

JUMP POINT

A ROBERTS SPACE INDUSTRIES PUBLICATION ISSUE 03.02

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GREETINGS, CITIZENS!

When I started putting together this month's Work In Progress on ArcCorp (the planet), I was figuring it was going to be relatively dull compared to a ship report.

I was wrong. I realize it won't be the height of entertainment for everyone, but the development of a world has just as much depth as the development of a ship — in fact, more than many ships.

We've already spent some time illustrating ArcCorp in the Persistent Universe (PU) demo (and the corresponding JP) last fall, but it's not as much fun for you if we're the only ones who can play there. We're close to having it ready for you to enter, as well. "Close" doesn't mean "Done," but we're close enough that we can show you around and start introducing you to some of the folks you'll meet there (for better or worse . . .).

Meanwhile, we are analyzing ArcCorp (the corporation) as well, in Portfolio. And this issue's Behind The Scenes discussion is with the folks who are developing the gameplay that will greet you when you take your first steps in the PU within the next few months.

(And I am idly wishing that ArcCorp were a real company and place, so that I could pocket the fees I would have gained from giving them so much exposure.)

We went to Vega for this month's Galactic Guide, while Autumn supplies us with another installment of *Phantom Bounty*, at the end of the issue.

The word for this month is "spline." The devs talk about



splines in Behind the Scenes, describing the path of the incoming ship. A spline is a smoothed path generated from several input points. As Andrew Nguyen (Gameplay/Physics Programmer) put it: we have splines to approximate and predict ship paths over the network to reduce frequency of network updates. A "Kythera spline" (also mentioned) is a spline generated by the Kythera AI software used by our partner Moon Collider.

I do want to solicit feedback related to a question that was raised this month in the forums. Now that we aren't introducing a new ship every month, what do you want to see in *Jump Point*? I assume you still want Portfolio (discussing a corporation, military unit, or the like), Galactic Guide (exploring a system), Behind The Scenes (a discussion with one or more devs), and Chronicles (a story installment). But what do you want for Work In Progress, if it's not a brand new ship? What other things do you want to see here? Feel free to repeat previous suggestions, even if I said "no" before . . . it's a couple of years down the road, and some things may have changed.

I'll be interested to see what you suggest, and I'll let you know which of them are feasible as soon as I can.

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

David

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COVER:

COLLABORATION

PAGE 53:

CHRISTINE MARSH

PAGE 64, 65:

KEN FAIRCLOUGH

PAGE 68:

KEN FAIRCLOUGH



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42

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FROM THE HICKORY

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ArcCorp

ArcCorp (planet), placed by Metric Minds.



WORKING FOR THE FUTURE



It was hard to put a byline on this month's Work In Progress, because it's very much a collaborative effort. Artists are the primary contributors, of course, but designers and others have also been directly involved. In the remarks that follow, please don't assume the speaker is the one who created the related image; many hands and eyes have been working together to create a persistent universe that is as awesome as the rest of *Star Citizen*.

As with many aspects of *SC*, the work on ArcCorp began with concept art, this time by Corentin Chevanne, Art Director at Behaviour.

Corentin: I've started to think about Stanton. I've just made a sketch so far. I should probably do one or two others. I chose ArcCorp as the planet, but it could fit also for Hurston Dynamics I guess. Microtech would probably be more "high tech" and Crusader more industrial.



WORK IN PROGRESS



Corentin: Here are some comparisons [this page and next] between ArcCorp and Crusader, and our plan to create variations between different Stanton planets reusing the same assets.

Chris Olivia, Chief Visual Officer, CIG: Amazing! I definitely can see the same architecture style but used in a completely different way. Nice job!

ARCCORP



CRUSADER



WORKING IN PROGRESS

STANTON PLANETS VARIATIONS PROPOSAL

Further than using different layouts and unique landmarks, here are some different ways to create unique environment look and feel, using pretty much the same assets.

- **Textures, Colors and small parts:** Color stripes, amount of dirt, Materials (more metallic or more matte), adding glass windows, etc...
- **Lighting:** Playing with the main light (from "sun") color, intensity and shadows, as well as playing with artificial lights present on the planets, like public lighting, neons, logos, etc...
- **Environment:** Skybox, clouds, rain, dust, fog density and color, etc...

KEYWORDS

I Microtech

- Cold Planet
- Unnaturally dense clouds.
- Large swaths of lands kept undeveloped.
- Relatively clean
- Glass
- Blue / White

II Hurston Dynamics

- Ultra-industrialized
- Heavy Smog and soot
- Dirty
- Old tech
- Metal / Rusty

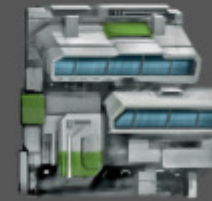
III Arccorp

- Entirely built/manipulated
- Mid tech
- Industrial
- Moderately Dirty
- Smog
- Yellow green / red stripes
- Blue lights

IV Crusader Industries

- Gas giant / No land
- Network of floating platforms
- Inviting place
- Shipyards and planetary atmosphere
- Clean
- Glass
- Green Stripes / white

TEXTURES / COLORS



LIGHTING



- **Natural:**
 - Bright
 - Diffuse/ Ambient (Cloudy)
- **Shadows:**
 - Low / Diffused
- **Artificial:**
 - Low



- **Natural:**
 - Low
 - Diffuse/ Ambient (Smog)
- **Shadows:**
 - Low / Diffused
- **Artificial:**
 - High



- **Natural:**
 - High / Bright
 - Direct Lighting on surface
- **Shadows:**
 - High / Smooth
- **Artificial:**
 - High Underground



- **Natural:**
 - High / Contrasted
 - Direct Lighting
- **Shadows:**
 - High / Sharp
- **Artificial:**
 - Low

ENVIRONMENT



- **SKY:**
 - Bright yellow
 - Dense Clouds



- **FOG:**
 - Bright
 - Dense



- **SKY:**
 - Dark
 - Dense Clouds
 - Black Swoot rain



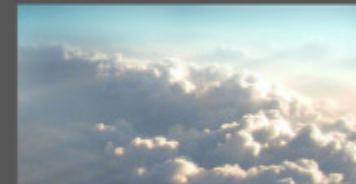
- **FOG:**
 - Dark
 - Dense



- **SKY:**
 - Bright yellow
 - Cloudy
 - God rays



- **FOG:**
 - Bright
 - Medium density



- **SKY:**
 - Light Blue
 - Clear as Clouds are underneath



- **FOG:**
 - Bright
 - Low



WORKING DRAFTS



Corentin: ArcCorp main shop and bar concepts, located on the ArcCorp planet.

Chris Roberts: Looks GREAT! Really nice work!
I TOTALLY want to see this in-engine!



WORK IN PROGRESS

Corentin: Tweaking the background in my spare time.

It's final now, I promise. :)

Chris O: Lovely! Can you add a person standing on the top of one of the far buildings? jk

Dave Haddock, Lead Writer: Agreed. Pretty awesome.

Rob Irving, Lead Designer: Looks good to me.



WORKING PROGRESS



WORK IN PROGRESS



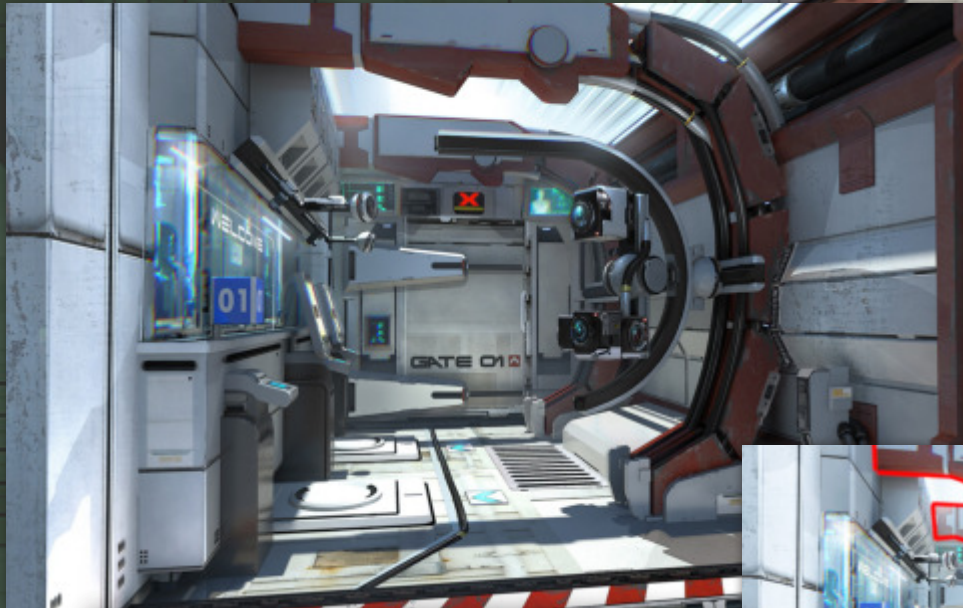
Corentin: ArcCorp, view from the landing pad. [above]

Corentin: This concept [below] used the tier system and our ingame layout as a base. We try to emphasize the architectural evolution in this one, showing some older, more industrial buildings on the left, and some more recent (for the shopping mall) on the right. Concept done by Nicolas Ferrand.

Chris R: Looks great!

Corentin: Customs lobby concept art. It's more an indication of mood and props, as some proportion seems to be off compared to the actual layout. Ingame blockout feels larger.

Mark Skelton, Art Director, CIG Austin: The floor to me feels a bit busy for a lobby.



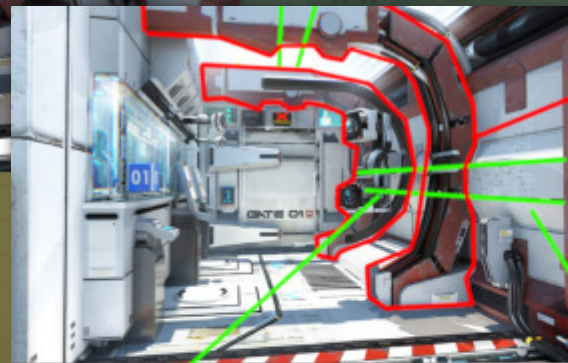
Corentin: ArcCorp Customs establishing shot.

This is the small 8x8 m room where you get scanned / talk to the Customs guy, etc.

We are going to refine the scanner / mecha / animation based on the script if needed.

Paul Jones, Art Director, F42: Sweet stuff!

Mark: Looks cool. Here's some feedback:



These shapes are too large and obtrusive. I feel it would be better if the Tracks that hold the scanner were more built into the walls and ceilings. The idea is to track the player around the room so he doesn't have to be stationary while being scanned.



WORKING PROGRESS



Corentin: Exploration sketches for the landing area of ArcCorp. Basically, it would be the first view when you get out of your ship. Customs are in the other direction. Done By Nick Ferrand.

Chris R: Looks awesome! I kind of like all of them, but #3 is my fave.

Chris O: Agreed ... maybe include some of those pipes from #2, though.

Chris R: Good call. I also like the raised building elements in #1 (the 078 building and the ArcCorp one).

Corentin: Thanks for the comments. I think the first one gives a good sense of a large-scale environment. I like the pipes of #2 and the industrial feeling of #3. We could have something like the large blocks of #3 close to the pad, with large pipes coming from their bases, but instead of the factory in the middle, we would have the open vista of #1. We'll do an updated version soon!



WORK IN PROGRESS

Corentin: Test on ArcCorp with the large building as the ArcCorp Store.

Pedro Camacho, Freelance Composer: This is so inspiring



Corentin: ArcCorp Back Alleys concept.

Chris R: I like it!



WORK IN PROGRESS



Corentin: Concept art for Cubby Blast, a personal weapon shop on ArcCorp. Done by Sebastien Larroude.

Corentin: Dumper's Depot façade (8x8 m) in ArcCorp. Done by Mathieu Beaulieu.



Corentin: Concept for Abernathy's interior, a luxurious furniture dealer for your hangar, located on ArcCorp. We're actually re-working the deluxe hangar using the same theme (sleek surfaces, rounded corners, luxurious materials, etc.). It might also be a good preview of what the inside of the 890 Jump could look like. Done by Sebastien Larroude.

Chris O: Lovely!



WORK IN PROGRESS

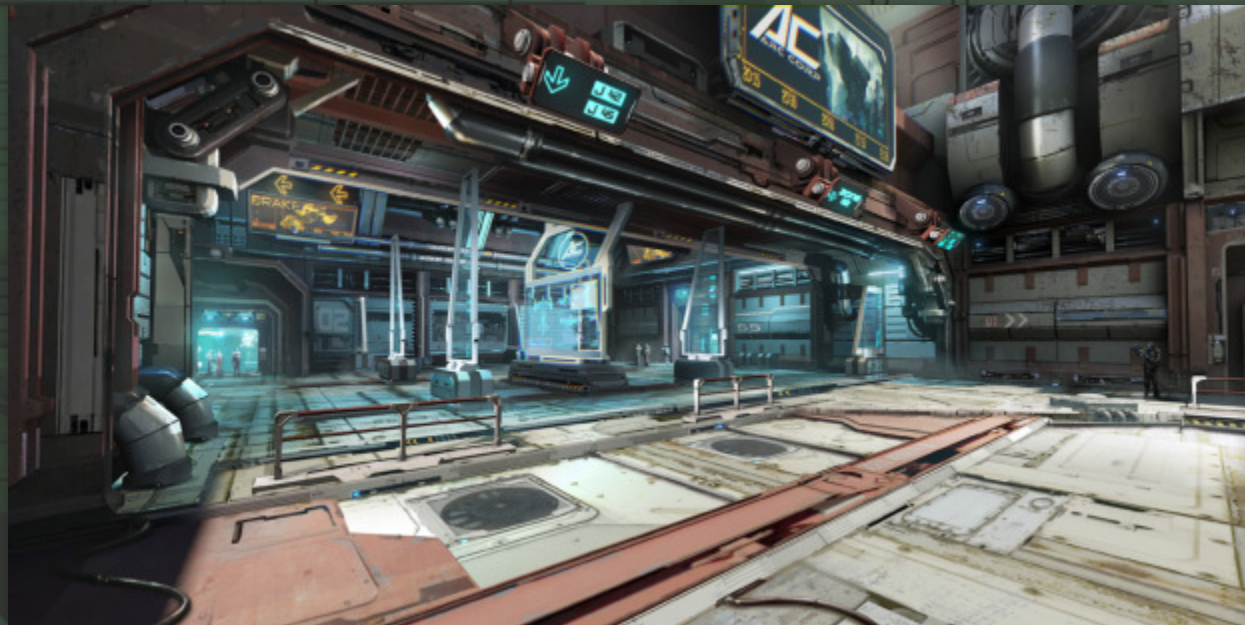
Corentin: Concept for Casaba Outlet, a cheap clothing shop on ArcCorp. Done by Nic Ferrand.



Corentin: Concept for Astro Armada, a luxury ship dealer on ArcCorp. We plan to use the same visual look for the refactoring of the deluxe hangar. Done by Nic Ferrand.



