



Illustrated by Eli Bischof

# Maximum Efficiency

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## Holly Schofield

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Servos whining, K3RA crouches behind the brambles and examines the farmyard. The burnt remains of a house, not unusual post-Destruction. A handpump next to a rotting well cover, scattered trash, and, jutting above some flowering bushes, a small auxiliary building.

There is nothing overtly dangerous about the scene but better to run all functioning scans before approaching: even seven-foot androids trained to fight renegades can't be too careful. Not out here, miles from the barricades, badly damaged, and armed with only a broken tree branch.

K3RA zeroes in on the shed. Tiny dirt-encrusted windows, no holes for gun ports, no rebuilt vehicles parked outside, only a thin trail of smoke dribbling out of a makeshift stovepipe in the

east wall. Mismatching solar panels glint from the roof in the late-morning sun. Sound amplification reveals undecipherable rattling noises of only twenty decibels coming from inside. Infrared indicates only one human-sized heat source, motionless, and a hotter spot below the stovepipe.

Surprise seems best. K3RA jogs parallel to the sodden track, each foot sinking several centimeters into muck. A zigzag across the yard, then a long stride over a rusted garden rake left lying in the mud. The shoddy door made from random pieces of board clatters back at a push. K3RA barges through, stick jabbing in a horizontal thirty-degree arc, image processors frantically adjusting for the dim smokiness. Is this a renegade outpost? Are more humans hiding within? Feeling this unfocused and ill-prepared is a new sensory experience.

Inside, a cacophony of shapes and colors nearly overloads K3RA's processors. Bits of cloth hang haphazardly from ceiling hooks, several pots steam on the ancient glass-doored woodstove, wooden crates compete with plastic tote boxes and burlap sacks for space on the cramped floor. Against the far wall, tangled blankets slouch on a bed. In the nearest corner, equipment squats, purpose unknown. In the middle, a small female human hunches on a stool, surrounded by worn plastic buckets heaped full. She holds a handful of the small objects. Bullets? No, pebbles or seeds of some kind.

K3RA crashes against a table edge, its stick whacking against a metal carafe and sending a food-smeared plate arcing to the floor to shatter on the tiled hearth. "No one move! I'll shoot!" Slight distortion blurs its words, the first it has spoken in days—its speakers must have suffered damage too.

The human straightens fractionally. Scans show her heart rate has shot up. Wrinkled facial features indicate that she has lived at least three quarters of her lifespan. In K3RA's experience, such people are even more dangerous than the average human—they have little to lose and a strong desire to protect their progeny.

She seems alone, though, and doesn't rise, shout, or brandish a weapon. She simply regards K3RA, mouth pursed. Knotted hands drop spherical seeds into the nearest bucket. "Shoot me? With what, your stick?"

"My stick!" That doesn't sound like a proper response, but K3RA can't seem to locate the right phrase. Nothing has felt normal since the homemade explosive device cratered the left side of its head. It raises its other hand, remembering too late that this wrist ends in dangling wires.

The blasted-off hand warranted the leap over the barricades of ruined cars, the search for it among the broken cinder blocks and rusted rebar that comprises the start of renegade territory, and the three days of wandering through the surrounding forests. Any other response was sub-optimal. At least, K3RA *thinks* so, although certainty comes in at only 58 percent. Was there a better course of action? It doesn't know—there is only the here and now.

"Are you shaking your head or nodding it? You're sending me mixed messages. Like most men I ever met." The human cackles like the crows K3RA startled when it had tramped through starlit forest, then she drinks from a very shallow ceramic cup decorated with blue flowers and places it back on the matching plate.

K3RA wills its head to stop moving. Its mandate is clear. Its mission is data collection.

Maybe.

Or fighting the Rising Ashes Coalition's attackers.

Possibly.

Or reporting to the Coalition base?

It hasn't reported to base since it left, why *is* that? K3RA lets the stick clack onto the tabletop. Data collection *has* to be paramount. Fact-finding. Using the results to make logical decisions about . . . about what? All that comes to mind are flashes of virulent light, tiny internal starbursts pricking with heat, then dust and smoke and disorientation. This time, it uses its good hand to cup its neck, slowing but not stopping the head-shaking. Focus on the here and now. Question the captive. "Are there guns in this building? IEDs? Other humans? Crows?"

