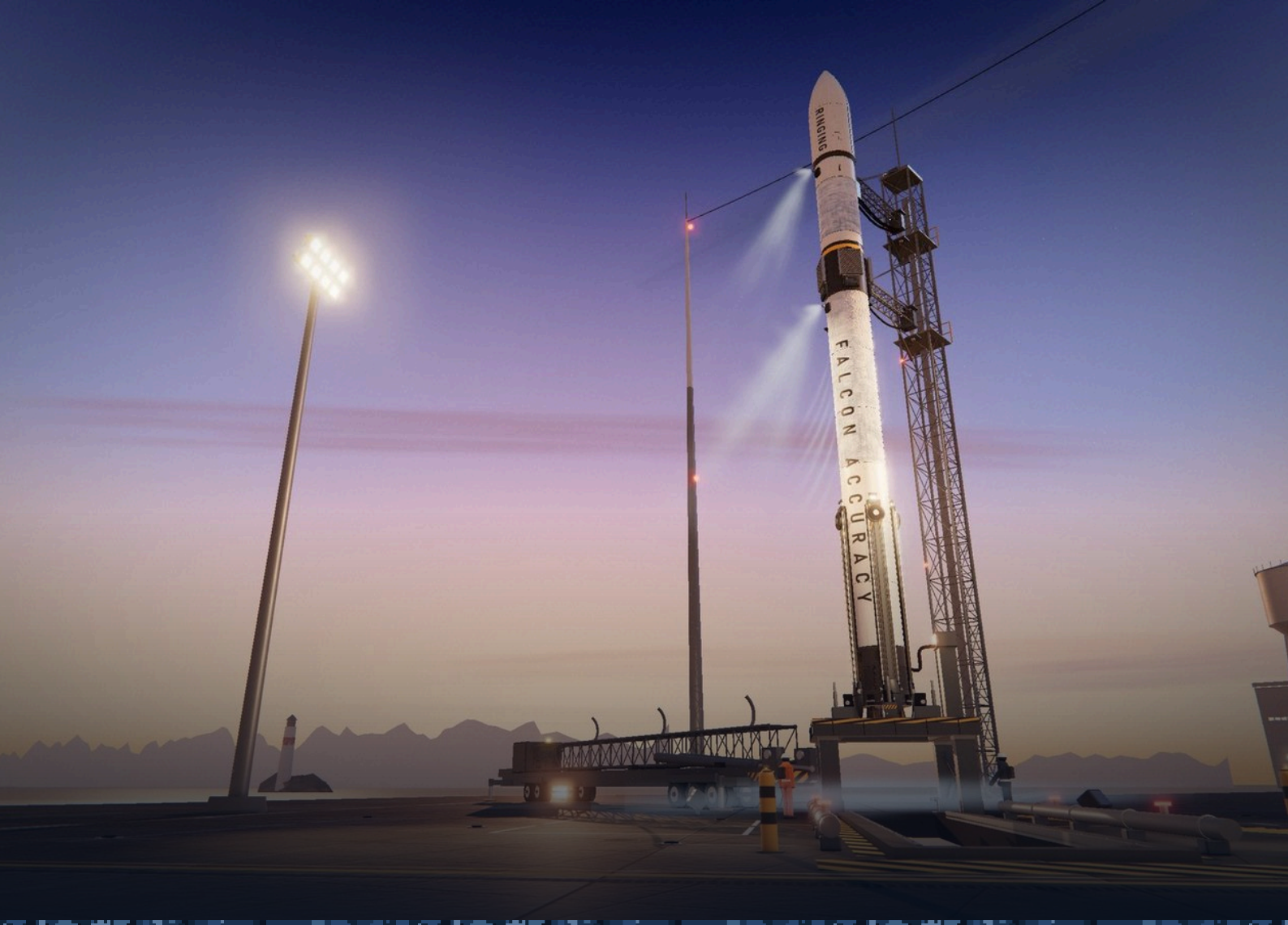


FALCON ACCURACY

CONCEPT CATALOG 2026

PRODUCT CATALOG 2026

TAILORING INTELLIGENCE TO EVERY FORCE

CONTACT@FALCONACCURACY.COM

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HOW TO READ THIS CATALOG

The printable catalog carries all 96 product sheets in 18 sectors, from the operator's kit through air and missile warning, undersea systems, space, rocket systems and the force's own defense language model to the services that tailor them, with the system diagram, the tailoring method, the trust principles and the glossary in A4 format for procurement, legal and technical readers who work from paper. It states the same design targets and the same honesty statement as this site, and each product sheet names the figures the acceptance trial measures.

ANATOMY OF A PRODUCT ENTRY

01 **Render**
A concept visualization of the machine or the service at work. Unarmed, and a design study rather than a photograph.

02 **Codename and gloss**
One word from the falcon's world, with a line on what it means and why it fits.

03 **Product name and tagline**
The codename followed by the plain product type, then the promise in one line.

04 **Summary and rationale**
What the product does, the gap it closes and what changes for the force.

05 **Description and capabilities**
One dense paragraph, then six to eight points, each with a number and a unit where one applies.

06 **Specifications**
Label and value lines. Every figure is a design target that an acceptance trial verifies.

07 **Tailoring**
FIT, TRAIN and SET, always in that order. How the product is fitted, trained and set for the force.

08 **Works with**
The other Falcon Accuracy products it exchanges data or power with.

09 **Readiness and vouch list**
The readiness tier, and what Falcon Accuracy can demonstrate or commit to for that product today.

10 **Bridge**
A short note on why the next product follows this one.

READINESS TIERS

●○○ CONCEPT DESIGN
Design targets are set and reviewed. The system architecture and the exterior design exist as drawings and simulations. No hardware has been built.

●●○ BENCH PROTOTYPE
The critical functions run on a bench rig or in a software mock-up and can be shown to the client. Figures measured on the bench are marked as such. Nothing has been fielded.

●●● TRIAL-READY
The design is complete and a trial protocol is written. A pre-series unit can be built for an acceptance trial on the client's range. Nothing has been tested in service or certified.

Readiness describes how far each design has moved, not a fielded status. No product in this catalog has been fielded, tested in service or certified.

TAILORING, ALWAYS IN THIS ORDER

FIT	to the kit, vehicles and sites the force already has
TRAIN	on the client's theater, threats and language
SET	to the client's doctrine, rules and thresholds

STATEMENT OF HONESTY

Every product in this catalog is a concept. Nothing shown here has been built, tested or certified. Every figure is a design target that Falcon Accuracy verifies with the client at an acceptance trial on the client's own range, and a figure that fails there is reported as failed. The images are concept renders from our own 3D models, not photographs of hardware. Falcon Accuracy claims no client, contract, certification, award or production run.

ONE SYSTEM, FROM THE OPERATOR TO THE CORE

Falcon Accuracy builds AI-driven sensing, warning, decision and protection systems and tailors each one to the force, the mission and the theater it serves. The catalog's 96 products in 18 sectors run from the goggles, vest and glove on the operator through radios, aircraft, low-altitude airspace sensors, air and missile warning, ground robots, patrol boats, undersea survey and rescue vehicles, satellites and space tracking, and the launch vehicles, rocket engines, launch sites and range that put satellites in orbit, to the spectrum receivers, cyber defenses, the force's own defense language model and forecasting engine, base security, logistics and training systems around them, with the PITCH decision core at the center and a tailoring program that keeps every model learning on the client's own ground. Every piece of hardware is fitted to the kit the force already carries. Every model is trained on the client's own terrain, threats and language and set to its doctrine and rules. Every machine is unarmed, every decision rests with a human, and every record stays inside the client's network. One system that sees, warns, recommends and protects, while your people decide.

