

# ***Destination Azahar***

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CONTENT: noseX ScFi

UNIVERSE: The Swarm Cycle

## ***Chapter 18 - Preparations Gone Awry***

The first order of business for the newly operational factory was to extrude the core components of its first clone. Fully half of the station's replicators were tasked with fabricating the supporting equipment and containers that would preprocess the raw materials consumed by the factory.

The two factory replicators would be positioned in a line with the raw material entry ends facing one another. The structure housing the 48 industrial replicators that were currently in orbit was positioned to form a T with the two factory replicators. The direction of flow was reversed on the first double ring of twelve industrial replicators. They would be tasked with pre-processing the raw materials needed by the two factory units.

The shipyard was ready and waiting for *Sir Galahad* when it returned to orbit Azahar after delivering its load of propulsion units to a score of rogue asteroids. Captain Collins eased his ship into the framework of the shipyard, set his watch crew, and transported down to Barcino with his senior staff.

Tuan finally understood the benefit of such a large residence when Constance invited the senior officers of *Sir Galahad* and Delta Company to dinner the evening that the shipyard began working on *Sir Galahad*.

During cocktails before dinner, Major Sarah Bronson asked her hostess, "I've seen a pair of massive triple-barrel turrets floating near your stockpile of habitat pods. They're not listed in your inventory report and I've been wondering what in the world they're doing here. Can you tell me what they're for?"

Constance blushed and tried not to choke on her drink. Tuan was nearby and spoke as he approached, "Constance had a moment of paranoia several weeks ago and thought we needed some big guns to protect us from raiders, be they rogue asteroids or savage invaders. We had intended to mount them on the industrial station, but it's actually not heavy enough to be stabilized against their recoil. Do you have any suggestions for using them?"

Bronson smiled, but was sympathetic when she said, "Big guns do make a girl feel less vulnerable, and those are really big guns." Her smile morphed into a puzzled expression when she added, "They look a bit like plasma cannon, but they're so big!"

Constance found her voice. "The turrets you saw are fully automated 210mm plasma cannon in triple mounts to give continuously overlapping fire when operated in sequence. There's not a good place on the station to mount the behemoths without them getting in the way of something or something blocking their field of fire. I had intended to ask Captain Collins for a recommendation for the placement of these weapons. We also have a dozen dual 38mm pulse cannon turrets that we intend to mount on defensive platforms in the vicinity of the station. Their counter rotating barrels give them twice the rate of fire of the 38mm units typically deployed as point defense weapons."

Bronson chuckled, "Oh my, you did have a moment of weakness, didn't you? I'd be happy to look over your planetary defense plan. I have some experience with weapons from an encounter with Sa'arm frigates at Sa'Triste."

"She's being modest," Collins interjected. "She designed the armament modifications to all of the ships that participated in an expedition deep into Sa'arm-controlled space, and she served as the fleet weapons officer. We were jumped by an overwhelming force and managed to fight our way out thanks to her preparation and guidance."

"I'm afraid that our planetary defense plan is primitive: 'need guns, build guns'. We're kind of stuck at the 'have guns' step and don't know what to do next," Tuan volunteered while trying, unsuccessfully, not to laugh.

Commander Patrick Kehoe filled the awkward silence by remarking, "I've been inspecting the progress you've made with the underground facility: very impressive. The excavation of the main chamber has started and only a few tunnels don't have the outer set of blast doors operational."

Tuan remarked, "The biggest headache was getting survey benchmarks established in such a large area for the laser transits that kept the tunnels aligned. The spiral ramps were a nightmare to survey. We actually considered excavating a huge cylinder, installing the spiral ramp, and then backfilling the hole."

On cue, Aswani approached Constance, "Dinner is ready, mistress."

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*Asimov* was due in three weeks, and Tuan and Constance's attention was in a four-way split along with the industrial resources of Azahar. The excavation of the mysterious tunnel complex was nearing completion, but there were blast doors and a massive interior structure to fabricate along with HVAC and atmosphere processors. The construction of the two domes that would house Delta Company was almost complete over one of the entrances.

The modification of *Sir Galahad* was occupying all of the resources of the first operational factory-class replicator. At this stage, *Sir Galahad* was a source of raw

materials, not a consumer as the aft section was being dismantled down to the spine. Even the undamaged sections between the bridge and acceleration compensator were being recycled as scrap.

The construction of the third factory replicator was in progress by the second one, and the raw material flow had to be adjusted to accommodate the changing needs of the production schedule. *Sir Galahad* was providing most of the steel and copper needed for the new factory.

