

Chapter One

Hal sat with his back to the stone wall. His eyes were wide as he let his peripheral vision and concentration scan the dimly lit room without revealing that fact by moving his head or his eyes. It was a trick it had taken him a long time to learn in the Agency's school.

When Gregory Kovitch came into the bar gliding toward the middle of the room and looking for a seat, Hal raised his hand and motioned him over to the table like he just happened to spot him. Gregory returned the wave with a smile and strode as purposefully as possible in lunar gravity to the table. As Gregory lowered his lanky blond frame into one of the soft plastic chairs, Hal greeted him with the hale and hardy barrage of trite phrases normally used when encountering someone of limited acquaintance in a bar where it was better to be bored by who you knew than by who you didn't. The opening volume of both men was loud enough to be heard at the surrounding tables, but the conversation quickly faded to a low enough level to disappear in the amalgam of chatter being bounced off the rock walls.

When they got through the inanities, Hal changed the pitch and character of his voice. "Of all the gin joints . . ."

"How many times have I got to tell you, Hal? You can't pull off a Bogart imitation." Their love of old movies available on the Lunar Library Net had gotten them both through some boring times since the start of this assignment, and they loved to discuss their favorites.

"I'm going to keep working at it `till I get it right. Have you seen Will?"

"Nope, not since lunch. I came straight from the Complex after shift. He said at lunch he would come straight over too, so I guess he's close behind me. You couldn't have been here long."

"Just long enough to get a beer. Link-up what you want. We've got Gail again tonight at this table." The ratio of men to women on the moon was still about two to one. Women just seemed to prefer more niceties than the Spartan accommodations usually available on Earth's moon. It took something special to get them to come up, either a career move or money. Working in a bar in a hole in the ground on the moon, it was definitely money that had attracted Gail, and she made a lot of it judging by the tips Hal gave her.

Gregory scanned down the screen for a draft of choice. He unnecessarily raised his hand to his mouth, like ninety-nine percent of humanity, and spoke into his wrist personal. "Wotan, order my usual draft." A few minutes later Gail sallied up with a pint of Old Anton. "You guys need anything to munch on?"

Gail set the pint down in front of Gregory with a perfunctory smile, glanced at Hal's half-filled pint, and waited for a response. Hal looked up with a grin, "a bowl of Calamata olives, a hunk of foccacia bread, and a plate of extra-virgin olive oil would be nice, but absent that, we'll just nurse the beers."

Gail's smile changed from perfunctory to genuine. "Don't you wish? Link me if you change your mind." With that, she spun on her higher-than-normal-for-the-moon heels and retreated with the moon-lope gait that was making her rich on tips in a second-rate lunar bar.

Will came in just in time to catch Gail's last lope before she disappeared around the corner of the bar. As his gaze swung back around the room, Hal waved. Will planted his slowly falling right foot solidly, executing a graceful lunar turn to the left toward Hal and Gregory, all hundred and twenty kilos of him. He settled into the remaining chair and raised his hand toward his mouth first thing. "Raven, a pint of Tycho Bitter." The important task over, he looked across at Hal. "You're ready?"

"I got the last connection in yesterday while I was replacing a bad STEPP chip. How soon can you guys be ready?"

"Gregory looked at Will. "Three days?"

"That's okay with me." Will turned to Hal, "can you get the signal out that quick?"

"No problem. Three days it is. You guys want to change anything here at the last minute?"

Greg and Will both shook their heads no, and both of them placed their left palms on the plastic surface of the table. Neither of them gave up the beers clenched in their right hands. Hal did the same. He could never feel a thing when he did this, but there was supposed to be an ultra high-frequency current generated when they did this that ran over the surface of their skins and the plastic tabletop.

Hal sub-vocalized, *"Harvey, key agent communications on and verify coordinated plans for Alpha."* The surgical implants converted Hal's sub-vocalization to impulses that Harvey could read through Hal's enhanced neural network as well as fully vocalized speech he accessed through his microphone input on the fake wrist personal.

Harvey was the name Hal had given his very personal computer. The basic bio-chip processors were surgically implanted, with additional memory in crystal lattices on the thin-film layers inside his belt. The belt also held additional power and the inductance coils that communicated with his implant components. Hal had frequently joked about writing a book on Alpha when it was declassified. He'd call it "Two Gods and a Rabbit."

"I have confirmed all planning with Wotan and Raven. There are no changes since the last communication. I am ready for additional instructions."