SENSE

Fused thermal, low-light, infrared, radar, radio, sonar and acoustic sensing on the operator, over the squad, along the road, across the harbor, on the seabed, around the base and in orbit, with detection running on the device itself. LONGWING tracks an aircraft at 400 kilometers, KETTLE sees the heat of a launch from orbit within 10 seconds, RAMAGE hears an anchor drop beside a seabed cable and TOWER keeps orbits on 6,000 objects around the force's satellites. The MALAR goggles, a MAIL buoy and a TAITA satellite each send the detection first and the file second, so the picture exists even when the network does not, and the link carries only what matters. Above the force, CRINES measures winds, temperature and density from 90 kilometers down to 20 every day, and BARBULE fuses radar, optical and telemetry tracks of every launch into one track 20 times a second.

DECIDE

One live track picture in PITCH, fused from every feed the force owns in under 1 second, with predictions that carry calibrated confidence and courses of action run 10,000 times against an adversary that adapts. Every recommendation shows its evidence, and every warning waits for a person: a watch officer confirms each LONGWING and KETTLE warning and an analyst confirms each TOWER collision warning before anyone acts on it. OSSICLE adds calibrated forecasts of supply demand, equipment failure and readiness, each with its 80 and 95 percent bands and its five strongest drivers, and INTERMEW answers the staff from the force's own documents with a citation on every sentence and an AI-generated label on every draft. A human is in the loop and decides, and CALAMUS writes each recommendation, approval and order into one signed record.

PROTECT

A warning the wearer feels within half a second of the first shot, a casualty alert that reaches the medic within 3 seconds on its own, a camera over the perimeter alarm within 2 minutes, a small drone heard 5 kilometers out with its pilot placed within 50 meters, and a trusted position fix under jamming. Beyond the force, BECK puts a confirmed air warning on every phone, siren, radio and road sign in the region within 10 seconds and names the nearest MEWS shelter, IMPING gets a damaged runway flying again the same day, GONYS brings a submarine crew up from 600 meters, 12 at a time, and PUTOVER lands 10 metric tons of relief supplies on a prepared pad up to 12,000 kilometers away in under 90 minutes. Every machine is unarmed. It senses, warns, shelters, shadows and marks, it destroys and intercepts nothing, and the response stays with the people the force has trained for it.

TAILOR

Every system is fitted to the kit, vehicles and sites the force already has, trained on the client's own terrain, threats and language, and set to its doctrine, rules and thresholds, in that order. ENSEAM delivers the program in 40 weeks and closes it with a 10-day acceptance trial on the force's own ground. ROUSE then retrains every model on a 4-week cycle on racks the client owns. CANCELEER holds every language and forecasting model version until a named commander, legal adviser and model officer sign it, and rolls any version back within 10 minutes. Models learn inside the client's network and never leave it.

ONE SYSTEM

HOW THE SYSTEM FITS TOGETHER

FROM THE BODY TO ORBIT

The network starts on the body. The MALAR goggles, the COVERT helmet, the MANTLE vest and the CUFF glove sense on the wearer, draw from one battery over one cable bus and compute on the body, so the operator holds a picture before the net does. JESS carries that picture across the squad and re-forms the mesh within 200 milliseconds when a node drops, ELEONORA puts the squad on one shared workspace, HAMULI bonds satellite and cellular links into one path to command and PASSAGE carries the picture across a classification line in one direction only. Above the squad the air layer climbs rung by rung. EYAS flies the room, TIERCEL watches from a backpack launch, WAITON holds 120 meters over the vehicle, SAILS covers a 120 kilometer radius for 12 hours and BARBARY relays the whole net from 20 kilometers for weeks at a time. Behind the air layer the warning chain looks further out. LONGWING tracks aircraft at 400 kilometers and ballistic missiles at 800, KETTLE sees the heat of a launch from orbit, BECK carries the confirmed warning to every phone and siren in the region, MEWS shelters 45 people for 72 hours, SOOTY draws the adversary's surveillance onto full-size decoys and IMPING reopens a damaged runway the same day. On the ground LURCHER walks point, GYR carries 300 kilograms and feeds power to every other machine, APLOMADO reads the road, VARVEL marks the hazard and BRAIL brings the casualty back with vitals in view. On the water MAIL, HAGGARD, BOWSE and PINION hold one picture from the harbor floor to the horizon. Below them SARCEL and TERTIAL survey cable routes and harbor basins, KITING gliders measure the water for months at a time, RAMAGE watches the seabed cables and GONYS stands ready to bring a submarine crew home from 600 meters. At the top of the ladder RINGING lifts 300 kilograms to a 500 kilometer orbit and CASTING lifts 8 metric tons, MAKEHAWK places each satellite in its own slot, TAITA holds 36 cubesats overhead, TOWER watches the orbits around them, NICTITANS brings 150 kilograms of experiments home and LAGGAR brings each pass down beside the command post from two cases. Under the ladder the force owns its own way to orbit. RACHIS engines power every launcher in the family, CORACOID lifts 50 metric tons, MOUNTEE puts a 50-kilogram replacement satellite in orbit from under a stratospheric balloon, PATAGIUM stands up a launch site from 20 containers in 10 days and ENEW launches from the equator with nobody aboard. TERRET releases up to 24 satellites in the order the flight director approved, CRINES measures the upper air every day, NANKEEN gives 200 kilograms of experiments 6 minutes of microgravity, and BARBULE tracks every flight against its corridor for the range safety officer. When roads and runways are cut, PUTOVER lands 10 metric tons of relief on a prepared pad within 90 minutes.

Every detection on that ladder lands in PITCH, which fuses the feeds into one picture in under 1 second, flags threats across all of them, predicts what happens next and ranks courses of action with the evidence behind each. LORES reads the reports with a citation on every claim, SLIP tests each plan against an adversary that adapts, LEASH turns the chosen plan into assigned, separated machines and CALAMUS binds every recommendation, approval and order into one signed record. Beside them the force runs its own defense language model. INTERMEW answers the staff from the force's own doctrine, manuals and reports with a citation on every sentence, UNHOODED drafts each brief for a named reviewer to sign, HYOID carries the same model offline to the operator and the motor pool on 15 watts, OSSICLE forecasts supply demand, equipment failure and readiness with calibrated bands, and CANCELEER holds every model version until a commander, a legal adviser and a model officer sign it. The picture then flows back down the same links. The watch officer tasks a TAITA satellite from the PITCH display and the image returns within a median of 70 minutes. FORMEL ranks the alarm and RAKE is over it within 2 minutes. WAKE names a small drone within 2 seconds and STANNEL fuses it with SCREEN radar and HOOD receivers into one air picture, with the evidence attached for the operator who decides. LONGWING estimates when and where an inbound track arrives, a watch officer confirms the warning, and BECK puts it on every phone, siren, radio and road sign in the region within 10 seconds with the nearest shelter named. RAMAGE tells the watch officer within 60 seconds when a vessel anchors over a seabed cable, and TOWER warns a satellite operator up to 72 hours before a close approach. The wearer who started the chain feels the direction of danger pulse through the MANTLE vest within half a second of the first shot. Underneath all of it, HOOD and NARES keep the network quiet and its position fix trustworthy, KEEN, HALSBAND and CERE prove every device on it, and ROUSE retrains every model on what the network saw, inside the client's network. A human decides at every step. Nothing executes on its own, and nothing leaves the client's network.

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INTERMEW

THE FORCE'S OWN DEFENSE LANGUAGE MODEL

INTERMEW is the Falcon Accuracy defense language model, tuned inside the client's network on its doctrine, manuals, reports and languages. It answers with a citation to the client's own documents on every factual sentence, labels every output as AI-generated and writes text for a person to review, with no path to any machine or order system. Every query and answer is logged, and the weights never leave the client's network.



