# JUMP P✦INT

IN THIS ISSUE

GREETINGS, CITIZENS!

This month's Work In Progress — the Terra Landing Zone!

Oh — you weren't serious about wanting that? Then ... if you've been around long enough, you've seen the Hornet here before, but you haven't seen the Hornet like this. The first half of our Work In Progress covers the changes to the new and revamped Hornet, bringing it up to par with the rest of the ships in *Star Citizen*. The second half covers the development of the Privateer player character. Before you say it, I will: not the character everyone will be playing, but then you won't be flying every ship we profile in **JP**, either. :)

We've been doing conventions over the last month, which can really interfere with normal job responsibilities but which we still enjoy. Ben describes Gamescom and DragonCon in Behind the Scenes. Chris reports that PAX Prime was "a lot of fun!" And meanwhile I was at WorldCon, the World Science Fiction Convention that LoneStarCon hosted, just down the road in San Antonio. I don't have any pictures (yeah, thought about it yesterday as I started pulling this together, about a month too late), but I did get a chance to meet writers, writers, and more writers — including Griffin Barber (who just wrapped up our Spectrum Dispatch serial, "A Separate Law"), plus Alistair, Marina, Tina, Kristine, Andy, Amy and other potential
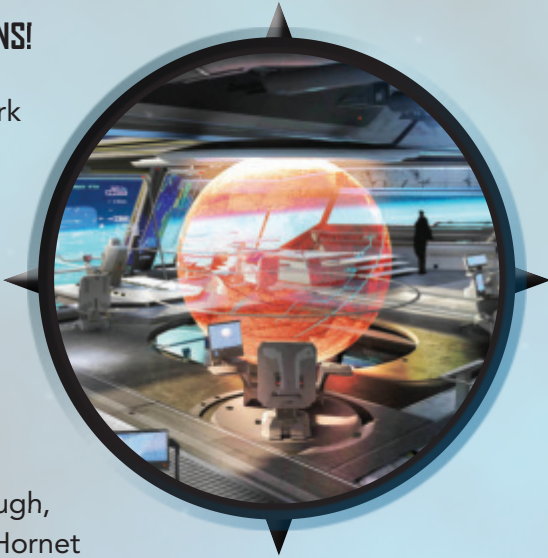
writers. In fact, we're already moving ahead on proposals from at least two of them — I think you're gonna enjoy what they have to say.

Which reminds me — in addition to editing **JP**, I'm also responsible for finding good stories, both for Spectrum Dispatch and **JP** itself. Any fledgling writers out there who want to run a proposal past me, you know where to find me. I hesitate to mention this, because, sadly, I'm going to reject many more than I accept, and I don't like writing rejection letters. But that's part of the writing life (as I well know from sitting on the other side of the desk).

Back to this issue: the second half of our look behind the scenes began as a Work In Progress report on the K&W CF-007 Bulldog Laser Repeater, our first on a ship weapon. However, it soon became obvious that there was much more that went into the creation of a gun than images. Here's the story from the perspective of design, concept art, modelling, back to design for hook-up, and finally animation. This month's Portfolio details Klaus & Werner, the corp that makes the CF-007.

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

David

David.Ladyman@cloudimperiumgames.com

Hornet Revamp

Chris Smith: The Hornet is one of the first ships built for *Star Citizen*. It was made for the demo video and it looked really great, but after we started to make progress on some of the other ships we realized that the Hornet was starting to show its age a bit.

So I started on the process of revamping the Hornet so it would fit better graphically with the other ships. We had no intention of redesigning the Hornet, just a nice makeover.
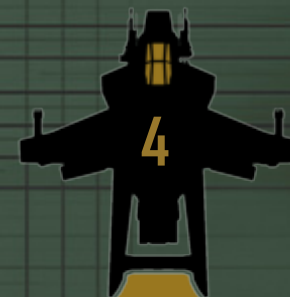
The first step was to remodel all the mechanical parts like the landing gear, engine parts, thrusters and so on and give them a lot of nice detail and resolution.

All those parts were first high-poly modeled and then baked onto a unique normal 4096x4096 map. All the ships in the Star Citizen universe will have a combination of baked and tiled textures to get the best from both worlds in terms of texture detail and resolution.

The poly count for the ship was also raised considerably in order to bring out the shapes and detail even more.

The pics on the next page show the new and old versions of the thrusters and landing gear.

get rid of this guy ;)

Maybe reroute cable or move other part here
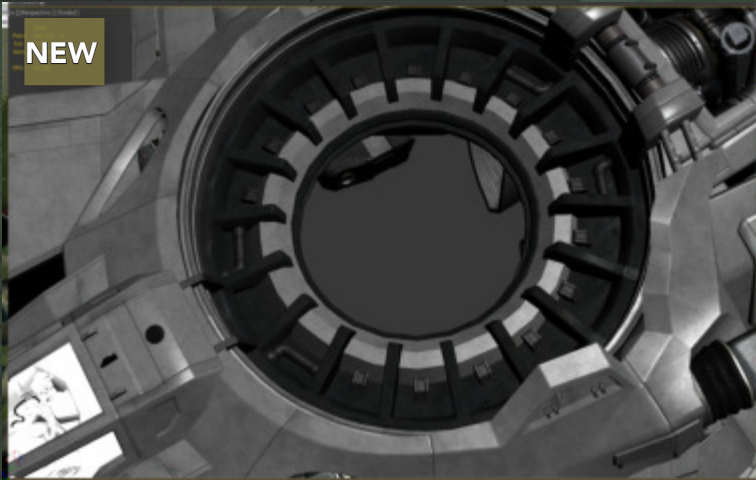
NEW

OLD

NEW

OLD

NEW

OLD

5
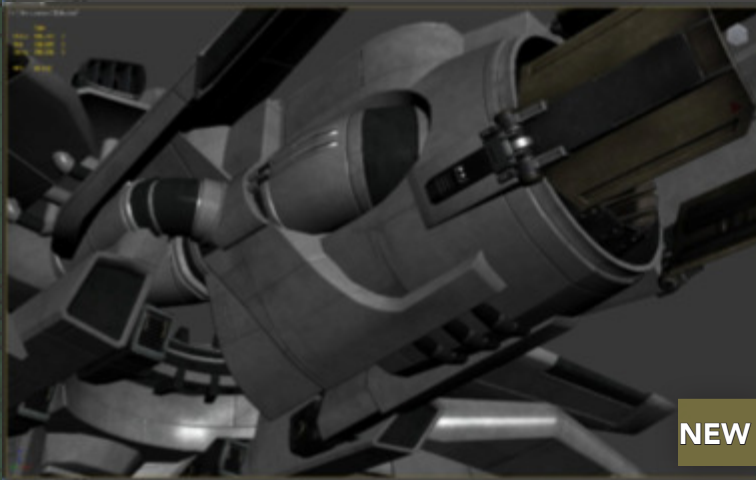
WORK IN PROGRESS

Next up was the hull. In order to get a nice amount of resolution on the big surfaces (like the hull of a ship), we use tiled textures for these open areas. First I made a tiled texture (2048x2048) and then I went into Max and adjusted and worked the UVs of the mesh so all the panel lines of the tiled texture made sense on the ship and looked good.

I also added some cuts into the actual geometry for a few extra supporting panel lines.

[+] [Perspective] [Shaded]