WORKING IN PROGRESS



Corentin: ArcCorp beautiful corner paintover. Nick Ferrand worked on the set dressing for this one.

Chris R: Is this an exterior shot? Seems a little sparse to me. (What area is it, BTW?)

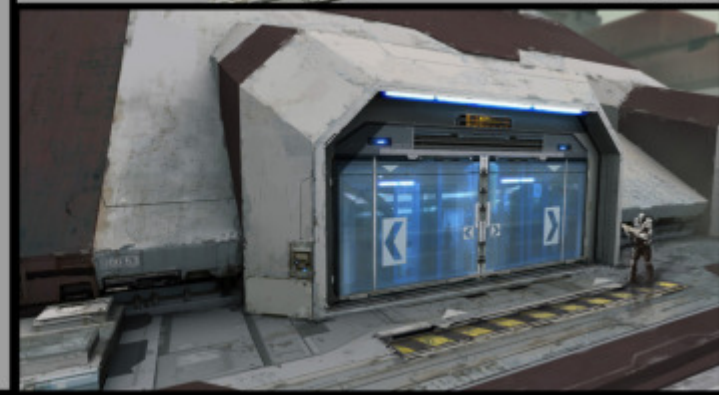
Corentin: Yes it's the entrance to Area 18, right after the "customs" and all the foreground part of the picture is outside. In terms of "emptiness," I think there is perhaps a lack of props like trashcans, electrical boxes, cables and hoses, crates, etc. We'll add that in-engine.



Corentin: ArcCorp headquarter branch, in Area 18. It used to be the hotel, but it made more sense to have an official ArcCorp Building here as a cool landmark. Done by Nick Ferrand.

Chris R: Looks GREAT!

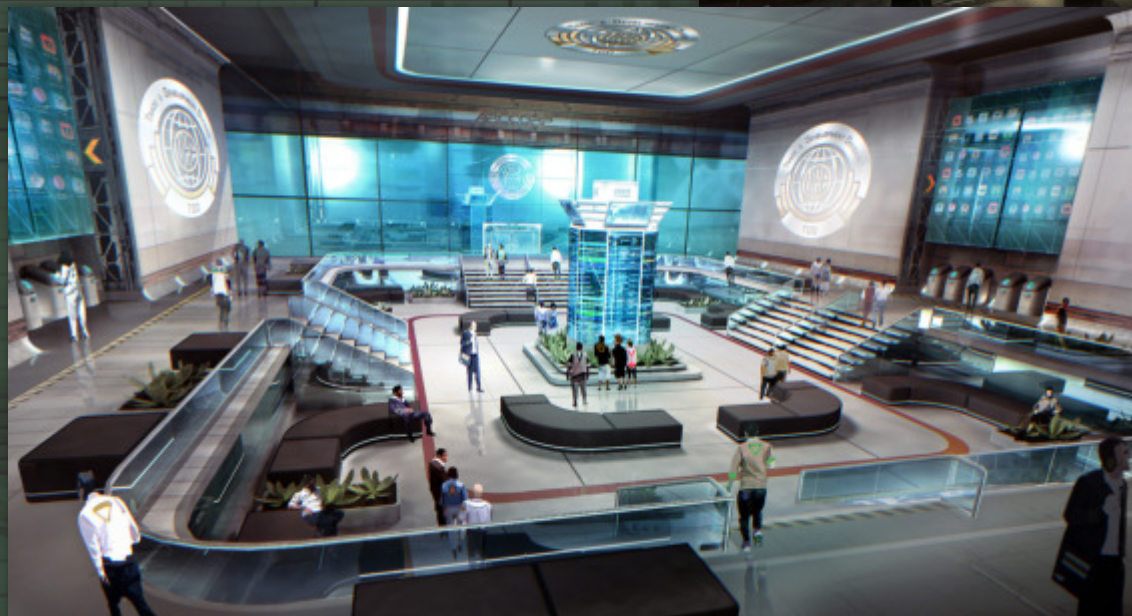
Corentin: Thanks! I'll forward the greatness to the artist!



WORKING IN PROGRESS



Corentin: Version of ArcCorp Bar with windows/shutters.



Corentin: TDD on ArcCorp, same architectural style (S-modernism) as the previous one, just using a different theme (ArcCorp).





WORKING ON PROGRESS



LT. MICHAEL CALLUM
- CRIMINAL INFOAGENT
- CORRUPT OFFICER WORKING FOR PMC BLACKJACK SECURITIES
- TRAINED FOR COMBAT BUT MOSTLY WORKS IN THE BLACKJACK OFFICES

TWITCH

CLOR VEE

LEV CRONENBERG

Corentin: Named NPCs from ArcCorp. In the description, Lt. Callum didn't have a first name so we made him a woman. The recent post on RSI makes him a man, but we can keep the same kind of armor while make her into a Michael!

Clor Vee. An animated man with an (over)accentuated Cathcart accent. The reality is that he lost the accent a long time ago, but his customers like the sense of danger it provides so he keeps it going. Runs Cubby Blast.

Lev Cronenberg. A hard-drinkin' jolly old vet who's enjoying the hell out of his retirement. Found in ArcCorp Bar.

Lt. Callum. BlackJack Securities local criminal infoagent. Does not actively work in the field. More like a office worker, but still wears some gear and the colors of BJ Securities.

Twitch. Criminal Infoagent. Merc who suffered nerve damage (hence the name) who lurks around, making deals, introducing people. Fascinated by the connections of people.

Corentin: Micheal Callum, ArcCorp Security.

Dave H: I really dig this. Really expressive and seethes a 'don't screw with me' attitude.

One question, is that a holdout pistol on his ankle?

Corentin: Yes, I think so.



BARCLAY'S ESTATES
LAWYER
FEATURED NPC



BARCLAY'S ESTATES
ADMINISTRATIVE ASSISTANT
FEATURED NPC



DUMPER'S DEPOT CLERK
FEATURED NPC



DUMPER'S DEPOT
SCRAP WORKER
FEATURED NPC



GENERAL MECHANIC
CROWD NPC



ASTRO-ARMADA
SALESPERSON
FEATURED NPC



CASABA OUTLET
SALESPERSON
FEATURED NPC



ARC-CORP STORE
SALESPERSON
FEATURED NPC



COMMODITY MARKET
AGENT
FEATURED NPC



WAITER
FEATURED NPC



BARTENDER
FEATURED NPC



ARC-CORP FACILITY
DAY LABORER
CROWD NPC

Corentin: Featured and Crowd ArcCorp NPCs concepts. Done by Nicole. [this page and next]

Dave H: Nice. I particularly like the Dumper's Depot Scrap Worker, Ground Controller and BlackJack outfits. The Advocacy ones feel a little too Star Trek-y for me, but overall really cool stuff.



WORKING IN THE DARK



ARMADA
PERSON
NPC



ASTRO-ARMADA INSURANCE
REPRESENTATIVE
FEATURED NPC



CENTERMASS CLERK
FEATURED NPC



ABERNATHY INTERIORS
SALESPERSON
FEATURED NPC



LZ GROUND CONTROLLER
CROWD NPC



BLACKJACK SECURITIES
PMC
FEATURED NPC



ARCORP FACTORY
DAY LABORER
CROWD NPC



ARCORP FACTORY
ENGINEER
CROWD NPC



ARCORP OFFICE WORKER
CROWD NPC



ADVOCACY OFFICE GUARD
FEATURED NPC



ADVOCACY OFFICE
RECEPTIONIST
FEATURED NPC



ADVOCACY OFFICE AGENT
CROWD NPC



WORKING DRAFTS



WORKING FOR THE FUTURE

Mark: ArcCorp scanner. Overall, looks fantastic – nice job!

I feel that the scanning should start in a straight line from the top down, like how the scanner actually moves on the wall.



Behaviour: This video shows ArcCorp in what appears to be a less advanced state than what had been shown previously. This is because we've had to ditch a lot of what had already been done to fit within the new systems.

So, what is done and what isn't:

- 1) ArcCorp is now smaller by design. This was partly a reaction to the comments wanting the world to feel more intimate and less sparse. It is also due to the fact that we're no longer landing the ships in the walkable area but rather in a separate area.
- 2) The landing zone is not completed. We're still working on that, but what we are showing is that you land in an area and then go through a customs type interior before coming out the other side to access the shops and bar.
- 3) Textures and shaders are only there to validate texel density and the UV unwraps, as we are holding off doing tons of work there until we have our hands on PBR.
- 4) All geometry now fits the powers of 2 rules.
- 5) All assets now adhere to our rules for Tiered prefabs within the "Stanton Set".
- 6) Lighting and effects are just temp.
- 7) We have a basic interior kit defined and we are now working on detailing that to finals (geometry and UVs only until PBR).
- 8) The display screens dotted around the place will be changed to a nicer design.



WORK IN PROGRESS



Mark: Looking nice. Here are some notes from our meeting:

- Modeling is nice, detail level is good.
- Material breakup is holding it back.
- Put some metal scratching in there somewhere to break it up a bit.
- A slight shift from walls to floor material would be good.
- There are a lot of first, second, third degree reads, which is good.
- Anything that is player level is going to be scrutinized, so add smaller human scale break ups to give size cues.
- The cracks in the ground should be thinner so it doesn't look like you will trip and fall.
- Put indication around the edge of steps to prevent players from walking off.
- Put human-scale indicators and signs on stuff to give it more life.
- Put in more wires and lights, but not overbearing.

Mark: At right are some references for material breakup.

Eric Peterson, Austin Studio Director: Great feedback and good meeting. I think we are going the right direction.



WORKING IN PROGRESS



WORK IN PROGRESS

- Concrete floor details pass
- Re-work railings with better detail/material
- Add weather effects (rain) to outside section

Here are the notes from the meeting:

- Decals on the floor would be nice to help move the player around.
- Something to separate the floor from the walls.
- Tightening up of the floor looks awesome.
- Much more human scale.
- Contrast is good.
- Put a caution sign up to account for the wires and stuff on the ground.

- Go a little further with the floor, break it up a bit more.
- Lee to change fonts on screens.
- Screens to be driven by real-time billboard stuff.
- Floor seems a little flat; the breakup on it looks too procedural.
- Directional scuff marks might be good.
- Continue the scratches along the ground.
- Reads and level of detail are great.

ArcCorp Beautiful Corner update.

Mark: Great update, guys! Here are BHVR's Build Notes:

Updated:

- Materials and blending updates on several building assets
- New floor tiles unwrapped and textured
- Decals added
- Animated screens (yay!)
- Lighting tweaks
- Set dressing added/tweaked
- Ceiling updated in covered section

• Railings tweaked

Next week:

- TV screen textures
- Entrance block updates (mesh and material)
- New bench to replace old one
- Pipe kit updates (material and texture)
- Couple of floor tiles need final material pass.
- Final lighting pass

Wish list if there is time:

- Add 'cargo door' in the back corner

Mark: Looks fantastic! Really happy with this; you guys are almost there!

Here are BHVR's Notes:

Updated:

- New floor tiles to define path from customs to exterior.
- New parking and charge station for buggies.
- New cargo area for shipping all your crates.
- New cargo door and entrance.
- Set dressing updated.
- TV screens (from Lee A.).
- Mini screens texture + mesh updated.
- Floor decals updated/added.
- Door/entrance block detail pass.
- New bench model.
- Lighting.

To Do:

- TV screens need some work.
- Bench texture final polish (in progress).



- 'Charging station' asset in progress to replace the garbage bin next to the parking area.
- Final detail and material tweaks to cargo door entrance.

Notes:

- Collision is dysfunctional on the floor in some places.

Here are my notes from the meetings:

- Need to fix decal distance disappearing bug.
- Worn stripes on the ground need to be broken up a bit different from each other.
- Screens look too new.
- Good balance between eye rest and detail.
- Include flickering lights to give life.

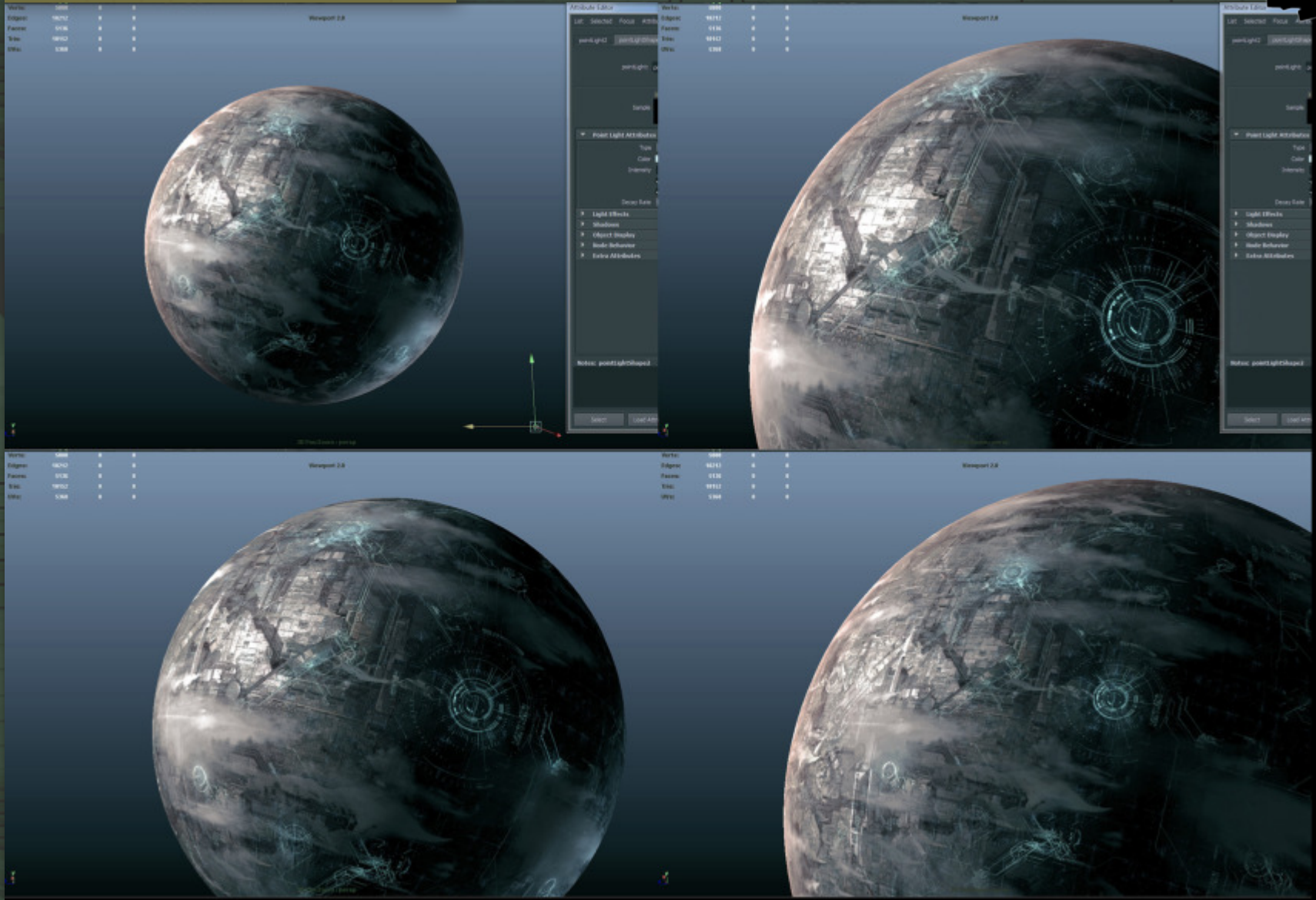
Lee Amarakoon, Senior VFX Artist, Austin: ArcCorp's info sign holograms.



