JUMP P⊕INT

IN THIS ISSUE

GREETINGS, CITIZENS!

We venture into unknown territory this month, attempting to describe the creation of a couple of large arenas. It turns out that there are a lot of peopl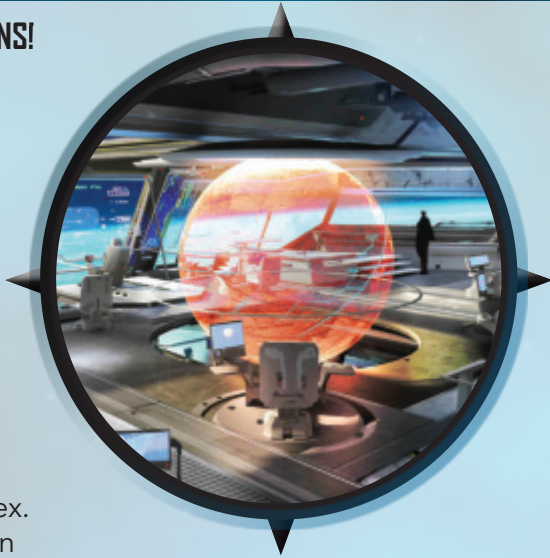e involved in making something this complex. We focus on Sean Noonan, lead designer for the *SM* arenas, but there are others whom we could have featured as well — we just ran out of time and space. Our other articles this month include a discussion of how we balance ships in *SC*, the most popular *SM* website in the 'verse, Kallis, a new system (in more ways than one), and the second part of Dave Haddock's short story. Speaking of which …

I read a lot of SF. Some authors I avoid after trying a book or two; some I enjoy so much I keep looking to find a new title on the shelf.

I won't find Dave's stories on the shelf (at least not so far, though I'm still hoping for an anthology of *SC* stories), but I do relish when a new one comes out. And we've got a new one simmering nicely now. Check out "Drifters," at the end of this issue. Part 1 was last month. We're halfway through, and I'm still not sure if I want Mags to succeed or fail — that's a mark of skillful character design.

Meanwhile, Dave doesn't have nearly as much time to write stories now as he did when *SC* was first getting underway, so you have to go back a bit to find his other stories. It's worth the effort. Let me point you in the right direction.

A couple are in early **JP**s; you just have to go to the ar-

chives to find them. The other three are serials posted on the website, with about ten weekly episodes each. You can find them with a Comm-Link search for the title; let me know if you have any trouble.

Whisperer in the Dark (Tonya Oriel). *Jump Point 01-01*. People complicate things. That's one of the main reasons treasure hunter Oriel seeks out the mysteries of the void — it's uncomplicated … usually. But the darkness can hide uncomfortable whispers, as well.

Last Flight of the Seraphim. *Jump Point 01-02 – 01-04*. A mercenary unit on its last legs must decide which way to turn. It's not a decision made lightly, nor will you always choose the same path as those who have flown beside you.

The Lost Generation (Tonya Oriel). *Comm-Link*. Tonya returns in search of the *Artemis*, a generation ship with 5000 aboard, vanished without a trace. Is a treasure beyond measure worth what it will cost?

Cassandra's Tears (Cal Mason). *Comm-Link*.
Tales of Kid Crimson. *Comm-Link*.
Cal Mason and Kid Crimson are the classic hero and anti-hero. Lt. Mason can seemingly do no wrong, even when he's choosing which regs are beneath his regard (most of them). Crimson has chosen a life of crime, but not if it will harm innocents. Both are written as glorious pulp fiction, and both have their readers asking for more … or better still, a story starring both of them. Good reads, all of them!

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

David

David.Ladyman@cloudimperiumgames.com

Star Marine Arenas: Demien & Echo 11

WORK IN PROGRESS
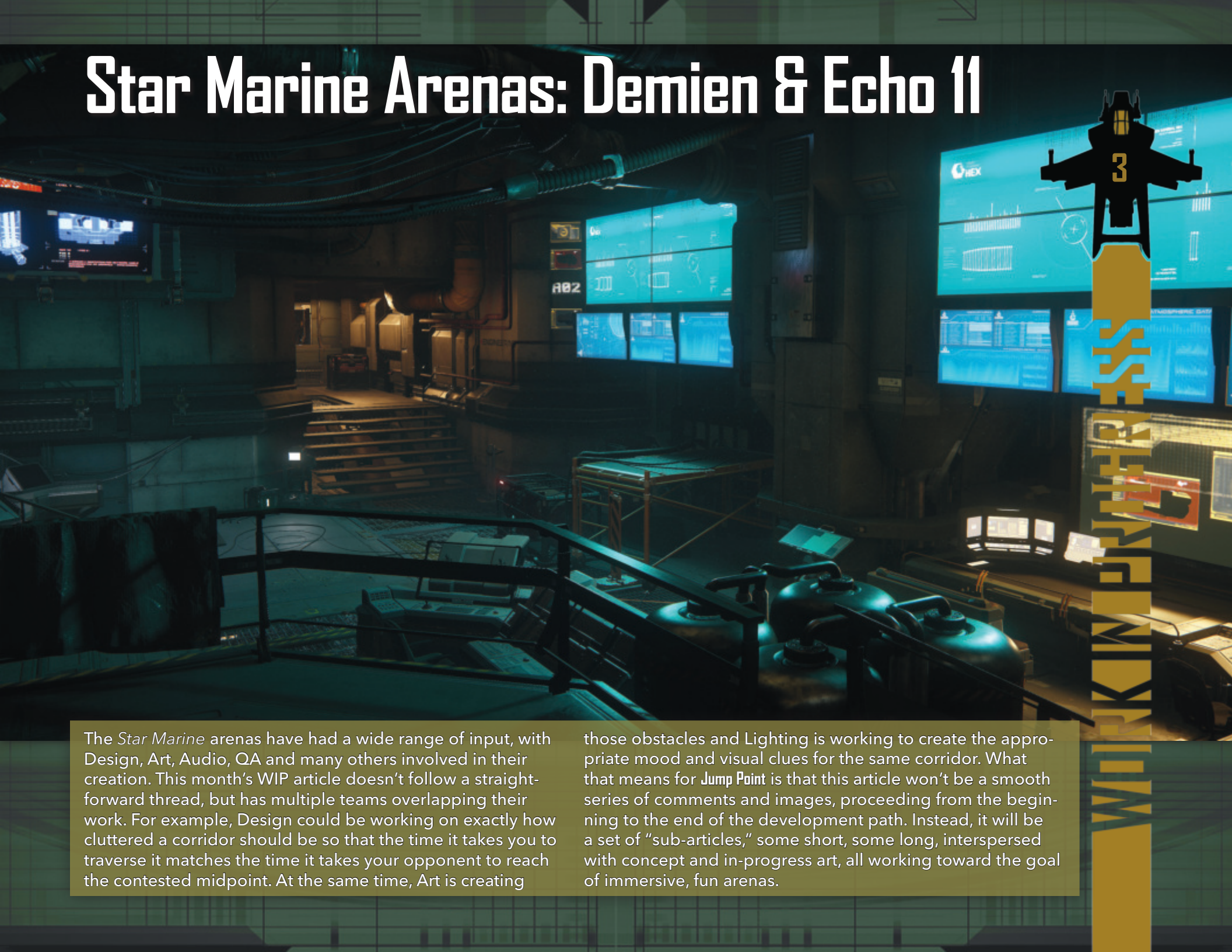
The *Star Marine* arenas have had a wide range of input, with Design, Art, Audio, QA and many others involved in their creation. This month's WIP article doesn't follow a straightforward thread, but has multiple teams overlapping their work. For example, Design could be working on exactly how cluttered a corridor should be so that the time it takes you to traverse it matches the time it takes your opponent to reach the contested midpoint. At the same time, Art is creating

those obstacles and Lighting is working to create the appropriate mood and visual clues for the same corridor. What that means for **Jump Point** is that this article won't be a smooth series of comments and images, proceeding from the beginning to the end of the development path. Instead, it will be a set of "sub-articles," some short, some long, interspersed with concept and in-progress art, all working toward the goal of immersive, fun arenas.

HIGH LEVEL BREAKDOWN OF THE FIRST SM ARENAS

Security Station (4-8 players)

- Deserted unfinished security station/ unfinished airlocks/ pressurization

- Built with newer materials, but the builder ran out of money to complete it.

- One or 2 big (hero) rooms with a connecting passage between them

- 1 or 2 levels vs the 3 maze like levels in Port Kareah

- EVA is available around the outside of the station

- Has these features:
  - Staff quarters (sleepers, breakroom/kitchen)
  - Weapon/security room
  - Jail/detainment area
  - Communication center
  - Power control room
  - Solar panels
  - Gravity generator

Asteroid Mine (8-16 player)

- Manmade mine built into both sides of a ravine (Could be 2 sided or a Y)

- At least 1 pathway that connects the 2 sides

- EVA opening that allow the players to fly from side to side

- One side could be a hangar, the other could be the refinery.

- Has these features:
  - Staff quarters (sleepers, breakroom/kitchen)
  - Weapon/security room
  - Jail/detainment area
  - Communication center
  - Power control room
  - Solar panels
  - Gravity generator

OP STATION DEMIAN INITIAL BACKGROUND & LORE

Location: Near Nexus II

Factions: Marines / Outlaws

History: Constructed shortly after the UEE claimed the Nexus system, Demien was one of the operations/housing/ transfer stations for workers attempting to terraform Nexus II. The planet was never successfully terraformed though, because the station has a much darker reputation: the site of the infamous Walzer Massacre of 2935. This incident marked the first serious clash between the UEE and the criminal element that were driven out of their system.

The incident occurred in between shifts, when members of the Horizon Crew slipped aboard the station and murdered the small security detail tasked with monitoring the station. Now in control of the landing pads, they allowed more of their pack to board without attracting any attention. The group stalked the halls of Demien and murdered anyone they came across. One young inhabitant managed to make it to a comm station and alert authorities before he was slaughtered. By the time they arrived, there were only outlaws left. Local authorities were significantly outgunned and were beaten back from entering the facility. They were forced to call in the Marines to retake the base. The ensuing battle lasted for six hours, as Marines and criminals fought over every centimeter of territory.

The _Star Marine_ scenario takes place in 2935 as the Marines infiltrate the overrun station.

Design: OP Station Demien is a small space station consisting of two interior spaces linked by two large landing pads. The station is surrounded by open space and EVA opportunities for combat and shortcuts. This results in a high frequency of dynamic combat in and out of gravity.

Demien is a bright, well-lit location, so players are often exposed and must rely on map control to stay on top.

Keywords: optimistic, hopeful, safety, maintenance, massacre, space station, demien
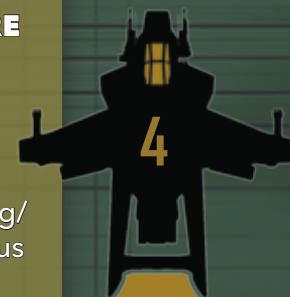
Echo Concepts, top to bottom: Lounge, Security, The Cell (Point D)

ECHO 11 INITIAL BACKGROUND & LORE

UEE NOT IN CONTROL

Location: Elcibre Belt

Description: A former extraction facility built into the asteroid that it was servicing, Echo 11 was built by the Hathor Group and abandoned as they abandoned the system. Since then, it's become a den for squatters and outlaws.

Recently, it's been used by some of the more aggressive outlaw packs to stage surgical strikes on UEE forces. The base has been launched into the public consciousness after a series of high-risk Advocacy raids attempted to take out members of Argul Dawn, which had been preying on supply ships for weeks.

Overall Tone: Since Demien represents a civilian station, Echo Station gives the outlaw perspective. This place has much more visual history and color, since people have been living here in some form or another for hundreds of years.

Echo 11 is a facility within an asteroid, featuring a number of large spaces connected by a network of tight corridors. The only EVA space is in the centre point of the map and is primarily used to take short cuts to avoid the afore-mentioned corridors.

Demien is bright; Echo is grim, dark and seedy – a camper's delight.

Find out if Argul Dawn should have custom paint jobs on their armour or different kits.

Find out if Marines should be replaced with Advocacy.

Abandoned – more piped in stuff from the outlaws and evidence that they tried to clean it out.

WORKINPROGRESS
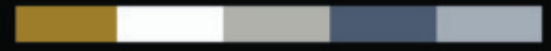
Different wall treatments & color values for Demien

Walls / Floors / Ceiling   Signage   Lights

Art: Played with inversed color schemes between Demien walls and floors. It keeps the difference clear between walls and floors while bringing overall uniformity to the scene.

Played with inversed color scheme between walls and floors.
Keeps the difference clear between walls and floors while bringing overall uniformity to the scene

6

WORK IN PROGRESS

Two alternative Demien Lobby concepts

JP: *This article is roughly chronological, but for the next few pages (8-11), we'll be taking a step back and reviewing the entire process with level designer Sean Noonan. In keeping with that overview, we've got several pairs of images from Echo 11: each pair shows the whitebox that Sean created for the initial layout of Echo 11, matched with a screenshot from version 2.6.*

And then we'll return to the chronological sequence on page 12 with very early map layout feedback from Mark Tobin and a specular review from Eddie Hilditch.

DISCUSSION WITH SEAN NOONAN, STAR MARINE LEVEL DESIGNER

JP: *Standard first question: what is your title, and what are you doing on* Star Marine?

Sean Noonan: I'm a senior designer at Foundry 42. I'm responsible for handling level design for *Star Marine*. I also work on game mode design and help keep the overall design of *Star Marine* consistent with the Star Citizen experience.

JP: *What exactly is game mode design?*

Sean N: Game mode design has me providing objectives for players as a means to provide purpose for combat. The intention is to provide a rough abstraction of scenarios that could feasibly occur within the persistent universe. The game modes provide an accessible wrapping to simulate said scenarios.

For example, in our Last Stand game mode, we're simulating a scenario where Outlaws are locking down a station while they pillage it for resources. From the Marine point of view, they are simply doing their jobs and taking out the trash (the Outlaws).

JP: *What's the primary difference between the two current SM arenas? (Is "arena" the best term for them?)*

Sean N: Arena is a good term – they have limits represented with a virtual boundary that keeps gameplay focussed within the arenas.

The key difference is the use of EVA. OP Station Demien is a space station with two interior spaces surrounded by open space and EVA opportunities. This means there's a lot of dynamic combat in and out of gravity.

On the other hand, Echo 11 is a facility within an asteroid, featuring a number of large spaces connected by a network of tight corridors. The only EVA space is in the centre point of the map and is primarily used to take short cuts to avoid the aforementioned corridors.

There is also a huge tonal difference between the maps – Demien is bright and optimistic (if you avoid the bodies ...), so players are often exposed and must rely on map control to stay on top. Whereas Echo is grim, dark and seedy – a camper's delight.
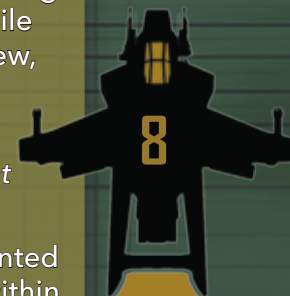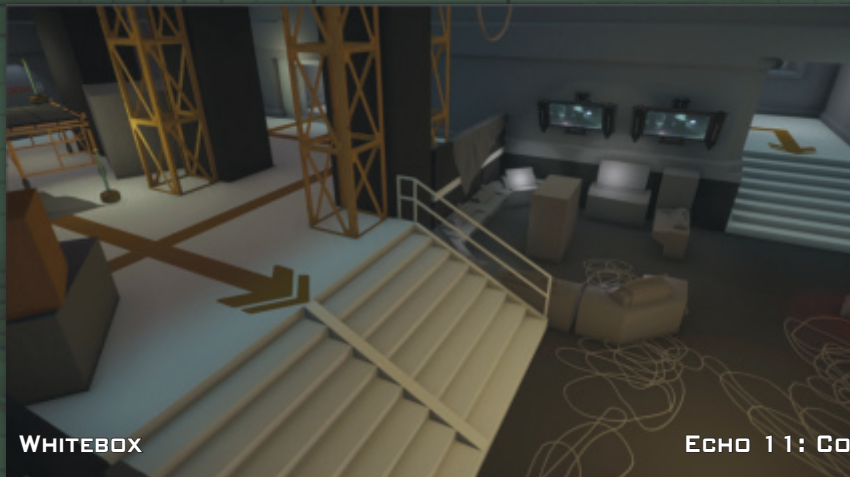
Whitebox   Echo 11: Comms (Point C)   Current Version (2.6)

Whitebox   Echo 11: Engineering   Current Version (2.6)

The design approach was different, as well. The design doc for Echo 11 called for the dark areas, and the arena was built around that concept. The result can be hard to navigate sometimes. The design doc for Demien was simpler, with more open space.

JP: *Is either game mode more suited to one arena or the other, or could you enjoyably play either mode in either arena?*

Sean N: Both Echo and Demien can be enjoyed in both Elimination and Last Stand. However, in our latest patch we've made some mode-specific changes to Echo 11's layout to better focus the gameplay to a number of lanes and choke points. This is something we will explore further in future updates and maps.

JP: *Let's talk design process for a few minutes, and use Echo as our example. In a very simplistic way, what's the process? How does a level, an arena, get built?*

Sean N: The high level of our process begins with a brief.

For Echo 11, the brief was simply to build a space to house a new team-based game mode (at the time we only had Elimination). We knew we wanted a team-based mode with bases, so we began working with the idea that we'd have two bases split by an EVA space.

JP: *And when you say "EVA" do you mean actually exiting the structure, or simply a gravity-free area?*

Sean N: A gravity-free area.

We then respond to that brief with reference gathering and a pitch doc, both of which make up the initial concept of a level.

JP: *What did you want to have in each base? Would they be basically identical?*

Sean N: We knew that one team would be invading, so one team would be at an entry point (the freight elevator) and the other at the core (the gravity generator). However, both needed to have similar options from spawn — access to EVA, a nearby control point and lanes that lead towards choke points.

JP: *So, do you then start sketching something out on paper?*

Sean N: Yes, in the concept phase I wrote a short level pitch document and provided some initial visual reference for the rest of the team while I started scribbling some rough ideas down on paper. Personally I like to work in 3D as soon as possible, so once I had a rough idea and overall plan on paper I jumped into the editor and started wrangling 3D shapes.

JP: *Is it approved to go ahead with development at this point, or still speculative? Is anyone else working on it besides you at that point in the process?*

Sean N: At this point Art and Lore are working and responding to the concept I initially provided. Flexibility is important during this stage of the process – the concept phase is merely for idea creation and to help ease production along.

WORK IN PROGRESS

For example, at this point in Echo's production, Design had planned it to be a clean, high-tech science station. This is what initially drove the level's corridor-heavy layout; it just so happened that the purpose of the station evolved as production expanded to other departments.

JP: *At what point do you actually have a 3D environment in which characters can move and act?*

Sean N: Around when my aforementioned shape wrangling begins to form the basics of a whitebox. We build our whitebox layouts using a template kit. This is a simple collection of walls, floors, ceilings, railings, etc. that all follow metrics and snap to a 1m grid. This provides the skeleton of a location where initial gameplay will take place and provide other departments, such as Art and Audio, a rough idea of their workload and where their focus will be.

