JUMP POINT

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GREETINGS, CITIZENS!

Another month, another **Jump Point**. And this time, no raging threads or compelling comments in the Den to respond to. Whatever shall we talk about?

We can talk about this issue. We've got a Work In Progress on the four Mustang variants after the Alpha. The artists have done some interesting things to create four different ships, all based on the same core; take a look.

Our Portfolio this month examines Accelerated Mass Design, the sponsors of the Mustang Omega. Any resemblance to corporations of a millennium ago is purely … well, you be the judge.

Behind the Scenes answers the question, what happens when you put a dozen QA testers in a room together: they talk. A lot. Fortunately, they've got interesting stories, and even more interesting pictures. I think you're gonna enjoy what they have to say.

While we're on the topic of Behind the Scenes, I wanted to ask for a little feedback – what do you think about the interview format we've used in the last couple of **JP**s? It's hard to get any group at CIG together, even if they're all in the same city (which they usually aren't), but text chats have made it possible to carry on a conversation, and I like the way they've turned out. That's what I like, but what you like is more important: are the interviews we've had recently interesting and informative to you? Let me know.

Galactic Guide covers Helios, one of the systems you'll see earlier, rather than later (but not right off when the PU launches). And Chronicles this issue begins the story of Mila and Rhys, bounty hunters on the trail of the Phantom. It's written by Autumn Kalquist, who starts a third category of authors for us. We've had authors who haven't played *SC*, and authors who have; she's the first whose *husband* is a backer. If you want to see more of what she's written, check out www.autumnkalquist.com. Oh, and she has a few opinions there as well, such as whether women can write science fiction.

And with her story, our staff artist Ken begins his regular gig illustrating the Chronicles (along with the Galactic Guide).

Meanwhile, we passed an anniversary last month, and I didn't think to note it. **Jump Point** has been published (posted? Uploaded? I never know what to call the process) for 25 issues and two years as of December. I know it won't last forever, but I'm enjoying it while it lasts; I hope you are too.

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

David
David.Ladyman@cloudimperiumgames.com

FROM THE COCKPIT

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Mustang Variants

Alpha (Base)
July 2014 WIP

Beta (Explorer)

Gamma (Racer)

Omega (Limited-
Release Racer)

Delta (Fighter)

Six months ago, in the July 2014 Jump Point, we detailed the development of the base Mustang, what you now know as the Alpha. **David Hobbins**, with **Chris Smith (Lead Vehicle Artist)**, created the Alpha design. Since that time, we've created four variants – the Beta (explorer), Gamma (racer), Delta (fighter) and Omega (limited-release racer).

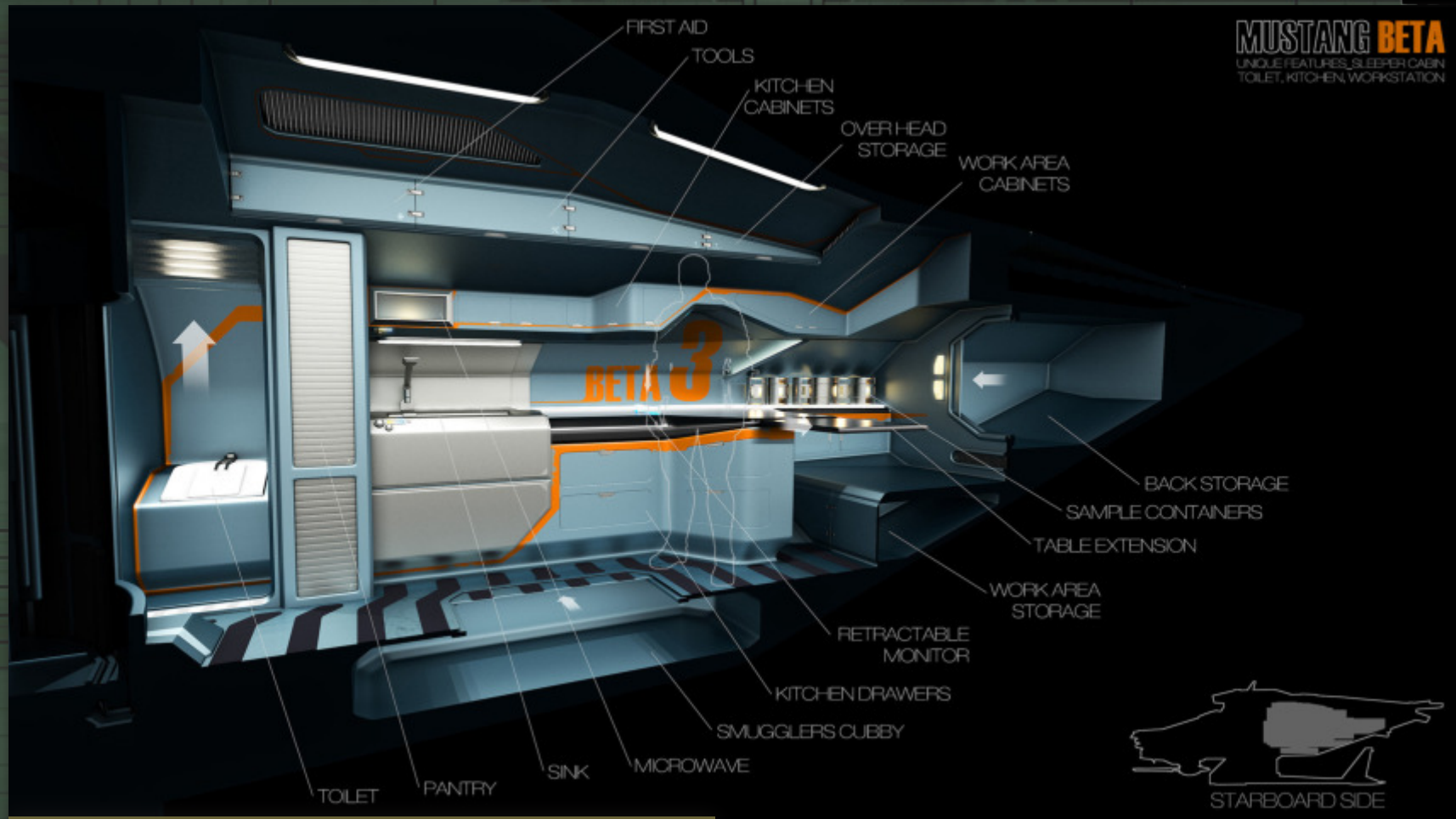This month, we're going to examine those four variants, con-cepted by **Gurmukh Bhasin (Concept Artist, LA)** with additional work by Chris Smith, again.

This article won't be as in-depth as some, because the designs that Gurmukh and Chris came up with were approved right off, with very little modification or comment.

We'll start with the Beta.

Mustang Beta

FIRST AID
TOOLS
KITCHEN CABINETS
OVER HEAD STORAGE
WORK AREA CABINETS

MUSTANG BETA
UNIQUE FEATURES_SLEEPER CABIN
TOILET, KITCHEN, WORKSTATION

BETA 3

BACK STORAGE
SAMPLE CONTAINERS
TABLE EXTENSION
WORK AREA STORAGE
RETRACTABLE MONITOR
KITCHEN DRAWERS
SMUGGLERS CUBBY
TOILET   PANTRY   SINK   MICROWAVE

STARBOARD SIDE

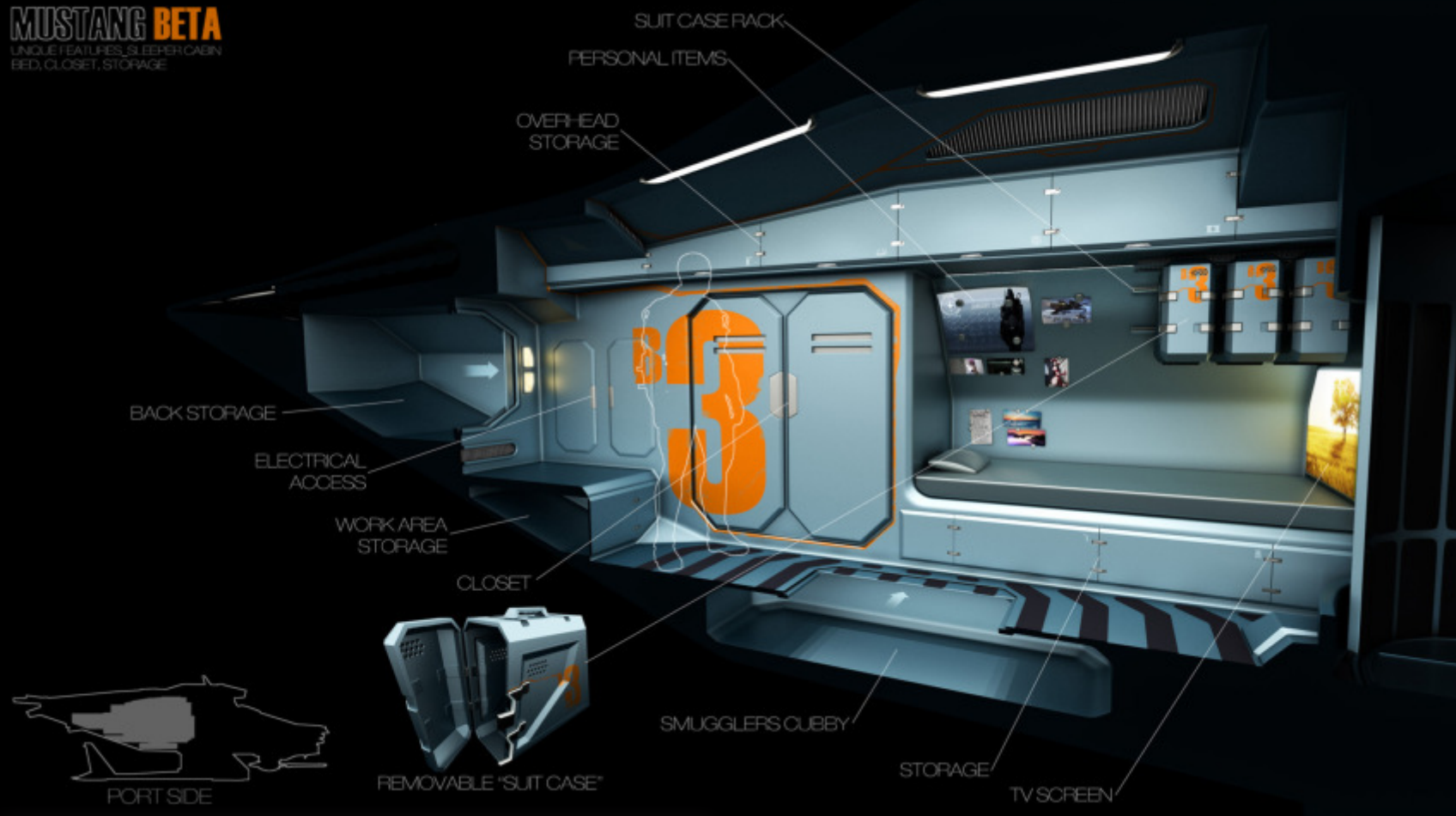**Gurmukh:** Here is the render of the starboard side for the sleeper cabin in the Mustang Beta ("Winnebago"). I have removed the cargo hold from the back of the Mustang Alpha and sealed it off to enclose the sleeper cabin. This cabin has a bed, closet, toilet, kitchen and work/eating area. I am finishing up the port side render and will post it soon. I should have a few interior renders to post as well.

MUSTANG BETA
UNIQUE FEATURES_SLEEPER CABIN
BED, CLOSET, STORAGE

SUIT CASE RACK

PERSONAL ITEMS

OVERHEAD STORAGE

BACK STORAGE

ELECTRICAL ACCESS

WORK AREA STORAGE

CLOSET

REMOVABLE "SUIT CASE"

PORT SIDE

SMUGGLERS CUBBY

STORAGE

TV SCREEN

Gurmukh: Here is the render of the port side for the sleeper cabin in the Mustang Beta ("Winnebago").

MUSTANG BETA
UNIQUE FEATURES_SLEEPER CABIN
TOILET, KITCHEN, WORKSTATION
BED, CLOSET, STORAGE

BHASIN '14

Gurmukh: Here are the last 2 interior views of the Mustang Beta sleeper cabin.

Possible animations are noted.

Gurmukh: Here [this page and next] is the exterior livery for the Mustang Beta. I went with the same color scheme as I did with the interior. The Mustang Beta is ready to go off to production.
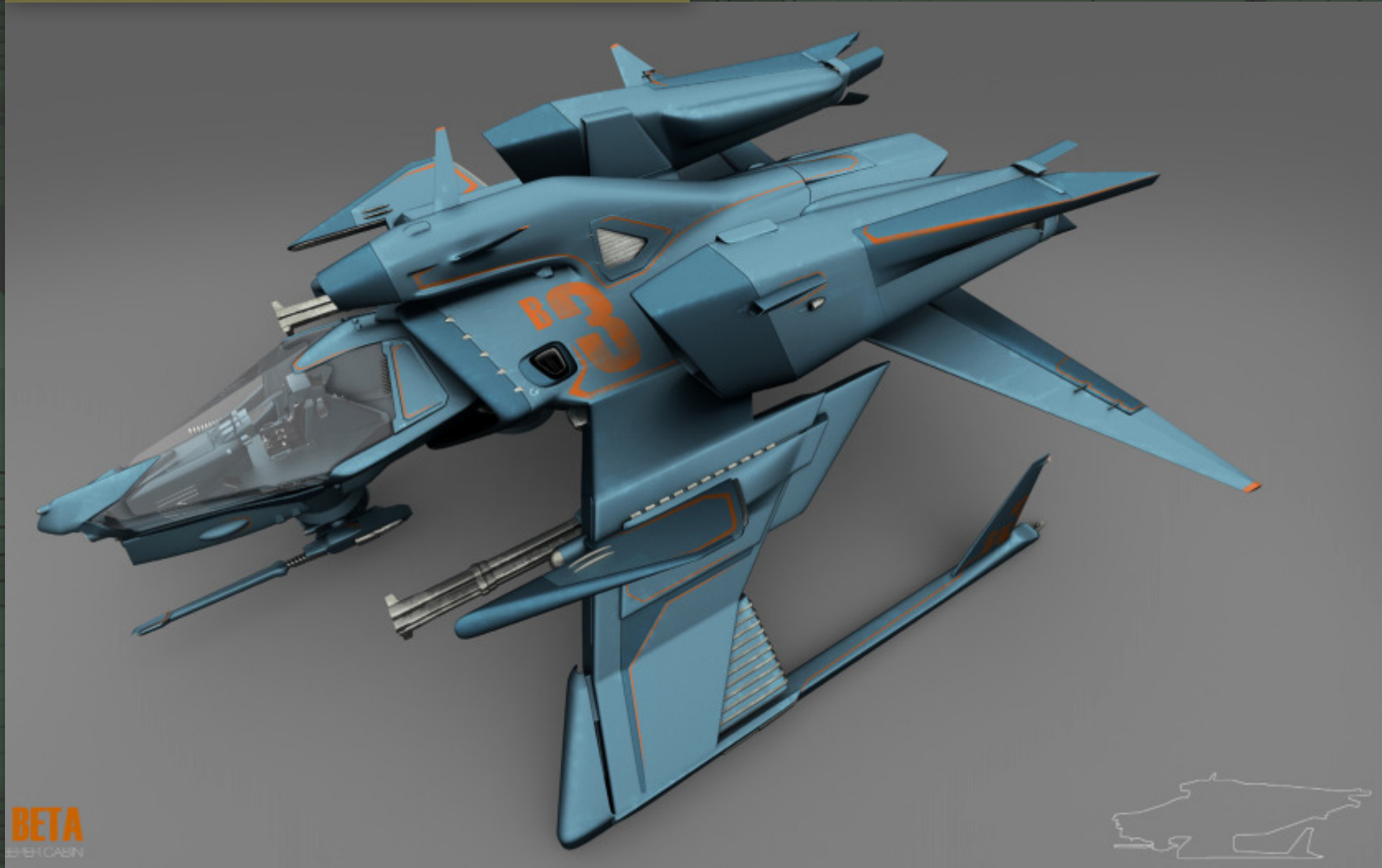
BETA
ESPER CABIN

MUSTANG BETA
UNIQUE FEATURES_SLEEPER CABIN

Elwin Bachiller, Senior Spacecraft Modeler, LA:
Art Model for Mustang Beta. I put together a basic lighting setup for the interior.
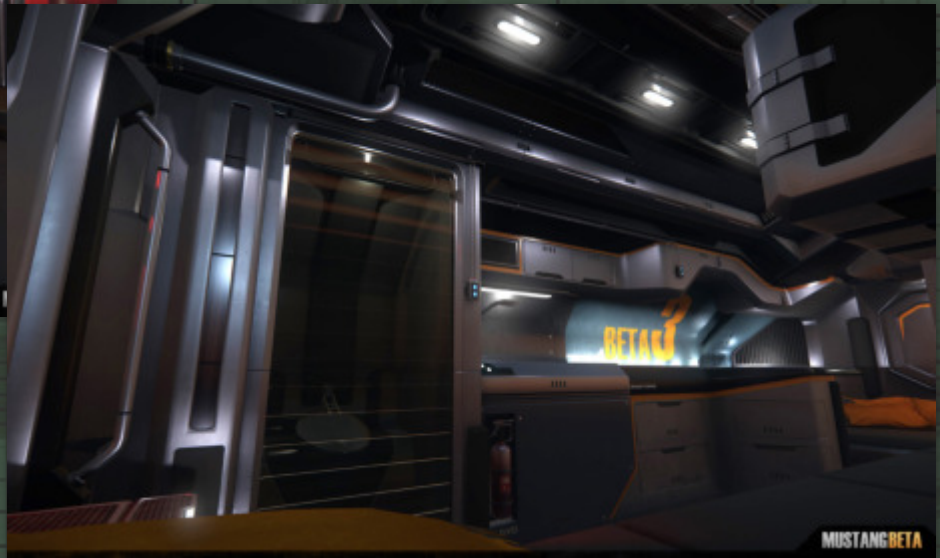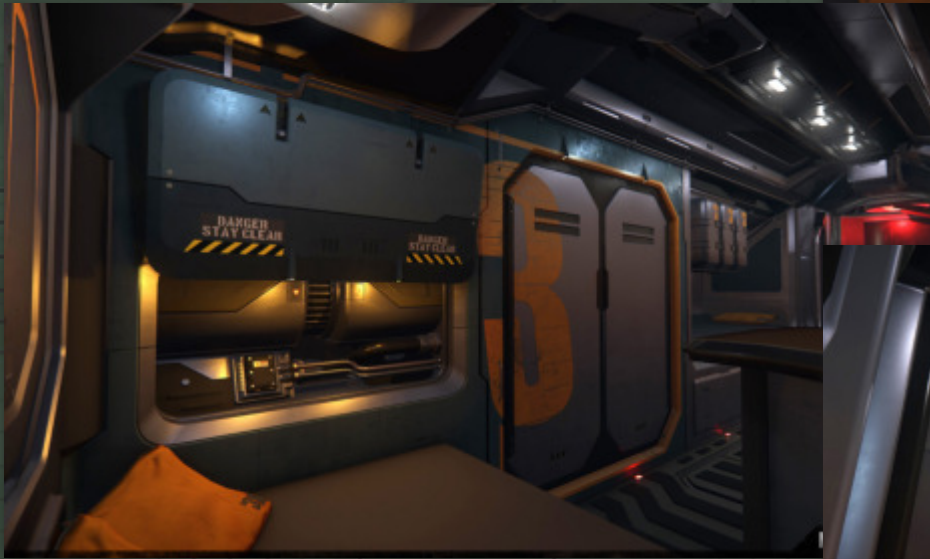
MUSTANGBETA

MUSTANGBETA

WORKINPROGRESS

MUSTANGBETA

MUSTANGBETA

Elwin: And whiteroom renders. Please do enjoy.

