currently working on the audio component for the Actor Status System, which triggers breathing SFX based on your level of exertions and stamina.

**JP:** In this context, is "SFX" = Sound Effects or Special Effects?

**Lee B:** for sound people, SFX is only ever sound effects.

**JP:** Barney, what are you working on today?

**Barney O:** I'm working on sound layers for weapons. Our process for designing weapons is to break them down into key elements and then combine in real time, in the game. Today I'm working on some 'body' layers (essentially the initial big punchy transient sound) which will be used in our ship armament weapons.



RECORDING A TESLA GLOBE



## FIREARMS RECORDING SESSION



**JP:** *How many different layers does a typical weapon have? What are they?*

**Barney O:** For a ship weapon, for example the Behring M3A Laser, we typically break the sound down into; body layer (the initial thuddy transient sound), character layer (the distinct specific character and 'flavour' of that specific weapon), mechanical layer (the sound of the mechanisms in the weapons – this is key for making weapons 'feel' rewarding), chargeup layer (or 'pre-life' as I like to call it – subtle sounds before the main transient of the shot) and then 'tail' layers, environment layers and sweeteners which are mixed in as needed. These last three are extensions of the character layer, usually.

**JP:** *That is a lot of various types of sound, all combined together.*

**Barney O:** Absolutely. Each aspect plays a different part in combining together to make a united singular weapon sound.

**Luke H:** Another aspect of ship and handheld weaponry is the third-person sound. Typically, third-person sounds should differ from the first-person ones, so that there can be a difference in feel and a more interesting general mix during combat. Up close you want a big punchy loud feeling. From further away, a weapon's main character should stand out, but given you can have multiple enemies shooting at you at one time, it's important that we have variation in the sounds. By having different layers combined at runtime, we can make differences to each layer based on things like distance, angle and environment type. For example, this means we can have less 'punch' but more 'noise' at a longer distance, or a variation based on the angle to which you are facing the weapon. We can also change the sound of a weapon based on criteria such as; ammo remaining, heat levels, energy levels and even how many of the same weapon are firing at once. For example, three Gats-220s mounted on your Hornet have a much different sound than just one! Having so much flexibility in this domain does complicate design, but at the same time it's something SC will greatly benefit from given its fidelity in other areas. We're aiming for maximum detail in our audio systems.



## FIREARMS RECORDING SESSION



BEHIND THE SCENES

**JP:** I imagine headphones are a major aspect of your work, so that you don't drive each other crazy with cross-purpose sounds.

**Darren L:** We generally have an isolated room each, with precision loudspeakers. Headphones are used very rarely.

**JP:** Once you're created a sound, what happens to it? How does it get integrated into the game?

**Darren L:** When the raw material has been designed in a tool called Reaper, we then put that sound file into our audio middleware (Wwise) which allows us to set up the behaviour of that sound when the game engine calls it.

Wwise generates something called an 'event' that we then implement into the game engine. The engine calls the event, which causes Wwise to play the original sound asset back with all the rules and behaviors we have defined and applied to it.

The game engine can also drive Wwise to directly 'play'

the sound, much as you would play an instrument. So the thrust level from a ship, for example, might drive the pitch and volume of the roaring thruster sound.

**Jason C:** Presently I am working on visual effects (VFX, AKA particles), audio implementation and content.

**JP:** So today you're not working on a specific sound, but on how to implement sounds in general into the game?

**Jason C:** I am working out details and finding bugs related to how to make the particle system play the sound effects in an ideal way that:

- a) does not leak voice instances or spam the noise too much,
- b) starts and stops with the visual timing, and is sized according to the scale of the particular visual effect, and
- c) moves with the particle (or not, depending on the particulars).

**JP:** What does "spam the noise too much" mean?

**Jason C:** Play a sound too frequently.

**JP:** And how about "leak voice instances"?

**Jason C:** In this case, "voice" refers to a channel of sound in the Wwise system, not voice as in speech.

Leaking voice instances means either creating too many audio proxies than are needed for the effect, or not cleaning up audio proxies correctly so that they are left behind and waste memory. An audio proxy is a position in the world where a sound can play from. Its source can be another game object or invisible, depending on the specifics of how each effect is best implemented.



**JP:** Last few questions: What is the sound effect you're most proud of, or that you like the most? What's your favorite?

**Darren L:** I'm really happy with how the RSI Ursa Rover turned out. We were really limited on the tech side for wheeled vehicles but I think, despite that, it sounds pretty cool. I hope, as we make more ground vehicles, we can expand and improve on the toolset there and get even better results.

**Matteo C:** Mmm ... probably the engines of the Xi'an Scout. Working with ships is always a fun experience – what makes a ship sound interesting doesn't usually depend on a single sound or layer, but is how multiple layers interact within the multiple variables from the game (speed, acceleration, brake, pitch, yaw, etc.).

**Philip S:** The sound design that I'm most proud of is probably still the mobiGlas UI SFX, or some good sounding laser sniper bullet whizby's I designed.

By far among the coolest things I've done for the sound department is head over to Copehill Down, an MOD training site, and record various firearms, such as the Browning 50 cal machine gun or the 50 cal sniper rifle called the Destroyer.

**Barney O:** I'm quite proud of my work on *Star Marine*. I did the majority of the ambience and environmental sound design in those two maps (it took ages) and I'm happy with how they turned out. I hope they're both characterful and exciting spaces for people to play in! :)

**Luke H:** Over the past couple of years I've been most proud of supporting our 'module' releases. Initially they were things like the Dogfighting Module having new



game sounds with each new patch release. Improvements to ship thrusters and weaponry made a good deal of difference to the feel of things. One set of things I did really enjoy creating were ship explosions. I got a kick out of backers' reactions to them. I specifically remember the patch release where an exploding ship was suddenly a much more dramatic sounding event. There's room for improvement and added detail (particularly with larger ships), but I'm happy with what we have as a base sound.