As soon as the basic whitebox is completed, spawn points, objectives and pickups can be placed and the arena can be tested.

JP: *So you're not waiting for art or textures or realistic-looking elements – you're playing in a black and white environment?*

Sean N: Early on, we generally work with a basic low contrast grid pattern; it's important to be able to gauge distances. As we progress and areas of the map become more set in stone, we'll start to apply colour and light up areas of interest, such as doors or balconies.

As areas are completed from a design stand point, Art begin replacing the kit pieces with textured artwork.

JP: *What are a couple of the biggest/most interesting changes you made to the design once you began testing it? What didn't work the way it was intended?*

Sean N: Echo 11 was being made alongside the new game mode (Last Stand), so as the game mode matured, so did the level. Early on, the game mode was asymmetrical and tiered, with one faction having multiple spawn points and more varied timings between spawn points and objectives. The game mode evolved into a symmetrical game type, so the map was modified – what was once a spawn room became an objective, what was once a connecting path became a choke point, etc.

Similar changes have been made since we went live with 2.6; for 2.6.1 we made some large changes around the Control Points in Demien to better balance the timings. I would say that as the game continues to evolve, the biggest changes are still to come.

JP: *What do you mean by "tiered"?*

Sean N: There were multiple stages. The first round was similar to what we see in Last Stand now, except once the attacking team captured all of the Control Points the second round would trigger. At that point, the defending team would move back to a further spawn point and all focus would move to a single Control Point that would decide the game.
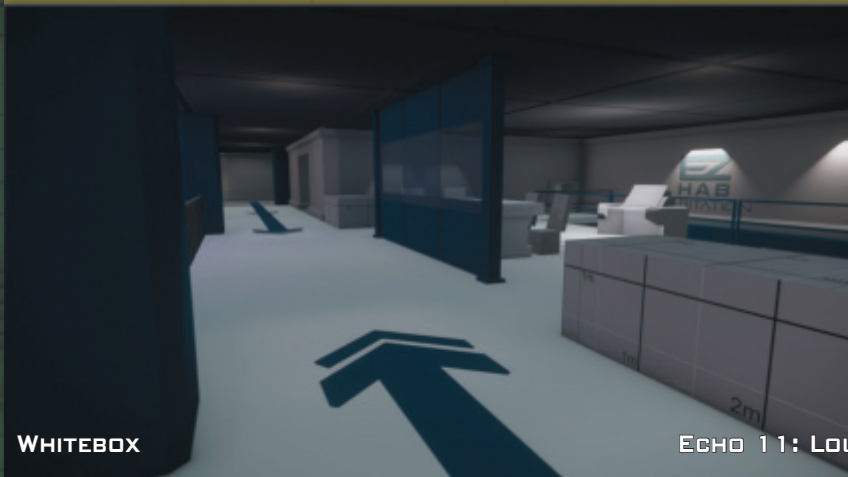
Whitebox

Echo 11: Lounge (Point B)

Current Version (2.6)

WORK IN PROGRESS

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JP: *What is an example of a large change around a Control Point in Demien to better balance the timings?*

Sean N: The "C" Control Point in Demien went through a number of changes. There wasn't a good balance between "A" to "C" and "B" to "C". Our plan was to have "C" act as a choke point between "A" and "B"; so as a player heads up the stairs from "B" and gets eyes on the "C" Control Point, a player running from the "A" balcony will also have eyes on the "C" Control Point.

JP: *It sounds like a Control Point is simply a location, not necessarily a place with buttons, etc. – correct?*

Sean N: It's a laptop. Teams need to hack them in order to control that location. The more locations you control, the more score your team gets.

JP: *And so balancing a Control Point in this instance involved modifying where each team starts, so that they have an equal chance of reaching the CP first?*

Sean N: Not where the teams start, but the routes into the area housing the Control Point. Before we basically had two parallel corridors. We've taken a sledge hammer to the walls and opened the area up, allowing for a clear view from the B side stairs and the A side reception room.

JP: *Looking to the future, what other SM game modes can we look forward to? What other types of arenas?*

Sean N: Well, there's plenty of plans, but everyone's ultimate goal is to integrate FPS and ship combat so that an arena (or an appropriate PU area) can combine all types of combat at once. And that's all I can say about that. :)

WORK IN PROGRESS

MAP LAYOUT FEEDBACK

Mark Tobin, QA Tester: As requested, here is a list of Echo 11 map layout feedback from yesterday's playtest:

- Some wider and longer corridors with cover would help develop more team tactics beyond running and gunning.

- The map is well designed with lots of space.

- The map encourages gunfights at all ranges, which is good.

- I like how the map is multi-levelled. However, it also makes it harder to find people.

- The use of the suit lockers near the EVA exits is a good visual reminder that the player is near an EVA exit.

- Have more variety of paths to take in the ventilation ducts. Players usually just camp and wait for the players at the other side.

- Playing TDM on maps that size, the spawn area should be locked off from the other team, and there should be more than one exit at that lockout point to prevent a death zone choke point. The teams can always spawn in their starting spawn zones to give better orientation.

- The map has a maze-like feel to it and will definitely need plenty of signposting when finished. (Team bases marked with colours, signs to airlocks, etc.)

- Balcony areas for sharpshooting in the EVA area would be a nice addition to the map.

- The ladder in the EVA exit room leads to a room with a set of stairs leading back to the EVA exit room. This feels unnecessary, as stairs are in close proximity to the ladder, and the room leads nowhere else.

- Dead ends in the map don't add much to the gameplay. Certain paths lead to blocked off areas, making you travel all the way back to wherever you came from. Every area should be open, to have continuous flow of combat.

- The outside EVA section feels to be lacking something, maybe floating debris, walls and scaffold rails.

SPECULAR VALIDATION PASS

Eddie Hilditch, Senior Lead Environment Artist: Some of the materials being used on both Echo and Demian have some baaad specular values. Load up your level and turn on the button from the 'ReviewArt' toolbar.

If the materials are set correctly you should see a lovely, all grey image. However, both Echo and Demian suffer from some very odd spec values that exist outside a proper PBR workflow. It's super important that we do a pass on these as soon as possible because it will effect Ash's ability to properly light stuff.

I know a lot of materials are old/rotten, but if we do this pass now, especially on the older Bravo materials, we'll help ourselves out a bunch going forwards. Especially before we make any more accent materials! Please do this.

PBR values fall into two distinct categories. Metal (just shiny metal) and Dielectric. If it's a shiny metal it needs to be above 180. If it's a dielectric it needs to be between 40-65. In 90% of cases you can set metal to be 190 and non-metals to be 55 and go about your business. You don't need a spec map most of the time, and you certainly don't need any detail in a spec map. If out of necessity you do use a spec map with different materials on it, it simply needs to call out the different materials with correct block colours and be done with it. Variation in surface glossiness goes into the gloss map, not a spec map.

Here are some examples *[beginning on next page]*.

A. This is completely unnecessary, seems to have AO and random colour variation. If this is just a painted floor you don't need a spec map at all.

B. Not sure what kind of material this spec map is for, but it won't work for PBR.

C. Random noise/colour in the darker areas, has an AO map! Too much variation in the metal areas; should just be blocks of colour calling out dielectric and metallic materials.

A

B

C

Validation mode

FPS 83.3 · 12.7ms

grey: OK
blue: spec too low (OK in crevices due to AO)
yellow: spec too high for non-metal
orange: spec far too high for non-metal
pink: colored spec on non-metal
green: albedo darker than charcoal
cyan: albedo brighter than snow
red: normal facing away (two sided)
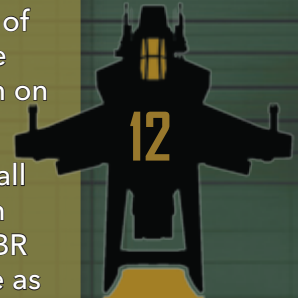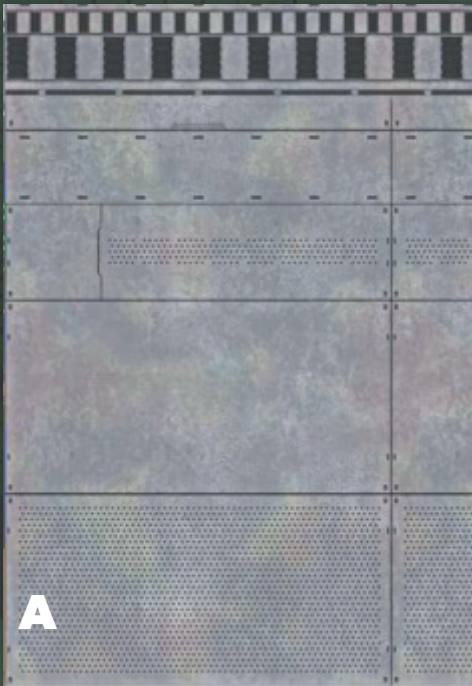
Eddie H: Currently this is what it looks like in Echo [**D**, **E**, **F**, *this page and next*].

D

Fmt: A8R8G8B8, Type: 20

WORK IN PROGRESS

E

F
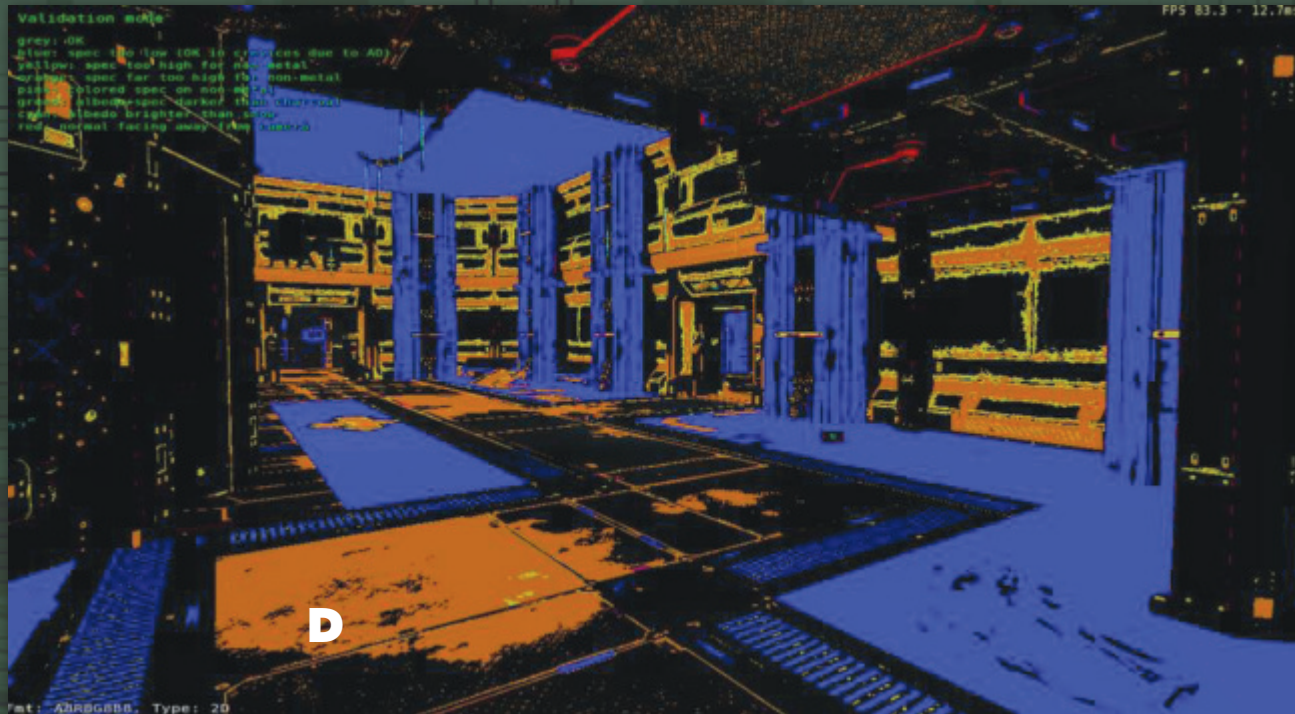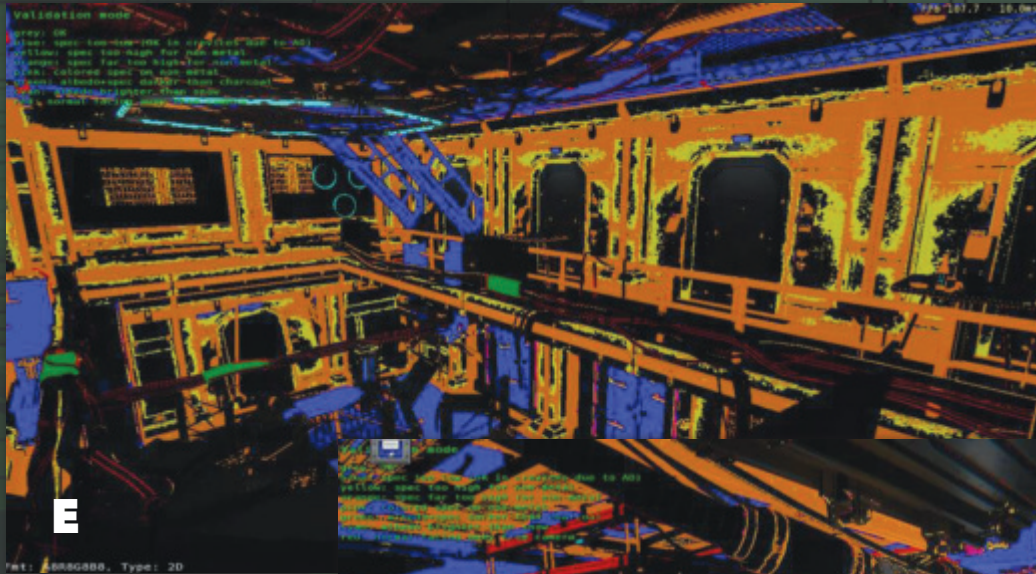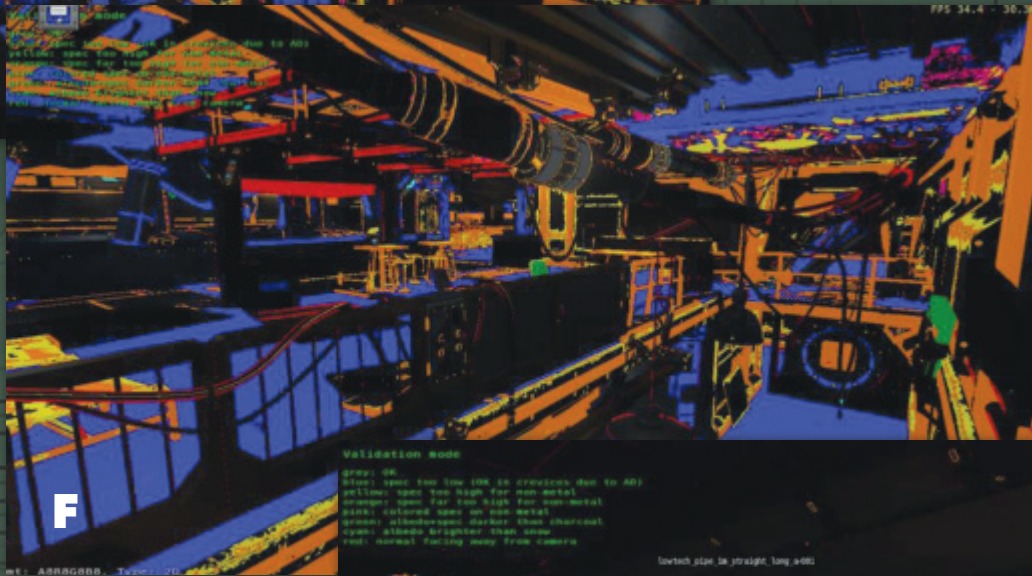
G

Eddie H: Demian [**G**] is better, but still not without problems.

Thanks and happy spec hunting.

PLAYTEST FEEDBACK

Mark T: Here is the feedback from QA's *Star Marine* Control playtest on the Demien map.

- Another lighting pass is required. Delta Terminal's room is too dark, which makes it hard to spot players, whether teammates or enemy. The Rear Pad for the attacking team is very dark and feels empty.
7 players agreed
2 players were indifferent

- The red spawn zone force fields look out of place. Placeholder or not, they look really out of place in this game mode. The map has a good flow and is great to move around in, but the red and to some extent blue force fields feel they break the immersion of the game.
8 players agreed
1 player was indifferent

- The player spawns seemed a bit everywhere. You could spawn and as you're about to run, someone will be right behind you.
6 players agreed
2 players were indifferent
1 player disagreed

- EVA area would benefit from floating props, e.g. crates/ship parts.
7 players agreed
2 players were indifferent

- Make more vault obstacles in interior corridors, e.g. block a corridor off but with an object the player can vault over. It seems that vaulting is used very little – having more obstacles would make use of vaulting, and also use of cover.
6 players agreed
2 players were indifferent
1 player disagreed

- An EVA (zero gravity) section indoors as well would freshen combat up a bit.
5 players agreed
2 players were indifferent
2 players disagreed

- Not sure if they have it, but defenders could do with some time to set up, to prevent the opening to their base during phase two being too easy. It would also help to add UI/Audio alerting the defending players to fall back.
7 players agreed
2 players were indifferent

- Add more floors to the map, like a basement section to add a bit more variety to player flow. Adding a corridor where the pipes at the bottom of the Mess Hall connect to the Engineering Room is an example.
3 players agreed
2 players were indifferent
4 players disagreed

- Adding a control tower for sniping opportunities is usually favoured by FPS players.
5 players agreed
1 player was indifferent
3 players disagreed

- It is difficult to see players in EVA over the Alpha and Beta capture points using the Arrowhead sniper to camp, due to their being against a darker background.
3 players agreed
5 players were indifferent
1 player disagreed

- Have the area lighting around the capture terminals change, depending on which team has control.
8 players agreed
1 player disagreed
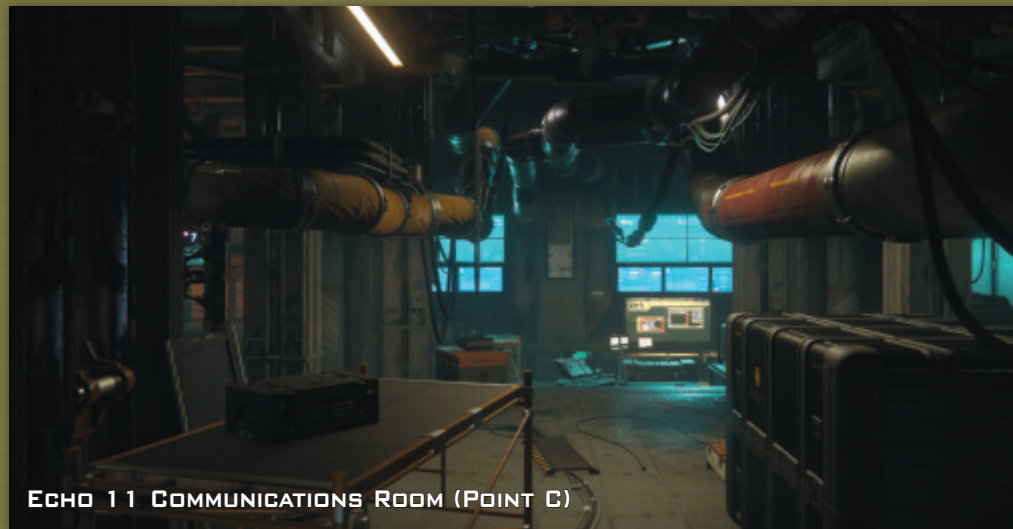
ECHO 11 COMMUNICATIONS ROOM (POINT C)