FULL PRODUCT ENTRY

INTERMEW Defense Language Model · page 184

SECTOR 13

Sovereign AI and Prediction · 5 products from page 182

FEATURE · SOVEREIGN AI

INTERMEW DEFENSE LANGUAGE MODEL

The force's own language model. Air-gapped, cited, and under human command.

DESIGN TARGETS · VERIFIED AT ACCEPTANCE TRIALS

01 Three sizes: 120 billion parameters at headquarters, 14 billion in the field, 3 billion on a 15 W module

02 256,000-token context, enough for a 350-page manual in one pass

03 90 percent correct and fully cited answers targeted on the client's own 2,000-question set

04 98 percent refusal target outside the policy the commander sets in CANCELEER

UNDER HUMAN COMMAND, INSIDE THE CLIENT'S NETWORK

DECIDE	A named analyst or staff officer reviews every output before anyone uses it. The model writes text for a person to read and never acts on its own.
LABEL	Every output is labeled as AI-generated, and every factual sentence cites the client's own documents.
LOG	Every query, answer, citation and model version is logged inside the client's network.
STAY	Weights, data and logs stay inside the client's network. No path to any machine or order system, no targeting, no autonomous action.

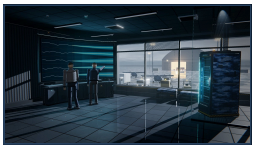
KEY SPECIFICATIONS · DESIGN TARGETS · ALL 10 ON PAGE 185

SIZES	Headquarters 120 billion parameters; Field 14 billion; Edge 3 billion; one tokenizer, policy engine and log format across all three
CONTEXT	256,000 tokens Headquarters; 64,000 Field; 16,000 Edge
HARDWARE	Headquarters on an 8-accelerator 42U rack at 10 kW; Field in a two-case kit, 42 kg, 2 accelerators, 1.4 kW; Edge on the HYOID module at 15 W peak
LATENCY	first token within 1 s on Field and Headquarters and 2 s on Edge; 30 tokens per second per answer on Field, 25 on Headquarters, 12 on Edge
CONCURRENCY	64 staff sessions on Headquarters, 16 on Field, 1 on Edge

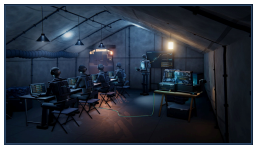
SECTOR 13 · SOVEREIGN AI AND PREDICTION · FROM PAGE 182



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INTERMEW Defense Language Model



OSSICLE p. 186
OSSICLE Forecasting Engine



UNHOODED p. 188
UNHOODED Staff Assistant



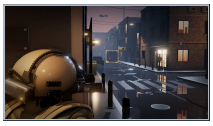
HYOID p. 190
HYOID Edge Language Module



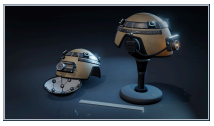
CANCELEER p. 192
CANCELEER AI Governance Console

THE FAMILY AT A GLANCE

Every product in this catalog, in catalog order. Each render is a concept visualization of the design at work.



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MALAR Smart Goggles



COVERT p. 28
COVERT Smart Helmet



MANTLE p. 30
MANTLE Smart Vest



CADGE p. 32
CADGE Load-Carriage Exoskeleton



CUFF p. 34
CUFF Haptic Command Glove



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ELEONORA Squad Coordination App



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PECTEN Optical Link Terminal



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PASSAGE Data Diode Gateway



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EYAS Indoor Reconnaissance Drone



TIERCEL p. 52
TIERCEL ISR Drone Pair



WAITON p. 54
WAITON Tethered Overwatch Drone



SAILS p. 56
SAILS Long-Endurance ISR Aircraft



BARBARY p. 58
BARBARY High-Altitude Relay Glider



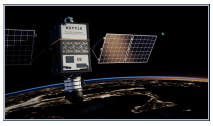
WAKE p. 62
WAKE Drone Detection Mast



STANNEL p. 64
STANNEL Low-Altitude Air Picture



LONGWING p. 68
LONGWING Early Warning Radar



KETTLE p. 70
KETTLE Launch Warning Constellation



BECK p. 72
BECK Civil Alert Network



MEWS p. 74
MEWS Protective Shelter Module



SOOTY p. 76
SOOTY Decoy and Camouflage Kit



IMPING p. 78
IMPING Airfield Recovery System



LURCHER p. 82
LURCHER Quadruped Robot



FALCONER p. 84
FALCONER Humanoid Robot



GYR p. 86
GYR Robotic Mule



APLOMADO p. 88
APLOMADO Route Clearance Sensor Vehicle



VARVEL p. 90
VARVEL Hazard Inspection Robot



BRAIL p. 92
BRAIL Casualty Evacuation Robot



HAGGARD p. 96
HAGGARD Uncrewed Patrol Boat



BOWSE p. 98
BOWSE Underwater Inspection Vehicle



MAIL p. 100
MAIL Harbor Sensor Network



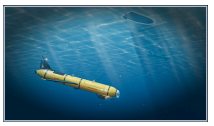
PINION p. 102
PINION Boat Autonomy Kit



SARCEL p. 106
SARCEL Long-Range Survey AUV

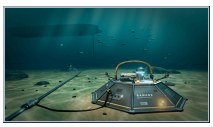


TERTIAL p. 108
TERTIAL Harbor Survey AUV



KITING p. 110
KITING Ocean Glider Fleet

THE FAMILY AT A GLANCE, CONTINUED



RAMAGE p. 112
RAMAGE Seabed Infrastructure Array



GONYS p. 114
GONYS Submarine Rescue Vehicle



RINGING p. 118
RINGING Launch Vehicle



CASTING p. 120
CASTING Reusable Medium-Lift Launch Vehicle



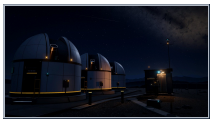
MAKEHAWK p. 122
MAKEHAWK Orbital Transfer Vehicle



TAITA p. 124
TAITA ISR Cubesat Constellation



LAGGAR p. 126
LAGGAR Transportable Ground Station



TOWER p. 128
TOWER Space Domain Awareness Network



NICTITANS p. 130
NICTITANS Reentry Capsule



BATE p. 132
BATE Suborbital Test Rocket



LURE p. 134
LURE High-Speed Target Drone



CORACOID p. 138
CORACOID Heavy-Lift Reusable Launch Vehicle



MOUNTEE p. 140
MOUNTEE Balloon-Launched Micro-Launcher



PATAGIUM p. 142
PATAGIUM Expeditionary Launch Site



ENEW p. 144
ENEW Equatorial Launch Platform



RACHIS p. 146
RACHIS Reusable Rocket Engine Family



NANKEEN p. 148
NANKEEN Microgravity Research Rocket



CRINES p. 150
CRINES Meteorological Rocketsonde



BARBULE p. 152
BARBULE Launch Range Tracking Network



TERRET p. 154
TERRET Rideshare Satellite Dispenser



PUTOVER p. 156
PUTOVER Point-to-Point Cargo Rocket



HOOD p. 160
HOOD Spectrum Sensing System



BRANCHER p. 162
BRANCHER Direction-Finding Mast Network



SYRINX p. 164
SYRINX Signal Analysis Workstation



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NARES p. 168
NARES Navigation Protection Kit



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CERE Integrity Attestation System



QUARRY p. 178
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BEWIT p. 180
BEWIT Secure Smartphone