Elwin: Finished Mustang Beta in Asteroid Hangar.

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WORK IN PROGRESS

MUSTANG BETA

Mustang Gamma

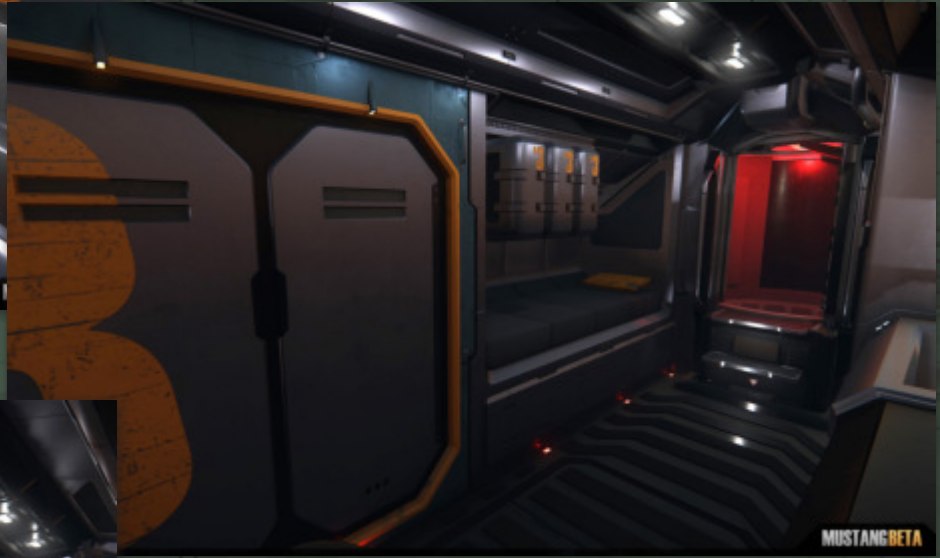**Gurmukh:** Here are three livery variations for the Mustang Gamma "speeder" (racing variant). This variant is stripped down, with a third engine in the back, and the EVA hatch and bottom guns are removed to make the ship lighter and faster. The cockpit glass opens up for pilot entry. I figured racers would want to have their own color scheme and there would be different sponsors for each racing team. I will post some images tomorrow of the modified back and how the pilot enters the cockpit.

Chris Roberts: Nice work!

I like both of these, with the green maybe being funner / louder. Looks good so far to me. I wonder how easy it will be to modify the kick-ass in-engine version Chris Smith did so we can have this flyable at New Horizon soon?

Gurmukh: The cool thing is that these colors can be swapped around and the results still look really good. For example a Black, Red and Blue version can look like either of these images. The idea is to create a few patterns and sponsor placements and let the players pick which colors they want to use, so that these would be very easy to customize.

MUSTANG GAMMA
REAR VIEW
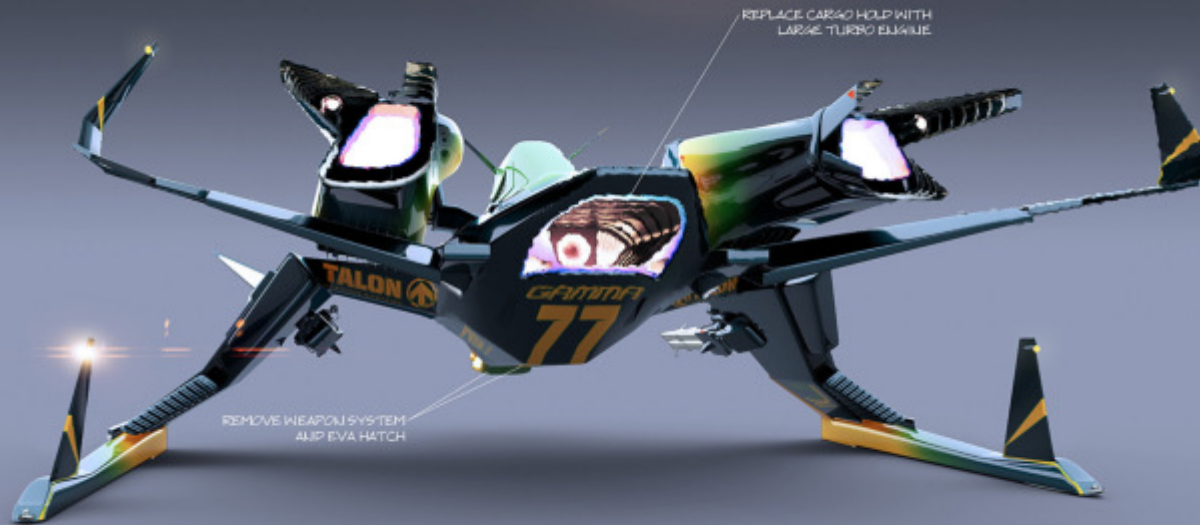
REPLACE CARGO HOLD WITH
LARGE TURBO ENGINE

TALON

GAMMA 77

REMOVE WEAPON SYSTEM
AND EVA HATCH

The actual modifications to 3D models of this variant are pretty minimal, mostly with stuff being removed and an engine added to the back. I will check in with Chris to see if he can get this ready soon.

WORK IN PROGRESS

MUSTANG GAMMA

77 GAMMA

ACE

WINDSHIELD ROTATES OPEN

TALON

EXTERNAL LADDER OPERATED
BY RACING TEAM

Gurmukh: Here are the last two views for the concept of the Mustang Gamma. One view shows how the pilot enters the cockpit. The glass windshield rotates open and a crew member from the racing team puts in place the ladder to enter and exit the ship. The other view is of the back side, showing the additional large turbo engine which is unique to the Gamma racing variant.

Chris S & Ryan Archer, Marketing & Web Artist:
Finished Mustang Gamma at New Horizon.

Mustang Delta

Gurmukh: Here are the call-out renders for the unique features on the Mustang Delta (military variant). This version of the Mustang has:

- protective armor over the intakes

- a stronger frame on the cockpit canopy with an emergency pilot ejection cutaway

- a total of 2x3 under-wing air-to-air missiles, 2x18 under-wing folded fin aerial rockets with 2 launchers, extra ammunition storage in the back, with space for 36 rockets and 4 missiles that need to be manually reloaded

MUSTANG delta

ADAPTIVE CAMOUFLAGE SILHOUETTE

x3 AIR TO AIR MISSILES

ROCKET LAUNCHER W/ x18 FFAR

GURMUKH '14

MUSTANG delta

ADAPTIVE CAMOUFLAGE SILHOUETTE
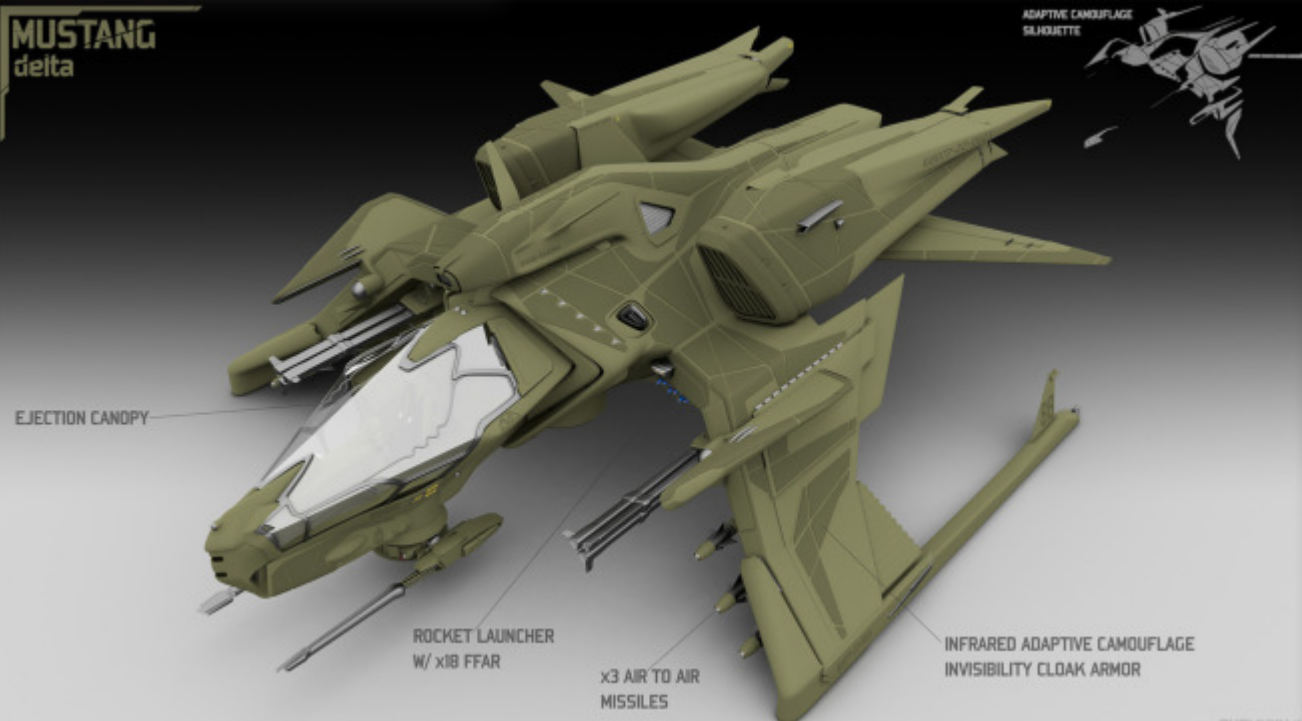
EJECTION CANOPY

ROCKET LAUNCHER W/ x18 FFAR

x3 AIR TO AIR MISSILES

INFRARED ADAPTIVE CAMOUFLAGE INVISIBILITY CLOAK ARMOR

GURMUKH '14

- flare countermeasures in the back

- IACICA (Infrared Adaptive Camouflage Invisibility Cloak Armor)

The IACICA is the darker color camouflage pattern. It is made of a unique metal that gives off a stronger infrared signal than the lighter paint (which gives off almost none). The IACICA also provides an extra plate of armor to the overall ship, making it harder to damage.

WORKINPROGRESS

MUSTANG
delta

ADAPTIVE CAMOUFLAGE
SILHOUETTE

x3 AIR TO AIR MISSILES

ROCKET LAUNCHER W/ x18 FFAR

EXTRA AMMO STORAGE
30 ROCKETS 4 MISSILES

INFRARED ADAPTIVE CAMOUFLAGE INVISIBILITY CLOAK ARMOR

FLARE COUNTERMEASURES
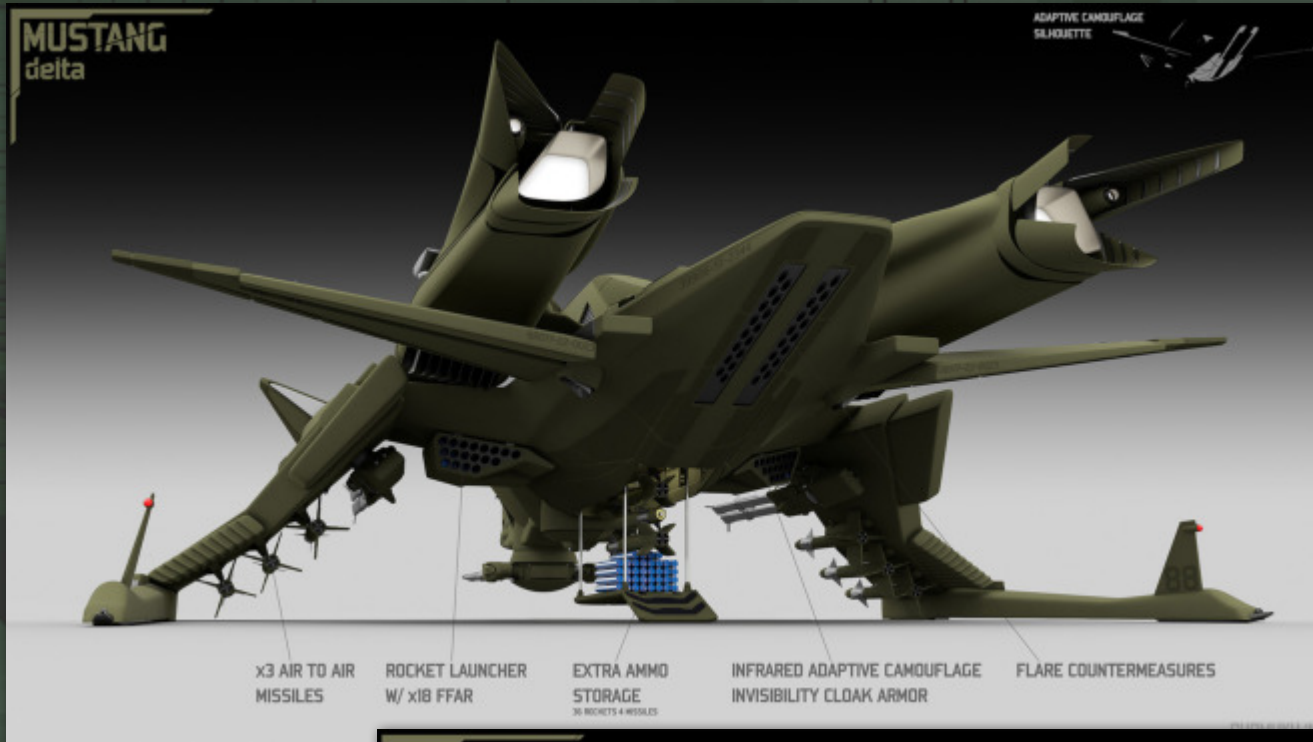
William Weissbaum, Writer, LA: Looking really cool. It struck me as slightly odd that a ship that is trying to camouflage itself in space would be camo green. Wouldn't it want space-colored camo to avoid visual detection?

Gurmukh: One of the features of the adaptive camouflage armor is that it can change color to match its sur- roundings.

MUSTANG
delta

ADAPTIVE CAMOUFLAGE
SILHOUETTE

INFRARED ADAPTIVE CAMOUFLAGE INVISIBILITY CLOAK ARMOR

MUSTANG delta

ADAPTIVE CAMOUFLAGE SILHOUETTE

x3 AIR TO AIR MISSILES • ROCKET LAUNCHER W/ x18 FFAR • EXTRA AMMO STORAGE 36 ROCKETS 4 MISSILES • INFRARED ADAPTIVE CAMOUFLAGE INVISIBILITY CLOAK ARMOR • FLARE COUNTERMEASURES

GURMUKH '14

Nick Elms, Creative Director, _S42_: Looking great! Can we get a cockpit view?

Gurmukh: Thanks! I wasn't planning to do a cockpit view, as the cockpit is staying exactly the same as per the base Alpha. The only change is the paint. If you have any cockpit-related questions, I think Chris Smith would be the one to talk to. Let me know if you have any other questions.