**JP:** What is the funniest/weirdest sound effect you've been involved in creating?

**Darren L:** The weirdest sound I've worked on in SC would have to be the quantum drive. As far as sci-fi sound design goes, that is pretty out there.

**Philip S:** The funniest for me was probably recording myself breathing at slowly increasing rates from 20BPM to 130BPM, resulting in nearly passing out by the end of the recording.



BEHIND THE SCENES

**Matteo C:** That is probably still the Xi'an Scout. I was asked to make the ship sound organic, so I used some recordings of dog food as one of the layers. :p

**JP:** *How can you record dog food ...?*

**Matteo C:** You get your hands dirty.

**JP:** *I hope you had a dog to help clean it up.*

**Matteo C:** That would have helped, but instead I ended up with the smelliest room I've ever been in.

**JP:** *I don't think a can of dog food would have occurred to me. I suppose I should ask where you all get your inspiration for recording real-world sounds.*

**Darren L:** As a sound designer, you work with sound all the time. You hear possibly useful material all around, all the time. The world starts to become a source of useful noises and you begin to hear things in a different way ... not just what a sound is, but what it could become.

**Matteo C:** I would say that what's interesting in a sound is mostly the texture: how the waveform can be reshaped using the tools at our disposal. A can of dog food can sound totally different after going through a specific effects chain and can give interesting results compared to more noisy or washy sound sources.

**Barney O:** Yeah – it's never a drag-n-drop, 1:1 sound effect to in-game asset job for us. We take textures and sounds from libraries and our own recordings, mangle them together using software, audio processing, etc., and try to create something that's completely unique.

**Luke H:** Some of the computer interface sounds in SC were made from tiny little snippets of odd sounding animal calls and me straight making weird sounds into a microphone and then processing them with effects. When

a sound is extremely short, less than a tenth of a second, you tend to not recognize the source at all. The shortness brings new meaning to the sound. Anything and everything can be used for short interface sounds, so I tend to get weird with it.

**Darren L:** And at the end, the sound makes you feel something. So we work with the emotional connection to the listener. It's magic.

**JP:** *Any last words?*

**Matteo C:** We usually follow and consider backers' feedback, so any thoughts or comments on our design is always appreciated and accounted in our team. As always, a big thank you to anybody out there playing the game. :)

**Darren L:** I'd like to add that I feel extremely fortunate to be part of this team, working on the most amazing game of my career. And thank you to everyone out there who joins us on this unprecedented journey to create the space sim we have always wanted to play.

**Luke H:** A huge thank you to the community for making SC possible. Because of your continued support, we are able to remain ambitious with our sound design and model in as much detail as we can think of for the best possible experience. For this reason I'm excited to see how the soundscape unfolds as we approach SC Alpha 3.0, S42 and beyond.



BEHIND THE SCENES



# HADRIAN SYSTEM KEDSU REEF



EDITH HILLMAN

## A ROCKY BEGINNING

No place may be a stronger reminder of just how much the Empire has changed since the fall of the Messer regime than the Hadrian System. Once commonly referred to as a 'No Man's Land' for its role in the cold war, today the rapidly changing system has become a bastion of trade between the Empire and our Xi'an neighbors.

Anchored by a red giant, the three-planet system was first discovered in 2510 through its connection with Pyro. Although the jump point was uncovered by a Pyrotechnic Amalgamated scan crew, the company, already stretched thin by its recent investments in Pyro, decided to forgo any claims on the nearly uninhabitable solar system in ex-

change for the influx of capital that the sale of the discovery would bring. Likewise, with its focus mainly on finding worlds to terraform for settlement, the UNE showed little interest in pursuing an active role in the new system. Instead, the first wave of inhabitants would be those drawn by the resources waiting to be harvested from the asteroid belt circling between the second and third worlds. As the mining population slowly grew, small stations were built to cater to their needs and provide housing for the new influx of support workers that came as well. However, the system's growth was to be short lived.

## A DANGEROUS CONNECTION

While the discovery of a jump point in 2539 to what would become known as Gurzil opened up more economic opportunities, the arrival of a Xi'an scout ship in 2542 would lead the UPE military to cordon off both systems from civilian use. Shortly after, the Perry Line was formally created and the system began its transition into a militarized zone.

Note that though it was originally named the Nivelin System, after Pyrotechnic Amalgamated founder Tromo Nivelin, the UPE switched to the military designation Hadrian in reference to the legendary defensive wall used by the Ancient Earth civilization of Rome. This was fitting since military strategists concluded that if Gurzil was to be the front line in a Xi'an war with Humanity, Hadrian would become a barrier system to stop any Xi'an incursions from penetrating further into UPE-controlled space. Fortifications began to be constructed near known jump points, and additional resources were poured into discovering any possible unknown connections with other Xi'an systems. While no direct connection with Xi'an space has yet been found, Hadrian was revealed to be connected to other border systems such as Oya, Castra and Kiel, which increased its strategic importance. In addition, Hadrian

received a huge influx of resources once a direct jump to Terra was discovered. Eager to protect this rapidly growing system, the military decided that more drastic defenses were needed and considerable efforts were put into creating a vast minefield throughout the system as an additional deterrent.