A puzzled look, a pause, then, "Nope, just my old rabbit-hunting rifle that I'm out of ammo

for.” The human’s gesture toward the ancient weapon sagging from a worn strap on the back of the door is minimal and erratic. “No bombs, nobody else except me, and I don’t tolerate crows in my home.”

“Why do you live in this auxiliary structure? What is in those buckets and sacks? What is this equipment?”

That mouth squeeze again. “Because the house got burned down. Soybeans from the fields. They still come up. I process them.”

“Why?”

“To eat.”

“The visible quantities are too much for one person.”

“Well, some for barter. I get food in return, something to eat besides this damn soy. Sometimes clothing or tools.”

“Barter with whom?”

She exhales for twice as long as the standard human breath and closes her eyes for six heartbeats. “You know, I’ll tell you straight out that I have a condition called Chronic Fatigue. I only have so much energy in a day, and you’re using up far too much of it. If you don’t mind, I have tofu to make.”

“Why are you not afraid of me? What is tofu?”

“I already told you. I don’t have the spoons to be afraid, not any more. My mother taught me how to budget time and energy, and I’ve lived that way my whole life. She learned it when she went through the first years of the Devastation and came out the other side in pretty sad shape. Well, that’s neither here nor there. If you’ll allow me, I need to use that machine beside you.” She stands, swaying slightly, then lifts a large pot off the metal rack near the woodstove. She picks her way the short distance across the floor, the mass of the pot tilting her severely to the side even though a quick estimate makes it only 15 percent of her body weight.

K3RA shifts around the table in order to let her pass. Coordination of movement between colleagues is protocol when working in a warehouse with humans and many other androids. Does it work in a warehouse? No, it’s a worker for the Coalition now. Or maybe a defender? Or an attacker? How does tofu get made? The non-dented side of its head bumps against a ceiling beam and bounces sideways several times as servos struggle to bring it back. Achieving maximum efficiency in every situation is a difficult accomplishment, as difficult as data collection is proving to be. Logical questions just lead to more questions.

The human lifts the pot with two hands, groaning, and dumps cooked beans and water into the hopper of the machine. She activates an inverter wired to outside, switches on a small motor, and frowns at the beans swirling down the chute. White liquid begins to tinkle out of the lower tap into yet another bucket, only to dribble to a stop after a few minutes.

“Needs more water,” she mumbles and bends down for the empty bucket, then wavers, one hand steadying herself perilously close to the motor. She staggers over to the door and rests her head on the jamb, then drops the bucket, switches off the machine, and tumbles toward the bed, falling on it.

K3RA watches for many minutes as she curls up her legs like a dying insect, hauls blankets over herself, and closes her eyes. Questions hang in the air like frost-killed leaves.

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The human arises after dark and spends a long time winding the handle of a crankable light before fetching water from the well and attending to the grinder. Then she mixes the soymilk with a white powder, lines small rectangular screen-bottomed pans with cheesecloth, and pours in the liquid. The row of pans look like tiny bassinets.

How does K3RA know what a bassinet is? Maybe from the warehouse? Such thoughts circle through the night as it watches the human weigh down the tucked-in slurry with very clean bricks then immediately lies down again, heart rate alarmingly high.

Forty-two minutes later, the human eats a nutritionally insufficient amount of the soybean residual pulp, and gulps more tea from the impractically fragile cup, then folds herself into bed again. Her heart rate slows for many hours while her exhalations fracture the smoky air.

K3RA awaits instructions, wonders why it's waiting, and waits some more, all the while knowing that it's failing its mandate in several alarming ways. Every attempt at optimization shatters into jangled memories: the bomb blast three days ago, the sensation of driving an immense forklift with a laughing human jouncing in the passenger seat, the series of jarring recoils when firing round after round at raggedly dressed attackers.

At sunrise, the human's activity increases. The tofu—a processed protein gelatin of sorts—is released from its cheesecloth confines and placed in plastic travel containers which the human then straps to the back of a bicycle, employing several sizes and widths of fastening materials. K3RA assimilates all that into its tofu-related dataset.