	Total	
Polys:	406,513	0
Tris:	728,509	0
Verts:	390,836	0
FPS:	39.996	
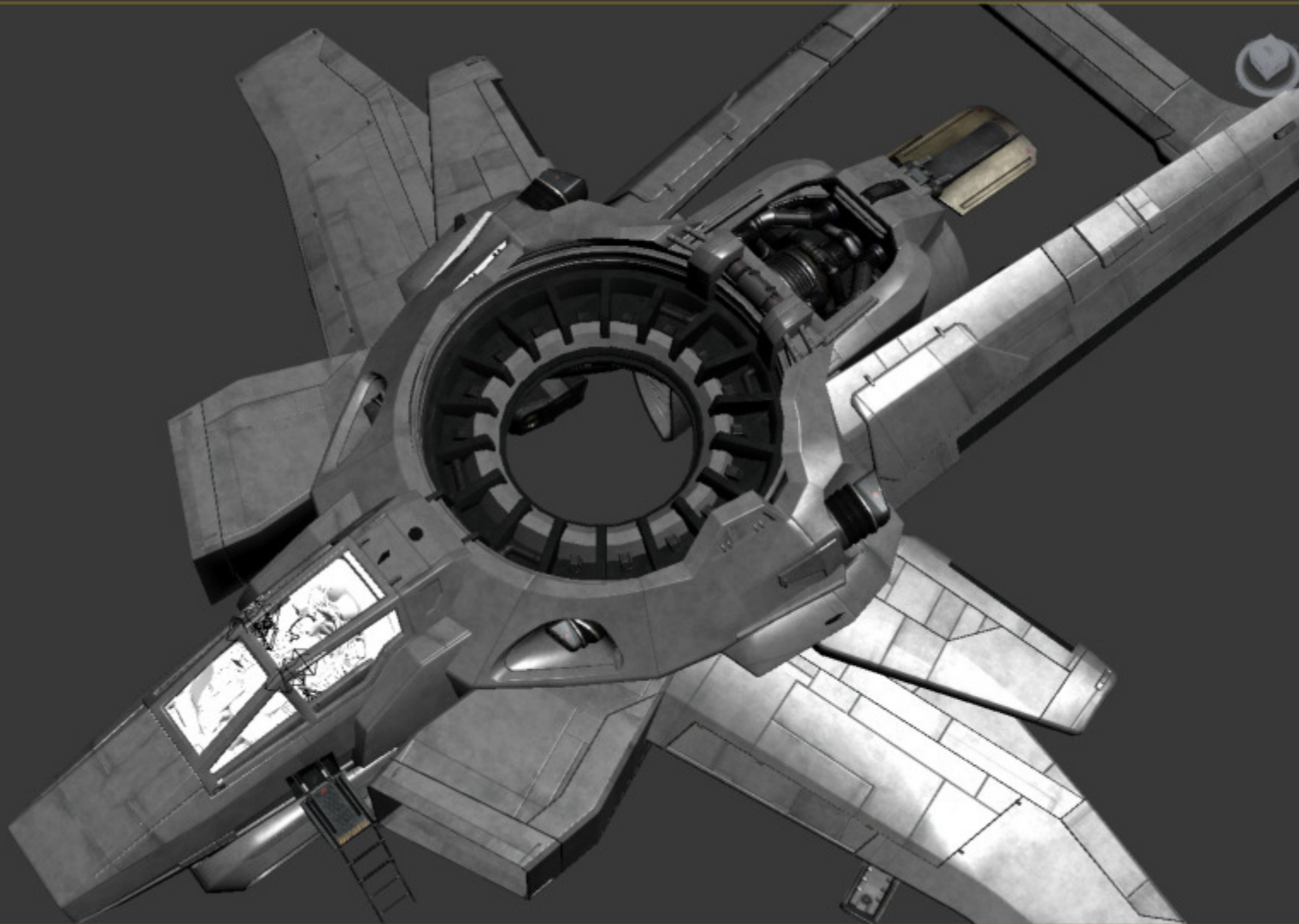
Now the UVs were adjusted and the panel lines looked good, but the texture was still all one hue and there was no other breakup of color. To fix this I used vertex coloring in Max to further break up the parts and panel lines and add more interest to the overall look of the ship.
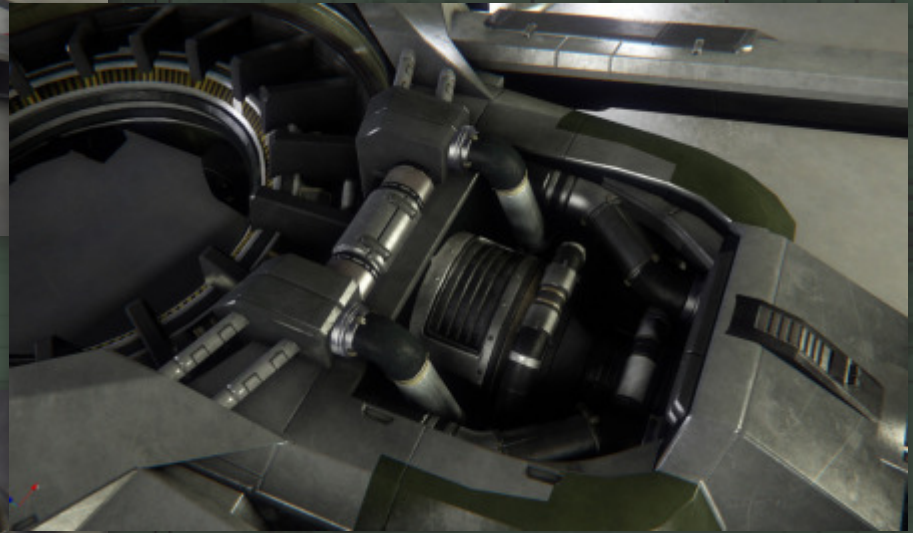
After that I incorporated the original green paint scheme to make the Hornet revamp almost complete!

After completing the initial revamp I went back for some last polish passes, such as incorporating blend layers and detail maps (which are driven by the vertex alpha channel in Max) for dirt passes and to further enhance the specular breakup and look of the tiled texture.

The (currently) finished Hornet.

WORK IN PROGRESS

Privateer Player Character

Art Direction Sheet
PRIVATEER

PRIVATEER CHARACTER

MODELING JACKET

Mark Skelton (working with CGBot): The Privateer posed a few interesting challenges that we hadn't run across before in Star Citizen. Since he's supposed to be more civilian, he has less hard armor and more rubber and leather. First we did an Art Direction Sheet to work out the texture details before we start the modeling process. This helps determine things like how heavy or light the leather is, if the rubber is shiny or not, and so forth.

MATERIALS

■ Jacket	■ Jacket Belts	■ Gabardine
■ Gloves	■ Knee	
■ Boots	■ Pants	
■ Belts	■ Jacket Collar	

The next part of the process is the block out. This is where we explore the silhouettes and general straps and belt placements. At this point, we can begin to spot possible problem areas that maybe need to be adjusted before we move on to the high res stage.
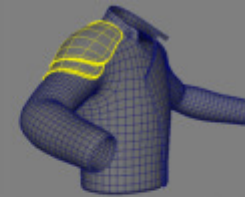
Main Form

CR M8 | Privateer HP | CGBOT

Here I reminded CGBot that we need to make sure we have cuts in the jacket where we can swap out robotic arms in the future.

We need to make sure that we put a seam in where the shoulder and torso meet so we can swap it in character customization.

Main Form

CR M8 | Privateer HP | CGBOT

Next, we start working out the details of the high-poly model. At this stage, we begin to put in the folds and hard edge details, and begin finalizing the model.

WIP

STAR

Reference for Folds and wrinkles
reference

boots

knee pad

Belt

CR   M8 | Privateer HP | CGBOT

Early WIP Jacket

After a few feedback loops, the final high-res model is approved and ready to be baked — the normal down to the low.
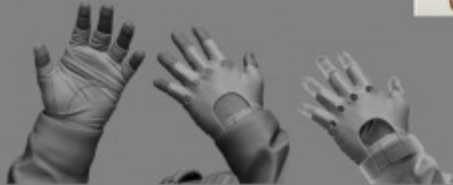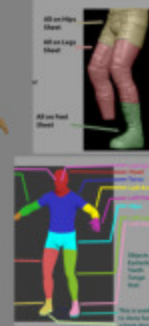
WORK IN PROGRESS

CR   M8 | Privateer | LP | 25603 tris | CGBOT

Topology Flow reference

Next is building the low-poly model that will go in the game. The important thing here is to make sure the topology flow is good, so when we animate the character it bends and twists correctly. This is also the point that we UV the mesh and prep it for the high-poly to low-poly normal map bake down.
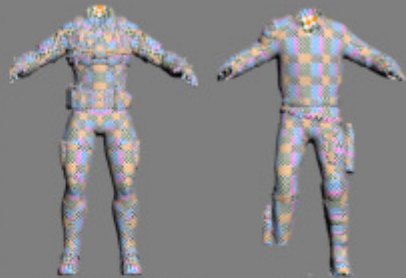
density: privateer vs UEE

The Arm Fit under the this area
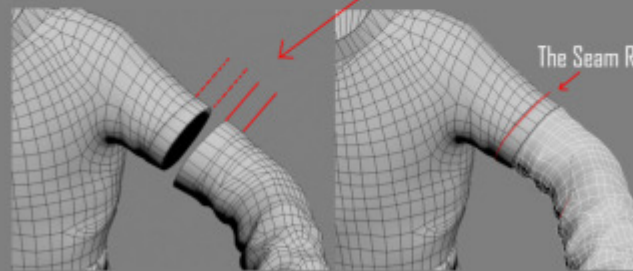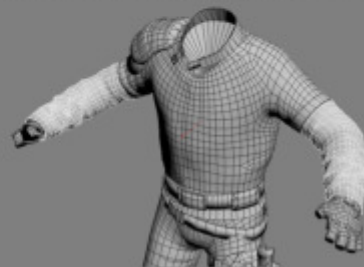
The Seam Remain Here

CR   M8 | Privateer | LP | 25603 tris | CGBOT

WORK IN PROGRESS

CR   M8 | |Privateer | Bakes | CGBOT
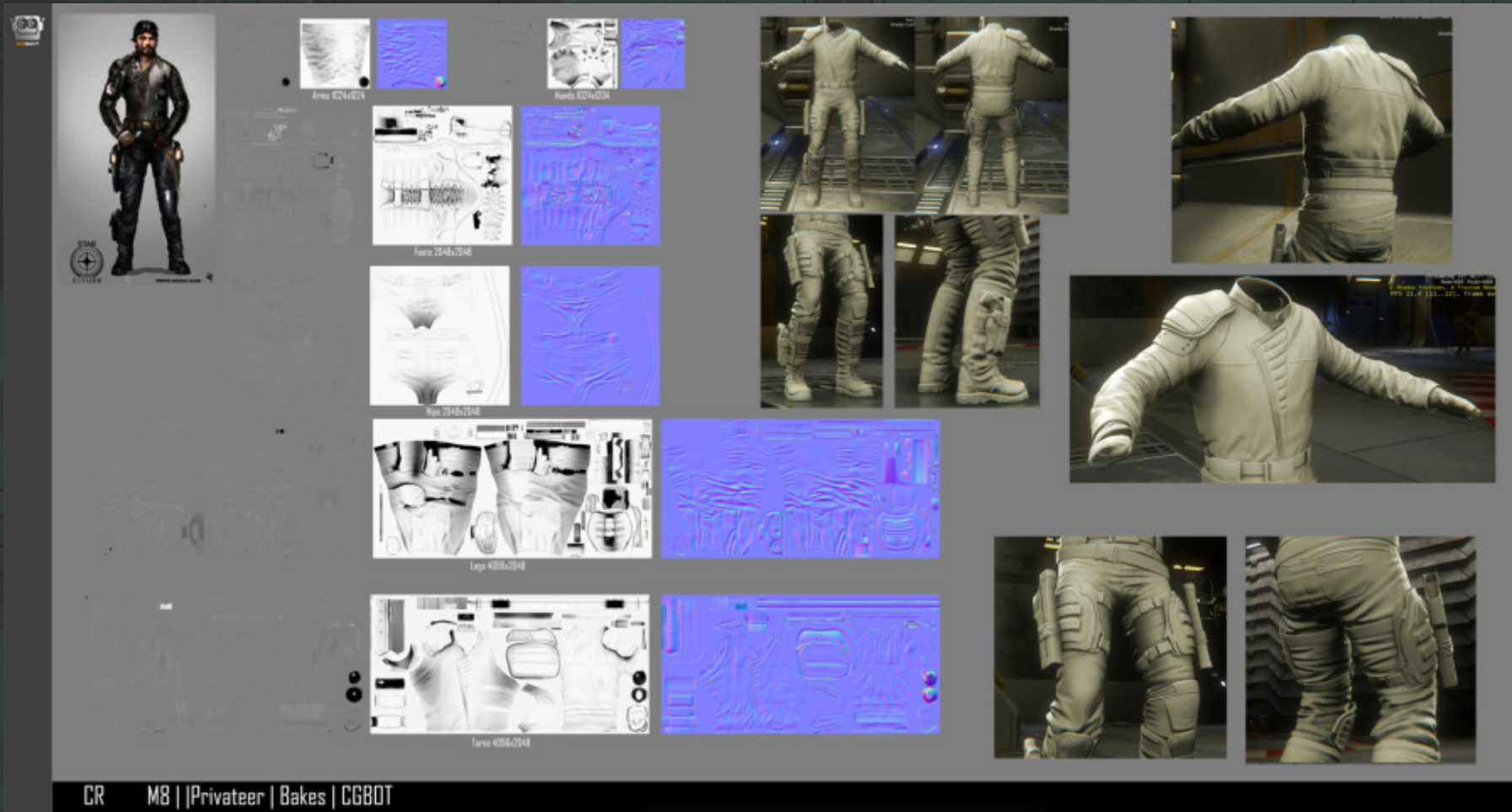
After the bake down, the normal map and low-res mesh are checked in the engine to make sure there's no stretching or weirdness.