MUSTANG delta

EXTRA AMMUNITION = 36 ROCKETS, 4 MISSILES

GURMUKH '14
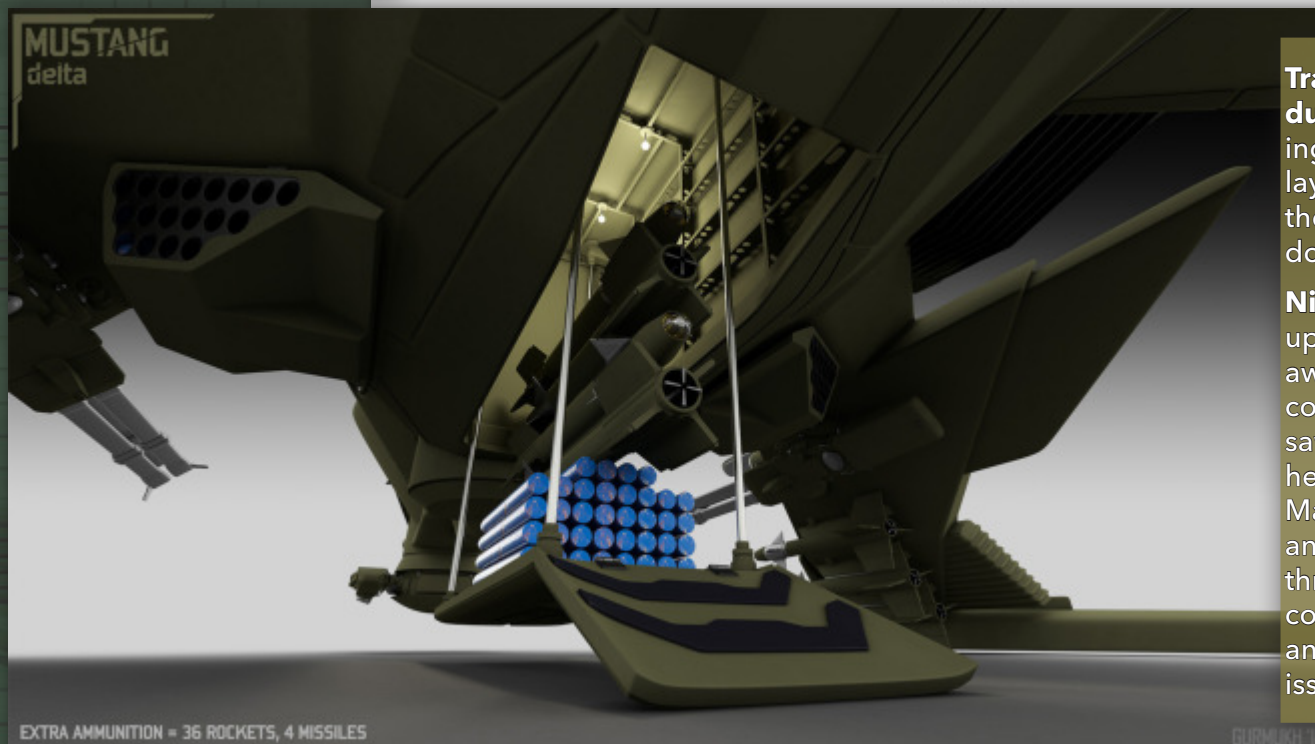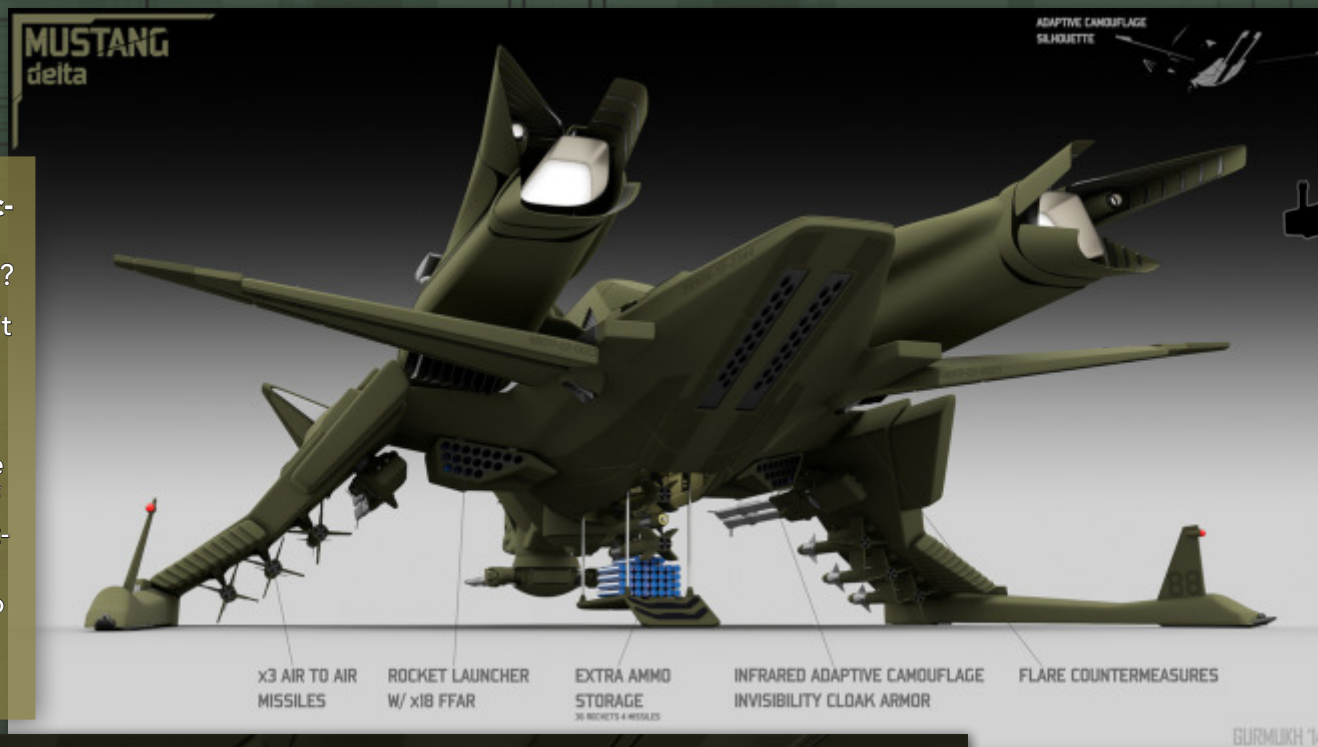
Travis Day, Associate Producer: Zane is currently working on a concept for the HUD layout in the cockpit, using the base model that has been done by Chris Smith.

Nick: Ah, right. Thanks for the update, guys. The ship looks awesome. I was just slightly concerned that last time I saw the cockpit, the pilot's head was touching the glass. Made me worried that any animation would push you through the glass. But after a conversation with Paul Jones and Andrew Ley, it seems that issue is in hand.

Josh Coons, 3D Modeler, ATX:
Art Model for Mustang Delta.

WORKINPROGRESS

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Chris S & Ryan: Finished Mustang Delta at war.

Mustang Omega

by ACCELERATED MASS DESIGN
MUSTANG OMEGA
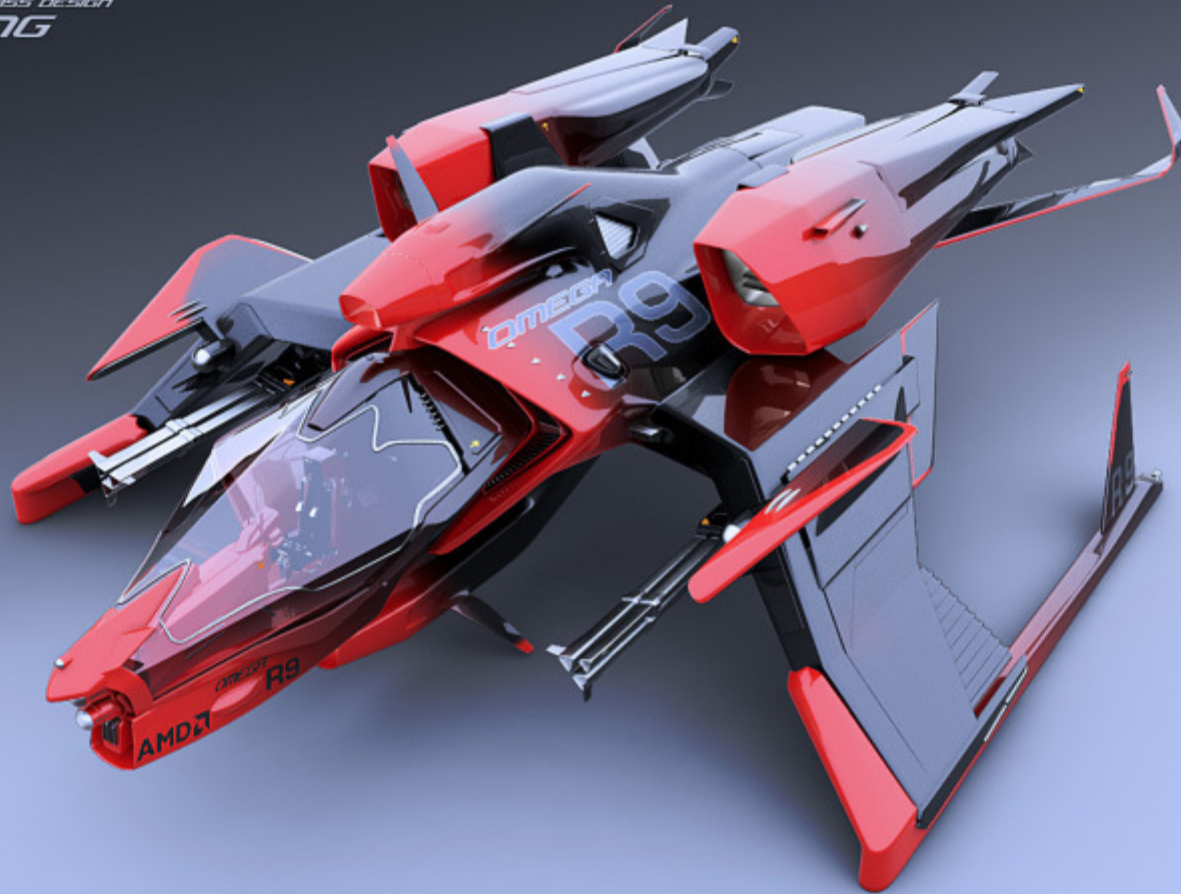
There's not a lot of difference between the Gamma and Omega – the main distinction is that the Omega has an extra fuel scoop, which means greater thrust over the long haul. This is Gurmukh's concept for the Omega; when the AMD Omega Mustang was requested, he worked closely with AMD on the colors and layout of decals. With the concept done, it was turned over to Chris Smith.

Chris S: Since all the Mustangs (including the Omega) share a lot of parts, it was logical to only replace the parts of the ship that are different.