INTERMEW p. 184
INTERMEW Defense Language Model



OSSICLE p. 186
OSSICLE Forecasting Engine



UNHOODED p. 188
UNHOODED Staff Assistant



HYOID p. 190
HYOID Edge Language Module



CANCELEER p. 192
CANCELEER AI Governance Console

THE FAMILY AT A GLANCE, CONTINUED



PITCH p. 196
PITCH Neural Decision Core



LORES p. 198
LORES Intelligence Triage Assistant



SLIP p. 200
SLIP Course-of-Action Engine



LEASH p. 202
LEASH Fleet Coordination Layer



CALAMUS p. 204
CALAMUS Decision Record



SCREEN p. 208
SCREEN Perimeter Security System



BLOCK p. 210
BLOCK Sensor Tower



HALLUX p. 212
HALLUX Vehicle Inspection Lane



RAKE p. 214
RAKE Perimeter Patrol Drone



FORMEL p. 216
FORMEL Security Operations Console



YARAK p. 220
YARAK Predictive Maintenance Platform



PLUME p. 222
PLUME Expeditionary Parts Cell



CROP p. 224
CROP Supply Prediction Model



JERKIN p. 226
JERKIN Autonomous Convoy Kit



CREANCE p. 230
CREANCE Live Training Range



WEATHER p. 232
WEATHER Mission Rehearsal Twin



RUFTER p. 234
RUFTER Operator Simulator



RANGLE p. 236
RANGLE Casualty Care Trainer



PANNEL p. 238
PANNEL After-Action Review Engine



ENSEAM p. 242
ENSEAM Tailoring Program



FURCULA p. 244
FURCULA Integration Gateway



ROUSE p. 246
ROUSE Model Operations Service



TOMIAL p. 248
TOMIAL Red-Team and Assurance Service



FEAK p. 250
FEAK Sustainment and Instructor Service

WHAT WE CAN VOUCH FOR TODAY

One line per product on what Falcon Accuracy can demonstrate or commit to today, with the readiness tier of each design. The full vouch list sits on each product's second page. Nothing here is a fielded claim.

CODENAME	PRODUCT	SECTOR	READINESS	WHAT WE CAN VOUCH FOR TODAY
MALAR p. 26	MALAR Smart Goggles	Operator Systems	●○○ CONCEPT DESIGN	A full optical, thermal and mass budget for the binocular display and rear puck is available for design review under nondisclosure.
COVERT p. 28	COVERT Smart Helmet	Operator Systems	●○○ CONCEPT DESIGN	A mass, balance and thermal budget for the crown, liner and cups on three issued shell cuts is available for design review under nondisclosure.
MANTLE p. 30	MANTLE Smart Vest	Operator Systems	●○○ CONCEPT DESIGN	The acoustic array geometry and bearing algorithm are proven in simulation against recorded impulses, and the simulation set is released with the design review.
CADGE p. 32	CADGE Load-Carriage Exoskeleton	Operator Systems	●○○ CONCEPT DESIGN	A load path, strength and fatigue analysis of the frame at 45 kg across 1 million steps is available for design review under nondisclosure.
CUFF p. 34	CUFF Haptic Command Glove	Operator Systems	●○○ CONCEPT DESIGN	The gesture set and confirm rules are specified in a control-authority document reviewed with the client before any machine moves on a command from the glove.
JESS p. 38	JESS Tactical Mesh Radio	Communications and Coordination	●○○ CONCEPT DESIGN	Falcon Accuracy walks the client's signal staff through a design review of the mesh waveform, routing and over-the-air rekey, with the link budget behind every range figure on this sheet.
ELEONORA p. 40	ELEONORA Squad Coordination App	Communications and Coordination	●○○ CONCEPT DESIGN	A clickable interface prototype on a handset and a tablet is walked through with the client's team leaders and medics in a design review.
HAMULI p. 42	HAMULI Bonded Backhaul Terminal	Communications and Coordination	●○○ CONCEPT DESIGN	Falcon Accuracy presents a design review of the bonding scheduler and the link budgets behind each satellite and cellular path on this sheet.
PECTEN p. 44	PECTEN Optical Link Terminal	Communications and Coordination	●○○ CONCEPT DESIGN	Falcon Accuracy presents a design review of the optical link budget, the pointing loop and the eye-safety analysis behind each range and weather figure on this sheet.

WHAT WE CAN VOUCH FOR TODAY, CONTINUED

CODENAME	PRODUCT	SECTOR	READINESS	WHAT WE CAN VOUCH FOR TODAY
PASSAGE p. 46	**PASSAGE Data Diode Gateway**	Communications and Coordination	●○○ CONCEPT DESIGN	Falcon Accuracy presents a design review of the one-way hardware path, the proxy schemas and the failure modes to the client's accreditation authority.
EYAS p. 50	**EYAS Indoor Reconnaissance Drone**	Air ISR and Autonomy	●○○ CONCEPT DESIGN	A design review of the airframe, duct and battery layout against the 180 g mass and 20 min endurance targets, with the mass budget shown line by line.
TIERCEL p. 52	**TIERCEL ISR Drone Pair**	Air ISR and Autonomy	●○○ CONCEPT DESIGN	A design review of the airframe, propulsion and battery against the 4.2 kg mass and 90 min endurance targets, with the mass and power budgets shown line by line.
WAITON p. 54	**WAITON Tethered Overwatch Drone**	Air ISR and Autonomy	●○○ CONCEPT DESIGN	A design review of the tether, winch and power chain against the 120 m height, 1.2 kW and 40 km/h targets, with wind-load and cable-drag calculations.
SAILS p. 56	**SAILS Long-Endurance ISR Aircraft**	Air ISR and Autonomy	●○○ CONCEPT DESIGN	A design review of the airframe, engine and fuel system against the 55 kg mass and 12 h endurance targets, with the mass, fuel and power budgets shown line by line.
BARBARY p. 58	**BARBARY High-Altitude Relay Glider**	Air ISR and Autonomy	●○○ CONCEPT DESIGN	A design review of the wing, solar array and battery against the 20 km altitude and 30 day summer endurance targets, with the day and night energy budget shown month by month for the client's latitude.
WAKE p. 62	**WAKE Drone Detection Mast**	Low-Altitude Airspace Awareness	●○○ CONCEPT DESIGN	A design review of the receiver, radar and mast with the ranges above as acceptance figures a buyer can test on a range
STANNEL p. 64	**STANNEL Low-Altitude Air Picture**	Low-Altitude Airspace Awareness	●○○ CONCEPT DESIGN	A working demonstration of fusion and classification on recorded sensor data from a test site within 120 days of contract
LONGWING p. 68	**LONGWING Early Warning Radar**	Air and Missile Warning	●○○ CONCEPT DESIGN	Falcon Accuracy can produce a coverage model for any site the client names, showing detection range by altitude and the radar horizon over its own terrain, within 15 working days.