The other challenge was the long coat that a Privateer will wear. We went through a few R & D cycles with this to make sure that we built it correctly to support CryEngine's physics system.

CR   M8 | Privateer | Coat | CGBOT

WORK IN PROGRESS

18

Next is the texturing stage. This is where we apply color and specularity to the materials, and begin to finalize the in-game model.

Legs 4096x2048
Torso 4096x2048
Arm 1024x1024
Hand 1024x1024
Feet 2048x2048
Hips 2048x2048

CR   MB | Privateer | Texture | CGBOT

CR   MB | Privateer | Texture | CGBOT

Finally, we check it all in game and make any final color / specularity tweeks before finalizing the in-game model and passing it on to Animation for skinning and animation.

CR   M8 | Privateer | Textures | CGBOT

KLAUS&WERNER

The majority of gun manufacturers diversify their manufacturing lineups. A&R makes reactors, GreyCat makes buggies. Even Behring, considered the platinum standard for laser-class weaponry, also designs shield generators. Klaus & Werner doesn't; they make guns, and they make them well.

This simple philosophy was the brainchild of Hector Klaus, a successful weapons inventor who believed above all else that simplicity of design would triumph in a combat situation. He long advocated creating weapons with as few moving parts as possible, reducing the needed supply chain and wherever possible rethinking weapon roles. He began his career working in Behring's famed Terra lab, where his designs were applauded but his philosophy ignored. Military contracts were most profitable when they meant that a company would con-

tinue to produce replacement parts, upgrade kits and other maintenance supplies. A chance meeting with Jassica Werner, the widow of a wealthy industrialist, lead to Klaus' resignation from Behring and the founding of a new company based on his principles.

In the ensuing years, Klaus & Werner has become a household name. Civilian pilots of all stripes rely on their affordably priced, effective guns systems and their personal arms divison has seen great success. The company has had little success in the military arena, though. Repeated bids for lucrative military contracts have resulted in only token production orders, with the Army and Navy continuing to rely on Behring and other well-established standards for their weapons technologies.

EXTERIOR

CF Series

The key limitation of laser weapons is their low damage potential. Lasers recharge quickly, they impact a wide variety of energy fields and armor types, and they cause "clean" hits, but despite attempts at increasing battery pools and energy generation, no one has engineered a laser that does the kind of damage that a neutron gun or a kinetic weapon can inflict. Most designers work around this limitation by increasing the range and the surgical precision of their lasers. Not Klaus & Werner: the CF-series of laser repeaters is based on an entirely different principle: deliver as many hits to a wide area as quickly as possible. Three models of the CF series, the Bulldog, Badger and Panther, currently account for the majority of Klaus & Werner's Voyager Direct sales.

Klaus & Werner positions the **CF-007 Bulldog Laser Repeater** as its "beginner" laser, with a low price point designed to introduce new pilots to the repeater concept. The ultimate hope is that a pilot who picks a Bulldog as a first gun will become used to the style of weapon and opt for a Klaus & Werner gun when it's time to upgrade, rather than switching to a Behring with wholly different firing specifications. The Bulldog features a three-barrel sequential fire design which is capable of high rates of power while maintaining a good degree of accuracy. The overall low damage rate is countered by low overall power consumption. Reviews of the Bulldog have been middling, with many recommending that those with enough credits to spend opt for a higher quality weapon.

The **CF-117 Badger Laser Repeater** is a mid-range repeater intended as the next step up from the Bulldog. From a technical standpoint, it is merely a better-tuned Bulldog (with some additional styling to attract higher-credit spenders). The Badger maintains the Bulldog's power issues, producing an overall poor power-to-damage ratio. Serious repeater advocates generally skip the Badger during their upgrade process, unless their ships are customized in such a way that the higher-yield Panther would be an ineffective choice.

The **CF-227 Panther** is the pinnacle of the Klaus & Werner repeater line for smaller ships. The Panther well overcomes the design limitations of the Bulldog and Badger, creating a true fire-and-forget weapon with a respectable power consumption-to-damage ratio. Pilots who can afford to outfit their ships with Panthers, both in terms of power capacity and credit balance, rarely regret the decision. The greatest limitation of this weapon is its struggle with power efficiency.

KLAUS & WERNER CF-007 BULLDOG LASER REPEATER
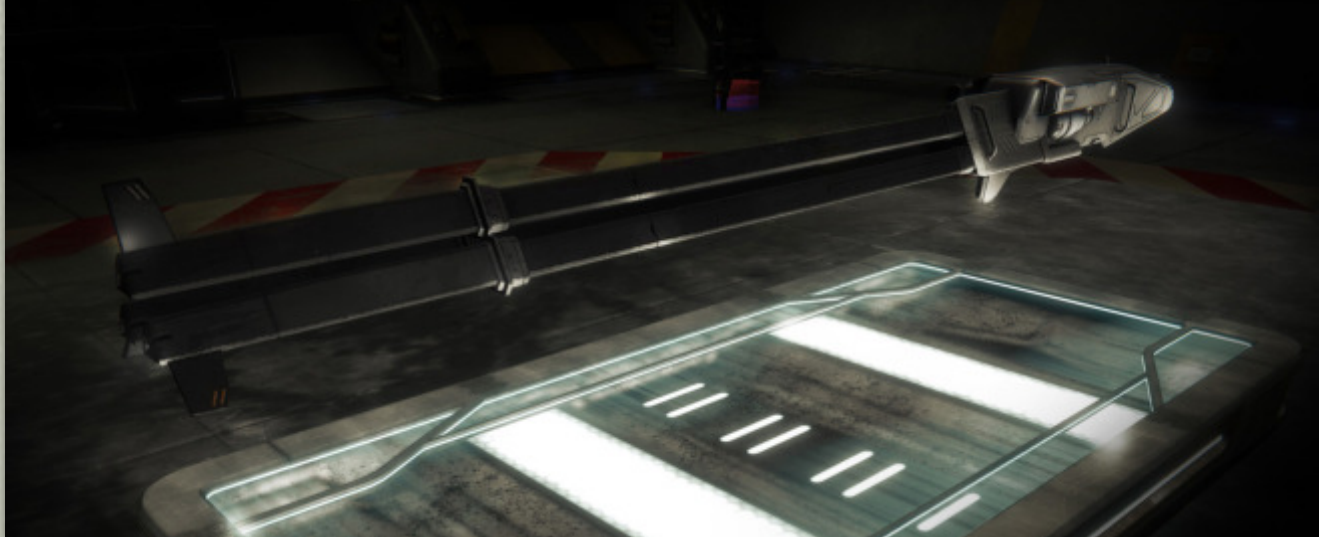
Mass Drivers

Klaus & Werner's second, less celebrated line of weapons is its class of ballistic mass drivers. These hard-ammo ballistic weapons are capable of firing multiple types of ammunition and generally offer better shield penetration in exchange for requiring ammunition reloads. Low energy requirements are ideal for pilots hoping to conserve power and reduce EM signature. Klaus & Werner currently manufactures a 60mm hard-ammo mass driver for the civilian market, as well as several other bore ratings under restricted contracts. The major criticism of these weapons is their limited magazine space, although a number of aftermarket upgrades are available to somewhat alleviate this problem.

Although the mass driver line got off to a slow start, recent years have seen sales quadruple annually. This is likely the result of the increase in Vanduul attacks on the frontier coupled with the popular impression that mass driver-style weaponry will do more damage to a Scythe than a simple laser. While military surveys do not necessarily support this thinking, it has spread to the popular consciousness and seen frontier worlds adopting mass drivers for use in their militia spacecraft in large numbers.