WORK IN PROGRESS

Corentin: ArcCorp planet exploration (in Maya) for the Freelancer commercial.

Chris R: LOVE IT!



WORKING IN PROGRESS



Time of Day sequence. (See notes on next page.)



WORKING IN PROGRESS

Corentin: Video of ArcCorp Time of Day sequence from the Thursday review.

Updated:

- Lighting, inc. first pass of time of day (TOD) cycle.
- TV screens have new screen animation.
- Bench is finished.
- Charging station finished.
- Improvements to painted line decals.
- Cargo doorway finished.

To Do:

- Lighting work continues, especially evening/night settings.
- Expansion of corner to a wider shot that shows more foreground and backdrop buildings.

Mark's Notes:

- Gaz pump: remove some of the rusted details on some areas.
- Add dirt to the screens.

Chris R: TOD is great – really makes the environment seem alive!

We should also play with the various environment effects that CryEngine has (and that are pretty easy to use) like rain (they have a cool new puddle manager; may not be in yet, will have to check), snow, wind, etc.

Having this sort of stuff will really make the various landing areas feel alive and placed in the environment.

Mark: A couple of small things, noted in image.

Corentin: Yes, totally agreed. The doorlights should be "warm" already, but I'll check if something is missing in the lighting. Good idea for the large numbers!



WORK IN PROGRESS



Mark: ArcCorp Flight Path for PU Demo

Chris R: It's cool, but aren't we starting from space, breaking through the clouds (which hides the transition) and then descending down to land at ArcCorp? This feels like flying from point A to point B inside ArcCorp.

Mark: Yes – that's the shot before this one. In this one, you're in the atmosphere in the pilot's seat looking around before you land.

So 3 sequences:

1. In space, start entry (outside camera showing ship heating up / shaking).
2. Out of the clouds into the city (inside First Person looking around through your Connie window).
3. Landing on the pad at ArcCorp Customs (outside Camera Blade Runner shot, ship landing kicking up dust).

Notes:

- A few more overhangs and walkways in the flight path.
- Add NPCs and trains on walkways? Maybe at a later date.
- Smokestacks, overcast.

Forrest Stephan, Technical Artist, CIG: Setting up a spline, then having an attached camera showing the path, will

help with prototyping. Also using Kythera splines is another option, since that way you will have a ship and you can land the ship with multiple cameras attached. I think it's just a little bumpy with the W-A-S-D keys.

Mark: Yep. This will be on a spline in the final, with you inside the Constellation looking around as you fly.

Travis Day, Associate Producer, CIG: Is there a plan to dress the set a bit more? This is all pretty muted and grey, without much color breakup. There is also the illusion of verticality, but I don't feel like that path takes much advantage of some cool moments you could have buzzing close to or under some of the spires/pipes.

Perhaps there could also be additional ship traffic taking off and landing from other pads as you fly in/by.

Mark: WIP, man, WIP. :)

ArcCorp's planet is industrialized to the point the whole surface is pretty much nothing but factories pumping filth into the air. Imagine huge smokestacks everywhere, billowing gross clouds of smoke, making the atmosphere yellow. Think of the cities more like oil platforms, where the areas of the city are color-coded and the buildings assigned numbers instead of map keys. And yes, ships coming and going, even people and buggies on the skyways. There is no "ground," only an endless sea of metal.



WORKING IN PROGRESS



Mark: ArcCorp PU Demo Flight path
Getting there!

- Needs more color; very black and white right now.
- Add some landing and taking off of ships while flying in.
- Lighten the landing pad area up a bit.



WORKING IN PROGRESS

Flightpath and landing pad

Mark: Overall looks fantastic!

Cole Eggen, Illfonic: This is incredible!

Pedro: And now I have to change all the music :p

GREAT work!

Alex Mayberry, Executive Producer, CIG:
It could be more interesting if there were a bit more over and under movement along the path. There's a lot of geometry to maneuver around that might make for a more interesting flight (or maybe even some close encounters with passing ships).

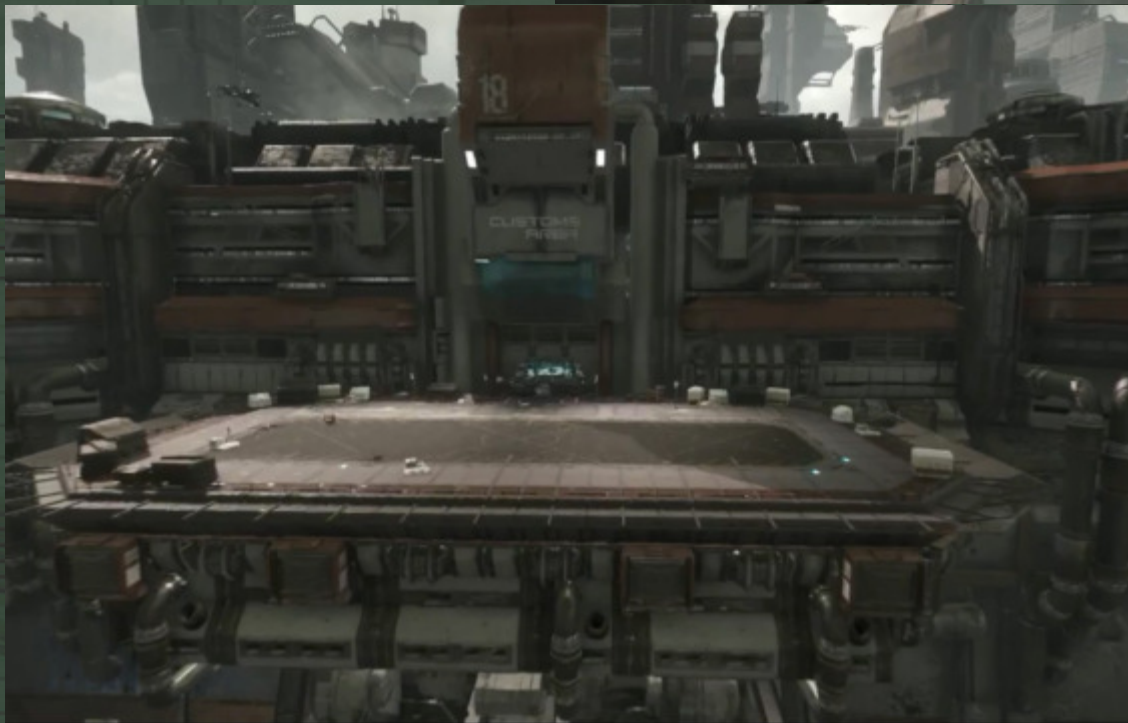
Mark: I agree.

[sequence continued on next page]



Mark: Flight Path:

- Landing pad needs some support under it.
- Needs more symmetry to balance out the right landing pad.
- Make the customs doorway pop more.
- Add banners around customs entrance.
- Buildings need more painted color variation, like the oil rig reference.



WORK IN PROGRESS



Mark: ArcCorp Planetside update

Overall looks fantastic; nice job!

Dave H: That looks amazing. My only little nitpick is that, from this angle, some of the smoke stacks look like the building is burning. I've attached an example from frame 1608.

Corentin: You're right, we'll pay attention to it for the subsequent iteration. Thanks!

Mark: Looks great; here are some notes:

- Pull the green out in the sky.
- Dial in the lighting a bit.
- Buildings should have more color in them – more blue lights and more variation on the painted reds; maybe some oranges or yellows.



WORK IN PROGRESS



Jake Ross, Associate Producer, CIG: Video for notes/callouts for character animation in ArcCorp environment.

Rob Reininger, Senior Technical Designer, CIG: Notes for animation run-through.

The Air Marshal, the NPC with batons, will need a home base somewhat close to the landing area. We will need an animation to holster his batons. He can be talking to some of the other landing pad technicians about the various ships that are landing. How nice they are. Commenting on how something is the new model that just came out. The amount of damage done to a ship (if it's significantly damaged). Repairs that might be needed. Surprise that the ship was even able to land if significantly damaged.

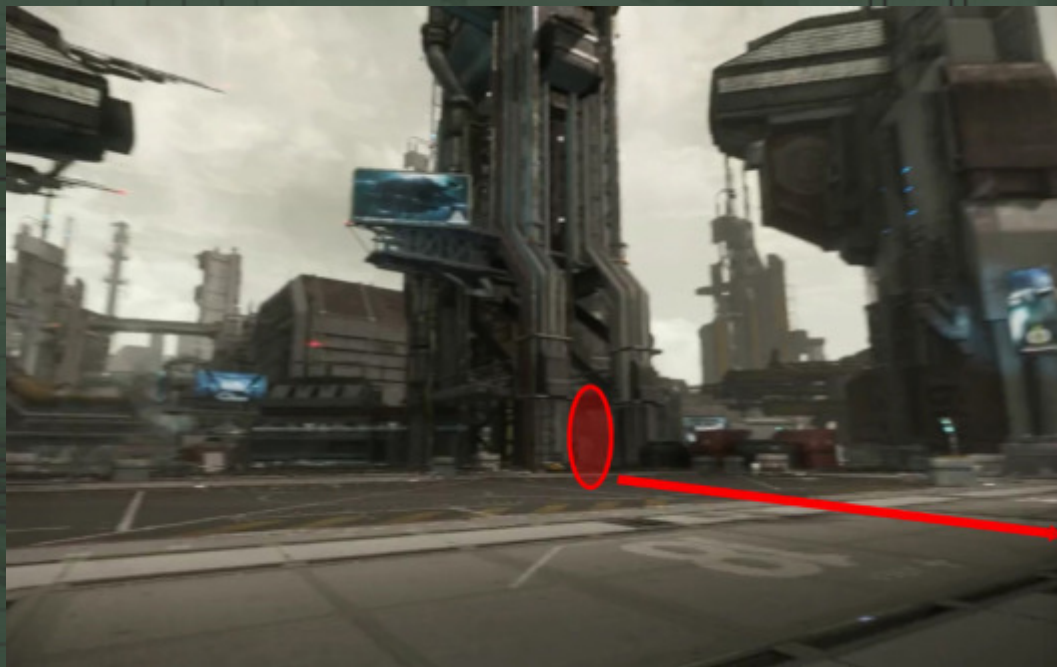
Steve Bender, Animation Director, CIG: This place feels like it's LOUD. REALLY LOUD. It feels like there should be vehicles that move back and forth on the platform, like luggage/cargo movers, etc.

We will need a system design or tag that is passed to Flowgraph to fire animations and audio related to damage amount.

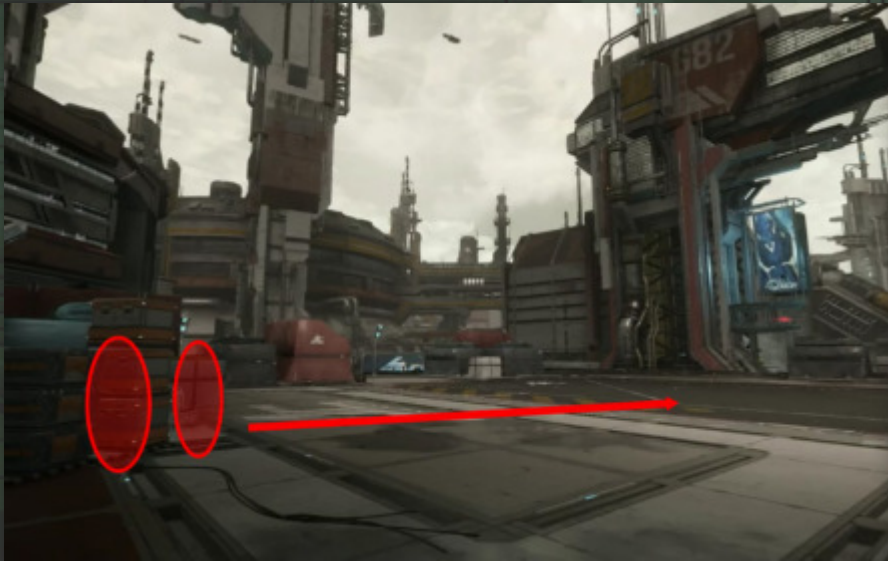
How big is a typical ship going to be here?

Rob R:

- Ramp Marshal: guy with batons would be out here when directing a new ship onto the landing platform (including on player approach; anims for this exist).
- Upon touchdown, marshal walks to his area just off screen to the right.
- Could also serve as a greeter as player exits the ship.
- Directs the player to the customs entrance.



WORKING PROGRESS



Rob R:

- Landing pad workers congregate here.
- Unload cargo from ships that have it. (Grav pallets.)
- Always commenting on the ship that people have. (Conversations and gestures toward ships.)
- Organizing their equipment. (Rummaging in boxes.)
- Welcomes player (if UEE faction standing is high enough).
- Can apply work zone animations to these guys. (Low/Floor)
- Backpack-driven pressure washer that is used to clean the landing platform's floor.



Rob R:

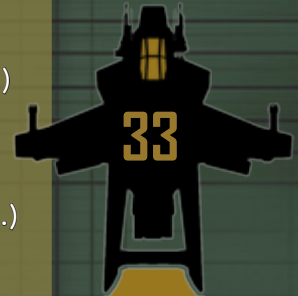
- Security guards could be on left or right side of door. (Will randomly pick a side for the pair.)
- Welcome to the LZ (in this case, Area 18).
- Conversational stuff. (Talking about player's ship, happenings on the planet, family life, sales at various shops, etc.)



Rob R:

- Custodial worker comes through and waters the various plants in here. (Green)
- May stop and strike up a conversation with the security guard on back wall. (Red)

Steve: With what is he watering? a can; a hose? Does he always have it?



WORKING PROGRESS

Rob R:

- People sitting on benches waiting for their ships to be brought to them. Head in hands in boredom. Looking at mobiGlas. Talking to another person that's waiting. "Need to buy a hangar at this LZ. This 'public landing pad' process takes forever."
- Talking about customs process and what a hassle it was.
- Looking at information kiosk in the middle of the room.
- Someone could be lying down on one of the benches.
- People looking up at the screens posted around the room. (back left)



Rob R:

- Security guard manning scanner. There is always someone manning the incoming scanner when a player passes through. (See CitizenCon script for standard scan process.)
- Guard sitting while operating scanning process. Interaction with computer keyboard or touch screens during scan.
- Manager/Supervisor could come in and lean over security guard to either check some information, give instruction, deal with problem regarding NPC in the "incoming" security room.
- Manager could put hands down and lean on counter for the interaction.
- Scan finds illegal weapons or products on player, forcing security guard to react to it.
- Scan finds micro organisms that need to be dealt with.