So, the first part of creating the Mustang Omega involved identifying the parts that are different from the Mustang Alpha base. In this picture, I've highlighted the parts that were replaced by the Omega parts. In this case it was the cargo, body, tail rudders, tube entrance, front turret and nose/cockpit.
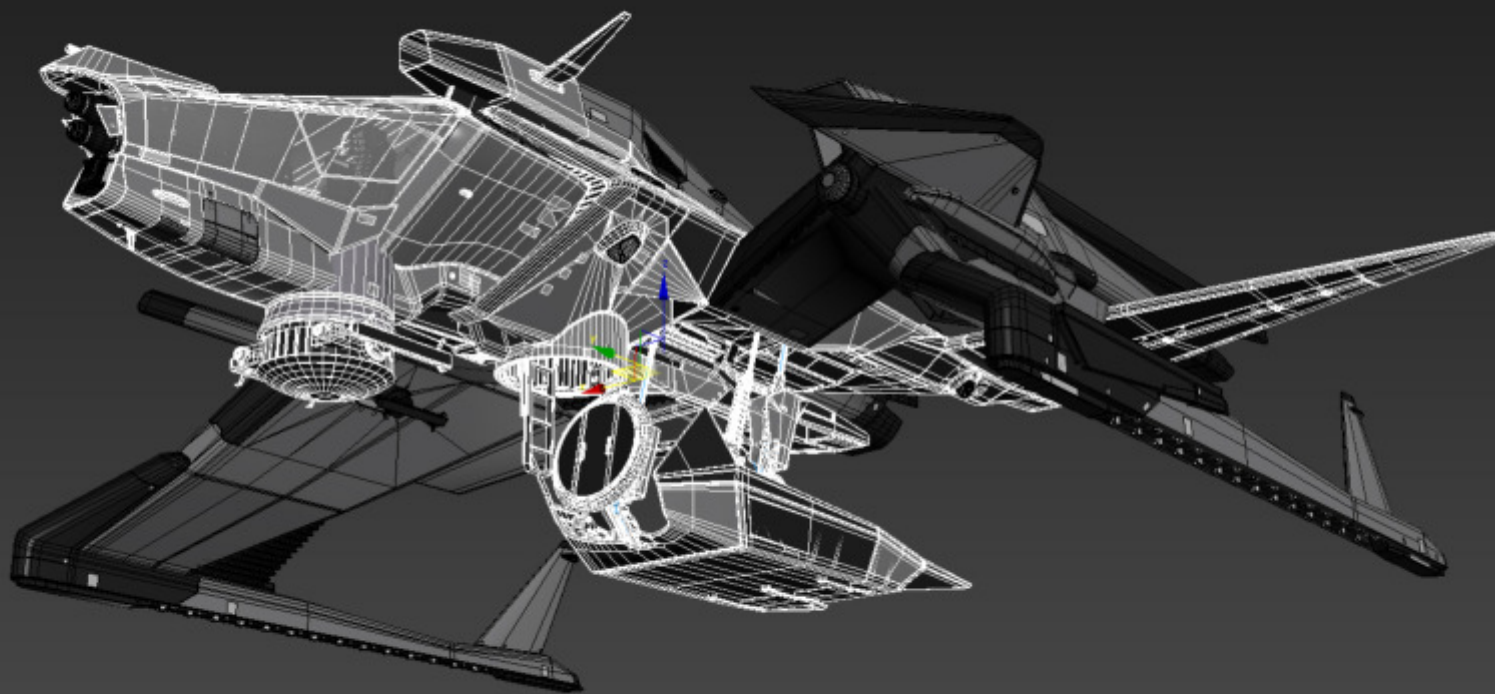
Chris S: The next stage was to model the actual Omega parts that would slot into the areas where I had eliminated the parts from the Mustang Alpha. Here is progress of the body, bottom intake and tail rudders.
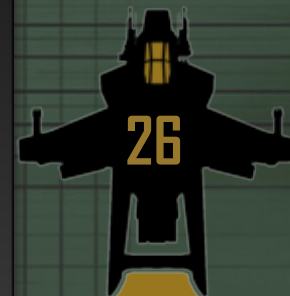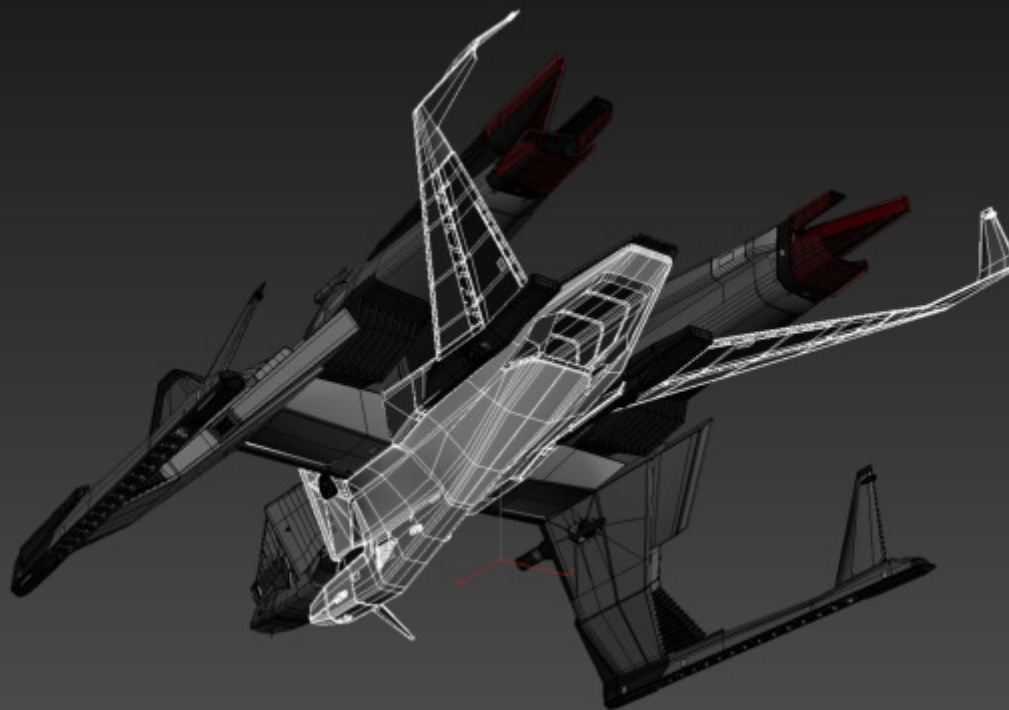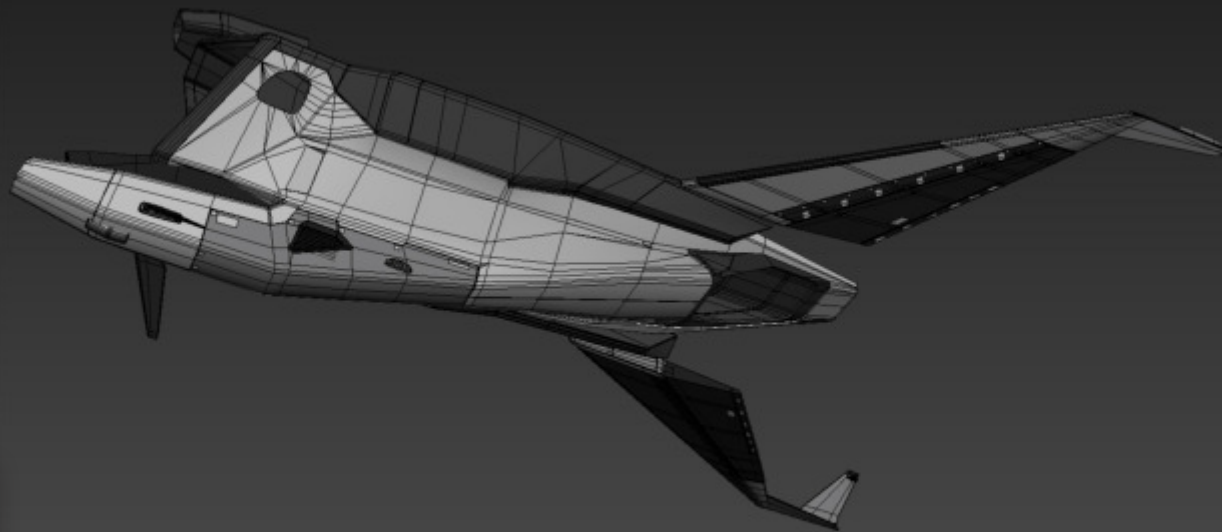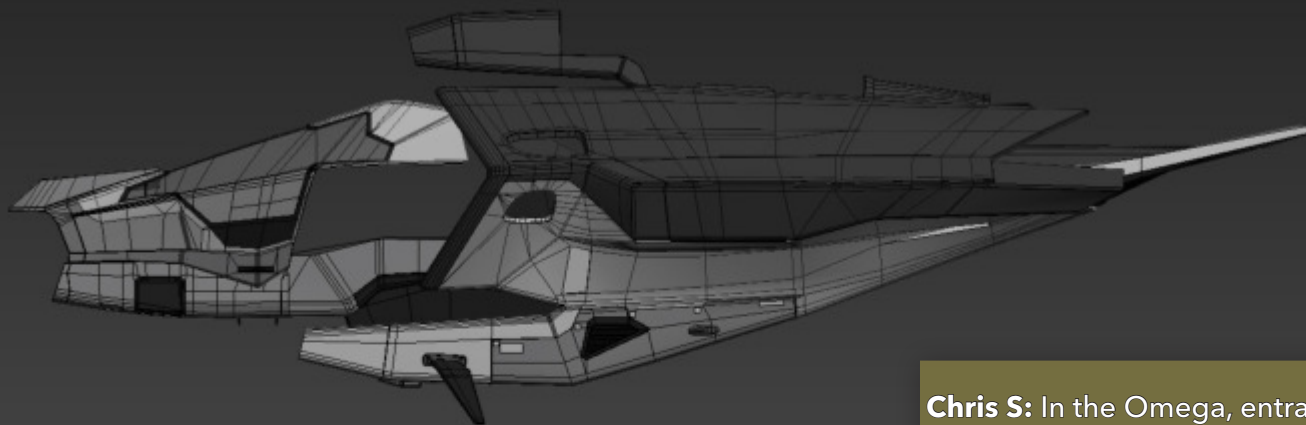
Chris S: In the Omega, entrance is through the front screen. Here are progress shots of the cockpit and ladder animation block-outs. This stage was more involved, as it included more animating parts and also reconfiguring how the pilot gets into his seat (as opposed to the Mustang Alpha, which has the tube hatch entrance.)
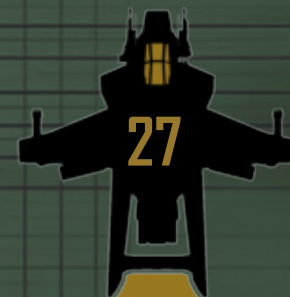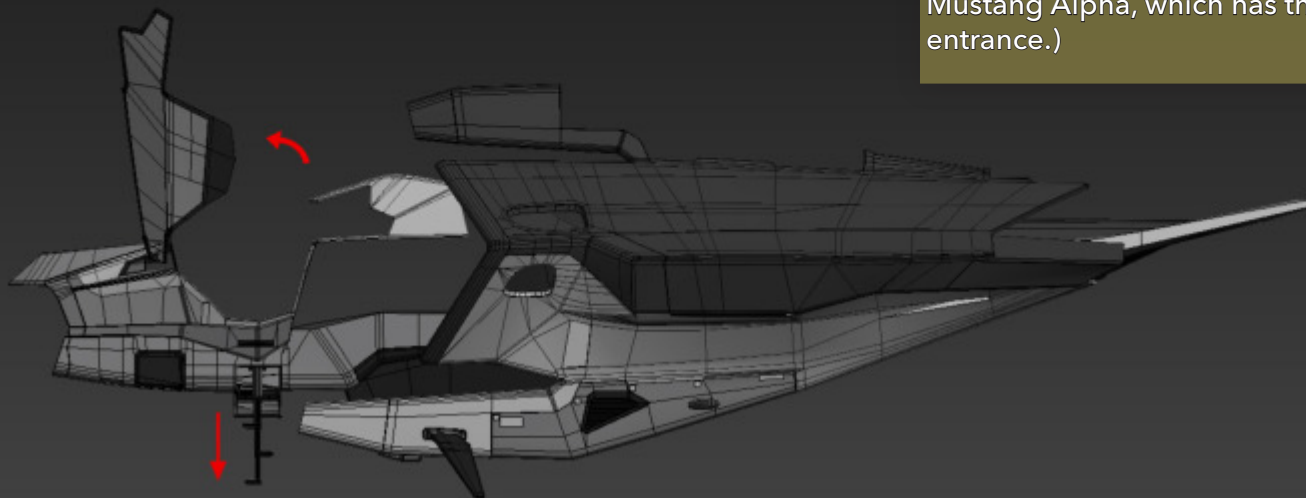
Chris S: Here are the Omega parts integrated into the Mustang.
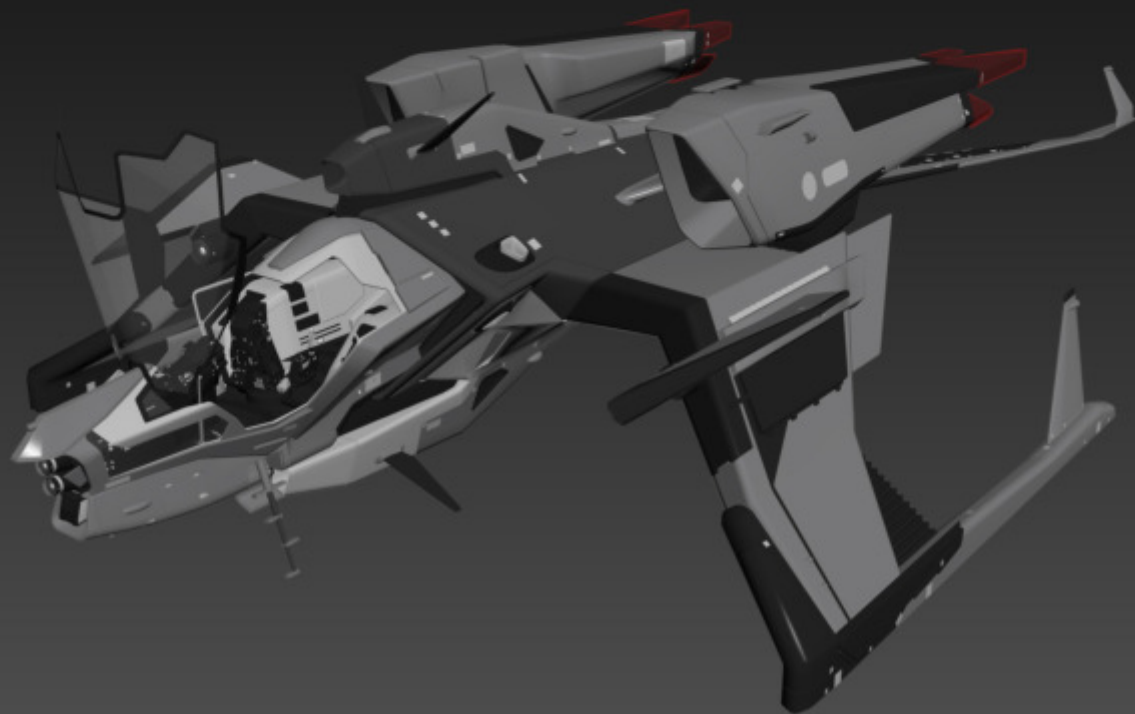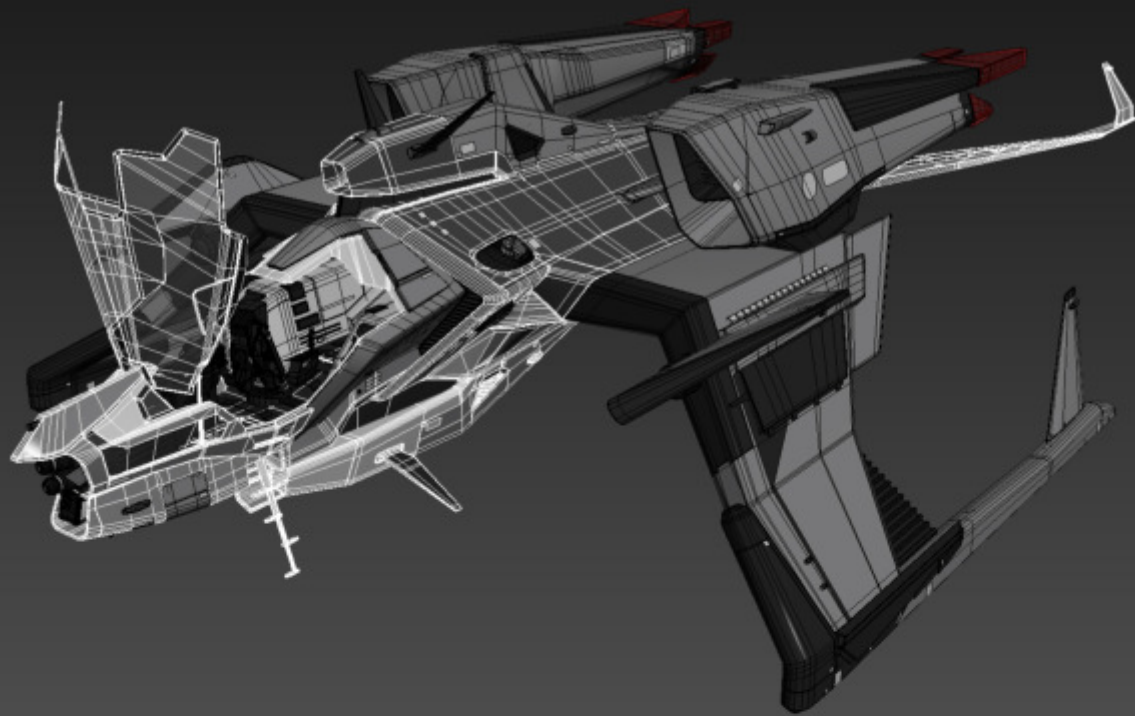
Chris S: After the modeling stage, the parts get UV'd and the existing base textures from the Mustang Alpha get reused on the new parts for efficiency. After that, we add the paintjob via a 2nd UV set and place the Omega decal set.

Chris S & Ryan: Finished Mustang Omega, leading at New Horizon.

WORK IN PROGRESS

AMD

ACCELERATED MASS DESIGN

Company History

Founded at the turn of the century, Accelerated Mass Design gained renown as a high-end electronics design and tuning companies. AMD has been responsible for dozens of commonplace (but disparate) technological items used in consumer spaceflight, as well as most recently the development of their own starship variant, the Mustang Omega.

In 2899, Sander Katt and a team of six other engineers left their design positions with Ayre Semisonic to form a new corporation focused on high-level design. In 2901, the company released its first product: the UE-9300 expansion card. Designed for near-absolute-zero operation, the UE-9300 was an immediate high-end replacement for the aging CarthSys Multidock, piquing the collective interests of both luxury and military spacecraft manufacturers.

For the first dozen years of operation, Katt's team dedicated their time to streamlining and increasing the efficiency of existing technology. By 2908, a specific bureau had been established for taking in other companies' standard production technologies and tweaking them past their design limitations. AMD-branded versions of ev-

erything from escape hatches to laser cannons became a sought-after accessory for ship owners of means.

In 2920, the conglomerate signed a two-decade development deal with Anvil Aerospace, providing high-level circuitry for a number of military spacecraft in exchange for exclusive branding. While initially considered an unusual deal for a company seeking to position itself as a civilian lifestyle brand, the value behind the agreement quickly became apparent as Anvil began to launch civilian-branded variants of their Hornet and Gladiator lines. AMD took in billions in revenue as Anvil ships spread brand awareness and a need for expansion of their technology support chain.

By the late thirties, however, the limitations offered by the Anvil deal had begun to chafe. The demand for F7C Hornets had overshadowed AMD's capacity to manufacture internal parts, leading Anvil to begin to source outside the company (as allowed by contract). Their brand began to be associated with subpar parts rather than top-of-the-line components, and all projections indicated that their own production could never keep pace with spacecraft demand. Ultimately turning down a massive offer to sign for a third decade, AMD threw caution to the wind once again, serving as a free-agent ship component synthesizer.

Racing Ahead

Seeking to renew their appeal in the youth market (and now free of their exclusive Anvil deal), Accelerated Mass Design teamed with Consolidated Outland in 2940 during the early stages of the Mustang development program. AMD financed a significant, undisclosed portion of Koerner's spacecraft prototyping, in exchange for exclusive branding rights to create their own dedicated racing variant of the ship.

The corporation embedded a pair of their top designers with Silas Koerner's Mustang team. Bryce Halliday and Jennifer Aykers, both hired away from MISC's auspicious spacecraft design bureau, sat with the Mustang team through every step of the spacecraft's design. Engineers involved report that the duo had a significant uncredited role in the creation of the Mustang lineup, although they were only technically observers. Halliday and Aykers spent four years 'roughing it' on the frontier, often finding themselves at odds with Koerner's demanding personality … but the results of their work speaks for itself.

On its own, the Mustang (which Aykers described in a dispatch as looking like a "battle butterfly") outpaces the Roberts Space Industries Aurora in over a dozen categories, chief among them speed and maneuverability. The early choice to lock down an exclusive racing version seems to have offered significant recompense: Mustangs are now the de facto choice of young racers, with the Gamma model alone looking to outsell the Origin M50 in its first quarter on the market.

The most notable feature of the AMD-exclusive spacecraft, dubbed the Mustang Omega, was the addition of a ramped-up fuel intake for faster hydrogen recycling. This allows the Mustang to 'double down' on the existing boost system, enhancing its overall straight speed. Some critics have claimed that the standard Mustang racer, the Gamma, is simply a 'cut down' version of AMD's Omega. The truth is that the Gamma and the Omega were developed independently, and the existence of the Gamma in the first place likely owes itself to AMD's desire to be associated with racing. (It is also worth noting that the materials cost of the enhanced boost system equal almost the entire hull of the Mustang Gamma.)

Further aiming to attract the younger, affluent spacecraft-buying audience, Accelerated Mass Design enlisted the efforts of underground artist Sektor8 to design a distinctive "cherry pie" red paint scheme that evokes nothing

short of the Origin M50, the reigning racing spacecraft. Seeking to brand the AMD logo as a lifestyle icon, the sigil is featured prominently on the spacecraft's hull. Sektor8 was paid an astounding three million UEC for the job, which he insisted be donated to an aquatic animal rescue organization on Helios.

A limited number of Mustang Omega hulls have been constructed, many of which have been seeded to top racing teams and (after a lengthy search) promising newcomers on the Murray Cup circuit. Both Accelerated Mass Design and Consolidated Outland are hoping that this investment will pay off in 2945, with the powerful new Mustangs poised to place highly in all major competitions. The only reason there isn't an Omega with a Murray Cup, a company spokesman recently opined, is because this year's contest hasn't happened yet.

The Future

The terms of the Consolidated Outland deal are unknown, but given the recent reappearance of AMD-badged missile pylon connectors it is likely they are not as restrictive as the Anvil contract. Industry rumors even claim that the company is strongly considering taking their experience with Consolidated Outland to the next level and designing their own spacecraft. Recent hirings, which have brought engineers away from both Roberts Space Industries and MISC, seem to support this idea. Could Accelerated Mass Design create their own kit spacecraft, or even a dedicated luxury vehicle produced in extremely limited numbers? Perhaps – the sky is the limit!

Bug-Hunting: QA

Before you ever see the game, Cloud Imperium's Quality Assurance (QA) teams are playing it, testing it, messing with it … over and over and over. With the launch of Arena Commander v1.0, we took a few minutes to talk with the QA teams from Austin and Manchester, plus the BugSmasher himself, Mark Abent. Of course, Mark isn't the only dev dealing with bugs, but he adds a bit of the dev perspective to our discussion.

JP: *First, to introduce everyone, what's your job title and how have you been involved in CIG's bug-hunting?*

Chris Hill: I am UKQA. I make the bugs.

Geoffrey Coffin: Senior QA. I've been working for Foundry 42 QA since May (Just over 8 months).

Glenn Kneale: QA tester. I've been a part of Foundry 42 for just over 3 months.

Andrew Hesse: QA Tester at CIG-Austin, started back in June of 2014.

Tyler Witkin: Austin QA. I have been with CIG since November of 2014!

Andrew H: He's new.

Tyler: *Pulls out new guy card* It's true.

Melissa Estrada: I've been a QA tester at Cloud Imperium Games in Austin since August 2014.

Jeffrey Pease: I've been documenting tech support solutions on our internal knowledge base, drafting test cases that we use to test various systems of the game, helping out develop some standardization for our QA processes, writing the patch notes for game releases that we have, and spearheading the testing of the new lobby system.

Justin Binford: QA Manager. I started working at CIG in May 2013 so I've been here for about a year and 9 months.

Andrew Nicholson: I'm another of the Senior Testers at Foundry 42, and I beat Geoff to the role by about 4 days (making me the most Senior of the Seniors).

Tyler: lol

Geoffrey: I'll tell Will on you now, Andy.

Andrew H: As far as being involved with CIG's bug hunting, as QA, we are the bug hunters.

Mark Abent: I'm a GamePlay programmer (also known as the BugSmasher on *Around the 'Verse*) at CIG in Santa Monica, since Sept 2013.

Tyler: "Bug Smashers!"

Mark: :)

Jeffrey: I'm staring at a graph of our player totals at the moment because I want to see how the lobby system behaves when the value gets higher.

Justin: My role is building the team and directing QA operations, which includes among other things bug smashing.

JP: *How did you get started with what you're doing, and how did you end up at CIG?*

Gerard Manzanares: I joined the team back in October of 2013. I was working from home for a few months due to the small size of the office back then.

My role here has been acting as QA Lead when needed. Focus testing Xbox controller and multi-clienting on the three PCs that I have at my desk. I also am one of the few testers that tests the game in the 5760x1080 resolution. And I also test the game using numerous hardware setups that are mostly AMD-based.

A PRIVATEER DOING HIS BEST NECROMORPH IMPRESSION, WITH BATWINGS AND ORANGE CLAWS

Justin: Yeah, the office was really small then. We were in the basement of a house near the University of Texas campus in Austin and we could not physically fit another person in there. Tom Davies, one of our engineers, had his desk in a walkway.

Tyler: I had the opportunity to work with Justin and Jeffrey at Blizzard Entertainment before coming on board at CIG. As the new guy, I am the largest target during Nerf battles.

