

JUMP POINT

A ROBERTS SPACE INDUSTRIES PUBLICATION ISSUE 01.13

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GREETINGS, CITIZENS!

I warned last month that there would come a time that we couldn't coordinate the WIP ship, its manufacturer in Portfolio, and its home system in the Galactic Guide ... but not this month.

We've got the Avenger for WIP, Aegis Dynamics for the Portfolio, and Davien System in the Galactic Guide.

We went behind the scenes at Turbulent in Montreal to get the inside story on what the Org system is intended to do, and how they're doing it. And Chronicles concludes Doug Niles' *The Void Rats*. Our heroes are really torqued, but they don't intend to take it any longer.

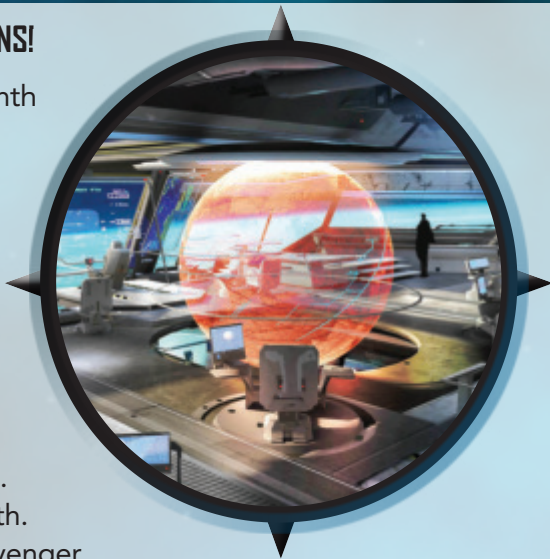
Aspiring SC authors: The update is that there is very little update. What with a late Thanksgiving, a livestream, the holidays, the current fiction being written, and the Austin office move, my dev reviewers had little time for new samples. We'll be doing some catch-up in January.

As I write this, it's the day after Xmas. Thanks especially to Ben, Dave and Benoit for working during time off and illness to get you JP on time (tomorrow), and to Chris and the other JP reviewers who will be spending time Friday to make sure everything's in order.

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

David

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AVENGER STATS

The Aegis Avenger has had a long and storied life, first as a frontline combat craft, then as the standard patrol craft of the UEE Advocacy. Although aging, the Avenger features a sturdy, reliable hull and the capacity for larger-than-expected engine mounts.

Manufacturer: Aegis Dynamics

Length/Beam/Height: 19/14.3/5.4 meters

Crew (max): 1

Mass (empty): 22,000 Kg

Focus: Interceptor / Interdiction

STRUCTURE STATS

Cargo Capacity: 10 tonnes

Power Plant: MaxNet Powerfountain 2+ (max 3)

Factory Shield: Sterne Katzen AG Hornisse-36 (1; max 3)

Factory Engine: Hammer Propulsion HL 2.4 (1x TR4; max TR5)

Maneuvering Thrusters: 8x Hydra Propulsion M1-16 (8x TR1)

HARDPOINTS

2 x Class 1 (size 2; wingtip): 2x Joker Suckerpunch distortion cannon

1 x Class 2 (size 3-4; nose): 1x Kruger Intergalaktische Tigerstreik T-21

2 x Class 3 (size 3; underwing): (none)

EDITOR: DAVID LADYMAN, INCAN MONKEY GOD STUDIOS
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FROM THE HICKORY

Avenger

This month, our Work In Progress contributors include:

Nathan Dearsley (ND) Artist

Chris Roberts (CR)

Chris Olivia (CO) Chief Visual Officer

Chris Smith (CS) Lead Vehicle Artist

Mark Skelton (MS) Art Director

Rob Irving (RI) Lead Designer

Dave Haddock (DH) Lead Writer

Bryan Brewer (BB) Lead Animator

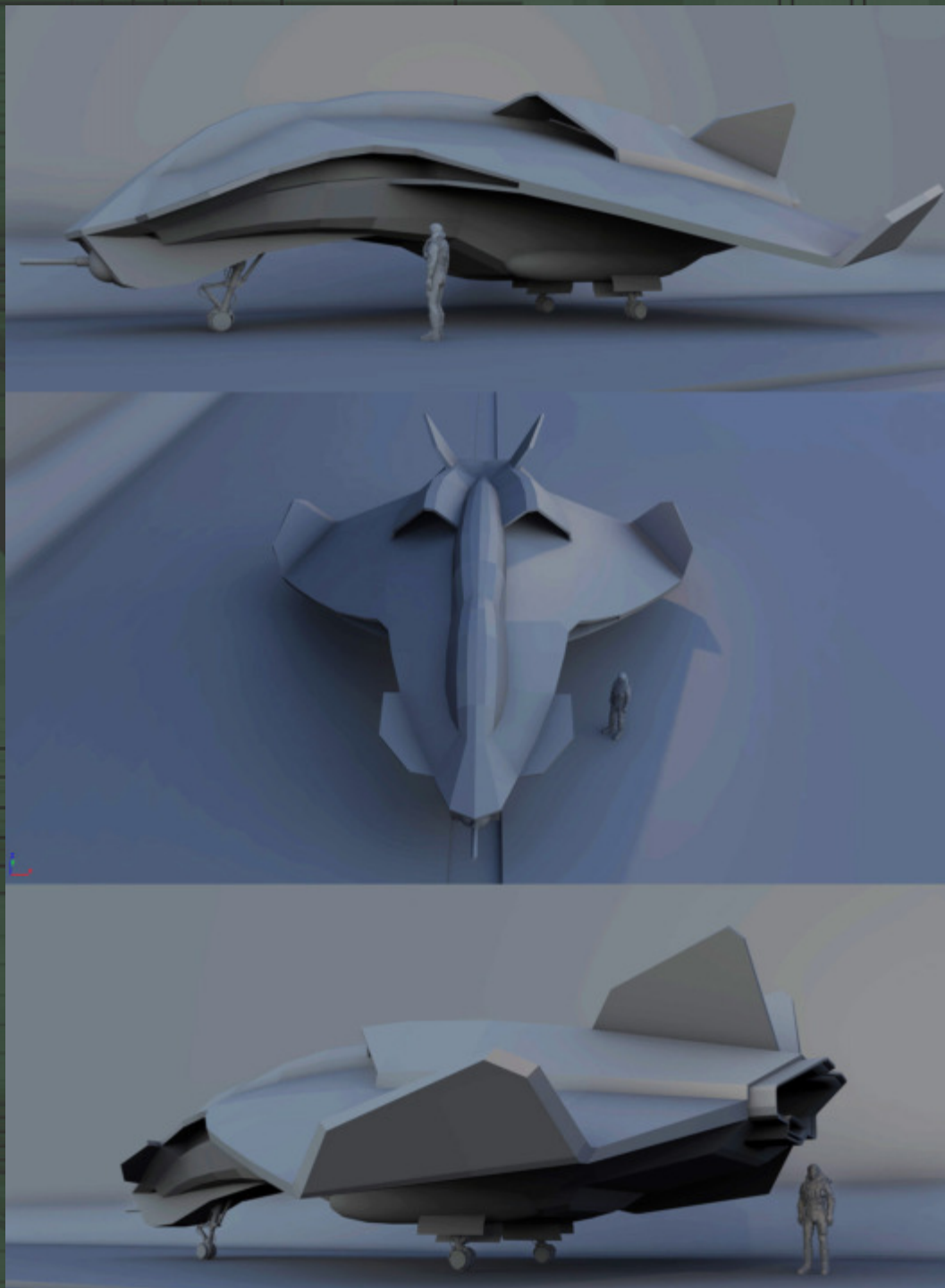
Travis Day (TD) Associate Producer

Harry Jarvis (HJ) Art Producer

In addition, we have (in black text) more commentary from Nathan.



WORK IN PROGRESS



Inspiration & Block-Out. Having been given the task of conceiving the Avenger, the first thing I did was to have a read of the ship's specifics from design, and take away points such as:

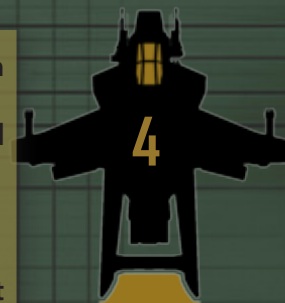
"It avoids more specialised weapons in favour of a single, center-line gun mount that makes it something of a marksman's ship"

"The Aegis Avenger has had a long and storied life as the standard patrol craft"

"Police Avengers"

For me these very high-level ideas become the very first step in imagining what this ship may look like. It's old, has plenty of rich history being a police craft, it's pitched as a bounty hunter ship, and so on.

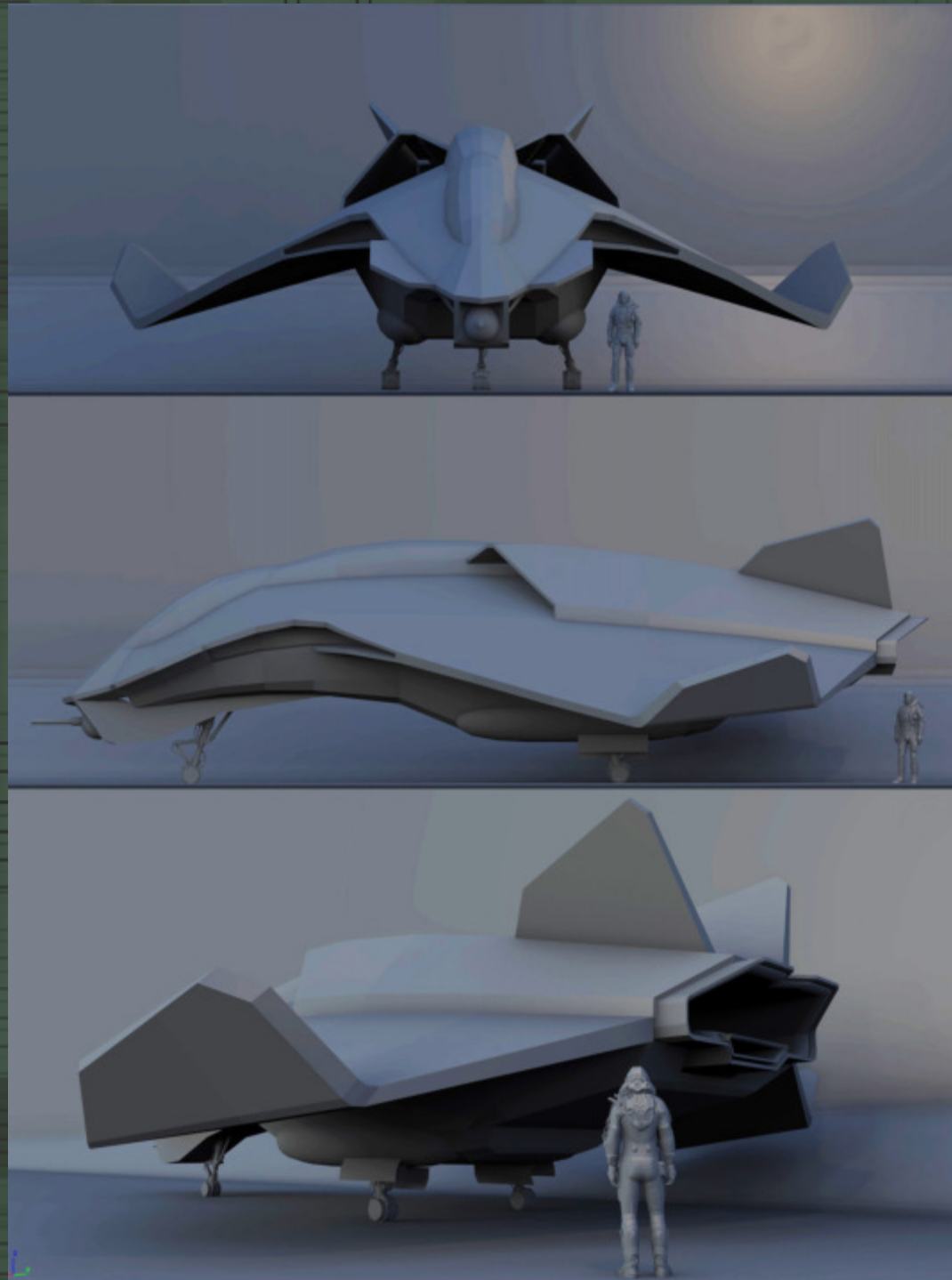
So my thinking is that this needs to be actually quite primitive in its core values and design, built for function, not over-complicated, with it being old in the SC universe. "What does old look like?" I asked myself. Every artist would probably have a different conception of what old looks like in the future; for me, that meant looking at present-day designs for a lot of the inspiration behind the ship's design, form and textures/shaders that would be used. Stealth fighters and NASA shuttles were used on a regular basis, whilst the initial designs were being done for inspiration.



WORKING PROGRESS

Inspiration & Block-Out (cont). We did have other designs flying around for the Avenger at the time I took it on, but I didn't really look at these. I was confident I could pitch something to Chris R that he would like, but was also slightly different in design to everything else we had at the time – something with a bit more focus on elements that onlookers may recognise from today's designs, a smooth, slightly more organic design.

As you can see, the block-out is purely to give a high-level idea of a design: is this where we want to go? Chris R and Chris O were pleased with this, so I was given a green light to develop the design further, add more detail, make it more appealing, and so on.



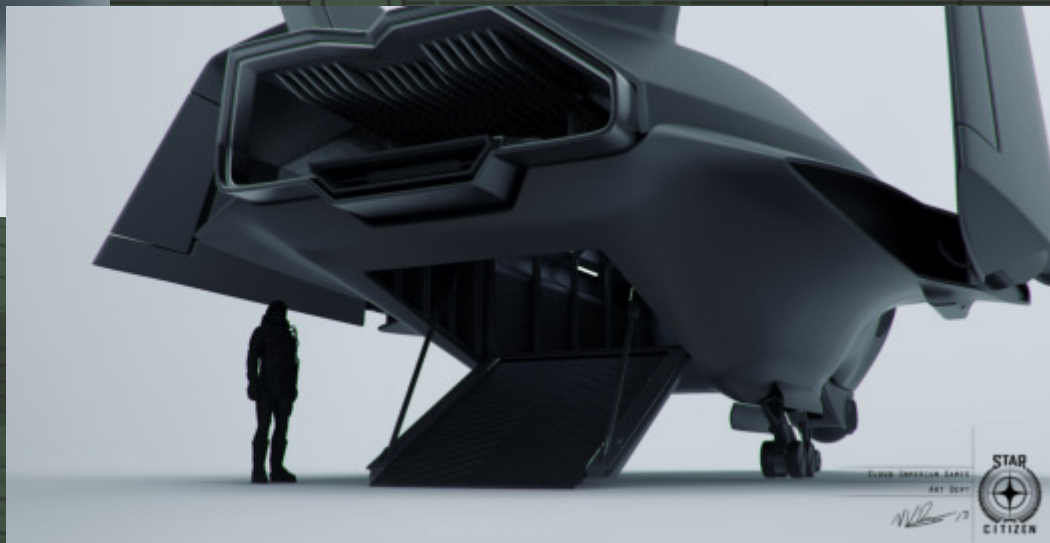
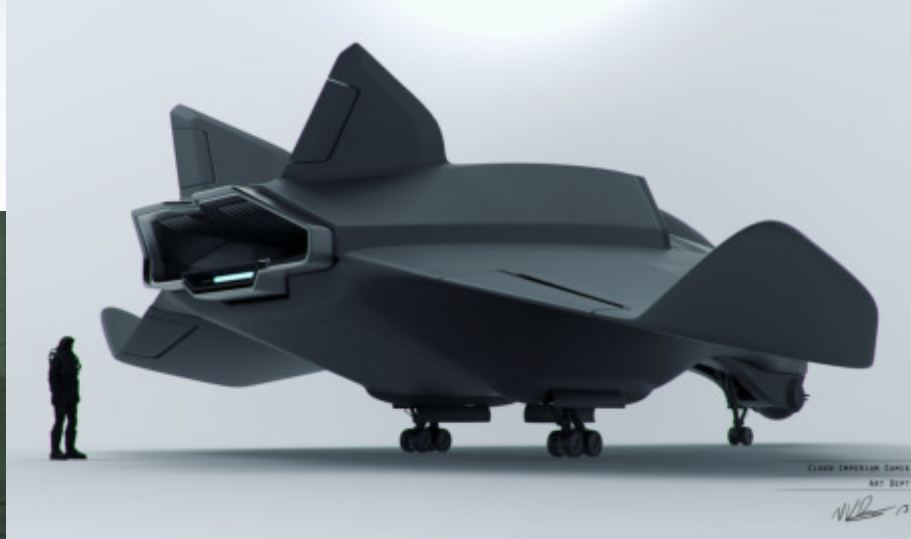
WORKING PRINCIPLES



Further Iterations. I guess you could say by trade I'm a sub-D modeller (sub-D = high-res hard surface modelling, millions of polies used), so this was the kind of pass I made. I'm not really focusing on the small details at this stage, I'm more interested in broad brush strokes of modelling to get the overall 'feel' of what I want. For me, the details come much later on.