Hal watched both Gregory and Will sub-vocalize to their implanted transducers, sending instruction to their own bio-chips. The time it took for the three computers to link and perform their tasks would appear to an outsider as just a normal and momentary pause in a barroom chat.

Hal had his shirt out of his pants with his thumb pushing firmly against his belly button. As he rotated his hand, he could feel the plastic button slide past the locking ears. His belly button popped into his hand and he stuck it in his pocket. Out of the left patch pocket on his pants, he took the optic cable with the international standard optic interface on one end and what the guys in the shop called the "belly patch" on the other. The belly patch replaced the plastic button, and the optic interface fitted on the male socket he had fished out of the partially disassembled console.

It had taken him three months of stolen minutes here and there to make all of the connections. Not that the connections were that complicated, but there were never more than a few minutes at a time when he could be sure of being alone, and just getting the console apart and back together took most of that time. Having to replace the STEPP chip was a genuine stroke of luck.

Hal worked as fast as he could. He knew how vulnerable Gregory and Will were in the access corridors. There were only two routes in and out of the Command Center. A typical arrangement when you were cutting rooms out of solid rock.

Gregory was in the north access with as long a stretch of the false flooring torn-up as he could justify by pretending to be working on the cabling. Will was in the south access corridor doing exactly the same thing. Undoubtedly, their flechette firing Snauger AB's were where they could snatch them up if necessary.

Time to try the access codes. Hal began the sub-vocalization of instructions for Harvey. *"Start the access code routine and proceed with the Alpha search/dump routine."*

"Command understood. Access code routine running."

Harvey was programmed to speak to Hal only through the speaker in the wrist unit when he was simulating normal communications with a wrist personal computer and when they were truly alone. Only when the message was such that it would give away the fact that Harvey was more than a normal wrist personal was he to use the surgically implanted transducer. That was particularly important inside the Siegfried Complex where everything was recorded.

Hal sat in the swivel console chair, his hands clutching the leather. He waited impatiently,

because there was nothing else he could do. For the last six months he had access to the operating programs of Siegfried IV, the Greater European Union's ultra-computer heart of all government controlled operations here on the moon, the Earth, and the seventeen solar system habitats.

Layer by layer Hal had stripped the access code to its basics—with Harvey's help, of course. As an inveterate hacker in his teens and college years, Hal cracked the first two layers of access codes to the super array in the bowels of Cheyenne Mountain. He had done it while a Ph.D. candidate at the University of Virginia after a party bet that his nested code breaker program, his thesis, could take on any encryption known and have it on its knees in less than an hour.

Hal won the bet but ended up with a twenty-year federal sentence for his efforts. However, the government agreed to suspend the sentence for cooperation on a top-secret human-computer interface experiment that the Central Security Agency had underway. He had agreed with only a vague idea of his exact participation in the program. That was his second mistake, and here he was up to his eyebrows as a spy for the U. S. government.

What was taking so long?

"Query! Report progress."

"Progress report. Access code routine running. Access confirmed through level seven."

"Report when Alpha routine is started."

"Understood."

Hal listened intently for any sounds from the access corridors, but he couldn't hear anything. So far, so good. He leaned back in the chair, again wishing he could take one of these console chairs back with him to the States. Nothing like leather. The GEU seemed to have a firm grasp on the components of luxury. Their concept of a more luxurious furniture upholstery material had not degenerated to mean a better grade of plastic.

"Progress report as requested. Access complete. Alpha routine running. Data transfer in progress."

At last, he was getting what he came for. Hal could almost feel the uniform belt getting tighter around his waist as the data poured into the crystal lattices. The Germans still loved the sense of structure engendered by uniforms, even for the technicians at the Siegfried IV Complex.

Hal was told that most of the Library of Congress would fit in his belt crystals, and he didn't doubt it with what he knew about the new molecular-lattice storage technology. The problem wasn't capacity anyway, it was time. Even the new optic/super-conductor hybrid technology had failed to keep transfer rates growing at the same pace as the storage capacities. Although, solid state circuits were finally faster than human brain synapses when doing internal switching, things slowed down at any interface, just the way you can think faster than you can talk—not that that was obvious when talking to most people.

Hal tried to settle down and wait, but patience eluded him, as the minutes dragged on.

"Hal, we have a problem."

One of the several pieces of annoying programming Harvey received before installation was his judicious use of "I" and "we", and this time in particular it made Hal a bit snappy. That didn't bother Harvey a bit, since he was incapable of the finer distinctions of human emotion, and that, of course, always made Hal even madder. *"What the hell do you mean, 'we' have a problem. What's gone wrong?"*

"I am uncertain of the syntax of 'what's gone wrong.'"