Small Arms

Likely the most famous device in Klaus & Werner's pantheon is the Model II Arclight, a handheld laser made famous as Kyle Fenris' sidearm on the hit vid show The Frontier. Fenris' reliable Arclight became so closely associated with the character that the series' producers were once forced to torpedo a licensing deal with VOLT after fan reaction to the weapons change set off widespread reaction and crippled ratings. As such, the Model II Arclight has become extremely popular on the civilian market; it's the gun most likely to be found under a pillow or, in plastic toy form, battling it out in a child's game of Vanduuls and Star Heroes.

The other side to this coin is that the Arclight has become as much of a fashion statement as a weapon, with serious enthusiasts decrying it for such. Despite this, the Arclight is a high quality laser with what is arguably the best handgun-to-Optiglass link in the business. Arclights are durable and the lack of moving parts, per Klaus' philosophy, means that they survive in a number of extreme environments that would freeze or otherwise totally disable many of their peers.

KLAUS&WERNER

Convention Report:
Gamescom & DragonCon

The Gamescom team and a few of our friends

Ben Lesnick: A year ago, we were preparing to unveil the *Star Citizen* crowd funding campaign. It seemed like an impossible dream. There hadn't been a AAA space sim in years, and publishers weren't interested. What if they were right and there wasn't a community out there? Could we really raise $2 million to prove otherwise? We knew space sim fans and PC gamers were hardcore, we knew *Star Citizen* was going to be an amazing game … but we didn't know if it could all come together. Back then, I had a boring office job and no reason to think that would ever change. Organizing the *Wing Commander* community was a hobby and helping to design video games was my fondest unspoken fantasy.

A year later I was standing onstage at Alter Wartesaal in Cologne, Germany next to a collection of my childhood heroes in front of the greatest community in the world. The sheer energy that night was impossible to believe; *Star Citizen* fans treated Chris Roberts and the team like rock stars, col-

lecting autographs, asking for photos, chanting our names, cheering as the hangar was unveiled. The events of the last year finally crystalized for me: Chris's vision had well and truly been shared with the world, and the amazing group of fans who had come together to support us genuinely believed in what we were doing.

Gamescom

I met up with Lead Designer Rob Irving at the office at 5 AM. Not only were we catching an early flight to Chicago and then Dusseldorf, but we were carrying a pair of high-performance PCs gratefully loaned to us by Alienware with which to demo the Hangar Module. Fourteen hours and very little sleep later, we were in Germany racing to Cologne in the back seat of a cab whose driver spoke absolutely no English, didn't understand where we were going, and twice stopped to get out of his car to curse at other drivers.

and *Squadron 42* shirts.

On Friday and Saturday, we hosted a pair of events for fans. The first was a live recording of Wingman's Hangar at a biergarten and the second was the Hangar Module launch. You have all seen the video of these events, and I can't add much more save to say that nothing we have been able to put together properly expresses the sheer energy pulsing through everyone at those events. It was genuinely electric being able to meet and interact so many excited *Star Citizen* fans. Despite our genuine exhaustion, the whole team would have stayed forever to enjoy the company of those fans if it had been possible.

The team spent the next day at Gamescom. Chris Roberts had gotten to town early to begin press interviews. I caught up on my community duties while I watched him interact with the press. It was a great experience, seeing him dazzle reporters with an early build of the Hangar Module (the team was hard at work in Austin and LA perfecting it for the fans!) and engage them with his vision. At one point the German magazine, *Gamestar*, invited him to come out to the show floor to do an interview onstage, and I marveled at the crowd that suddenly formed around him. Everywhere we went, we found *Star Citizen* fans. At one point, Rob stood in the hall and collected backer after backer, identified through their *Star Citizen*

At the Reveal: Everybody else

Ben Lesnick, Dave Haddock on MOG Nation radio

DragonCon

The next weekend was DragonCon, the largest science fiction convention on the East Coast. Marketing VP Sandi Gardiner had arranged for Dave Haddock and me to present, since Chris Roberts was already scheduled to attend the PAX Prime convention in Seattle. The team at MOG Nation had graciously offered us use of their booth and scheduled us for an hour-long panel on *Star Citizen*. I was no stranger to DragonCon; years ago, my friends in the *Wing Commander* community would regularly meet there. One year, I even wore a rubber Kilrathi mask in a parade. The opportunity to see what it was like as a presenter was exciting!

The convention has grown. It now encompasses five hotels and convention centers, seemingly the whole of downtown Atlanta. Moving from place to place was nearly impossible. But the energy was again incredible. Within five minutes of arriving at the convention, I had been stopped by two fans who recognized me from my appearances on Wingman's Hangar. We spent Saturday at the MOG Nation booth, meeting with all sorts of fans and many people who were not familiar with the game at all. The Hangar Module had been released the day before and everyone had the same question for us: why did you release the module when we were traveling?

The panel was the real surprise. I had been to many panels in my day and I knew they could turn into anything. I'd been the lone person in the audience as a model builder critiqued individual shots in a *Voyage to the Bottom of the Sea* episode … and I'd waited in line for six hours to see the *Firefly* cast. Surely, *Star Citizen* would be more the former?

Dave and I couldn't believe it when we reached the room: a line stretched as far back as we could see. Fans had been waiting for more than an hour to make sure they would have a seat! I was terrified: did we have enough to talk about? Was there enough in our presentation to make this worthwhile? I shouldn't have worried: the concept art, the VoidAlpha Terra video and a live demo of the hangar seemed to delight. The hour was up as soon as it had begun, and we could have happily stood there answering questions all night.

Throughout all of this, fans have come up to tell me that Chris is making the game they've always dreamed of. The truth is that he's making the game everyone on the team has ever dreamed of, too. What this summer's conventions have taught me is that publishers are absolutely wrong: there's an audience out there that wants exactly the same game we've been imagining. I'm truly grateful that they are trusting us with this responsibility.

More than one person showed up for the *Star Citizen* panel

BEHIND THE SCENES

Creating the K&W CF-007 Bulldog Laser Repeater

Design: Pete Mackay

One of the first things we did was create a matrix of qualities for each of the weapon types that we have. (For example, Neutron is slow but heavy hitting, while Plasma cannons can charge up a blast before firing.) Once that was done, we determined all of the attributes and characteristics that we needed to create these weapons in the game, and set about building out several spreadsheets and calculators. We use the spreadsheets and calculators to carve out a unique space for each of the weapons, then do some high-level balancing using the formulas we've created in Excel. The high-level balancing allows us to make sure that our starting values for the attributes are reasonable and that we are creating meaningful choices in weapon selection.

The CF-007 is the smallest laser (energy) repeating weapon in the game, and the weapon that many players will start the game with. The core concepts for it were high rate of fire, high projectile velocity, medium range and low damage per projectile. Since Lasers are the most basic type of weapon in *Star Citizen*, we didn't want to include any secondary effects like damage over time, or extra shield or armor penetration.

After the initial functionality was determined, we turned to the visuals. What does a laser repeater look like, and how is it different from a ballistic Gatling? A primary feature of Gatling weapons in the real world is a multiple barrel configuration, so we wanted to stick with that as a primary feature of all our repeating weapons. To differentiate between energy and ballistic we determined that our energy weapons would all be sequential-fire barrels, while ballistic Gatlings would have the traditional spinning barrel.

Now that we had all of the core ideas for the weapon laid out we turned it over to the art team for concepting!

Concept: Ted Beargeon

Once I received the task I followed my usual procedure:

Reference. First I gather reference … real-world photos, military photos, gun displays, etc. … to fill the well. I select real-world weaponry for detail-level reference and the mechanical "anatomy," and art from games and movies to see what the latest and greatest look like.

Sketchbook. Then I begin thinking through the design. I'll do some sketching in a small sketchbook I like to keep handy — just quick-n-dirty little noodles meant for my eyes only.

SketchUp. Once I have a solid idea for the design, I move into SketchUp (a little program that allows you to sketch in 3d) … for a 'rough' 3d concept.

Ted Beargeon

Submit for Approval. Feedback is provided during this process by Chris Olivia, Mark Skelton and Chris Smith, and once the final design is approved it moves down the pipeline to be modeled in higher, GLORIOUS detail …

JP: How do you build a gun that functions with multiple spacecraft?

TB: We set parameters — size and shape limitations, etc. — and then create something that fits the bill within those limitations. It can end up being a balancing act between something generic and something unique …

BEHIND THE SCENES

Model: Patrick Thomas

Before we start we get direction verbally and visually. One of the most important types of direction is a 2d or 3d concept. For example, the CF-007 has a unique look and movement to its barrels. Once a final concept is approved, we begin blocking a 3d model. This provides us an overall view of everything that needs to be built and how much detail each area needs. One aspect we needed to be sure of on the Bulldog was its triangular barrels.

To make each gun "feel" different, I try to add unique details to the gun — for example unique bolts, metal seams or large details that are repeated throughout the model.

Once the high-detail model is complete and approved, we prepare it for baking. We have to build a version of the model that is far less detailed. This model will display special images called textures. On these textures you see a false topology of the original mesh called a Normal map. The reason we do this is the game can't compute all the original high-poly models, so we have to optimize them with this process. Fortunately the CF-007 and other models like it are symmetrical. This allows us to make one half, then mirroring that half-model to get the other half.

To get these textures on the optimized model we first have to unwrap the low-poly model. This process is very similar to taking all the stitches out of your clothes and flattening them out. This allows the special images called textures to fit evenly on the low-poly model.