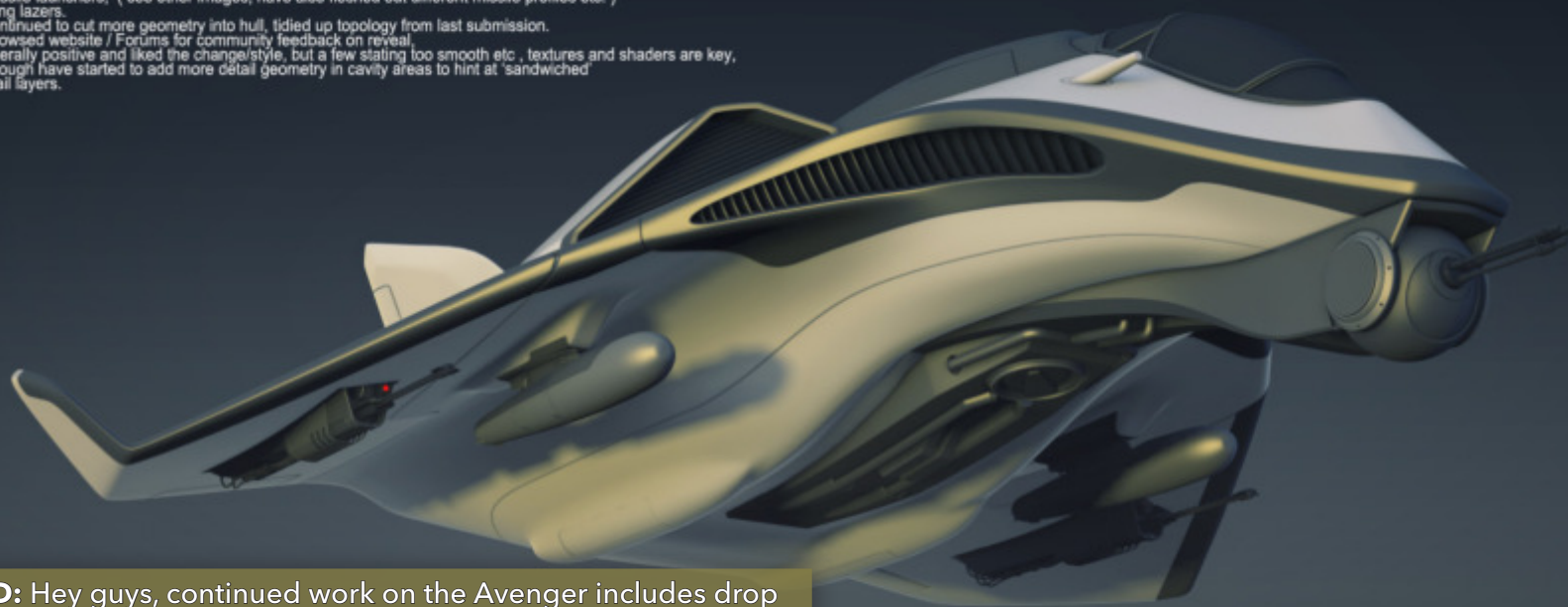
WORK IN PROGRESS



WORKING ON THE



General work all over the ship,
- rear bay doors now modelled (see rear images)
- drop tanks
- thruster alternatives / upgrades
- missile launchers, (see other images, have also fleshed out different missile profiles etc.)
- wing lasers.
- continued to cut more geometry into hull, tidied up topology from last submission.
- Browsed website / Forums for community feedback on reveal, generally positive and liked the change/style, but a few stating too smooth etc , textures and shaders are key, although have started to add more detail geometry in cavity areas to hint at 'sandwiched' detail layers.



ND: Hey guys, continued work on the Avenger includes drop tanks, bay doors, thruster alternative / upgrades, missile launchers, wing lasers (spelled with a z in the images for your lols), several fixes to existing topology and general modelling 'sins' hidden in the reveal shots, cut more detail in here and there, and so forth. I took it upon myself to look through forum / website feedback on this also, all explained in the shots.

Not shown in image, but may be cool to shorten front landing gear whilst 'parked' meaner more aggressive stance? Back gears beefed up slightly also. 'Shown with missiles'



WORK IN PROGRESS

Drop tanks now added to wings, could swap out for missiles also shown in other images
Wing lazars fleshed out also

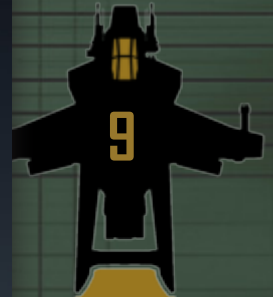


CO: Nathan, looks amazing.

MS: Looking great, Nathan! Not sure if you have access to any of the max files for our ships, but if you need anything let me know. :)



Work in Progress



WORK IN PROGRESS

Thruster / Upgrade A



Work in Progress

Existing Thruster / or Upgrade B



Thruster / Upgrade C



Work in Progress



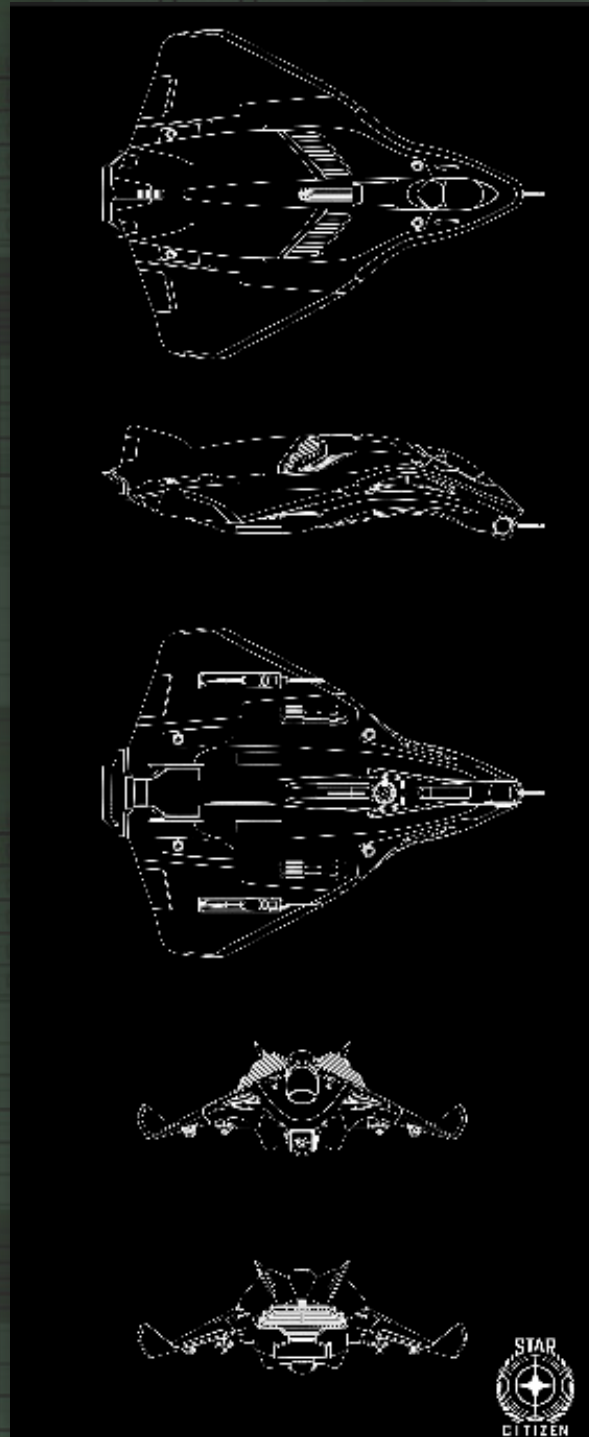
WORK IN PROGRESS

I used Keyshot at this stage as we needed some images for the reveal. Keyshot is a great piece of software to quickly get your model in, apply some nice lighting, play with where certain materials may go and so on.

As can be seen at this stage, the model is very bare bones. If you actually were to zoom in on it, it's very minimal, which is fine at this stage. I took further reference from some species of fish (manta rays, etc.). These also gave me some nice ideas for where to place things such as the side inlets, mimicking gills, and so on.

It's now time to wait for feedback. There were certain key things missing such as manoeuvring thrusters and so on, so these needed to be addressed before moving further. I wanted to make sure these would make some sense without destroying the overall design we had arrived at, so for me, rather than building out the model, I approached it by working into the model wherever possible so as not to break the appealing silhouette we have.

During this phase and, well, every phase, I tried my best to keep up to date with what the Citizens on the forums are saying. You're never going to keep everyone happy, but I'll always try to. The main thing that was popping up was the fact of how smooth the model was. This didn't really bother me as I know how much can be done with game shaders and textures applied down the line – you could take a Jaguar E type, probably the smoothest, most beautiful car designed, paint over it in a different colour, rust it up some and it instantly feels like a different design. This is kind of what I'm doing here, once the crown in the police line-up has fallen off its perch, into the hands of bounty hunters and such.



CS: looks awesome!

CR: Yeah, looks really great.

The other things that need to be designed / thought about are the manoeuvring thrusters. There's a write-up on Confluence: the Avenger has 8 TR1 manoeuvring jets, so it would have 4 upper (front left, front right, back left back right) and 4 lower. They will need to gimble and / or flex (for a fixed set you need at least 12 to handle pitch, roll and yaw).

You can look at the Hornet or 300i for thruster guidance.



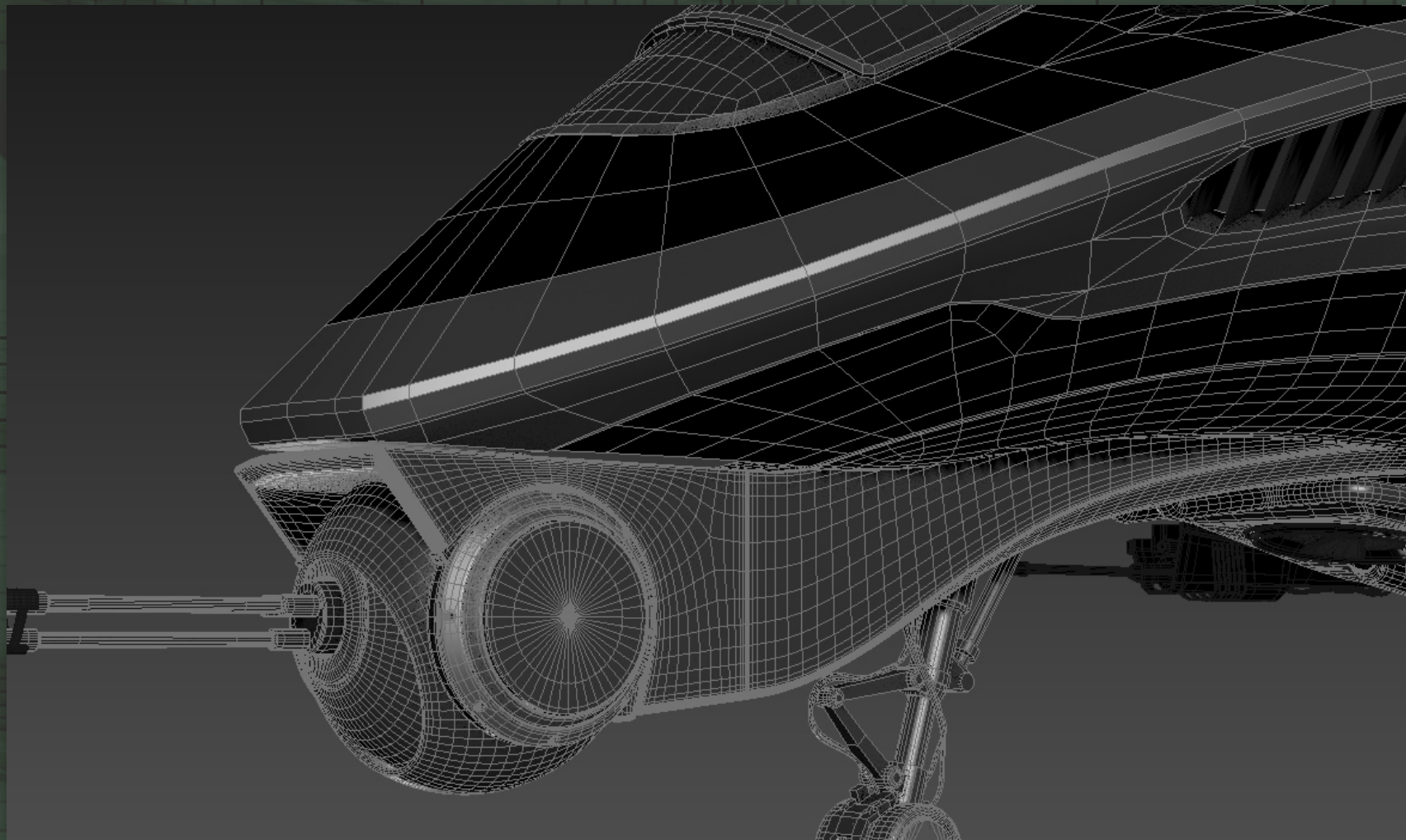
WORK IN PROGRESS



Once we're all happy, it's time for me to start getting something together that Cry-engine will like. A sub-D model in a perfect world would be great, but in the real world you wouldn't be able to have anything else on your screen in the game – it's got far too many polygons. This process basically involves taking the geometry and lowering its triangle count as much as possible without it looking too polygonal, keeping

in mind that I am not going to be using any unique shaders for the exterior. Everything will be made using tiling textures (making it possible to re-use them on something else in the future.)

Here's a good example of the poly count differences made during this phase. Look at the difference between the upper and lower parts of the image.



WORK IN PROGRESS

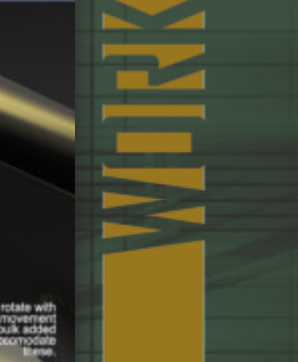
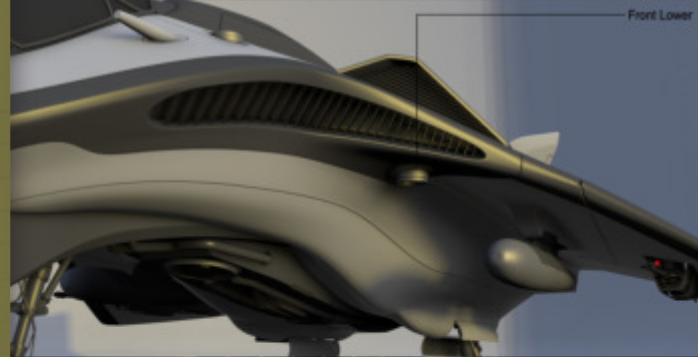
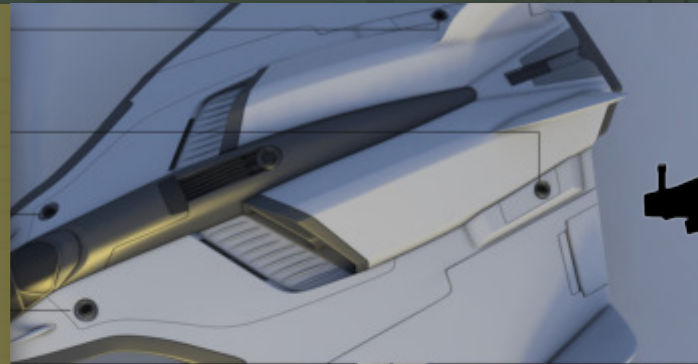


ND: Hey all, added 8 thrusters (each corner, or close to it). Had to build additional bulk in areas to get these in, helping the visuals a little more I think. Here are pure orthographic views; I also took the liberty to render out edge-line versions in case you were needing these for HUD / UI placeholders.

CR: Looks cool. One question: can the thrusters articulate to thrust on the X axis (+ and -)? This is needed to create yaw. I'm not sure they can rotate 90 degrees on the Y axis at the moment to achieve this (assuming +Y is front and +Z is up) – but maybe they can!

Also the triangle support strut on the front landing gear should be facing the other way – that's the way it would be to be load bearing.

ND: I'll flip the front gear; these were ripped from the 300i as placeholders for the blockout / concept. With regard to the thrusters, roll and pitch are cool with this setup but yaw may be an issue. I thought this could be achieved by saying if you wanted to yaw clockwise, both the front left thrusters and rear right thrusters would work together at roughly 45 degree angles to achieve this (cancelling the roll out, if this makes sense). I can certainly redo this, or add an additional 4 thrusters (1 each corner) to achieve this (it would look better I think) at a 90 angle. Other options may be to rig these existing ones so that they pop out slightly once activated (to sit above the hull geometry); happy to do it whichever way.



WORK IN PROGRESS

All thrusters rotate with ship's hull for movement. Additional bulk added throughout to accommodate these.



ND: Everything you see is still very much work in progress; lots to do as can be seen. The ship isn't mirrored at present, but I did mirror some of the grabs as I find pictures more appealing flowing from left to right ;), so some text on the decals is inverted, etc. Everything seen is being done with my tiles; should the exterior need any unique mapping I'll grab this space from the interior pages once we get to it.

P.S. Many lambs were sacrificed during the uv process, but I kept shells to a minimum to cull vert count in-game.



WORK IN PROGRESS



Texturing. This is a fun part; I really enjoy shader creation. As I mentioned earlier, I took a lot of inspiration from NASA shuttle designs and this was the driving force behind my choices of material application: white central plating with dark grey / black on leading edges and every possible area around the ships silhouette. Initially, my thoughts were to make the ship pretty grubby, giving it plenty of age as can be seen above – slightly rusty, plenty of dust, etc.

But we are actually going to be doing this procedurally in game – over the course of time, the more you use your ship, the more it will show wear. I had already set up the shaders to be able to do this in a fashion, so with some code support in the future you'll get effects mimicking something along the lines of the image to the right.