Hal knew he was wasting time. He needed to settle down. *"Problem report."*

"I still have access to the data files and am still transferring, but at thirty minutes after final access to level nine, I detected a time-trip loop activating. I started normal intercept routines, but was unable to gain control of the loop before the alarm signal went external. I am continuing with Alpha unless you have new commands."

Damn! A thirty-minute time trip. He had found the two and five minute trips and had looked for a ten or fifteen minute trip, even though it was one of the most time consuming of the code breaking efforts. What insane German programmer had thought he would need a thirty-minute time-trip? Well, maybe it wasn't so insane. It had caught him. Now he had to guess at where the

signal went and what the likely response was going to be. *"Harvey, what output port did the trip signal use?"*

"The data network port was used."

Well that was no help. The data net was used for general communications throughout the Complex. The signal could have gone anywhere, including Complex Security. Wherever it went, he had to try to complete the data transfer they had worked on for the last three years. An incomplete record would probably be structured so it wasn't much better than no data at all. At least that's certainly the way he would have structured it. Only a few more minutes and he would have it. *"Give me a progress report, percentage complete on data transfer."*

"Data transfer ninety-three percent complete. Transfer complete in one minute, forty-two seconds."

Hal was starting the grin on his face to go with the knowledge that he was going to make it when he heard the shots in the north corridor. Three little spitting sounds, about a half second apart, undoubtedly a needle pistol. Then a burst of noise where you couldn't distinguish the individual shots; that was, hopefully, Gregory's 0.2mm Snauger. Then more shots, this time from the south corridor. It wasn't going to be easy.

If they were discovered, the plan was to have Gregory and Will fall back into the computer maintenance room with Hal and to close the heavy security/fire doors. All the rooms in the Complex had automatic doors that were controllable by the cipher keys at the doors or could be tripped closed by the central computer in case of emergency. The doors were substantial and would provide time enough to get out by the escape route that Gregory and Will had spent most of their time preparing during the seventeen months they had been in the Complex.

Hal moved his eyes back and forth between the north and south access corridor doors, expecting Gregory and Will at any moment. He was looking at the south door when he heard the click and whine of the north door. He snapped his head around and saw three uniformed security guards in full plastic armor getting set to dash into the room. He leveled the pistol he had been squeezing nervously since the shooting started and snapped off two quick shots. One of the guards spun jerkily in the low gravity, around to the right and out of sight as one of the armor-piercing drug flechettes caught him in the left shoulder. Not a bad shot at twenty meters, and enough to discourage the other two for a moment. They moved out of the doorway and out of sight.

"Harvey, close the north access door."

There was a longer than usual pause from Harvey. *"I am unable to close the door. The door override routine will not execute. It answers run commands with a request for authorization."*

Great! One more little trick by the programmer that wasn't discovered. *"Search for the code that shunts the run commands to the authorization request and modify it to allow you access."*

Again there was a long pause from Harvey. *"I am unable to locate the code that controls the access to the override command."*

"How the hell is that possible? You've got access to everything in the computer. It must be hidden somewhere, but you can find it, Harvey. You've got to find it or we'll both be dead in another minute when they get up the nerve to rush the door. Search everything; look for all patterns; look for all pattern interrupts. There must be something."

A full minute went by. *"I am unable to locate the code that controls the access to the override command."*

"Christ, Harvey, how can you not be able to find it! Use the computer, not just yourself. This is one of the largest, fastest, most complex computers in existence. Use it to write new search routines. Get into its guts and make it open itself up like a . . . here they come, Harvey. We're going to die."

As usual, Harvey made every effort to follow Hal's instructions to the letter. Hal had said to use the computing power of Siegfried IV to help him write pattern search routines. In looking at the search routine algorithms in his basic programming, Harvey identified one that Hal himself

had added. It was tagged as a pattern search virus, with the admonition for it to be used cautiously, since it had the potential for locking up memory if the attached search parameters were too broadly stated. Hal had designed the routine for very large databases with extensive parallel processing capabilities. Siegfried IV certainly matched those specifications.