Chris: I began my life as a music programmer for a sing&dance (which I heard did "ok"). I then spent two and a bit years at Traveller Tales QA'ing and doing audio on LEGO games (mostly). Then Geoff begged me to work cause I am cool … ok, I applied and got the job. :)

JP: *What's a "sing&dance"?*

Chris: Like *Singstar/Now that's what I call music* (the game)/*Just Dance*.
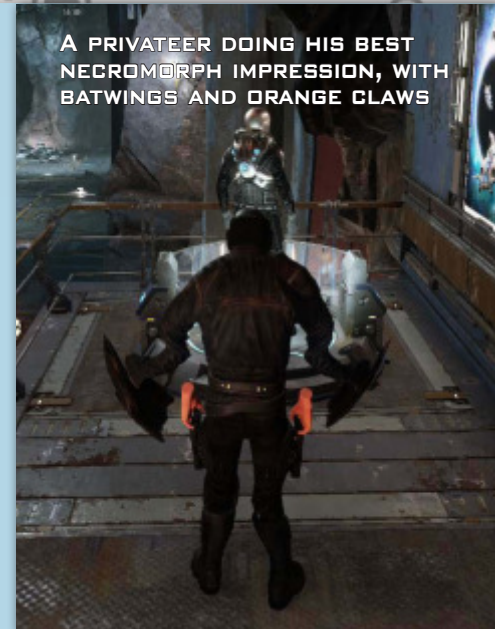
Geoffrey: I sold telephone insurance and figured I didn't want to be doing that, so applied to TT on a whim and got the job. I worked for TT Games (as many of UK QA did) for 4.5 years, decided I'd like a change of pace and applied to Foundry 42. Realising how cool this place is, I begged Chris to come here.

Jeffrey: Started testing for SCEA on PS3 *Warhawk*. After that I was involved in testing a number of games for SCEA over the course of two years before moving on to work at SOE. At SOE, I was an assistant QA specialist for the *Free Realms* MMO where I was the point of contact for anything relating to the pet system they had (kinda like what I do for the lobby system in *Star Citizen*). After SOE, I worked as a gamemaster at Blizzard for five years doing everything: compromises, scams, harassment reports, fraud, etc. I was also known for being the gamemaster that gave waffles to players. Then in August 2014, Justin and Gerard interviewed me for the position here, and waiting for the answer was the longest week of my life.

Glenn: Originally I applied along with Geoff Coffin and Andy Nicholson for a Senior role, but turned it down. Three months later a QA role appeared and I threw my CV in straight away. I had worked alongside UK QA at Travel-ler's Tales for three years, working as a standard tester and a Project Lead.

Mark: I started my programming and bug hunt addiction in the early 2000's modifications for the game Half-Life.

I was later seduced into working on a bigger full-fledged mod call *Black Mesa*, which turned into a recreation of the original *Half-Life*. The publicity from this huge project allowed me to land my first job at a small indie studio called New World Interactive, to work on a game called *Insurgency*.

I had to move to Colorado to work on *Insurgency*, but I wanted to come back home. So I looked for another job in Cali. I found *Star Citizen* and applied. It also helped I was a major fanboy of *Freelancer*.

Oddly enough, my old company, New World Interactive, shared the same office building with Illfonic.

Geoffrey: (As most of us UK QA are from TT, we may joke about begging each other to come here, etc., but we didn't actually – for fear of being accused of poaching staff!)

Glenn: Freaking loved *Black Mesa* Source!

Mark: Me three. :D

Melissa: I've been playing video games for as long as I can remember, and always knew I wanted to be part of the gaming industry. I got my first opportunity as QA at NCSOFT, where I worked on the MMO *WildStar*. NC-SOFT went through some layoffs, and shortly after I was in the market for a new job. I was really looking to work on another MMO project, so when Mark Hong, a former (and now current) co-worker of mine from NCSOFT, told me that CIG was looking to bring in more QA, of course I jumped at the opportunity because I really wanted to work on *Star Citizen*, and now here I am. :)

HEAD-TURNING
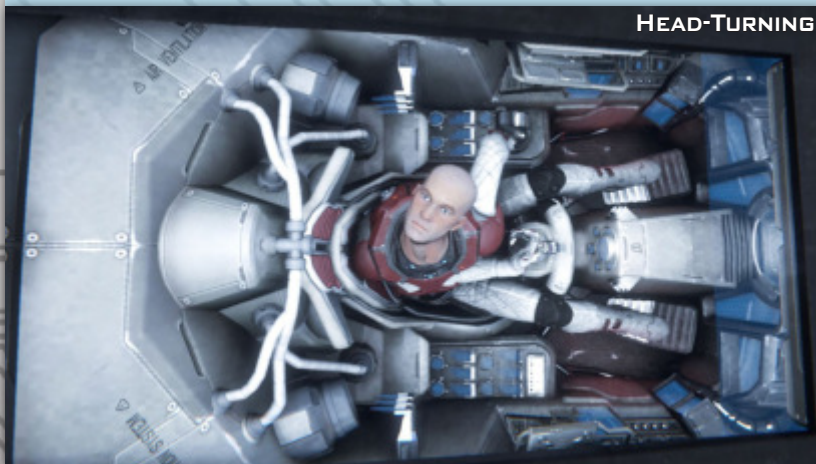
Andrew N: Like the others here, I got started in the games industry doing QA at Traveller's Tales, where I worked for 4 and a half years (the same amount of time as Geoff …). My background was Creative Writing at university, so I hadn't intended to work in this field and I consider myself to be very lucky to do so. The jump to CIG was a challenge I wasn't willing to turn down – I wanted a fresh start and honestly haven't regretted it for a moment. It was, however, a big step up joining Foundry, and there was an overwhelming amount to learn from Day 1, but it's been great so far!

Justin: Like Tyler said, I worked at Blizzard Entertainment as Customer Service. I did that for four years before leaving there to begin a QA role at Richard Garriot's Portalarium. After working at Portalarium I managed to secure a position at CIG doing Customer Service, with the intention of doing more QA work. This was before we had a live product. As soon as the hangar module was released I became full-time QA. I was the entirety of the QA department until I was able to hire Gerard. We joked at the time that once he was hired the size of the QA department doubled.

Andrew H: I took the long way around. I originally went to school for 3D modeling/animation, with the intention of getting into game development. After moving out to Austin in 2000 to start my job hunt, I took what should have been a temporary job at a printer (I thought I'd be clever and be able to print my portfolio cheaper). Then the dot-com bubble burst and the economy went down the toilet. Everyone was either laying off or in hiring freezes. My few friends that had industry jobs all said, "lay low … you don't want to be out here! Are you hiring?"

More than a decade down the line, I'd been following *Star Citizen* since it was announced, and back in January of 2014, I had decided I was done with the print/publishing industry, and if I was ever going to get back on track to get into gaming, I needed to do something about it. So, I wrote up a resume/cover-letter and applied to CIG. Didn't think anything would come of it, as there were no openings for QA posted on the CIG website, but figured it didn't hurt to apply.

Three months later, after a particularly soul-crushing conference call at my last job, I checked my email on a whim, and saw a message from Justin asking if I was still interested, and went from there.

Andrew H: there's never enough bacon.

Mark: indeed.

JP: *Bug-hunting, bug-smashing ... I suspect there's a more official term for this process. What is it? And what's your favorite unofficial name for it?*

Mark: Shit's broke, time to get the coffee.

Melissa: what Mark said.

Jeffrey: Ad-hoc or exploratory testing, test cases, white box, gray box, black box testing, regression. My favorite unofficial name would be lighting things on fire.

FISHING

Andrew H: Making devs cry.

Melissa: Adhoc testing, automation testing, regression testing, white/black/grey box testing.

JP: *What's regression testing?*

Justin: It's looking at a bug that is reported to have been fixed and verifying it was in fact fixed by testing it.

Tyler: The nail in the coffin for the bug's life.

Jeffrey: Regression testing is a really important part of QA because sometimes when something is fixed, it will break the systems that it interacts with so we make sure to test the areas of the game around what was fixed as well.

Tyler: I quite like the term bug smashing.

Andrew H: But we don't smash the bugs.

Chris: *looks away*...*looks back*... shit. It broke. Time to figure out what happened. :(

Mark: Bug smashing is the politically correct name.

Andrew H: That's Mark's job.

Mark: xD

Tyler: "Hmm, that's weird, it's working on my machine."

Mark: Whenever I get a message from Andrew, my first thought is ... oh no ... what's broken now.

Andrew H: :)

Justin: We spot the bugs. Once they are smashed, we verify they are indeed smashed.

Geoffrey: On a serious note, we just tend to call it bugging.

Mark: The worst bugs are when you guys claim it exists yet my PC shows otherwise ... cough ... xD

Helmet aimed a little too high

Andrew H: haha

Melissa: Yeah, I can't think of another unofficial name that hasn't been mentioned.

Andrew N: Let's not forget Quality Assurance!

Glenn: I've always used the term bugging.

Andrew N: We're doing a service for the public.

Melissa: "It works on my machine."

Mark: ^ famous last words

Justin: "It works in the editor."

Andrew H: "Hmm, that should work."

Tyler: "That's strange."

Jeffrey: "Is this the fake meeting?"

Gerard: lol

Melissa: "Weird."

Geoffrey: I like it when the devs have got it 100% working, then you call them over and watch that wave of depression wash over their faces.

The Mustang senses its prey.
(see p. 48)

JP: *Y'all do realize that devs will be reading this, don't you?*

Mark: <-- dev

I am taking all the notes.

Geoffrey: In that case, I hate it when that wave of depression washes over a dev's face. Sometimes.

Andrew H: Hey, who let a dev in here?

Gerard: "You guys sure test in third person a lot."

Tyler: lol

Mark: lol

JP: *How about white-box/gray-box/black-box testing? What are they, and what's the difference between them?*

Jeffrey: Blackbox would be like sitting someone in front of a game console and telling them to break the game.

Whitebox testing is not the same as the term that is used for game design. It's where the people doing the testing have access to information that lets them see 'under the hood' of what's going on in the game to have a better understanding of what's going on when something breaks.

Justin: We do it all here at CIG. Whitebox, greybox and blackbox testing.

Jeffrey: Graybox is somewhere in between the two and defining it is kinda ... gray.

Andrew H: ba-dum tish.

Chris: grey* ;)

Jeffrey: I will hit you with a newspaper. Both of those are correct spelling.

Tyler: Ha! We just had the argument over how to spell "grey." Apparently I am un-American ...

Mark: They spoke not wrong.

Jeffrey: Google told me that "gray" is typically used in the U.S. and "grey" is elsewhere.

Melissa: Me too, I've always typed "grey."

Justin: Same here; "grey" all the way.

Andrew H: "Blue."

Tyler: Democracy says it's "grey." Sorry, Jeffrey.

Jeffrey: Pfft. We aren't a democracy. We're a business.

Glenn: I learnt them in University but never once have I actually heard them in the industry unless I'm being interviewed to make sure I'm a legit tester.

JP: *Let's go somewhere a little less gray. Step me through the process – what do you do to find bugs, what happens when you find one, and how do you take care of it?*

Glenn: Fob it off to Simon.

Andrew H: That sounds dirty.

Glenn: NO!

Melissa: xD

The Mustang strikes ...

Jeffrey: There's two main ways to find bugs. Test cases and exploratory testing. Both are important and help find things that the other won't. Test cases are mainly used to check the integrity of the game and make sure that we cover all of the content. Exploratory testing finds the more creative bugs, like a Constellation needing to visit its people by exiting through the hangar roof. When we find a bug, we have to not only document what is happening, but how to get it to happen as well. If the developer we're communicating it to can't get it to happen, it's a lot more difficult to fix. An easy way of defining QA's purpose would be that we're here to document anything in the game that has an unintended result, and we want our database to be representative of all issues that are currently occurring in the game.

Chris: Easiest bug I have found: smashed face into iPad; application crashed. Other bugs can be harder.

Tyler: It largely depends on the type of testing we are doing. If exploratory testing, then you just use your instinct to try to break things. If you are doing structured testing, then you will have checklists to go through to meticulously make sure everything is working. Once you find a bug, you will want to search to make sure that it has not already

been reported. Once you have verified it has not, you create a bug report and prioritize the bug.

Tyler: Also don't forget the step where if the bug is absolutely epic, you have to share it with your team.

Andrew H: Yeah, most of the time, you can find a lot just by walking around playing the game and clearly seeing something is wrong. But exploratory/ad-hoc testing, where it's more like "ok, turn QA loose and see what they come up with," is more fun. It's more about trying to think of devious ways to break the game. Or sometimes just noticing that something "feels" wrong, and then digging deeper until you find it.

Tyler: "Guys come look!! I have no head!"

Justin: Once you find a bug, one of the most important things to have are clear reproduction steps.

Chris: I was taught the two main strategies: play like the end user (great for end users), play like a toddler (great for stability).

Geoffrey: Hammering the buttons repeatedly is a great way to find bugs too; just muck about with the keyboard/controller and see if you get a result. Then you've got to make sure you can reproduce the issue, though.

Tyler: Exploratory testing is an art form.

Andrew N: I always run left instead of right.

Geoffrey: One of the most important things a bug needs is a screenshot. The most flowery prose in the world isn't quite as useful as having a picture that can instantly convey what you're trying to show.

Mark: Videos! Screenshots are awesome, but videos are a dev's best resource.

... AND CELEBRATES ...

Andrew H: Yeah, videos of everything.

Geoffrey: Videos need to be opened though. I've had people complain about a lack of screenies before. Vid+picture seems to be most popular.

Justin: Once a bug is found, it is logged in our bug tracking software. We currently use JIRA.

Glenn: In my experience, it's usually down to a task I've been assigned or just generally destructive testing. Some times it can be "In yo face" unavoidable or you can get tricky and work towards causing a problem. Once found, it's a cases of writing up a report with the correct information provided and attached.

Glenn: Those usually go to production and are then assigned to a dev.

Tyler: Once a bug is discovered, it is assigned to a specific producer who specializes in that aspect of the game. The producer is then tasked with assigning it to a developer who can begin the smashing.

JP: *I've heard the term "smoke test." What is that?*

Melissa: Pretty much just think of any ridiculous way to break the game in a way that a player might. If you've ever had a "what if I do this" moment then you should do it, and take note of what happens. In most games you would walk forward when you first enter the game world; what if you turned around and walked backwards? Would you fall through the ground? Would you bug the introductory quest, etc. If we find a bug we make sure to get solid reproduction steps, create a bug report with as much information as possible, and send it to the devs for further investigation.

Tyler: Contrary to popular belief, it does not involve a smoke break of any kind.

Glenn: Smoke testing is usually a case of ensuring everything on a critical path works, along with anything encountered.

Andrew H: It's a basic "sanity check" of the game. Ensure that you can get into the game, and verify that the basic functionality is there. You can launch it, load into a hangar, and get into a game of some kind, and actually play it.

Glenn: Ships, levels, booze cabinet.

Jeffrey: Ideally it's supposed to be a mid-duration test that gauges the general health of a build. The meaning of the term can vary between one company and the next. It's called a smoke test because it tends to be used to see if any of the major systems are on fire. A shorter duration test would be called a sanity check and a longer duration test would be something like a full complement of test cases to cover all the game systems.

Currently, there's so much content in the game that our smoke test has gotten a bit longer than it should be. :P

Justin: Where there is smoke, there is fire.

Tyler: ^

Glenn: ^ I just learnt stuff.

... AND THEN DISAPPEARS INTO THE NIGHT.

Geoffrey: Smoking is generally blitzing through a game, making sure everything works at the fundamental level. Levels load and complete, ships fly/get blown up, hangars display ships correctly, etc. No real in-depth testing going on there, as you're trying to check everything.

Melissa: Smoke testing is mostly done with checklists and fixed test cases. Everything from each individual ship, flair item, hangar, game modes, and all other systems within the game is checked to make sure that all their basic functionality is in working order.

JP: *How is the CIG process different from how you've worked in the past?*

Tyler: One of the things that I love most about how CIG operates, and this is even outside of just testing, is the level of transparency. We have such a high level of interaction with the community via the chatroom, forums, etc. that it really feels like we are working hand in hand. Another great example of the transparency is the "Bug Smashers" clip that Mark Abent does in *Around the 'Verse*.

Mark: *SC* has lots of complicated and complex systems that can break on a dime. You have to be very, very careful what you touch, otherwise you will get a ton of JIRAs from QA about the things you broke by implementing new feature X.

Geoffrey: It's less structured. The work we come in to every day can vary wildly. You can't really plan for sure to do a smoke on day X because a new important task might come through. At the same time, we're a lot more freeform: everyone in the department can be an individual and focus on individual aspects of the game to take under their wing. There are a lot of ways that an individual's skills can grow here, too.

Gerard: CIG is extremely fast-paced. Quick iterations, constantly. I've also never tested dev/editor tools before. With having the UK studio, it's even faster because there is almost 24 hours of dev time. Which means 24 hours of possible bugs that were added to the game. :P

Glenn: Previously, I found testing to be a rut managed by test cases. The design of the titles didn't vary, so the testing didn't need to. At CIG, things can change quickly, so the testing seems to change and adapt to that. I find I'm always learning something new. Also, this company's testing methodology is much greater than my previous experience, even causing me to enter the editor and so on.

Yes, it's gone.

Jeffrey: We're smaller and less formal. More fluid, which makes it a lot easier to give feedback to help improve how we do things. There have been things about previous jobs that I didn't like, that I have a chance to try and prevent from happening here. For example, communication between QA and Customer Service wasn't too great at some places I've worked, so I am trying to keep in touch with them as much as possible. Our small size also makes it easier for me to be able to take on side projects and use all of my skills to their fullest, which I really appreciate. We have to wear a lot of hats for the time being, but once we get bigger, we'll have to specialize. Since we're less formal, we can be less efficient in some areas, but that's something that will improve in time.

Justin: At CIG, QA works very closely with development. There is not a wall between development and QA.

Tyler: As far as the QA team goes, we have the opportunity to do a lot more than the average QA tester usually does. There is a lot of opportunity to learn and grow individually, and as a team. CIG is really good at utilizing individuals' strengths and passions.

Andrew H: Even though I previously worked on vastly

different software, I can't say it's all that different from how I used to work. Software is software, and it can all be broken with a little creativity. My biggest difference is that I no longer have to do 3+ hour conference calls, and I'm a lot more interested in what I'm doing. :)

Melissa: It's much more involved. We get to test the actual game engine and we work closely with the developers. We're also asked for feedback on a regular basis, whereas in my last QA position we only did black box testing with set test cases, and everything was very rigid and structured. There also seemed to be a wall between us and the developers, so we weren't as involved in the actual game creation process. We don't have that CIG. The devs are always available to assist us when needed. ^_^

Glenn: It seems the testing here is composed of everyones' positives from previous employment.