Last, but certainly not least, was the research facility needed by Professor Avalareddy to replicate Dr. Brown's collection and begin developing carbon-dioxide-tolerant strains of vegetation. The four new greenhouse pods were in place and ready long before the plaza or anchorages for the two pods brought from Earth were completed. The central dome would be started as soon as the two original greenhouses were in place.

Nancy and Judith wandered through the CIC on their way home after delivering more industrial pods to the Marine complex. Nancy made the casual observation, "You know, we have several hundred pods in orbit to replace the pods on any colony transport that shows up, but what are we going to do with the pods full of colonists that they're bringing us?"

Constance gave Nancy a classic dear-in-the-headlights look and softly breathed, "Oh, shit!"

Tuan laughed, "Talk about target fixation! We've been concentrating so hard on the trees that we forgot about the forest! What *are* we going to do when *Asimov* arrives in less than three weeks with 96 pods loaded with Marines?"

Nancy rolled her eyes and took Judith by the hand. "We're going to get something to eat and head back to the station. You geniuses need to get busy."

On the way out Judith could be heard saying, "How on Earth did they manage such high CAP scores?"

Constance's jaw dropped, but Tuan just started laughing and shouted, "That is a very good question, Judith." When the two turned to look back, Tuan wadded up a piece of paper and threw it at them. "Git! Cheeky concubines shouldn't stand around to gloat after upstaging their sponsors." Constance finally managed a chuckle.

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The naval architect sent to Azahar by Admiral Forney was the technically capable, but socially inept, Lieutenant Denise Williams. She expressed her concerns about harmonics and angular moments during high-performance maneuvering as well as several other obscure engineering terms. She rather bluntly remarked, "Major Bronson, I don't think your plan to mount three rings of pods on *Sir Galahad* is going to be stable."

"I had wondered about that myself when Admiral Forney first proposed the configuration," Bronson replied. "The two cargo sections of *Sir Lancelot* ships aren't long enough to accommodate three rings of pods *and* the corridors that connect the leading end of the pods to the rest of the ship. Do you have an alternate configuration in mind?"

In less than an hour the two engineers were happy with a new arrangement, and they presented it to Captain Collins who expressed mixed feelings. "I like the fixed bay between the two rings of pods. It can serve as a secondary weapons platform. Any chance of mounting medium- to long-range guns in that position?"

Bronson laughed. "Not the monsters that are floating around outside looking for a home, but maybe something like the single mounts of 130mm plasma cannon that we installed on the *Castle*-class ships that escorted us at Sa'Triste."

"I know that you think of them as a pacifier, Major, but guns do provide a level of comfort to a crew under fire and people are less likely to make poor decisions if they believe they're fighting back. No one is at their best when they feel like a sitting duck," Collins pointed out. "*Sir Galahad* is a great deal heavier than the *Castle*-class ships and the plasma cannon would not be as hard to control. See what you can do even if you have to reduce the number of pod mounts."

"The really nice thing about the pod concept, Captain, is their universal mounts," Williams pointed out. "The mount can accommodate not only habitat pods, but also cargo bay pods, auxiliary fuel pods, and hangar-bay pods. They can even house an auxiliary weapons platform making it quick and easy to tailor the ship for a wide variety of missions."

You could almost see the wheels turning in Bronson's head as that simple concept sank in. She had been struck by inspiration when she remembered a report she had read, but she was not yet ready to share her thoughts.

"One other weakness of Confederacy warships is their total dependency on a central AI," Collins remarked. "I'd like to be able to breathe and shoot back even if the AI is disabled. Admittedly it would be a luck shot, but warships should have a viable alternate to every critical system. We don't need a second AI. The emergency systems can be less than optimal. They just need to be functional."

They unanimously agreed that when the aft section of *Sir Galahad* was stripped to the spine it was to be reinforced but not lengthened as called for in the original plan. The plan was further modified to accommodate only 24 pods in two C-shaped rings of twelve with a compartment between them that could be configured for storage or auxiliary fuel as well as accommodating eight additional point defense gun mounts or possibly something with a bit more firepower. The lighter and missile bays would occupy the ventral opening of the C-ring arrangement of the pod mounts.

While Lieutenant Williams finalized the modification specifications for *Sir Galahad*, Major Bronson began drafting a preliminary plan for planetary system defenses that included a self-propelled platform for the two plasma cannon turrets and point defense satellites that could be placed near the orbiting station plus sensor and missile platforms that would be located well outside the orbit of the two moons.