CONTROL GAMEPLAY

- Objective Points should be clearly labelled with Alpha, Beta, Charlie, etc. Hack/Defend should be info on the Ready Up screen or something subtle in the corner for reference and should appear as part of the Inner Thought system. Players are still very confused about what is going on with Control game mode.
7 players agreed
2 players were indifferent

- Other than the functionality not being quite there, objectives being locked out permanently is good. It gives players direction and forces objective focus, but it also gives players less reason to explore the level.
4 players agreed
3 players were indifferent
2 players disagreed

- A kill feed would greatly improve the gameplay experience. It would be nice to see who killed whom and with what weapon, and if it was a direct headshot. Possibly have the weapon silhouette to show what the player was killed with, a space helmet with a skull if they wandered out of bounds, even a drop of blood if they have bled out.
9 players agreed

- The locked-in animation for control points will look really cool when final assets are implemented. I also like that the player can still look around, but include a way to quickly stop interacting if they need to escape.
9 players agreed

- The loadout screen is sorely missed, as so much time is wasted going and picking up weapons. It also limits players' options if their preferred weapon has already been taken. The loadouts should be changeable midgame, taking effect when they next respawn.
7 players agreed
2 players were indifferent

- Dual weapon functionality should be considered, although this is usually thought to be OP. In other games, the user suffers a loss to have dual primaries. Two Primary weapons should be limited to the medium and heavy loadouts, but they should move slower as an armour class.
5 players agreed
4 players were indifferent

- There should be waves of spawning so that it forces the players to go towards the target at the same time rather than in dribs and drabs. If we want players to play tactically, we should encourage it as much as possible.
3 players agreed

4 players were indifferent
2 players disagreed

WEAPONS

- Firing from the waist is too effective; there's not enough spread to encourage using ADS in a firefight. Take the P4-AR for instance – this is too effective compared to the Devastator 12.
5 players agreed
3 players were indifferent
1 player disagreed

- Damage dealt during firefights felt inconsistent. Sometimes players died in 3 or 4 shots, sometimes half a clip. The bullets don't feel they have as much damage. Perhaps this is a desync issue.
9 players agreed

- Firefights are often a mass of bullets in automatic. Changing it to 3-burst as the default could reduce the spam during fights as previous builds.
5 players agreed
2 players were indifferent
2 players disagreed

Echo 11 Engineering (Point C)

- The Arrowhead Sniper is still really inaccurate in EVA.
  7 players agreed
  2 players were indifferent

- Have more weapons or a variety of customization. The P4-AR has a scope, suppressor and forward grip; why not include them in this game mode?
  8 players agreed
  1 player was indifferent

- There should be an indicator when hitting a player with Melee, besides the audio ping.
  9 players agreed

- Hit boxes don't seem to matter. Head-shots should do more damage than it feels like they're doing right now.
  8 players agreed
  1 player disagreed

- Overall, weapons should do more damage or players should have less health, because the more realistic the game, the less damage players should take before dying. It feels like currently it's somewhere between Battlefield and Halo in terms of how much damage you can absorb. With the desync and lag, it makes the fights very scrappy and doesn't give off a feeling of "I'm controlling a deadly soldier." This is something that will take a lot of fine tuning; it's not quite there in its current state.
  8 players agreed
  1 player was indifferent

- Secondary weapon needs to have a much faster switching time due to the very long reloading times. *Counter Strike/CoD/Battlefield* all recognise this as a must have. This may be a lot more important to competitive play than people think.
  9 players agreed

- Grenades take a long time to explode.
  4 players agreed
  2 players were indifferent
  3 players disagreed

- Aiming down sights still feels too slow, and the handling feels tight (Possible due to lag). This mostly seems to be caused by complete lack of aim assist.
  5 players agreed
  4 players were indifferent

- The ATT-4 burst fire mode is still broken – as there is no penalty for using the weapon in auto mode, the burst fire should be more powerful.
  6 players agreed
  3 players were indifferent

PLAYER

- Stand up / Heal animations take too long.
  7 players agreed
  2 players disagreed

- It's very difficult to tell the teams apart. Armour is too similar in style and colour. It's really unclear who's the enemy and who's friendly. Both loadouts seem identical when running around shooting, the only way I knew who was on my team was by the names above players' heads but these don't always come up in that split second when you're firing at them.
  9 players agreed

- Maybe a red outline around enemy players or blue/green for friendly players. There needs to be a more effective way to tell teams apart, perhaps a gentle UI overlay for first encountered players that gradually fades?
  7 players agreed
  1 player was indifferent
  1 player disagreed

- Player names should appear over their heads when you have them in your sight. If you target an enemy, your name should appear in red above their head. It should disappear when you stop targeting.
  5 players agreed
  4 players were indifferent

- There is absolutely no reason to use prone at the minute. No one really uses it in the matches.
  8 players agreed
  1 player was indifferent

- Players can run through enemies, making Melee difficult.
  6 players agreed
  2 players were indifferent
  1 player disagreed

- While in cover, the gun gets right up in your face. In order to be able to pop out, half your body needs to be round the corner already, which removes the point of cover.
  8 players agreed
  1 player was indifferent

- It takes too long to get into cover. The player moves a little sluggishly, and in most cases there isn't time to get to cover.
  7 players agreed
  2 players were indifferent

WORK IN PROGRESS

SIGNAGE

Ben Curtis, Global Prop Lead: Here are some ideas for signage. Most seem to have ended up being warning / security related, which I'm not sure works and if they are too specific.

Location Signs
- Security
- Exit
- Airlock
- Controlled Zone

Warning Signs
- No Entry
- Danger
- Checkpoint
- Authorised Personnel Only
- Caution
- Electronic hazard
- Restricted Area
- No Access
- Hot Surface
- Helmets must be worn
- Atmosphere warning
- Beware, security cameras in use
- Monitored zone

Information Signs
- Array 67/B
- Generator 4A/5H
- Access Terminal
- Assembly Line
- Access point
- Information point

Commerce
- Enjoy!
- Modules Bought and Sold – All items considered
- Welcome
- UEC
- UEC accepted
- Used Goods

Ben Parr, Associate Producer: We are looking at creating a prop fluff screen with a UEE planetary division logo on it. The planetary division would be responsible for terraforming of the
nearby planet of Station Demien.

Is there any such UEE section that deals with Science or Terraforming or anything along those lines?

Dave Haddock, Lead Writer: Historically, we'd been saying that companies did the actual terraforming. For the area, it'd make sense if we use the Hathor Group (they controlled the Nexus system after it was discovered) or we could even do Gold Horizon (they built these types of stations to house terraformers).
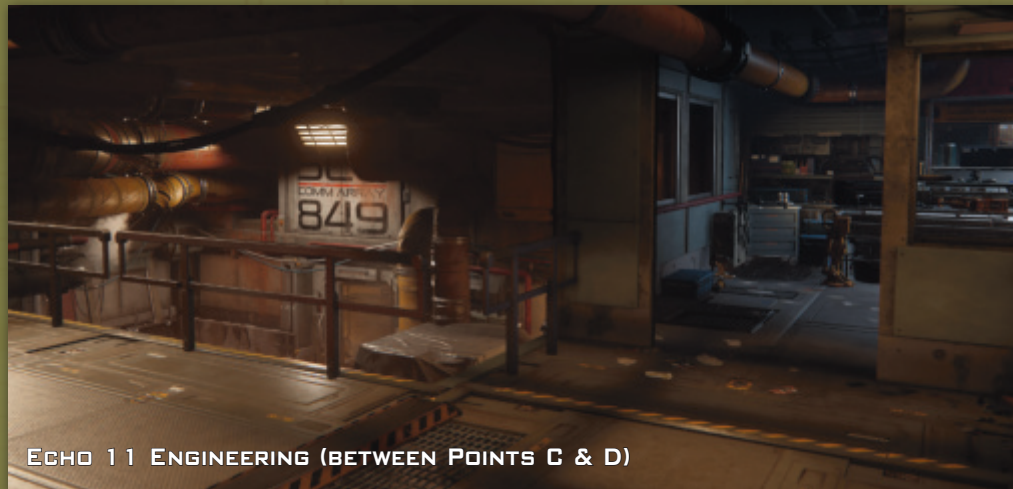
Echo 11 Engineering (between Points C & D)

ORIGINAL.

TARGET

NEED SOME
COOL LIGHTS

REF
SHOTS.

Echo 11 lighting and sign samples

PLAYTEST FEEDBACK

Will Maiden, Systems Designer: Here are my thoughts on *Star Marine*'s playtest today.

Will M: *Dark.* The maps feel VERY busy with > lots of darkness.

I can't really spot the enemies or make out where threats should be coming from because there's stuff … everywhere!

< **Will M:** I know it fills the scene up, but this is a control room and someone's used it as a dumping ground for 'generic black things.' I can't make out a single thing, except maybe a free-standing lamp.

And it's so dark. Space is dark, the underneath of landing platforms is dark, the corridors are dark, the terminal areas are dark, even when bathed in light, the map seems dark.

Will M: When everything is dark, everything seems > the same, and it gets difficult to notice the difference between anything. There are two landing pads and the only thing I can remember as being different is that the moon is on the side of Pad B. Cargo containers look like machinery, look like grating, look like the floor. Everything is 50 shades of grey, and not in a sexy way; the entire colour palette is dark and dull.

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WORK IN PROGRESS

DEMIEN LIGHTING PLAN

Eddie H: Hey guys, we need to make sure the lighting is mostly locked down today. I came in this morning and it seems like a lot of it has disappeared from areas that were previously lit yesterday. We are currently 2 working days away from needing this solid so I'm going to need to split the lighting tasks up today.

Ash will look at the whole of the interior for Operations today, so that's:

- Atrium rear
- Comms
- Maintenance
- Mess
- Top corridor a
- Top corridor b

Emre, please concentrate fire power on the opposite building and the exterior areas of the map:

- Departure upper
- Departure lower
- Departure upper airlock a
- Departure upper airlock b
- Landing pad a (under the pad)
- Landing pad b (under the pad)
- Sunlit areas

I will attempt to do a pass myself on the departure area to at least get it functional today and you can take it from there, Emre.

I can't reiterate enough how important it will be to get a solid check-in tonight. We need to be looking only at must fixes and polish tomorrow.

DEMIEN VISUAL TARGETS

OLD VALUE RANGE · OLD BASEPLATE · NEW VISUAL TARGET · NEW VALUE RANGE

Demien: Working on different lighting values so that crucial areas and POIs are more highlighted

DEMIEN BALANCE FOR 2.6

Sean N: Here's what I believe is the bare minimum we should go to get towards balancing Demien. Alex, could you flag these as art tasks?

Outlaw spawn to A side; this is a primary route for players coming from spawn, so it needs to be a lot clearer that there are two exits (doorway and elevator).

Art estimated less than half a day

Sean N: Outlaw spawn elevator drop down; here we need to slightly slow the player speed from spawn to capture point D, so we can shave off a little time with either props or a partition outside of the elevator.

Art estimated less than half a day

Sean N: Outlaw spawn to B side; the route from here is a little awkward. It would be preferable if these stairs were wider to allow players to just cut across rather than having to take right angle turns to pass.

Art estimated less than half a day

WORK IN PROGRESS

Sean N: Marine spawn; currently enemies can shoot from outside through the highlighted corners (in red), but the area in general feels like a strange space to be without atmosphere, so an airshield/airlock should be added to the left spawn route (in green) and removed from the building entry (in purple).

It's worth noting, if we don't have interior corner caps for landing pad cages (shown in red), we probably should add them.

I didn't get an art estimate on this

Sean N: From capture point D; we really need to block the area with the tanks off as shown in the below image.

Also, if we could light up the platform edge and add some tall objects at the rear of the pad to add some parallax to show depth, that would be great.

Art estimated half a day
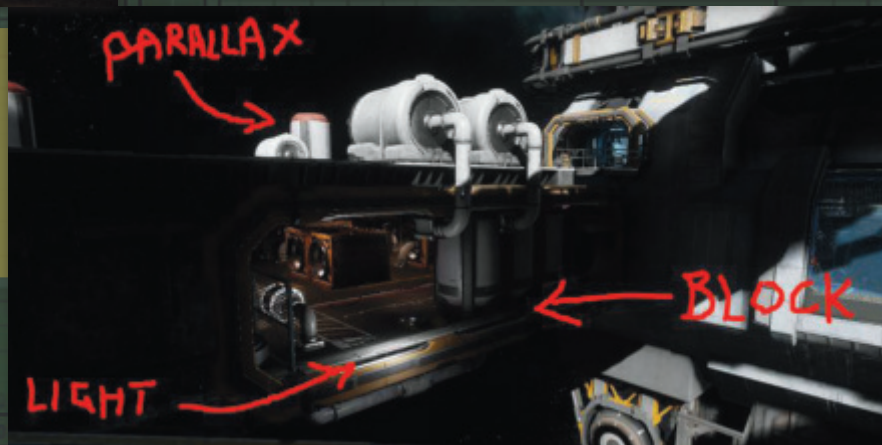
Sean N: We're also going to be moving capture point A and B slightly towards the Outlaw side (the original point in red and desired point in green).

I will do a first pass on moving the points before Art dresses the surrounding areas.

Art estimated 1 day per capture location

By Sean Noonan, age 8½

Eddie H: Nic and I discussed these with Sean yesterday and I'm ok to implement them for 2.6.

Signage.

- Feels like clipart / cheap photoshop texture
- Needs more character
  - Font variety
  - No stroke outline
  - Better graphic design

Random Placement

- Placement around the level is too random
- Shouldn't be used as a golden bullet
- More variety in scale + value
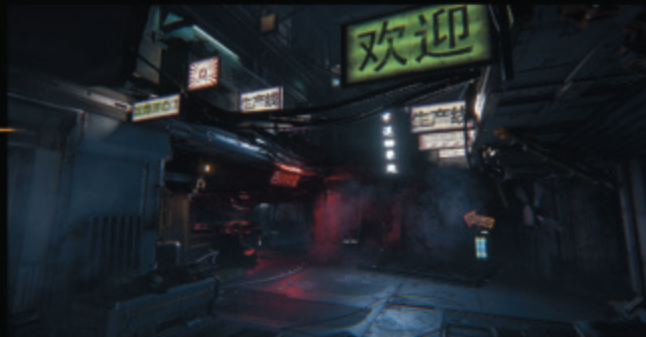
Perfect example of a bad placement

- Asset way too big
- How is it attached?
- Cheap excuse for a big light here
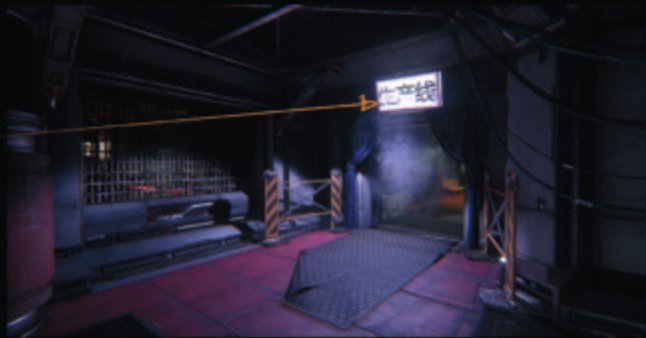
Need to replace all grimmer screens with new ones

DEMIEN BALANCE CHANGES

Sean N: Playtests have highlighted a number of instances where the game was weighted towards the Marines. I have been rejigging things with as little an impact to art as possible, to achieve balance across the map.

To the right are the current point-to-point timings across the map, and the changes to achieve this are listed below. For now, I am ignoring the timings between chokes and first line of sight checks – these are far easier to tune via sensible prop placement.

Times indicate quickest possible time, but as the arena is being balanced, these times are constantly in flux.
Do not assume they are accurate today.

Outlaws

~13 secs

~15 secs   ~16 secs

D

~21

~11   ~11

B   ~15   **A**

~21*

~10   ~11

C

~18 secs   ~15 secs

~13 secs

Marines

Map: Op Station Demien

* ONCE WINDOWS ARE BROKEN

I'm moving capture point C from here...