The next process is telling the computer to bake textures. This is a process of projecting the surface detail of the dense model onto the optimized model through a process called ray casting. Next we take the raw images or textures

Patrick Thomas

Rotating Barrel (initial design)
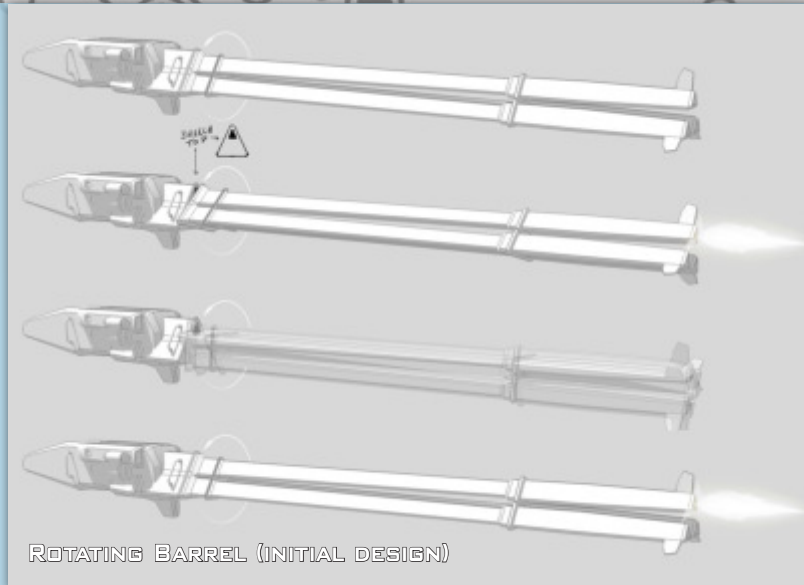
from the baking process and add details. This can be anything from scratches to changing colors on parts of the texture map. At this point, we start to see a finished product.

After all that we are now ready to put the model in the game. This usually requires an hour of technical set-up by telling the game where on the hard drive all the different parts are saved.

All in all, a game model can take anywhere from a day to months to assemble. The Bulldog CF-007 repeater took about a week and thankfully had few challenges.

Hookup: Pete Mackay

Once the model is complete we can hook it up in the XML. In basic terms the XML file is the piece that tells the engine where to find the art, what art to use in specific cases (such as mounted on the ship, or lying free in the holotable). It also tells the engine what ammo type to use and outlines other weapon characteristics such as the rate of fire and whether or not the weapon requires a spin-up time.

The initial hookup is relatively simple: Find the path to the correct art asset and insert it with the proper XML markup. Once it's tested locally to make sure we didn't break anything in the process, it's ready for check-in!

Animating: Daniel Craig

In order for me to animate the CF-007, I first had to break it into its individual moving parts. Depending on the complexity of the item it can take a bit of time to get all the little parts pivoting in the correct spot. It's not necessarily a difficult process, but it's very important to keep the orientation of each item correct to prevent any issues going into the engine.

Daniel Craig

For the first pass of weapon animations I had very few guidelines as to how they should move. As long as it looked interesting and seemed mechanically sound it was fair game. Eventually the design department will narrow down such things as how fast a weapon should recoil, and I will go back and edit and polish the animations.

After creating basic recoils and reloads, I export the animations into the CryEngine. Once in the engine, I have to connect the animations to the appropriate weapon skeleton. Finally, I drop the new animations into a level to make sure everything is moving as it should. If it looks good, I pass them on to get hooked up for use in game and move on to the next task.

More Design Questions: Pete MacKay

JP: Where do you look for reference in creating the Star Citizen weapons system?

PM: When I started work on the weapons system I mainly looked at two things: Guns in other games and movies (particularly Chris's earlier games) and fantasy action RPGs like Demons Souls and Dark Souls. One of the things that I thought was brilliant about the Souls games is that players weren't forced to use certain weapons just because of class restrictions. The choice was wide open whether or not I wanted to play through with a fast but weak dagger or massive axe that left me vulnerable if I missed my target. And even though both may have been viable in most situations in others they were the wrong tool for the job. That sort of system felt more natural and less contrived than 'oh you're a thief so you have to use the dagger'. So this freedom and flexibility really informed the way that the guns system was designed. After that it was just a matter of looking at the

PM: Modifying your weapon will have two parts. Modifying the damage output of your weapon is handled by the overclock system, while modifying other characteristics is handled by a new item attachment system we are working on. The overclock system we've outlined previously, but we're not quite ready to pull back the curtain on the attachment system.

PETE MACKAY
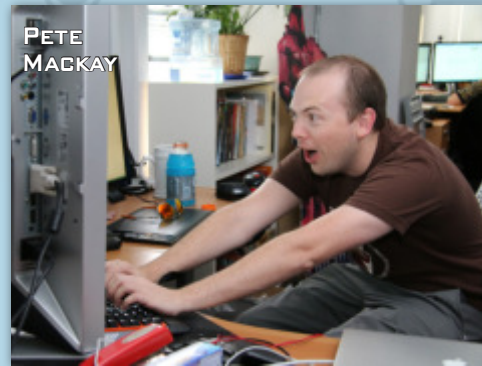
JP: Walk us through the pros and cons of energy versus ballistic guns.

PM: How about a brief table:

ENERGY GUNS

Pros: Unlimited ammo, generally higher per-round damage

Cons: Energy weapons do not penetrate shields easily (or at all), and require more power

BALLISTIC GUNS

Pros: Highest rates of fire, wide selection of ammunition, shield penetration, less power usage

Cons: Limited ammunition per reload, lowest per-round damage

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types of guns we wanted to include and figuring out what 'space' we wanted them to play in so there would be a compelling reason you would select a Multi-Particle/Wave Cannon over a Helicon Plasma Cannon.

Some of the other major systems that guns use drew initial inspiration from the classic table top games *Battletech* and *Starfleet Battles*.

*JP: What are the inspirations for the different gun companies?*

PM: Klaus & Werner is a nod to the venerable HK firearms company and I believe Behring was modeled after Springfield Arms (sorry if I got that one wrong, Ben!). Sakura Sun is sort of modelled on the Sony powerhouse of the 80s and 90s. Gallenson Tactical is named for my best friend whose family owns one of the oldest gun shops in Salt Lake City. It just seemed like a natural fit.

JP: What's the difference between a Class 1 and Class 2 gun?

PM: Class 1 guns are forward fixed, while Class 2 guns have a limited pivot on 1 or 2 axes.

JP: How will players be able to customize or 'overclock' their guns?

JP: What's the best rejected weapons manufacturer name you've come up with?

PM: We actually haven't had any manufacturer names that have been outright rejected. But there is an interesting story about a certain part that was temporarily named 'Unicorn Face Turbo.' Maybe I'll tell it one day. ;)

GOSS SYSTEM

The Goss System is the epitome of natural beauty on a grand scale. Located at the forefront of a massive emission nebula, The Olympus Pool, this binary star system is so stunningly different from anything else in space that early explorers could not believe what they had happened across. Massive, permanent bands of turquoise, gold and deep orange expand infinitely across the sky in brilliant patterns from any viewpoint in the system. A persistent, unverifiable rumor claims that the system's name derives from the first explorer captain's reaction to his discovery: "Gosh." Erstwhile travelers should be warned: do not repeat this anecdote in the presence of Gossians; they consider it the ultimate insult to their home and more than enough reason to start a fistfight.

Like the Grand Canyon on Earth or the Magnetic Ridge on Terra, Goss exists first and foremost as a tourist destination, with little to offer those not interested in taking in the sights. Goss was initially settled by a plethora of naturalistic religious groups, likely motivated by the belief that the system's majestic nebulascape would allow them to better commune with their deities. As a result, the population today prides itself on its self-sufficiency, producing their own goods with little excess. The end result is that Goss is no place for a bulk trader.

TRAVEL WARNING Do not approach the binary star core point without properly strengthened shields. Consult *current* gravity maps before attempting transit.

GALACTIC GUIDE

Small-haulers are another story. Between hand-made Gossian goods, mountains of assorted tourist knick-knacks and the rare life forms native to the system's inhabitable worlds, there are plenty of high-demand goods available in small numbers. It's a great way for an Aurora or a 300i pilot with a smaller cargo hold to supplement their vacation. Or, in the case of the more restricted life forms, a way for a pilot living outside the law to make quite a bit of profit.

The UEE military also regularly utilizes Goss as a port of call for shore leave for their longer-duration frontier-facing fleets. Civilians would do well to avoid the nightclubs and other hotspots on Cassel when a UEE carrier group is in orbit! The servicemen visiting the planet in such instances have usually been in space for eight to twelve months without relief, and enter the atmosphere looking for a good time. Local authorities are used to these visits and generally look the other way to much of the rowdiness. There is also a large military hospital complex on Goss III, the ultimate destination for warriors wounded in battle with the Vanduul.

Goss I (Unrecognized)

The innermost planet in Goss is an abundant world, considered the system's breadbasket. From mineral-rich mountain ranges to endless fields for farming, Goss I produces 98% of the resources required to sustain both the system's natives and the tourists who frequent the system. There is no room for out-system trade, though: almost everything produced on Goss I is shipped to the other two worlds in the system (extremely short-haul pilots are sometimes in demand for these runs, although it is dull work that produces a very small paycheck!) All of the property on Goss I is owned by natives and the world's laws are incredibly strict about blocking outsiders (and corporations, specifically) from ever gaining a foothold.

Unlike most other successful biospheres, Goss I has almost no ocean. The single largest body of water, roughly the size of Earth's Mediterranean Sea, is filled with stagnant water that is almost entirely void of life (a species of moss-covered quasi-shrimp is the lone exception). Attempts to introduce some of the varied life forms from Cassel or elsewhere in the Empire have resulted in abject failure; for reasons yet to be determined, aquatic life can not adapt here.

Market Deals — Goss I

BUY:	WHEAT	+1
SELL:	LUXURY GOODS	+1

Goss II: Cassel

Cassel (Cas-séll, never "Castle"; a common mispronunciation that also irritates the natives) is the resort world of the Goss System, the ultimate destination of hundreds of millions of Human tourists every year. As opposed to Goss I, Cassel is a beautiful ocean world. 85% of the world consists of vibrant, life-filled oceans and most of the rest is home to tropical rainforests.