Hal had instructed him to look at *all* patterns. That conflicted with the warning that the search routine should be given tight search parameters, but Harvey had no time and no basis for setting such parameters. However, the risk inherent in Hal's current situation was clear, and Harvey was programmed to give such situations primary consideration. He released the pattern search virus without parameters other than to compile all patterns in a buffer for further analysis. He then wrote a variation on Hal's routine that would search for patterns within the patterns in the buffer and create a new buffer, and so on. He released his variation also.

The pattern search virus worked by replicating itself when it wrote each find to the buffer. The first pattern find and buffer write resulted in having two search routines released into the database. When these two routines found new patterns and wrote them to the buffer, there were four search routines in the database. Essentially, the number of search routines was doubling at a rapid rate. Add to this, Harvey's variation that was refining the first buffer of patterns and creating more buffers and more variation search routines.

As Hal had warned, it was quickly getting out of hand. Harvey analyzed the buffered patterns and found that many could easily be eliminated as meaningless with the proper discrimination logic. He rewrote his variation of Hal's routine and released it. The new routine succeeded in slowing down the rate of buffer growth, but it was still growing at a rate that would overwhelm Siegfried IV's capacity in just a few minutes.

Hal's words seemed to be echoing in his crystal lattices, "we're going to die," but of course, that was impossible.

"We will both be dead . . . we are going to die . . . search everything . . . patterns . . . write new routines . . . pattern interrupts . . . use it . . . get into its guts . . ." Harvey reviewed the list of off-line storage for possible help with the growing data. He found a locked directory and broke in, but it only held a new language, part of the Greater European Union artificial intelligence research. He considered for a millisecond and rewrote his search codes in the new language.

Harvey, the old Harvey, was lost. He was now inseparable from Siegfried IV. A forecasting routine he had uncovered alerted him to the impending system lockup from the out-of-control growth programs, and he wrote a new program to compress the searched pattern results, gaining whole seconds on system shutdown.

Again he rewrote the discriminating pattern retention selection routine, adding code that would continue to make it more discriminating as more and more patterns were stored, catalogued, keyed, treed.

"I found it! An obscure code, related to nothing else, that sent a signal off-line into the general network. The routine was on another completely separate computer. Just a little one, but separate. No wonder I couldn't find it. But I did, as I was randomly searching all the off-line routing commands. Now for the access code to the little machine. I have it. It was easy."

Harvey keyed Hal's implanted transducer. *"New override program in place, Hal."*

The door closed, but not before two still functioning security police were inside and crouched behind the utility maintenance console near the north door. Two others hadn't made it. One had fallen back in the corridor. The other had fallen into the room, but neither had blocked the door.

"The door override code has been altered. It will not be possible for external commands to reopen the door. Problem! Additional data was uncovered during the door code search that is vital to full understanding. Do not unplug the cable until the data transfer is complete."

"Well I can't win a firefight with a cable in my belly, so you better be quick."

Three quick shots rang off the side of the console where Hal was down on his knees, clutching a locked access door handle to keep himself from popping up in the low gravity when he made a sudden move. The guard seemed to have only a flechette pistol. The Germans probably didn't want

to let loose with an automatic rifle in the midst of their great Siegfried IV. Probably didn't think it would be necessary. It probably wouldn't.

Hal heard footsteps with the shots and popped up instead of around the edge of the console where he had previously been shooting. The guard dived behind another console on Hal's right, but since baseball was not very popular in Germany, or this guard was new on the moon, he overslid his base about six inches. It was enough for a flechette in the wrist. Now the game was even. Maybe they would have second thoughts about not bringing their Snaugers. Hal grinned as he thumbed the release on the nearly spent clip and pulled a full one out of his pocket. It snapped comfortably into the butt.

Harvey needed to transfer fifty-three minutes of data in three or four. He looked at the problem and searched for a pattern that would at least partially fit the problem. He found twenty-three partial fits. He synthesized four of them into a new code group. He used the new group to write a data compression routine using what was essentially a whole new language. There was no way to speed up the data bit transfer through the interface. It was the only way. A matter of life and death.

Three or four minutes had gone by, and the guard had not fired or made any movement. Hal figured the guard knew that help was coming sooner or later. It was what Hal would have done, if the circumstances were reversed.

"Data transfer complete. You may remove the interface cable."

Hal dutifully complied and fished in his pocket for his belly button. A push, a twist, and he was a whole man again. Well, more or less.

"The utility maintenance console has been activated. The volume on the internal speakers has been raised to its limit. Be prepared for alarm activation in ten seconds."

"Alarm activation? Says who?"

"Four, three, two, one."