...to here!
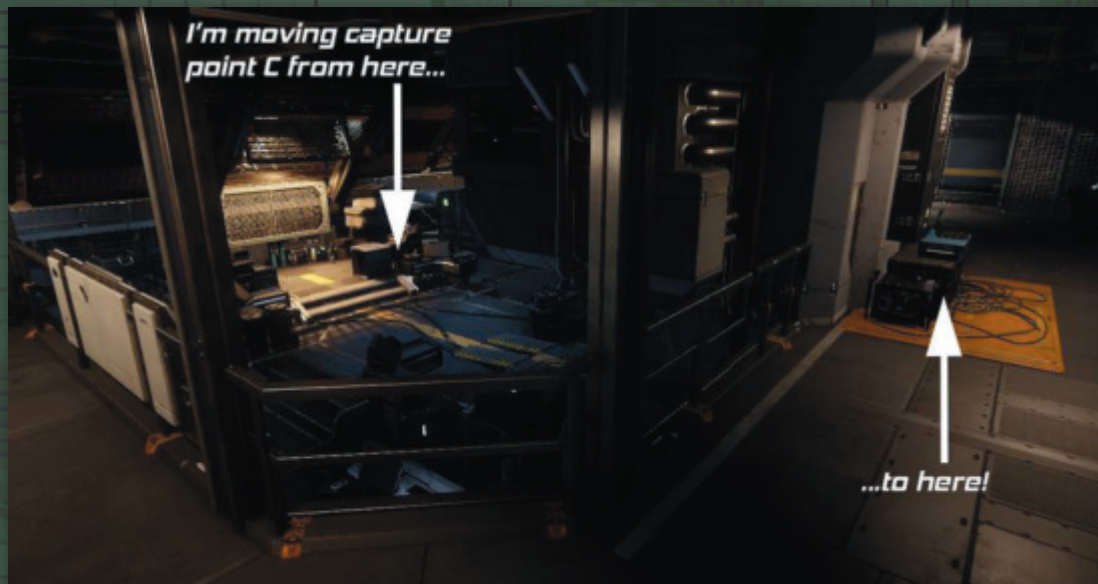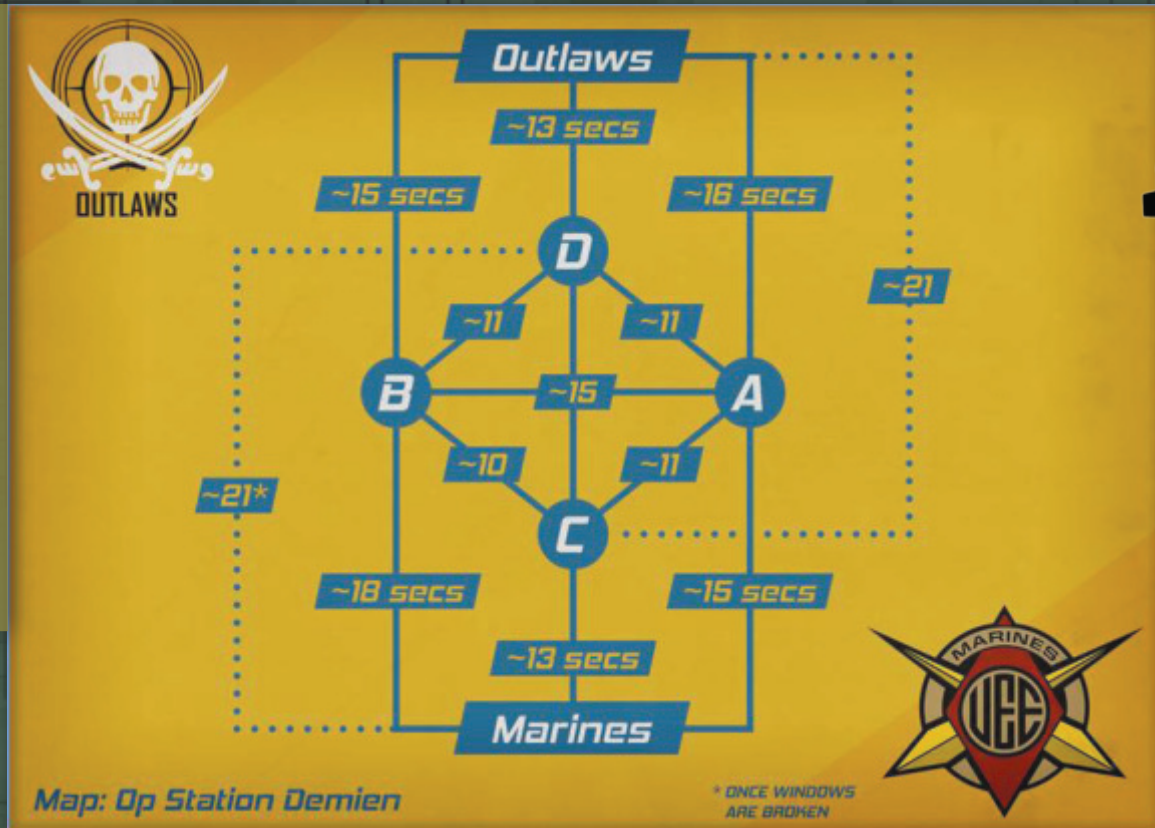
Sean N: The main change required is to move C to a point that doesn't instantly feed into A and B.

WORK IN PROGRESS
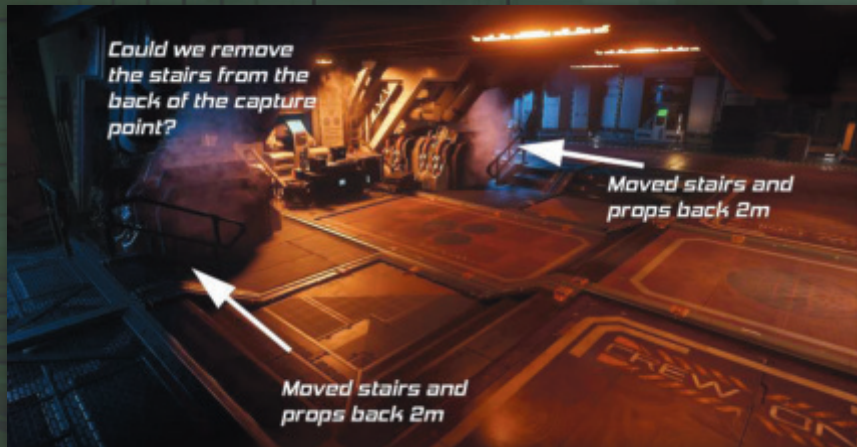
Sean N: To maintain this balance, we need to shave off a little at D and Outlaw spawns.
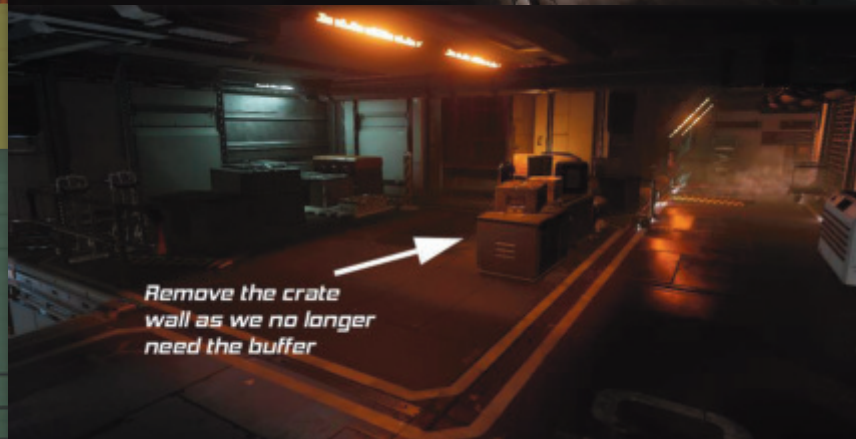
Sean N: And then to grant the same benefits of the sightline on A from Marine spawn to B from Outlaw spawn, we need to adjust the crate configuration and position on B.

Sean N: I discussed these changes with Todd and Nic and both agreed with the move. I'm happy to make the changes myself as I'll be moving the points after lunch, but if the rest is on Art, that's cool too. Let me know!

Eddie H: This sounds fine to me too. We'll do it ASAP.

STAR MARINE SCREEN REQUIREMENTS

Eddie H: Hey guys, I just spoke with Ben about what we're going to be getting from him and very briefly with Zane for use in *Star Marine*. The original list seems very ambitious and I would say unnecessarily large for what we need.

Regarding who does what on screens, if Props have a sheet for each station they can UV to, I imagine we can do variants of static screens very quickly. In that case would Props be able to take on the static screens from the below list? Can the prop guys make size variants from one screen, or do UI need to make different screens per size?

I'd propose this:

Echo11 - Props

- 1x bespoke large screen frame in the Comms area.
- 3x mid-size screen frames for wall mounting – different styles.
- 1x small-size screen frame (can be one of the same from Echo).
- 1x large-size screen frame.

Demien - Props

- 1x large screen in the departure lounge (done, but was the spelling changed on 'endeavour' before Cory left?).
- 1x mid-size screen frame (can be one of the same from Echo).
- 1x small-size screen frame (can be one of the same from Echo).
- 1x large-size screen frame (can be one of the same from Echo).

Echo11 - UI Screens (4x flash screens, 5x static)

- 1x large bespoke flash screen for Comms area
- 2x mid-size flash screens
- 3x mid-size static screens (1 can be generic screen-saver)
- 2x small-size static screens
- 1x large-size flash screen

Demien - UI Screens (3x flash screens, 5x static)

- 2x mid-size flash screens
- 3x mid-size static screens (1 can be generic screen-saver)
- 2x small-size static screens
- 1x large-size flash screen

Echo 11: The Cell (Point C)

ECHO 11 BALANCE CHANGES

Sean N: I'm still working on my balance pass, but I don't foresee many changes outside of a corridor that links the dead end at the base of D to the airlock at D. There's a layer for this already in (seen below).

There are several issues here:

- It's a dead end outside of the ladder.
- The ladder is hidden.
- It's a cramped space.
- There are no flanking opportunities to get into D from EVA.
- The corridor from D to Outlaw EVA is redundant due to the overhead corridor.

Ed and I suggest the change illustrated at the right to fix this.

I should be done with my timings check by the end of today, so expect a mail on that in the morning. Let me know if you have any questions about this.

Before

After

MORE ECHO 11 BALANCE CHANGES

Sean N: I've worked on getting the timings down in the map to better balance the on-foot routes between Outlaws, Marines and the capture points. With the following minimal art changes we can achieve balance.

Map: Echo Eleven

Outlaws
~12 secs
~23 secs
~17 secs
D
~29
~16
~16
B
~24
C
~26
~30
~16
~16
A
~23 secs
~18 secs
~11 secs
Marines

Add a doorway here...

Sean N: The first change is that we need quicker access in and out of A, which we can get by adding a back door to the security office. This will balance the route from A to C.

(Nic had a cool idea that it could have a door smashed down on the floor/wall opposite.) I'd also recommend changing the door immediately to the left of this new doorway into an archway.

WORK IN PROGRESS

This was not a great place for B due to the long on foot trek...

百快樂星

(old B)

Sean N: Our main issues are with B side — both the location and the approaches — so these proposed changes will get us to the acceptable timings as seen in the timings image [on the previous page].

BEFORE

AFTER

I swapped the side where the opening is here...

(new B)

WORK IN PROGRESS

Make this wider by 2m...

...and lose the bin on this corner :D
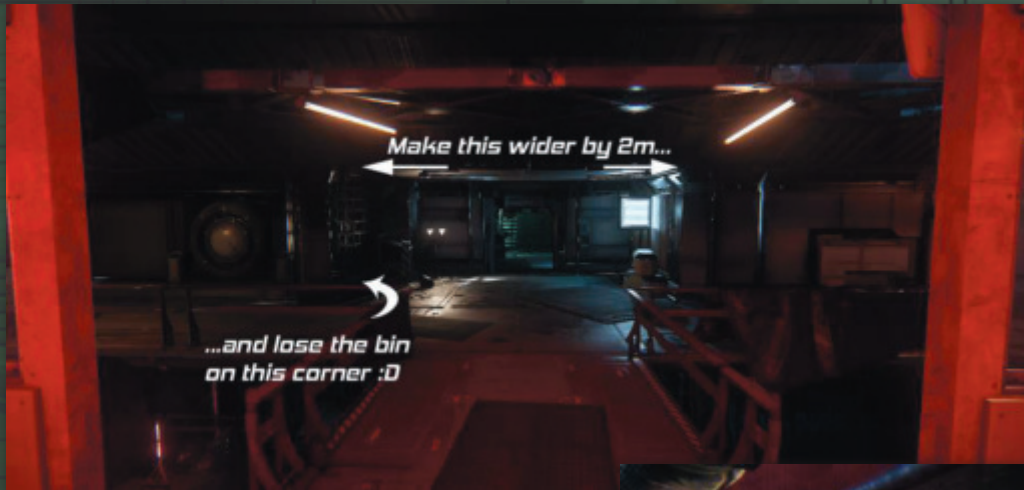
Sean N: And finally, to fix the slow times on the Outlaw side, we need to clear the path to B from D.

Sean N: And the main change – moving back the staircase at the D-B connector into the wall.

Thanks, let me know if you have any questions!

Luke Davis, Producer: Just to update the mail thread, we had a quick call, Art will take these changes on as soon as we confirm when we are going to PTU. Hoping to start these changes early next week, should take roughly 2 days. Alex M to confirm with Todd what the plan regarding PTU is.

Before

After
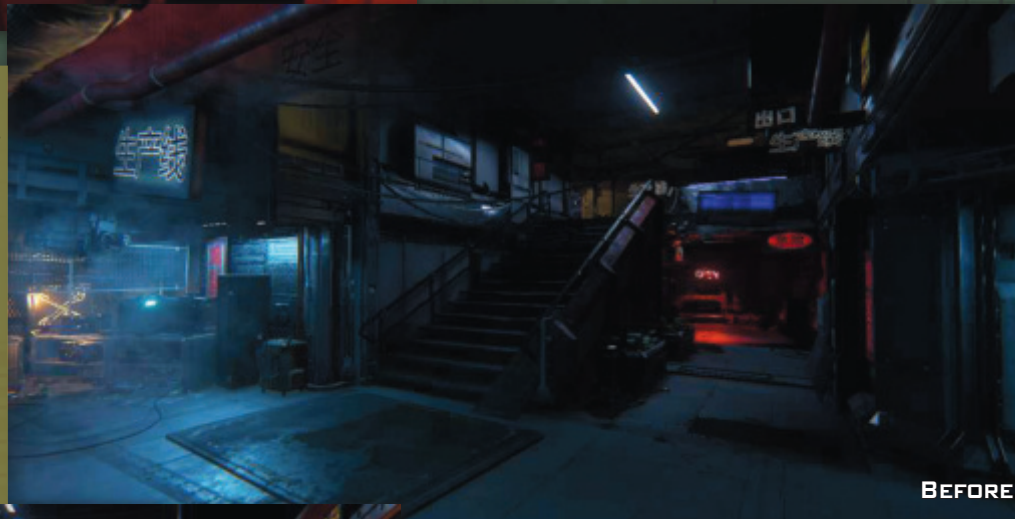
Alex Marschal, Senior Producer: According to what just got discussed in the live sync, we will go Evocati today and PTU at earliest on Wednesday, maybe Thursday depending on the build. Meaning we do have 2 days until Wed (as we can kick a build in the evening our time), possibly 3 days.

Shall we get these changes going, starting Tuesday morning then?

Eddie H: Yep, lets kick these changes off today as soon as people get in.

SCREENS

Ben C: We are working on the screen surround now to give it some love.

Here is an option for the large comms screens.

Ben C: There is also this screen in the high-tech prefab library.

I am just going through and sanity checking them all now to make sure all the material work across the screens. You should be good to go, though.

Nic Etheridge, Lead Environment Artist: Luan is working on replacing these now.

After control, can you do a pass on the comms screens, Luan?

Ben C: It'd be good to get these removed too.   >

Luan Vetoreti, Junior Environment Artist: Ben, I'm sure we talked about this a few minutes ago, but is there any way we can have the screens greyscale and light-linkable? They don't seem to be right now, and we need them to be red on the Control Room.

Ben C: I'll check, but they absolutely should be light linkable. I think the material might have a tint in the diffuse and that's why you're getting the tint, I'll get it checked.
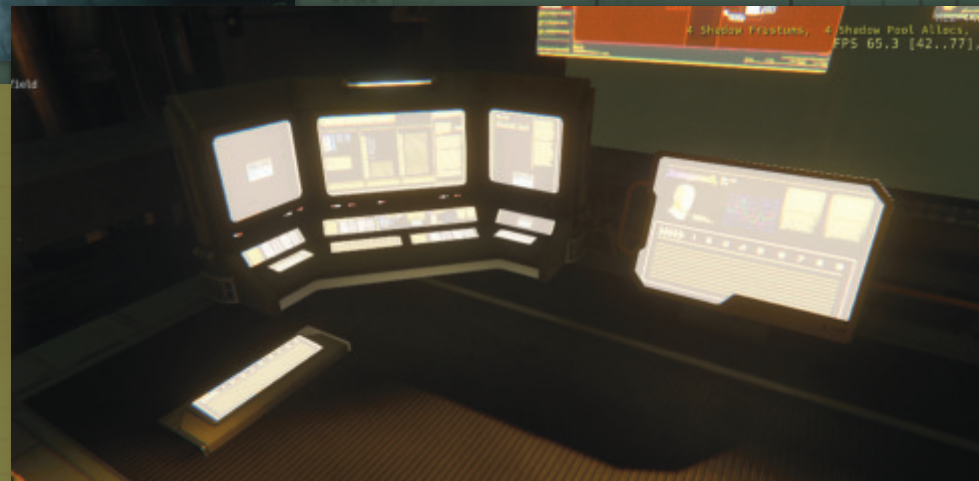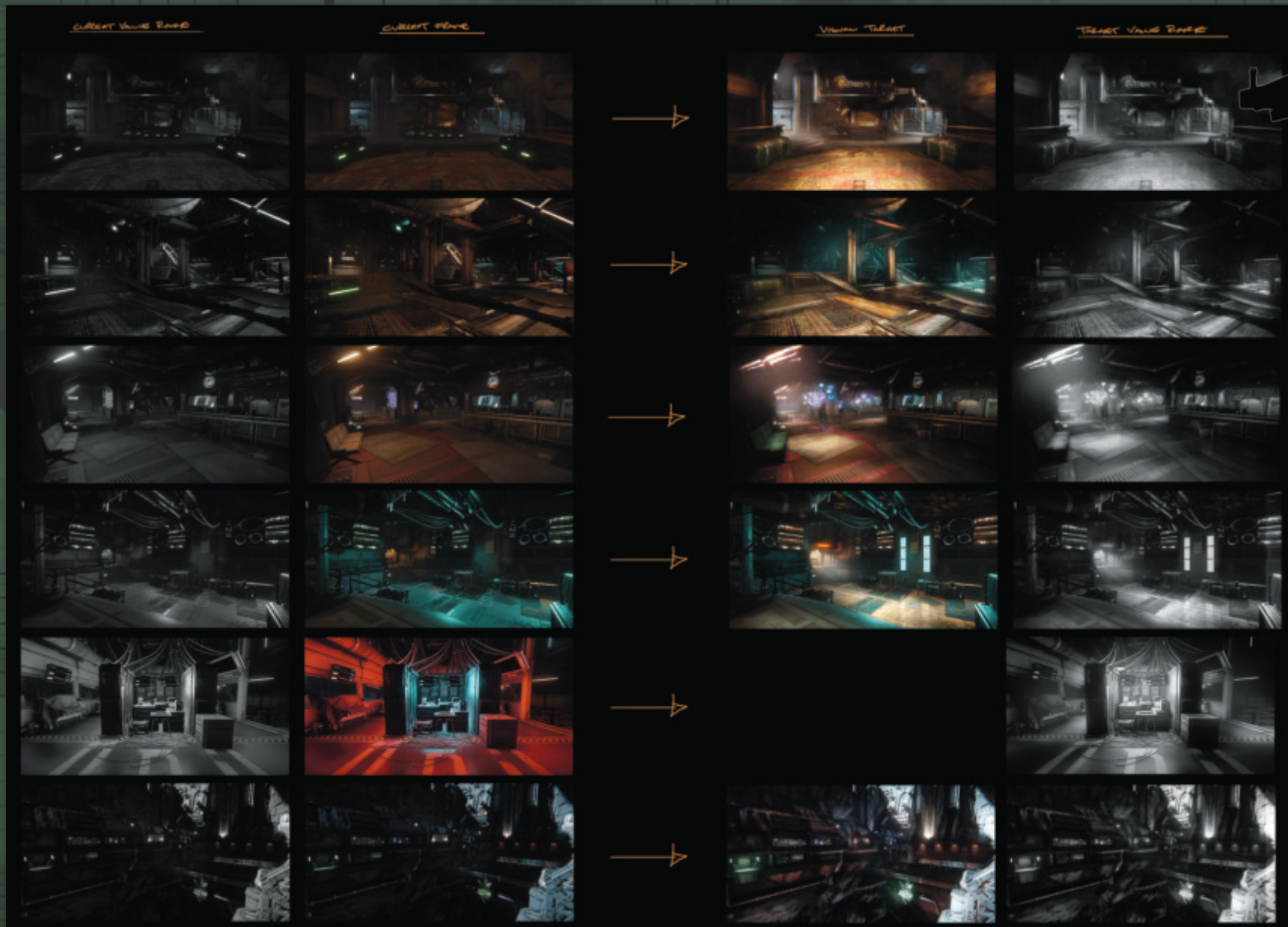
Echo 11: Working on different lighting values so that crucial areas and POIs are more highlighted

WORK IN PROGRESS

SYNCING WITH LORE

Eddie H: There are a few *Star Marine* lore and storytelling tasks that have come down from the writers that I'd like you to look at for the rest of the week please:

Demien (Dan)

- Remove the Hathor branding from Demien, potentially re-use in Echo. Replace with more generic 'Demien' branding.