The design and planning was not limited to the naval architects. Over in the McKinsey study, Constance was shaking her head. "We didn't plan ahead when we dropped the colony AI and our pods at this site, Tuan. We have ours, the botanists', and the ten temporary pods along a single, straight corridor with our backup CIC and a transporter room at one end and a blank wall at the other end. Not a very efficient layout."

"It's not that bad, but clusters of pods around a common courtyard would create a more active neighborhood," Tuan commented. His tone and body language appeared noncommittal, neither agreeing nor disagreeing. "If we extend the tunnel past the transporter room to a much larger chamber with wider corridors leaving the central chamber..."

He sketched his concept. "The 200-meter tunnels, branches that connect 30 courtyards 50 meters in diameter with fifteen pods arrayed around each courtyard, making a kind of shared front yard for the fifteen pods. That gives us a cluster of 450 pods with no more than 400 meters from any pod to the transporters."

Constance did the math in her head. "200 to 400 meters isn't really much of a hike."

"Our little sidetrack can be left undisturbed, but we can run two very long tunnels from the central junction near the transporter room making six, 60-degree branches from the center of the colony. Kind of like the police barracks in what used to be the center of Paris. The avenues radiated out to allow a central vantage point to identify rioting mobs. These two long tunnels can lead to outlying neighborhoods," Tuan suggested.

"Hopefully we won't have many rioting mobs to deal with," Constance said with a giggle. "They could also be 100 meters long, on a downward slope for 250 pod communities," she suggested, borrowing a page from the layout of the massive excavation being conducted to the north. "We might need to think about transporter pads in the outlying areas, or maybe some kind of automated shuttle. I don't think we want to allow any kind of private vehicles, not even golf carts or those two-wheel scooters mailmen stand on."

Constance sat back and looked at the ceiling. "The first load of Marine pods is due in as little as two weeks. Do we have time for nanites to excavate these tunnels, or shall we get Judith to retrieve one of the tunneling machines from the anthill?"

Her question didn't register on Tuan's consciousness. "Are we going to house the Marine families here, or nearer to the Marine compound above the anthill?" Tuan asked absently.

"Well," Constance mused, "We don't know how big the Marine compound will eventually become, and there's no reason to isolate and socially ostracize their families."

"But we don't necessarily want them in our laps, either," Tuan countered.

Constance went back to Tuan's sketch, "The two long tunnels..."

Tuan waited a moment before prompting her with, "The two long tunnels...?"

"Oh, sorry," Constance said as her mind returned to the present. "We'll eventually have both Navy and Marine personnel stationed here. What if the long tunnels lead to Marine and Navy enclaves that have transporter stations at the main junctions? The residents could go directly to the Marine complex from one and the space dock from the other. The tunnel would give them access to the colony center. They could use the transporter if they were in a hurry to get to the CIC. These 450 units," Constance indicated the three tunnel clusters near the CIC, "would be for dock workers and local support personnel."

"I like it," Tuan enthused. "If we make the long tunnels gentle ramps they can lead to a community center with nine tunnels servicing 1350 residences. If Delta Company has six platoons of about 50 soldiers, then they would need about 300 family residences. The three-tier arrangement would accommodate four companies."

"Let's get one of those borers to work as soon as possible," Constance recommended. "We can only count on having two weeks to get this done before *Asimov* arrives."

"We'll want to do something a little more open in the mountain location. There'll likely be larger family units that need more space than we've allowed with this layout," Tuan suggested.

"We should have a bit more time to draft a layout for that area. We can get started on some of the surface structures, but let's hold off drawing a layout until things are a bit less hectic," Constance suggested. "What else are we forgetting?" She looked up and asked rhetorically, "Where are those cheeky concubines when we need them?"

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It turned out to be faster to use one of the replicators at Barcino to build boring machines the size they needed rather than retrieve one of the huge machines from the anthill and downsize it. The first machine was in place three days after being scheduled through the replicator. In five days it had completed the 12,000 meters of tunnels planned for the Marine community. A specialized excavator and an army of nanites were busily completing the 90 50-meter diameter nodes that would be the common connection for fifteen habitat pods. For safety and security an airlock entry was designed into the short tunnels that connected each of these 90 courtyards to the local branch tunnel.