WORKING ON THE SHIP



ND: Waiting on confirmation that we can fold the wings whilst on the ground (exposing the inside of the wings and main chassis with lots of noodly pipes, etc.). It would look epic climbing in and seeing the shape and light changing at the rear.

CR: Sure! Not a problem to do! If you need any non-CGA bits (say detailed pipes / wires that bend), that part can always be attached as a CHR to the vehicle. The new Hornet F7C landing gear is actually 3 CHR's attached to the main vehicle CGA. The landing bay doors are actually part of the CGA and there is animation saved out for the main CGA and the three CHR's – they are all played in by Mannequin automatically when you retract or deploy the landing gear.

ND: Wicked :) Thank you!

CO: freaking gorgeous ... Rob, you mentioned a giant nose gun for one of the variants / upgrades?

RI: Yeah. The nose gun is supposed to be BIG (like A-10 nose gun big) at its maximum size. (In technical terms, it can mount a size 3 through a size 5.) That's sort of the whole centerpiece of the Avenger, since its wing guns are pretty puny.

ND: Hey Rob, I'll beef this one up and make more of a feature of it for sure; it's getting lost right now, as you have both pointed out.

TD: This doesn't count as direction, just a personal opinion. One of the things I have loved about the Avenger from the beginning is how sleek and curvy it is, you just wanna grab it by the hips. In this image, the wiring coming from under the

fuselage and connecting to the gun turret seems counter to the rest of the ship. Something so clean and curvy wouldn't have a bundle of wires marring its belly.

ND: Hey Travis, I appreciate your input. As with everything 3d, things can be changed easily. The reason I have started to add these details is that after looking though all the feedback on various forums, and on the stream when we

revealed it, many commented on maybe it looks 'too' sleek, even though they liked the design. Maybe pipes / wires aren't the right choice and we should maybe think of more gill / fish-like forms (still playing as I go through). I'm planning on layering these parts on very localised areas, much like the 'sandwich' design language you see on the early *Star Wars* ships. Boba Fett's Slave I for example, another bounty ship, had all its detail contained on its 'belly'; you'll notice this is what I'm starting here if you look further back underside. So in essence the top of the ship remains sleek, the underside is the business end, also giving players some details to appreciate once grounded. Hope that makes sense ...

TD: Hey man, do your thing, as it has looked amazing so far. I usually don't comment on things but I just wanted to throw in my two cents on this because the Avenger is my favorite ship design so far. :)

I get what you are saying about needing some "chatter" to break up the sleekness and I get the Slave I reference.

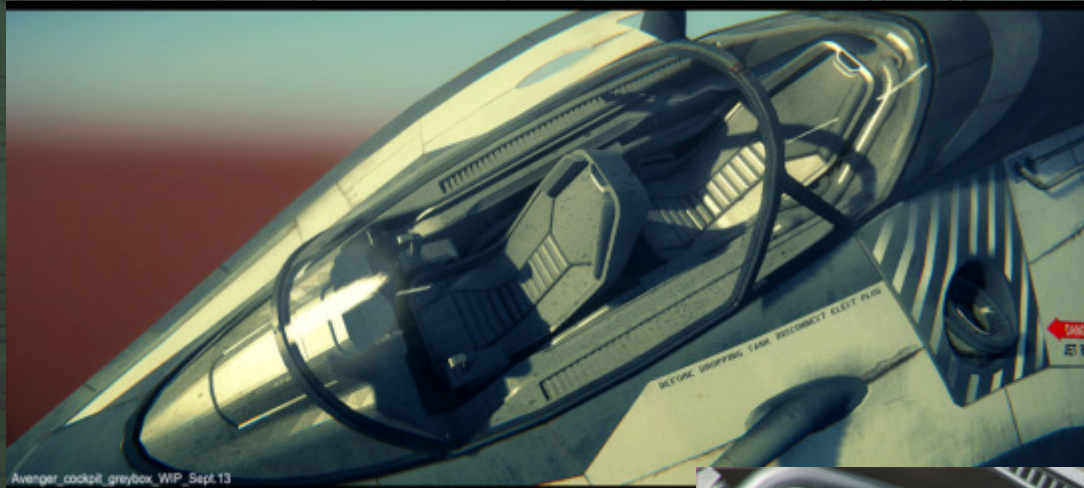
The fish gills may end up adding to the sleek factor, not sure though. Maybe if you want to counter that you could look at some of the F-117 style angular paneling from the top and apply it to the belly of the Avenger?

I am gonna leave it there before I derail this ship for the negative. Like I said, it is my favorite, so I am really looking forward to what you come up with! :)

CR: Looking good! Can't wait to see it finished (with cockpit) and pilot animations from Bryan!



WORK IN PROGRESS



Avenger_cockpit_greybox_WIP_Sept.13

Cockpit. The initial cockpit was for the trainer variant (which posed lots of controversy on the forums after it went into the hangar). It's a two-seater, pilot at the front, passenger at the rear. It was a pretty tight fit into the space available and required some subtle rework to make everything fit just right. I always wanted it to feel tight, more like a fighter, but then also have a clean / clear visibility for the player. This was pretty much the same process as for the ship's hull.

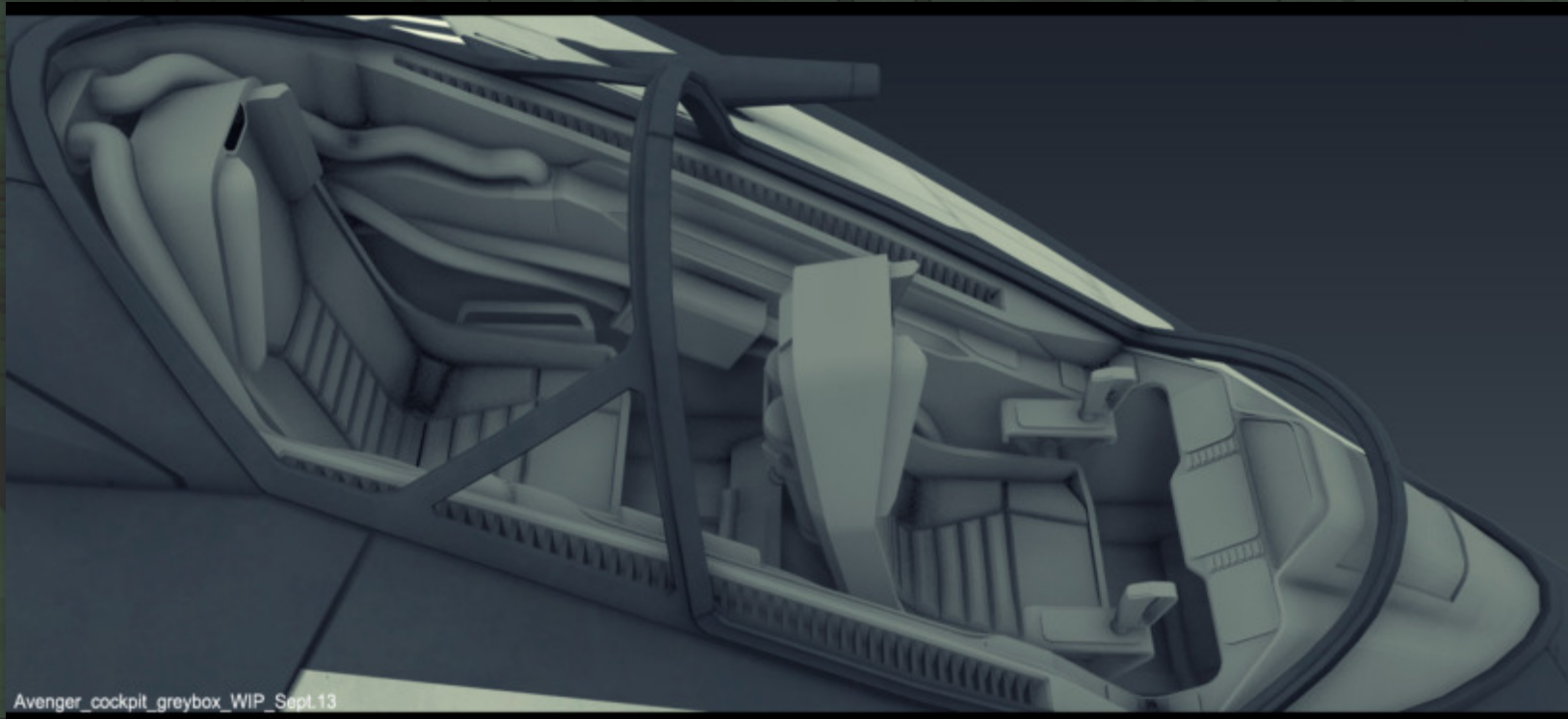


Then as the cockpit was to have its own texture set (it's cheaper overall, it gives the ability to have more refined detail, which is required as players live so close to this area for long periods of time, and also it's very possible the cockpits and interiors of the ships will load drastically before the exteriors, so they should carry their own textures whenever possible), it was time to sub-d this up and again get it into Keyshot for some quick ideas about material layout, colours and so on.

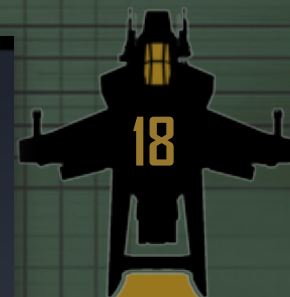


You then take the high res and bake all the lovely information onto a lower res mesh, texture it, age it, etc. For unique things like this I like to use a program called dDo as an initial pass for general edge weathering, then into Photoshop for further photo overlays to give everything surface definition and texture.

WORK IN PROGRESS



Avenger_cockpit_greybox_WIP_Sept.13



STARLINE
WORK IN PROGRESS

ND: Blocking in cockpit now (I have the human cockpit proxy in place). In the description it states capacity as one, although two for the trainer variant. That gives us some options – we can model a cockpit with a two-seater variant, then another configuration for a single-seater. That would mean moving the single-seat position for it to look 'natural' in my opinion, meaning two cockpits to be made. Or, we could model a single-seater, and training could be deployed via some kind of cpu program and voice comms if this make sense (which would mean only one cockpit to be made). Or (third possibility) we could model it with two seats and leave it at that. Also in blocking in the cargo bay

area, I was wandering if some holding cells would be nice, similar to that of the opening of *Pitch Black* if you get me?

CR: I think the Avenger should be a two-seater, but flyable solo. Holding pens à la *Pitch Black* would be a cool option – I would think we would want a few "hold" options as upgrades / variants: Bounty Hunter edition, Hauler edition, etc.

ND: Sweet, I'll make the cargo modular, so we can swap out between open and cell blocks if required later on. I'll get both done for this delivery. :)

ND: Update on Avenger progress: cargo bay is more or less there without the cells for now – 1k texture for this. please ignore the fact that the ship isn't mirrored yet; I'm still adding stuff as I go along, and refining normals / uv shells. Cockpit greybox is in place. I need to refine entrance parts, split the section and bulk up where hinges go, etc. I've made lots of little tweaks to the main model here and there; I should have a file ready for Bryan Wednesday for anims.

HJ: Looks good – what's Human scale here? Can a character stand up in it?

ND: Naturally. :)

MS: so what happens to the tubes when we fly around? do they stay in place? Or were you wanting some physics on them? What are they for? (besides looking cool)

ND: Looking cool, and the tubes are there for some subtle early dressing, with the idea in mind that between the main supporting structures on the chassis these will plug into the bounty cells / cryosleep parts for oxygen supply and so on. You can't see them in this shot, but there are also small cylindrical details on the ceiling for more tubes, etc. to plug into (rather than

just placing an asset in there and not marrying it to its surroundings). I would go further if I could with things such as belt handles on the ceiling that would pick up gravity easily using a hinge constraint, cargo nets and so on, but need to get the cockpit resolved.

DH: Sweet. I really like the hookups for transport cells.

CO: perfecto.

CS: looking nice, Nathan!

ND: Avenger cockpit sub-d pass, shader look dev / presentations. Cracking on with optimising and uv's for bakes next. Cheers!

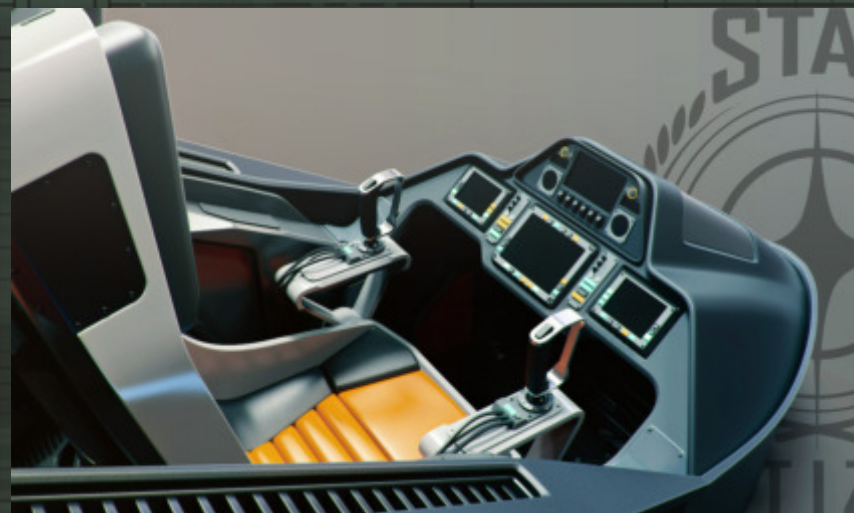
CR: Looking really great – as always! Nice work, Nathan!

ND: Thanks, Chris :)

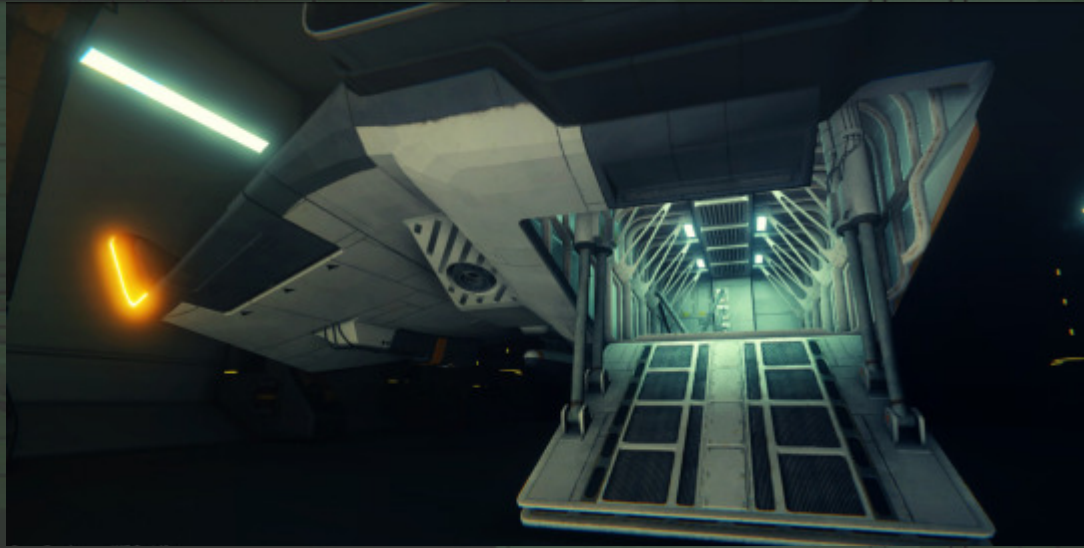
ND: Here's the cockpit. Plugging the rest of the model together now and working on the cockpit opening.

cockpit_ingame, also a to c

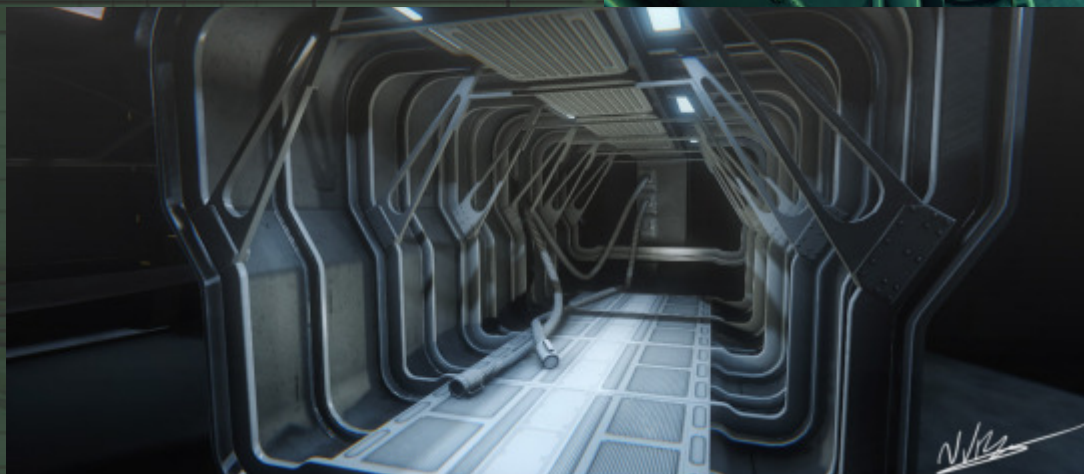
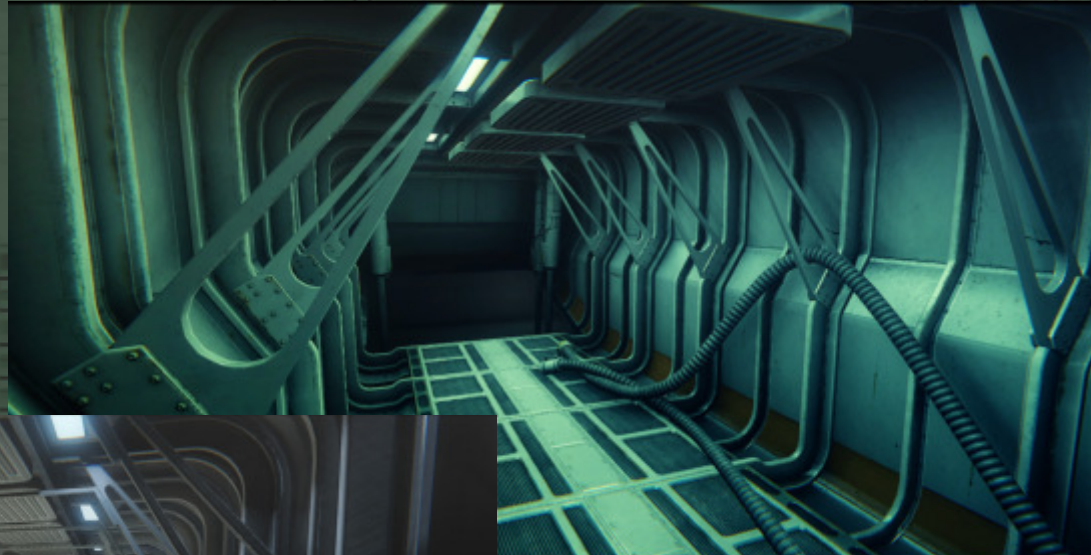
CR: LOVE IT!!! There will be some happy Avenger owners!