- Add bloody hand print and Pips machine.

- Add more evidence of civilians in the departure lounge – some piles of luggage, a teddy bear (Props are making one), would be good to go alongside the bodies.

- Add blood to glass. Not sure this is technically possible with the transparency funkiness, will need investigating.

- Bodies. Sean was going to do a pass on this, please liaise with him and see how it looks from an Art POV. Grab me when you have a look and we'll go through it together. I think these will be expensive, so need to be used sparingly.

Echo (Mantas)

- Do a Hathor branding pass (re-use the logos from Demien, make them more faded/old). We don't want these to dominate, but it'd be good to see them in a couple of places and they should be much more faded/old, so feel free to adjust the existing texture if needed.

- Replace all vending machines with older brand- ed/ destroyed versions from Props. Add to this a pass with any new drink can props, gang sign decals, propaganda graffiti and posters. I don't yet know exactly how many of these we'll get by the end of the week; I'll check with Ben.

Echo 11: Corridor between Points B & D

Echo 11: Sleazy Hab

Echo 11: Bar by the Pit (Point B)

Demien Point A: Back upper hall (which will soon be replaced by a larger, more open area)

Demien: Entry point from rear landing pad (Marine spawn point)

Echo 11: Corridor connecting Points A & B

Echo 11: Point B (the Pit)

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WORK IN PROGRESS

MARINE ONE

The Star Marine Community

Unless you've been living on the edge of the frontier, there's no doubt that you're at least familiar with *Star Marine*. InterDimensional Software's red hot ground combat simulation game has been tearing up sim pods across the empire. Since its release, countless appearances have made James Romanov the go-to face of the realism-in-gaming debate, while technical mastermind James Vandyke has been declared the 'Next Gaming God' by Hitbox magazine. While the release has had its fair share of detractors, with complaints ranging from ethical questions about whether it was appropriate to let players assume the role of outlaws in the Walzer Massacre to a recent spate of illegal hacks, the game has still managed to garner an impressively loyal community who've embraced *Star Marine*, flaws and all.

The group as a whole is hard to strictly quantify: there is no stereotypical *Star Marine* fan. Players, who refer to themselves as "Starheads," range from UEE veterans

lured by the incredible attention to detail, to successful politicians, and even to the Empire's elite — businessman Silas Koerner keeps a sim pod in his office for regular *Star Marine* breaks. It seems that fans of all ages, genders and species have found something that speaks to them in the historically grounded battles and shoot-outs the game portrays.

Starhead Central

The heart of *Star Marine* community discussion takes place at a dedicated spectrum hub known as MARINE ONE. The core of the hub is a news and broadcast arena which collates every conceivable piece of *Star Marine* news for the waiting public. From plans for future updates to previews of new game assets in the process of creation and even outright gossip about the game's developers, MARINE ONE has become the one-stop spectrum spot for all thing *Star Marine*. Hundreds of thousands of *Star Marine* players can also be found 'casting their gameplay at any given time, with the most popular being traded around the Empire. Big name streamers like GoodTimeDuke and MARSHMALLOW run casts that have become appointment viewing, attracting sponsors and dedicated fanatics of their own.

Then, there's the Forge. Managed by a team of die-hard ultrafans, this Marine One forum is a wild, ever-expanding gyre of discussion, speculation, arguments, incomprehensible in-jokes and more. Generally good-natured despite the kilometer-a-minute movement of the conversations, the group is known to fixate on the smallest aspects of the *Star Marine* experience in a big way. From generating lengthy backstories for each of the game's corpses to forming what can only be described as an unlikely cult around a cola dispenser prop created for the game, the one word that best summarizes the group is passionate.

Art is also popular form of expression. *Star Marine* fans have turned their talents to everything from traditional pen-and-ink sketches (an ongoing comic titled Jaeger is the best known) to the creation of mods or minigames that celebrate the smallest details of the *Star Marine* world. Countless talented artists carefully pose in-game 'feel shots' to create their own, increasingly elaborate scenes. In some cases, dozens of players might work together for hours posing not only their characters in particular positions but also rearranging set pieces, props and lights to improve a composition.

That said, *Star Marine* players are never afraid to go toe-to-toe with the development team at InterDimensional, occasionally engaging developers in debates and often protesting the appearance of bugs and (most especially) perceived inaccuracies in the battlefield simulation. One notable initiative saw players from locations around the UEE shipping empty battery cartridges to InterDimensional's head office as protest for what they saw as an inaccurate feel following a weapons pass.

First time visitors are advised to interact with the community via the marked 'Landing Craft' welcome area. While the community is extremely accepting, it is also known for the fact that regular users speak something of an alien language. Recently created hub accounts should also be on the lookout for grifters who will sometimes attempt to trick new Marines into giving away their weapons, armor and REC balance.

Electronic Access Invitational

With the widespread appeal of competitive *Star Marine* matches, it was only a matter of time before the game went pro and joined the Electronic Access Invitational, one of the largest sim competitions operating in the Empire. The EAI brought together leading players from around the 'verse to compete in the inaugural *Star Marine* competition in 2946. While the event had always been popular among sim-enthusiasts, the event's organizers considerably underestimated the public's reaction by the introduction of *Star Marine*. Administrators at the EAI were flooded with fans who complained that their favorite players weren't invited. The event, held at the Intergalactic Aerospace Expo, proved that even EAI's best laid plans could fall short as record-breaking crowds showed up to watch the matchup. Lines formed outside the venue the night before the event, forcing them to hastily organize a thousand more seats to cover the overflow.

InterDimensional even got into the act by supporting this and other tournaments; Romanov famously awarded his Lynx rover to the first player who was able to beat him in a live competition.

Based on the dynamic turnout, it's a natural assumption that *Star Marine* will return to the competition next year and if today's fans are any indication, they'll show up in droves to support it.

John Crewe   Andy Nicholson   Jonny Jacevicius

Balancing Ships

An ongoing task with Star Citizen *is balancing ships, so that they're realistic and make sense within the 'verse. Today we chat with three of the principal designers – **John Crewe**, **Andy Nicholson** and **Jonny Jacevicius** – responsible for that effort, along with a companion interview with **Luke Pressley**, who keeps the* Arena Commander *arenas under control.*

JP: *Standard first question: What is your title, and what are you working on (that relates to our topic today)?*

John Crewe: I'm the Lead Technical Designer here at Foundry 42 UK and oversee the balance work going on for both the ships and FPS side of the game. That covers *Arena Commander*, *Star Marine*, *S42* and the PU.

JP: *Is that your primary responsibility, or one of several tasks?*

John C: One of my many tasks here, as the team of tech designers in the UK is seven including myself. We deal with FPS and ship weapon setup, alongside setting up the ships from the UK Art team and other stuff like feature design.

Jonny Jacevicius: I'm a Technical Designer here at Foundry 42 in the UK. I have recently been pushing forwards design alterations to our missile, weapon and ammo systems, and assisting where I can with other balance changes. Otherwise I'm usually setting up ships and weapons, or designing new systems, weapons and ships to go in-game in the future.

Andy Nicholson: I'm also a Technical Designer at Foundry 42 UK. I mainly work on the ship and controls balance. Foremost, that is flight tunings of all ships, which determines their speed and maneuverability, and ship items (which can be anything from planning and implementing weapon HP to DPS to projectile speed).

JP: *What does this mean, typically? How do you decide something needs to be adjusted?*

Andy N: When it comes to ship flight tuning, I usually get feedback from many, many sources!

JP: *What are your top three sources? I can't imagine that the feedback is all unanimous, about any subject in this area.*

Andy N: Something like this is most definitely subjective, so having people that I trust to work with is important. So foremost, it's the other designers. We talk a lot about the feel of ships in combat and general flight, and playtest them together.

After that I speak to QA and get feedback from their ship specialists. This often crosses over with the third source, which is the community, as QA often filters this kind of thing for us. Though, more often now I'm in amongst some of the more dedicated players to get their feedback directly in Discord channels.

John C: Game Support also get us a good high level feedback thread very soon after public releases, collected from a variety of sources like Spectrum, the forums, reddit, Discord, etc.

Andy N: One-to-one commentary on the latest tweaks and changes is pretty invaluable to me. With us being able to push out regular builds, we can get iterative feedback very fast. Often QA are snowed under with other funda-

mental areas of test, meaning we rely a lot on community dedication. There are so many out there that are so willing and happy to help … and criticise. :D

JP: *Is this pretty much the same for you, Jonny?*

Jonny J: More often than not, I deal with things at a design and system level, so changes more often come about through playing the game, noticing there are issues and formulating a solution internally.

Sometimes major issues will be brought up from the community, which can also influence changes as well.

JP: *Please explain this a bit further: "deal with things at a design and system level."*

Jonny J: As an example, when I started looking at our weapons (the speeds of the projectiles, the rate of fire, all of their basic properties), they all felt very similar. I brought this up internally, we discussed what we could do to improve how weapons feel and behave, then started to put a plan into place to tackle it.

JP: *So you tend to deal with things before they get a lot of external exposure?*

Jonny J: Yes and no. Some systems have been in place for a long time now, and at the time they were implemented they may have been fine, but as the game evolves changes sometimes need to be made. If we're coming out with something new, we can keep that under wraps until it's ready, but any slight change to anything existing and the community notice immediately. :)

John C: A lot of the decisions for how the ships/weapons interacted with each other was based on when we only had a small amount of them. That's changed over the years and now theres a significant amount more to factor. [cont. on page 43]
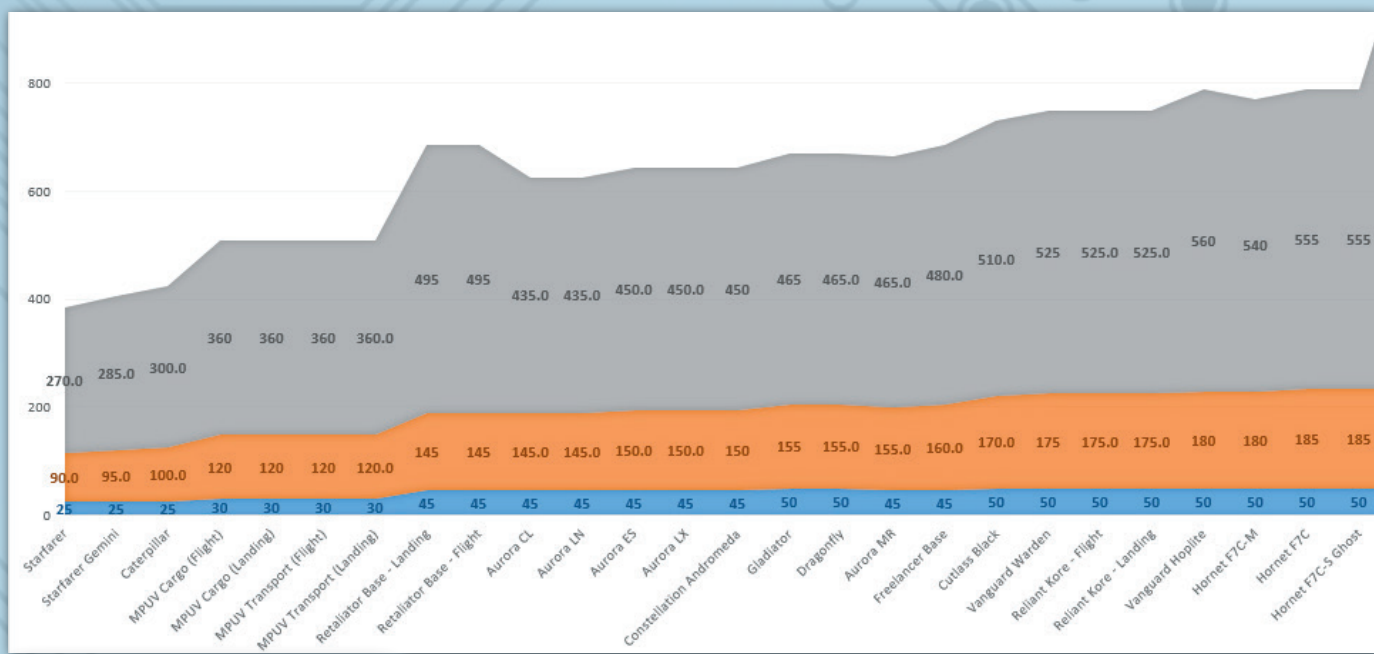
Maximum Ship Speeds

Andy Nicholson maintains this file for reference. It charts the maximum speeds for each ship listed, in three different categories:

- *Precision* (blue)
- *Space Combat Maneuvering* (SCM; orange)
- *Afterburner* (gray)

It doesn't include Quantum or Jump Drive capabilities.

Please note that *all of this will change*.

Top chart

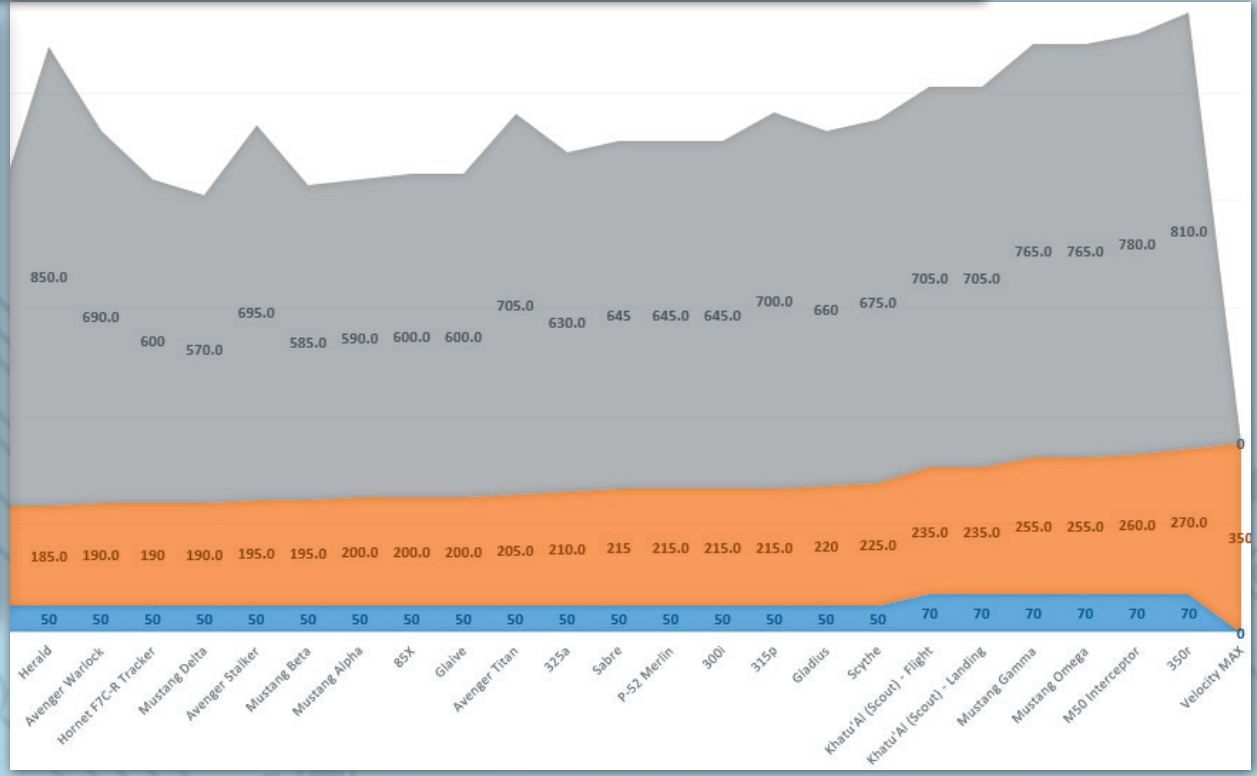| Ship	Precision	SCM	Afterburner
Starfarer	25	90.0	270.0
Starfarer Gemini	25	95.0	285.0
Caterpillar	25	100.0	300.0
MPUV Cargo (Flight)	30	120	360
MPUV Cargo (Landing)	30	120	360
MPUV Transport (Flight)	30	120	360
MPUV Transport (Landing)	30	120.0	360.0
Retaliator Base - Landing	45	145	495
Retaliator Base - Flight	45	145	495
Aurora CL	45	145.0	435.0
Aurora LN	45	145.0	435.0
Aurora ES	45	150.0	450.0
Aurora LX	45	150.0	450.0
Constellation Andromeda	45	150	450
Gladiator	50	155	465
Dragonfly	50	155.0	465.0
Aurora MR	45	155.0	465.0
Freelancer Base	45	160.0	480.0
Cutlass Black	50	170.0	510.0
Vanguard Warden	50	175	525
Reliant Kore - Flight	50	175.0	525.0
Reliant Kore - Landing	50	175.0	525.0
Vanguard Hoplite	50	180	560
Hornet F7C-M	50	180	540
Hornet F7C	50	185	555
Hornet F7C-S Ghost	50	185	555

Bottom chart

Ship	Precision	SCM	Afterburner
Herald	50	185.0	850.0
Avenger Warlock	50	190.0	690.0
Hornet F7C-R Tracker	50	190	600
Mustang Delta	50	190.0	570.0
Avenger Stalker	50	195.0	695.0
Mustang Beta	50	195.0	585.0
Mustang Alpha	50	200.0	590.0
85X	50	200.0	600.0
Glaive	50	200.0	600.0
Avenger Titan	50	205.0	705.0
325a	50	210.0	630.0
Sabre	50	215	645
P-52 Merlin	50	215.0	645.0
300i	50	215.0	645.0
315p	50	215.0	700.0
Gladius	50	220	660
Scythe	50	225.0	675.0
Khatu'Al (Scout) - Flight	70	235.0	705.0
Khatu'Al (Scout) - Landing	70	235.0	705.0
Mustang Gamma	70	255.0	765.0
Mustang Omega	70	255.0	765.0
M50 Interceptor	70	260.0	780.0
350r	70	270.0	810.0
Velocity MAX	0	350	0

JP: *We've been talking about balance, but (as Jonny just noted), it isn't good for everything to be exactly the same as everything else. With the ships in Star Citizen, it seems like the objective isn't exact balance, but rather significant imbalance.*

Andy N: That pretty much sums up any complex video game, but the level of detail that we're going for with Star Citizen perhaps takes things to another level.