For the next two hundred and fifty years, Hadrian system would remain a labyrinthine maze of mines and fortified outposts bristling with rapid-launch defenses, all in preparation for a Xi'an attack that would never come. In 2793 the Perry Line Treaty was signed and with the cold war officially at an end, Hadrian was rapidly demilitarized and civilians were once again permitted access to the system. Despite that, the original mining boom that had first sparked interest in Hadrian was no longer an option for economic development. While large swaths of mines were removed as the military pulled back resources, other areas, such as the asteroid belt, were deemed too dangerous to clear and instead were marked with warning beacons. Yet though its primary industry was ended because of Hadrian's proximity to Xi'an space, it would also receive a fresh start because of it.

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## A FRESH START

As the 29th century drew to a close, relations with the Xi'an had finally thawed enough that trade was beginning to blossom between our two species. Hadrian became a natural stop for goods and commodities moving from Terra and the rest of the Empire into Xi'an space. It had good infrastructure in place for refueling, restocking and repairs, thanks to the former military installations built into the system, and even though they made travel difficult, the

mines throughout the system also made it hard for outlaws to gain purchase, since ships had to take very specific, well-guarded routes through the system. These clear travel lanes also created an ideal situation for the UEE to establish customs scan stations to help control the flow of goods from the Xi'an. They can easily monitor ships arriving from the border since most prefer to pay the import taxes owed than risk flying along unmarked routes.



As trade increased, so too did the stations that catered to the haulers that were moving goods through the system. The largest of these stations, the flotilla known as Kedsu Reef, has grown in the last decade to become one of the busier xeno-trade hubs in the Empire. Now, with the pro-

posed Human-Xi'an Trade Initiative being decided upon by the Senate and the growing industrialized Xi'an system of Rhilah only a jump from neighboring Gurzil, Hadrian is primed to grow even more.

## HADRIAN I & II

Both the of the two inner planets of the system are gas giants. Hadrian I has a rocky core beneath its tempestuous atmosphere, while the bright blue atmosphere surrounding Hadrian II is calm in comparison. Once the military

began to permit civilians access to the system, gas collection and refining at Hadrian II represented the majority of the credits earned in Hadrian until trade income eclipsed it later in the century.

## KEDSU REEF

Many of the former military stations positioned along the major trade routes were quickly purchased and retrofitted to serve the transports crossing the system. However, there were still numerous stations located elsewhere in Hadrian that remained for the most part abandoned, owing to the fact that they saw little traffic or were in sectors dangerous to traverse. Where most people saw these floating husks as mere derelicts, one enterprising trader saw opportunity.

Delilah Havers had the misfortune of being captured by slavers when she was a teenager. Sold at market, she was purchased by a Banu trade-souli who put her to work as a translator. Fortunately, owing to the Banu practice of allowing indentured servants to earn their freedom, Delilah was able to liberate herself by the time she was thirty. Having become apt at negotiations after working closely with her souli, she continued working as an independent trader and was able to amass a small fortune. In 2881, while making a run through the system, an idea struck her as she flew past an abandoned station – all of these

derelicts would make the perfect platforms from which to build a Banu-style flotilla. Home to some of the biggest markets in Banu space, flotillas traditionally grow organically as various ships and stations are lashed together at trade hubs. Rather than let it happen on its own (as the Banu would), Delilah purchased several derelict stations and had them transported into position to form the nucleus of a flotilla. By doing this she was able to create a single service center capable of handling multiple large transport vessels and their crews at the same time, but for significantly less than the cost of building such a station from scratch. She named the flotilla Kedsu, the Banu word for reef, since the structure reminded her of the underwater formations she explored as a child on Goss. Commonly though, it has come to be known by the misnomer "Kedsu Reef."

Since more traders could do business here at the same time than anywhere else in the system, it was no surprise that Kedsu Reef became a very popular destination. Home to the largest permanent population in Hadrian, its



EMPIRE

markets and bazaars stock goods from all over Human, Xi'an and even Banu space. Every day, huge quantities of commodities and credits are negotiated and traded. But with habitats for rent and numerous dining and entertainment wings, even if you're not looking to trade, Kedsu is still very much worth the visit. Today, Kedsu Reef has continued to grow and more pieces are frequently added, further expanding the station. The popular spot has even spawned a small neighborhood of competing stations looking to take advantage of the steady flow of ships.

## HEARD IN THE WIND

"From the softest sheets, to the freshest beef, nobody matches Kedsu Reef!"

- Commercial jingle for the flotilla, 2938

"I dare them to come."

- Attributed to Navy Admiral Les Holstein, in supposed response to a Senator asking if the forces of Hadrian were prepared for a Xi'an incursion, 27th Century

## HADRIAN BELT ALPHA

Though still abundant with resources, the majority of this asteroid belt remains untouched thanks to the undetonated anti-ship mines that remain from the cold war era. It is true that there are some brave souls willing to take the

risk for the chance to earn the credits that harvesting the ore would bring, but most will only visit the belt as they traverse along one of the designated safe flight lanes.

## HADRIAN III

Out where it orbits in the distant reaches of the system, the ice giant Hadrian III has a permanent dark storm cloud that stands out in stark contrast to its otherwise pale color. This dramatic appearance earned the planet the nickname "the Watcher," as it seems to be keeping a careful eye over the rest of Hadrian.

**TRAVEL WARNING** Despite the abundance of beacons warning about the hazards of mines, dozen of ships are still lost every year when they leave the safety of the designated flight lanes.



EMERGENCY





# DRIFTERS

BY DAVE HADDOCK

CHRONICLES

## Episode 4

The gunshots were still echoing around the massive landing bay. That high-pitched whine rang in Mags' ears, but she was locked on Trin, watching as the blood seeped out of her body into the dirty grate. She felt Kel move beside her. He'd put his hands up, as high as he could reach.