Cities on Cassel have formed around the original landing arcologies established by Gossian colonists hundreds of years prior. Massive resort towns have also sprung up along the thousands of miles of beautiful coastlines. These are the ultimate destination of tourists. Whether you are here to view the Olympus Pool reflected on the pristine oceans or to frequent the planet's infamous nightclubs, there is something for everyone on Cassel.

Cassel is home to one of the most complex aquatic ecospheres in the explored galaxy. With hundreds of thou-

sands of complex species identified and many more lurking in the depths, Cassel's seas are a sight to behold. It is most famously home to the Midas fish, a naturally golden animal which has become symbolic of its home world and prized in fish tanks throughout the galaxy. Other native creatures include the eerie lang crab and the mammalian z-whale. Licenses to ship live animals are few and far between; there is a teeming black market for anyone willing to ship expensive fish off-world.

Market Deals — Cassel

BUY:	SEA LIFE	+3
SELL:	NARCOTICS (ILLEGAL)	+2
SELL:	FOOD	+1
SELL:	LUXURY GOODS	+1

## Goss III (Unrecognized)

Goss III, a small sub-tropical world, is the acknowledged property of the UEE. The planet is largely undeveloped, although it is home to a mid-sized naval refitting base and the aforementioned hospital complex. Goss III is generally closed to visitors, although anyone who has business with the military facilities established there can acquire a landing pass with relative ease.

The Pool

The dark side of the Goss System is that the system's nebula also acts as an effective curtain for nearby pirate operations. Pirate organizations have been known to base themselves in the outer gasses of the Olympus Pool and raid shipping or conduct illegal trade. It is believed that at least one standing pirate facility exists within the Pool, as well as standard rendezvous coordinates for several narcotics runs. Tourists should avoid this region of space entirely. Its denizens are especially brazen, given the frequency of UEE shore leave visits to Goss, although some theorize that the UEE actually encourages piracy in the region as it gives newly trained pilots a ready source of target practice.
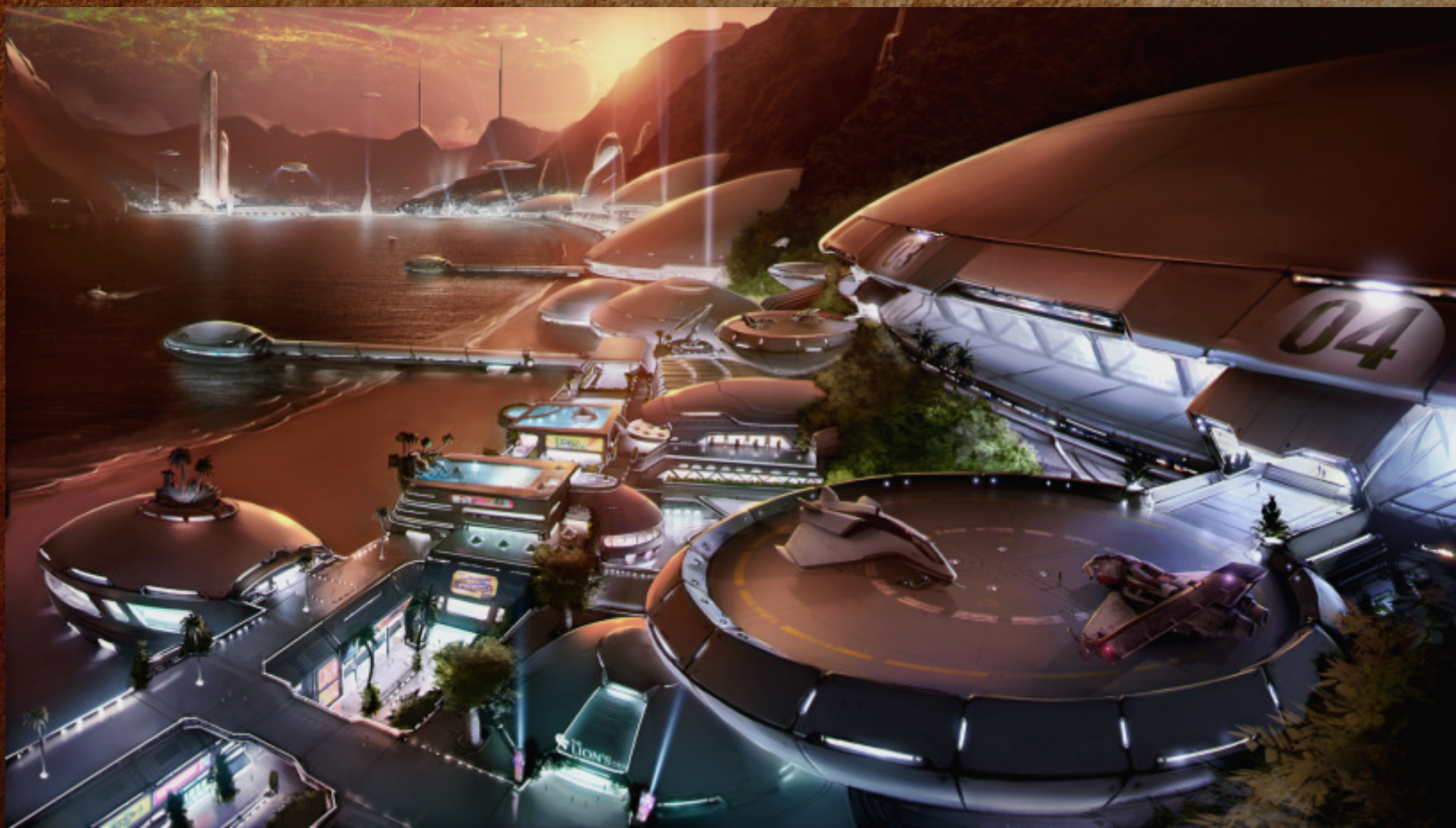
The Cup

by Robert Waters

CHRONICLES

PART Three

Recovering from her disappointing start in the Cup series, Darring has worked her way back to the front of the pack. She is on her way to victory in the Sorrow Sea — the Bone Yard — when her ship explosively overheats . . .

Darring awoke in a quiet, sanitized room of white walls and beeping monitors. She lay in a medbay tub containing a pale, viscous gel-like fluid. There were monitoring nodes on her neck and chest. She lifted her arm out of the fluid and tried sitting up. A strong hand kept her from doing so.

"Not yet," the voice said. "Not until the doctor says it's okay."

She stared at a figure standing alongside the tub. Tall, thin, gray. She laid her head back against the tub wall and blinked repeatedly until the shape focused. "Zogat," she said, her voice cracking, her throat dry and pasty. "Where — where —"

"Carrier infirmary," he said, "in orbit above Ellis VIII."

She tried sitting up again and felt a deep pain in her shoulder as she moved her arms. She reached across her chest and felt a layer of burnt skin, soft and supple due to the fluid, but still present. Terrifying memories flooded back. "My ship!"

Guul nodded. "Unsalvageable. It's now a part of the Sorrow Sea."

Darring massaged her sore shoulder. "What happened?"

"They do not know for certain. But your fuel went through a rapid temperature increase, spread through your systems and ignited the plant. It's a wonder it didn't explode while you were still strapped in."

"How did it happen?"

"They couldn't recover enough of the fuselage and its monitoring equipment to know the exact cause. No black box either. But . . ." He paused, letting the word linger there in the space between them. "Remisk has confessed."

"What?"

"He's confessed to it. Went mad, in fact, attacked a reporter, nearly ripped off her face. He says he put some kind of gel capsule into your tank; or rather, hired someone to do it on your crew, which, by the way, has been scrubbed. He even confessed to sending those thugs against us."

She nodded, feeling a moment of relief. "Then Motak is finished as well."

Guul cast his eyes down. He shook his head. "No, Hypatia. Motak has confessed nothing, nor has Remisk implicated anyone else. He's gone catatonic, can't speak, can't move. He's on something, but it can't be detected. They fear he'll die before he's interrogated. He's out, but Motak is still in and has condemned Remisk publicly in the most powerful words. The race has been suspended for a few days so that all remaining crews can conduct a mandatory check of their ships. Then it will resume." He shook his head. "There are three things certain in the galaxy, as you Humans might say: Death, taxes and the MCR. The race *will* go on."

Darring closed her eyes and laid her head back once again. She fought tears. "Yes, but it's over for me."

A pause, then, "Not yet."

She tried asking how, but on cue, the room door opened and in walked Motak, straight and proud, wearing a fresh jumpsuit of gold and purple. Three reporters followed in his wake, one with a camera. He pulled his mouth back and said in a sincere voice, "Ah, I am so glad to see you alive and awake, my dear. You had us all worried."

I bet. She wanted to say those very words, but the pressure that Guul placed on her arm with his strong hand recommended otherwise. She forced her anger down and tried to smile. "It seems as if the Fates are on my side."

Motak nodded. "Indeed. And it would also seem that Lady Luck has granted you favor as well. With my gift, you can now return to the race."

"What gift?"

Motak seemed surprised, pointed to Guul. "Your friend hasn't told you?"

"I was just about to," Guul said.

"Well, then let me say it proudly for all to hear." Motak adjusted his position among the reporters, giving them time to ready.

The Xi'An cleared his throat. "I and the Motak family corporation want to again strenuously condemn Ykonde Remisk's actions. His cowardly assaults are inconsistent with what I and the MCR are all about. The integrity of the race must be maintained. Thus, as a gesture of good will and healthy competition, I have donated my personal M50 so that Hypatia Darring can return to the race."