Jonny J: So many of our ships have so many different roles – if you pit one of our military fighters against a small cargo ship, it wouldn't even be a contest. If you pit a fighter against a different fighter, we'd expect it to be a close contest.

Andy N: Creating the imbalance is all about using real world considerations where possible.

JP: *So if you get a complaint that a Hull C can't outrace a Mustang, I'm guessing you pretty much ignore it, but what do you do if a lot of players complain that the M50 and Mustang and Razor aren't balanced? That one has a significant advantage over the other two?*

Andy N: Well, once I've finished crying, the first thing to do is verify what they consider to be the imbalance – and whether that is intentional. With the racers, there is clear differences with the top speeds vs. accelerations, for example.

Or at least there are on paper. Sometimes that doesn't translate as well as we'd think into the game.

Jonny J: That's generally when we grind down into it, look at the ship stats and start playtesting to find out where the major advantages and disadvantages lie – and find out if there is actually a problem.

Andy N: We need to be sure that the case they describe is not due to other factors.

JP: *Why wouldn't paper stats translate directly into game performance?*

John C: For example you can have two imaginary ships with exactly the same strength thrusters, but depending on the placement on the ship you'd get radically different rates of roll/yaw. But on paper, it reads as ship A and B have the same stat.

Jonny J: That's why our focus on testing is so key, you can only do so much of the work on paper.

Andy N: Thruster placement can lead to other situations too, via inertia or torque errors (either intentional or not!) that can affect the manner in which a ship moves or translates movement from one direction to another – something that is hard to get a feel for on paper until you play it. Then realise that this imbalance makes the ship harder to fly during a race – something I found out the hard way when I made the M50 dip rather drastically when accelerating forwards.

JP: *Have you run into a situation where it seems to be that the pilots of one type of ship are simply more skilled than the pilots of another type of ship? Or does that immediately suggest to you that the first ship is somehow easier to pilot?*

Andy N: It's probably more that there are so many factors that are on paper, that it's hard to get a grasp of everything they may be causing the observed behavior, so getting in and playing distills everything down to simpler-to-understand performance.

That happens a lot, so it's never as simple to judge from that. You need to see more than one instance, look for patterns in the feedback that suggest perhaps it is easier.
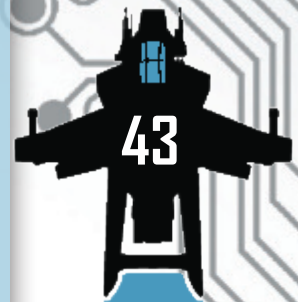
John C: Another thing to factor in is the control method used. Players using say, dual joysticks vs. those using mouse and keyboard, often have drastically different opinions on issues regarding flight due to the nature of how you have to play with the two different methods.

JP: *Andy, give us an example of using real world considerations when creating intentional imbalance.*

Andy N: The example I referred to of the M50 was based around the real world or physical engine placement being above the height of the ship's centre of mass. The effect of this would be the ship dipping when engaging these engines when we allow the other thrusters to no longer counter the force from them.

The IFCS model should, where possible, counter that kind of thing, so that raises the difficult question of whether we want to override certain IFCS controls to allow for more character in the ship.

JP: *What do you do if Ship A usually defeats Ship B using dual joysticks, but Ship B usually defeats Ship A using mouse and keyboard?*

John C: It's not so much that different control methods mean A > B, more that, for example, Dual Joystick users tend to not use the throttle at all and instead use strafe commands so it might fly differently to someone using throttle and regular movement via mouse/keyboard.

Ship loadouts also can massively impact it. Stick users tend to not use gimballed weapons either, as it's not a particularly easy thing to do compared to a mouse user. So Ship A in the hands of a stick user would generally roll with all fixed weapons, while other input methods might have smaller but gimballed guns.

Andy N: (Continuing on the M50) I thought it was a cool effect for the ship, to highlight its large engines and its low mass, so I went with it. However, as I said, I completely overdid it at first. To the point that feedback wasn't good ...

JP: *Overriding IFCS controls makes it more fun, but less realistic?*

Andy N: I'm only saying that in the cases where the IFCS balances the ship's movements, it can be more interesting to tweak things so that there is a margin of error. The result is the ship's flight character being different.

The last thing we want with *SC* is boxes in space. That's been done infinitely before.

Another example of this behaviour is in the Hornet, where strafing to the left or right initiates a slight roll of the ship. For me, this is far more interesting behaviour.

JP: *The roll wasn't intentional, but you decided to leave it in because it is more interesting and/or more realistic?*

Jonny J: It makes the ship much more individual. Owners of it will get used to and possibly even like the little quirks about it. None of these imbalances hurt the ship's performance much in any way, they just add a little more character and variety.

Andy N: We take a look at the thruster placements on the ships (often the result of rule of cool from the art side) and then look where we might find imbalance. I'm not saying the Hornet was an intentional result, but sometimes it does happen that way.

JP: *When you decide a ship needs to be slightly faster, what are your options? Do you give it less mass, do you make the engine or thruster stronger, do you give it a different engine or thruster ... what do you do?*

M50 Stats. These charts illustrate the current M50 max movement capabilities. In all of the charts, red and orange indicate forward and backwards movement (y+, y-), blue and green indicate movement to the right and left (x+, x-), while pink and blue-green indicate movement up and down (z+, z-).
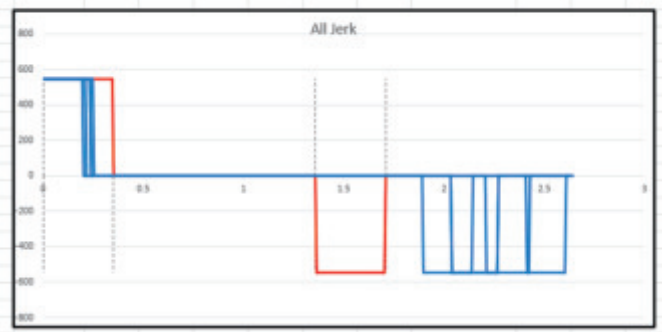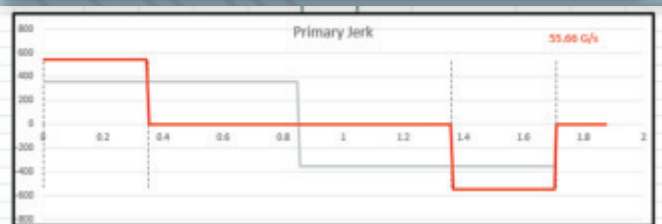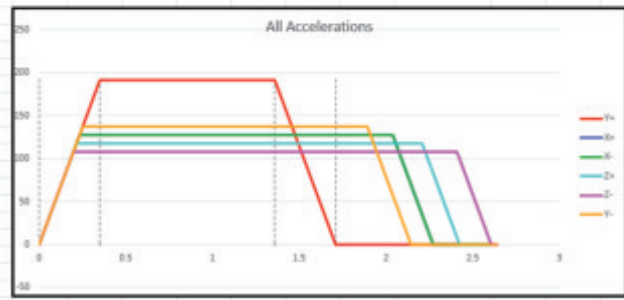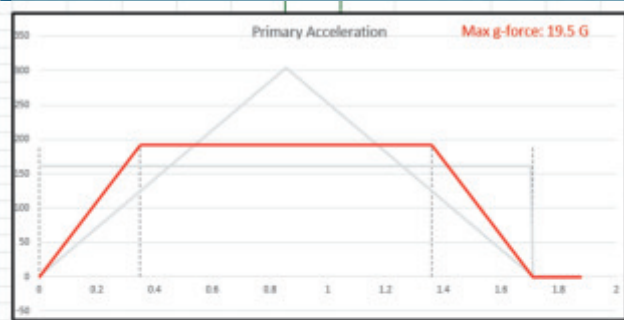
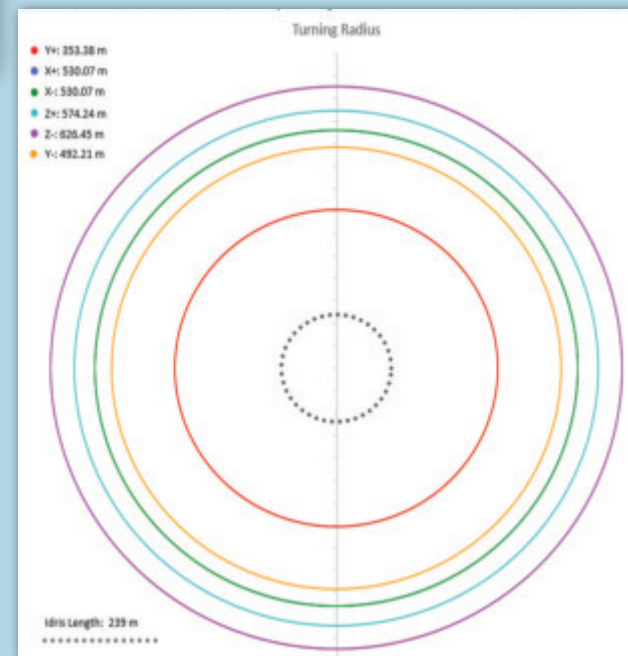All units of time are in seconds; all units of distance are in meters. The Stop chart shows how long it takes to stop moving in the indicated direction, while the Turning chart shows how tightly the M50 can turn in each of these directions, each while travelling at max SCM. (Imagine it is travelling along the path of each circle.) The Idris length is given for convenient comparison.

Please note that *all of these stats will change*.

Primary Acceleration — Max g-force: 19.5 G

All Accelerations

Primary Jerk — 55.66 G/s

All Jerk

Primary Velocity

All Velocity

Stop Distance

- Y+: 222.24 m
- Y-: 278.80 m
- X+: 295.40 m
- X-: 295.40 m
- Z+: 315.15 m
- Z-: 338.92 m

Idris Length: 239 m

Turning Radius

- Y+: 353.38 m
- X+: 530.07 m
- X-: 530.07 m
- Z+: 574.24 m
- Z-: 626.45 m
- Y-: 492.21 m

Idris Length: 239 m
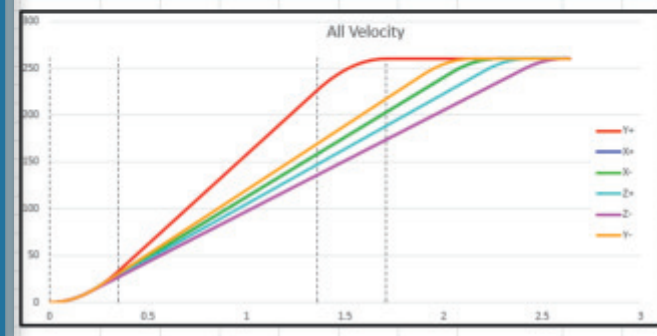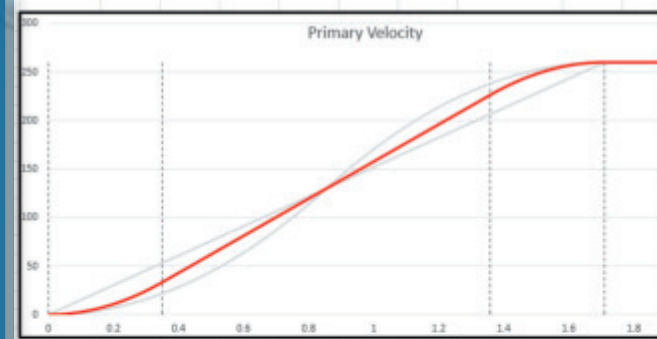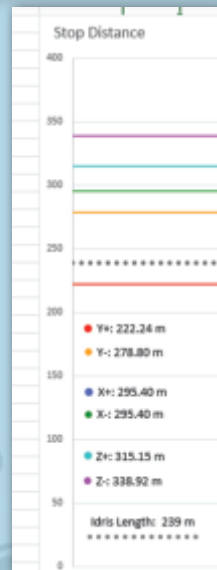
Andy N: well right now, we tune a ship to its standard or default state or baseline. Mass would only affect changes to this tuning after the fact, when items are removed or added, and is not something that currently works. Also, we have to determine where the ship needs to be faster.

Taking the simplest, the +y velocity [forward velocity], we can't simply raise it without also considering the effect this will have on the ship's acceleration and stopping distance. All of these things are tied together in the flight model.

Oh, and jerk as well!

JP: *So how do you make a ship faster?*

Andy N: in literal terms, we add a bigger number into the xml that controls the IFCS max velocity! But this has many considerations, as I pointed out, due to the complexity of the flight model simulation. Due to the third order motion we use currently, if we make a change to the velocity we have to alter the stop times for the acceleration and the jerk values and juggle them to try and keep things where we can keep the character of the ship (thinking of the character in terms of "is it too floaty? does it feel too nimble?"). With the way things work, something has to give to get a benefit in another area. So you want more velocity? Well, we might lose some acceleration if we want to keep the ship sluggish. Want a shorter stopping distance? Then perhaps we have to lose the high jerk. Sometimes I do wish it was simpler than this to get what we want, but I really do think we have something completely unique in SC that needs to be protected. Learning the ins and outs of the system challenges me daily!

JP: *I gotta ask ... what are "jerk values"?*

John C: Now you've done it, prepare for science.

Andy N: Perhaps the right to wear a wife-beater vest?
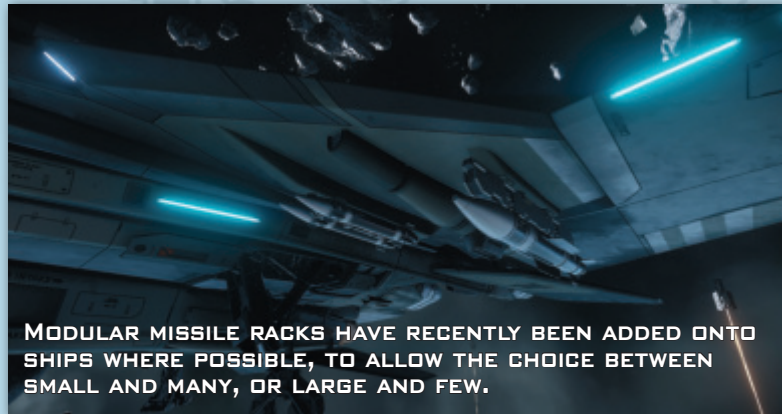
Modular missile racks have recently been added onto ships where possible, to allow the choice between small and many, or large and few.

I'm not the physics engineer of the flight model, that title belongs to John Pritchett. I'm just a lowly designer. I'm not smart enough to give you much of a scientific explanation of what we're modelling.

Andy N: My understanding is that the jerk is the rate of change of the acceleration. So the lower the jerk, the longer it takes a ship to ramp up to the peak acceleration rate. This is felt quite easily by a pilot. You can feel high jerk in the real world if an inexperienced driver is changing gears awkwardly in a car, with erratic, sudden bursts of acceleration.

Only in our system, the jerk factor is reversed, so that a high value means smoother acceleration. So on +y if the jerk is high, the ship will appear to slowly ramp up to a steady rate of accel, then accel close to max velocity, before then hitting an accel ramp down.

JP: *Jonny, what are a couple of items you've been dealing with recently?*

Jonny J: Most recently I've spent some time looking into ammo and damage types for both our ship and FPS weapons. We currently only have a few of types of ammunition – laser, ballistic, plasma, neutron and distortion – all of which behave very similarly. I've greatly expanded the list of ammo types players will eventually be able to choose

from, and given them all unique properties, behaviours and in-game effects that make each of them useful in different situations.

JP: *And I gotta ask again — new ammo types?! What can you tell us?*

**Jonny J:** New ammo types! I'm never sure what I'm allowed to talk about. ;)

What I will say is we have a list of approved and unapproved ammo types currently, the first containing all our current types plus a few others and the latter containing some that are a lot more 'fantastical' (which I'd best not bring up, as they might never make it in-game!). I can say that some of our existing types will be changing (for the better!) and having some new properties added. Plasma, for example, will start to do additional burning damage over time, as that's what you'd expect plasma to do, right? Neutron ammo will be extremely powerful at the start of its lifetime, but as the unstable projectile reaches the end, the damage value will diminish.

JP: *And now the editor of the editor is telling me to stop asking about unreleased new features that might change, so we'll leave it at that. :)*

Moving on. Maintaining balance sounds like a significant ongoing task, but I have the impression that you were focused on 2.6 as a balance milestone. Is that correct?

John C: 2.6.0 was a target for us to improve the feel of the game across the board, so it had a heavy focus on balance.

We'd been working on the changes from the flight and weapons side since before 2.5.0 went live, and set aside a large amount of time to essentially do it from the ground up, rather than piecemeal iterative changes like we had done previously.
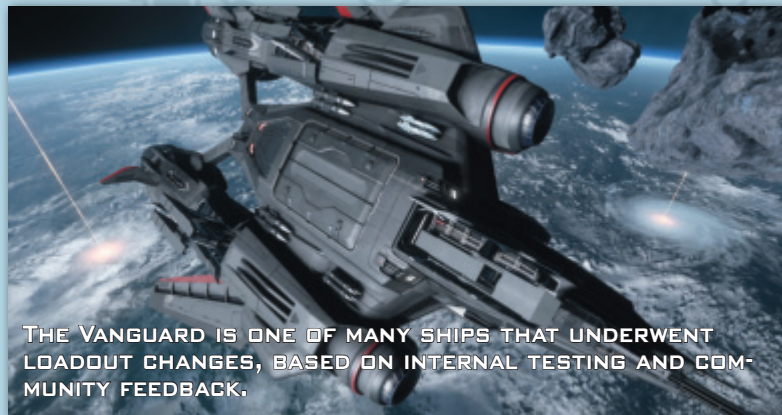
The Vanguard is one of many ships that underwent loadout changes, based on internal testing and community feedback.

Jonny J: We've definitely never done this much internal group playtesting before, so everyone has been pitching in to help get it done.

JP: *What are plans for the future? Will we have distinct differences among similarly rated components? For example, will two different brands of thrusters have slightly different specs?*

Jonny J: They certainly will in the future — a key to what we are building is to allow players to create a ship that is uniquely theirs, and part of that is to offer as much choice as possible when kitting it out.

John C: Currently each ship thruster is bespoke to that ship (or ship series in the case of variants). In the future we'll be offering sets with pros/cons to swap in and out.

For other items we definitely have a range of attributes, which will become much more apparent and usable when the item 2.0 conversion and rollout happens.

JP: *And final question: any last words?*

Andy N: Keep the faith!

John C: Hope everyone enjoys the changes we've made in 2.6.0 and 2.6.1!

Jonny J: Have fun, enjoy and see you in the 'verse!

Luke Pressley

While working on the ship balance, we also took a few minutes to talk with Luke, who has been dealing with making sure the AC arenas are balanced and fun. Here is what he had to say.

What is your title, and what do you work on?

Lead Designer, Star Citizen Live. My responsibilities are creating and maintaining content and quality in *Arena Commander*, *Star Marine* and the Persistent Universe. I've been helping Sean Noonan wherever possible, providing support, resources and knowledge of how systems work from my previous experience building *Arena Commander*. The main practical role I've played has been in defining and balancing the *SM* scoring system, as well as trying to unify it and *AC*.