Mags looked up at Ozzy. He still had the pistol aimed. His face was twisted, filled with rage. Moments before he shot Trin, he'd accused her of leaving him behind. Years ago, back when they both ran with the Souther Titans, a job went sideways and Ozzy got pinched. He lost five years of his life in the penal hellhole of Quarterdeck while she got away. Mags couldn't say it came as a complete surprise. Trin had threatened her more than once, most recently to shoot her and dump her out of an airlock. Hopefully in that order.

"What do you wanna do about them?" asked the guy who looked like a spectrum show grandpa.

Ozzy finally broke away from Trin and looked at Mags and Kel. The rage faded as he holstered his pistol.

"Let 'em go, Jack."

The old man laughed one of those deep belly laughs.

"You been outta the fold for too long, kiddo. Titans don't let witnesses walk."

"Jack." Ozzy glared at him. "Leave them alone."

*Blind Jack Sticha*, she realized. Definitely not what she had imagined based on the rep. Maybe that was his trick. She saw him draw a pistol, out of sight from Ozzy.

“You let people with grudges go, all you’re doing is makin’ headaches down the way,” he said, like he was telling a kid about the facts of life. His thumb silently clicked off the safety.

Mags knew she didn’t have long.

“I can get you out of here,” she blurted out. Blind Jack hesitated. She kept going before he could reconsider. “Levski’s on lockdown. You got a way past that?”

Blind Jack didn’t say anything. Ozzy gave her a quick shake of the head that said *you don’t want to do this*.

“I know how to get you out.” Mags continued. Her mind was racing. Back in the day when she ran with Frank McGarr, they had to slip past a lockdown or two. Hell knew if the same tricks would work on Delamar. Besides, if she could stick with the eriesium, maybe she’d find a chance to steal it back. “Seems to me like you’d want to get a head start on those Four Point hitters roaming around here.”

She could tell Blind Jack knew what she was talking about. Maybe he was the one who pointed the assassins their direction.

“You let Kel walk,” she said, taking a step towards Blind Jack and Ozzy, “and I’ll get you out of here.”

Blind Jack looked at Kel, who hadn’t moved. His hands still reached for the sky.

“Your lucky day, Banu,” he said and motioned to the other Titans. They lowered their weapons and started to leave. Ozzy gave Trin a last look then lifted the lockbox with the eriesium.

“After you,” Blind Jack motioned for Mags to start walking. She looked back at Kel.

“Captain Mags . . .” he stammered as he lowered his hands.

“I’ll see you again.” She squeezed his arm then backed away and joined the Titans in the airlock.

She gave him one last reassuring smile as the airlock sealed shut.

\* \* \*

Kel stood there for a few moments, unsure what to do. He looked around. The mechanics who had been hanging out must have run when the shooting started. They’d left their music playing. Strange Human whines droned on, providing a bizarre soundtrack to the scene.

He finally acted, going to Trin’s body, but there was so much blood. He didn’t even know where to start, so he just pressed on the wounds.

“Holy shit.”

Kel jumped at the new voice. He looked over to the airlock to see Honan Yao clutching a bag of takeaway food. He might’ve still been high – the black drug stains in his arm now ran all the way down through his hand – but he didn’t act like it.

“She is badly broken,” Kel asked helplessly. “What do I do?”

Yao raced over to Trin and began examining her, checking her pulse, looking at her pupils.

“She’s alive, but barely.” He said with a matter of factness that Kel had never heard from him. “We need to get her inside the ship. Now.”

Kel grabbed Trin’s legs and they quickly moved her into the *Harlequin*. Once inside, they cleaned off the table in the communal table and put her down. Yao took off for his bunk.

“Put pressure on the wounds,” he yelled as he rooted around his sleeping berth, tossing bags, empty cans of beer and food wrappers onto the floor. He reappeared moments later carrying one of his duffel bags.



He tossed it down on the bench and rooted through clothing until he found a case buried all the way at the bottom. He unzipped it to reveal a basic field medic's kit, and quickly hooked up a handheld biometer which quietly beeped a subtle heartbeat.

Kel stepped back as Yao went to work. The Banu washed the blood off his hands.

Yao hooked her up to some oxygen and ran through a series of quick injections. Trin's vitals fluttered while he laid out some pristine surgical equipment.

Kel approached cautiously and fidgeted with the Captain Levo figure he'd bought from a stall in the Grand Bazaar.

Yao moved precisely and expertly. Kel was impressed; he hardly seemed like the same Human who had fallen asleep while patching up laser wounds. He carefully extracted three of the rounds that were still inside her, then set about repairing the internal damage.

Kel stayed until he realized that he wasn't contributing anything to this. He drifted into the adjoining room and began looking up information about the Captain Levo character, anything to take his mind off the fact that Trin's life hung in the balance. More so, he was worried about Mags and her brave sacrifice to save him.

Hours passed. Kel had read everything he could get his hands on and was a few episodes into the first season of *Voyage Beyond*, the show that first introduced the character. He needed to get through two seasons of this before Captain Levo would get his own series.

Finally, Yao shuffled into the room and slumped down on the bench next to Kel. He dragged a can of beer over, popped it open and took a long drink.

"Is she fixed?" Kel finally mustered up the courage to ask.

Yao took another drink and leaned forward.

"Yeah, all good," he replied.

Kel nodded and patted Yao on the forehead, a Human sign of affection he had learned a few months ago.