WORK IN PROGRESS

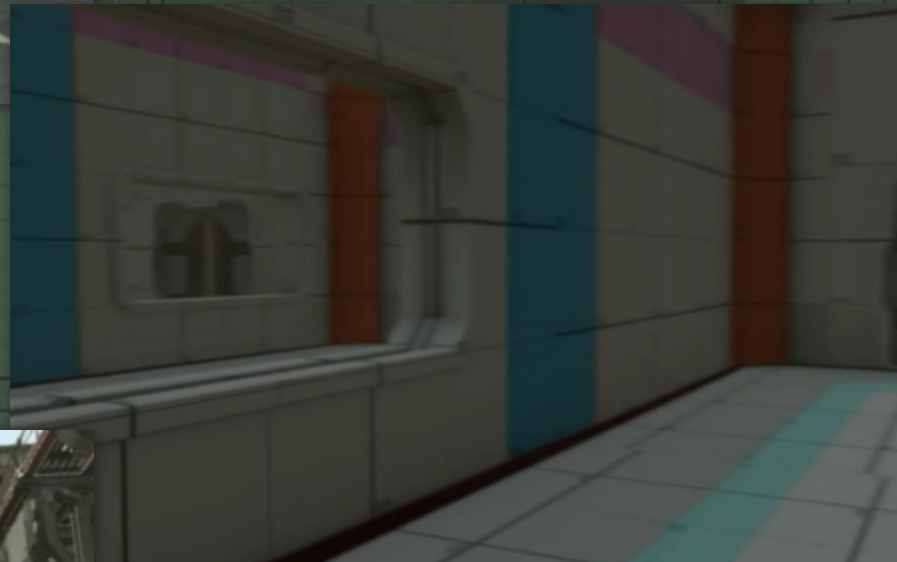


Mark: ArcCorp Customs Blockout

The reveal when you walk out the door should be epic.

Notes:

- Layout feels too big. The scan room and security room in between needs to be smaller.
- Time of day should be around 2:30 PM or so for nice shadows.
- Scanning room should have machines animating when it scans.



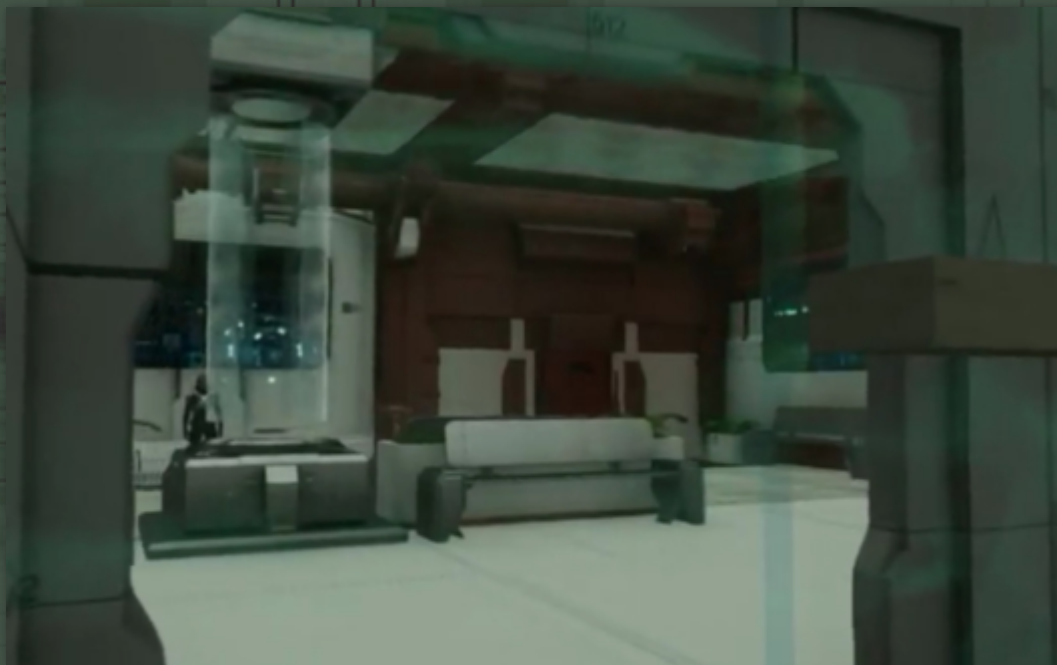
Dave R: This may be more a concern for later, but the scanning room needs to allow groups. Just imagine landing with your multi-crew ship and having to go through the scanning process one by one. Waiting in line would slow down the pace too much in my opinion; it would be best to pass the process as a group.

WORKING IN PROGRESS

Mark: ArcCorp PU Demo Update

Looking kickass, guys!

- Move the couches to be surrounding the central feature, instead of parallel to it.
- Try to get a hot rim of light on the central building.
- Light up AC signs more.
- Lower some of the spaceship traffic.
- Break up materials on the central building; maybe some windows towards the top?
- Use Dumper's Depot.
- BHVR will swap store fronts with TDD.



WORKING ON IT



Mark: ArcCorp Planetside update

Overall, it's coming along fantastically!

- Front glass doors feel generic; add frost and adjust frame.
- Scanner needs more details, material adjustments.



- Light up the logo and sculpture to accentuate it.
- Put a cylinder of refraction/distortion under the sculpture to make it seem like it is being affected by anti-gravity.
- Put indicators on the ground for where paths go, strip lighting for at night.

Forrest: That centerpiece is beautiful. Two thumbs up!

WORK IN PROGRESS



- Bar façade feels really bare; add some more detail outside.
- No defined walkways to shop entrances.
- Add more vents on the ground so steam can come up through them.

Mark: This is the proper layout of the ArcCorp shops, which is a little different from the PU demo layout. Here are some notes:

- Looks like there are some problems with blend layers.
- Not as scratchy or textured as it was.
- More street lamps; think about how it looks at night.



Will Weissbaum, Writer, CIG: Random Thought: It might be interesting if ArcCorp tried to green up the space a little to make it more livable. A couple options that might be fun: uncared for planter boxes, thin strips of dying trampled grass and plants, glass-covered terrariums, or even slightly grubby fake plants.



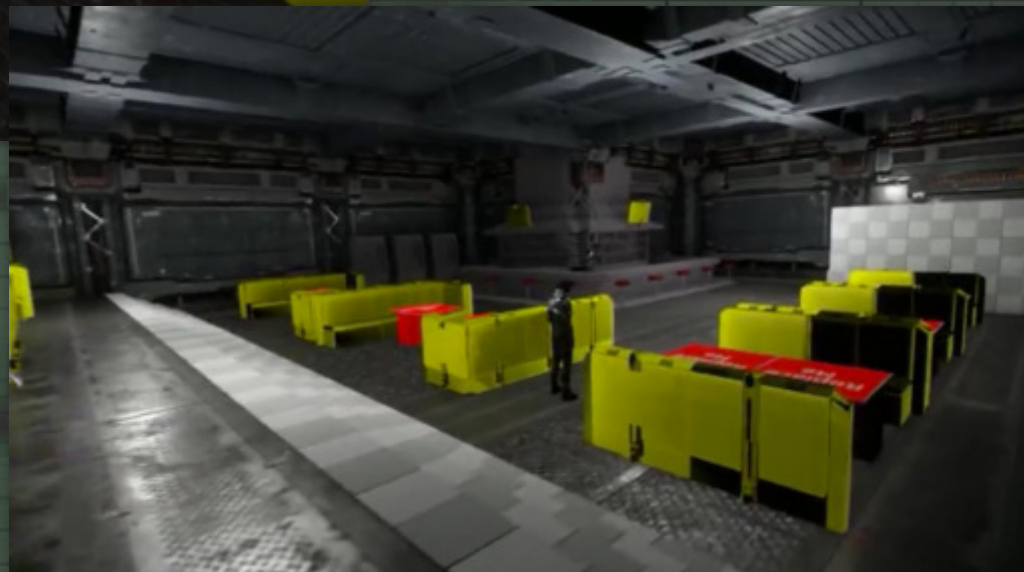
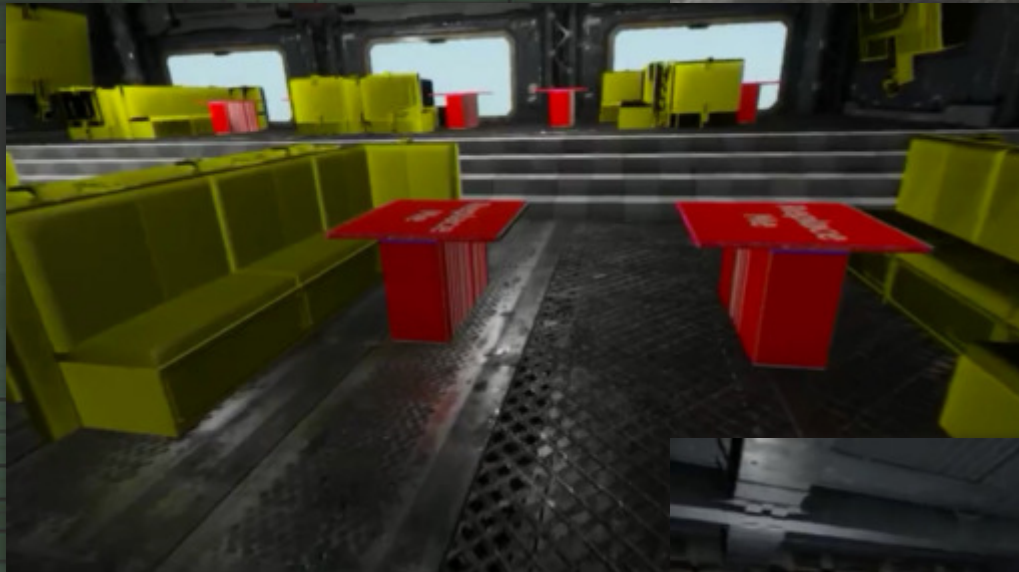
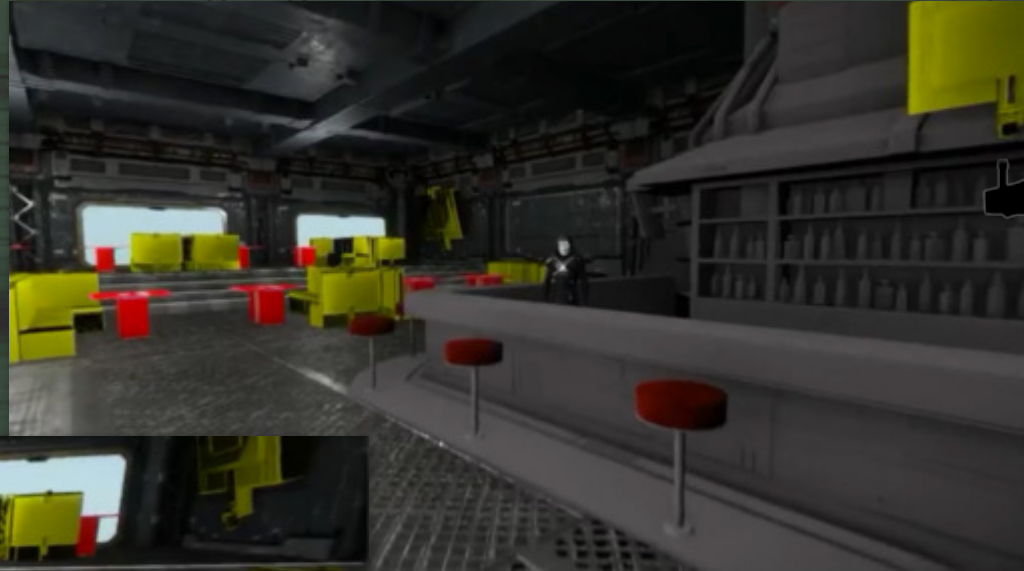
WORKING ON PROGRESS

Mark: ArcCorp Bar Update

I like the layout. FYI, this is a VERY WIP version of JUST the layout of the bar:

Notes:

- We need to reuse these pieces for Terra bar.
- Raise entryway wall to the ceiling for better occlusion.
- Remove ATM machines.



WORK IN PROGRESS

Mark: ArcCorp Bar Update

Looks awesome. We will have to work out the front façade.

Notes:

- Feels a little tight; open it up a bit? Let's look at the metrics and evaluate.
- Floors look a little high and noisy; make them a little more flush.



Will: I love the engines hanging from the ceiling as part of the bar's theme. It might be neat if the tall bar tables were converted engines as well.



WORKING IN PROGRESS

Mark: ArcCorp Bar update

Mark: Looking good, guys! Here are some notes:

- Warms and cools are nice.
- Make some room for the props Megan is doing.
- Still feels a little tight; might need to open up a bit.



- Put bounce lights under tables to help brighten and define them a bit.
- Make textures a little more dingy and dirty.



WORKING PRIORITIES



WORKING IN PROGRESS



Bartender

Mark: I dig #6 ... has a nice layered feel to him. I think we should add a belt and a rag to Bartender him up a bit.



WORK IN PROGRESS

Mark: High-rez sculpt of the Bartender on ArcCorp

Chris R: This looks cool, but doesn't look like a bartender at all to me. Looks like a repair guy.

Now this [at right] could be a futuristic bartender.

Mark: To make someone look like a bartender, you just put a towel over his shoulder.

The guy you chose is out of theme for the ArcCorp bartender. He's more the Terra bartender.

Here's the description:

The Bartender serves drinks at bar count-

er; he is the bar manager. The bar is corporate owned, he should somewhat be identified as an ArcCorp worker. I also believe he was supposed to be ex-UEE military, grizzly and gruff.

Chris R: The guy has a utility belt! I'm sorry, but bartenders don't have outfits like that – he would probably take his vest off as it would get in the way of mixing. But in any event he just feels way too informal to me for the ArcCorp bar I've seen. If he was ArcCorp he would have a simple top (like the one in the linked shot) with an ArcCorp logo on it. The bar on ArcCorp is not a dive – it's got booths and nice lighting. It's kind of like a high-end but old-school bar (think a bar out of the '30s or '40s like the Formosa).



Bartender Concepts



Megan Cheever, Associate Concept Artist,
PU: More concept ideas for new ArcCorp bartender.

Chris R: I quite like D.

Megan: ArcCorp Bartender revision + material callouts

Mark: Very nice, Megan. Love the callouts.

Paul: Sweet – nice and clear.

Chris R: Yep – good stuff!

Patrick: Great work, Megan.

ARCCORP BARTENDER



WORK IN PROGRESS

ARCCORP PATRON 1



Mark: Random ArcCorp NPCs

ARCCORP PATRON 2



WORKING IN PROGRESS



Corentin: Refinement on the ArcCorp Bar couches, in a modular way.

Patrick Thomas, Lead Artist, PU: Design is cool! Cushions look odd; maybe better to go with a flat leather surface?