Tyler: I agree with what Justin said, especially. There really is no wall between QA and development, which allows us the opportunity to really make an impact on the game.

Glenn: ^^ DAT YO.

Mark: The LA office is one of the smaller dev teams, compared to the Austin or even the UK office. So we have a very open relationship where we can walk to each other desk and ping pong ideas back and forth.

However, communicating with the rest of the team is just as straight-forward, except you use Skype or email. I can freely ping Andrew about a bug he found and he will be more than happy to give me all the details or help me try to replicate it. I do not have to go through some bureaucracy layer like most game studios when I need to ping other developers. :D

Andrew H: Yeah, knowing that your feedback will be read and considered really means a lot.

Melissa: ^this

Glenn: especially this ^^

Mark: Indeed.

Geoffrey: Agreed.

Andrew N: That transparency really is the key difference for me. As well as allowing us to work closely with the people who want to play the game, it makes the whole working environment more fun than any job I've had before. SEND US MORE SWEETS PLS

Justin: Melissa highlights a good point. Chris Roberts really listens and acts on feedback from QA. Not only do we make sure things are working, but we can provide our opinions on aspects of the game and it can be pretty fulfilling to participate in the direction of the game in such a way.

Mark: It's also awesome to have QA because we poor devs can implement something from a designer and we have no idea if it's fun or not. QA will give it a try and provide suggestions which help improve the experience. :D

Though sometimes Andrew just slaps me and goes, "what where you thinking?" j/k

Jeffrey: No, he really does that.

Andrew H: haha. I try not to use the back of my hand.

Glenn: We also get thank-you emails.

JP: *So far, you've mostly been testing the ship-to-ship system. Have any of you spent much time testing the FPS? If so, how is that different from ship-to-ship?*

Geoffrey: Glenn's our resident FPS master!

Justin: Before Glenn it was Matt Webster. He did such a good job he's a producer now.

Mark: By the end of the year we may no longer have QA, as they would all be promoted.

Jeffrey: I haven't touched it much, but I've seen Andrew Hesse and Melissa fighting one another and cussing up a storm. Usually if a shooter game can make someone cuss, they're having fun.

Andrew H: Melissa and her damn holograms ...

Tyler: It was hilarious. You could hear Melissa and Andrew yelling and laughing throughout the office. People kept walking over to the QA area and saying "What's going on in there?"

Glenn: Well there was no ship, for a start. :D

It wasn't massively different. The fundamentals were the same. Testing if the character works and functions is much like testing ships. Characters in any FPS have a HUD system much like our ships.

Andrew H: Anytime you get your hands on a new game mode after you've spent months on the same thing, it's always a welcome change of pace.

Glenn: I sure am.

Glenn: FPS does have unique features though, that change the way battle is fought. That made testing pretty fun.

Justin: The studio creating FPS, Illfonic, has one dedicated QA, Russ Peterson. It is really helpful to have at least one dedicated tester continually testing FPS. He is doing a great job. He will send out periodic updates reporting the status of the FPS module.

Glenn: Good old Russ.

Melissa: Andrew and I have tested it, and it's really fun. There was one day where we had downtime to test FPS, which was a really nice change of pace. It's different from ship-to-ship in that you have to change the way you think because you're against a player on foot vs. a player in a ship.

Andrew N: It has unique features and a unique feel – it doesn't feel like a cut-out-and-paste FPS game. So I'm actually looking forward to testing it more.

JP: *Are all the bugs fixed when each version is released?*

Geoffrey: No.

Tyler: No.

Andrew H: No.

Melissa: NOPE!

Geoffrey: Next question.

Jeffrey: As a business, someone has to make a choice whether fixing something is worth the amount of money it will cost. But even more so, our game is still being developed and it's actually more efficient to leave some things broken while we're developing the game because some of the new technology we develop can end up fixing things in a much cleaner way. If a studio fixes all of the bugs that are in a game, they will go bankrupt because they won't be able to make content fast enough to keep their money coming in.

Mark: You can have 100 bugs, and only 1 gets fixed in the next release. Some may take 5 minutes to fix, while some may take weeks.

Tyler: Fixing bugs is an ongoing organic cycle that never really ends, especially in a game that is continuously producing new content.

Gerard: No. We end up having to go through the entire <open, but not resolved> bug list and then cherry pick the ones that we feel really affect the user and need to be fixed before release.

Stretching out

Mark: It not only depends on how quickly a developer can determine what the root of the problem, but also how long it takes to implement the solution.

Andrew H: There's always a bunch of things that just can't be fixed in time. At some point the producers will have to prioritize which ones are the most critical. There's always going to be those "but it will take five minutes to fix" bugs that get through simply because the people fixing them have about fifty other "it only takes five minutes to fix" bugs that they have to take care of.

Geoffrey: We generally try to fix up the majors – the showstoppers and anything related to any new ships we're trying to put out (so when the Cutlass went out, many minor Cutlass issues that might have otherwise been ignored were fixed up). The problem is, fixing a bug can provide knock-on bugs. So we generally fix what needs to be fixed and add a small amount of quality of life fixes.

Melissa: There will always be a way to break something; it may not be obvious at first, but it's there.

Glenn: Production tend to discuss priorities and severity with us but ultimately it's their call.

Andrew H: Sometimes bugs linger for months simply because, while yes it's obvious, and annoying, it isn't as bad as some of the other things that people haven't seen.

Geoffrey: It's nice to get to sit down with production and get to help choose what needs fixing for a version and what doesn't.

Glenn: Geoff likes the power!

Tyler: There is a balancing act that has to be done. You have to prioritize and weigh the community impact a bug may cause. We want to get the players' hands on the game as quickly as possible, but you also want a high quality game.

Justin: Definitely not. We are still in a very early stage of development. We try to ensure all the major bugs are resolved that would hinder gameplay, but since our team overall is still relatively small, we need to prioritize a lot. We also utilize the community as much as we can. They

TWISTER

have been incredibly helpful in pointing out all the bugs that are in the build after it ships. Then we can focus on polishing with further updates.

Geoffrey: It's just nice to say "No, don't fix this be-

cause X," instead of having an inflexible high up demand it has to be done for an unknown reason.

Justin: The plan is as our team grows, we will have more resources for bug fixing, and eventually releases will be more polished.

JP: *What's the most irritating bug you've had to deal with?*

Andrew H: The Hornet nose landing gear being up in the hangar is currently driving me crazy. It's also a dreaded "Release only" bug, so it looks correct in the developers' version of the game, but every time we get a new release build, its still there ... or rather, not there.

Jeffrey: I'm the kind of person that likes to play support classes in games I play because I enjoy helping others. QA is very much a support role so it fits me really well. So the bugs that irritate me the most are the ones that prevent players from being able to play the game. We had a bug a few months ago where accounts that had specific ship load-outs granting them a loaner 300i wouldn't be able to load into the game. Naturally, I wanted to get this fixed because I want our players to be able to happily kill one another. But it turned out to be more of a complex issue than one would imagine, and took a good deal of people looking through the game code to find out what was causing the issue.

Glenn: No helmet during HUD sweep. URGGGH, MY DAYS!

JP: *"HUD sweep"?*

Glenn: Simon and I were tasked with ensuring all ship HUDs were functioning properly. The HUD was attached to the helmet at that time. There was no helmet. :'(

Geoffrey: Network latency where ships would rubber band for an unknown reason. We were given so many pieces of software to try to isolate the issue, but no-one really knew what was causing it. And it lingered for so long.

The rubber banding made the game a real hassle to play, as well.

Geoffrey: That was in the early days of *Arena Commander*.

Tyler: I think any bug that returns from the dead. You find a bug and report it, it gets fixed, and then like five builds later it randomly returns for round two.

Andrew H: The pause that occurs when players respawn in multiplayer ....

Geoffrey: Essentially if a bug lingers for more than a month, it's a candidate for "irritating."

Justin: For me it is all the small moderate or trivial bugs. Sometimes the way things are prioritized, these issues can end up not being fixed for some time. Most of which are really quick fixes. It can be really frustrating knowing a bug is in the game for months when it can be fixed rather easily.

Melissa: The most irritating bugs are timing bugs. Where it only happens at one specific exact moment, making it very difficult to reproduce. But then it will magically repro on its own when you're least expecting it and don't have any kind of video recording program set up to record at that exact moment.

Glenn: There was a lot of fixing and ideas which changed many things during that HUD sweep, which lead to it being two weeks late.

Glenn: I'd close my eyes at night and see stalker missiles turned off and power triangles.

Melissa: lol!

Andrew H: Ugh ... I had a similar issue after my trip to LA .... Xml ... xml everywhere ...

Glenn: HUGS

Tyler: Andrew Hesse: Quality Assurance Balance Designer.

Mark: The player standing up in his seat after reviving. This was a network issue that took weeks to track down with a number of developers. The bug resulted in the way we handled player respawning and ships' seating. Depending on the order of the packets, the player animations would reset before or after the player is in the seat. If the packet happened after sitting, then the player would be in T-pose and would appear to be standing in his seat.

Mark: Landing gear. I swear this breaks every other patch.

Andrew H: Fix!

Tyler: Any bug on waves 6-18 of Vanduul Swarm.

Melissa: haha

Andrew H: haha

Tyler: Creating reproduction steps for that can be ... a bit time-consuming.

JP: *Because it takes so long to get to that point to reproduce or check it?*

STANDING TALL

Tyler: Yes, exactly. Let's say a bug happens on wave 13. Well you have to manage to get back to wave 13 to make sure you can reproduce it. Sometimes you die on wave 12 and have to start over. Oh the rage ...

Mark: Any bug that happens only on the release build == nightmare.

Justin: Also any bug that is a result of a race condition. A race condition bug is something that is caused by things happening or loading in the wrong order. This can happen because the developer build has a lot of debugging enabled. The release build does not have this debug code, which results in the release build using less resources and running and loading things much faster. This can result in things happening in different orders that the developers did not expect. These race condition issues can be particularly difficult for developers because they are not readily set up for the release client and end up having difficulty reproducing these issues.

Geoffrey: For an alternate take on irritating, I nominate the players that abused ejection not taking a life in Vanduul Swarm, then commenting about how easy the mode was. Grr!

JP: *How about the most amusing bug?*

Andrew H: for me, it was the Constellation flying out the back of the hangar. You would "use" the elevator of the Constellation to try to enter the ship, but it didn't appear to do anything. Just looked like the elevator didn't work. However, if you waited for a minute and 30 seconds, the Constellation would fly out the hangar backwards.

Jeffrey: The Aurora had this funny collision issue with its cockpit that allowed for things to clip through the glass. Well, one day, I collided with a Vanduul Scythe and got

Bladed Aurora

its ramming blade stuck in my cockpit. I swapped to third person and I had basically become an Aurora running around with a sword. One of the UK guys took the video I made and put some Final Fantasy combat music to it because it really did look like the Aurora was running around with a bastard sword.

Tyler: There was a bug that I will let Melissa tell you about, as she is the one who literally got eaten alive by it. That bug is definitely one of my favorites.

Melissa: The Mustang Beta seemingly "came to life" and started moving on its own the first day it was in the Hangar. I was standing next to it one minute and the next minute the cockpit was moving and turning toward me ... I backed away and around it slowly, but it wasn't stopping. I walked up closer to it out of curiosity and the cockpit abruptly turned and devoured my character, then the cockpit disappeared. It was the most bizarre and hilarious thing I have ever seen … and sadly, I have not been able to repro it ever since.

Geoffrey: Ship boarding, where you could eject and land on another ship, then get inside it by pushing yourself through the roof.

One 300i; three pilots

Geoffrey: Or going for a sleep in the back of an Aurora, then loading into *Arena Commander* still sleeping in the back of the Aurora.

Glenn: Andy (using TrackIR) could see through his own head and stare at his tongue.

Gerard: The buggy moving on its own. That was pretty good. You would wander around your Hangar, then it was like a meta game trying to find your buggy because it's not where you parked it.

Justin: For awhile, the buggy had a mind of its own. At first it would slightly move. The bug got passed around between studios and engineers for awhile. Eventually it got worse and when you logged into the hangar you would immediately see the buggy fly up in the air and flip over. It was pretty funny.

Mark: Damn that sliding buggy.

Mark: In the early days you could shoot off every bit of a ship and just leave the items such as thrusters ... so you would just be a character on a chair with a bunch of weapons and thrusters moving around.

Glenn: For me, turning off most of the Avenger's components and sneaking up behind Geoff, only to power up and annihilate him. He was not pleased.

Justin: Another amusing bug was when we first started populating ships in the hangar, we found we were able to actually fly them around in the hangar. That was fun.

Mark: Our physics programmer, John Pritchett, was working on IFCS one day and was wondering why ships were moving rather sluggishly. He was joking that it felt like the ships were underwater … welp … he did some debugging and found out the engine was forcing certain physics properties on the ships that made them act like they were underwater. xD

It's hard to fight from the bed of an Aurora ...

... but the view can be pretty nice.

Justin: I found in the older hangars if you used the buggy and bumped a barrel into a Hornet, it would cause an explosion. We got a kick out of that one too.

JP: *What are the best and worst features about helping to kill bugs?*

Geoffrey: Best: We get to make the game better for our (frankly awesome) public. It's nice to see how well new patches go down. There's also an intense sense of satisfaction to finding a really interesting or tricky bug.

Justin: The best is knowing we are helping improve the game. We are all fans of the game and genuinely want it to be the best damn space sim ever.™

Glenn: Best features for me are just closing really annoying issues and knowing the game is progressing that step further.

Worst is if you suck at racing (This Guy) and the Avenger is no longer indestructible …

Melissa: Best for me would be finding them and once they're fixed it feels like a win and we just made the game that much more polished. I also really like the feeling of making the players happy when a rather irritating bug is

SPACE
BUGGY

"GUYS COME LOOK, I HAVE NO HEAD!"

finally squashed. Worst is when the bug is really awesome and you know you probably should report it, but the bug is so good you want to keep it in the game.

Andrew H: Best: what they said.

Worst: when a bug just refuses to die. Or you know something happens, but you can't find a way to repro it at will.

Geoffrey: Worst: When a patch goes out with problems and there's backlash. We put a lot of effort into the patches and it's always a bit disheartening to see a negative reaction. Also when you try to abuse a bug for a cheap kill/exploit and it's been fixed.

Glenn: ^^ Geoff's nailed it.

JP: *Melissa, what bug(s) were you tempted to leave in the game?*

Melissa: Things like taking non-flyable ships/vehicles into *Arena Commander*, such as the buggy or the Constellation before it's ready to fly.

Tyler: I agree with Geoffrey on that for sure. The feeling around the office on release day is electric! Getting to see things that we have been testing over and over for months finally get into the community's hands is a great feeling.

The community's excitement is what really recharges the ol' battery and makes all the overtime worth it.

Justin: The worst would be working on a particular issue for some time and after multiple fix attempts it continuing to rear its ugly head. But it also makes it that much more satisfying when it is finally smashed for good.

Tyler: ^ Definitely

Tyler: Some bugs just don't know how to die.

Gerard: Sometimes, we fix a bug and verify that it was fixed (regressed) prior to the public patch, then find that after we push that exact same build, the bug is present again!

Jeffrey: It's like playing a game that is never the same twice. Every day we come in, things will be anywhere from slightly different to totally foreign. Being able to not only see the game evolve, but to be part of the team helping it along is an awesome experience. The worst part is probably testing all the chairs. Sit down, get up, sit down, get up. Imagine what that's going to be like in our bigger ships?

Andrew H: ugh … beds and chairs …

Justin: The Bengal has 900 seats …

Andrew H: A bug that was tempting to not report: the flying space crab …

JP: *The flying space crab?*

Melissa: Oh yeah, for a while the crab was missing from the fish tank, and then out of nowhere it would just waltz back into the Hangar.

Melissa: and back into the tank.

Melissa: Should've left that in there …

Jeffrey: We should have a music track called waltzing space crab.

SPACE CRAB WALKABOUT

Mark: Yes.

Andrew H: The space crab from the fish tank had its idle animation swapped with the walking animation from the Constellation cutscene. So it would spawn at the 0,0,0 coordinates of the map, and then proceed to "walk" to the fish tank even though it was hovering about 10 feet in the air. I opened a set of doors in the asteroid hangar expecting to see a room that was there for a build, only to see empty space, and then the space crab floated by. It was a very bizarre moment.

JP: *What do you remember most about getting v1.0 signed off?*

Glenn: The flu. I was plagued in flu …

Geoffrey: Relief. It was a long, hectic wind-up to that release.

Mark: Sleep.

Melissa: Friend invites not working, and having the urge to flip a few tables.

Tyler: We ended up staying extremely late and worked through the company holiday party. The community really came together and took care of us. We had junk food

being delivered to the office that whole week from the community. Pretty sure I gained like 10 pounds.

Geoffrey: Every day there were a lot of tasks, frequent sit-downs with production to prioritise what needed doing and what didn't. Trying to hammer the biggest issues as quickly as possible and move on to other tasks. It was a colossal juggling act.

We also got free German Christmas goodies, and the all important ATX QA CARE PACKAGE! Whoo!

Melissa: Geoff has the best answer.

Andrew H: I got to spend two weeks working alongside the LA team, and had a blast with them. However, I was so buried in xml for so long that for days after I got home, I couldn't sleep because every time I closed my eyes I saw xml and my brain kept going into "work mode."

Geoffrey: Reese's Pieces by the way, very nice. Funyuns are unusual, I like them but I'm not in love with them like those Cheezo's or whatever they were.

Tyler: It was a really special thing to see the community show so much passion towards CIG that week. The forums were filled with players telling us to all go home and enjoy the holidays with our family. They said we needed to take a break and deserved it. They were almost down right adamant that we stop working. I think it's safe to say that was extremely heart-warming for all of us and only pushed us all to work even harder.

Justin: We did a very brief test of our new Public Test Universe a few days prior to release. We had asked that no-one stream from the PTU to keep things a surprise for our public release. The community was very responsive to our request and we did not see anyone streaming the PTU. We all got warm fuzzies from that.