"Thanks, buddy." Yao finished off the drink. "I'll keep an eye on her, but vitals are strong and she's responding well to the meds. She'll probably be up soon."

"That's great to hear," another voice said from the side airlock. Kel and Yao looked over.

Arno and Osane, assassins of the Four Points criminal syndicate, stepped forward. Their weapons were aimed at the two of them. Kel put his hands up again.

This was getting to be a habit.

\* \* \*

Executive Devin carefully stepped through the crime scene. He could smell traces of ozone in the air from the EMP grenade. From what he could piece together, there were anywhere from three to five combatants, but that was all he could get. Vague descriptions. No one willing to offer anything substantial.

All this chaos because some deal went wrong. Six dead. Eight wounded.

*Because some deal went wrong.* He shook his head and looked over the scene again. This was the kind of aggro nonsense that drove him out of 'civilized' space all those years ago.

One of his local administrators (the People's Alliance didn't like to use the term 'police') named Riegert stepped into the bar and waved. Devin beckoned him in. The young administrator quietly made his way down the stairs, carefully navigating around the bodies and pools of blood to approach Devin.



“Executive,” he said with a deferential nod. He was clearly uncomfortable around the corpses. Devin wished he could remember back when they would have bothered him.

“What is it, Riegert?”

“Got reports of gunfire on one of the landing platforms.”

Devin muttered to himself.

“Any witnesses?” he finally asked.

“No, sir.”

“Course not,” he said with another shake of the head.

“That it?”

Riegert hesitated.

“What.”

“Some of the maintenance engineers were looking into a clogged vent in subsection two,” Riegert shifted uncomfortably. “They found Phillip Desmond inside. Dead.”

Devin pulled out one of the nearby barstools and sat down. He sipped from an abandoned drink at the bar while he thought. Phil was a longtime local. Didn’t even drink, so there’s no way he’d have been in here when the fight broke out. *This is getting out of hand.*

He pushed off the stool and headed for the exit. Riegert followed.

“I want you to seal up the Residencies. Call for volunteers to reinforce the peace.”

“Yes, sir.” Riegert rushed to keep up without stepping in any blood.

Devin slowed to a stop as a realization hit him.

“All the hangars are routed through the emergency system, right?”

“I think so.”

“Take the backup generators offline. Just in case.” Devin started walking again.

“Okay.”

They stepped out of Cafe Musain and walked to the rail overlooking the Grand Bazaar which had almost resumed its usual hustle. Executive Devin scanned the faces.

“Pull together whatever administrators we have left. Whoever’s done this is still here. Since they can’t slip our lockdown, I want to go into the tunnels to make sure they don’t have any other ways out.”

“Got it.”

“And break out the guns,” Executive Devin added quietly. “I have a feeling we’ll need them.”

\* \* \*

The Souther Titans had taken over a large landing bay and packed it with a handful of smaller fighters, speedrunners and cargo boosters. Turns out the *Harlequin* ambush was just a small percentage of them. Mags counted about ten more.

They were all lounging outside of their ships when Blind Jack returned with their prize. He’d already taken Mags’ mobiGlas and gun. Ozzy hadn’t said a word to Mags the whole walk back, just carried the lockbox with the priceless haul of eriesium. She could tell that he didn’t entirely trust the Titans either.

Once inside, Blind Jack turned back to Mags.

“So, how about it, little lady?” he said with that trademark grin. “It’s your show now.”

“It’d be easier with my mobi,” she said flatly and held out her hand.

“Nah, I think I’ll hold onto that.”



CHRONICLES



Mags shot a glance to Ozzy then back at Jack. A couple of the other Titans got up as she started to cross the landing pad. On the far side, there was an old office originally used for this particular landing pad's flight operations. The inside had been completely stripped, wires dangled from open panels like rusted guts.

Back in the early days of Levski, each of the landing pads had a dedicated flight control system, probably so they could keep a steady stream of cargo ships hauling away the minerals the station was extracting from the asteroid. When the People's Alliance took over, they consolidated all the separate flight control to a single terminal.

Mags trudged through the scattered trash, broken machines and spent bottles towards the gaping hole where the control center once stood. A couple Titans posted up at the window to keep an eye on her. They were watching her with the kind of look she'd had to deal with in the past. She clocked a couple makeshift weapons if things turned south, then rooted through the wires in the wall.

This was an old trick they used to pull back when she was running scams out of here. In her early days here, the People's Alliance were just getting wise to the fact that any criminal with half a brain could take advantage of their hospitality and use Levski as a perfect hideout. When they'd catch wind that someone was up to no good, they'd do the same lockdown trick to try and identify the criminal element to 'exile' them.

Frank had come up with a way to bypass the lockdown. Even though they had rerouted all the controls from the various landing bays into a single, central terminal, they didn't realize part of those wires were connected to back-up generators with automatic overrides to open or close in the event of a catastrophic power failure. You just needed to tap into them, you could bypass the lockdown.

She checked one of the old hiding spots for the handheld terminal they'd used to control. To her surprise, it was still there and even had fresh batteries. There must be some locals still using the same trick. She set the terminal aside and started sifting through the handfuls of wires for the ones that were going to flight control.

Ozzy walked into the room. He glanced at the Titans keeping guard, then put the eriesium lockbox down beside Mags and sat on it.

"What the hell do you think you're doing?"

"Getting your new friends out of here," she replied without looking back. "Isn't that what you want?"

"You shouldn't be here."

"He was going to kill us both," she snapped back. "Besides, why the hell do you care?"

"I did you a favor," Ozzy said after a long pause.

"She was your sister," she said as she looked back at him.