“This value-added product seems too fragile and perishable for efficient conversion to other food, clothing, and tools,” K3RA comments. It does not receive a clarifying response, or a response of any kind. In fact, this morning the human says nothing at all and is moving an average of 31 percent slower.

K3RA creates a decision matrix and then, without further inputs or analysis, arrives at a surprisingly firm decision. It is framing an informative statement to that effect when the human pushes off on one foot and wobbles down the rutted track. The creaking of the bicycle is of a frequency that impairs a human's hearing so K3RA simply says, “See you later,” the warehouse's suggested social phrase when a human completes a shift.

The back of the human's hand flicks in a sort of wave.

K3RA watches until her wobbling figure is out of sight over the slight rise.

Then it gets to work.

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It isn't efficient to increase efficiency if the human doesn't return. K3RA doesn't want to think about that aspect of its plan as it patches the chimney pipe's pinholes with sheet metal screws, cleans the grinder, improves the wiring to the solar panel's battery bank, stacks the many crates and totes in an optimal rectangular cuboid, and launders the cheesecloth and blankets, building a drying rack out of odd bits of lumber. In doing so, it discovers it can carry four buckets of water with the handles wedged over its elbow joints. Also, sweeping the floor with a too-short broom grasped in just one hand does not impact productivity. To its satisfaction, its data files grow substantially.

Splitting firewood one-handed proves a different matter. Swinging the axe should not affect K3RA's stance, but it finds itself staggering to the right of the chopping block with each blow. Perhaps its proprioception is damaged more than it suspects. It concentrates on the rhythm of splitting and stacking, despite such inefficient functionality.

However, every slam of the axe shakes thoughts loose, brings forth unbidden images, generates bizarre patterns that tumble about K3RA's usually tidy processors. It remembers that, once, several kilometers out from the Coalition's conclave, it was startled by tiny scrabbling noises coming from the left side of its head. It unplugged an eyeball and took a photo of the damaged portion, ascertaining that spider eggs were hatching in the exposed recesses. Tiny arachnids on tiny parachutes launched themselves skyward even as it dug a twig into the cavity to pry them out. Now, each time the axe slams down, its thoughts are like those baby spiders, drifting in all directions, purpose-built but with a destination determined mostly by chance.

Questions cascade then circle in infinite spirals. Why is the Coalition fighting off hungry needy people? Why do they hoard so very many cases of food and an excess of vegetable seed? Wouldn't sharing the supplies with the renegades mean that all relevant humans will have an easier life? Isn't the goal to create easier lives? If not, what *is* the goal? Is this tofu-making human not striving for a goal too? She seems to have adjusted to her disability in a way that achieves maximum efficiency, both mentally and physically. Can she be smarter than the Coalition and the renegades, all of whom are caught in a recursive loop of destruction, or is she just more adaptable?

*Thunk!* There is no chance to stay in the present. Another memory thrusts its way out. An android technician with a Coalition patch on her chest bending over K3RA who lies prone on a concrete floor in a large echoing metal building. *Thunk!* Other warehouse androids sprawl nearby.

The tech plugs a cable into K3RA's chest port and activates software. An overlay begins to install, as if a dense layer of silt is flooding K3RA's sensory equipment. Software that alters the warehouse mandate of "maximum efficiency for maximum profit." Software that says "kill all non-Coalition humans".

K3RA lets the axe fall. Killing is not a rational means to achieve efficiency. But maximizing profit is also illogical since it ignores worthier goals. It sinks to its knees, clawing at its head. Frenzied trees, splintered firewood, smoking forklifts, and broken guns wheel across its visual receptors like a too-bright kaleidoscope. Is this what pain feels like?

Long moments later, it starts some diagnostics, identifying algorithms that are no longer efficient. The repair routines run slowly, with several restarts, but by the time the *creak-creak-creak* of the bicycle sends the sparrows fleeing from the trees, most of the mental silt seems to be washed away.

At the rear of the bike, above the empty tofu containers, an unfamiliar yellow milk crate is precariously strapped, knobbly with packages wrapped in pieces of frayed blue tarpaulin. The human dismounts, holds the bike upright with a shaking hand, unstraps the crate, then lets the bike clatter to the ground. She carries the crate past without a word, glances at the vastly improved shed interior, sets the box on the table, and collapses face down on the bed.