Tyler: YES! That! There were about 10 streams online of players streaming. I made a post asking if players would not stream the Public Test Universe. To my awe, they all listened and streams went offline one by one.

That really blew my mind. They all earned mad respect from me that day.

Geoffrey: There was a lot of excitement for 1.0, you could feel it in the office. People really wanted to deliver a great product.

Glenn: In seriousness for me it had to be having the final day where QA were priority and in charge of dev – haha – when everyone was getting along just fine and having a laugh. I'd never have thought I'd see that and it just made me enjoy my job here a lot more. Not only that the public were massively supporting and sent tons of lovely gifts and nibbles. It motivated me so much even though I was so ill.

Justin: Also like Tyler mentioned, we had some connection issues post-release that we had to work on. The community continued to be positive and understanding while we troubleshot the issues. They were more concerned with our well-being than the game. We have the best community.

Geoffrey: We really do.

Melissa: Mostly I remember it being very fast and furious and everyone was working diligently to get 1.0 pushed to the public because we thought it would be an awesome surprise for our backers. When it was all said and done all the late nights were completely worth it to deliver 1.0 to the public – it was very satisfying and I felt proud to be on this team because we helped make it possible.

Mark: QA did an amazing job with 1.0. :D

JP: *Any final words?*

Geoffrey: The usual thanks list, but especially to the fans for being so supporting and helping us when we need it (and remembering Foundry 42 exists and sending goodies to us!). Also to ATX QA and Production for being awesome.

Gerard: Mark Abent did an amazing job with 1.0. :D

Mark: QA > 1 silly bug smasher

Tyler: A HUGE thank you to the community for really being supportive and sharing your passion with us. We are so fortunate to have one of the most epic gaming communities around. As we begin the new year, I hope that we can take this momentum we have built up and run with it. Thanks for taking the time to shed some light on QA and I'll see you all in the 'verse! :)

Jeffrey: I'm really grateful that I get to work here. The players are so eager to help us out in making an amazing game, and this is the kind of game I've been wanting to make since I was in high school. My dad got me my first *Wing Commander* game when I was in middle school and a few years after that, he got me *Wing Commander III* for Christmas. It was such a great storytelling and game experience that it started me down the path of wanting to make games. Thanks to all of you for your help. There are a whole lot of bugs that just can't be found without people playing the game.

Justin: We have the absolute best QA team around. Each individual is a badass in their own way. Many will end up transitioning into development. This presents a challenge for me to continue finding and hiring high-caliber individuals. As a result, I will always be considering qualified candidates to join our QA team.

Geoffrey: I've never really worked in a studio (or any other company) where the fans and supporters are as supporting or helpful. It's nice to know they truly care not just about the game being made, but also about us as a company.

Tyler: <3

Glenn: I'd do the list of parents and so forth, but this really goes to the fans. It wouldn't be what it is without their support and love for the game. Also a thanks to Geoff for putting up with my moaning. XD I'm very happy to be a part of this and don't regret my decision to be here for a moment!

Melissa: Thanks to everyone for all the support! The community has always taken really good care of us and we appreciate it immensely. :)

Also thanks to the UK QA team for being awesome and staying late with us sometimes despite the time difference, and thanks to our devs for plowing through all the bugs we entered during the 1.0 push (sorry about that! :P). I love our team and our community and I can't wait to keep moving forward and delivering the best space sim ever!

Geoffrey: I agree with Justin about having the best QA team. It's nice to know every one of us can be asked to do basically any job, and you'll know it's going to be completed to the highest standard.

Mark: Indeed.

Andrew H: I don't know if there's anything else I could add that hasn't already been said. Everyone here has been amazing to work with; working on this project has been extremely fulfilling, and the continued support from the fans is always a surprise.

HELIOS SYSTEM
TANGAROA

Helios is the rare place in the settled galaxy where natural beauty can stand directly beside junkyards and military fortifications, with seemingly no overlap.

The star itself is partly to blame for this unusual variety of purposes. Helios is a Helium Strong type B star that produces an unusual astrophysical phenomenon: long bands of non-ionized helium. These bands result in strong magnetic fields in the photosphere, which in turn wreak a peculiar type of havoc with ship sensors: even large capital ships are capable of 'hiding' in the star's EM wake.

Helios' unusual photosphere also attracts countless scientists from around the Empire who have built a series of platforms close to the star as labs and observation posts. These platforms, moved in by barge and designed for short-duration use, are typically discarded into the sun itself and replaced with new stations as particular project needs change.

Helios' discovery certainly ranks as one of the livelier origin stories for a system, as it is the only one ever discovered by the Advocacy. An outlaw pack colorfully known as Daybreak Marauders had been prowling Odin system, knocking over convoys from the local mining companies. As quickly and efficiently as the Marauders would attack and rob their prey, they would disappear without a trace. This went on for months. One business, Orion Mining Corporation, lost so much of their cargo that they went into debt hiring merc groups to safely escort their ships out of the system — a debt that would ultimately drive the company into bankruptcy.

The Advocacy finally got involved. They assigned Special Agents Avon Dorville and Gia Trask to hunt down this elusive pack. When the Advocacy agents finally found their quarry, they were stunned to realize that the Daybreak Marauders hadn't discovered a particularly effective route through the remnants of Odin I, they had discovered a jump point.

Helios I

Helios I is a dead planet that has never attracted an especially significant amount of interest. It has no atmosphere, and only limited minerals that are blocked from access by the world's proximity to the star. Helios I was the site of a brief flurry of interest in 2937, when a scientific survey station actually crashed onto the planet's surface. A daring rescue by members of the local Gladiator garrison (rapidly modifying their fighters for high heat protection) saved six lives from a horrific death on live vid.

Helios II (Tangaroa)

Helios II is an oceanic world with a greater circumference than Earth (though a lower overall gravity). It has a single 'fast orbiting' moon with a dense nickel/iron core. The low density of the ocean planet combined with the moon's unusual orbit give rise to frequent and unpredictable volcanic activity, ultimately causing terrestrial islands to form and then be reclaimed by the sea rapidly. Originally classified as mineral-rich, the planet was quickly terraformed and deep-sea mining rights sold to a variety of mining outfits. It wasn't until decades later that the planet began to see an influx of the rich and famous.

Despite the rapidly changing and erratic tidal and volcanic activity, it has become vogue to construct elaborate temporary housing on Tangaroa's short-lived islands.

TRAVEL WARNING Beware of the high-intensity magnetic activity. What can hide you from other ships can also hide lurking ships from you and can distort or even disable your sensors, leaving you blind.

More permanent housing is often established on or under the sea. For those who want to enjoy the planet without the risk, hospitality magnate Tyler Newman recently unveiled plans for a permanent undersea hotel.

Only the polar regions sustain standard populations. To the north, scientists and engineers typically call the planet home, supporting the cottage industry that has grown up around Helios' odd star. In the south, the limited amount of land belongs to R&D facilities that support the nearby military forces. Failed projects and surplus equipment are often shipped from Helios to the nearby Odin system. The planet's capital and prime landing zone, located in the north, is officially named Mariana, although it is called Shorebreak by the natives. Shorebreak offers an interesting case study in land use, as the city has literally used up every square foot of land and is now expanding ever-forward into the sea.

Not everybody lives in fear of the planet's unique tidal nature. Native subsurfers celebrate it as they pilot streamlined and maneuverable submarines in rides on thousand-foot waves.

Market Deals — Tangaroa

BUY:	LUXURY GOODS	+2
BUY:	WEAPONS	+1
SELL:	SEAFOOD (PERISHABLE)	+3
SELL:	SCIENTIFIC EQUIPMENT	+2
SELL:	WATER	+1

Hephaestus Station

Perched in orbit above Helios II, Hephaestus Station is the most accessible military outpost in the system. Landing on the station's main landing pad requires special permission, but a planetside outlet station allows traders to sell the luxury and home goods most requested by the military forces assigned there.

The station acts as a general staging area for system security, but traveling battle groups will occasionally also use the station to stage wargaming scenarios and training exercises.

Helios III

The third planet in the Helios system is a large gas giant. **Helios III** is an unremarkable globe save for its use as a pit stop: the planet is a source of readily accessible hydrogen with minimal impurities. Helios III does approach the upper bound for gas giants in terms of size, a fact that has attracted the occasional scientific survey. The planet itself is unattractive, lacking the distinct bands of color and the complicated lunar systems found on many Jovian planets.

Helios IV

Helios IV is a common ice planet, much like those found in the outer systems of most stars. Why, then, did the UEE government expend the massive amount of credits and material required to terraform the site? The official answer is that Helios IV is a strategic military base, offering unspecified facilities beyond those aboard ships on station or at Naval Base Hephaestus. Helios IV has become known as a world where careers go to die. Seen by many in the military hierarchy as a dumping ground for trouble spacers, it is considered one of the least desired duty stations in known space.

Civilian analysts, however, point out that none of this explains the cost of terraforming the planet. Ad-hoc military environmental structures could have been established on the planet providing a similar low quality of life for servicemen and women unlucky enough to serve as a trip-wire. The strong suspicion is that Helios IV's surface hides a larger-scale black ops-centered base. Absolutely no solid information exists to support this initial supposition, and theories range from Helios IV hiding a permanent strike base capable of engaging in operations behind the Empire's border to the creation of a site for illegal biological experiments.

CHRONICLES

Phantom Bounty

by Autumn Kalquist

Part 1

Two hundred and sixty-five days. That's how long they'd been hunting the Phantom. It seemed like they'd entered a thousand of these tiny, dark, hole-in-the-wall taverns, seeking leads from shifty informants, always just too far behind. Mila leaned against the metal prefab wall and tried to breathe through her mouth, but the scent of stale alcohol and vomit flooded her nostrils anyway.

Rhys stood at the bar, towering above the other patrons, his broad back all she could see as he haggled with the owner for information, likely bribing away the last of their meager credits. Her stomach churned just watching him. They *had* to be close this time. Because if they didn't land that 100,000 credit bounty soon, they wouldn't be able to afford so much as a mug of this dive's swill.

Mila ran a hand through her straight brown hair, and a toothless patron leered at her from his stool at the bar. She crossed her arms over her breasts and shot him a challenging glare, which unnerved him enough that he looked away and took another swig of his drink.

A younger man with a ripped synth liavold-skin jacket and questionable hygiene inched his way up to the bar and stood off to the side, pulling on the silver hoop in his ear. *Typical*.

There was usually at least one lowlife in a place like this — wearing synth-skin of nearly extinct creatures. They thought it made them look badass, like *they* didn't fear the law, like they were above it. Mila's nails bit into her palms, and she forced herself to unclench her fists. He probably didn't even know it was a fake. Real liavold skin never came in that shade of grey.

The lowlife stepped closer to Rhys, clearly trying to eaves-drop, and Mila pushed away from the wall to go run him off. But Rhys finished haggling before she made it to the bar, and he gestured at her toward the exit. Relieved, she followed him outside.

The yellow-white sun had finished its descent while she and Rhys had been inside the tavern, and one by one the century-old light globes running the length of Tevistal's streets flickered on. A loud murmur echoed down the al-leyway, voices in the night, evidence of the crowd that had been gathering a few streets over in the square to cele-brate the new year.

Damn Traveler's Day. Sure, the huge crowd afforded her and Rhys an easy way to blend in, but that went both ways. If they could stay low profile, then the Phantom could do the same, slipping away like always.

Rhys grabbed Mila's arm as the tavern doors swung closed behind them, and she gazed up at him: at the sharp angles of his face, his tousled brown hair, at the rough beard he'd allowed to grow in as they'd chased the Phantom from system to system, barely sleeping.

Rhys's green eyes were bright, glinting in the light of the globes as he leaned down close. Mila warmed at the look in them. If she was being honest, their recent sleepless nights had less to do with the Phantom and more to do with . . . other things. They *had* been sharing a bunk for almost a month now.

"Good news," Rhys said. "Maybe." A familiar smirk ap-peared on his face.

She cleared her throat. "Oh yeah? What did he say?"

"That we might actually catch our Phantom this time."

Mila's pulse quickened, and her hand involuntarily dropped to the laser pistol holstered beneath her jacket. "She's here? Still in Tevistal?"

Rhys's smirk faded, and he took Mila by the arm and led her down the alleyway toward the main street. "I want to believe it," he said, keeping his voice low. "I paid the fixer his fee and . . ."

"And what?"

"He gave me an address to a hostel. RoomTab's still click-ing. Said he saw the Phantom yesterday."

Yesterday. "Why do I hear a 'but' coming?"

Rhys halted as they exited the alley. "But I'm not sure we can trust him. It was all . . . too easy."

Pressure grew in Mila's chest, and she blew out a breath, surveying the crowd at the end of the globe-lit street. Rhys had solid instincts — one of the many reasons Mila had charmed the successful bounty hunter into forming a partnership with her. With his hunches and her tech skills, they made a great team.

"Well, what do you want to do?" she asked, a note of the desperation she felt seeping into her tone. "I think we should check it out. We *need* this."

"I know."

She met his eyes. "We don't have a choice."

"There's always a choice."

"We're too close. I say we check this out."

Rhys worked his jaw and finally nodded. He pushed up the sleeve of his jacket, revealing the MobiGlas strapped to his forearm, and swiped his finger along the flexible clear screen to bring up a street map of Tevistal. After a moment, he concluded, "The address isn't far from here. Travel advisory says it's a high crime area."

Mila snorted and swept her arm around. "And this isn't?"

Fetid pools of water had gathered in potholes from the last rains, and the low prefab buildings here were dirty and

dented, nothing like the tall, sparkling skyscrapers that had grown up further from the docks as the city matured. If Tevistal had an armpit, this was it.

Rhys laid a heavy hand on her shoulder. "Doesn't matter. Because *you're* heading back to the ship. I'll scout this out to see if it's legit."

"Like hell I am. No way." Mila flared her nostrils and shrugged off his hand. "It's dangerous. You need back-up."

The Phantom had single-handedly attacked seven Phan Pharmaceutical research facilities in the past year and had managed to evade every agent of the law since. The UEE wanted the saboteur — dead or alive — on charges of terrorism, murder and armed robbery. *Dangerous* was an understatement.

"Let me scout it out," Rhys repeated, his voice rough.

"We go *together*," Mila responded through gritted teeth.

Rhys let out a low growl, but when it was clear Mila wouldn't back down, he shook his head and started walking.

Mila released a breath and caught up to him. Rhys never would have suggested going alone before. He'd grown more cautious, more protective since they'd taken things to the next level. *Controlling*, even. It needed to stop, but right now wasn't the time to address it.

The Mobi directed them away from the crowds and deeper into the dockside slums. One cramped alleyway led to another, and the scent of burning garbage wafted over them as they passed homeless transients tending fires in front of scrap-metal lean-tos.

Hovers flew overhead, their lights illuminating the dark night as they ferried those who could afford it between the docks and the gleaming towers in the more affluent sections of the city. The soothing hum of their engines reminded Mila of another life, where she'd have been the one headed for better lodgings. But that old existence on Terra was long gone. And this — the chase, the hunt, taking down criminals with Rhys by her side — this was her life now. *No regrets.*

When Rhys's Mobi beeped to tell them they'd reached their destination, he deactivated it and drew his Arclight. "Down that alley. Building Two. Apartment Nine."

Mila readied her own pistol and followed him into the dark alley. The prefab self-service "hostels" that filled this area were owned by investors who probably never set foot here. If you wanted to do something shady, this was the place for it.

Adrenaline flooded Mila's body, making her pulse thrum faster. A cracked globe flickered above the low buildings, barely illuminating the letters engraved in the walls. She activated her pistol's nightlight, but it didn't help much.

A slow drip echoed from somewhere, and the only other sound was the pad of their boots on the pavement. Mila pointed her light at the nearest building and found the number etched in the side.

"One," she said quietly.

A low rustle emanated from where she'd cast her light, and she and Rhys tensed. Metal hit metal, and Mila swung her weapon toward it. A skap tore out of the darkness and skittered across their path. Another dark shape, a blur of claws and fur, raced after the rat-like creature. As the predator and prey disappeared into the gloom, the skap let out a brief, interrupted shriek.

Mila released her breath with a shaky laugh. Maybe it was an omen. Maybe this would be the night she and Rhys finally caught their prey.

"Building Two," Rhys said, shining his light on the building where the animals had headed.

Mila barely breathed as Rhys pushed open the outer metal door. It swung in on rusty hinges, creaking in the silence.

Dim globes lit up the space automatically, revealing a narrow corridor that was strewn with litter and stank of piss.

Mila darted a glance at Rhys. His eyes were narrowed, and that hint was enough for Mila to know he was worried.

"It's too quiet," Rhys murmured.

"Maybe it's pickpocket-the-pilgrims night," Mila responded, but her sarcasm didn't ease the tension. Rhys was right. These prefab buildings had paper-thin walls, yet the place was dead silent. Not a good sign.

They walked a few more paces, and Rhys pointed his weapon at a door on the right. "Nine. Watch my back. I go in first."

As he turned the knob, every muscle in Mila's body went tight. The door swung open, unlocked, and the bright lights inside flooded the dimly lit hallway.

Rhys stepped through the door, and Mila's jumpsuit suddenly felt too tight. Sweat dripped down her back as she scanned the other doors and kept an eye on the one they'd come in.

Rhys returned, finished with his sweep of the small space. His face was a blank mask. "Empty. RoomTab's been hacked."

Heat coursed through Mila. She let out a grunt and shoved past him and into the room. *So close.* Her throat thickened, and she fought the urge to punch a hole through one of the thin walls.

The room contained a low mattress and a metal folding table and chair. A partition separated the sink and toilet from the rest of the room, but other than that, the room had been stripped bare.

Mila whirled around to face the hacked payment scanner. Wires had been ripped out and reconnected in a knot, forcing the RoomTab system to keep the water running and the lights on without payment.

"Search the room," Mila said, her voice hard. "You find so much as a hair, you save it."

Rhys gave her a pained look. "You know we won't."

"I'll check the scanner." Mila clenched her jaw as she rolled up her sleeve to activate her MobiGlas and access the payment scanner.