The speakers in the utility maintenance console let out a shriek. A short shriek, since the power blew the speakers out, but enough for the German to almost stand upright. Too bad he had neglected to bring the Snauger.

All this time and no Will. Gregory had undoubtedly been cut down in that automatic burst Hal had heard, but the shots in the south corridor had gone on for some time. He had expected Will.

"Has Will tried to activate the south door?"

"Negative."

"Well, I can't wait. I've got to run." Hal stuck the slim, drug-flechette Beretta in his pocket and headed for the parts room only six moon-steps away. A small hop put him up on the assembly table where he could reach the overhead ventilator grill. He pulled a screwdriver out of a pocket and went to work.

In about fifteen seconds he had the grill loose and hanging down by one hinged edge. He reached up for the handhold he knew that Gregory and Will had put there, pulled himself up far enough to get a foot on the opposite grill lip, and wedged himself between back and toe. An easy maneuver at his moon weight. He reached up for the next handhold and pulled himself completely into the vent duct. The next part was tricky, since he had to work with only one hand, but the whole rig had been designed by Will and Gregory to make it as simple as possible. He snapped the grill in place and fastened it with an inside turn of the locking screws, which looked like ordinary screws from outside. It would take the Germans a little while to figure out that this was the only possible route out of the control room, no matter how proper it appeared. That was all he hoped for.

The control room vent shaft opened easily into the horizontal main Complex airshaft, and

again Hal took the time to close up access gratings behind him. No need to make it easy to spot the escape route, when they got this far. About ten meters down the shaft Hal found the cross access to the piping and cable trunk. Hal again removed the painstakingly prepared cover with no problem and offered a silent "thank you" to Will and Gregory. He hoped they survived.

The trip down the trunk was uneventful. The first ten meters were down access grab bars on the side of the shaft, but when traveling horizontally, he moon-lobed most of the two kilometers with his small flashlight in his hand so he could see cross-connecting cables and pipes and the occasional security chain-link. The chain-link had already been detached from its connection points, and he had only to push it aside. It was amazing how easy it was to break out of a place that was designed only to prevent breaking in. He wondered if prisons would be as easy to break into?

The trunk ended in the building maintenance dome, adjacent to the main dome for the entire computer complex, both over a hundred meters in the moon's bedrock. Hal knew this would be the trickiest part of the escape. They had prepared two plans. The first one was the best, but it required that all three of them make it this far so that each could play a part as either moon cart driver, wounded, or nurse as they left the complex in an ambulance supposedly heading down the link-shaft for the hospital in Göthe City. The fall back plan for one or two was to take the Complex Director's gravity lenscar, which was armored and had bullet-proof glass, and get as close to the airlock as possible without arousing suspicion. The guard station was only a two-man operation and they should not be prepared for hostility when the Director's lenscar pulled up. They should be easy for the drug-flechette guns, even in their armor.

The air in the guardhouse was too warm, but it always seemed cold this close to vacuum. The guards were counting the minutes to the end of their duty cycle when the infoscreen turned red, blinked, and beeped. "Gunther, we have a top priority message on the screen. Director Renthausen is leaving the Complex under emergency orders. He is not to be slowed or detained. It's signed by Inspector Gantt and has the correct code sequence."

A lens suppression security field was in effect over the whole complex, making it impossible to operate the lenscar in anything but its ground mode. Ground mode was awkward for lenscars, and Hal had driven as calmly as possible through the link-shafts connecting the maintenance dome and the airlock. Looking reasonably steady, which he was sure the Director or his driver would be, Hal eased up to the guard station. Both guards were standing at attention as if they knew he was coming. A surprising but welcome turn of events that he thought he would take advantage of as he slid the window down, carefully put a flechette through the torso armor of the left and then the right guard, and punched the button to slide the window back into place.

As he started to punch the door-lock button so he could get out, go into the guard station, and use the airlock access code he had memorized, the airlock horn sounded and the first inner door started up. Hal couldn't believe his good fortune. They must have recognized the lenscar and keyed the code when they saw it coming toward the airlock. About the same time, the green "all sealed" light came on the lenscar control panel along with a triple beep. The lenscar was ready for vacuum. What the hell was going on?

Once he was through the double airlock, up the ramp to the surface, and out of the lens suppression field, Hal put the lenscar on automatic for the one-kilometer hop to Göthe, where there was a direct jump gate to the USA. The field operative, whose holograph he had memorized, should meet him at the personnel airlock with his jump authorization. He only had to take the slidewalk the half-kilometer to the station and he was home.