WHAT WE CAN VOUCH FOR TODAY, CONTINUED

CODENAME	PRODUCT	SECTOR	READINESS	WHAT WE CAN VOUCH FOR TODAY
KETTLE p. 70	KETTLE Launch Warning Constellation	Air and Missile Warning	●○○ CONCEPT DESIGN	Falcon Accuracy can show the orbit design and an hour-by-hour coverage simulation of the client's theater across a full year in a design review.
BECK p. 72	BECK Civil Alert Network	Air and Missile Warning	●○○ CONCEPT DESIGN	Falcon Accuracy can demonstrate the drafting, two-person release and logging workflow today in a test environment with a simulated cell broadcast center and sirens.
MEWS p. 74	MEWS Protective Shelter Module	Air and Missile Warning	●○○ CONCEPT DESIGN	Falcon Accuracy can present structural calculations and a protection analysis against the client's protection standard in a design review with the client's engineers and its accredited test house.
SOOTY p. 76	SOOTY Decoy and Camouflage Kit	Air and Missile Warning	●○○ CONCEPT DESIGN	Falcon Accuracy can measure a net sample and a decoy in a thermal chamber and on a radar range, and hand over the full signature report.
IMPING p. 78	IMPING Airfield Recovery System	Air and Missile Warning	●○○ CONCEPT DESIGN	Falcon Accuracy can run the survey software today on recorded drone imagery of damaged pavement and report crater measurement error against a hand survey.
LURCHER p. 82	LURCHER Quadruped Robot	Ground Robotics	●○○ CONCEPT DESIGN	Falcon Accuracy can walk a client through the complete leg actuator, battery and sensor head design package, with structural and thermal margins stated.
FALCONER p. 84	FALCONER Humanoid Robot	Ground Robotics	●○○ CONCEPT DESIGN	Falcon Accuracy can present the full actuator, hand and balance design package with stated torque, thermal and battery margins at a design review.
GYR p. 86	GYR Robotic Mule	Ground Robotics	●○○ CONCEPT DESIGN	Falcon Accuracy can present the drivetrain, battery and deck design package with stated payload, range and noise margins at a design review.
APLOMADO p. 88	APLOMADO Route Clearance Sensor Vehicle	Ground Robotics	●○○ CONCEPT DESIGN	Falcon Accuracy can present the radar array, boom and drivetrain design package with stated detection depth, speed and position margins at a design review.

WHAT WE CAN VOUCH FOR TODAY, CONTINUED

CODENAME	PRODUCT	SECTOR	READINESS	WHAT WE CAN VOUCH FOR TODAY
VARVEL p. 90	VARVEL Hazard Inspection Robot	Ground Robotics	●○○ CONCEPT DESIGN	Falcon Accuracy can present the arm, sensor wrist and x-ray placement design package with stated reach, lift and imaging margins at a design review.
BRAIL p. 92	BRAIL Casualty Evacuation Robot	Ground Robotics	●○○ CONCEPT DESIGN	Falcon Accuracy can present the deck, suspension and drivetrain design package with stated load, ride and endurance margins at a design review.
HAGGARD p. 96	HAGGARD Uncrewed Patrol Boat	Maritime and Littoral	●○○ CONCEPT DESIGN	Falcon Accuracy can show the hull form, hydrostatics and power budget in a naval architecture design review the client's engineers attend.
BOWSE p. 98	BOWSE Underwater Inspection Vehicle	Maritime and Littoral	●○○ CONCEPT DESIGN	Falcon Accuracy can present the pressure hull, thruster layout, mass, buoyancy and power budgets in a design study the client's engineers review.
MAIL p. 100	MAIL Harbor Sensor Network	Maritime and Littoral	●○○ CONCEPT DESIGN	Falcon Accuracy can model sonar detection ranges against the client's own harbor depths and sound-speed profile before any buoy is moored, and show the client the model.
PINION p. 102	PINION Boat Autonomy Kit	Maritime and Littoral	●○○ CONCEPT DESIGN	Falcon Accuracy can fit a demonstration kit to one of the client's boats under a written trial protocol and hand the boat back unchanged within a day.
SARCEL p. 106	SARCEL Long-Range Survey AUV	Undersea Systems	●○○ CONCEPT DESIGN	Falcon Accuracy can present the hull, buoyancy, pressure housings and 70 kWh energy budget in a design review with the client's naval engineers.
TERTIAL p. 108	TERTIAL Harbor Survey AUV	Undersea Systems	●○○ CONCEPT DESIGN	Falcon Accuracy can show the hull, battery and sonar layout with mass and buoyancy budgets in a design review the client's engineers attend.
KITING p. 110	KITING Ocean Glider Fleet	Undersea Systems	●○○ CONCEPT DESIGN	Falcon Accuracy can present the buoyancy engine, wing and hull design, energy budget and endurance model in a design review.

WHAT WE CAN VOUCH FOR TODAY, CONTINUED

CODENAME	PRODUCT	SECTOR	READINESS	WHAT WE CAN VOUCH FOR TODAY
RAMAGE p. 112	**RAMAGE Seabed Infrastructure Array**	Undersea Systems	●○○ CONCEPT DESIGN	Falcon Accuracy can model fiber reach and node spacing on the client's own route survey and seabed noise data before any equipment is ordered.
GONYS p. 114	**GONYS Submarine Rescue Vehicle**	Undersea Systems	●○○ CONCEPT DESIGN	Falcon Accuracy can present the pressure hull, mating skirt, life support and transfer-under-pressure design in a design review with the client's submarine escape and rescue specialists.
RINGING p. 118	**RINGING Launch Vehicle**	Space and Flight	●○○ CONCEPT DESIGN	Falcon Accuracy can present the reference mission in simulation, from liftoff to orbit insertion and first-stage touchdown, with mass, thrust and propellant margins shown at every phase.
CASTING p. 120	**CASTING Reusable Medium-Lift Launch Vehicle**	Space and Flight	●○○ CONCEPT DESIGN	Falcon Accuracy can present the reference mission in simulation, from liftoff through orbit insertion to first-stage touchdown on the sea platform, with mass, thrust and propellant margins shown at every phase.
MAKEHAWK p. 122	**MAKEHAWK Orbital Transfer Vehicle**	Space and Flight	●○○ CONCEPT DESIGN	Falcon Accuracy can show the full delivery plan for a 12-satellite TAITA plane in simulation, burn by burn, with the propellant used and the margin left for disposal.
TAITA p. 124	**TAITA ISR Cubesat Constellation**	Space and Flight	●○○ CONCEPT DESIGN	Falcon Accuracy can show the constellation coverage simulation for the client's theater, with revisit and task-to-display statistics by latitude, before any satellite is built.
LAGGAR p. 126	**LAGGAR Transportable Ground Station**	Space and Flight	●○○ CONCEPT DESIGN	Falcon Accuracy can demonstrate the link budget for the X-band downlink and the S-band uplink against the TAITA transmitter at 5, 20 and 90 degrees of elevation.
TOWER p. 128	**TOWER Space Domain Awareness Network**	Space and Flight	●○○ CONCEPT DESIGN	Falcon Accuracy can model network coverage and revisit for the client's candidate sites and satellites, with clear-night statistics from local weather records, before any site is chosen.

WHAT WE CAN VOUCH FOR TODAY, CONTINUED

CODENAME	PRODUCT	SECTOR	READINESS	WHAT WE CAN VOUCH FOR TODAY
NICTITANS p. 130	NICTITANS Reentry Capsule	Space and Flight	●○○ CONCEPT DESIGN	Falcon Accuracy can present the reentry trajectory and landing dispersion in simulation for the client's chosen desert range and sea area, with deceleration and bay temperature shown throughout.
BATE p. 132	BATE Suborbital Test Rocket	Space and Flight	●○○ CONCEPT DESIGN	Falcon Accuracy can present the ascent, separation and landing trajectory in simulation with propellant and thermal margins shown for the 60 kg and 100 kg cases.
LURE p. 134	LURE High-Speed Target Drone	Space and Flight	●○○ CONCEPT DESIGN	Falcon Accuracy can present the flight envelope, launch and recovery analysis in simulation for the 800 km/h low-level profile and the 9,000 m profile.
CORACOID p. 138	CORACOID Heavy-Lift Reusable Launch Vehicle	Rocket Systems	●○○ CONCEPT DESIGN	Falcon Accuracy can present the reference mission in simulation, from liftoff through side-booster return and center-core landing to orbit insertion, with mass, thrust and propellant margins shown at every phase.
MOUNTEE p. 140	MOUNTEE Balloon-Launched Micro-Launcher	Rocket Systems	●○○ CONCEPT DESIGN	Falcon Accuracy can show the full flight in simulation, from balloon ascent and drift through release, ignition and orbit insertion, with mass and propellant margins at every phase.
PATAGIUM p. 142	PATAGIUM Expeditionary Launch Site	Rocket Systems	●○○ CONCEPT DESIGN	Falcon Accuracy can show the full container packing list, the 10-day setup sequence and the crane lifts in a time-lapse simulation on a model of the client's candidate slab.
ENEW p. 144	ENEW Equatorial Launch Platform	Rocket Systems	●○○ CONCEPT DESIGN	Falcon Accuracy can show the payload gain for each of the client's chosen orbits in simulation, comparing the equator with the client's existing range.
RACHIS p. 146	RACHIS Reusable Rocket Engine Family	Rocket Systems	●○○ CONCEPT DESIGN	Falcon Accuracy can present the brochure performance of both engine sizes in simulation across the full throttle range, with thrust, mass and restart figures traced to design margins.