She brought up the program she'd written to hack basic systems. Technically it was illegal to use a program like this, but she'd written it so she could bring criminals to justice, hadn't she? She'd never use one of her programs to *break* the law.

"This was rigged less than twenty-four hours ago. We just missed her." Mila disconnected her Mobi and slammed a hand into the room's thin metal wall. The whole thing shuddered in response. "We need to —"

"Mila." Rhys's sharp voice was a warning, and she turned to face him. The heat drained from her as she saw what he held in his hands. He'd turned the folding table over and part of it rested on his thighs. A small bundle was taped to the underside of it. It let out a low beep. Then another.

Explosives.

Mila's pulse skyrocketed, roaring in her ears. She kept her eyes glued to Rhys, to the thinly masked fear on his face, and reluctantly backed out the door. It had happened too fast. They should have listened to Rhys's gut on this.

She paused for a moment outside the unit's door, indecisive, then turned and took off running down the corridor.

Reaching the outer door, she threw it open and glanced back to find Rhys hurtling toward her. They stumbled into the alleyway together as a deafening blast rocked the flimsy structure, and the shock wave knocked them both to their knees. Heat rushed over them and stole Mila's breath away.

Mila stared down at the pavement, ears ringing as the shock faded.

Rhys recovered first, panting, and pulled a shaking Mila to her feet. He held her close and searched her face. "Are you all right?"

It took Mila a second to find her voice. "Yeah. You?"

"Fine." Rhys glanced back toward the building. "Do you think anyone else was in there?"

"You know it was empty. We gotta get out of here. If we get stopped here, we'll be wrapped up for a day or more in questioning."

Rhys nodded, looking as dazed as she felt, and they jogged down the alleyway and back out to the street. The explosion had summoned a small group of the transients, and they openly gaped at Mila and Rhys as they ran by.

Red crowded the edges of Mila's vision, and her anger mingled with an old, dark pain. They needed to bring the Phantom to justice. *Had* to. It was a need that overwhelmed logic, a need she couldn't deny, and Mila probably would have chased the Phantom even if the bounty had been far lower.

It was all because of Casey, even if Mila tried to pretend it wasn't. Casey Phan, kidnapped and murdered when they were sixteen. The inept police force had just let the killer get away. Watching that crime go unpunished was the *reason* Mila decided to work for justice. The reason she abandoned her family to become a bounty hunter.

Casey's father owned Phan Pharmaceuticals, and seeing the Phantom blow up the facilities, kill Phan Pharm workers, steal research . . . it had rekindled all of Mila's old memories. She'd take out the Phantom the way she'd never been able to take out the screwed up person who had stolen Casey away.

When Mila and Rhys were almost to the crowded square, she halted and wiped the sweat from her face, still breathing hard. She was dangerously close to losing it, and she wasn't about to have a breakdown in front of all the revelers between them and their ship.

Rhys stopped when she did. "What is it?"

"That was a set-up," Mila said, her voice breaking. "That fixer knew he was sending us to die. *Everyone* must have known it. Someone warned the rest of the tenants to get out."

She swung her body around, seeking something, anything, to take her anger out on. She slammed the toe of her boot into a piece of scrap metal and sent it flying. A sharp pain coursed through her foot, but she gritted her teeth against it and tried to ignore the burning sensation in her eyes.

She let out a little guttural scream and turned back to Rhys, her hands clenched into tight fists. "We need to beat the kak out of that fixer until he gives us the truth."

Rhys grabbed Mila by the shoulders and leaned down so his eyes were level with hers. "Calm. Down."

"No!" Mila pushed him away with both hands, but he held her tight and didn't let go. She blinked against the continued burning sensation in her eyes. "We *need* this bounty."

Rhys shook his head. "If that fixer knowingly sent us to a trap, I'm not about to advertise we survived it. This is his turf. We're at a disadvantage here. You should *know* that."

"We were just so close," Mila replied, her voice shaking.

Rhys loosened his tight hold on her. "I'm calling it, Mi. This isn't worth getting blown up over. There are plenty of other bounties to go after."

But none like this one. Hot anger lit a fire in Mila's chest, and she shoved Rhys away. "Coward."

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Surprise flashed across his face, and he stiffened. "Don't be an idiot. This isn't about bravery, it's about survival. *You* wanted to hunt this one, so I agreed. For you. It was always a long shot. We'll survive off less until something else comes along. We're done."

"No," Mila shoved Rhys again, and he stumbled back a step. "We're finding the Phantom. And if you won't help, I'll keep searching by myself."

"What is it about this case that you're not telling me? You've never been this stubborn about any of the others. It's like you're not thinking clearly."

Mila swallowed past the lump in her throat and pushed past him so he couldn't see the look on her face. She'd have to tell Rhys about her past someday . . . when she was ready. And today wasn't that day.

"Mila." Rhys was by her side again. "Tell me what's going on."

She took a deep breath as she turned toward him, struggling to get her roiling emotions under control. He really thought he was making the right choice. But he was wrong.

"The trail was cold before," she said, trying to keep her voice even. "Whispers of the Phantom passing through, week-old transactions. Twenty-four hours, Rhys. Twenty-four! The Phantom was in that room a *day* ago. We can't stop now. We need food. The *Devana* needs maintenance and upgrades. And maybe . . . maybe after we finish this, we can take a break, right? Go to some pleasure planet, maybe Cassel . . . together."

Her cheeks flushed at how her own words sounded, but Rhys's eyes grew dark, and he cupped her chin in his callused hand and tilted her head up until their eyes met.

"One more time. We'll try to find one more lead," Rhys conceded, his voice rough. "But if we don't . . . we can't afford to keep ignoring other work for this bounty. So if the next lead doesn't work out, promise me you'll give it up."

Mila pushed his hand away. "I'm sorry. But no. I can't promise you that."

The low hum of an approaching hover caught their attention, and they both looked up. Flashing lights. Local police.

"Let's get lost in the crowd," Rhys said. "But this conversation isn't over."

Mila pushed down her irritation and followed him. She'd convince him. Because they were not quitters.

They kept up a brisk pace until they were well into the main square, where the mass of people had gathered outside the Journeymen Hall. It was an interesting spectacle — a mix of normal-looking civilians and people dressed for the occasion. Some of these Travelers liked to mimic old Earth customs, more-so than those on Terra.

A cluster near Mila and Rhys wore silken cloaks and fantastic masks adorned with feathers. Another dozen had forgone the costumes, but their walking sticks were intricately carved and inlaid with gems and smooth stones. Another pair wore gold robes with masks carved to resemble predatory animals.

Rhys pushed through the crowd, carving a path to the far edge of the square where vendors had set up booths filled with all the goods and trinkets a crowd of pilgrims could want on Traveler's Day.

The scent of roasting meat made her mouth water and her stomach growl, reminding her she hadn't eaten since this morning's breakfast on the *Devana*. Rhys seemed to be of the same mind, because he led her to where the nearest food vendor had set up a grill.

"How much for a skewer?" Rhys asked.

"For you? Only eight credits."

"What kind of meat?" Rhys scoffed.

The middle-aged woman winked and waved the skewer at Rhys. "Special. Is a secret."

"Ah, right. Might that be some *special* skap meat from dockside?"

The woman's face soured. "Insults! I no sell skap."

Mila wandered over to the next table, zoning out Rhys's haggling. He was so tight-fisted with their creds. How could he not see how important catching the Phantom was to their bottom line?

The table Mila found herself at was strewn with trinkets. Incense burners, Christian crosses, Wiccan pentagrams, Buddhist statues, and a wide range of other eclectic-looking jewelry.

A bronze-toned pendant on a long chain caught Mila's eye. She picked it up without thinking and turned it over in her palm. It resembled the shape of an infinity symbol, and small pearlescent stones in all different shapes and sizes dangled from the end of it.

"That piece is almost as beautiful as you."

Mila started and felt her cheeks redden as she met the vendor's gaze. The colorfully dressed woman looked to be in her early thirties and had pale skin and ice blue eyes like Mila's, but that's where their similarities ended. The woman's space-black hair was styled in dozens of tiny braids, and she wore a nose ring that glinted beneath the sparkling lights hanging from the metal awning above.

"Um . . . thanks," Mila said. "It is a nice piece."

"Better than nice, girl. It's the ideal gift to celebrate the new sun. That is, if you want to have good luck. That pendant's been blessed by Cassa."

Mila glanced back down at the pendant, at the way the twinkling lights overhead made the colors on each stone warp and change, like tiny rainbows. She wasn't superstitious or religious, but the pendant reminded her of a ring she'd owned as a child. She wanted to try it on, hold the stones closer to the light and see them change, but she resisted.

"What kind of stones are these?" Mila asked.

"Those stones were collected from the null point between two binary stars. Only travelers with great luck and persistence can thread the needle to reach that point."

A low laugh sounded from behind Mila, and she whirled to find Rhys standing there, two skewers of meat in hand. "Stones collected from between paired stars, eh?"

The woman's serious expression didn't change. "That's exactly what they are."

Rhys shook his head. "Maybe you should get off this rock some time. Because *nothing* hangs between binary stars; one or the other pulls everything in."

The woman leaned across the table, and a slow smile spread on her blood-red lips. "The journey can teach us much, my friend. But build a life on false beliefs, and you'll soon find your ship has drifted into a mine field."

"You done here, Mi?" Rhys's question came out like a command, and he looked like he was trying hard not to respond to the woman. He didn't have a lot of patience for religious types, Journeywomen or otherwise.

The merchant ignored Rhys and looked at Mila expectantly. "The colors in that piece really do suit you."

"It's gorgeous. But maybe some other time." Mila sighed and reluctantly dropped the necklace into the woman's waiting palm.

Mila grabbed a meat skewer from Rhys without meeting his eyes and strode toward the center of the square. Why did he always have to be such a buzzkill?
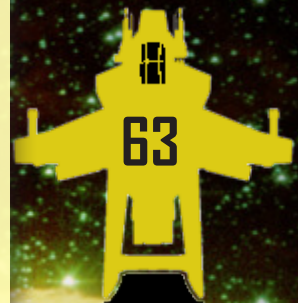
She stopped at the edge of the crowd, watching an unfamiliar ritual unfold at the center of the square, and gnawed at the stringy meat. Skap meat or not, it was a thousand times better than the bland nutrition bars on their ship.

She finished it, tossed the stick, and started searching the crowd for Rhys. Time to convince him to continue their search for the Phantom.

She found him only a few yards away, watching her intently, and despite her earlier annoyance, a smile budded on her lips. He knew when to give her space, and he knew when she really needed him not to. His solid presence in her life *had* been the best part of these past months.

A flash of grey in her peripheral vision drew her gaze, and it landed on a man wearing a silver hoop earring and a fake liavold skin jacket. It was the lowlife from the tavern.

Mila's pulse quickened, and she pushed past the people surrounding her to get closer. The lowlife was staring at Rhys, but when he noticed Mila heading for him, his eyes widened and he scrambled away, disappearing into the crowd.

Mila shouted and sprinted after him, shoving people out of her way, ignoring the obscenities they yelled in her wake. She was vaguely aware of Rhys falling into step behind her. That dock scum knew something, she was sure of it. He might even be a spy for the fixer. She couldn't let him escape.

The cries of anger erupting in front of her let her know she was on the right path, and as she exited the main press of the crowd, she caught sight of a grey jacket disappearing around the corner.

She ran faster, a stitch growing in her side as she caught up. When the man faltered ahead of her, trying to decide which way to turn at the end of an alleyway, she launched herself forward, knocking him into the wall. They both hit hard and slid toward the grimy pavement.

Rhys was there an instant later, hauling Mila out of the way and pinning the man's arms behind his back so he couldn't pull a weapon. The man's bloodshot eyes were wild, darting between Mila and the alley's exit.

Rhys raised a brow. "Care to explain?"

Mila sniffed and wiped the dust off her pants. "What? Didn't you notice him back at the tavern? This snake was eavesdropping on you. I bet he works with the fixer. And he was definitely watching you back there."

"Is that so?" Rhys pulled his pistol and shoved the man against the building to frisk him. He pulled out a slide blade concealed at the man's waist, then retrieved a small black case from his jacket. He tossed Mila the case, and she opened it, her heart still beating a staccato rhythm against her ribcage.

Inside lay a syringe and a vial filled with black, viscous liquid.

"Show us your arm," Mila demanded.

The man was shaking as he pushed his sleeve up, revealing a web of veins stained black from his habit.

Rhys whistled. "Got ourselves a WiDoWer, eh?" He adjusted his Arclight so it lined up with the man's face. "Now why were you following us?"

The man's Adam's apple bobbed as he swallowed, and he held his hands palm out as a drop of sweat slid down his forehead and into his eye. "I followed you 'cause I got info. I'll trade for it."

"What kind?" Rhys asked, his eyes hard. "The last info we got wasn't worth much."

"Harris — he set you up. But I know the truth."

"No trades." Mila closed on the addict, still holding his drugs in her grasp, and wrapped her other hand around his throat, squeezing. "If you knew about the trap, you should have told us before. We could have died."

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"Mila." Rhys's low warning did nothing to calm the rage buzzing in Mila's head.

"No trades," Mila repeated, squeezing tighter. The lowlife gasped for air.

"Mila." This time Rhys's voice broke through, and Mila dropped her hand from the man's throat, then forced herself to step back.

Rhys narrowed his eyes at her, then turned back to the addict. "What do you want for the info?"

"Creds," the man said, wheezing. "Ninety creds."

"For drugs." Mila opened the case and held the vial high so the addict could see it. "How 'bout this? You tell us everything you know, or I feed your precious sludge to the pavement."

"No. No no no." The man was sweating more freely now, and the desperation in his voice made Mila nauseous with sudden self-loathing. But she wouldn't back down. She was done with haggling. With the trades. Done with all the lies and dead leads.

She placed the vial on the ground and positioned her boot over it. "You get one second to decide."

"I'll tell you. I'll tell you! Don't. It's my last one. The Phantom was here. She was callin' herself Elaine. Harris hooked her up with new tags. I got a shot of 'em on my Mobi."

"Show us," Rhys demanded.

The man revealed the Mobi beneath his sleeve and brought up the data. Mila swiped her arm across his screen and her Mobi captured the tag numbers. Then she placed her boot back over the vial of WiDoW. The lowlife seemed to turn green in the dim light of the globes overhead.

"Where was Elaine headed next?" Rhys asked.

"Septa — she had a meeting on the platform. She's got a way into Xi'An space. Someone powerful is helpin' that girl. Musta paid off Harris big, 'cause I ain't never seen him help set up a bounty hunter like he did to you two."

Mila's mind raced, considering the implications of what this snitch was saying. If the Phantom truly had a way into Xi'An space, they'd never find her again. She'd reach Rihlah, and the Xi'An wouldn't do kak to help them catch a terrorist. They'd just pretend to, acting diplomatic while the Phantom got to live out her life, with the Advocacy and the rest of the UEE stuck waiting for her to voluntarily cross into Human-controlled space again.

"He could be lying," Mila said. "Describe this Elaine."

"Uh — red hair. I think it was a wig. I followed her back to that hostel and saw her leave with black hair. Dark skin. Late twenties. Kept her face all covered up. Never got a good vid." The addict tapped his Mobi again and brought up an image of a woman, covered up as he'd described.

All Mila and Rhys had ever seen were blurry images of this woman, no better than what this man was showing them. But what else did they have to go on?

She exchanged glances with Rhys, and Rhys gave her a slow nod.

Mila picked up the vial and shoved it back in the case. She wanted to destroy the drugs, force this scum into withdrawal, but the withdrawal could kill him. And Mila was no murderer and never would be.

She dropped the case back into the man's hands and flicked his jacket with her finger. He flinched at the touch.

"If you need creds, you should start by demanding a refund from whoever sold you this knock-off."

His brows went up in surprise, and he glanced down at his jacket, then back to Rhys, who still held his weapon. "Can I get my blade back?"

"Get out of here," Rhys barked.

The man flinched again, then pocketed his drugs and took off running.

"What the hell was that?" Rhys's face was red, his voice so low Mila knew he was pissed. "That's not our agreement. I do the haggling. I handle the contacts. Not you. That's our deal."

Mila put her hands on her hips. "Well, it worked, didn't it? We need to get back to our ship and get to Septa before our phantom disappears for good." She turned heel and walked off without waiting for a reply.

Rhys didn't speak a word as they made their way back to the docks, and his anger hung in the heavy silence between them, ruining what should have been a celebration and leaving her to her own thoughts. When they finally reached the well-lit entryway that led up to their Freelancer, Mila turned to Rhys.

His expression was blank again, showing nothing of what he might be feeling. Sometimes he was so damn hard to read. She pressed a hand to his chest, and his eyes softened slightly at her touch.

"I'm sorry. For how I acted back there. You're right. I broke our agreement. I promise I'll try to keep it together from now on —"

Rhys placed a gentle finger over her mouth, silencing her. "Don't. You got what we needed. But if this lead doesn't pan out?"

He dropped his finger so she could answer.

She pressed her lips together and shrugged. "Fine. If it doesn't pan . . . then we're done searching."

It didn't matter. Because if the Phantom really was headed for Xi'An space, and they missed her one more time, it was as good as over anyway.

A look of relief passed over Rhys's face. "Good. Then we agree. We'll follow this lead, but if we lose her, we move onto something else."

He hesitated, then reached into his pocket and drew out a small velvet bag. Mila's lips parted as he pulled out a length of chain, the Cassa pendant hanging from it, its gorgeous pearlescent stones shimmering in the light of the dockside globes.

Rhys fastened the good luck pendant around Mila's neck.

"But our credits . . ." Mila warmed at his light touch. "We didn't have enough to waste on this."

He shrugged. "Could be that Journeywoman was right about this thing after all. All we needed was a little luck. And it seems we got it."

His voice came out husky, and Mila stood on tiptoes to kiss him. He responded with intensity, pulling her close, pressing her body to his. She wrapped her arms around his neck and lost herself in him, until they were both breathing hard.

When he pulled away, his eyes were dark. "Flight plan first. But while we're waiting for clearance . . . "

Mila gave him a small smile. "Meet me in the bunk?"

He smirked and pulled her close for another kiss. "And after that . . . we catch our phantom."

To be continued

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