STARHORN
WORKING IN PROGRESS



Cargo. Working up the cargo was fairly straightforward. Textures needed to be kept to a minimum, so there is plenty of re-use to be done from exterior shaders. Everything else was made in a modular fashion, basically sections that could tile back further into the ship if needed. Initially I got the scale slightly wrong, but this was fixed at a later stage – being a bounty hunter ship, you’ve got to have prisoner cells, right? These are also made in a fashion to be able to add more and more as required and fit between the main structural sections of the cargo without looking out of place.



WORKING IN PROGRESS

Further Work & PBR. At this stage it was time to consider the multiplayer version of this ship. It had to have sleeping quarters and access to and from the cargo and cockpit. This meant quite a bit of rework of the rear quarter of the cargo hold, losing the back seat in the cockpit and slightly adjusting the cockpit side walls to be able to spin the chair around when a pilot sat in it. During this time we were also lucky enough to get a PBR (physically based rendering) build of the engine from Crytek.



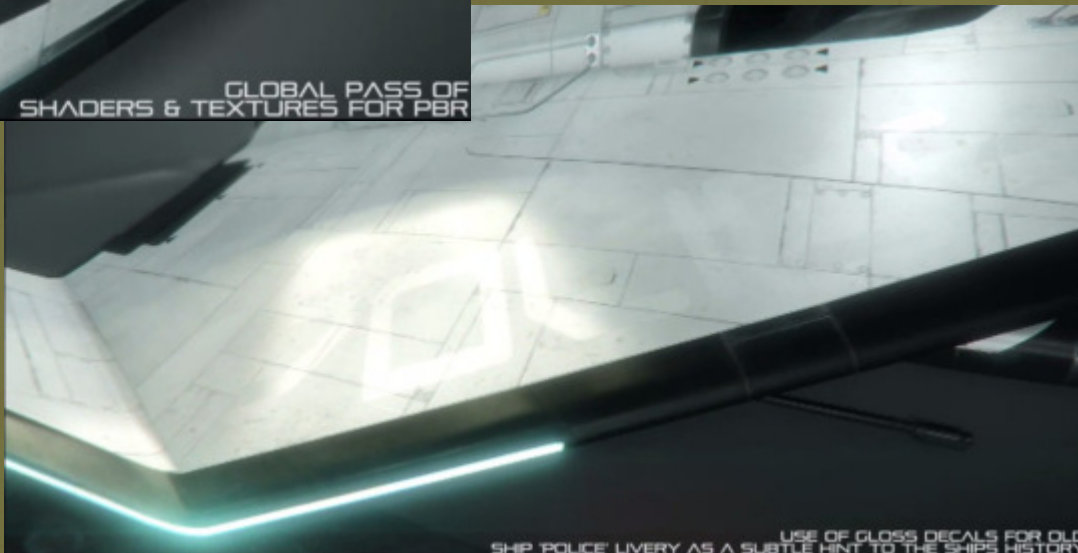
SLEEPING CABIN ADDED BEHIND SECURE DOOR



GLOBAL PASS OF SHADERS & TEXTURES FOR PBR

creation and having a good clear understanding of how surfaces react to light in the real world. The differences when done correctly are incredible, although it's too easy to go off and make everything 'shiny shiny.' This in my opinion is wrong. I like seeing this tech used subtly, hence with the Avenger I used plenty of matte materials, then complemented these with shiny metals, etc. in localised areas, creating contrast and (in general) creating far more interesting assets and scenes.

I've worked at Crytek for several years, so I'm already familiar with PBR processes in this engine, and I set this technology up on the art side for another company, so I was asked to get the ship all PBR'd up. There are a lot of different work flows when it comes to PBR compared to earlier tech. It's not affected by any modelling tasks as such; it's all about your texture and shader



USE OF GLOSS DECALS FOR OLD SHIP 'POLICE' LIVERY AS A SUBTLE HINT TO THE SHIP'S HISTORY



WORKING IN PROGRESS

MS: So what does the rear cockpit pilot do?

ND: As far as I'm aware the rear seat is for training purposes for your intro missions. I figured it's for your instructor to come along and show you the ropes?

CR: Totally AWESOME! Or ACE as you would say. :-)

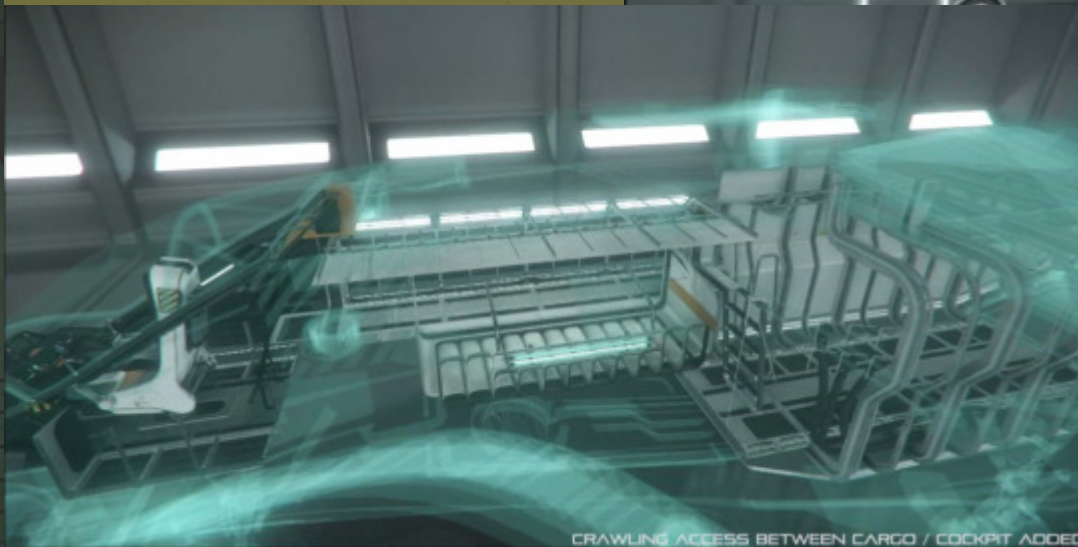
I guess the sleeping cabin could double as a confinement pod, or would that be an add-in for the hold?



FOLDING / TELESCOPIC LADDER FOR EASE OF ACCESS

Does the rear seat fold down to allow access to the crawl space? Or could someone squeeze past the seat?

One other thing – I love the spectral / see-through schematic shot. I assume that was just done with material swaps on the model in engine? It'd be great to get that look / detail for our live ship holograms – in cock-



CRAWLING ACCESS BETWEEN CARGO / COCKPIT ADDED

pit (in HUD or displays) or in the Hangar holo-table.

ND: Ahhh, thanks Chris, so I was thinking the sleeping cabin is purely for the pilot. I've already made 'safe like' doors for each end of the access shaft; the dimensions for this I grabbed from the Aurora opening for sleeps, so these two doors lock this area down tight. The cabin also has a small monitor top left in video; it may have gotten lost with the lens flare. ;)



REMOVED CLUTTERING FRAME SUPPORTS / INCREASED HEIGHT TO ENABLE PLAYER TO STAND EASILY



WORK IN PROGRESS

ND: If you're referring to the rear seat in the cockpit, I thought this was for the multiplayer game, capacity one? With the single-player two-seater as the training variant? worried now ...

I thought we could do confinement pods as separate uprights in the cargo, something similar to the escape pods on the *Prometheus* but obviously act as holding pens as you have said.

I also was thinking of placing a surveillance camera in the cargo with a feed to either the cockpit or the sleep cabin as and when required. I'll tidy up my max file and get it all uploaded tomorrow, then couple together some holding pen concepts for your approval.

CR: We'll have both a single-seater and dual-seater training variant (that will be in Squadron 42, but there would no reason to not have one in the Star Citizen PU).

It seemed from the video that there was a second seat (which I assumed was kind of a jump seat) – so does the video have shots from both versions?

I would guess that the training variant would have a more fully featured rear instructor seat with a full flight control / avionics package, that perhaps doesn't allow cargo area access. The single-seater pilot version has a second fold-out jump seat ... that can go away to allow access to the sleeping pod / hold.



WORK IN PROGRESS



ND: All shots in the vid are from the new pbr / single-seat version. I have the double seater banked, as I kinda thought we could go back to it, and incorporate flight controls, etc. into the rear seat also. Controls are a simple copy and paste of the sticks, but it would be cool to plug in some more monitors, etc. as some kind of a mould around the back of the front seat. Maybe then for the multiplayer I could

investigate trying to tell a story of 'this ship used to be a double-seater' by leaving (say) the ground mounts and bolt holes there, unplugged wiring looms, etc., repurposed / ambient story telling if you will.

CR: Ah, yes, now I see it's a single-seater – and what I thought was a utilitarian back seat obscured by the canopy frame is actually the entrance to the



crawl space!

So I definitely think you can go with the trainer variant set-up that doesn't allow access to the hold – that area is replaced by a second seat and avionics.

Patrick Thomas: DAMN!

Jeff Cavitt: Looks awesome!

Forrest Stephan: sexy

DH: That looks awesome, Nathan. That little detail of the traces of ship decals is a brilliant touch. One little thing – at some point, the name of the

company got switched to Aerospace on one of the internal docs, but it should be Aegis Dynamics.

ND: ahh, right. Thanks, Dave, I'll pester CO for a new logo sheet and/or font to go over the decal, no biggy.

DH: Awesome. Thank you, sir. Sorry again about the mix-up.

CS: looks great, Nathan!

MS: We still need to work out the gun mount on the nose. As it is, it won't support our weapons component system. I'll have Harry set up a Skype meeting where we can walk through the Avenger together and make sure we are accounting for all that needs to be represented.

MS: Can you tone the window grim down a bit?



WORKING IN PROGRESS

Final few tweaks and work carried out on the Avenger :

- Took a look through the exterior lighting and considered the guidelines Alan put up on confluence,
- Involved making some additional mesh parts to attach light sources onto, these can all be retracted into the hull whilst on ground if need be.
- Subtle re-use of these on the cargo ramp pistons for illumination whilst ramp is down.
- More decal work throughout the ship, mostly around entrance and exits "Mind your Head" and so on.
- Pilots pedals now split.
- Front gun reworked , roughly about twice the radius of the previous submits with plenty of additional bulk added to the body itself



ND: Avenger cargo update, holding cells, shaft doors, etc., all info in pictures, cheers!

CO: purty.

CR: Looks sweet!



Manufacturer lights



Front gun reworked, additional bulk and features added, verticle lights added to framework, maybe searchlights or again, could push a blues n bios there with one of the skins.

WORK IN PROGRESS



DTD 5500
TITANIUM
MATERIAL

Landing lights



Additional cockpit work, foot plate now split, shader work etc



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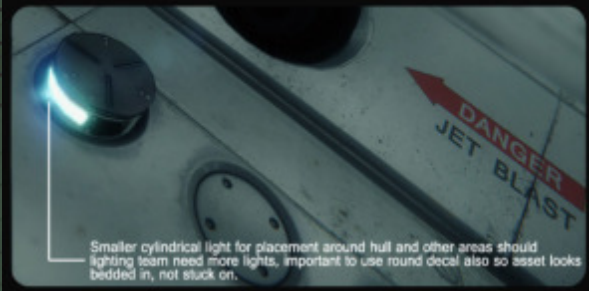
WORK IN PROGRESS



Landing lights front view, powerfull!



Landing lights , can retract into casing around drop tank / missile area



Smaller cylindrical light for placement around hull and other areas should lighting team need more lights. important to use round decal also so asset looks bedded in, not stuck on.

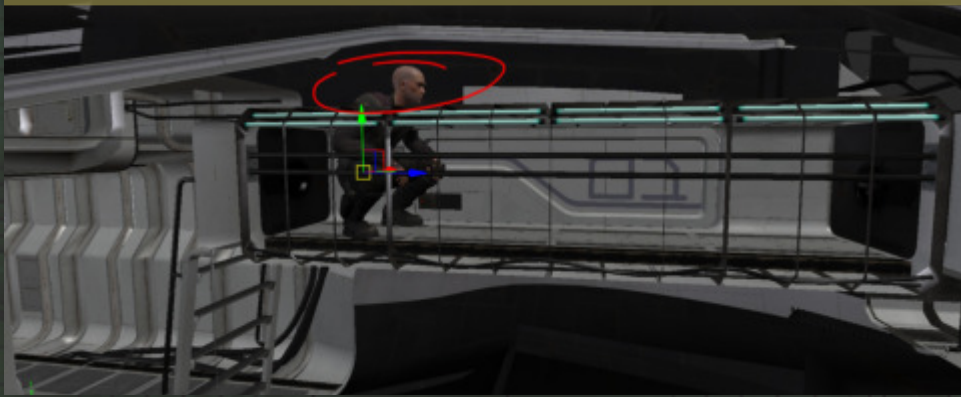


re-use example on cargo ramp for when down

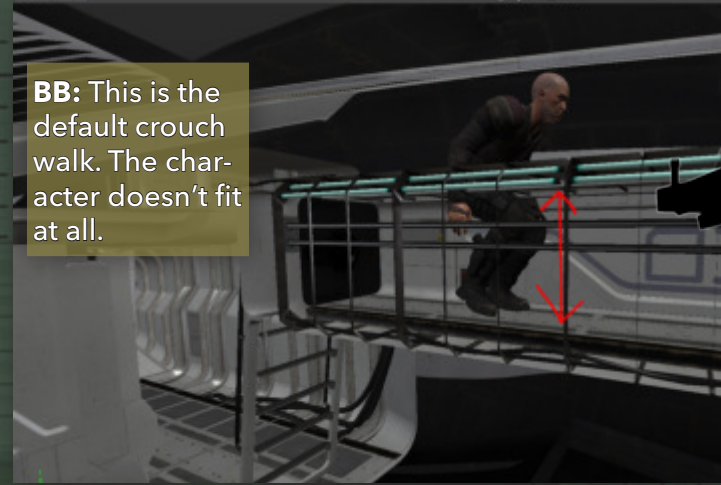


WORKING IN PROGRESS

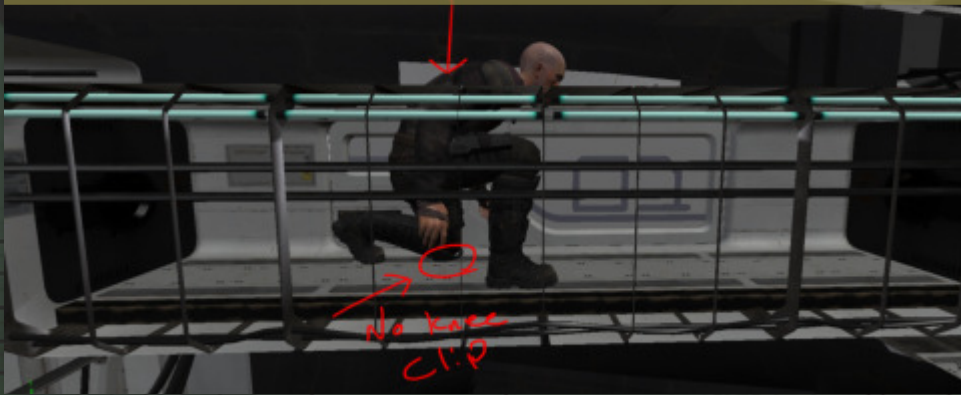
BB: I got the character in and started working with it. This is the character's crouch idle. The head clips through the top of the hallway.