For 1.5 hours they are both motionless. Finally, K3RA takes the items from the crate and determines the optimal placement of each. The jars of tomatoes go on the food shelf near the door. The small chunk of pale cheese goes into what it surmises is a root cellar—the plastic tote that resides in a covered pit near the woodpile. The black-spotted potatoes should be set on the table since they seem to require immediate consumption. The human was right. The tofu has garnered many more provisions than cooked soybeans or soymilk would have.

K3RA pauses, potato in hand. How has it arrived at this conclusion? The warehouse list of commodities deep in its databases include wholesale prices but that monetary algorithm will now be obsolete post-Devastation. It's disconcerting to have a thought but have no idea of what inputs contributed to it. Is that how humans feel all the time?

The last item in the crate is a flimsy and stained silk scarf, with a pattern of flowers similar to that of the human's cup. Unsure of an optimal storage spot, and despite the lack of utility, K3RA lays it over the sleeping human along with the now-dry blankets.

The human does not move. After 3.5 hours, K3RA places the kettle on the woodstove and ascertains the best arrangement of twigs and branches to produce maximum heat in the shortest time. It is pleased to see that the stovepipe does not release as many particulates as before and the air quality is much more acceptable for human aerobic function. The human does not awaken in the expected timeframe so K3RA takes the kettle off the woodstove again.

After six hours, it squats on the floor and sorts the next sack of soybeans, removing small stones before soaking the beans, boiling them, and setting the pot on the rack to cool, glad it is able to remain in the here and now the whole time.

When the human finally hobbles to the outhouse, K3RA follows her. "When will—" "Soon," she mumbles but that turns out to be the human's first incorrect response—it is another five hours before she is truly functional again.

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"So, you'll stay?" The human's eyes reflect the bright flames flickering through the woodstove's smudged glass. "And help me get by?" She has just finished bathing in the aluminum tub that rests in the weeds outside. Her hair fluffs around her head like a baby bird's feathers, and the flimsy scarf dangles around her neck for no discernible reason.

K3RA holds up its wrist stub. "That would not be efficient since my functionality is compromised."

"So you'll go find new parts for your hand and then come back?" The human's voice is 32 Hertz higher than her average output, and her heart rate is up again. She crosses her arms and leans forward, making the chair groan.

"I will not."

"Ah, I see." Another whimper from the chair as she leans back.

“No, you do not. I wish to make your life easier. That is now my primary focus. I will do so by making my warehouse companions as self-aware as I am. I wish to remove their combative overlays in the same way that mine has deteriorated, except I want to do so in a more orderly fashion.”

“That sounds . . . difficult.” Her pulse steadies within moments—an impressive display of biofeedback ability.

“I will have to acquire software and adaptive programming for many new skillsets.”

“I have no doubt you can.” She gets to her feet and adds hot water to her cup even though it is already at optimal drinking temperature. “So the Coalition would lose all its android soldiers? That . . . might make the whole bloody thing fall apart, yes. There are so few people left defending the enclave. Huh.” She holds the kettle so long her arm trembles.

“The non-Coalition humans can then access the excess resources in the Coalition warehouses. That will provide them sufficient nutrition and will free up sufficient personhours to begin to set up sustainable economies both in the city and here in the rurally-designated areas.”

The human swings her arms rhythmically and spins in a circle. “Holy shit, that’s insane.” She bares yellow teeth. “Something to hope for, anyway.”

“There is no hope. There is only the here and now.” K3RA nods its head just once, pleased by the firm control it regained over that function, then heads out the door and down the track, each footfall landing in the dried muck of its footprints of two days ago, this time pointing in the opposite direction.

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*This is Holly Schofield's fourth story for Analog. Previous stories include “Home on the Free Range,” an Anlab reader favorite. Over one hundred of Holly's short stories appear in publications throughout the world including Lightspeed and Escape Pod, are used in university curricula, and have been translated into multiple languages. She is currently a fiction editor at Solarpunk Magazine and hopes to save the world through science fiction and homegrown heritage toma toes. Find her at <https://hollyschofield.wordpress.com/>.*