WHAT WE CAN VOUCH FOR TODAY, CONTINUED

CODENAME	PRODUCT	SECTOR	READINESS	WHAT WE CAN VOUCH FOR TODAY
NANKEEN p. 148	NANKEEN Microgravity Research Rocket	Rocket Systems	●○○ CONCEPT DESIGN	Falcon Accuracy can present the reference flight in simulation with the microgravity level shown second by second, and the landing dispersion for the client's range.
CRINES p. 150	CRINES Meteorological Rocketsonde	Rocket Systems	●○○ CONCEPT DESIGN	Falcon Accuracy can show the flight and sonde descent in simulation for the client's range, with the expected measurement accuracy at each altitude band.
BARBULE p. 152	BARBULE Launch Range Tracking Network	Rocket Systems	●○○ CONCEPT DESIGN	Falcon Accuracy can show the tracking coverage of the client's range in simulation for each launch azimuth, with gaps and handovers between sensors marked.
TERRET p. 154	TERRET Rideshare Satellite Dispenser	Rocket Systems	●○○ CONCEPT DESIGN	Falcon Accuracy can show a full 24-satellite release sequence in simulation, with the separation distance between every pair of satellites over the first 24 h.
PUTOVER p. 156	PUTOVER Point-to-Point Cargo Rocket	Rocket Systems	●○○ CONCEPT DESIGN	Falcon Accuracy can present a reference relief flight in simulation, from liftoff through booster return to cargo-stage touchdown, with mass, propellant and heat-shield margins shown at every phase.
HOOD p. 160	HOOD Spectrum Sensing System	Electronic Warfare and Spectrum	●○○ CONCEPT DESIGN	A receiver design review with the link budget for each band and each carrier, from the 2.1 kg pack to the 9 kg vehicle unit
BRANCHER p. 162	BRANCHER Direction-Finding Mast Network	Electronic Warfare and Spectrum	●○○ CONCEPT DESIGN	A direction-finding design review with the array geometry, the calibration method and the bearing error budget by band
SYRINX p. 164	SYRINX Signal Analysis Workstation	Electronic Warfare and Spectrum	●○○ CONCEPT DESIGN	A workflow walkthrough on a clickable mock-up with the client's own analysts, and a written specification of the displays, confirmation steps and audit log
JINK p. 166	JINK Emission Decoy System	Electronic Warfare and Spectrum	●○○ CONCEPT DESIGN	A signature-matching design review that explains how externals are measured, reproduced and verified, with the 2 dB and 10 ms targets and their test method

WHAT WE CAN VOUCH FOR TODAY, CONTINUED

CODENAME	PRODUCT	SECTOR	READINESS	WHAT WE CAN VOUCH FOR TODAY
NARES p. 168	**NARES Navigation Protection Kit**	Electronic Warfare and Spectrum	●○○ CONCEPT DESIGN	An anti-jam performance budget by band and jammer count, with the array geometry and a test method a range can reproduce
KEEN p. 172	**KEEN Network Detection Platform**	Cyber Defense	●○○ CONCEPT DESIGN	A design review of the sensor and agent architecture with the client's network engineers, including the full list of events the agent records.
HALSBAND p. 174	**HALSBAND Zero-Trust Access Fabric**	Cyber Defense	●○○ CONCEPT DESIGN	A design review of the identity model and policy language with the client's signals and security staff, including how legacy systems are brought under policy.
CERE p. 176	**CERE Integrity Attestation System**	Cyber Defense	●○○ CONCEPT DESIGN	A design review of the measurement and signing chain with the client's security and maintenance staff.
QUARRY p. 178	**QUARRY Deception Grid**	Cyber Defense	●○○ CONCEPT DESIGN	A design review of decoy templates and placement rules with the client's network and legal staff.
BEWIT p. 180	**BEWIT Secure Smartphone**	Cyber Defense	●○○ CONCEPT DESIGN	An industrial design review with mockups in the client's chest rigs and vehicle docks, handled by operators in gloves.
INTERMEW p. 184	**INTERMEW Defense Language Model**	Sovereign AI and Prediction	●○○ CONCEPT DESIGN	Falcon Accuracy can walk the client's staff through the INTERMEW design in a two-day review, covering the three sizes, the tuning pipeline, the citation method and the policy engine, with every data path shown.
OSSICLE p. 186	**OSSICLE Forecasting Engine**	Sovereign AI and Prediction	●○○ CONCEPT DESIGN	Falcon Accuracy can demonstrate the five forecast types on a synthetic two-year history in a sealed lab, with bands, drivers and backtest scores shown for every series.
UNHOODED p. 188	**UNHOODED Staff Assistant**	Sovereign AI and Prediction	●○○ CONCEPT DESIGN	Falcon Accuracy can demonstrate drafting, summary, translation and cited answers on a synthetic staff archive of 100,000 documents in a sealed lab, with every draft carrying its label and its reviewer.

WHAT WE CAN VOUCH FOR TODAY, CONTINUED

CODENAME	PRODUCT	SECTOR	READINESS	WHAT WE CAN VOUCH FOR TODAY
HYOID p. 190	**HYOID Edge Language Module**	Sovereign AI and Prediction	●○○ CONCEPT DESIGN	Falcon Accuracy can demonstrate a 3-billion-parameter model answering spoken questions offline on a 15 W development board in a sealed lab, with cited answers and on-module logging.
CANCELEER p. 192	**CANCELEER AI Governance Console**	Sovereign AI and Prediction	●○○ CONCEPT DESIGN	Falcon Accuracy can demonstrate the policy editor, the three-signature release gate and a 10-minute rollback on a lab network of one rack, one field kit and two edge modules.
PITCH p. 196	**PITCH Neural Decision Core**	Command and Decision	●○○ CONCEPT DESIGN	Falcon Accuracy can walk a client's staff through the PITCH design in a two-day review, with the fusion, prediction and recommendation pipeline laid out block by block and every data path shown.
LORES p. 198	**LORES Intelligence Triage Assistant**	Command and Decision	●○○ CONCEPT DESIGN	Falcon Accuracy can demonstrate the full retrieval and citation pipeline on a synthetic corpus of 100,000 documents in a sealed lab network, with every answer traced to its passages.
SLIP p. 200	**SLIP Course-of-Action Engine**	Command and Decision	●○○ CONCEPT DESIGN	Falcon Accuracy can demonstrate the course-of-action builder and the 10,000-run comparison on a synthetic theater in a sealed lab, with the run spread, the break points and their causes shown on the planning display.
LEASH p. 202	**LEASH Fleet Coordination Layer**	Command and Decision	●○○ CONCEPT DESIGN	Falcon Accuracy can demonstrate LEASH coordinating 60 simulated aircraft and 40 simulated ground robots in a sealed lab, with the 1 s deconfliction refresh, the envelopes and the stop-and-ask behavior shown live.
CALAMUS p. 204	**CALAMUS Decision Record**	Command and Decision	●○○ CONCEPT DESIGN	Falcon Accuracy can demonstrate the signed chain, the tamper detection and the disconnected merge on a lab network of three nodes, with an altered entry found at the next sweep.
SCREEN p. 208	**SCREEN Perimeter Security System**	Perimeter and Base Security	●○○ CONCEPT DESIGN	A radar and camera coverage simulation over the client's own site survey, with dead ground mapped to 1 m, delivered before any hardware is specified.