It took a moment for the announcement to register in her mind. To help drive the point home, a vid screen on her wall activated to reveal a clean, gold-and-purple trimmed M50, with new scoops, new heat dispensers, and freshly polished cockpit windows. It was brilliant, beautiful. Darring loved it.

"No way," she barked, pulling herself up in the tub. "I'm not putting one toe into that —"

Guul applied pressure to her arm once again. "What Ms. Darring is saying is that she would be *honored* to accept your gift and looks forward to further competition in the days ahead."

"Hey," she said, pulling her arm away. "Don't answer for me. I'm not a child, dammit!"

"Well, let's leave Ms. Darring and Mr. Guul alone," Motak said. "Clearly, they have much to discuss." He leaned over Darring's tub and stared into her eyes, his sharp mouth inches from her face. "I'm so glad to see you well, my dear. Please do accept my offer. It would be a disgrace to lose one with so much talent."

They scurried out, but left the image of the M50 on the vid screen. When the door closed, she rounded on Guul. "You're not my father, old man — don't answer for me."

Guul shook his head. "I am not your father, Hypatia, but I am trying to get you to grow up a little. If you refuse this offer from Motak, he will have won thrice: by getting rid of Remisk, by getting rid of you, and by further damaging your reputation. Racing is as much about your public image as it is about skill. You already have a bad reputation. Don't damage it further by being ungracious."

"But it's his ship!" she said, pointing to the vid screen. "He's done something to it, I'm sure."

Guul shook his head. "No, he's not that stupid. There's too much light on the competition now, too much that's transpired. He can't afford to offer this gift and then sabotage it. He's done all he can do. It's a matter of who's the best now. There's plenty of racing left, Hypatia. Go out there and prove to everyone, prove to Motak, that you will not be stopped, that you *are* the best."

Despite the logic in his words, Darring just wanted to reach out and scratch his face. She was so sick of *males* telling her what she should and should not do. Dammit, if she wanted to refuse Motak's gift, she would. And yet, to beat Motak with his own ship, that would be so lovely. But it wasn't just a matter of getting up and strapping into the cockpit. Every M50 had its own quirks, its own personality. There were always balancing issues, thrust issues, drift issues that needed to be identified and learned. The cockpit displays would be configured to Motak's own preferences, which would take time to sort out. And it could take weeks for her to get comfortable on the stick and throttle. She had maybe 48 hours to make it all work. Her burns were healing in this goo around her, but her flesh was tight and still stung beneath her movements. Motak was setting her up to fail. He didn't need to sabotage the ship, she realized. Her current condition was its own sabotage.

And now Guul was taking advantage of their new friendship. He had no right to interrupt her and speak for her publicly. *Guul may admire me*, she thought as she pulled herself up and sat on the edge of the tub. *Now, he needs to respect me.*

"Okay, Zogat," she said, looking around for a towel. "You win. I'll accept his offer. I'll show him I'm the best, but more importantly . . . I'll show *you*."

*   *   *

Hello again, and welcome to another GSN Spectrum broadcast of the Murray Cup Race. After the tragedy rising from the Sorrow Sea, Darring's near death experience, and Remisk's shocking confession, the competition has gotten back on track and has settled into a sweet groove. From the midway checkpoint and out all the way to Ellis XII, the top racers have pushed their craft to the limit. Hypatia Darring has come back with a vengeance, accepting Shoo-ur Motak's M50 and taking two of the last three courses before the stage through the asteroid belt and back to the final checkpoint at Ellis VIII. The completion around Ellis IX, in particular, proved raucous, as Darring slowed to allow Motak to gain the lead while dogging Guul's Hornet, forcing him to flirt with the Eye's crushing tidal forces. No love was lost between those two during the following press conference. But now the aged Tevarin has surprised everyone once again by taking the final obstacle course in the outer asteroid belt, painting his targets with non-lethal laser fire, showing a refinement that proves that he will go down in history as one of the finest pilots ever to race The Cup. Now, the competition enters its final leg with only 65 racers remaining, and the top three positions held by Motak, Darring and Guul. Can these three power-houses hold out, or will someone fly past them and beat them all?

The final leg awaits. Let's kick it back to Mike Crenshaw who's in the thick of it. What's the mood on the carrier, Mike?

*   *   *

Raw.

That's what she was. Just a raw nerve, always ready to spark if you gave her a chance. He had hoped that he could share with her a little of his experience, teach her some wisdom, in a sport just as rough on the spirit as it was on the body and mind. And perhaps she had learned a little. She was racing better, maneuvering better, taking to heart his philosophy . . . *speed is life.* But looking across the carrier bay floor at her as she ran a cloth across the belly of her borrowed M50, Zogat Guul could not tell if Darring's improvement was motivated by skill or anger. Did it really matter? In the end, if she blew across the finish line in first place, it would all boil down to victory. And that was the ultimate goal of everyone in the race. Go home a winner . . . or just go home.

"Hypatia Darring has it out for you, doesn't she?"

Crenshaw's face was all perky as if he had just said something infinitely clever and devious. Guul did not take the bait. "She is a tough competitor. Like a Tevarin, she shows her enemy no mercy."

"But she held back around The Eye just to force you to lose. That's the move of someone bearing a grudge. What did you do?"

What indeed. He could not fathom it. Perhaps he had come on too strong. Was it when he interrupted her and spoke for her publically at the hospital? She would not say when he asked; instead, she would change the subject or walk away. But direct action, direct speech was the Tevarin way. Surely she realized he was right. She had to compete. She had to accept Motak's offer and finish the race. Not just for herself, but for the honor of her family. Surely she did not blame him for pointing that out.

"Scurry away, bug."

Motak appeared, alone this time, and flicked his long fingers at Crenshaw as if he were swatting a fly. "Yon Tevarin warrior will not condescend to answer such a silly question. Shoo! Go bother someone else."

Crenshaw pulled a rueful face but put his recorder and pad away.

When he was gone, Motak closed on Guul and offered his hand. "Good luck," he said.

"You want to break my hand like you tried to break Hypatia's?"

"I wouldn't dream of it, my friend. I merely want to wish you a safe final course. This is your last, isn't it?"

Guul nodded. "Perhaps."

"And you are braced to win it all and be remembered as the greatest racer in the history of the sport. For that, I wish you good luck."

Guul took the handshake reluctantly. Motak's fingers were firm but not vise-like. He moved until he was beside the Tevarin. They were similar in height, but Guul was thinner, leaner. Motak placed his free hand on Guul's back.

"Look at it all one last time, Zogat. All of it. The bay, the racers, the media, the hustle and bustle of the crews. You will miss it. But I think you will miss that young lady right there most of all."

Before Guul had a chance to speak, Motak pushed his hand hard against the Tevarin's neck. Guul heard a high-pitched squeal, then his skin ripped apart.

It was a short, sharp pain, quickly over like a bee sting. But then he felt something crawling beneath his skin. He tried to move, but Motak gripped his hand harder. "Now, now, Zogat. Don't strain yourself. You'll die quicker that way."
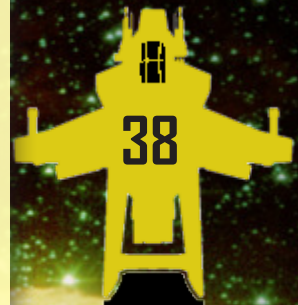
"What have you put in me?"

Motak maintained his composure and kept looking forward as if they were having a pleasant conversation. "The pupa of an Eealus Lime Worm. It loves the warm comfort of your blood. It moves with the beat of your heart. If it beats fast, the pupa moves fast. If slow, it moves slowly. Eventually, it'll be flushed into the ruddy chambers of your heart, where it will divide again and again until it squeezes off all blood flow."

"I should kill you right now."

"But I think you won't. You may still win this race. It may or may not reach your heart before the end. It all depends upon how much effort you put into winning. Do you go slow, keeping the worm from finding your heart, thus losing the race? Or do you go faster, letting your adrenaline build and build in order to beat the worm to the finish line?

"Now imagine it . . . me, Shoo-ur Motak, the greatest Xi'An racer in the history of the sport, crossing the finish line in first place, while the legendary Zogat Guul sputters at the last moment, his overwrought plant boiling to mush, or his ancient heart giving out from the exertion. It matters not. Either way, I blow across the finish line to glorious victory. Imagine the headlines in the news the next day."

"I have to imagine nothing," Guul said, feeling the worm work its way deeper into his body. "Whether I win or lose, Darring is still out there. If I fail, she will beat you."

Motak chuckled, released his hold on Guul. "Don't forget. She's racing in my ship."

He winked, gave a warm nod. "Good luck out there, *old friend*," he said, as the media crowded around once more.

Guul leaned against his Hornet, trying to ignore the thing moving deeper into his back, far beyond any hope for simple removal. He could, if he wanted, have the nasty little grub removed surgically, but that would take too much time, and everyone was suiting up, strapping in, readying

for the final course. He couldn't get out now, not when the end was so close. He had to take his own advice. He had to finish the race. Motak was right: there was a chance to beat the worm to the finish line. And he could not leave Darring to whatever fate Motak had in store for her. *What has he done to her — his — ship?*

He looked across the bay floor, toward Darring. She was putting on her helmet, getting ready to climb into her cockpit. He tried catching her attention with a wave. She did not see him, or she was ignoring him. Whatever the reason, he did not care. He was grateful that he had had an opportunity in the twilight of his career to race against such a warrior, such a competitor as she. And he would make damn sure that he saw her win it all.

Speed is life. *Indeed it is*, he thought as he put on his helmet with shaking hands. *But this time, speed also means death.*

* * *

Guul was just ahead of her, Motak at her six. She was perfectly placed to take advantage of the Tevarin's erratic behavior. He had been speeding up, slowing down, speeding up, as if unsure what to do. Or perhaps he was playing with her, working to sap her resolve, force her to slow down and deal with his uncharacteristic movements, thus giving the lead away to Motak. But that was silly. Guul did not want the ruthless Xi-An to win any more than she did. So, what was his game?