Mark: Ditto.



David Jennison, Lead Character Artist, CIG: High-rez sculpt of ArcCorp Bar Patron 2.

Chris R: Let's lose the silly parachute straps on the legs – for a start, they cause skinning / animation issues (see RSI suit character); secondly they are totally superfluous.

Other than that it's looking good!

Mark: We were using the straps to break up the lower section because the top is so busy. We could also do this via a material change on parts of the pants and drop the straps.

David J: No problem removing it. I do wonder about it being a bit plain compared to the top, as Mark said. Also, skinning shouldn't be a problem, as it would be built as a single piece of geo.

But we could go back to concept and come up with an alternative for the pants.

Chris R: I think it should be fine just losing the parachute straps. Also, the upper harness (which feels like a fancier / cooler version of what's on the RSI suit) is cool, but it should be a separate item so you can have the patron with and without it (and without it, I suspect you won't have the same concerns about balancing the business of the top).

Paul: I like the quality of sculpt though, in general (bum area a bit vague though, in the creases :P).

David J: Thanks. Yeah, I'm resculpting that area now that the straps are gone.

Lance Powell, Supervising Art Director, CIG-LA: Is he an ArcCorp blue or white collar generic? Is he wearing a uniform that we'll see a lot of (like a doc worker)?

David J: I believe he is supposed to be somewhat of a freelancer, maybe a light smuggler type. No official affiliation.

Mark: My direction to Megan was that he was a visiting off-world pilot that landed for a drink. (think Mos Eisley Cantina)

Lance: I haven't dug into the archetypes, yet, so this is just my two cents: He feels like a generic guy; more, Luke from Empire (snow speeder), but less so (pants tucked into boots, etc.). Not suggesting changing direction – just tending to the creative.



WORK IN PROGRESS

ARCCORP PATRON



ARCCORP PATRON



Megan: Patron #3 for ArcCorp bar
Will: Random Thought: It might be interesting if wearing a mobiGlas has become so standard that fashion has adjusted for it, i.e., a sleeve with an access panel, built-in mount, etc. (Something similar is happening now with pockets being adjusted for larger phone sizes.)

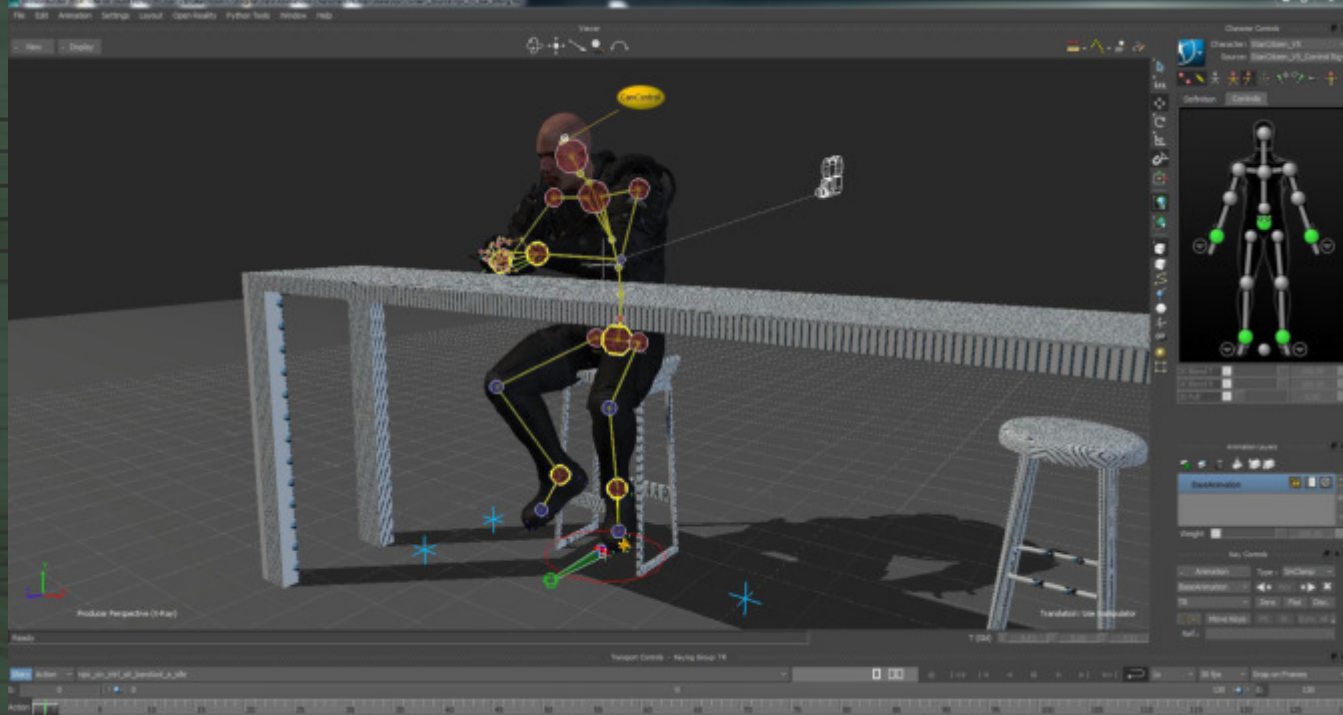
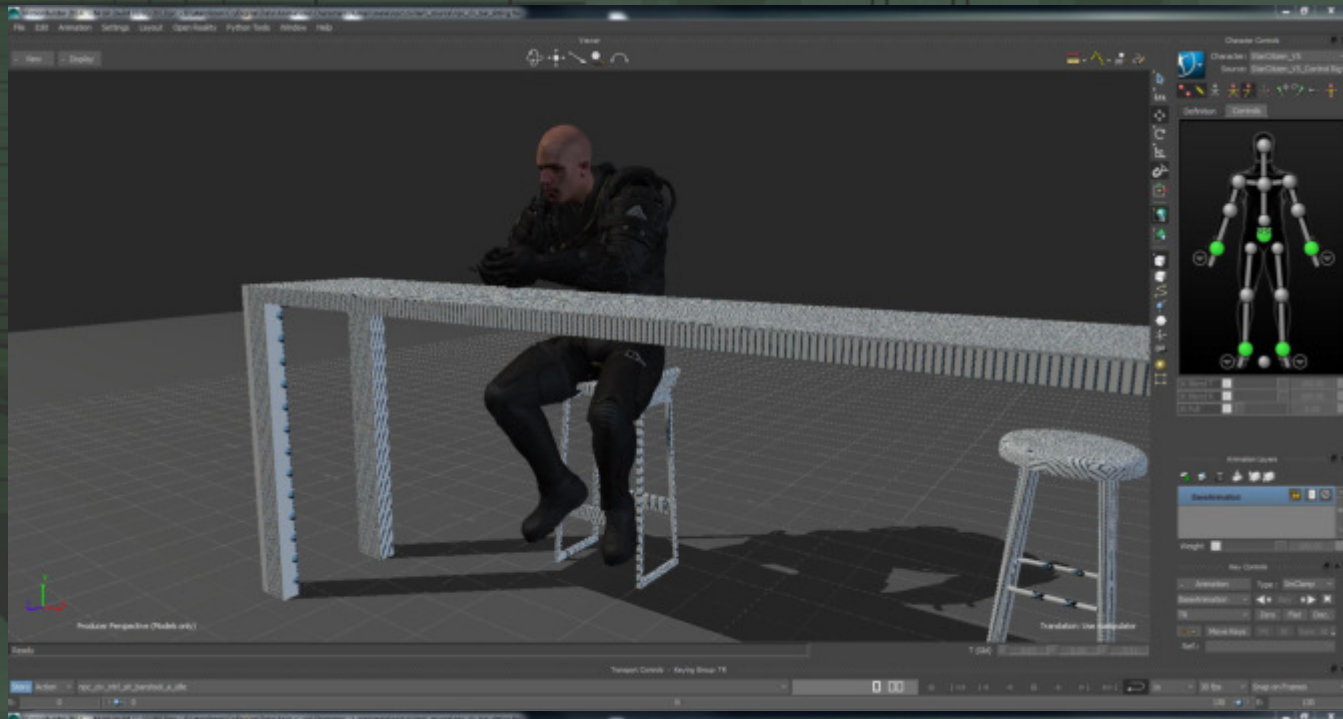


WORKING IN PROGRESS



While characters are being designed, the animation team is working on getting them moving. Here are several images of motion-capture actors sitting at a bar and dancing, supplied by **Bryan Brewer, Lead Animator, CIG**.

WORK IN PROGRESS



Daniel Craig, Animator, CIG gave us these images of a man sitting at a bar . . .



WORK IN PROGRESS



... while Vanessa Landeros, Animator, CIG had several frames of a couple of dancers.

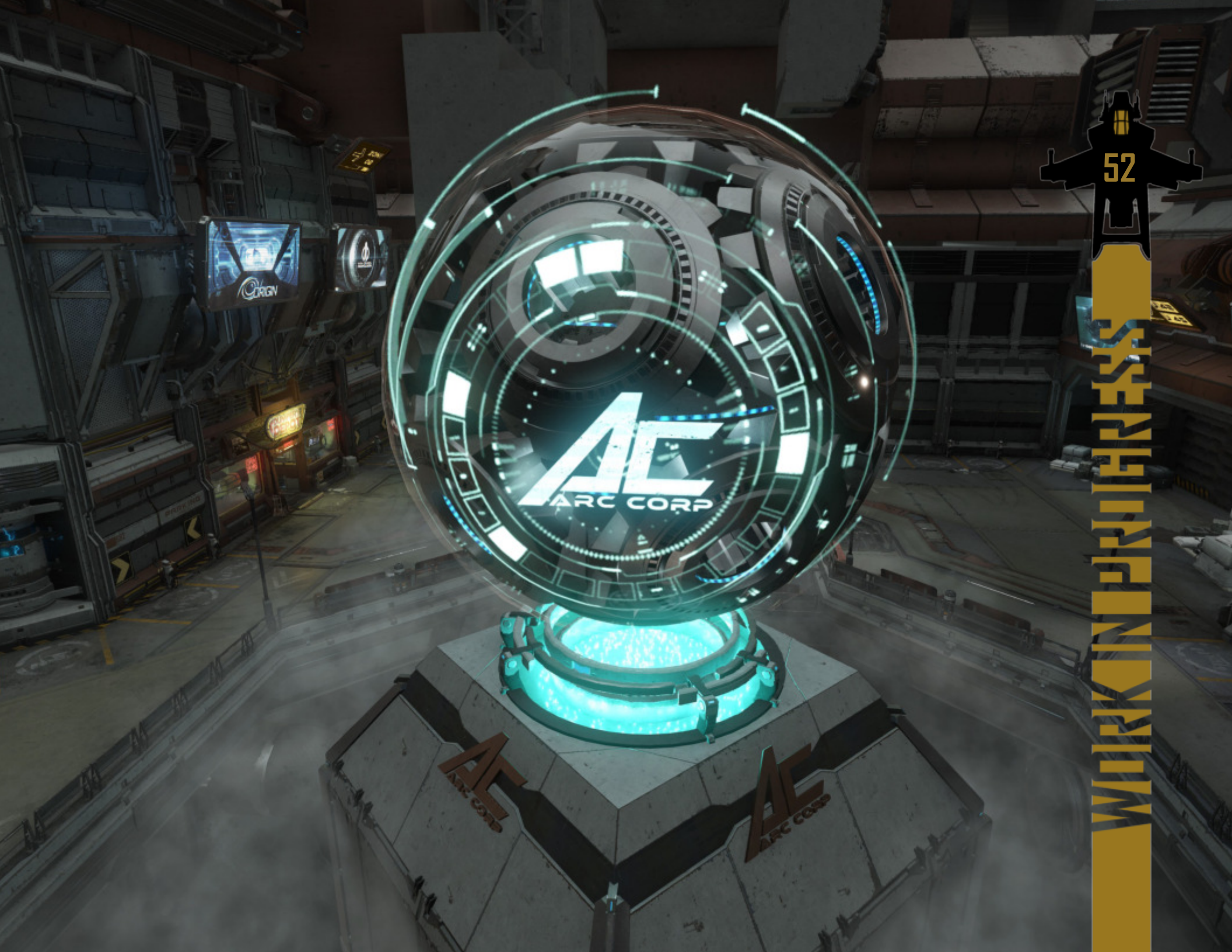




Rob Reininger was able to import the man's animation into the bar; there's more to come – of all sorts – as we continue development.



WORKING IN PROGRESS



52

WIKI IN PROGRESS



The Company

ArcCorp! The so-called mega-corporate monster. Few in known space aren't familiar with the conglomerate, the planet that bears its name, its infamous employment practices or its ubiquitous fusion generators. Even beyond Humanity's borders, the ArcCorp logo is becoming a familiar sight, as the result of a tricky export deal that ultimately provides a counterpart shell corporation

within the Xi'An with hundreds of thousands of branded engines every year.

Few realize, however, that ArcCorp actually began life as a deep-space exploration consortium in 2687. Started, essentially, in a Stor-All Hangar by a group of friends, the company aimed to use their lone Zeus IV spacecraft to locate and catalog jump points for UEE bounty money. Pooling credits (that included a lottery win and an unexpected inheritance) the quartet of friends began

the process of exploring the universe.

Except that they didn't do a very good job. Coming out of the turmoil of the 2690s, ArcCorp has made a shift from exploration (having accumulated a grand total of one jump license) to mining. During this period of rapid expansion, the corporation found a significant amount of success acquiring mineral rights to newly discovered planets. Soon, the renamed ArcCorp Mining Consortium was one of the most profitable companies in the galaxy, albeit one unrelated to the group's original purpose.

Mid-28th century, ArcCorp first became involved with BCK, a massive terraforming conglomerate at the fore-

front of the then-lucrative trade. By then, ArcCorp had moved beyond mineral rights and was also dealing in planets for settlement. The synergy between the two companies was very positive, resulting in record profits for both. ArcCorp's expert salesmen could lock down rights to a planet and then terraform it quickly at a low cost. As terraforming fell out of favor, ArcCorp absorbed BCK and the massive corporate structure they had used to help shape the modern galaxy. This was something of a hostile takeover, with BCK's director being accused of corporate malfeasance by a still-unidentified whistleblower. Most suspect the company was taken down by their partner, but no evidence has ever surfaced.

ArcLight 300 (ArcCorp) Thruster / Engine

For the F7C-S Hornet Ghost



In 2811, another sea change altered the destiny of ArcCorp. That year, looking to solve a problem with some of BCK's legacy orbital platforms, they acquired an engine manufacturer called NovaLight. Staffed with excellent designers but lacking in business sense, NovaLight had a ready-to-go series of upgraded fusion engines but no ability to properly manufacture or sell them. The buyout, initially seen by observers as an error, lit a spark. Within two quarters, ArcLight-branded fusion engines were profitable. Within five years, they were the premiere engine type for large (100+ meter) spacecraft. Today, ArcCorp fusion engines are the basis for the technology, the pattern from which all competition is developed.