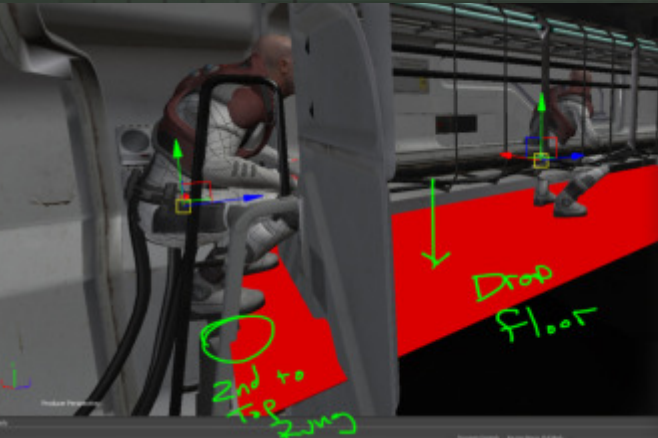
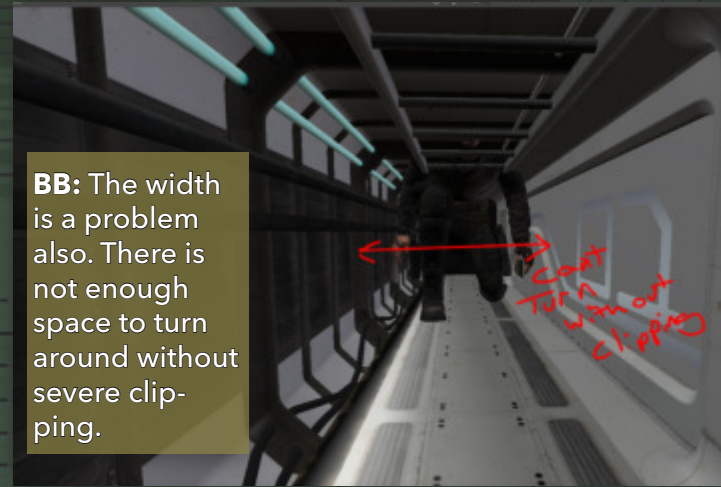
BB: This is the default crouch walk. The character doesn't fit at all.



BB: I adjusted the crouch walk as low as I could get it without letting the knees clip through the floor. Clipping is still pretty bad.

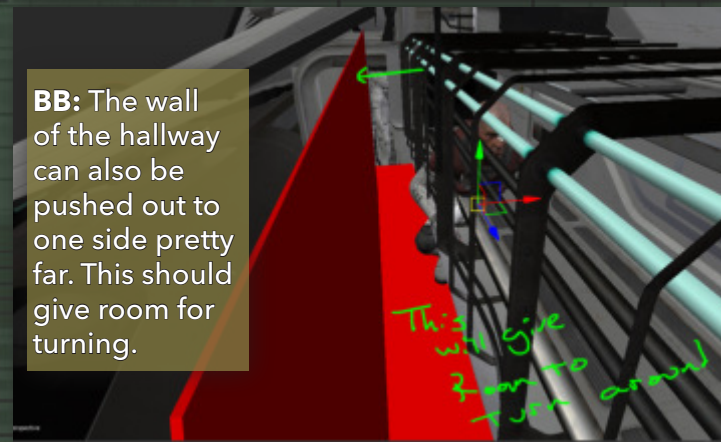


BB: The width is a problem also. There is not enough space to turn around without severe clipping.



BB: My solution would be to drop the floor. This will give clearance for the character's collision to get through with few hangups. The doors can stay the same width, but I would also drop the bottom to floor level.

BB: The wall of the hallway can also be pushed out to one side pretty far. This should give room for turning.



WORKING IN PROGRESS

ND: More tweaks and work on the Avenger. Physics meshes overhauled and custom normals refined, lots of minor bugs fixed. Max file had a good sort out to be nicely picked up by Bryan. Dirt / grunge pulled back slightly on the exterior for now until we get the aging stuff working.

CR: Looks beautiful! Do things like the landing lights deploy / retract? How about the other animations?

Also, have we broken out the elements that will be vehicle items (like thrusters, guns, mounts, avionics, etc.)?

Seems like she should be ready to rig for flight in-engine!

ND: Thanks!

All the lights I have added for the landing / searching and livery illumination can all be retracted. They are separate meshes in the max file, all aligned to the hull's normals, so they can easily retract back in if needed. I thought it would be better like this both for stealthy stuff and to stop it being lit up like an xmas tree whilst on the ground. :)

The max file is broken up into its separate elements – thruster, maneuver thrusters, cockpit, cargo, etc., and helpers are in place, all nicely layered, so hopefully (touches wood) ani-



mation can have an easy time with the file. After I got the file back from the reveal it was all kind of combined, so I broke it all up again. Oh, also the ladder is all amended following the feedback session (not seen in these shots).

ND: *I think* it's done. I'm off to bed. Enjoy!

CR: Get some sleep & great job! :-)



WORK IN PROGRESS



AEGIS

D Y N A M I C S



Aegis Dynamics began life in a merger between Earth-based Aegis Macrocomputing and Davien-based Dynamic Production Systems. The former constructed computing systems for the burgeoning spacecraft industry and the latter maintained four systems worth of production yards (including the specialized component factories on their home system). The goal from day one was to build naval spacecraft, and the resulting company was tailor-made for military contract bidding in an era when mankind was marshalling its forces. As Messer consolidated power, Aegis was there to supply spacecraft to his legions. Craft like the Retaliator became synonymous with the government's iron hand.

With Messer's fall, Aegis Dynamics seemed destined to fade away. The once-popular hardware supplier of Ivar Messer's

tyrannical regime — closely associated with the horrors of those years — Aegis was all but consigned to the dustbin of history. Then, a funny thing happened: the civilian world began to adopt Aegis' military designs for their own purpose. Whether a testament to the increasingly dangerous galaxy or the sheer reliability of Aegis' weapons of war, the company once fueled by dictatorial government contracts now thrived on the population it once helped oppress.

The company began a significant makeover after the fall of the Messer era; gone was the hard-edged and militant 'AD' lighting strike logo, replaced with a softer and less distinctive signifier. The damage of the association was done, however: contracts were cut and the company suffered massive layoffs as military spending went to newer and

WIKIMEDIA

DEVELOPMENT OF THE NEWEST AVENGER MODEL IS WELL UNDERWAY.



less-politically-dangerous corporations like Anvil Aerospace and MISC. But a funny thing happened: civilians began converting the rusting yards of Aegis warbirds for their own purposes. Retaliator bombers were no longer the feared symbols of government power; instead, they became personal transports, mobile homes, mining spacecraft and even firefighters. The burdens of Aegis' past began to lift and the company began to focus on civilian variants for their current-generation designs.

Avenger

The Avenger began its life serving dutifully as the premiere front-line carrier plane of the late 28th century. Avengers racked up a number of impressive space-to-space victo-

ries in that era, but were ultimately supplanted by more maneuverable designs like the Hornet. With space combat focusing more on skilled maneuvering than pure weapons storage, the Avenger fell out of active duty with the military and was repurposed as the standard ship for Advocacy and local law enforcement. Today, the military will still use Avengers as trainers; the two-seat variant is a forgiving first spacecraft for new pilots.

The current civilian model Avenger is marketed towards bounty hunters, with the second seat removed for direct access to the hold. Munitions storage has also been replaced with traditional cargo hooks, and (perhaps most importantly) the standard exterior flight line ladder entry system has been replaced with an internalized solution that allows the pilot to more easily maintain control of access (and egress).



Retaliator

The Retaliator, once the symbol of Messer's iron fist, has transitioned along with the company to become an all-purpose spacecraft design. With over two centuries of design evolution, modern day Retaliators barely resemble the original model. Built first as a ground-based strategic bomber, the Retaliator is capable of delivering a heavy payload of bombs to a planetary target or an array of ship-killer torpedoes to any size of capital ship. It was exactly this modularity that allowed civilian pilots to adapt the Retaliator for their own purposes: adaptable bomb bays could be swapped for after-market living quarters, cargo racks or other, more exotic options. Added to this was the vast quantity of surplus Retaliators stored in low-humidity conditions around the galaxy, making them a cost-effective option for pilots looking to make a start with a larger crewed spaceship.

The resulting 'do it yourself' nature of Retaliator ownership has caused an interesting, ship-specific culture to flourish. Though they come from all walks of life, civilian Retaliator pilots have formed something of a brotherhood around their love of their "Talis." So-called 'bomber boys' organize Retaliator conventions and compete to find the most interesting new uses for the spacecraft. BB gatherings may bring thousands of the ships together at once, and provide an interesting sight for anyone caught in the middle.

Surveyor

Today, the Aegis Surveyor is the company's best-selling remaining military contract ship. Surveyors are heavy-duty space salvage ships designed for a strong support role. The design isn't pretty to look at, but it features a variety of rugged specialized tools, all designed for operation in a combat theater: long-range jump drives, launch pods for drones, tractor beams, floodlights and more. Civilian surveyors are

also a common site on the frontier, where they are adapted as dedicated salvage ships and explorers. A crew traveling deep space in a Surveyor should be capable of taking home some of whatever mysteries they happen across!

Idris

Idris corvettes are one of Aegis' larger present-day designs (in prior years, the company's shipyards turned out everything up to battlecruisers.) The original Idris-M is a warship that serves alongside ships-of-the-line in the UEE Navy. Fast, armored predators, Idris-Ms are used for everything from long duration patrols to scouting dangerous jump points to interdiction. A properly-outfitted Idris with an effective crew can serve as a torpedo boat; in rare instances, the Idris has even used its speed and maneuverability advantages to scuttle opposing cruisers.

Militia units have also adopted the Idris, in its lighter Idris-P variety. The Idris-P removes the spinal mount weapons platform found on the M, in exchange for additional cargo storage and a higher effective top speed. Idris-Ps frequently carry several light fighters and are used for anti-smuggling operations. It is not uncommon to come across an Idris-P laden with multiple prizes. The most brazen pirate clans are even known to target non-military Idrises for this reason!

The Idris-P patrol design is available in limited quantities on the civilian market, and it continues to rehabilitate Aegis' reputation, having become something of a luxury item. Idris captaincy is considered a prestigious position and Citizens frequently compete to purchase the limited number of civilian craft the company can produce. An Idris isn't just a luxury item: these crewed ships can effectively transport cargo, explore distant worlds or take on any other role, all while involving a larger crew than a Freelancer or a Constellation.





THE TURBULENT
STAR CITIZEN TEAM

ORGANIZATIONS ORGANIZATION

Turbulent, in Montreal, Canada, is one of our allied teams. With the release of the initial Organization framework, we decided to call on Benoit Beauséjour and the rest of the Turbulent team for a discussion of how they put it together and where it's going from here.

JP: *What were your design parameters — what did CIG originally ask for? How did the task change as you developed the system?*

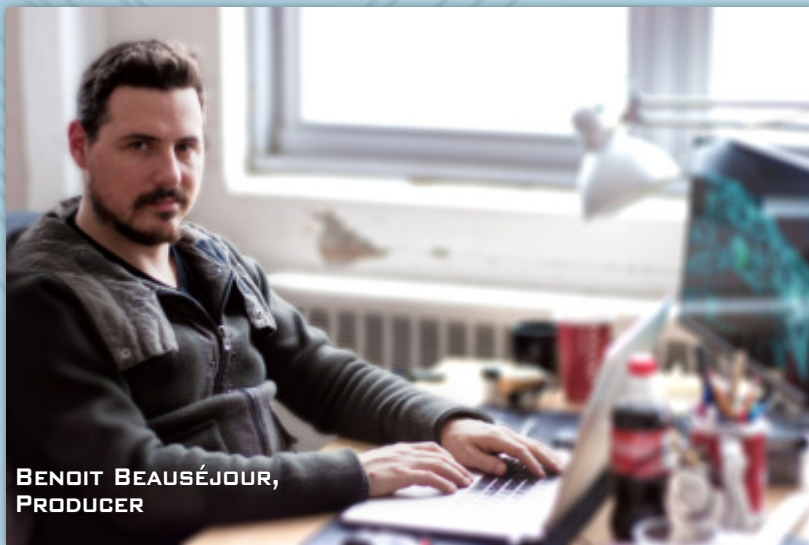
T: *When we first started discussing the Organization (Org) system with the CIG team, it was meant to be a smaller-scale system that would allow basic grouping on the site. Everyone felt that while the first release of the site was a great upgrade, especially for content and funding, community features needed to be more robust. The Org system*

was the obvious answer to tie the link between the content and the community.

JP: *Why launch the Org system now instead of with the game?*

T: *We think that the need to build the system on the website now instead of waiting for the full persistent universe was driven by the demand of players. Just browsing the RSI Forums you can see the enormous amount of different organizations that already exist and how much effort and care has been put into defining them by their leaders.*

The community members are already fully engaged in their own guild and squadron groups and are already putting countless hours building their brand and names and discussing how they will play the game together.



**BENOIT BEAUSÉJOUR,
PRODUCER**

CIG is not following the traditional “behind closed doors” development model. We want to get players engaged during the development period; giving them a space to create their group identity and connect with their members was primary to this.

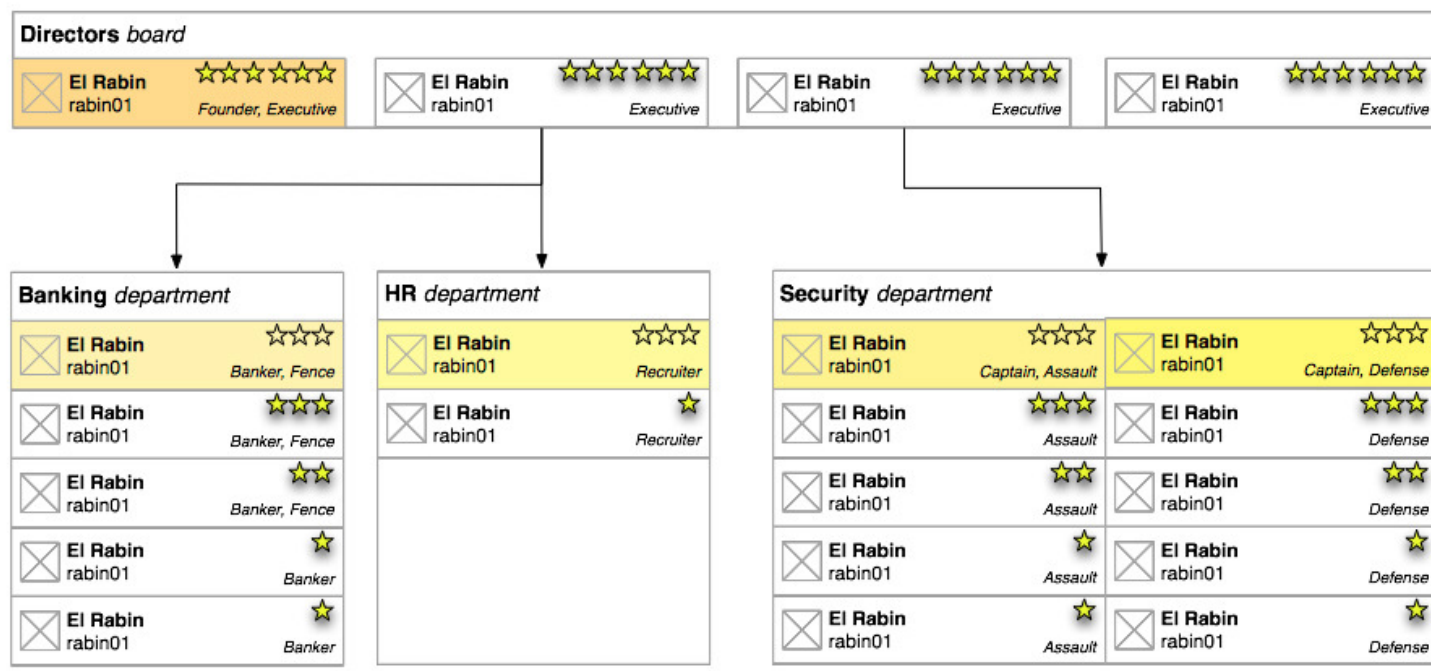
Having this system up on the site also has the added benefit that we can try different scenarios in the web system that would be very costly to switch about in-game. It also gives a great window for community feedback, which is very important to CIG and Chris’s development process.

JP: Explain the purpose behind the Organization archetypes. How did you decide on them?

T: The archetypes are designed to be a Role-Play element. They serve as a high-level classification of Orgs so



Organization structure - Corporate sample





BENJAMIN FARDEL,
PROJECT MANAGER

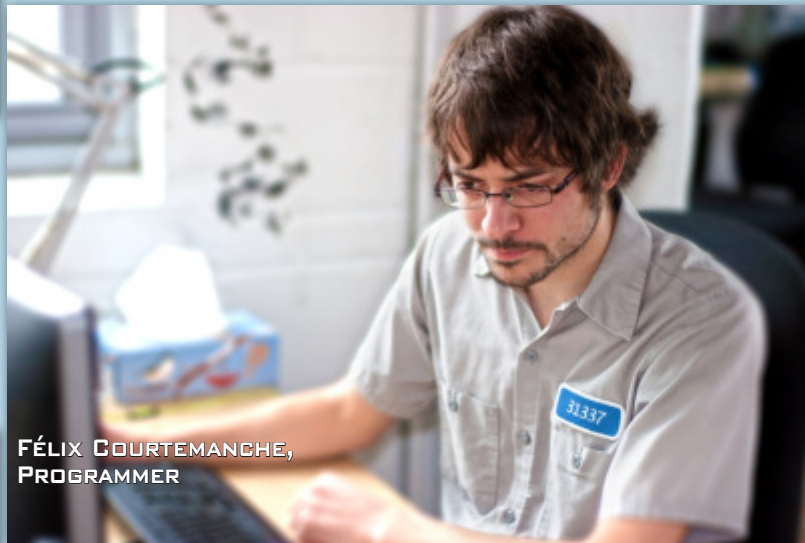
that new players can find them using the Organization hub. This way a player can search for an organization that has an archetype that fits the play style he wants to take.

The archetypes also serve to help new leaders who want to create an organization but need some help in choosing how to define it.

In order to find a good list of base archetypes we created a huge inventory of all the different existing organizations that were on the Guilds & Squadrons forums. We went through every one of them to see in which archetype they would fit, trying to reduce it to a fundamental list.