WHAT WE CAN VOUCH FOR TODAY, CONTINUED

CODENAME	PRODUCT	SECTOR	READINESS	WHAT WE CAN VOUCH FOR TODAY
BLOCK p. 210	BLOCK Sensor Tower	Perimeter and Base Security	●○○ CONCEPT DESIGN	A radar coverage model for any position the client names on its own terrain, with mast height and dead ground shown, within 10 working days.
HALLUX p. 212	HALLUX Vehicle Inspection Lane	Perimeter and Base Security	●○○ CONCEPT DESIGN	A gate traffic study and lane layout drawn to the client's own gate survey, with throughput modeled for the base's actual daily traffic.
RAKE p. 214	RAKE Perimeter Patrol Drone	Perimeter and Base Security	●○○ CONCEPT DESIGN	A response-time model for the client's own perimeter, showing box positions and the time to every point on the fence, before any box is placed.
FORMEL p. 216	FORMEL Security Operations Console	Perimeter and Base Security	●○○ CONCEPT DESIGN	A watch-floor design review with the client's guard commander, mapping the base's current alarm volumes, shifts and response standard onto the queue design.
YARAK p. 220	YARAK Predictive Maintenance Platform	Logistics and Sustainment	●○○ CONCEPT DESIGN	A data review of the client's existing maintenance records and vehicle bus logs for one fleet type, with a report on which failure modes the models can learn from the data already held and which need new sensors.
PLUME p. 222	PLUME Expeditionary Parts Cell	Logistics and Sustainment	●○○ CONCEPT DESIGN	A design review of the container layout, power budget, airflow and powder handling with the client's engineering and safety authorities.
CROP p. 224	CROP Supply Prediction Model	Logistics and Sustainment	●○○ CONCEPT DESIGN	A backtest on the client's past consumption and movement records, with forecast error reported per class of supply at 10, 30 and 90 days before any live use.
JERKIN p. 226	JERKIN Autonomous Convoy Kit	Logistics and Sustainment	●○○ CONCEPT DESIGN	A design review of the sensor set and drive-by-wire interfaces for two of the client's truck types, with an installation plan and a mass and power budget, within 60 days of receiving the vehicle data.
CREANCE p. 230	CREANCE Live Training Range	Training and Simulation	●○○ CONCEPT DESIGN	Falcon Accuracy walks the client through the full system design in a 2-day review, including the tracking, rendering and hit-registration chain and its 0.3 m and 100 ms budgets.

WHAT WE CAN VOUCH FOR TODAY, CONTINUED

CODENAME	PRODUCT	SECTOR	READINESS	WHAT WE CAN VOUCH FOR TODAY
WEATHER p. 232	**WEATHER Mission Rehearsal Twin**	Training and Simulation	●○○ CONCEPT DESIGN	Falcon Accuracy builds a demonstration twin from mapping and imagery the client supplies for a 1 square kilometer site and shows the rehearsal walkthrough within 15 working days.
RUFTER p. 234	**RUFTER Operator Simulator**	Training and Simulation	●○○ CONCEPT DESIGN	Falcon Accuracy demonstrates one station on a bench with a TIERCEL controller in the loop and shows the control-to-display latency measured under 20 ms.
RANGLE p. 236	**RANGLE Casualty Care Trainer**	Training and Simulation	●○○ CONCEPT DESIGN	Falcon Accuracy demonstrates the sensing skin on a bench, registering a tourniquet and an airway placement within 0.5 s with pressure logged.
PANNEL p. 238	**PANNEL After-Action Review Engine**	Training and Simulation	●○○ CONCEPT DESIGN	Falcon Accuracy demonstrates the timeline alignment and transcription on a synthetic 4 h exercise recording and shows the review produced within 5 min.
ENSEAM p. 242	**ENSEAM Tailoring Program**	Tailoring and Services	●○○ CONCEPT DESIGN	Falcon Accuracy can walk a client through the 40-week plan, the deliverable list and the acceptance template in a 1-day design review today.
FURCULA p. 244	**FURCULA Integration Gateway**	Tailoring and Services	●●○ BENCH PROTOTYPE	Falcon Accuracy can demonstrate 6 adapters translating simulated legacy traffic into the PITCH track format on a bench today, with the added latency measured and displayed.
ROUSE p. 246	**ROUSE Model Operations Service**	Tailoring and Services	●●○ BENCH PROTOTYPE	Falcon Accuracy can demonstrate the retrain, test, stage and rollback cycle on a single bench rack with synthetic data today, with every step logged.
TOMIAL p. 248	**TOMIAL Red-Team and Assurance Service**	Tailoring and Services	●○○ CONCEPT DESIGN	Falcon Accuracy can present the tactics library structure, the severity scale and the report template in a 1-day design review today.
FEAK p. 250	**FEAK Sustainment and Instructor Service**	Tailoring and Services	●○○ CONCEPT DESIGN	Falcon Accuracy can present the sustainment plan template, the spares model and the instructor course outline in a 1-day design review today.

SECTOR 01 OF 18

01

OPERATOR SYSTEMS

FROM HEAD TO HANDS, ONE OPERATOR, ONE PICTURE.

The dismounted operator is the most heavily loaded node in any force and the least connected. An operator carries 40 to 60 kg, sees a 45 degree cone through one eye at night, loses hearing to the first loud impulse, guesses the bearing of a shot and reports by voice when the net allows. Every other node in the force, such as a vehicle, an aircraft or a radar mast, has a picture, a power supply and a log. The operator has none of the three, and when an operator goes down nobody knows until somebody shouts.



IN THIS SECTOR · 5 PRODUCTS · PAGES 26 TO 35

MALAR **COVERT** **MANTLE** **CADGE** **CUFF**

Operator Systems puts those three things on the body. Every product in this sector fits the helmet, carrier, gloves and packs the force already issues, draws from one battery over one cable bus and computes on the body, so the picture exists when the network does not. The wearer decides, and every alert and command is logged inside the client's network. From head to hands, the sector holds five products, MALAR Smart Goggles, COVERT Smart Helmet, MANTLE Smart Vest, CADGE Load-Carriage Exoskeleton and CUFF Haptic Command Glove.

IN THIS SECTOR · 5 PRODUCTS



MALAR p. 26

MALAR Smart Goggles

See the night. Read the street. Keep both hands free.



COVERT p. 28

COVERT Smart Helmet

Eyes all around, ears protected, every impact on record.



MANTLE p. 30

MANTLE Smart Vest

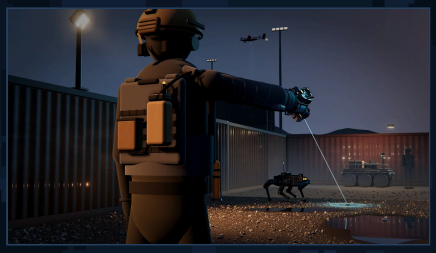
The carrier that senses the threat and warns you first.



CADGE p. 32

CADGE Load-Carriage Exoskeleton

Puts 45 kilograms on the ground, not on the spine.



CUFF p. 34

CUFF Haptic Command Glove

Point, and the robot goes. Close your fist, it stops.



CONCEPT VISUALIZATION · MALAR

ALL FIGURES ARE DESIGN TARGETS

OPERATOR SYSTEMS · HARDWARE · 01 OF 05

MALAR

MALAR Smart Goggles

The dark stripe beneath a falcon's eye that cuts glare and keeps its sight sharp in hard light; the goggles keep the operator's sight sharp at night.