Where do you get feedback?

My top source of feedback is the players. I try to watch Twitch streams most evenings and I read forums. I like to hear people's honest, unfiltered opinions on our game — it's then down to me to ensure I listen to enough varied sources to be able to form a balanced judgement.

What have you been doing recently?

There have been two major changes to *Arena Commander* (outside of ship balancing) and these were the addition of pickups and the persistence of missiles between deaths.

The reason we decided to add pickups was mainly practical: players could quickly find themselves out of ballistic ammo or having lost weapons, with no way to restore them without forfeiting a life to come back with a new ship. This was highly frustrating. Giving players the opportunity to replenish ammo, fuel and missiles, as well as repair their ship and restore any lost weapons would keep players in the action for longer and add a new layer of gameplay, as players fought over the spoils of a kill.

Without pickups there would have been no way we could persist missiles between deaths, and this was desperately needed to fix the so-called "Missile Commander" issue. Previously, after a death, your ship would respawn with full missiles, encouraging players to spam all their missiles, then immediately suicide and respawn rather than engage in dogfighting.

I was also keen to revisit the *AC* scoring system. The addition of *Star Marine* gave me a good excuse as I looked to unify the two so that when we inevitably mix the two modes (FPS and vehicles) the scoring will still work.

On deeper investigation one of the coders, Paul Brocklehurst, found a huge inconsistency: we weren't giving credit for destruction of most ship items and therefore we were creating noticeable scoring dead zones on a ship. Critical items aren't just the weapons, but entire engines, and obviously this is an issue on ships such as the Cutlass and Constellation, which have large, distinct engines.

But after he fixed it so that items were taken into account, we found that the additional hit points they added to the overall ship diluted the points by almost a factor of 10, meaning that if you scored 10 points for a hit previously, you would only score 1 now. We couldn't just lower the hit points on these to make everything sensible again, as this would make them frustratingly easy to shoot off, so instead we had to scale their contribution to the total pool of hit points.

After all that, it should mean that, while you generally score less per shot on a ship than you used to, you are able to score for item hits so you will no longer find misleading scoring dead zones (where you hit the ship but score no points for it).

KALLIS SYSTEM
OB STATION GRYPHON

A Star Is Born

A whirling mass of potential, the recently discovered Kallis System has excited scientists and researchers the Empire over by offering them a rare opportunity: to witness the formation of a stellar system first hand.

Kallis was first visited in 2921 through its jump point connection with Oso, and initial ICC scans of the system revealed a G-class main sequence star anchoring nine protoplanets in various stages of development. Officially, the system's discovery is credited in the records to OB

Station Chimera, the main research facility in Oso, but many still persist that it should be rightly attributed to former PFC Gabby Rifon.

Part of the Army security force detailed under the Fair Chance Act to protect Oso II from poachers, smugglers and other trespassers, Rifon served as a long range scan technician tasked with sweeping the system for any errant ships. According to later interviews, Gabby was often "bored as hell" looking for ships hours at a time. Instead she would

shrug off her duties and adjust the scan station to search for spatial anomalies. It was during one such unauthorized session that Gabby excitedly noted faint indications of a jump point. Informing her commanding officer of the discovery brought to light the fact that Gabby had been "wasting" hours during her shift. A week before the first ship would traverse the Oso-Kallis jump point, Gabby was dishonorably discharged for improper use of Army resources.

A second Chance

Almost immediately it was clear that Kallis, meaning "beloved" in a Martian dialect, was a system to be cherished. Once again, Humanity was getting a chance to witness the birth of a solar system firsthand, and scientists around the Empire pledged to not let the opportunity be squandered as it had been in Gurzil.

When Gurzil, a system still in its accretion phase, was discovered in 2539, scientific access was cut short due to security concerns. Upon the arrival of Xi'An ships in 2542, Gurzil was drafted into the UPE's recently created Perry Line and set aside to protect Humanity's borders. For the next several centuries, the system was off limits to everyone but military forces.

Upon the dissolution of the Perry Line, the scientific community had hoped that Gurzil would fall under the protection of the Fair Chance Act. However, various industries lobbied that the military's centuries of intervention had already damaged the system past its original scientific value and that it would better serve the credit-strapped Empire by allowing the harvest of its valuable resources. In the end, the Senate voted against applying the Fair Chance Act to Gurzil and decided to allow both research and restricted mining in the system.

The scientific community was strongly motivated to make Kallis a different story.

A Front Row Seat

Within a month of the first scan report from Kallis being released, a bill was introduced on the Senate floor to place the system under the protection of the Fair Chance Act and, this time around, thanks to the pristine status of the system as well as a much more favorable Transitionalist-controlled chamber, the vote passed. The system at once became off-limits to commercial development and general traffic. From that point on, Kallis would be a sanctuary for research and discovery.

Under the guidance of a joint Army and Imperial Science and Technology Foundation governing body, the past two decades have already greatly expanded our knowledge and understanding of the universe around us. Undoubtedly, this is just the start of a trend that will continue for decades to come as research continues in Kallis around the clock and new generations of scientists eagerly await their turn to study nature's mysteries first hand.

Heard in the Wind

"I learned a ton during my two years in Kallis. Unfortunately, I forgot most of it thanks to my two years visiting Gryphon."

– Dr. Wahid Allimon, Professor of Geology,
University of Rhetor, 2945

Kallis I

A loose fusion of recently merged planetary embryos, this small developing protoplanet has an aggressively eccentric orbit that has many researchers speculating whether it will break apart before it can establish itself.

Kallis Belt Alpha

As the gravity wakes from the nearby forming worlds tug at this dense orbiting collection of planetesimal, frequent collisions can cause chaotic motion and hazardous travel conditions anywhere nearby.

Kallis II & III

These two rocky terrestrial worlds are currently sharing an orbit, but it is estimated that one of the worlds will eventually pull in enough mass from the surrounding asteroid belts to "win the race" and subsume its sibling.

Kallis Belt Beta

A swirling mass of asteroids and dust grains, this belt is composed of materials with high melting points. Although there is enough mass here to compose three to five planets, orbital resonance with the surrounding worlds has prevented this from happening yet.

Kallis IV, V & VI

These three terrestrial worlds hold special interest for researchers as they have the greatest chance for the potential to one day support life. Kallis IV in particular has a striking resemblance to what many believe Earth must have looked like in its infancy. With active volcanoes possibly forming an atmosphere, researchers are looking into creating monitoring methods that are capable of lasting the lifetimes it will take to see it form. While Kallis V may not currently have any potential for developing an atmosphere, the swirl of debris orbiting its rocky surface indicates that it may soon have a series of moons to call its own. The least developed of the three, Kallis VI has a surface that is entirely composed of molten rock, giving it a planetary glow.

Heard in the Wind

"Even though my mom didn't get the credit she deserved for discovering the system, there is some small consolation in that they named that station after her. Sure, if you ask they'll say it's named for one of those lion-bird things, but come on, it's pretty clear that the scientists in charge were sticking it to those Army guys when they chose the name."

– Alice Thomas, daughter of Gabby Rifon, 2943

OB Station Gryphon

Located near the Kallis-Oso jump point, OB Station Gryphon was sealed late in 2922 and has served as the main operational hub for the entire system ever since. In order to preserve the living experiment that is Kallis and its protoplanets, construction throughout the rest of the system has been extremely limited. While there are small observation posts and scan satellites positioned throughout the system, if you are looking to refuel or restock, Gryphon is your only choice. All deliveries to the system are also

routed through the station to ensure that the strict Fair Chance Act protocols are followed.

Despites the system's focus on serious scholastic pursuits, it has begun to gain a bit of notoriety for the unique community that has developed over the years. Between the Army personnel stationed here to guard the system and the young grad students conducting research, the median age of the system's small population is well under thirty. It is no wonder that the habitation decks can get a bit raucous as researchers (looking to blow off steam after days spent alone in remote obervational outposts) and soldiers (with extra energy after long shifts spent patrolling for trespassers) meet for drinks and heated debates. Toss into the mix a growing number of philosophers and spiritualists who have come seeking deeper truths about the universe's origins, and you can see why OB Station Gryphon is a destination that's not quite like anywhere else in the Empire.

Kallis VII & VIII

Located out beyond Kallis' frost line, the system's two giants formed from volatile icy compounds and captured hydrogen and helium. Kallis VII has drawn its fair share of exoclimatologists interested in studying its burgeoning storm systems, while Kallis VIII has proven exciting for those seeking to construct a more complete model regarding dynamics and chemistry in ice giant atmospheres.

Kallis IX

A small planetesimal in distant orbit around the sun, Kallis IX has the distinction of being the only celestial body in the system whose surface has been marred by orbital mining lasers, thanks to a joint UEE project with mining conglomerate Shubin Interstellar's research department seeking to better understand this dwarf planet's role in the system's formation.

DRIFTERS

BY DAVE HADDOCK

Part 2

Maybe a Starliner . . .

Mags rolled onto her side and pieced together a scenario: pick up a new Starliner, deck it out real nice and make passenger runs from hotspot to hotspot, but — and this was the important thing — not open it up to every sucker that can pay the ticket. Keep it exclusive. Choice clientele who would keep it classy. Make it be *the* party experience of the universe.

Although . . . the more she thought about it. Partying every day sounded like it'd get kinda exhausting after a couple months.

She'd been at this for hours. Ever since they'd identified the eriesium from the lockbox, the potential payout kept overtaking their conversations. Everything was a joke now: the terrible food packs, the shitty condition of the *Harlequin*, all of it. Because now they could see a way out. Hard to think that hours before, they were arguing about whether to put a bullet in Mags.

They were right though. It was hard not to get excited. The strange, rare element wasn't just a 'nice payout' kind of score. This was life-changing.

She couldn't believe it herself. From a youth spent picking tourist pockets on nameless stations and breaking into cargo haulers to sleep among the pallets and crates, to growing up bouncing from hustle after hustle, scrape after scrape. All that was about to end. She was actually about to be able to take a breath and relax . . .

But not yet. She still needed to line up a buyer. Someone who could pay them what this beautiful lump of ore was worth. An amount that would wash away all the betrayal, murder and despair the crew had waded through to get to this point.

She flicked the safety off her pistol with her thumb while gripping the knife with her other hand and carefully opened the hatch to her sleeping berth. The door hissed slowly as it slid. Mags looked out. The hall was empty.

Mags gave it another second to be sure. Underneath the persistent hum of the power plant, she could hear the intermittent banging of the engine echo down the hall, but still nothing else. Trin wasn't waiting with a shotgun.

She put the knife back in its hiding place, pulled on her boots and thudded down onto the floor. Still no ambush. Mags finally relaxed, confident in the knowledge that Trin wasn't that patient. She safetied the pistol, tucked it in her waistband and pulled on a heavy sweater to hide it from sight.

The bridge of the *Harlequin* was quiet. Ozzy was up there alone, casually flying the massive ship through the seemingly endless void. He glanced over as Mags stepped onto the bridge. She couldn't read what was behind that look. Maybe nothing. She had yet to really get a bead on the guy. Outside of his obvious loyalty to his sister, Trin, he seemed to speak the bare minimum. Even when they picked him

up from Quarterdeck, he said nothing. After spending five years in that hellhole, he just walked onto the *Harlequin* and sat down.

"Anything exciting?" she asked.

"Nope," he replied and cracked open a can of Smoltz.

"Need to take a break?"

"Nope." Ozzy took a long swig from the beer and settled back.

A few moments of silence passed.

"Okay, cool. Give a shout if you do." Mags moved over to one of the side terminals and slumped into the seat.

It was time to get to work.

<p style="text-align:center">*   *   *</p>

"What kind of work do you do?" the gruff, friendly voice asked over the comm.

"Commercial hauling mostly," Trevor responded. As captain of *Veronica's Dream*, he'd received the distress comm from a downed hauler about a half hour after shoving off from Port Red Oak above Angeli in Croshaw system. Damn lucky too, he was just spinning up his quantum when the comm came through. They'd been talking ever since.

"Cool, cool. You work for one of those big name companies? Covalex or some such?"

"Used to, but got out as soon as I raised the creds for a rig of my own," Trevor finally saw the faint beacon appear on his scans. "Just tired of working for other people, I guess."

"I hear that," the voice responded. It had a scratchy quality to it, reminded Trevor of the way his grandfather talked after a day in the mines. Reminded him of home. "Ain't never been the type to take orders."

"Finally caught your signal. Adjusting course now. Should be there real soon. How you holding up otherwise?"

"Oh been doing fine. Got plenty of air and tunes. All I need."

"I hear that, brother." Trevor kept sweeping with his scanners. Turns out the hauler he was looking for had busted down in a small cluster of asteroids. "You got yourself in quite the bind."

"Yeah, like my mama always said, I ain't got nothin' if not a knack for finding trouble."

"My uncle used to say the same thing." Trevor brought his ship around to get a first look at the disabled hauler.

"I believe it," the old voice over the comms said.

Trevor crested the final asteroid blocking his view, he finally got a look at . . .

Nothing.

A gap of space between several silently tumbling rocks. There was something small floating out there, blinking, but that was it. No ship.

Nothing.

His terminal pinged, pleasantly alerting him that the aft airlock had opened. Trevor reached over to see if it was an error, but it looked like someone had run a bypass. He didn't see the incoming rocket launched from one of the asteroid clusters up ahead before it punched through the canopy of *Veronica's Dream*. The explosion incinerated the entire cockpit in a flash. The ship hardly moved.

Blind Jack Sticha scratched his chin through his frazzled beard with a faulty cybernetic hand as he watched the damaged hauler slowly begin to pitch down.

"Alright Southers. Get to it."

The rest of the Souther Titans emerged one by one from their hiding places. Slashes of bright colors criss-crossed their hulls in ritualistic marks. The lead breacher moved inside the wreck while two more leapt from airlocks towards the damaged ship to try and get it flyable again.

Blind Jack settled back and ripped open a pack of Ma's Chicken Patty while his crew got to work.

*   *   *

Dr. Honan Yao woke up face down on a grate. He'd weirdly gotten used to waking up in strange places, but there was always that initial shock. It felt like that moment when you start to fall, a jolt goes through your body as if to right itself. Then two things would happen: the reality would set in, along with the dull ache in your veins after a long high. His professors in med school said it was the WiDoW burning the lining of the veins, contributing to the black marks that stained the body. He glanced down; the inky black lines had moved up to his wrist.

Yao rolled onto his back and looked around. As his eyes focused and his head settled, he could see he was in the engine room of the *Harlequin*, so, all in all, it could've been much worse. There was that one time he woke up in the airlock . . .

A wrench clattered to the ground. He looked over. Trin was working on the piping system. Her mobi was pulsing to the tune of whatever song she was pumping into her headphones.

Yao dragged himself to his feet. His head swam a little while he acclimated to the elevation change, but maintained his balance. None of these things surprised him. Although this morning was a little worse; his head a little heavier, the fog in his brain a little thicker . . . over the past year, this had more or less become a standard ritual of waking up.

He slowly shuffled through the ship. Kel was in the cargo hold, studying what looked like a rock . . .

That jogged a memory. Yao slowed down as he tried to sift through the cobwebs of his memories. Yeah . . . something had happened earlier. Something big . . .

That would explain why he was a little more sluggish. They'd been celebrating something.

"Hello, doctor!" Kel said cheerily. "Incredible, yes? Very exciting to be."

Yao nodded and made his way toward the bridge. As he made his way to his sleeping berth for a change of clothes and a quick shower, memories of the eriesium and subsequent party made their way back to his consciousness. It was about halfway through the shower before Yao remembered what had nearly transpired before they found the wreck.

He found Mags on the bridge, entrenched with a bunch of business pages on her terminal while Ozzy was napping on the stick.

"Hey Mags."

"Doc . . ." she said without looking up, and clicked through another page.

"Have any luck finding a buyer?"

"I'm barely finding anything at all." She sat back in her seat and rubbed her eyes. "No one seems to know nothing. Every mining company I've found doesn't even list it as something they'll buy. TDD don't even have it listed on their commodities. It's like the stuff doesn't even exist."

Yao nodded and looked out the window at space as he searched for the words.

"I'm sorry."

"About what?"

"The whole Trin thing. I should've been there."

"Well, if you know someone I could talk to about eriesium,

that'd make it up to me." Mags chuckled and went back to scouring the spectrum.

Yao paused for a moment.

"Actually, I might."

"Wait, really?"

"Ozzy!" Yao shouted, jolting Ozzy up from his nap. "Can you get us to Kallis?"

*   *   *

The Willoughby Housing Exchange had been extremely popular among miners cracking the Daedulus Cluster in Croshaw. That was over a hundred and fifty years ago now. Since the HEX shuttered in 2863, the station slowly decayed. Longterm residents, unable or unwilling to leave, eventually died off and the station fell silent, just another hulk drifting in the black.

That was until the Souther Titans moved in. Blind Jack couldn't believe his luck, finding a perfectly good station that only needed updated parts to bring it back online . . . or at least functional. Seemed like as good a place as any to have the pack hole up. They'd fixed it up smart too. Put in dead man switches to automatically cut the power, gravity and airshields if anyone but the Titans tried to take control. After years on the move, he had to admit, it was nice to find a place to call home.

Blind Jack Sticha and the rest of the Souther Titans set down on the various landing pads and quickly moved their ships out of sight. It was best to keep up appearances that the place was abandoned. They slammed the wreck of the hauler onto one of the larger platforms. Skivner and Leedy weren't able to retrieve the manifest from the blast, but did a quick check through the hold. Thing was packed to the gills. That was the great thing about indie operators, they had to make each run count. Sure they'd put up more of a fight, but Jack didn't mind a little scrap for his rewards.

That was just half of the haul too. Once they offloaded the merch, they'd break down the ship. Blind Jack would pick through the parts, keep a portion for upkeep on their own fleet, then sell the rest. All in all, they stood to make a nice little cut.

Blind Jack flipped on his suit lights as he trudged towards the HEX's airlock. All the timers had tripped, so he needed to power the station back up. About halfway through the startup routine . . .

"Blind Jack Sticha" came over the general comms.

Jack paused momentarily then continued the startup procedure. The hidden power plants chugged awake. The lights in the airlock pulsed to life and the systems came online. His knee ached as he got back to his feet.

As the airlock cycled, he drew his pistol, a custom Coda pistol with compensators, and flipped the safety off. Whoever had called to him must be close. Leedy jogged up, weapon ready. The other Southers had heard it too.

"There's no need for that," the voice said. "We're here to talk."

Jack looked up at the security cameras in the airlock. They must be in the system. Jack holstered the pistol and motioned for Leedy to sling the rifle.

The airlock hissed open. Music echoed through the halls. Blind Jack pulled off his helmet and tossed it on the ground.

"Eyes up, kid," he muttered. He yanked his gloves off and threw them by the helmet. "Anything go sideways, you paint the walls, hear?"

They walked towards the living area to find their two guests waiting. They were Human. One male. One female. Real nice flight suits. Male was visibly armed. Female wasn't, but definitely didn't look skittish.