Today, ArcCorp is the definitive megacorp; the company so large it could buy a planet (Stanton III). While ArcCorp still profits from a diverse set of industries relevant to their earlier days (mining, some terraforming and even a newly-re-launched exploration effort), they are known by most of the public only for their exceptional fusion engines.

Not as exceptional are ArcCorp's employment practices, earning them a somewhat deserved reputation for employing low-cost labor. Today, ArcCorp's factory workers live, age and die entirely within the ArcCorp system. What some call job security, others call indentured servitude. They shop at company stores, live in company lodging and spend their lives on dangerous fusion engine factory floors. Little money ever exits the cycle, and even those who retire generally find themselves remaining within the ArcCorp system. An ongoing social issue, the fate of ArcCorp's workforce periodically reappears in the headlines, generally resulting from fusion line accidents or factory worker suicides. While they were thrice voted the "Worst Company in the Universe" by Kaizen, the company does not comment on the issue officially and generally does not allow observers into their working facilities.

The Planet

ArcCorp is one of a very limited number of supercorporations to own its own planet. ArcCorp, aka Stanton III, is the single most industrialized world in Human space. A massive, terraformed superearth, the world consists of layer after layer of factory; so many that today building additional structures is actually impossible. New facilities are built on top of existing ones. The corporation's official headquarters is naturally located here, in the massive ArcCorp tower that rises above all other parts of the factory world.

The bulk of ArcCorp's facilities on ArcCorp (the confusion is frequently commented upon by the population, most of whom claim outsiders simply do not understand) are located in Commercial District Circle C. In addition to the tower (and the never-ending line of fusion engine plants, which ring the planet's latitudes), ArcCorp owns countless corporate towns. There is a cottage industry for tourists, who are invited to take pre-set factory tours. In fact, the actual fusion plants are so dangerous that a sanitized artificial factory complete with holograms and animatronics has been constructed for display to interested Citizens. While it was built for outsiders to make the trek to ArcCorp for the factory tour, it has also become a centerpiece of the local culture.

ArcCorp-the-world was first "discovered" by the United Empire of Earth in 2903, along with the rest of the Stanton System; what this actually means is that the government took advantage of eminent domain to claim possession of the planet from the existing inhabitants in that year, and in 2920 it was sold to the company. Unlike other corporate planets, ArcCorp decided to partition off the planet into smaller lots rather than reserve it for future development. Other companies (always non-competitors, but otherwise not pre-selected in any way) sprung up rapidly around the globe at a speed never before seen until the orb reached its current state.





ARCCORP & THE PERSISTENT UNIVERSE

CORENTIN: I DID THE PAINTOVER IMAGES IN THIS ARTICLE. THEY ARE IN-GAME SCREENSHOTS ON WHICH I PAINTED TO GIVE ARTISTS A BETTER IDEA OF WHAT WE EXPECT.

The teams in Austin and Montreal (Behaviour) have been cranking for almost a year to complete the first planetside environment in Star Citizen. Last fall, you saw the first result of their efforts — the demo where, in a single, long shot, a player checked out his Constellation in flight, then descended to ArcCorp, coasted in over the planet-wide city, landed, passed through customs, exited, and stopped in at Dumper's Depot.

This month, we sat down with several of the designers from the Persistent Universe team and talked about what they've accomplished, and what still needs to be done.

JP: As usual, let's start with the basics. What did you do for the PU demo last October, and what are you working on now for the ArcCorp environment?

Mark Skelton, CIG PU Art Director: Right now, Corentin and I are art directing the ArcCorp environment to get it back up to 100% after it's been readjusted, optimized and moved around a bit. For the PU demo, I helped Sean Tracy adjust the cutscenes and tweak the overall look and feel.

François Boucher, Lead Technical Level Design at BHVR:

I'm working on the design and integration of gameplay in the shops and around the plaza. For the PU demo specifically, I worked on the scanning sequence in the customs and the path of the ship approaching the landing pad.

Rob Reininger, Senior Technical Designer, CIG Austin:

I am currently working on getting the AI to look a little more life-like — using proper animations, getting them to do logical things without the AI system online yet. (Which won't quite be ready for primetime for the next PU demo.)

Corentin Chevanne, Art Director, BHVR: I originally did a bunch of concept art, trying to put some visuals on the lore we received from the writers. It has mostly been explorations at this point.

Then, I created some moodboards and the concept artists started to make some mood concepts more in line with the direction. Then, production kicked in and my job was more about giving feedbacks on the composition, the lighting, etc. Now I'm doing paintovers on some ingame screenshots, and also pushing to increase the quality in that last production phase.

Sean Tracy, Technical Director – CryENGINE: For the PU Demo I was responsible for its direction and essentially for gluing it all together.

Mark: Forrest [Stephan] helped out a bunch in that regard, too.

Sean: I did all the cinematics as well as a good deal of the technical setup and just getting the build running. :)

Guillaume Bourque, Game Designer, BHVR: I helped develop the multiplayer hangar elevator system, the chat system and dynamic item spawning in shops using our own tag system.

Nathaniel Blaisdell, Senior Game Designer, CIG Austin:

Same answer as Rob R's.

Rob: No fair taking the easy way out, NATE!

Guillaume: :O

Nathaniel: It's called efficiency.

I'm also getting together the list of shop items that players will be able to look at.

Stefan Horvath, Level Designer at BHVR: Same as François Boucher . . . just kidding.

I helped implement some of the scripting for the customs sequence and the Dumper's Depot reveal. I also helped with iterations between Austin and BHVR on the design side of things.

JP: *Mark mentioned readjusting, optimizing and moving it around a bit. For people who have seen the PU demo we made back in October, what are the main differences between it and ArcCorp today?*

Guillaume: There will be new shops and other locations that you can actually go in and visit.

François: The shops have moved around, and there are more of them. Cubby Blast, the TDD, The Medical Unit, Astro Armada and G-Loc have been added.

JP: *Cubby Blast? TDD? G-Loc? ... what are they?*

François: Cubby Blast is the personal defence weapon shop, selling guns, grenades and gadgets. TDD is Trade and Development Division, to buy and sell cargo, and G-Loc is the bar.

Nathaniel: There are increased numbers of NPCs. And hopefully even more after more optimizations are made.

JP: *How many NPCs could you interact with in the demo?*



BEHIND THE SCENES



CUBBY BLAST WITH AR MODE

And how many when ArcCorp is released?

Rob: There isn't going to be a ton of NPC interaction in the first pass release of the PU stuff. The main difference between the October demo and the upcoming release is that the characters are actually NPCs as opposed to anim objects. NPCs, when moving around from place to place, are actually pathfinding to their new locations, and interacting with things called "smart objects" that have been placed around the world. This is the start of us being able to test the new AI system that one of our contracting companies, Moon Collider, has been working on for us.

JP: *What are the most interesting features to you about ArcCorp?*

Nathaniel: Being able to use the mobiGlas for the first time.

Mark: Agreed — getting the mobiGlas.

JP: *What will the mG be able to do in this first iteration?*

Guillaume: We're still not sure about the mobiGlas; we might be able to use the AR (augmented reality) mode and we might be able to use to mobiGlas during shopping, to browse items). How much we can get done before the first release is still being determined.

Sean: The most interesting feature for me about ArcCorp is the public landing area. It's a beautiful vista and encompasses exactly what ArcCorp is meant to be — a bustling city with tons going on. :)

François: For me, it's seeing everything from the PU coming together in ArcCorp. NPCs, shopping, landing and taking off.



BEHIND THE SCENES

Corentin: ArcCorp is a fully industrialized planet entirely covered by buildings and factories, so by itself, the whole environment is an interesting feature. :)

Another one major landmark within that is a big ArcCorp headquarter building. It's visible from far away during the landing sequence, and the shopping plaza is in its basement, which makes a good visual connection for the player, from the flight path to the shopping area.

Rob: The most interesting feature to me is getting the new AI system up and running. Although it's still going to be very early and not very noticeable to the players yet, the foundation on which we're building the NPCs will evolve quite a bit over the next six months or so. As time goes on, NPCs will have schedules and go about their business just like you or I would do in our real lives. Every NPC will have a purpose. This is a core feature that is going to help turn the world into a living place. To start to get this system online is my personal favorite, even though it might not be as visible to the public yet.

JP: *What was the worst problem in bringing the ArcCorp environment to life?*

Corentin: One of the problems was the scale transition during the flightpath, going from some kilometer-large environments and assets to a human scale area. That can create a lot of issues in keeping the visual composition interesting and a clear scene reading.

Mark: One of the things we wanted to do is make these locations iconic. Some of the big icons that make this location stand out are the ArcCorp Headquarters building and the large gear sculpture in the front. When people land on ArcCorp we wanted to make sure that they have a "wow" moment walking out of customs.

Sean: Getting it to run for sure! The pure amount of geometric complexity was beyond anything I've seen thrown at a PC before. Just as Corentin said, the scale transition is surely the most difficult part of this. The other difficult part was the actual transition from space to planet, which still isn't half of what we need it to be. Having to mask the transition without a load screen was a very difficult thing.

Just to give an idea, at the highest point the demo was pushing over 25 million triangles and more than 10,000 drawcalls. With that said though, it didn't get nearly as much time to optimize as we would have liked, but that's why it's a demo and not a release. :)

Guillaume: From a level design perspective, changing the layout of the planetside a few times created extra work for sure, but hopefully it's for the best. Iterating and wanting to create the best layout possible and still meet a bunch of requirements like performance, flow and production time.

JP: *What are desirable triangle and drawcall numbers?*

Sean: For console budgets, about 2500 Drawcalls and 500,000 to a million triangles.

Rob: Let's just say, we're happy that it currently runs . . . >.>

Sean: For a current generation PC, figure about 4000 drawcalls and 1.5 to 2 million triangles.

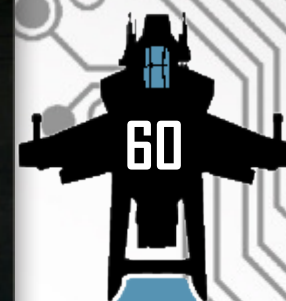
Sean: That's about "normal" in recent PC games.

JP: *Does that impact frame-rate?*

Sean: Oh, yes. It's pretty much the main factor in how fast things will run. Our renderer takes about 70-75% of our frametime.



BEHIND THE SCENES



BEHIND THE SCENES

JP: *What's our current frame-rate, and what's our target?*

Sean: To put some numbers on that, because numbers are fun to run, at 30 FPS you need 33ms frametime, so a frame can't take any longer than 33ms. Otherwise it runs slower than 30 FPS. Our renderer usually takes upwards of 20ms or more per frame, which leaves 13ms or so for gamecode and other things.

Our current frame-rate is 30 FPS, fortunately (on a good PC).

François: As a quick reference, what are normal numbers in Arena Commander?

Sean: Arena Commander is relatively easy because there isn't much in the levels in terms of complexity. The most complex stuff in the AC maps are actually the ships them-

selves. And since those get a good deal of LOD work, they aren't so bad and actually we can run at about 60 FPS in AC.

JP: *"LOD work"?*

Sean: Level of Detail work (lower detail at greater distances, so that the geometry can be processed faster).

JP: *What was the most enjoyable or funniest moment in this process?*

Sean: Seeing how Mark does at 5:00 AM with no sleep for the week prior. :)

Mark: lol

Sean: Actually for real, the most fun I had was when Mark would direct the camera shots over my shoulder and we

would bounce angles back and forth and collaborate on the shots. That was really fun for me.

Mark: Seeing Sean chain smoke like a WWII Marine.

François: Seeing the amount of work put in every day was awesome. Having teams from around the world working on this meant seeing something new added every morning when loading the level.

Rob: The most enjoyable part? Delegation of work! Seriously though . . . being able to do things the right way. Getting things hooked up properly instead of having to hack some things in like we've had to do for some previous demos. We're getting the time to do things the right way and it's nice to see it all come together.

Corentin: For me, it was when we first blocked out the flightpath and realized what the planet will look like. We were excited . . . and scared a bit at the same time. :)

Mark: Yeah, collaborating with Sean was fun. For me, the weekly meetings with BHVR are fantastically fun. Seeing the progression of ArcCorp come together from such a talented team is super exciting.

Guillaume: Yeah, seeing the level grow and grow. More things added, more details every day. Also being able to connect your hangar to ArcCorp through the elevator and meet other players on ArcCorp. It really starts giving a sense of how the PU will work and things will be interconnected.

Guillaume: Yeah, the first time you see the city and its vistas, it's a pretty cool feeling.

JP: *What is the most useful thing you learned about the PU from working on ArcCorp? (What are one or two things you don't plan to repeat in further work on the PU?)*

Guillaume: That we desperately need streaming.

JP: *We need streaming ... what ...?*

Guillaume: Wanna chime in, Sean? ;)

Sean: We need seamless streaming indeed!!! No hard level load.

Guillaume: Basically, streaming in games means that you can load/create a portion of the game, on the fly, without having to go through a loading screen.

Sean: We need to be able to load a ton of content and entire levels asynchronously on the fly.

Guillaume: We learned that we need that technology in order to meet the level of quality we want.

François: For me, it's been the realization of the huge amount of work we've got ahead of ourselves, and the importance of doing things the right way, on a solid foundation. It sometimes makes it seem like things go slowly, but it's because everything needs to be scalable to the entire universe, not just ArcCorp.

Rob: Using Flowgraph to script AI!!! I can't wait to say goodbye to the old ways and embrace the new! One thing I think I would do over is probably how the level is structured in the .cry file itself. Because we started from the previous demo's .cry file, it has a few things that I would probably start by cleaning up before getting so many people in the file. We need to do a massive reorganization of the file at some point to prepare for the streaming that we'll need to facilitate, but we will have to worry about that a little later. This is all transparent to the end user, of course. Just some nerdy designer OCD that I can't help wanting to fix every time I open the file up. ;)

Sean: I don't plan to repeat having to confine the level areas to small areas ;) or to ever try to load so much data up front (the space station in the first shot of the demo).



BEHIND THE SCENES



Corentin: ArcCorp was our first map and we are using it as a benchmark for several things. We learned a lot by iterating with the tier system and prefab, the way we're building assets also.

We do not plan to do another fully industrialized world!

JP: *Where do you go from here — what's left to do before ArcCorp is released, and what's next on your plate for Star Citizen?*

François: Adding all the gameplay in the new shops and even in the shops already shown, like Dumper's Depot; the shopping experience — buying/selling/trading; getting jobs and quests; interacting with NPCs. Then it's replicating that on other planets, like Terra.

Nathaniel: There are lots to do! Getting all of the NPCs

doing "stuff," playing interesting animations, etc. . . . I'd like to see the player be able to interact with many of the same things that the NPCs can, in time for the first release, but that may have to wait for a later update.

Guillaume: We still need to populate all the shops with actual items. With at least their name and description, to give a bit of information to the player when window shopping. Then we need to refine the Augmented Reality mode, its visual appearance and functionality, and finally work on the mobiGlas shopping experience. In the next few months after we reveal ArcCorp, new mobiGlas applications will be developed, like skyLine and cargoManager.