Ozzy was quiet for a few moments, like he was trying to form the words. Mags turned back to what she was doing.

"When I was down on QuarterDeck . . ." he drifted off, lost in thought, then tried shifting direction. "The two of us, Trin and I, came up in juvie centers all over the 'verse. Worst of the worst. We'd land in one, start dusting it up and they'd cart us off to another. So I been in prisons my whole life. But after one month down on QuarterDeck, one . . . I did this."

He showed Mags his forearms. Two long jagged scars were hidden among the mess of tattoos.

"The things I had to do to survive down there . . . I can't ever forget them." Ozzy stood and paced around the lockbox. "She put me there. She fed me to those agents and didn't even have the balls to own up to it. See, Trin's a survivor, always has been, but she didn't extend that shit



to include other people. She'd do what she has to do to make her way. Other people are useful when they're useful. Disposable when they're not. I know you've seen that turn in her."

Mags was quiet. She had. The first time was when she convinced Trin that the *Harlequin* was better off without the previous captain. The second was when Trin was about to throw her out of the airlock.

"She would've turned on you eventually, Mags. And if you think she was going to let you have a single credit from this eriesium . . . you're crazier than she is."

Mags mulled it over for a second then turned back to the wiring. In the next cluster, she found the right ones. She separated the hangar control wires from the rest and plugged the connection points into the handheld terminal.

"Well," she said as she powered up the terminal. It ran through its bootup sequence while negotiating with the hangar data flow. "Guess it won't matter now."

"Yeah?"

"Cause we're about to be free," she said and executed the command to open the hangar.

Nothing happened.

"Well, shit."

\* \* \*

Blobs of sounds pierced the darkness. There seemed to be nothing else. No feeling. The sound slowly began to crystallize and soon Trin could pick out single words. Her eyes still felt heavy, like she was slowly waking from a deep sleep, but her body wasn't ready to get up yet.

Finally, she opened her eyes. The light flooded in, overwhelming her senses at first as she struggled to focus. That's when the pain hit too. Searing pain in her chest.

Aches everywhere else. Her limbs were mostly unresponsive.

A form stepped into view. It was Arno, the syndicate hitter from Café Musain.

"Hey, sunshine," he said with a smirk.

Trin looked around. She was on the *Harlequin*. Kel and Yao were seated nearby. Osane, the other hitter, was guarding them. Kel waved.

"The hell's going on?" Trin tried to sit up.

"I wouldn't do that," Yao tried to move forward, but Osane kept him in place with her pistol.

Pain exploded throughout Trin's body, but she wasn't about to wince in front of these Four Point assholes, so she just took it. Her throat was dry as hell too. The rest came flooding back as she grabbed a nearby can of beer: Ozzy, Blind Jack and the Titans, the eriesium . . .

Trin finally looked down at herself. Five shots, cleaned and stitched up, dotted her chest. Her clothes were soaked in blood.

"Damn, doc," she said, poking at the wounds. She felt remarkably good. "Guess you ain't so useless after all. I hardly feel a thing."

"That's just the drugs," Yao replied. "When they wear off, it'll be agony."

"Whatever," Trin finished the beer and looked at Arno. "You know we haven't got the eriesium, right?"

"We know," Arno paced around, inspecting the faded and stained paneling on the walls. "We want to know where she took them."

"Who?"

"Captain Mags went with them," Kel chimed in as he nervously rocked back and forth. "She protect us."



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Trin nodded and swung her legs off the table, spilling some spend bloody bandages onto the floor. She tested out her feet. They felt like jelly. When she felt stable enough, she shuffled over to her bunk and started arming up.

“Where do you think you’re going?” Arno rested his hand on his weapon.

“To kill ‘em all.” Trin checked the round count on her shotgun. “You’re welcome to help.”

\* \* \*

“I’m telling you, it should’ve worked,” Mags said as she backed up from Blind Jack.

“If you can’t get us outta here, we ain’t got much use for you then,” he said as he kept pace with her.

“Give me a second,” Mags wracked her brain, trying to think of the other ways her crew used to slink out of here. Trouble was, all the other tricks required much more technical knowhow than she had. Out of the corner of her eye, she saw Blind Jack draw his pistol. “Okay.”

“Okay, what,” Jack replied and hesitated with the gun.

“I think I got something,” she said, still intently focused in thought. In truth, she didn’t have anything, but every second she was alive was another opportunity to try and get out of this, so she had to stall.

“I’m gonna need more than that,” Blind Jack said with a chuckle. “And choose your words careful.”

“You got any ships that didn’t land?”

Blind Jack glanced at Ozzy as he thought.

“Sure, we got a couple.”

“There are old storage bays in the tunnels. They were used to offload extracted ore from utility vehicles. They’re on a completely separate line from the hangar bays. If we can get down there, it’s easy to trip the wires and open

the doors. We’ll just need suits and then you can float out, get picked up and be on your way. The rest of you can leave when the lockdown lets up.”

Again, she was making it all up. Sounded logical though. There were a bunch of large sealed doors down in the old tunnels. There was one in particular that she was thinking of. She’d never been through it, but it would certainly sell the lie. There was just one thing she needed to do.

“We’ll need to separate though. It’ll be obvious if we move in a big group.” Mags went back to the handheld terminal she tried to hack the door with. She changed the connection wires from data to localized comm network. “Let me double-check to make sure the area’s still getting power.”

On the terminal screen, she brought up the local network and found the name she needed to complete her plan and typed out a hasty message.

She hoped this worked . . .

Then she hit send.