Of course, choosing an Organization archetype is optional and having an archetype will not confer any archetype-specific bonus.

JP: *How did your team go about developing the Organization system?*



FÉLIX COURTEMANCHE,
PROGRAMMER

T: Interestingly enough, even though the Turbulent team is a web team, many of our developers and designers are hardcore gamers. When we set out to build the initial design specifications for the system we used our experience in other games to define the features that we ourselves wanted to have in a guild management system. We also looked at the problem from a web perspective, trying to really harness the advantage of being out-of-game for managing large groups.



ANDERSON BORDIM,
USER EXPERIENCE



BEHIND THE SCENES



OLIVIER BERTHÉ,
FRONT-END

We had countless design meetings where we compared feature sets and approaches and settled on a base design that would be very flexible. It focused on giving the players

tools to make the system their own, instead of trying to reduce the system to a common denominator. Players, given the right tools, can be more creative than designers.

We also wanted to be able to support large and small groups.

Armed with this base design, we pitched it to the CIG design team, including Chris Roberts, Rob Irving and Nathan Blaisdell, and we juggled the design until the vision matched the game direction.

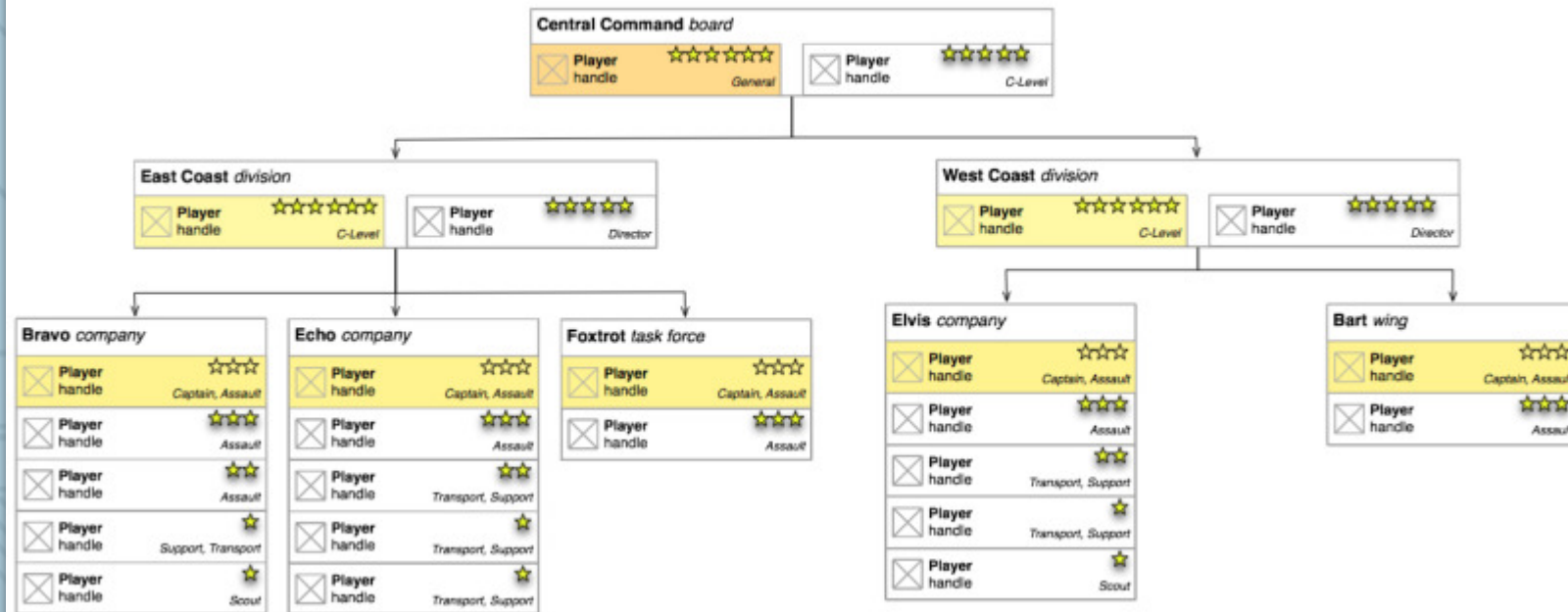
JP: *What unexpected benefits were included in the current product (if any)?*

T: The main benefit of having the Orgs system built on the site before the game can support it is that we will be able to tie information from the different alpha stages and other website events to the Orgs. For example, killboards in the Dogfighting module could be linked to Organizations. Similarly, different contest like the NGS and other weekly



BEHIND THE SCENES

Organization structure - PMC sample



community features like the Most Valuable Poster could be linked to Orgs. Having a way to address community groups as well as individuals is going to be important, since the community is growing and bonding very rapidly!

JP: Which one of these ideas will appear first?

T: You can be sure you will see **REDACTED** implemented soon.

JP: Will the Org system ever apply to individual characters?

T: Absolutely. The character slot system is in the works and



the current idea is that you will be able to join Orgs with your different characters. Right now, you can say that players are using a "community character" to join an Organization until the character slot system is in place.

Joining multiple Orgs is also going to be allowed, although not in the first release.

JP: How will Organizations moderate their chat system?

T: Players who have the **Officer** role in their Organizations will automatically have guild chat moderation options to kick, ban, mute room or remove a member from chat. Chat

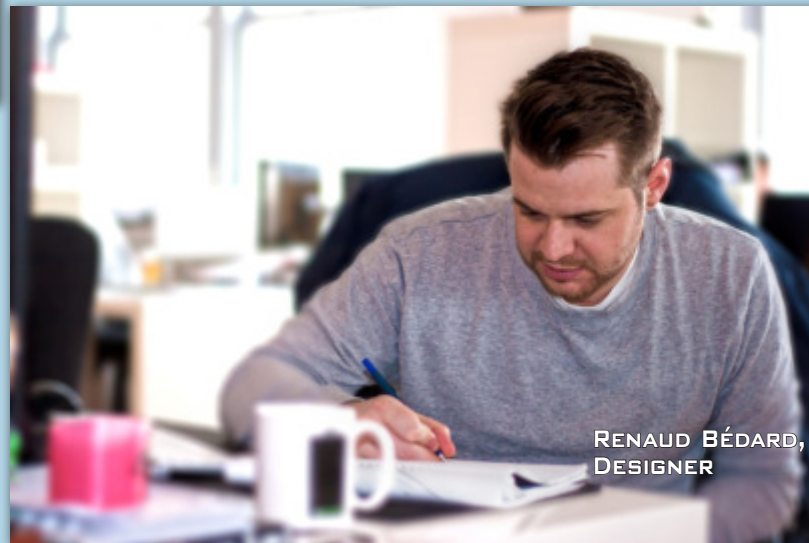


moderation will happen directly in the chat client.

And if a member is causing trouble, you can just remove him!

JP: What about the Org system is public-facing? What is private?

T: In the first iteration of the system all information is public, including ranks and roles and membership of all members. As we move through each successive iteration, this is



BEHIND THE SCENES

definitely a point we are going to address: what information should be displayed to the public and what should be kept behind closed doors.

We have some very nice design ideas in the works to support shadow-divisions that would allow for an Org to have an active spy group.

JP: What kind of responsibilities can an Organization's leader assign to its members?

T: The different responsibilities in the Org system are tied to the concept of Role. Leaders can assign multiple Roles per member, each of which will confer a set of permissions that unlock major functionality in the guild management.

The short-term roles are as follows:

- *Founder.* Manage all, including org settings
- *Officer.* Manage ranks & roles, and members
- *Marketing.* Manage org public profile and styling

- *Recruitment.* Manage recruitment, applicants and invitations

As we start releasing more modules, additional roles are planned, such as:

- *Operations.* Manage divisions, structure and fleet resources
- *Diplomatic relations.* Manage alliances & pacts
- *Accounting.* Manage funding and taxation

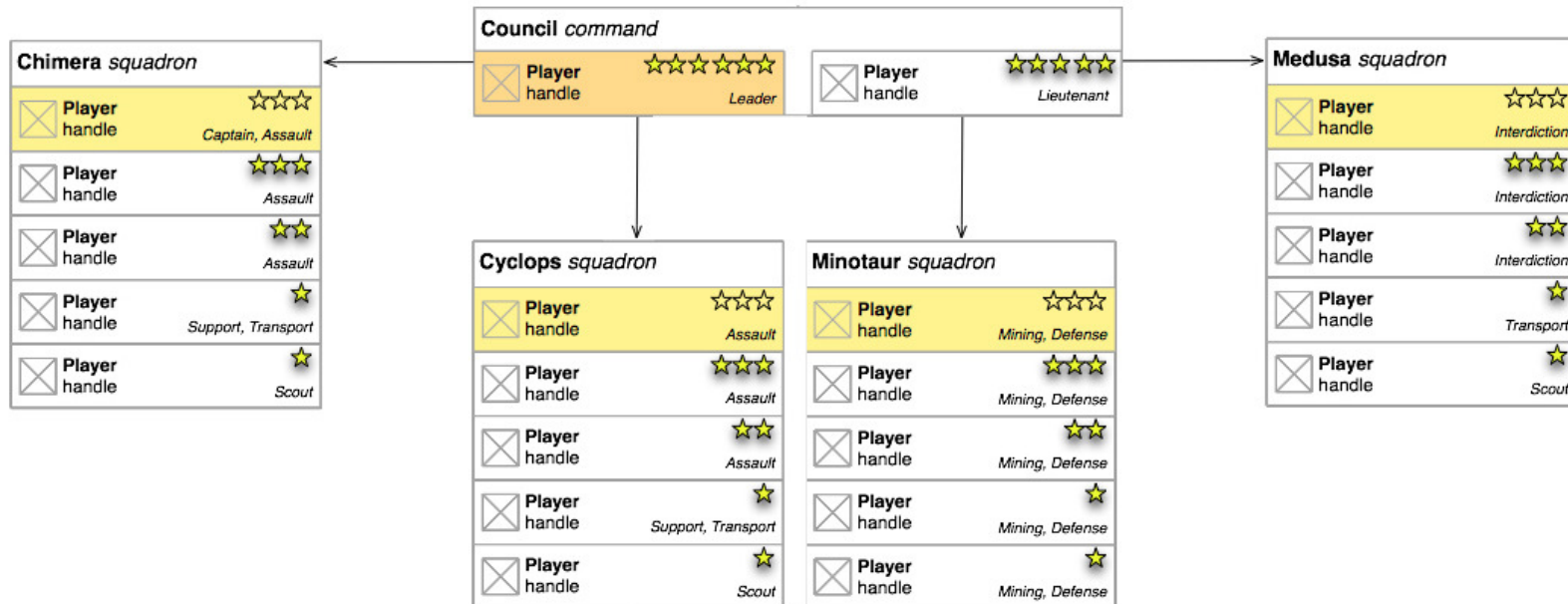
JP: When you started this process, did you have any idea you would be helping to design the game world?

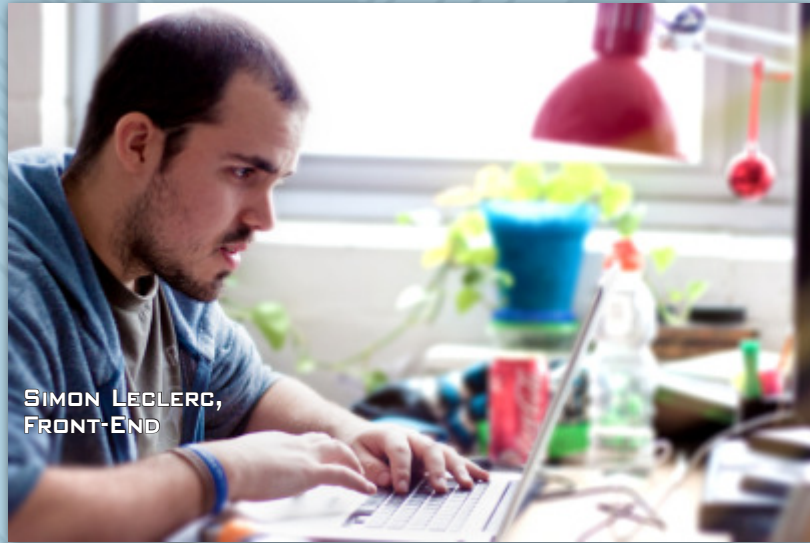
T: We had no idea. As we mentioned, we first started with a simple premise: "Let's let users make their groups official on the site." Several weeks later we're having frequent discussions with the game design team and actively participating in getting many of these ideas implemented immediately.



BEHIND THE SCENES

Organization structure – Syndicate sample





SIMON LECLERC,
FRONT-END

It's been very motivational for us to be this involved, and the whole team was very happy to bring their gaming and web experience to the table.

JP: *Are the current specifications (six ranks, four types, etc.) set in stone? Will these expand?*

T: Nothing is set in stone — this is a community-driven project! One of the advantages of building the Org system on the web is to get feedback from the community on the features, limitations and choices that were made. We can more easily incorporate the feedback in subsequent releases and iterate quickly.

JP: *What updates are in store for the Org system?*

T: We have a roadmap full of updates! Between each release (or drop) we'll have a period to gather community feedback and adjust the remaining releases.

- The first drop is going to be a baby step into allowing players to create their group identity and an online guild chat. We are shooting for an early release to get the base functions online.

- Second drop is going to see the arrival of divisions and structure tools. This release also comes with the concept of Jobs that allow players to tag members and organize them into task forces.
- Third drop will contain additional content tools, private forums and private messaging.
- Fourth drop will deliver event calendars and voting modules.

We are also thinking of a companion mobile application to interact with these different systems, though at this point we can't release any details.

JP: *What are you most hopeful that Star Citizen backers will do with this system?*

T: We sincerely hope the system will let the players define unique and creative organizations that become their home in the game universe. It will be great to see Organizations we haven't thought of or weird ideas that merge different concepts together.

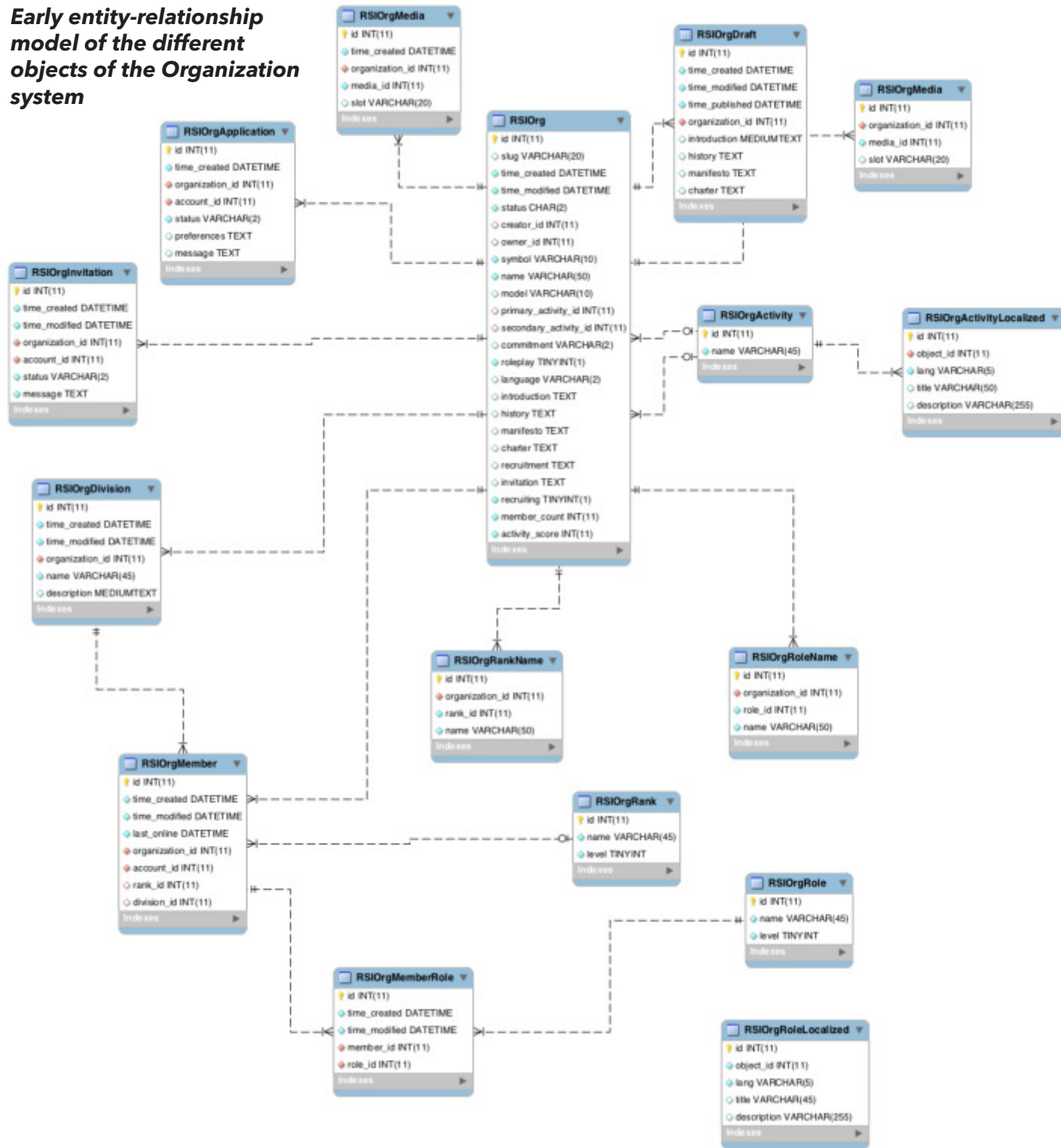


**JOCELYN RUEL,
JULIE COULOMBE,
FRANCIS BORDELEAU
& GREGORY PAYET,
QA TEAM**



BEHIND THE SCENES

Early entity-relationship model of the different objects of the Organization system



BEHIND THE SCENES

DAVIEN SYSTEM CESTULUS



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Davien is best known as the site of first contact between Humans and the Banu. Discovered early in mankind's extrasolar expansion, Davien was charted by Wendell Dopse and named after his father-in-law. The most unusual facet of Davien's discovery was what it represented to the broader astrophysics community: contemporary science had predicted that no additional jump points would exist in the Croshaw system. When Dopse charted the jump to Davien, it meant that textbooks had to be rewritten and it

ultimately lead to a flurry of advancements in jump scanning technology.