JP: *I can figure out what cargoManager does. What's sky-Line?*

Mark: skyLine is mainly a galactic map directory and a navigation planner used massively across the empire. It features walking maps for cities, along with a full blown star map to find your way around the known galaxy and its myriad of systems.

skyLine strength comes from its ability to be synced with other apps for various dynamic information such as market data, pirate sightings, touristic must-sees, and much more. It is aimed at being more than a NavMap. It's a complete atlas, "GPS" and repository of the player's planetary and spatial information.

skyLine is used on planets and on board multicrew ships via the mobiGlas, in deluxe exploration ships, and in some carriers as part of standard equipment and in hangar holo-rooms.

JP: Wow!

Mark: Thank you, Confluence [the SC internal wiki]. And Dave Richard.

Nathaniel: Conflucius.

Mark: And Guillaume.

Mark: One of my primary tasks will be getting the lighting and props all up to par. Corentin has done some great pain-tovers, with directions, to set the bar for where ArcCorp visually needs to be before release.

Sean: There is lots of work to be done on the crowd and NPCs. Also some polish on the environment itself and some optimization, then it's good to be consumed.

Rob: Yeah, Nate touched on something that's one of our next major hurdles. Getting the NPCs ready for player-to-NPC interactions. It's not just enough to have them walking around the world doing interesting things. Part of bringing them to life will be interacting with them in a personal way.

Drilling them for mission details or secrets, or to become mission givers through a conversation path. Getting the shopkeepers set up to buy/sell goods is another big one that our friends at Behavior are working on. That will help give additional purpose to the key locations as well. Once we get that up and working well, it should start to become a fairly immersive place to be.

Corentin: We have to finish Terra, which is also a huge city, but with more architectural variation in the cityscape.

We've also started working on Delamar, a big asteroid located in the Nyx system, which is a former mining colony where political radicals settled to hide from the UEE. It's also a good place for pirates.

JP: Any final words?

Mark: I would like to thank BHVR for making me look better than I actually am. Without them . . . ArcCorp would suck. And it won't.

Sean: I echo Mark's sentiments and want to point out that this is just the first planetside environment. Like everything else, it's only going to get better, so if you are impressed now just you wait . . . super fun times ahead!

Rob: I'm just happy to be a part of the game that will be changing the industry as we know it. As far as careers go in the game industry, you very rarely get to be a part of something that is pushing the boundaries of gaming like SC is doing. Typically, you are chasing a bar that has already been set by some other game. To be involved with this in any capacity is truly an honor, let alone to be as involved as I am. There are so many talented people that I'm getting to learn from and work with, it's definitely been very humbling.

Guillaume: I really hope Citizens enjoy wandering around ArcCorp and all the planetsides to come! :)



BEHIND THE SCENES

VEGA SYSTEM AREMIS, SELENE



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NEW CORVO, AREMIS

On the surface, Vega is an unassuming four-planet system orbiting a G-type Main Sequence star. Once seen as a potential centerpiece for rapid Human expansion that might someday compete with the likes of Earth and Terra, Vega has suffered as it has found itself on the front lines of the Vanduul conflict.

The system was first settled in 2402. Two planets in the green zone, Aremis and Selene, were quickly terraformed. The system's population expanded, constructed cities, mined the asteroid field and gained its first UEE representative in rapid succession.

That growth ceased with the fall of Armitage in the late

27th century. Suddenly finding themselves on a front line and fearing an organized, ongoing Vanduul campaign, the system's population rapidly decreased as those with the means to do so retreated to inner worlds. Real estate prices plummeted to almost nothing, and the tenor of the system's populace that stayed changed overnight. In the blink of an eye, the most profitable work on Vega became figuring out how to leave it.

The imagined Vanduul invasion has not, as of yet, occurred. Beyond the occasional rapidly defeated reconnaissance foray, the aliens have not made a solid push to take or significantly ravage Vega. Even so, the constant threat of invasion still looms over the populace.



TITUS, SELENE

While native Vegans consider themselves to be on the front line of the war effort, few in the military do: with the existing infrastructure and the connection directly to the home worlds, an assignment to Vega feels nothing like being forward deployed elsewhere.

Within the last decade, the system has begun to turn around. People feeling the effects of the difficult economy have begun to flow to Vega to take advantage of the cheap real estate. Even though the early warning systems will occasionally lock the system down as Vanduul Clans are detected roaming through Virgil, clearly that threat doesn't outweigh the appreciation some have for cheap rent.

VEGA I

Vega I is a dwarf planet located close to the system's star. No attempt at habitation has ever been made, and no interesting resources have ever been discovered. A single unmanned probe was all it took for astrogeologists to discount the planet as a potential source of commerce or science.



VEGA II (AREMIS)

Truly stunning for an inhabited world, **Aremis** is orbited by a set of planetary rings that contain a number of small shepherd moons. The planet's biosphere, while adapted for Human comfort in the terraformation process, evolved naturally and gave rise to a significant amount of flora and fauna which still survive.

Aremis was the second planet settled in the Vega system. For most of its 'life,' Vega II existed as home for a series of naval and other military bases, as well as a popular location for shore leave. The planet plays host to significant bases for all four services, including one of the oldest Army facilities, Camp [General Chester C.] Manheim. That dynamic has changed in recent years. Aremis has benefited the most from the recent population boom, resulting in several small cities of note and the development of much farmland.

VEGA III (SELENE)

Selene is the heart of the Vega system, though many suspect it will not hold that title for long. Although its population is down significantly from the system's heyday, it still maintains a population an order of magnitude above other border worlds. Selene is properly represented in the UEE Senate, with a seat considered significantly influential.

The largest city and main landout is Titus, a sprawling megalopolis that seems to dream of former glories. While the city center is quite developed, a rusting sprawl of construction projects enacted but never completed throughout the centuries rings the cityscape. Of late, these have been purchased by outside interests in the hopes of redeveloping the region; the success or failure of that initiative is yet to be determined.

This influx of population has invigorated the system after being named a 'planet to watch' by the New United. The city of New Corvo is currently the largest on the world, and is where all off-world commerce occurs; it is becoming quite the center of culinary science within the UEE. Many economists speculate that Vega II will surpass its sister planet, Selene, within a few years, and soon exceed Selene's stature even back in the height of its expansion. The local Governors Council has also aggressively been pursuing an application for recognition by the Senate. They have even taken steps to procure freelance mercenaries to support and reinforce local police and militia to diminish their crime stats.

One particular segment of the population is of interest: the descendants of survivors from the Orion system. A bloodthirsty lot with little to their names, the descendants of survivors who fled Orion frequently band together to support harrowing vengeance strikes into Vanduul space. These missions pay little and are extremely dangerous, but are considered particularly satisfying accomplishments for true mercenary dogfighters.

TRAVEL WARNING Don't let the local attitude fool you — Vega is on the front line. Vanduul traveling parties have been known to transit the system and traveling beyond Vega will place civilians in imminent danger of encountering raiders.



ASTEROID BELT & VEGA IV

Beyond Selene lies the system's dense **asteroid belt**. Officially owned by the UEE government, the belt is not patrolled and has been heavily mined. Independent contractors without mining claims of their own often frequent the region; while it lacks particularly valuable minerals, it is considered something of a training run for aspiring miners. The final world in the system, **Vega IV** is a standard

gas giant. A massive, dense, reddish-brown world, Vega IV will never compete with the likes of Jupiter or Krang for beauty. What it does provide is a reasonable stop-over for those seeking to fuel larger spacecraft. Independently-owned refineries dot the planet's orbit, and the outer layer of hydrogen is generally pure enough for individual sampling.

HEARD IN THE WIND

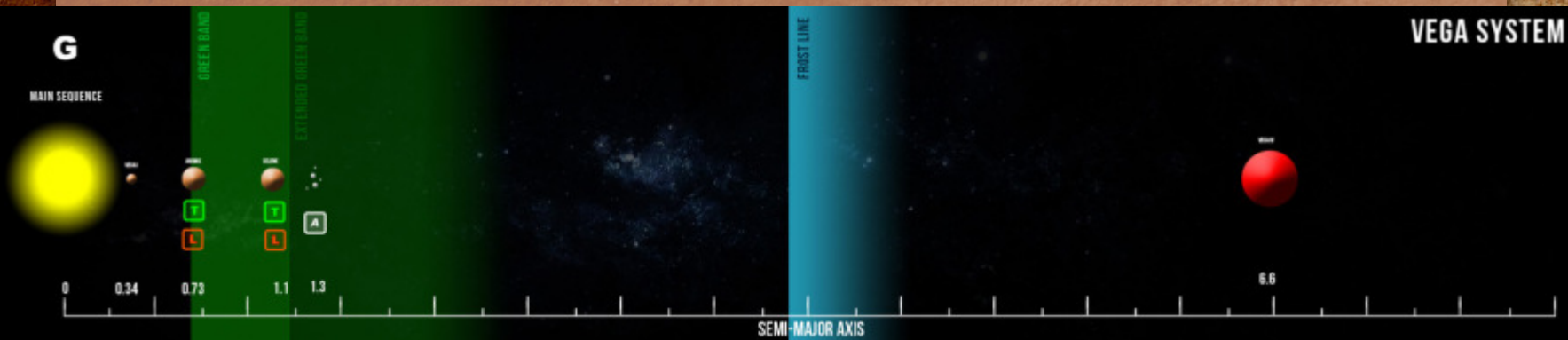
"Even though I spent three days in the brig, was down two week's pay and didn't remember half of it, I'll swear to it to anyone who asks, the best part of being in the Navy was that weekend shore leave on Aremis."

– Lt. Donald Hywanti, Gunnery Officer, Retired

HEARD IN THE WIND

"I worked on a landing zone, I've talked to people from all over the 'Verse, and I the more I met, the more I was sure that I'd never live anywhere outside of Vega. Sure you got Humans outside of the system, but Vega for me is the only place that's got people."

– Terri Santos, Cargolympics Champion



VEGA SYSTEM

Phantom Bounty



by Autumn Kalquist

Part 2

The *Devana* lifted through the sky, and the gleaming towers of Tevistal faded away beneath the cloudline. Exhilaration raced through Mila at the feel of the Freelancer moving through the air, her back pressed against the well-worn pilot's seat, all of the heady power of the ship under her command.

This was the one place she always felt free and in control, as if she could be anyone and do anything. But open space was a double-edged knife, filled with the promise of both endless possibility *and* danger. And today it was danger she and Rhys were headed toward: their last chance to catch the Phantom. To catch the terrorist who called herself Elaine.

"Did I ever tell you I love watching your face when you fly?" Rhys smirked at her from the co-pilot's seat.

Mila warmed at the look in his eyes and lifted a brow. "I think you love watching my face when I'm doing . . . lots of things."

Rhys grinned at her, and Mila knew they were both recalling the quick fun they'd just had in the bunk while waiting for clearance. She wasn't going to try to label this relationship as anything other than business . . . for now. But being business partners with benefits sure was nice for the built-in stress relief.

When they finished their ascent and hit the emptiness of space, Rhys brought up the system map on the HUD and set a course for Mila to follow. She altered their path to follow a trajectory that would take them to the orbital platform at the edge of the system.

CHRONICLES

"If that dock snitch told the truth," Mila said, "the Phantom's headed to the orbital platform to meet her contact. But what do we know about this Septa platform?"

Rhys brought up the system map and searched for available data. "Septa's owned by a company called McGloclin, but it looks like they haven't been active out there for a while. Not sure what we'll find on the platform. Maybe company workers, probably vagrants. No Advocacy agents there or any law officers at all since the corporation is supposed to be in charge. There's a pretty large debris field drifting a few clicks from the platform."

"Great."

"Here, give me that tag number so we can scan."

Mila pushed up her sleeve, and Rhys held his mobiGlas up to hers to grab the tag data the WiDoW addict had given them. It transferred over, and he ported it into the *Devana's* system. "Activating the long-range scanner."

They both tensed as the scanner completed its initial search.

No hits.

A twinge of disappointment hit Mila, but it didn't do much to dampen her excitement. "Well, we're still too far from the platform, if that's where she is. I'm sure the scanner will pick up something . . . soon."

She and Rhys rode in comfortable silence born of months of flying together, but as they approached the platform, Mila recalled how Rhys had acted back on Tevistal. How *she* had acted.

He'd been controlling and had tried to keep her out of harm's way when he'd needed back-up. And she'd acted hotheaded, violating their agreement about her handling tech and him dealing with contacts.

And now, this was probably it — the end of this mission,

whether they caught the Phantom or not. If Elaine escaped, they'd have to find a new bounty, and that would take time and more creds they didn't have. They needed to keep clear heads if they had any chance of succeeding today.

"Hey," she said softly. "We'll play this by the book this time, yeah? I take care of tech. You haggle and get info. We work together once we get close."

"Agreed."

"Just one thing." Mila swallowed and met his eyes from across the small space. "You have to allow me to do my job. If there's danger, we handle things the way we always have. This . . . this thing we have can't get in the way of that."

Rhys's jaw tensed, and he didn't answer right away. "I just want to keep you safe."

"We keep each other safe."

Rhys shifted in his seat and looked out at the nothingness ahead of them. "I've lost people . . . people I cared about before."

So have I. But Mila didn't say it. "We can't let anything get in the way of our judgment. The mission comes first."

He gave her a stiff nod. "Mission comes first."

Mila bit her lip. His agreement was the outcome she wanted in this conversation, wasn't it? So why the hell did she feel so disappointed?

Because you've fallen hard for him, idiot. Her cheeks heated at the thought. Now was *not* the time to be thinking about this.

She kept her eyes straight ahead, afraid the look in them might give her real feelings away. "I'm glad we agree then."



The scanner beeped, and Mila's heart rate picked up as she looked over at what it had found.

They'd located the Phantom's ship. Tentative ID: a Cutlass.

"She's heading away from the platform," Rhys said urgently. "We might lose her on the scanner with all the debris."

"Map a new trajectory. Maybe we can cut her off before she reaches it." Mila throttled up, her breath coming more quickly as she followed the new course.

In minutes, they came up on the tangle of floating junk. It loomed before them, hunks of twisted metal and dead ships in the distance, sprawled out in a mess that would be tough to navigate.

Just as they reached the edge of it, the Phantom's ship winked out of existence on their scanner.

"Kak." Rhys fiddled with the scanner, trying to manually find the ship. "We're gonna have to go in there. That debris won't be easy to fly through —"

"We'll be fine."

Mila searched ahead, seeking any sign of a ship where the Phantom had disappeared from their scanner.

"There. The only one moving!" Mila pointed to a glint of metal in the distance, weaving through the debris. "I'm taking us in."

"Let me check where she might be headed." Rhys zoomed in on his map.

Mila gritted her teeth and directed the Freelancer into the debris field, cutting around a half-destroyed freighter. "Do you think she knows we're here?"

"I don't think so. She hasn't changed her speed."

Mila edged the *Devana* around a hunk of twisted metal, trying to keep the distant glimmer in view.