A playground dome was offset above each of the nine junctions that serviced ten nodes (150 habitat pods). The offsets allowed clearance from pod sites for the elevator shafts. The first 450 pods would be installed on the lowest level. It would take five days for the pods to position themselves and connect to their 50-meter courtyard.

The tunnels planned for the 480 pods near the center of Barcino were completed in less than a day. The twelve kilometers of tunnels needed to accommodate Navy families would be completed just after *Asimov* was due to arrive.

Some preliminary planning was needed for the mountain site of Demopolis even if it was going to be another three months before colonists starting arriving in large groups. It would take at least a month for one of the industrial replicators to produce a colony core AI pod and months more for it to be trained by the Barcino and space station AI units. The existing AI units would supervise the new one's activities until it matured.

They agreed that the first colony AI off the production line should be located high in the northern mountains in a location that was not near any known mineral deposits. The cooler temperatures and scenic mountains made the location one of the best sites for a colony after the atmosphere was breathable, especially one focusing on academic pursuits and scientific research.

Tuan and Constance decided that when they got around to thinking about the Demopolis site in the mountains they would try using 300-meter tunnels off the intersections. The longer tunnels would allow enough room to place common courtyards at varying distances from the dead-end tunnels in order to create an infrastructure that could accommodate standard to triple-sized habitat pods.

Constance couldn't stand it. She scheduled a couple of industrial replicators to be dropped at the mountain site to begin creating the tunnels and infrastructure accommodations for a sizeable colony. Several of the stadium-size domes were planned for parks, recreation areas, community activities, research centers, and administrative offices.

She made a note to get with Tuan and have a pumping station installed somewhere near the Demopolis site instead of running a pipe the entire length of the island. It might even be feasible to tap one of the mountain lakes to supply de-mineralized water to the settlement's cooling towers.

It was easier for the first pods to be underground for solar radiation protection rather than trying to protect them on the surface. The shielding integral to the pods would quickly deplete the batteries and would not protect anyone outside. Getting rid of heat would also be an issue for surface structures, even in the cooler mountain air.

Constance could be heard muttering to herself, "Although, a single 150-meter dome would house a massive apartment complex." She scribbled some notes; then, "It could easily accommodate four, 12-high stacks of pod racks with eight pods per stack level.

That's four stacks of 96 — 384 pods, but it would need a cooling tower as big as the ones typically located at a nuclear power plant."

Her musings were interrupted by a visit from an apologetic Ensign Marvin Clark. "Forgive me for interrupting, but I was told that you might be able to include a personal message from me to some friends on Earth in your regular status reports. It'll need to go through the Civil Service office in Atlanta. I have all of the routing information in the message header."

Ensign McKinsey accepted the chip and plugged it into her PDA. After a few moments she smiled as she looked at the blushing Ensign. "This is a very personal and very cryptic message." She put the blushing Marine on the spot by observing, "I can see why you wouldn't want to give this to Lieutenant Peterson. Your details about who is pregnant make it sound like it's going to family. This reference to Lesa getting help makes me wonder if this isn't some kind of coded message. I guess I can send a concubine status update to Civil Service on Earth and tuck this in the attachments. I assume that this Decurion Chalmers is somehow involved?"

Clark continued to blush, "Yes, he responded to the recommendations I gave to Captain McGregor, sorry, *Commander* McGregor regarding a brain trust pickup and has been in contact with Lesa, or will be in contact with her. There's nothing subversive here, I assure you. Apparently Jake Caulfield visited the Decurion shortly after my extraction and made an impression. They're both going to be picked up this summer along with some other very smart individuals."

"Oh, really?" Constance was clearly skeptical. "I didn't think pickups could be predicted."

Clark shrugged. "This one isn't going to be targeting the usual suspects or the typical venues."

Clark changed the subject by complaining, "My ROTC training makes the combined rank structure created by the Confederacy Defense Forces more than a bit strange and hard to use unless I really think about what I'm saying. Scrambling traditional army and navy rank designations is just... Well, it's just wrong!"

McKinsey smiled. "It's actually easier for us newbie types. No confusion about Captain or Lieutenant. I can see where replacing Captain with Commander can get people twisted for a while, though."

McKinsey returned the media stick to Clark. "I'll do my best to get this to your friends as soon as possible. I wish them luck in whatever scheme they're hatching to get extracted as a group."

"Thanks," Clark responded as he accepted the media. "Ma'am," he added as he made the motion of tipping his hat as he left the room.



*A classic Southern gentleman*, McKinsey thought to herself as she smiled and returned her attention to the task that was briefly interrupted.