Davien itself was not seen as so interesting. A slight, orange Type K Main Sequence Star, Davien was immediately considered nothing to write home about by its original explorers. Four planets orbited the star, the second of which was a candidate (albeit not a top list candidate) for terraforming. The system held no exotic resource caches

or strategic military chokeholds; it seemed destined to become a lightly-populated backwater star system adjacent to more developed areas of the Empire.

That all changed quickly in 2438. Vernon Tar, an independent navjumper, opened fire on what he believed to be another private spacecraft attempting to jump his meager claim in the system. The ship in question turned out to be a Banu merchantman and the unfortunate incident (which luckily did not lead to loss of life) became humanity's first introduction to the Banu Protectorate. The UPE quickly established a military-led watch station in the system to take control of the situation, and the first interstellar treaty with the Protectorate slowly took shape. (The ultimate irony for all parties involved, not discovered for many years, was

that Davien was not especially close to the Banu core-worlds; the ship originally engaged by Tar was a fugitive fleeing civilization.)

The result for the Davien system was electrifying. Every independent operator in the galaxy wanted real estate in the system, now set to become the jumping off point to trade with the Banu. With the potential for exotic materials, alien technology and more, the system was flooded with all forms of humanity, and Davien II developed into one of the more populated Human worlds in the galaxy. BabCo GeoBuilders, which had won a low-ball terraforming bid before first contact, was propelled up the stock market as the demand for hangars, habicubes and underground domes soared.

DAVIEN I

A large, battered and gray rock that is visually similar to Earth's moon, Davien I makes a reasonable poster child for the concept of a useless world. Coreless and without any interesting minerals, there is absolutely no reason to set

foot on the planet. In fact, there have been no recorded landings on Davien I since the initial system exploration mission determined that it could never be a candidate for terraforming.

DAVIEN II (CESTULUS)

Davien II, named Cestulus after terraforming was completed in the early 26th century, is the system's inhabitable world. Cestulus has a very thin atmosphere and the majority of Human habitation is beneath its rocky surface: elaborate biodomes pump air from above ground into habicubes constructed to stack miles beneath the planet's crust. The world has no particularly interesting resources and the bulk of its economy is associated with transport and shipping. Despite the distance from the Banu, the infrastructure that has sprang up on Davien has allowed it to become the so-called "gateway to the Eastern Empire." Dozens of major cargo runs criss-cross the system, and the

planet is dotted in spaceports with facilities to entertain and supply long-haul transport crews.

MARKET DEALS — CESTULUS

SELL: REFINED ORE	+3
SELL: ELECTRONICS	+2
BUY: PLATINUM	+2
SELL: LUXURY GOODS	+2

Note: Cestulus does not produce any highly marketable exports.



Jata is Cestulus' most emblematic city, though not technically the world's capital. Located underneath an ever-expanding warren of air production facilities, the city is most famously home to Aegis Dynamics' corporate headquarters and initial production facilities. The base primarily produces components rather than a particular ship design. More exotic resources are imported and the need is consistent. Beyond Aegis' footprint in the city, the unique 'open air' underground cityscape has become symbolic of the Davien system as a whole.

For reasons not completely understood by sociologists, Cestulus became a flashpoint for political upheaval. In 2529, the feared economic collapse that accompanied the introduction of the Empire's unified currency, UEC, led to a bloody, two-week riot in the city of Jata. Only military intervention stopped the protest. In 2545 the planet was the site of terrorist bombings that left thousands dead,

with bombs being planted specifically to collapse some of the planet's more populated overground biodomes. These strikes kicked off a series of similar (and still unattributed) attacks across the UPE that led to the adoption of Ivar Messer's Prime Citizen plan. In recent years, Cestulus has become the adopted podium of everyone from Terran secessionists to anti-alien xenophobia groups.

Travelers are well-warned that owing to the system's history of political upheaval, the Advocacy forces and local militia units in Davien are no-nonsense elites. Your cargo will be scanned when you enter the system, land, take off and exit. Waystations and well-equipped militia spacecraft are the rule here, and only the most advanced artificial holds and scanner blankets can possibly move contraband through Davien's "galactic truckstop." There is no humor for smugglers, even the most harmless varieties.

DAVIEN III

Davien III is a smog planet with an acid-based atmosphere. With no apparent resources worth the risk of establishing a protective enclosure colony, the planet remains uninhabited. Rumors do persist that Davien III is a dumping

ground for troublemakers and others who find themselves on the wrong side of the region's organized criminal syndicates. The planet's pools of acid will quickly render any body (or spacecraft or most anything else) unrecognizable.

DAVIEN IV

Davien IV is a beautiful but inhospitable ice giant. Owing to its orbit's proximity to the system's jump point out to Cathcart (the jump point used by that first Banu) and its very stable orbit, the 25th-century UPE military mission was established in Davien IV's orbit. Today, the base is

the Banu Friendship Museum, where visitors can learn an overly-simplified story of mankind's interactions with the Protectorate. Few tourists are interested enough to make the trek to the system's outer reaches, however, and the museum is constantly in danger of losing its funding.





The Void Rats

by Doug Niles



PART Six

Two stormen of the United Empire of Earth Navy, Lieutenant Darrison Jackson and Chief Petty Officer Broderick Mac-Clean, are clinging to a flying hover that is being controlled by Zather Dane, a renegade officer and slave trader. The pair have infiltrated Dane's stronghold on a barren planet in the Nul System, but their plans went seriously awry when Dane took control of their vehicle. In a cutter docked at a smugglers' base on the dead planet, Jackson's squadron leader, Lieutenant Commander Naya Antoinette, is tracking her confederates by a concealed broadcasting sensor. Beside Antoinette, the pirate captain Sharona Sirene – captain of the cutter – sits, watches and waits. She knows that she is the wild card in this deadly confrontation.

The personal hovercraft rocketed through the dark passageway with terrifying speed, completely beyond the

control of the two men it carried deeper into the rock-bound caverns beneath the surface of Nul V. D-Jack, in the pilot's seat, yielded to the inevitable, knowing that if he did somehow regain mastery of the flying bike, he'd inevitably crash it into one of the stony surfaces he sensed – but couldn't see – very close to either side, and above and below them. He clung to the handgrips and kept his head down.

"Hold on!" he heard Mac growl, quite unnecessarily, as the speeding craft banked hard and turned tightly to the left. Once again it rocketed forward, though now Jackson could make out a glimmer of light ahead. The handlebar-mounted controls still resisted any of the pilot's attempts to slow or steer the vehicle.

A few seconds later the craft burst through an opening, a terminus where the tunnel entered through the side of a large, brightly lit chamber. The P-hov took a dive toward the

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stone floor below them, careening along a meter or two above that smooth, polished surface. Still clinging for dear life, Jackson saw a large, metallic ship resting on three struts. The vessel's skin gleamed like chrome. Multiple wings extended from the sides, and three large engine nacelles were visible at the stern.

Beyond the ship yawned a large, transparent airlock. The dark atmosphere of Nul V roiled beyond, visible as a murky gray sky shot through with flashes of electrical discharge. Jackson could barely see the shimmering barrier that separated the stormy planetary atmosphere from the temperate, breathable atmo within the hangar.

The hovercraft abruptly halted, stopping so suddenly that Jackson lurched forward and almost pitched over the handlebars. He had barely regained his seat when the vehicle rolled through a half-circle to hover upside down. The surprise maneuver dislodged him instantly, and he barely broke his fall with his arms, rolling across the floor. Mac cursed, and thumped to the ground behind him.

The pain and shock of the fall were forgotten as the pilot gaped upward at the shiny vessel. "The Silver Spider!" he barked out loud.

"That's quite a name, I rather like it."

Jackson recognized the voice as Zather Dane's, the same vibrato cackle that had addressed him through the vid-screen when Dane had taken over the controls of the P-hov. Pushing himself to his feet, rubbing a bruised shoulder, Jackson looked around for the speaker.

He spotted Dane easily. The man was sitting in a large chair that floated, apparently weightless, a meter or so above the deck, and just before the nose of the Spider. His chromed skull shimmered from the shadows.

"You will do me the kindness of dropping your weapons," said Dane. His eyes, black as coal but strangely bright, were fixed on the two men.

Jackson's hand was on the grip of his P4, though he hadn't been aware of reaching for the weapon. Four men, each armed with a laser rifle, emerged from the shadows, a pair of them to either side of Dane. Their weapons were leveled at Jackson and MacClean. Remembering Sirene's description of Dane's 'torques,' the pilot was not surprised to see that each man had a silver ring around his neck. For a split second time seemed to stand still, and the pilot's hand trembled on the verge of drawing his weapon.

"Come now, do you think you can slip anything past me?" asked the slaver calmly. His eyes never left the starmen, but Jackson got the distinct impression he was reading from some sort of display only he could see. His lilting voice suddenly hardened. "Put them on the floor or this will be a very short conversation."

With no obvious alternative, the two men dropped their weapons and stepped to the side, urged on by the gestures of the four riflemen. Dane waved at the P-hov, which righted itself and glided smoothly over to come to rest beside him. "That thing obeys him like a damn lapdog," Mac growled, softly enough that only Jackson could hear. The pilot could scarcely believe how easily the slaver manipulated the craft, without using any visible tool or equipment.

"But where are the ladies?" Dane sighed. "I was so hoping that they would join our party as well."

"What ladies?" demanded Jackson, going for the bluff.

Dane shook his head, as if in disappointment at Jackson's feeble ploy. "Lieutenant Jackson, I know all about you. Chief Petty Officer MacClean as well, so don't attempt to outwit me. I refer to Commander Antoinette, of course. And that ravishing pirate, Sharona Sirene."

"The pirate bitch is dead," Mac declared curtly. Though startled, Jackson played along and nodded his head firmly.

"How did that happen?" the slaver demanded, frowning in sudden disappointment.



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“She didn’t want to give us her ship,” Jackson snarled. “So I shot her.”

“Oh well, I had such plans for that girl.” Zather Dane sighed loudly. “Well then, I shall have to give little Naya twice as much attention.”

“She’s long gone by now,” Jackson shot back, trying for a tone of bravado he didn’t actually feel.

“Don’t be ridiculous. She would not have sent you here without some means of communication.” He waved a hand and two of the torques advanced and pushed MacClean to the floor, holding him face down with both barrels pointed at the back of his head.

“Now,” said Zather Dane, a new tone of steel in his voice. “Call Commander Antoinette, or I shall be forced to have this brave starman’s brains splattered all over my nice clean deck.”

“Don’t listen to —!” Mac started, before a brutal kick silenced him. Jackson looked at their adversary, whose eyes seemed to glitter even more coldly than before.

And the pilot knew that he had no choice.

* * *

“Skipper? This is L-Jack. I’m approaching the objective. I think I have that intel you’ve been waiting for.”

The words crackled from the speaker in *Plumetail’s* cockpit, though the vidscreen stayed dark. Naya and Sirene had both stiffened in their seats when the sudden communication came through. The lieutenant commander reached to activate the video, but hesitated when the pirate captain, a finger to her lips, reached out her hand to block Naya’s move.

Antoinette understood, and left the vidswitch alone. “This is Antoinette. Report,” she ordered crisply.

“We’ve located the target. Mac encountered some trouble, and he had to go to ground. He might have been captured.

And the subject knows that Captain Sirene is dead.”

Naya looked at the captain, who was very much alive in the seat beside her, and nodded in growing comprehension. “What do you suggest we do?” she asked.

“I think you need to get down here. Together we can work out some way to get Mac back, and then take it from there.”

The skipper was thinking hurriedly. Clearly Jackson was not speaking freely — she’d never called him L-Jack. And of course, the story of Sirene’s demise was pure fiction.

“Good idea,” she said, forcing herself to remain calm. “Look, I’m going to put the ship into auto-orbit to get it off the dock. Where should I meet you?”

“Take the train to the arena. I’ll be waiting,” Jackson replied. His voice sounded normal, but he had given enough clues for her to realize that events had taken a dire turn.

As if those clues might not be clear enough, as soon as she turned off the commlink, his signal suddenly flared — he had switched on the panic button.

She muted the alarm and cast a glance at Sirene, who was studying the screens showing the area immediately surrounding the ship. The pirate pointed with a dark finger, and Naya saw two teams of armed guards, each a half dozen strong, approaching the ship in skirmish formation; one group closed in from port, the other from starboard. They darted down the long, crowded dock as if approaching a military objective: half the men took up shooting positions behind bales, struts or hulls while their teammates dashed forward five or ten meters. Then the movers would take shelter and sight their weapons while the rear rank advanced past them. They were closing fast from both sides.

“Good call — sending the ship away. I’ll take care of that. You better get out there,” Sirene whispered. The two parties of armed men were less than a hundred meters away to either side.



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“All right,” Naya agreed. She wondered momentarily if she could trust the other woman, a known pirate and smuggler; she realized as quickly that she had no choice. She rose and was about to head for the ramp when Sirene held her up with a gesture.

“Remember: Act like you don’t know it’s a trap.”

“Right.” She paused to strap on her sidearm and threw a thin fabric cloak over her uniform. She darted down the exit ramp and turned away from the ship, heading for the gateway leading into the station’s commercial district. The riflemen before her melted away into the shadows, and she dared not look behind.

Immediately there was a hum and a click as the ramp swept back flush with the cutter’s hull. She did not stop to watch as *Plumetail* began to move, her engines backing her away from the platform, drifting slowly toward the electronic airlock and the dark space beyond.

“Hey!” came the call, and now she spotted the team behind her, running forward. “Hands up! You’re coming with us!” he barked.

One of them raised his rifle to aim at the ship, but apparently thought twice about blasting away in the bustling station. Besides, his laser rifle, though powerful, could have done little damage to the sturdy cutter.

“You were supposed to leave that ship here!” growled another of the armed men, this one emerging from below the hull of a neighboring ship where he had obviously been waiting in concealment. She noticed the metal circlet, like a collar, that he and each of the other men wore around their necks. He prodded Naya with the barrel of his laser rifle, but she set her jaw and refused to flinch.

“No one told me that!” she snapped. “I’m just going to meet a friend.”

“You don’t know the half of it,” declared the second speaker, with a meaningful gesture of his long gun. “Though I’d like to

see just how friendly you can be,” he added with a leer.

Naya stiffened, but bit back a retort. As the dozen gunmen took up formation around her, she kept her chin high and marched along the dock, determined not to give them the satisfaction of witnessing her anger.

Anger that was raging at a very high level indeed.

* * *

“What do you mean, you let the cutter *get away*?” Zather Dane croaked, his voice almost a whisper.

The leader of the guard detail, a swarthy, tattooed hulk of a man who had roughly prodded Antoinette into the hangar before his leader, seemed to shrink in the face of Dane’s rebuke. Jackson looked at the skipper, but she avoided his eyes to stare at the slaver with something like wonder. With a shiver of horror, the pilot saw that a silver collar, this one studded with at least a half-dozen huge diamonds, had been fixed around Antoinette’s throat.

The guard captain, meanwhile, struggled to create an articulate reply. “I . . . that is – we . . . were told that the ship had only one occupant. When she came off, we brought her here. I thought . . .”

“You *thought*?” Dane sneered. “You *thought* you would just let the ship go. I confess: I expected a higher level of competence, Tribune.”

“Caesar – great leader! No!” croaked the guard, falling to his knees. The other torques stared in momentary horror until, almost in unison, they turned and sprinted toward the door leading back into the mountain complex.

They never even got close. Dane waved a casual hand and each of the running men fell to the ground and thrashed silently, but in obvious agony. Jackson watched, appalled, as the torques dropped their weapons and clutched at the gleaming chromatic rings encircling their necks. Feet drumming a frantic tattoo against the stone floor, they flopped



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and flailed like nothing so much as a school of landed fish. It took more than a minute for their struggles to subside; finally, one by one, each man flexed rigidly and finally lay still. The pilot didn't need to take a pulse to recognize that the guards were all dead.

"Such is the price of failure," Dane said casually, addressing the surviving torque, the one he had called "Tribune." That hapless fellow gaped at his erstwhile Caesar mutely, his long gun apparently forgotten. The torque's left hand rose almost unconsciously to touch the ring at his neck. Zather Dane pointed toward the electronic screen of the airlock, the barrier separating the interior of the hangar from the harsh, virtually oxygen-free atmo of the wild planet beyond.

"I will give you one more chance to redeem yourself. Step outside," the slaver said calmly. He put a sliver of steel into his voice, adding "*Now.*"

The torque leader dropped his rifle. He momentarily looked as though he would argue, but Dane gestured curtly and the fellow stumbled toward the barrier. The screen flickered and sparked as he passed through, but it obviously presented no physical obstacle. Once beyond it, the man turned and cried something inaudible, but stayed on the outside of the barrier, despite his obvious despair. His face locked in an expression of horror, he soon began to stagger weakly. Slowly he slumped to his knees, wobbling unsteadily, until he finally collapsed onto all fours.