"We should get above this mess. It's safer."

"No," Mila responded. "We risk being detected, and then we'll lose her if she goes deeper into this floating pile of kak. We need to go in and flank her. Catch her by surprise."

Mila sped up, darting around small pieces of junk. Sweat popped up on her forehead as she tried to watch the debris and keep an eye on the glint of the Phantom's ship ahead of them.

They were flying straight for the center of the junk pile.

"Shutting down unnecessary systems to increase shielding," Rhys said. "Elaine's not gonna let us catch her without a fight."

"I know." Mila killed the main engines, relying on maneuvering thrusters. "Hold on."

As the *Devana* slipped through the detritus, it swayed from side to side, avoiding most of the scrap metal and decommissioned ships.

Rhys grunted and shook his head as small pipes and bolts bounced off their hull.

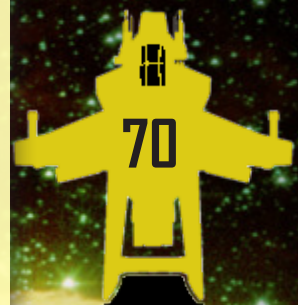
Mila's pulse pounded, buzzing in her ears with the thrill of the chase. Then the distant ship suddenly made a hard right and disappeared between two massive cargo hulks.

"Did she make us?" Mila pushed the *Devana* to the limit to catch up.

"Maybe. She could be waiting for us on the other side of that ship."

Just before they reached the Hull-C where the Phantom had disappeared, Mila rotated the Freelancer to starboard and slowed.

The massive skeleton of the Hull-C blocked their line of sight. She couldn't see the Phantom's ship, but it could be hidden just on the other side.



CHRONICLES

She tapped the thrusters and coasted beneath the cargo ship.

Mila barely breathed as they reached the far side of the dead ship's hull.

"I got her on the scanner. Hanging right above us," Rhys said. "A Cutlass, all right. Weapons ready. She knows we're here."

As they emerged, Mila's heart thumped wildly. She rotated the ship in a deft motion to face the Cutlass. The *Devana* was momentarily bracketed between the Hull-C and another freighter – a terrible place to be in a gunfight.

The Cutlass took a shot but missed, instead damaging the Hull-C above them. It was a straight shot; had the Phantom just missed *on purpose*?

"I gotta get us out of here." Mila dropped the ship lower, trying to escape the narrow chokepoint they'd found themselves in.

"Use the freighter for cover!"

The Phantom fired again, this time a steady fusillade that still missed the *Devana*, striking the hulk they were slipping toward.

"Mila, wait!" Rhys yelled, just as the Cutlass's barrage triggered an explosion in the Hull-C. It burst in a wave of shrapnel, generating a force that sent the *Devana* flying sideways.

Mila gripped the controls tighter as the Freelancer slammed into the other cargo ship with a hard shudder. The shielding held, but barely. Alarms sounded in response to the shield loss, and Mila felt the balance of the ship shift beneath her.

"Maneuvering thruster?" Mila asked, struggling to regain balance.

"Dammit. Yes. We lost one."

From above them, the Cutlass rained shots down on their weakened shielding.

"Shields at quarter power," Rhys reported.

Another explosion sparked near the second cargo ship, and a new wave of debris headed toward them. Mila watched in horror as a jagged metal panel flew straight at the nose of the *Devana*.

Rhys squeezed the trigger. Half the panel shot off in the opposite direction, but the rest of it stayed on course.

It slammed straight into them, and Mila's head snapped back against her seat. Alarms blared as the ship rotated wildly, and she gripped the stick firmly, trying to steady them. A thin crack spread across the Plexi, slowly widening, and the temperature instantly dropped.

"Kak." She and Rhys both said it at the same time.

"Gotta patch the screen. Now." Rhys moved, grabbing their helmets from the storage compartment, and took the controls as Mila latched hers on.

She took the controls back as he got his helmet on. Rhys unfastened his harness and stumbled out of his seat.

"Getting the repair foam." He said, his voice crackling over the helmet comms. He hurried toward the cargo hold as the *Devana* banked through a fractured Starfarer. When Mila came out of the turn, she spotted the Cutlass as it ducked behind a blackened hull that was too far gone to identify. Angling the thrusters, she turned tightly to follow.

Rhys stumbled back into the cockpit and applied the foam to the crack, temp-sealing it.

"This'll hold until we get to a repair dock," Rhys panted. "But not if we take another direct hit."

Mila keyed up the guns, her breath coming quickly now and frosting up on the interior glass of her helmet, as the Phantom danced in and out of sight ahead.



CHRONICLES

"It could have been far worse."

Rhys smirked at her tone and strapped back into his seat. "Fine. I'll say it. You were right about that extra armor."

"That always does have a nice ring to it." With Rhys back on weapons, Mila narrowed the distance to the Cutlass.

"Take her out, Rhys." Mila focused on keeping the Freelancer steady as Rhys targeted the Cutlass's engines.

The *Devana's* twin Kronegs opened fire.

The Cutlass jerked sideways, off course, and a small, bright flash told them they'd gotten a hit. Mila darted a glance at the scan. It updated, showing the Cutlass's left engine had been damaged.

"Targeting her jumpdrive," Rhys said. As the Phantom regained control of her ship, Rhys fired off a series of rapid shots, targeting the armored drive.

The Cutlass lurched and then took off again, swinging from side to side, this time heading for a half-scrapped Orion nearby. It disappeared on the far side of the ship, and Mila adjusted course to go after it.

"Not giving her a chance to drop another mine," Mila said.

"I think we got her, Mi," Rhys replied quietly. "She's not getting out of here."

Mila suppressed a smile and tried to ignore the giddy feeling in her stomach. "Good shot. But we still have to catch her."

The Freelancer's lights illuminated the torn-apart ship the Phantom had disappeared behind. Tangles of pipes and dozens of storage levels were partially visible where armor had been ripped out. The ship was a veritable warren of half-enclosed corridors.

Mila slowed as their lights found the Cutlass. It was stopped dead near the front of the ship, hugging close to

the hull. Mila searched along the hull as Rhys activated the comm and hailed the Cutlass.

No response.

He checked the scan again. "I think her systems are failing. Maybe life support. We got some good hits in."

A white spacesuit floated out between the Cutlass's far hatch and the freighter's hull. The Phantom flailed as she hurtled into the freighter and disappeared.

Mila pulled the Freelancer closer to the Cutlass and looked at Rhys. "We have to go in after her."

"She's setting a trap."

"She's running. She has nowhere to go. We have her."

"She could have called for help. What if reinforcements show up? What if she met someone back at the platform and commed them? This freighter's a death trap."

Mila edged the ship closer to where the Phantom had disappeared and unstrapped her harness. "I'm going in."

Rhys grabbed her arm. "Don't. She can't stay in there forever. We can wait her out. This is what she wants."

Desperation surged through Mila, mingling with her adrenaline high. She pulled her arm away and headed back to suit up.

Rhys followed her and watched as she pulled on her armored suit and strapped her pistol to her hip.

"She always manages to slip away," Mila said. She slammed a fist against the locker, frustrated. Knowing the Phantom was so close. . . right next to them in that ship. It was making it hard to think straight. But Mila was sure of one thing. She was going in after her.

"We're so close this time," Mila continued, trying to keep her voice steady. "Too close to risk losing her, and you *know* this could be our only chance. I'm going in. You can



CHRONICLES

come if you want to.”

Rhys wrapped a hand around Mila’s arm and turned her to face him. She reluctantly looked up at him.

“I should be the one to go in there after her,” he said gruffly. “You watch the ship. If she comes back out or anyone shows up, you can comm me.”

“No.”

Rhys narrowed his green eyes at her, clearly worried.

Mila took a labored breath. “We should go in together.”

“Mila, someone needs to stay with the *Devana*, and you’re the better pilot. Let me try to chase her back out here. The mission comes *first*.”

Mila’s stomach clenched at the thought of Rhys going in alone, but he was right. Someone needed to stay. And the mission had to come first.

Rhys took her silence as agreement, quickly suiting up and holstering his Arclight.

She kept her spacegear on — just in case she needed to go in after him. Her throat tightened as she returned to her seat and pulled the Freelancer closer to where the Phantom had disappeared.

Rhys came back up to the cockpit and squeezed her arm lightly. “Keep the commlink open. Stay on guard.”

Mila nodded and took a deep breath, trying to calm herself. This could go sideways so easily.

She depressurized the cargo hold and lowered the ramp for Rhys. He pushed off of it and drifted into the dark body of the freighter.

She very nearly commed him to tell him to come back, that they could wait until the Phantom gave up, but she hesitated. Her feelings for Rhys battled with her need to capture this terrorist. Her need won out. This was their

last chance to capture the Phantom. Rhys would be fine. He was a great shot.

Several moments passed, and Mila forced herself to check the scanners again. No sign of any other moving ships.

A dull thud sounded from somewhere on the hull, and Mila’s heart rate sped up as she pulled her gun from her holster.

She glanced back at the cargo hold door in time to see the light flash. The alarm sounded — a warning that the door was being opened from the other side while the hold was still depressurized. Mila turned back to the console and scrambled to lock the door, but she failed. It was too late to raise the ramp, too late to repressurize the hold.

Mila got to her feet, her pistol tight in her grip, and trained it on the door to the cargo hold.

At that moment, Rhys’s voice came over the comm. “There are too many places to hide.” His voice rose. “Mila, close the ramp! I just found an empty spacesuit. It wasn’t her.”

“I know. That’s because she’s here, Rhys. I repeat, she’s on the ship.”

The door slid open, and Mila’s body lifted off the floor as the artificial gravity systems were deactivated. She reached out to grab her seatback with one hand, and her pistol arm swung wide.

The Phantom floated through the door, weightless, and took a shot. It tore through Mila’s suit, and she cried out.

A terrible burning pain ripped through Mila’s shoulder, and her oxygen began to vent. She shot back desperately, but the Phantom pushed off the ceiling toward the floor in a well-practiced zero-G evasive movement, and Mila’s shot missed, taking a hunk of wall panel out instead.

Adrenaline flooded her. They’d cornered the Phantom and now she’d fight to the death to take the *Devana*. Mila wouldn’t let that happen.



CHRONICLES

She took another shot, but missed again as the Phantom pushed off the floor. She hurtled forward and slammed into Mila's injured arm.

Mila gasped and caught a glimpse of herself in the dark reflective glass of Elaine's helmet, at the bloodied torn shoulder of her suit.

Elaine slammed her pistol directly into Mila's helmet, then knocked her gun from her grip.

Mila recovered, grappling with the Phantom, and managed to slam a fist into her arm, making her lose her grip on her own gun. Both pistols drifted away, floating toward the far wall.

Mila tried to push off the wall toward the pistols, but Elaine grabbed her in a tight chokehold.

"Almost there, Mi." Rhys sounded panicked, and Mila didn't have the breath to respond. "Hang on."

She fought against Elaine, trying to throw her off, but the two of them just spun in weightless rotation, bouncing off the walls. Mila finally got her feet planted on one of them and pushed hard, slamming herself and Elaine back against a cockpit seatback.

Sweat dripped into Mila's eyes as they struggled, and blackness crowded around the edges of her vision as the oxygen escaped her suit. The cargo hold was wide open, all their oxygen gone. Soon Mila's suit would be just as empty.

Elaine kicked off the seat, propelling them both down the aisle, sending them flying toward the floating pistols.

Mila was still in a tight chokehold as she reached for the nearest pistol, but the gun spun out of reach. The Phantom punched Mila in the ribs, hard, and squeezed the bloody wound on her shoulder.

Mila nearly blacked out.

Without warning, the gravity came back on, slamming Mila and Elaine to the floor. The pistols clattered to the floor with them, and Mila scrambled away from Elaine and closed her gloved fist around the nearest one. She flipped over on her back, pointing the gun up at the Phantom just as she was about to attack.

The Phantom froze and slowly lifted her hands, palms out, in a gesture of surrender. Mila's pale, stricken countenance reflected back at her from Elaine's dark glass visor.

Rhys ran through the door, pistol out.

"Cuff her. Throw her in the pod. I need oxygen," Mila gasped. The pistol wavered in her grip as she fought to stay focused. She was suffocating.

Rhys slammed the Phantom back into the wall, then dragged her into a restraint pod.

In moments, he was back, reestablishing oxygen levels from the cockpit. Then he lifted Mila's helmet from her head, and the dark spots clouding her vision faded. She could breathe again.

She tried to smile up at Rhys, but the stabbing pain in her shoulder made it come out in a grimace. "We got her."

Rhys took off his helmet and lightly touched her cheek, his brow furrowed with worry. "Yeah, we got her. But it looks like she got you."

"I'm fine."

"No, you're not." Rhys grabbed a medpatch from the cabinet and tugged the suit off her shoulder. He smoothed the patch over her wound, and the numbing agent took over, easing Mila's pain.

Then Rhys leaned down and gently pressed his warm lips to hers. As they kissed, relief flooded her. She hadn't allowed herself to admit how worried she'd been for him when he went into the freighter.



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She lifted a hand to the rough stubble of his cheek, and Rhys laid his hand over hers. "You were right," he said. "I think my professional judgment's been compromised . . . by this. By us. I never should have agreed to that plan. We should've waited. But I saw that stubborn look on your face, and . . ."

Mila shook her head. "If you're compromised, so am I." She gave him another kiss. "We'll figure this out. The important thing is that we both made it out okay. We completed the mission."

Rhys finally cracked a smile and helped Mila to her feet. "We did it. Are you ready to unmask our Phantom?"

"I've never been *more* ready in my life."

Rhys typed in the pod's code, and the door slid open, revealing the Phantom cuffed to the interior bar.

This was the woman they'd hunted for months, the woman who had nearly killed them on more than one occasion. And they'd never even known what she really looked like.

Rhys raised a brow at Mila. "You want to do the honors, or should I?"

Mila lifted a brow in return, and he stepped out of her way. She winced as she used both hands to unlatch the Phantom's helmet. She pulled it off with one swift movement and took a step back.

She and the Phantom met eye-to-eye for the first time.

And Mila's heart nearly stopped. She lifted a shaking hand to her mouth, covering it.

Rhys gave her a confused look.

"Evony Salinas," the Phantom said. "Who knew a Salinas would ever go into bounty hunting?"

Rhys's eyes widened. "Who? What's going on, Mila?"

The Phantom stared at Mila intently. "Going by your middle name now?"

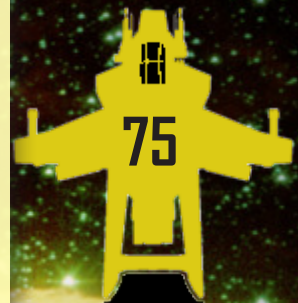
"You *know* the Phantom?" Rhys's voice was low, incredulous.

Mila dropped her hand from her mouth and finally found her voice. She backed up another step. "Her name is Casey Phan."

"Phan? As in *Phan* Pharmaceuticals?"

Mila nodded. "The same. But . . . Casey Phan was murdered ten years ago."

To be continued



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