Blind Jack casually walked over to one of their cargo containers converted to a cooler and pulled out a can of Smoltz. He offered it to the duo.

"Drink?"

The woman didn't move. The man smiled and shook his head. Blind Jack shrugged, popped the can and downed the whole thing in a long protracted drink. He crumpled the can and flung it into the darkness.

"So who the hell are you?"

"We're listeners, really. Our employer sends us to ask questions and listen. We're then entrusted to act accordingly."

"Uh huh," Blind Jack said with a glance to Leedy.

"But we aren't bounty hunters or Advocacy if that's what you're worried about. Think of us more like professional colleagues."

"So what do you want?"

"Not much. We've got two questions for you. The second is significantly more difficult than the first, but both need to be answered to our satisfaction or . . ." the man shrugged. "We will act accordingly."

Blind Jack burst out laughing. His bellows echoed in the abandoned station. The man smiled. The woman didn't move. The laughter finally died down.

"You walk into our den and make threats?" Blind Jack grabbed another can and popped it. "That's a quick path to a short life, my friend."

"I don't do anything for myself," the man stood and walked over to Leedy. The scrawny, tattooed outlaw stood tall and met the man's gaze without flinching. "As I mentioned, we are representatives. All you need to know is that, for all intents and purposes, Damien Martel of the Four Points is asking the questions."

Blind Jack Sticha coughed. Leedy looked over at his boss, whose demeanor had completely changed.

The Four Points were one of those syndicates that never seemed to die. They never dominated the criminal hierarchy, but somehow persevered for decades, maintaining a rep that was as calculating as they were ruthless. The leadership each represented a swath of territory, forming a council of Four that dictated orders down to their footsoldiers. Damien Martel was one of those Points.

"I see I require no further explanation," the man said after one look at Blind Jack's face. "Good."

The man walked over to Jack and studied him for a moment.

"Were you responsible for the attack on Mr. Martel's ship?"

"Huh?"

"Do you want me to repeat the question?"

"What? No." Blind Jack glanced at the woman. She'd circled into Leedy's blind spot. "I ain't heard about any attack."

"Are you lying to me?" The man said, never breaking his gaze. His voice was even, devoid of inflection.

"Hell no," Blind Jack looked right back. "My people are all here. All accounted for and nobody would make a move like that without me knowing about it."

The man watched Jack for a few moments. Processing him. Finally:

"You Titans have an interesting set of tattoos," the man said as he brought up his mobi and began to cycle through menus. "I never quite understood the appeal myself, but more so, could never just settle on a design I was comfortable living with the rest of my life."

The man found a picture and held it up for Jack to see. It

was a surveillance grab.

"Second question," he pointed to the surveillance grab. Some scrap yard that Blind Jack had used to offload scrap in the past. Wardlow Rec or something. The man pointed to a woman in the frame; it looked like she was sporting Titan ink. "Do you know who that is?"

It took Blind Jack a second to recognize her.

"I'll be damned," he said with a fond smile. "Name's Trin Liska. Been a spell since we ran with her. What'd she do?"

"Took something of value."

Blind Jack nodded, filing that little tidbit away for future deliberation. He took another drink from his can.

"Last I'd heard, she'd linked up with Reza Malcolm's ship. Horrible piece of shit called the *Harlequin*."

"I want that ship."

Blind Jack took his time thinking it over. He stepped past the man and took a seat in his busted up leather chair.

"Sure, I can help," he said with a satisfied grin.

Thirty minutes later, the two syndicate hitmen left without incident and fully loaded with the *Harlequin*'s multitude of reg tags and everything the Southers knew about Trin.

Blind Jack was halfway through the case of Liberty Lake, sitting quietly and humming to himself. The rest of the Titans watched their boss, perplexed. Leedy finally spoke up.

"What the hell, Jack?"

"Speak your mind, Leedy."

"Trin was one of us."

"Was, kid." Blind Jack settled back in his seat and popped another can. "She walked away. I told you before, we got no loyalty for quitters and besides, you're missing the big picture."

"What's that?"

"If she got the attention of the Four Points," a grin spread behind Blind Jack's beard, "we talking big money."

The Titans looked at each other. The prospect of a payout sparked that familiar fire behind their eyes.

"Strip your ships and travel light," Blind Jack said as he slammed the next can. "Let's go get paid."

*   *   *

The *Harlequin* dropped out of the Bremen-Kallis jump point near a cluster of cargo supply ships that were on their way out of the system. Recently installed CommRelays now floated near the jump point and the Army station charged with protecting this developing system.

The entire crew had gathered on the bridge of the ship. Mags and Trin were entirely focused on the Army base, looking for any sign that the military were paying them equal attention. Ozzy flew with his usual sullen indifference. Yao's hand trembled as he chewed on a nail. To the others, it seemed like the usual byproduct of going for such a long stretch without some kind of chemical balance. They did not know that it was something else.

Kel was the only one paying attention to the view. Outside the front of the ship was a staggeringly beautiful display of destruction and creation. Kallis was the very definition of a developing system. Discovered while the planetary bodies were still in the process of forming, it had become a nexus for astronomers and scientists who were eager for this unique opportunity to observe a solar system in its infancy. The system had even attracted its fair share of philoso- phers and spiritualists, who came to witness and contem- plate all sorts of questions about existence.

"Pretty . . ." was all Kel could muster.

"You really sure about this, doc?" Mags asked, her eyes still locked on the passing military station.

"Yeah . . . I think so," Yao replied. He realized he was biting his nails and stopped himself. "No, we should be good."

"So this guy is a doctor?" Trin asked while she chewed on some jerky.

"Buddy of mine from med school until he dropped out and shifted over to physics and geology. He's cool, though."

"Uh huh," Trin replied and took another bite.

Yao made his way to one of the chairs and brought up the commlink. He isolated OB Station Gryphon and sent a comm. It took a few moments before a bleary-eyed admin- istrator answered.

"Main Junction."

"Yeah, hi, Lev Dennis, pleas-"

The administrator had already cut him off and transferred the comm. After a few seconds of waiting, the rest of the *Harlequin* crew staring at him, someone new picked up. Lev answered the comm without really looking. Based on the rapid tapping, he was still clearly more interested in typing something.

"Yeah?"

"What's up, man? It's Honan."

Lev stopped typing and turned to look at the comm. His face brightened up.

"Holy shit," he rubbed his eyes and looked closer. "What the hell are you doing here?"

"Needed a bit of your expertise, actually."

"Yeah, right."

Yao shrugged and nodded.

"Really?" Lev sounded genuinely shocked. "Oh, damn, yeah, okay. Come on by. I'll arrange a pad."

Twenty minutes later, the *Harlequin* set down on the observation station. The landing bay door opened up as Lev Dennis burst into the bay.

"Yaooooo-" He stopped short at the sight of the rest of the *Harlequin* crew. Lev was around Yao's age, but clearly living in near isolation away from civilization hadn't done much for his personal hygiene. He backed towards the door.

"What's up, man?" Yao quickly stepped forward and shook his hand. Lev froze mid-reach. Yao looked down to see the WiDoW marks peeking out from under his sleeve.

"What are you doing, man?" Lev said in a whisper. "That looks really bad."

"No, it's okay, man."

"Shit don't look okay."

"Don't sweat it," Yao said, mustering up as much of a smile as he could, but realizing how much he'd probably changed since the last time he saw his friend. So much had happened . . . but he didn't want to think about that now. "Come on, meet my crew."

Lev forced a smile and looked past Yao. Although Trin and Ozzy weren't (visibly) armed, they were more than intimidating for the scientist. Kel quickly approached.

"Hello, Lev Dennis. Pleasure to acquaint. I Kel." he patted Lev on the forehead then hugged him. "Beautiful station here. Sound construction."

"Hey . . ." Lev sheepishly replied. Yao could tell Lev was getting skittish, so he kept the ball rolling.

"You got somewhere private we could talk?" He pulled Lev towards the halls and got them walking. Lev seemed to calm down the further they got and soon began to explain the various research companies and non-profits that had come and gone over the years he'd been there to study various facets of the growing system.

By the time they got to his lab, he seemed to be relaxed with the group, even fielding some questions from Trin about the station's security protocols. Inside, there were multiple scan arrays positioned around a massive floor-to-ceiling window that overlooked the swirl of flame and debris outside.

"So, what'd you wanna see me about?" Lev finally said.

Yao nodded over to Mags, who was carrying their lockbox. She set it on a table and opened it up, revealing the massive chunk of eriesium inside.

Lev glanced at Yao before looking in the box. At first, he didn't really notice anything special. It was when he tried to get closer and the light caught the violet glints just under the surface of the ore that he paused and looked at the faces around him in disbelief.

"Is that . . ."

Yao grinned. Lev made a move toward the eriesium.

"Can I?"

"That's why we're here, man."

Lev excitedly grabbed some gloves and picked up the ore. He shifted it between hands, testing its weight, then gave it a closer look.

"Where'd you find this?" he asked, never taking his eyes off the prized mineral.

"It's a long story," Mags replied as she watched him study it. "But it is eriesium, right?

"Yeah, I think so," Lev put the ore underneath a table lamp to study it closer. "You gotta remember they've only found eriesium in the UEE like four or five times. Ever. And I don't think any of them were the size of this. So it's not like there's a wealth of knowledge about the stuff."

"You know anyone who'd buy it?" Trin chimed in from the back, obviously bored. Yao cut her a glance. She shrugged and picked up a small statue from a shelf. Lev slumped down on a nearby stool.

"Plenty, but they won't touch it. The government's oppressively regulated any kind of open market. Until they know more about it, all discoveries and sales have to be reported. You have to indicate where you found it, how it was extracted, provide dig permits. So it's not as simple as walking into a TDD and offloading some ore."

"Wait a second." Trin tossed the statue back on the shelf and started to cross the room towards Lev. "You're telling me, we've got the most valuable mineral in the universe and we can't sell it?"

"Um . . . yes?" Lev said as he shrunk away from Trin. She stopped right in front of him and stared before shooting a glare at Mags and walking away. "I mean, you might be able to sell it to some Xi'an. They'd probably buy it, but that'd be treason . . ."

"What'd you say?" Mags perked up.

"That'd be treason?"

"Before that."

"Apparently eriesium's a little more common in the Xi'an Empire. They've worked with it a bit more."

Mags turned to the group.

"I think I know a buyer."

*   *   *

Searches for the *Harlequin* were coming up empty. For days, Arno Maas had been flooding his whole catalogue of snitches, corrupt Customs officials, local militia bruisers and general scumbags with the reg-tags, but so far, nothing. Blind Jack had been forthright and comprehensive with what he knew about Trin Liska, but Arno remained open to the possibility that the old outlaw would withhold some key fact to trip up their search.

He shut down his terminal and made his way to the cockpit where Osane was flying.

"Had any luck?" he asked as he approached.

"Waiting on word from Masterson. He's checking the Advocacy archives for known associates of this Malcolm guy."

Arno sat quietly for a few moments.

"I'm wondering if we should've killed a Titan or two. You know, punctuate our point."

"Blind Jack's old school." Osane placed the ship on autopilot and turned back to face him. "It would've made us look desperate to intimidate him."

An incoming comm chimed on both their terminals. Arno immediately activated the encryption protocols and answered it.

"Mr. Martel."

It took a moment for the image to appear. A man in his late fifties with strong angular features flickered in. Encrypting the comm created some sync issues, so his face sometimes jumped to catch up with his words. Damien Martel looked into the comm with completely emotionless eyes.

"Status." A sync jump made it look like his lips hadn't even moved.

"We cleared out any evidence of the *Echo Calling* from that scrapyard, staged the thing to look like slavers, so that's done. Just got a name and a ship for who's got the item now, but we think the Titans might have edited their responses." Arno double-checked his mobi to see if he'd received any incoming messages. "We've put the word out and are waiting to hear back."

Martel stared at them silently, his expression inscrutable.

"We've got a fortune's worth of Four Points property on the drift and you're waiting for people to comm you back?"

Arno glanced at Osane.

"I don't know what—"

"You kick down every door you have to. Raze cities to the ground. I don't care. Find it or we're all dead."

Martel clicked off.

Arno and Osane exchanged a glance. She spun her seat back and flipped the ship off autopilot.

"Guess we should've killed a couple Titans."

A comm message pinged on Arno's mobiGlas. He glanced at it and exhaled.

"Well, that's fun . . ."

*   *   *

Accessing the Bremen-Nyx jump point took forever. The Bremen Militia, paranoid on their best days, must have taken double their paranoia pill dosage today. Mags had sent an old reg-tag that they hadn't used in a while reserved for 'clean travel.'

The grilling from the militia almost made the tense flight through outlaw space more preferable. Mags was piloting the *Harlequin* while Ozzy ran escort in the P52. They passed the wreckage of a Hull. Mags couldn't tell what model, the thing was blasted into hundreds of pieces. A group of outlaws, presumably the ones who did the blasting, were picking through the detritus. One of them, a heavily armed gunship, turned to watch the *Harlequin* pass.

Mags was pretty sure there was a private conversation going on, weighing whether they'd stolen enough cargo that day or if there was room to tangle for a little more.

She kept the speed even, didn't accelerate or slow down, just flew on past and kept heading towards the Glaciem Ring and their destination: Levski.

Mags had spent some time there as a kid. She'd hooked up with Frank McGarr's crew: running spec scams, short cons and the occasional heist. They'd based themselves out of the 'burnout collective' (as Frank liked to call the residents of Levski) simply because they left people alone under the auspices of respecting their privacy. For a bunch of liars and thieves, it was perfect.

The rest of the flight to Levski passed without incident. Ozzy redocked with the *Harlequin* before they made their final approach. By the time they set down, the rest of the group had already gathered in the cargo lift. Trin waited with her foot on the lockbox with the eriesium. Yao was leaning against the wall, absent-mindedly chewing on his nail again. Kel was wearing all his 'Human clothes': a mismatched collage of Sataball team swag, a UEE scarf and a sweatshirt of the popular gag quote ("I'm With Mom") from a decade-old spec show.

Mags pulled on her coat and hopped down to join them.

"I'm thinking we should separate, my guy can be a little skittish." Mags reached down for the lockbox, but Trin didn't budge.

"It's staying with me."

"Yeah, okay," Mags said as she hit the lift button. The platform shuddered and began to descend. She turned to Kel. "Remember what we talked about."

"I am friend. Not slave." He replied with a carefully practiced cadence.

The lift thudded to the ground. The group walked towards the airlock as the massive overhead hangar doors screeched closed. The air had a tangy taste to it, probably been years since they'd cleaned out the scrubbers in the hangars.

They passed a banner outlining the 'rules' of the People's Alliance. One of these hung in each of the hangars, but this one had been stitched up multiple times, presumably from people throwing rocks or bottles through the sign.

Yao immediately darted away once they got inside and headed into the tunnels. Kel rushed to look at the crude map of the abandoned mining station and immediately struck up a (one-sided) conversation with a local who happened to be standing nearby. Mags, Trin and Ozzy took the elevator down to the main floor.

The Grand Barter was bustling, as usual. Transient hawkers shouted at anyone who happened to drift in their eyeline. If given the slightest acknowledgement, the hawker pounced.

The three of them stalked through the stalls, getting swarmed by wares from all corners of the UEE and beyond. Assurances of quality and rarity were laced into every sentence.

They finally cleared the other side. Ozzy shoved away a particularly persistent merchant and they all stepped towards the bar.

Cafe Musain was packed. A hauling team loudly celebrated in one of the side rooms, clearly blowing off steam after a big job. The rest of the place was filled with miners, locals wearing homemade clothes and transients who'd stopped off for a rest and a drink. Bartenders hustled to keep the glasses full.

Mags scanned the booths that ringed the room. She nudged Trin towards a secluded one in the corner where a Xi'an sat quietly.

"Ozzy, do you think you could hang back?" Mags asked with a little hesitancy. Ozzy glanced at Trin, who nodded. He broke away and headed for the bar.

Mags cut through the crowd towards the Xi'an while Trin followed.

"Nyasēng's.uo S.oam," Mags said as she approached.

The Xi'an looked up.

"xē'sueren, Thief Magdalena." Soahm settled back and took a moment to appraise Trin and the lockbox. ".axyoa? I hope you are well."

"You know, ups and downs."

"I believe I know the expression." Soahm kept his eyes locked on Trin. "What can I do for you?"

"I'm glad you asked."

The two sat down.

* * *

As far as Ozzy could tell, although there were about a dozen people who were armed in the place, maybe three of them looked legit serious. Two were sitting by themselves at the bar, but the way they were scanning the room, they had the look of vultures. The last was perched up near a back room, trying not to look like he was guarding it.

It was a habit he had picked up on Quarterdeck. A habit everybody picked up. You needed to assess every room, every moment, to know who was a threat or not. Maybe it was valuable training. Certainly wasn't worth being sent there to learn it.

He drained the glass and waved the bartender over for another.

"Ozzy Liska," a voice said behind him. There was something familiar about it.

Ozzy glanced back as Blind Jack Sticha climbed onto the next stool.

"Hey, Jack, how ya been?"

"I'm too old to change, you know that."

"Yeah."

"Heard you got out," Blind Jack said as he paid for both drinks. Probably off some dead man's account.

"Yup."

"And back running with Trin."

"Yup."

"Heard you two got a decent score going."

Ozzy turned to face Jack, mentally priming himself to jam his stashed blade in Jack's throat if need be.

"Where'd you hear that?"

"Whispers, son." Blind Jack grinned and took a sip. "Whispers always find their way to me."

"Then you know the answer."

"I can help." Blind Jack polished off the rest of his glass. "Help you move it."

"I think we got it handled," Ozzy glanced around to see if Jack had any more help lurking. There. Some tall lanky bastard posted up near the front.

"Fair enough." Blind Jack ordered two more glasses. He set them both in front of Ozzy. "Surprising you'd be so eager to jump back in with Trin after you got out."

"What's that supposed to mean?"

Blind Jack pushed himself out of his chair, careful to keep his hands in plain view and smiled.

"Well, she was the one who bailed on you to the Advocacy."

"Uh huh," Ozzy managed to muster between clenched teeth. The rage began to build. "So she called the shots for the Titans? Thought it was your crew, Jack."

"Wasn't my finest moment, Ozzy, but you know how she can get," Blind Jack said with a shrug. "She's got that temper that makes her real convincing. Offer's still open to come back if you want it. Family's one thing, but pack's another. Think about it."

Blind Jack motioned to the lanky stooge in the corner and they drifted.

Ozzy turned to look at the booth in the corner as Trin picked up the lockbox. She glanced around the bar before opening it. Her eyes met Ozzy's. She grinned then looked back at the Xi'an.

* * *

Mags had never seen Soahm so impressed. A former cop in the Xi'an Empire, he now worked as a security consultant for whoever would pay his fee, but he prided himself on his poise.

"You have outdone yourself, Magdalena," was all he kept repeating as he examined the eriesium.

"Funny . . ." a voice said behind them. Mags, Trin and Soahm turned back to see Arno and Osane step up to the table. "We were thinking the same thing."

To be continued

CHRONICLES