\* \* \*

Trin knew Blind Jack always wanted to have options when it came to escape routes. It was one of the tenets he drilled into his ‘family.’ Plan was to sweep the other landing pads first, then head back into the Grand Bazaar. She hit the crowd eager to find the walking dead in question.

Both Arno and Osane moved quiet. So quiet, she would occasionally forget they was there. Whoever these two were, they had serious training. She knew that from their tussle back in Musain. She couldn’t take any chances when the time came to kill them. Unfortunately, she knew the Titans had traveled in force, so she needed them both for the moment.



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Trin cut her way through the crowd, studying the faces as she went. All of them, clusters of dirty pilots, annoyed by the launch freeze, had gathered in the halls to collectively complain to each other. Up ahead, someone hooked down a hallway.

Something about him caught Trin's eye.

She hustled forward and peeked around the corner to get a better look.

He was dressed in a ratty old patchwork flight suit and was still fidgeting with his helmet. He glanced around before pulling the helmet on, but that was all Trin needed.

He had Souther Titan tattoos.

She glanced back at Arno who was keeping an eye out.

"We're in business."

\* \* \*

Mags tried to draw out their path down to the storage doors as much as possible without making it look like she was trying to. While most of the Titans had separated to look less conspicuous, Mags was stuck with Blind Jack, Ozzy and one other Titan. They passed remnants of mining endeavors, some of which dated back to the original owners of the base. After thirty minutes of descending through the winding tunnels, she could tell Blind Jack was getting impatient, so she headed for the rendezvous.

The hallway turned and then opened up into a large room. Two massive double doors occupied one of the walls. They were thankfully still closed. Empty crates were stacked throughout the room. Rocks and pebbles from extracted minerals littered the floor. There was an elevated sealed catwalk that ringed the space. This last feature was the reason why Mags choose this room.

Most of the other Titans had already arrived, presumably having taken a more direct route. Mags glanced up at the

catwalk as she made her way towards the control panel beside the door. She opened the panel to find the terminal ripped out. She stepped back like she was assessing the damage. In reality, she had no clue how to hotwire a door, much less this one.

Thankfully, she didn't have to wait long.

"All right, everybody!" a voice boomed from the catwalk. "Let's see those hands."

The Souther Titans all turned to see Executive Devin and a small army of PA administrators aiming weapons from the catwalk.

Mags tried to look as surprised as everybody else. On the inside though, she was glad her message got through. She wasn't entirely sure how she was going to wiggle out of Devin's custody again, but one thing at a time. Especially since none of the Titans made a move to drop their weapons.

Blind Jack Sticha stepped into the center of the room and looked over the faces of the administrators.

"Gotta be honest," he slowly drew his pistol and kept it aimed at the ground. "I don't see a killer among you. Now us . . ." he motioned to his crew who started getting emboldened. "Killin's our stock and trade."

*This is not good*, she thought to herself.

A tense pause hung in the air. Weapon sights sought out targets. Every movement felt like it was going to be the one that kicked everything off.

She noticed one of the Titans slowly edge their way towards Ozzy. Dressed in an ill-fitted patchwork space suit, there was something weird about their walk. As they passed Mags, she noticed fresh blood on the collar of the suit and, more importantly, recognized the face inside.

"Trin?!" she shouted without even thinking.



Trin whipped up her shotgun and leveled it at Ozzy. Mags' shout gave him enough of a warning to yank up the eriesium lockbox right as the shotgun went off. The shot caught the lockbox flush and knocked Ozzy off balance.

That's when everything went to hell.

Ballistic and laser fire erupted from every direction. Titans scampered for cover as they opened up on the People's Alliance.

Mags dove behind the nearest crate. She could see the lockbox with the eriesium had landed between Ozzy and Trin, who was pinning him down with shotgun blasts.

The Titans and People's Alliance were each taking casualties at an even clip. Gunfire blasted apart cover.

Mags tried to time a dash to go for the eriesium. Right as she started to move, bolts from rapidfire energy weapons opened up on both groups, cutting down Titans and PA forces alike. Mags scurried back behind cover and looked at the source of the shots.

Arno and Osane had jumped into the fray. They were loaded with tac-vests, body armor and grenades, surgically firing at their targets with what looked like mil-spec assault rifles. Osane advanced quickly through the Titans, firing shots from her assault rifle until it ran out of charge. Without missing a step, she slung the rifle and drew a knife. The Titan she was approaching unleashed a desperate flurry of shots. She wove around the shots as she closed and finally dashed past him, slashing his throat in the process.

Osane slid behind cover a short distance from the eriesium.

"Go for it, I got your back." Trin shouted.

Mags couldn't believe it. *She'd teamed up with the Four Points?*

Osane sprinted for the eriesium as Trin raised her shotgun towards Ozzy. At the last second, she turned the barrel on Osane and fired. The shotgun blast caught her flush in the midsection. Blood exploded out her back and her body slammed heavily into the ground.

Trin grinned and racked another charge in the chamber.

Blind Jack charged towards Executive Devin's positioned, two grenades cooking in his hands. Jack cackled as he puffed to get within throwing range. He flung one grenade.

Devin tagged him in the shoulder before he could toss the other. The grenade landed with a thud by Jack's feet. One of the PA administrators dove to shield Devin right as the first grenade went off.

The second detonation marked the end of Blind Jack Sticha.

"Osane?" Arno shouted from his firing position. "Osane! Talk to me!"

*He must not have seen what happened,* Mags thought and looked back at the lockbox. It was just sitting there, in the middle of a war zone, and she didn't have a gun. She could barely see Ozzy, but it looked like he had run out of ammo.