They raced in high orbit above Ellis VIII. The final stretch was a long, loping crazy-eight of rings that flashed brilliant reds and greens and whites, keeping a tempo with the natural flow of the racers as they shot past one another near the intersect. It was a dangerous place, for racers coming out of those rings could slam into one another and

ricochet into space. The time it would take to recover from such a collision would be race-ending.

Two orbital grandstands just outside the course held spectators and prominent dignitaries that had come out to see and share in the glory of the winner. The MCR allowed the energy and excitement of the crowds to be broadcast into the cockpits of each racer as GSN announcers gave the minute-by-minute account of the final laps. Some racers thrived on the energy of the crowds. Some reveled in the noise. Darring muted it all, preferring instead to concentrate on the racers around her.

She maneuvered her M50 to the right of Guul, taking advantage of the loop. He swung his Hornet out a touch too far, and she slipped right in beside him. His wing grazed the invisible walls of the ring course, letting the tip of it cut through the barrier like a shark's fin cresting a wave. He'd lose time for that, but he didn't seem to care, keeping his craft pressed against the loop to ride it all the way around. *He's getting old*, she thought, letting a smile slip across her lips. *Can't handle the rigors of such a sharp turn anymore.* Then she thought better of gloating. She wanted to beat him, to make him see her as a racer, an equal, not as a puppy dog to counsel. But she didn't want him to leave the race. There was still plenty of track left, plenty of twists and turns, and Motak was right on them.

The Xi-An thrust his 350r down to run right below her belly, keeping an interloper behind him in a souped-up Avenger from making a move. Darring banked to the right and felt the tug of strong G's despite being held tightly in the chair. Her skin had healed well and there was little pain left in her shoulders, but such a move reminded her of the frailty of flesh and her own mortality. Bank too strongly, and you could pass out.

"You're not winning this one, Motak," she said into her comm link. Only her crew chief could hear it, but he shared her sentiment. He gave her directions which she accepted

and moved her craft to the left as they cleared the loop and headed for the final intersect.

Guul came up to her side again, but he was still moving oddly, letting his wings wobble on the rebalance. She shook her head and focused on Motak, who had gunned his plant, showing significant burn out of his exhaust nozzles. He wouldn't dare cross her cockpit now, not with the MCR looking on so intently. In fact, Motak had acted reasonably well since his vanity display at the hospital. He'd let his racing skills speak for themselves. So perhaps he wasn't such a rotten son-of-a bitch after all. But she wouldn't be keeping his gift after the race.

Red blips danced on her navcomp, showing the racers that could be hazardous as she crossed the intersect.

She drifted up in the lane, taking the traditional approach for a right-side cross. Motak followed, but Guul struggled to drift up, taking too long, letting his craft fall behind once more. She fought the urge to acquire his frequency and link into his comm. Motak tried to force her down. She gripped her stick and moved with him, not letting him gain advantage. The blips on the screen grew brighter. She keyed her focus, thrust her M50 forward and sailed into the intersect.

Lagging ships flew past her at the right angle, trying desperately to keep up with the pack. One nearly clipped her wing. She banked left just in time. She tried finding Guul and Motak in the flurry of crimson blips on her screen. It was impossible. She banked left, right, left again, swirling through screaming racers.

Darring flew out of the intersect, righted her ship once more, and prepared for the final run. She checked her navcomp. The madness there settled to show those that had gotten through and were in pursuit. *Damn!* Motak settled again beside her, and Guul was not far behind, though struggling still. *Can't I shake these bastards?*

Finally, Guul made the move she was expecting. The Tevarin thrust his Hornet forward, clipping between her and Motak at such velocity that he was nothing but a blur. Her heart raced alongside him. She gunned her plant, falling just behind him, watching as the blips on her navcomp were replaced by the long green pulsing line of the final straight-away. She could hardly contain her excitement. She, Hypatia Darring, in second place on the final lap around Ellis VIII. The perfect position to be in to make a final move and win it all. And there was Zogat Guul, the master, egging her on, forcing her to put away her silly feud and chase him, chase him for glory, for fame, for personal fulfillment. She giggled like a little girl.

Speed is life.

They hit the final stretch together. One full lap around rocky Ellis VIII. Full bore speed. There was nothing like it in all the galaxy. She could not contain her excitement. She screamed into her comm link. Motak tried to muscle his way into her space. She refused him. He tried again. She pushed her M50 even faster, keeping pace with Guul, letting the green lights of the navcomp draw her forward.

Guul slowed, fell alongside her, slowed again, letting her take the lead. *Bullshit!* she thought, frustration growing as she punched a panel and said to him, "What the hell are you doing?"

She was greeted with coughing, spitting and moans. Something was terribly wrong. "I'm glad to speak to you once more, Hypatia."

"Do you remember what you told me? What you made me promise you? If I were in a position to win, I'd win. And now here you are, about to win, and you're falling back. Explain."

Guul coughed. It sounded thick, bloody. "It isn't important that I win, Hypatia. I've won enough in my life. It's time for others to shine. It's time for you to shine. Now, go beat him. And remember what I told you."

He cut their link. Darring shouted, but he was gone. Guul fell back, and back, until she could not see him anymore.

Motak pounced, took the lead. *Shit!* She gunned it, moved down in the lane, set her craft just below Motak's. The sleek, long body of his 350r shadowing her smaller M50. There was no doubt his craft had the endurance; in a rough and tumble, he'd prevail. She had to get out from his shadow, his influence. The only way to do that . . .

She tried pushing her plant, thumbed the throttle hard, but it did not register. She tried again. Her dashboard controls blinked, once, twice, then resettled with different settings, measurements, displays. *What the —*

"How's my ship?"

Darring's heart sank. "Motak!"

"It is indeed," he said, his voice fuzzy over the comm link, "and now that I have your undivided attention, I will reclaim what is mine."

Nothing she did registered. She tapped panels, flicked switches, tried raising an MCR official over the comm. Everything was null, but her ship responded quickly to Motak's remote commands. He banked to the left; she did the same. He banked right, she followed. The Xi-An finally settled his 350r beside her, waved smugly at her through his cockpit window, commanded her ship to move slightly ahead, then said, "I'll let you take the lead for a little while, my dear, then I'll dramatically pull forward at the last minute, flying on to victory, while you spiral out of control, hitting the royal grandstand and killing dozens. You'll be remembered as the Butcher of Ellis."

She pushed and prodded at the stick, banged at the dashboard. She even struck the eject controls. Nothing. "I'll kill you first, you sorry son of a bitch."

"And how will you do that, my dear? You have no control over anything . . . and your Tevarin is gone."

As if on cue, a flash soared past them both, a flush of red and gold nozzle fire. It was burning, its plant pushed beyond integrity. Darring squinted to see who it was. She recognized the blue Tevarin lettering on the hull.

Guul.

His Hornet barreled ahead, all flame and fury. Darring could hear Motak curse beneath his breath. She tried again to take control of her stick. Nothing. She tried calling out to Guul, but all she could hear was Motak's agitated mumblings as he commanded her ship to move up and ahead of him. Darring watched intently as Guul flipped his burning craft around, shifted it to align perfectly with her own, and headed straight for her.

Her comm link crackled with another voice. "Move!" it said, ragged, faint. "Dive! Dive!"

"I can't!" she screamed back, but there was no response. Only Motak's maddening cackle could be heard. "Say to him whatever you wish, my dear. He cannot hear you."

Guul banked left. Darring's ship moved to shadow the Hornet. He banked right; she banked in kind. Guul's weakening voice continued its pleading for her to get out of the way. Tears streamed down her face; her voice broke from exertion. Motak laughed and laughed.

Her ship began to spin like a cork-screw on its long axis. She closed her eyes, waited for impact, whispering softly to Guul, "I'm sorry, I'm sorry . . ."

Then she remembered.

Beneath the dashboard of every M50 lay a panel, and inside it, a power cut-off valve, independent of the main electrical and command systems. Could Motak have forgotten it? He might have, so foolishly overconfident in his scheming and back-stabbing, and spending too much time in his 350r to remember all the systems of his secondary ship. But it might be: A mistake . . . finally.

Through the dizzying haze of her spinning, she reached beneath the dash, found the panel with shaking fingers, ripped it open, and pulled the valve.

"You lose, Motak!"

The plant died, and with that sudden lack of propulsion her ship spun to port. Zogat Guul slipped right past her, hitting Motak's ship square in the front, exploding on impact, and sending their shattered, burning hulls into the void.

The cockpit came alive, her stick again responsive. She pulled her ship out of spin, reignited the plant, and blew across the finish line ahead of all others.

Her pit crew went wild, matching her own screaming, but for different reasons. They were joyous, elated, happy that their racer — the youngest Human to ever win the MCR — had just done so, and in a blaze of glory. They were happy, and they deserved to be.

She was not. Oh, she was happy to have won, to have taken the Cup, to have proven to her father that her choice in career was not foolish. She laid her head back into her chair and cried. Cried joyous tears for Guul. She understood fully now his words, echoing loudly in her mind. *Speed is life*, and there was no life without speed. She understood that now. The Cup was just one race in a thousand that lay ahead of her, and there would be no true happiness until she had raced them all and chased down that beast that lay in front of her, that lay in front of all racers. In his fiery death, Zogat Guul had finally caught the beast. Now, it was her turn to chase it, and she would do so for him, for Guul . . . forever.

Beyond the finish line, beyond the grandstands, beyond the accolades and cheering fans, beyond the media, and even beyond her father, Hypatia Darring gunned her power plant and kept racing.

THE END

CHRONICLES