Jackson, appalled, looked at the slavemaster. Dane was concentrating on his dying minion, and the pilot realized that the seated man was repeatedly clenching his fist as he stared at the exhibition before him. With each clench, the man outside gave another kick, lurch or groan.

For several minutes Zather Dane, his four personal guards, and the three starmen watched the man die. The guard lay just outside the electronic airlock screen. His face was blue, though his legs still kicked feebly. Finally, clearly bored, Zather Dane turned back to the three starmen.

"There is no redemption if you fail me." He then pointed a finger at Naya Antoinette. "Come to me." She didn't move. "No?"

He slowly and deliberately closed his right hand into a fist and Naya's face flashed with a look of consternation, even horror. The slavemaster flicked his left hand – and immediately Antoinette screamed and grabbed at the collar around her neck.

"Skipper!" Jackson shouted.

"You bastard –" Mac chimed in.

"Silence!" commanded Dane. His hand stilled and Naya stopped screaming. Instead, the blond officer slumped forward, panting and sweating, with her hands on her knees. "Take that as a warning; you may expect the same anytime that you consider disobeying me."

Turning from his latest prize to his four remaining torques in the chamber, Dane pointed at the young pilot and then the petty officer. "Bind them."

Immediately the men advanced. Two trained their laser rifles on the starmen, while the other two knelt beside a pair of their comrades' corpses and quickly unsnapped the rings around their necks. When they advanced with those metallic collars, Mac made a lunge to evade – and quickly dropped to the deck as a blast of hot energy seared his knee. One of the guards knelt on his chest, pinning him in place and securing the collar around his neck. Recognizing the inevitable, Jackson made no move to escape as he, too, was collared. The ring felt cold against his skin, and hummed with a kind of itchy energy.

"You will learn to obey," Zather Dane barked, "or suffer the consequences." He glared at the two starmen. Jackson, watching for his movement, saw Dane's right hand clench again, as his left swung quickly from side to side – and immediately Mac gasped and clapped his hands to his neck, as if the collar had grown impossibly hot.



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Jackson, however, felt no discomfort – and in a split second he saw the need for deception. He clutched at his own torque and mimicked the chief’s agonized gestures.

A moment later, Mac groaned in relief as, obviously, the pain ceased. Once again Jackson copied his comrade, determined not to reveal that his own collar had not been activated.

“Now, stay there,” Dane declared. “Next time I will not display such mercy.”

Jackson’s mind raced: how had he escaped the effect? He suddenly remembered the capsule in his pocket, the signal switch that had set off the panic transmitter he’d swallowed, initiating a powerful broadcast. He recalled that Naya had told him that the signal would be strong enough to overcome most any interference.

His hand slipped into his pocket and he found the capsule. Testing his theory, he flipped the switch back off. Jackson immediately felt a shock of static electricity, startling him and almost knocking him off of his feet. That sudden stagger suggested to him that the interference was having an effect; he quickly turned it back on and the electricity dissipated.

“Mademoiselle Antoinette, you may board my ship,” Zather Dane said with a great display of false graciousness. “You should see your father’s handiwork, firsthand.”

With a numb look on her face, Naya involuntarily touched her collar, then started toward the Silver Spider. Holding her head high, she almost vanished from sight in the shadows below the hull, but Jackson, watching, saw her climb the steep ladder leading into the ship’s belly.

“As for you brave starmen,” the slaver said, sneering contemptuously at MacClean and Jackson, “I’m afraid your usefulness has come to an end. Why don’t you go for a stroll outside?”

He gestured toward the airlock screen, where the body of the guard captain lay still and blue on the wide shelf of

stone outside the hangar. MacClean, his jaw clenched in resistance to the command, made as if to resist—until a zap of pain hit him so hard that he dropped to his knees. Staggering to his feet, he had no choice but to step forward.

Jackson went with him. He knew that he was free of the collar’s compulsion, but he was not about to leave Naya, and – with four armed guards still watching – he was not ready to reveal his successful resistance. But as Mac marched past the Silver Spider, Jackson’s path took him under the hull. Once that shadowy darkness embraced him, he sprang to the nearby ladder and quickly, soundlessly, pulled himself up into the cabin.

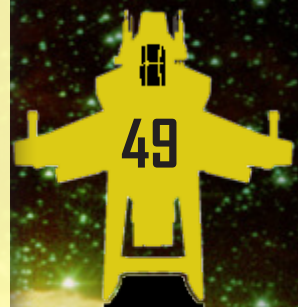
* * *

Sharona Sirene guided her cutter through an easy orbit around Nul V. Mindful of the cover story, that her ship was supposed to be operating on autopilot, she refrained from any vigorous maneuvers, maintaining a safe distance from other traffic and making no unnecessary adjustments to her flight path. She wondered if the pirates would send a crew out to try to board her in space – a risky proposition, given the known capabilities of her ship – and decided not to worry about that until such an attack materialized.

But she also knew she couldn’t just drift in space while her confederates dealt with the monster who flew the Silver Spider. She had no real tie to the starmen – in fact, they’d started their acquaintance as enemies – but she never gave any serious thought to fleeing the system.

She couldn’t just *wait* here either, she decided. Her whole being committed her to action, to striking at her enemies, to helping her friends, and – admittedly – to maximizing her profit margin. She could potentially make progress toward all three of those objectives if she could figure out something to do.

Sirene was surprised to realize that she placed the three starmen in the ‘friends’ category. To her amazement, she



admitted to herself that she respected Naya Antoinette for her accomplishments, and for the moral code that seemed to compel her to try to make up for her father's mistakes. Mac was a rugged pragmatist, like herself – he'd been the one to release her from confinement on their first flight together. And Jackson? Even with his broken nose, she thought with a wry smile . . . Jackson was kind of cute, if still a little wet behind the ears.

Her mind made up, she guided *Plumetail* into a gentle dive, still taking care not to perform any radical maneuvers. The ship was coming around the planet at the end of another orbit, and she could easily see the jagged mountains where, she knew, Zather Dane had his base.

After an hour of careful descent, she brought the cutter to a halt, holding it in a gentle hover barely a half dozen clicks from the hangar where she suspected the Silver Spider still sat at rest. Slowly, carefully, she turned the ship through a gentle spin. She didn't stop until she was in a precise position, with the particle cannon, *Plumetail's* most powerful weapon, perfectly lined up on Dane's hangar door.

Abruptly Jackson's alarm paused briefly and then restarted. She silenced it again with a push of a button.

"I know you're in trouble, pal," she muttered. "But you're going to have to hang in there for another minute or two."

She magnified the image of the hangar door in her viewer, making out the shape of the silver fighter through the gauzy curtain. Perhaps she should take a shot from here, striking the ship before it flew? The idea had merit . . .

Except that, very suddenly, circumstances changed. She saw something moving through the screen of the electronic airlock, and a man emerged onto the shelf of the mountain-side just outside of the hangar. She focused her magnifier and recognized Mac, saw the CPO stagger and drop to his knees. Only then did she spot the motionless form of another man, apparently dead, lying on that same black surface.

Cursing in frustration, she backed away from the particle cannon, turned, and sprinted toward the flight deck.

* * *

Jackson climbed into the belly of the Silver Spider and immediately found himself face to face with Naya Antoinette. She looked at him miserably, and shook her head in frustration – clearly she was so restrained by Dane's collar that she didn't even try to speak. The pilot pressed a finger to his lips and winked, provoking a spark of hope in her eyes. Then, as he heard the sound of movement just outside the ship, he ducked behind a bulkhead. He was worried about MacClean, desperately wishing that he had a weapon.

But at least he figured he could present the slaver with a most unpleasant surprise. And as he ducked deeper into his shadowy alcove, he spotted something fastened to the wall: a small fire extinguisher, a metal cylinder not even as long as his forearm. It was made of metal: a solid tool. He pulled it out of its strap and hefted it, waiting for the first opportunity to strike.

A soft hum of power, accompanied by a wash of light, infused the compartment as Dane's power chair floated upward to carry him into the belly of his ship. Though he was crouched in complete shadow, Jackson was able to watch the slaver's arrival in the reflective surface of the side bulkhead. For a second he allowed himself to be glad the man was so partial to bright chrome. He saw Dane deftly twist his wrist as he came aboard, and the pilot began to wonder if it was somehow related to Dane's control over the silver collars and other items.

"Have a seat, my dear. I do so hope to recover that splendid cutter our late pirate lass was so adept at flying around. Now, stand just so."

Dane stepped out of his chair, moving with the natural athleticism of a fit young man – a man much younger than the slaver's actual age, Jackson realized. He let his leering



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gaze run up and down Antoinette's body before he stepped into the cockpit. He left the flight deck hatch open, apparently so that he could admire Naya's lean, shapely form from the comfort of the pilot's seat.

"Are you ready to see your father's legacy?" Dane said with a grin. Almost instantly, with no touch on the controls, the Silver Spider thrummed to life and began to rise from the stone floor. "Impressive, no?"

Jackson couldn't see anything beyond the ship, but he hoped desperately that Sirene, and *Plumetail*, had been drawn to the scene by his distress call – the same radio broadcast that apparently blocked out Dane's ability to torture him through the silver collar. There was a chance, if she did, that she would spot Mac outside the hangar and rescue him before Nul V's smothering atmosphere asphyxiated the chief. How long had the guard survived out there? Five minutes? Ten? Almost groaning, Jackson knew that it was a forlorn hope.

Angrily he forced himself to cast that thought away. He felt a shiver of interference as the Spider passed through the airlock and began to accelerate. He couldn't save both Naya and Mac, he knew. But he had boarded the Spider not just for personal reasons. In fact, he had every intention of capturing or destroying this ship in the process.

With that grim determination foremost in his mind, he rose to a crouching position, hefted the fire extinguisher, and prepared to rush the cockpit.

* * *

Sirene watched as the Silver Spider shot through the airlock and flew along the face of the black mountains. *Plumetail* hovered, as dark as she could make her, a half dozen clicks away, and Zather Dane seemed not to be aware of her presence. As soon as his ship swerved around the shoulder of a vast, dark summit, she powered up the cutter and swooped in to land on the wide shelf outside of the hangar.

Mac was there, slumped on his hands and knees, in a very bad way. She slapped a breather on and grabbed a second one, then dropped the belly ramp and scrambled out. She strapped the second breather around his head. Grabbing the big petty officer under his armpits, she half carried, half dragged him into the hull. He collapsed on the deck as she repressurized the ship.

Only then did she hear the alarm from her cockpit. Rushing back to the pilot's seat, she engaged her engines and checked the scanner to see that the Silver Spider, bristling with weapons, had reappeared. The lethal fighter had obviously reversed course, and now curled around the mountain to dive into an attack.

And *Plumetail*, with the rocky shelf underneath and the sheer black cliff behind, was utterly trapped.

* * *

"*There she is!*" gloated Zather Dane. He turned to beam at Naya Antoinette, still standing outside the flight deck where he'd ordered her to remain. "Oh, do come in and sit down, my dear. You'll enjoy this . . . or rather, *I'll* enjoy making you watch as I capture your pirate friend."

Naya stepped through the hatch into the cockpit. Still observing the reflected action, Jackson saw her take the co-pilot's seat.

"Of course, I never believed the story that Captain Sirene had perished," the slaver declared. He pointed at his scanner's screen. "And certainly her ship, under autopilot, wouldn't be swooping in to rescue your comrades."

Rising from his concealed crouch, Jackson sprang through the hatch leading to the flight deck. He hoisted the fire extinguisher, aiming for that gleaming metal scalp –

And somehow, Dane knew he was coming. The big slaver bounced to his feet and spun, lifting an arm to block the container's heavy blow. Jackson staggered backward, his



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ears ringing from a metallic clang – and he knew that the slaver’s skull was not the only metal part of his body. Some kind of exoskeleton clearly protected his arm.

The bastard shifted with remarkable speed. Before Naya could move, Dane waved a fist toward her. Naya grimaced in pain as her collar seared her from the inside out and jolted her back into the co-pilot’s seat. Following up his parry, the slaver struck back, driving a fist toward the pilot’s still-tender nose. Jackson blocked with his own left, the blow smashing into his wrist with incredible force. He fell back, reeling from Dane’s powerful punch. The slaver then pointed his fist at Jackson, flexing his grip as if he had an invisible pistol.

Dane’s eyes widened in shock as nothing happened. The pilot lunged forward. His fist smacked into the slaver’s flat lips, knocking him backward, and the starman took savage satisfaction from the fact that he was finally giving his enemy an unpleasant surprise.

Yet that realization was small consolation as the metal-capped criminal reached with his other hand under the control panel against which he had fallen and pulled out a laser pistol, one that looked a good deal larger and more lethal than the standard issue P4. Jackson wondered if his luck had finally run out. Should he chance one desperate dive into the field of that lethal-looking barrel?

Abruptly the Silver Spider pitched under the impact of multiple rockets. Jackson, tumbling to the deck from the force of the wrenching barrage, guessed that Sharona Sirene had fired her entire arsenal in a single salvo.

“Damn that bitch!” Dane spun around to check his scanner, grabbing both sidebars for balance. Outside the cockpit, the ship’s batteries rotated and locked into position while the Silver Spider steadied on her course, all without the slaver touching a control. The mountain crest, a long, flat ridge of hard rock, loomed just below them and to port, barely a hundred meters away.

But at least his attention remained fully focused on *Plumetail*.

It was all the opening Jackson needed. He raised the fire extinguisher and threw it like a thick, short spear. The top end, with the valve, struck the slaver’s metal skull with a powerful force, clanging loudly off the hard surface.

Many things happened at once then: the ship lurched crazily, veering toward the nearby mountain summit; Zather Dane tumbled, cursing, into his control panel; Jackson fell again, thrown off balance by the wild tumble of the fighter.

And somehow Naya Antoinette ended up holding the big pistol. She pointed it at Dane’s head as the man recovered his balance, pushing himself off the panel, turning to see the weapon aiming at his face. He showed no fear, just fury, opening his mouth to bark a command at the still-collared lieutenant commander.

But Antoinette didn’t wait for him to speak. She fired one powerful blast, a searing shaft of energy that struck the slaver right in his open mouth. For a moment that oral cavity glowed like red fire – and then the force of the blast carried through his skull, burning his metallic cap into red heat. The stench of burned meat filled the cockpit as Dane’s body fell backward, his entire head charred black.

The Silver Spider smashed against the rocky ridgecrest then, the blow hurling Jackson forward. Only the slaver’s body cushioned his impact, the still-glowing skull searing a painful burn into the pilot’s arm. With a screech of tearing metal, the ship skidded along the – thankfully mostly level – expanse of black rock.

Antoinette’s hands were on the controls as she desperately tried to kill the engines and bring the fighter to a stop. For nearly a kilometer the wrecked fighter careened along the crest of the mountain ridge. One engine tore away and the ship twisted like a living thing as the remaining thruster fired in reverse. Finally the spider came to rest on the edge of a tall, precipitous cliff.



Jackson groggily climbed to his seat in the eerie silence. Antoinette remained in the co-pilot's seat, her face locked in an expression of shock.

"Skipper? Can you hear me?" the lieutenant asked, fearing that the effects of Dane's control collar might linger past the man's death.

But Antoinette nodded, and visibly recovered her wits. The ship lurched unsteadily and she quickly scrambled out of the seat. "We've got to get out of here!" she snapped.

Jackson was already moving. He saw an escape hatch at the rear of the hull and popped the lever. The hatch blew off and he immediately gagged at the foul, nearly unbreathable air. But glory of glories, there was *Plumetail!*

The cutter came to rest on the ridge crest barely twenty meters away. The two starmen, both limping and straining to breathe, covered the distance in seconds, and seconds later were safely inside the cutter's hull. Jackson drew deep, life-giving breaths for several long seconds, until he gradually became aware that Antoinette was looking at him with a strange expression on her face. He blinked: it almost looked like she was impressed with him!

"I – I never imagined he could control so much with his mind," she said finally. "Those collars . . . he just had to look at a person, and he could make it burn."

Sitting up, the pilot shook his head. "Not his mind," he said. "Tech. I was watching his hand, and he must have had some kind of interface inside his glove. His right hand was always in motion when the collar burned someone."

"How the *hell* did you ignore it, then?" Mac demanded in aggravation. "The thing damn near burned through my spinal column!"

"I've got to thank the skipper," Jackson said. He pulled the transmitter switch from his pocket. "I don't know if this helped you find me, but it put out enough interference that

the collar didn't activate."

Naya helped D-Jack to his feet, then pointed through the forward viewscreen. "Look at that." Together with Mac and Sirene, they watched through the Plexi as the wrecked Spider toppled over the edge and broke into pieces, smashing against ledges and outcrops of rock as it vanished into the darkness.

"Dane?" asked the pirate captain, squeezing profuse contempt into the single word.

"Dead," Jackson replied. "The skipper fried his brains out."

"Damn. I wanted to squeeze some treasure out of him," Sirene growled, watching the distant explosions. Still, her expression showed that she was far from displeased at the news.

"Here." Naya Antoinette had pried the metal collar from around her neck, and now she held it out to the pirate. Around the ring were eight diamonds, each the size of a small eyeball. "I guess he gives jewelry to women he wants to . . . impress." Her eyes were distant as she reflected on the fate she had so barely avoided.

"You're welcome to keep this," she told Sirene. "It's worth a small fortune, and you earned it. Besides, I never want to see the damned thing again, not as long as I live."

The End



AND FROM ALL THE
REST OF US AT RSI
— THANK YOU!



CHRONICLES