Trin sensed it too and started to advance on his position. Most of the other gun battles had subsided. Moans of the wounded started to fill the space.

Mags took her chance. She raced out of hiding and slid to the lockbox near Osane's body. Trin realized too late. She turned her shotgun towards Mags. It took a moment for Trin to recognize her, but it didn't change anything. She had that same look in her eye she had when she almost threw Mags out of the airlock. She raised the shotgun.

Ozzy tackled Trin right as the shotgun went off. The blast went wide. Mags could feel the crackle of energy singe her head as it passed.



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Trin and Ozzy rolled on the ground. He fought to wrestle the shotgun from her. She went for the kill. She punched him in the kidney once. Twice. Three times. Rolled on top of him and rammed her forehead into his nose. It broke with a wet crack. His grip weakened on the shotgun and she took full advantage, ripping the weapon out of his grasp and rising.

“Couldn’t even kill me, right, could you?” she said as she paced around him and pumped another charge. “What the hell happened to you? We used to be a team. You remember? What happened to that guy? That guy who was hard as nails. Who pushed me to get tougher? Nah, my brother died on QuarterDeck.”

She spit out some blood and snapped up the shotgun to execute him.

“Wait!” Mags yelled.

Trin stopped and looked over. Mags was standing, holding out the lockbox.

“You want the eriesium? Take it.”

Mags tossed the lockbox at Trin’s feet.

“What?”

“You heard me.” Mags stepped back.

“What is this?” Trin asked as she looked around suspiciously. “You’d just give it over . . .”

“Sure,” Mags said with a shrug. “Between you, the goddamn Four Points, the Titans and the cops. I don’t think I’ll be walking out of here with it anyway.”

Trin studied Mags for a second, searching her face for signs of deception. She turned the shotgun from Ozzy to Mags as she walked over to the lockbox.

“So I got to thinking,” Mags stepped further back, hands still raised. Trin reached down, weapon still trained on

Mags, and flipped it open. “Like you said earlier, I can live with no one having it.”

Trin looked into the lockbox. One of Osane’s grenades sat next to the lump of eriesium. The pin was out and it was whining to a high pitch. Trin flung the lockbox away at the last second. The thermal blast turned the eriesium, the lockbox and even part of the floor into molten slag.

Trin’s shock quickly turned into white hot homicidal rage as she whirled to face Mags. She raised the shotgun when a bullet punched through the side of her head. A fine mist puffed out the other side. Trin stood there for a second, like she had suddenly been unplugged. Then crumpled to the ground.

Executive Devin, charred and smoldering from Blind Jack’s grenade attack, lowered his rifle.

Silence settled over the room. A few Titans who were still mobile fled out into the tunnels while the remaining People’s Alliance administrators moved in to secure the prisoners and treat the survivors.

Mags went over and helped Ozzy to his feet. He clutched his nose to try and stop the bleeding.

“You okay?” She asked, wincing at the still steady flow of blood.

“No, but I’ll be fine.”

None of the administrators seemed that interested in them, so Mags started to ease her way out of the room. She then came face to face with Devin.

“Hey, thanks for the save,” she offered up.

“Sure. Thanks for the tip-off, Kristin,” he replied. “Oh wait, it’s actually Magdalene, right?”

“Um . . . yeah.” She looked around for a moment. “So . . .”

“Get out of here,” he walked past her to rejoin his team.



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“Do me a favor and don’t come back?”

“You got it.”

Mags motioned for Ozzy to follow and the two walked out.

\* \* \*

Arno rushed through the tunnels of Levski towards the landing deck where his ship was waiting.

He broke out the second he saw the eriesium go up. *This is not good.* That was Four Points property and he knew his boss, much less the other Points, weren’t going to accept ‘a shitty turn of events’ as an excuse for losing a fortune, so he had to disappear. Now.

He worked out a route to get to one of his safe houses, one of his personal failsafes in case he ever needed to get out. He had half a dozen similar ones spread around the ‘verse, each stocked with credits, a clean ship and a new identity.

Arno climbed into his ship, stowed his gear and slipped into the pilot’s seat to start his takeoff. The lockdown should end any time now and he wanted to be the first to bust out of here.

That’s when his mobi pinged with an incoming comm.

Arno ignored it, but something caught his eye in front of his ship.

A Xi’an was standing just outside the airlock to the landing pad. It was the same one from Cafe Musain . . .

He could see the alien key a command into his mobi.

Arno’s ship exploded right there on the pad.

Soahm watched the wreckage burn for a few moments. Automatic Fire Suppression Systems activated as extinguishers targeted the flames.

He turned and stepped back into the airlock, already planning what he would say in the report to his bosses.

\* \* \*

Back aboard the *Harlequin*, their engines heated up the second the lockdown was lifted. Mags couldn’t wait to get off this rock.

Kel was sitting in the back, calm now that she explained Ozzy was on their side again, working his way through some spectrum show and constantly giving updates to Yao. She hadn’t seen the doc take a hit in a while. Something seemed different about him. She’d figure out what.

As the dust and rocks above Levski gave way to the yawning blackness of space, all the madness, stress and pressure of the past few days started to fade and she was left with a single thought:

*Holy shit, that was fun.*

True, they were barely better financially than when they started this, and in the long term, she desperately wanted the kind of financial security that meant that she’d never need to stress about money, but honestly, she realized she wasn’t in a hurry. She’d found a crew of people she finally trusted. Who had her back and she had theirs. They were young and they’d have plenty of opportunities to hit that big score.

They just needed to keep hustling until they did.

For the first time, she was actually okay with that.

***The End***



**CHRONICLES**