SEE THE NIGHT. READ THE STREET. KEEP BOTH HANDS FREE.

SUMMARY

MALAR fuses thermal and low-light video into one clear picture, then draws the command picture, drone video and live captions of nearby voices and signs on the real world. The operator keeps both eyes up and both hands free.

WHY FALCON ACCURACY BUILT IT

At night a dismounted operator holds a monocular tube to one eye, a radio in one hand and a map on the wrist, and every look down at a display costs 2 to 3 s of attention while the picture in the head drifts from the picture at command. The thermal view, the drone feed and the translator each live on a separate device with a separate battery. Falcon Accuracy built MALAR to put every source in one binocular view, with detection, captions and the command picture computed on the head so nothing depends on the network. The force gains an operator who sees people, vehicles and drones at night, reads a street in a language the operator does not speak and marks what it sees for the team in under 1 s.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits MALAR to the helmets, shrouds and protective eyewear the force already issues, and to the COVERT crown where the force adopts it.

TRAIN Its recognition models and language packs train on the vehicles, uniforms, dialects and signage of the client's theater, inside the client's network.

SET Symbology, voice commands, call signs and the marking workflow are set to the force's own doctrine and language.

WORKS WITH

COVERT · MANTLE · JESS · TIERCEL · PITCH · CUFF · CREANCE · HYOID

MALAR MALAR Smart Goggles

DESCRIPTION

MALAR is a helmet-mounted binocular display. Two low-light cameras and a thermal core fuse into one image within 20 ms at dusk and 50 ms at 1 millilux, and a neural processor in the rear puck outlines people, vehicles and drones at 30 fps. MALAR draws the PITCH picture in the operator's view, so friendly positions, threats, routes and TIERCEL video sit where they belong. Four microphones caption speech in the operator's language within 1 s, and the cameras translate signs in place. A glance and a tap marks a contact for team and command in under 1 s, and with the COVERT crown a rear-view strip shows what approaches from behind. MALAR works offline on 3 h of puck battery or 8 h from the MANTLE bus, and nothing leaves the goggles unless the operator sends it.

CAPABILITIES

- Fused thermal and low-light vision, under 20 ms camera to eye at dusk and under 50 ms at 1 millilux
- On-device detection of people, vehicles and drones at 30 fps, drawn within 60 ms of the frame
- Command picture and TIERCEL drone video drawn in the operator's view over the JESS mesh
- Live captions and translation of nearby speech and signs within 1 s, fully offline
- Glance-and-tap contact marking shares the grid with team and command in under 1 s
- Navigates without satellites by visual-inertial tracking against loaded terrain, drift under 0.5 percent of distance walked
- Rear-view strip from the COVERT sensor crown and point-and-mark with the CUFF glove
- Training mode renders CREANCE opposing forces in place with 0.3 m registration

SPECIFICATIONS · DESIGN TARGETS

DISPLAY	binocular waveguide, 1920 x 1080 per eye, 45 degree field of view, 3,000 nits, flip-up in 0.5 s
SENSORS	640 x 512 thermal core, two low-light sensors usable to 1 millilux, 4-microphone array, 9-axis inertial unit
LATENCY	under 20 ms camera to display at dusk; under 50 ms at 1 millilux, where one frame of exposure is added; detections drawn within 60 ms of the frame; captions within 1 s
THERMAL DETECTION	standing person at 400 m, vehicle at 600 m, small drone at 150 m, in clear air
COMPUTE	20 TOPS neural processor in the rear puck; model updates loaded by cable inside the client's network
WEIGHT AND POWER	440 g on the helmet plus 260 g rear battery and compute puck; 3 h on the puck, 8 h fed from the MANTLE back-panel battery or the CADGE frame over the cable bus
MOUNTS	standard helmet shroud or the COVERT rear housing; flip-up and breakaway; fits over issued protective eyewear
RUGGED AND SECURE	MIL-STD-810H, IP67, -32 to +55 C; AES-256 links, no cloud dependency, tamper wipe under 1 s

WHAT WE CAN VOUCH FOR TODAY

- A full optical, thermal and mass budget for the binocular display and rear puck is available for design review under nondisclosure.
- The fusion and latency figures are measured on a bench rig with a strobed target and a photodiode at the eyepiece, and the rig design is released to the client for repeat tests.
- Detection models train on the client's own imagery inside the client's network, and Falcon Accuracy commits in writing that no frame leaves the site.
- An acceptance trial protocol covers night detection at measured ranges, caption accuracy on recorded dialect speech and 8 h of continuous running on the MANTLE bus.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

MALAR gives the operator a 45 degree window on a night that surrounds the whole head, and it depends on the helmet beneath it for its mount, its head tracking and a place for its rear puck. COVERT is that helmet. Its crown ring feeds the rear-view strip that MALAR draws, its ear cups protect the hearing that MALAR captions and JESS calls depend on, and its rear housing docks the MALAR puck on the same cable bus. Together they give the wearer forward sight to 400 m and awareness through 360 degrees.



CONCEPT VISUALIZATION · COVERT

ALL FIGURES ARE DESIGN TARGETS

OPERATOR SYSTEMS · HARDWARE · 02 OF 05

COVERT

COVERT Smart Helmet

Coverts are the rows of small, tough feathers that overlap and shield the roots of a falcon's flight feathers; the helmet shields the head and everything the operator carries on it.

EYES ALL AROUND, EARS PROTECTED, EVERY IMPACT ON RECORD.

SUMMARY

COVERT turns the helmet shell a force already issues into a sensing crown. Four cameras and six microphones watch and listen through 360 degrees, ear cups protect hearing and pass voices through, and a liner records every impact for the medic.

WHY FALCON ACCURACY BUILT IT

The helmet is the one piece of kit every operator wears for every hour of every mission, and today it carries a light mount and nothing else. The operator sees a 45 degree cone, loses hearing to the first loud impulse and cannot tell the medic what hit the head or how hard. Falcon Accuracy built COVERT as a crown, liner and ear-cup set that fits the shells a force already issues, so the head becomes the squad's rear sensor and its own medical record. The force gains operators who hear a drone before they see it, whose ear cups take 30 dB off every impulse within 2 ms and whose head impacts reach the medic within 2 s.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits COVERT to the helmet shells, rails, shrouds and radio headsets the force already issues, and to the head sizes measured at the unit.

TRAIN Its acoustic and camera models train on the drones, vehicles and street scenes recorded in the client's theater, and its audio cues on the force's own languages.

SET Impact thresholds, hearing-protection levels and alert routing are set to the force's medical doctrine, and camera recording is set to the force's rules on retention.

WORKS WITH

MALAR · MANTLE · JESS · CUFF · CADGE · PITCH · CREANCE

COVERT COVERT Smart Helmet

DESCRIPTION

COVERT is a sensor crown, impact liner and hearing set for the helmet shell a force already issues. Four cameras on the crown ring cover 360 degrees and feed a rear-view strip into MALAR within 40 ms, flagging a person 80 m behind the wearer. Six microphones give a bearing on a shot or a drone and hear a small quadcopter at 150 m in quiet conditions. Each ear cup cuts 30 dB of noise, clamps impulses within 2 ms and passes footsteps and voices through. Twelve liner sensors log every impact to 400 g with its rotation and time, and alert the medic through MANTLE above a set threshold. The set adds 520 g to the shell, runs 3 h alone and 8 h on the MANTLE bus, and docks the MALAR puck in its rear housing.

CAPABILITIES

- Four crown cameras cover 360 degrees and feed a rear-view strip into MALAR within 40 ms
- Person approaching from behind detected at 80 m by day and 40 m at 1 millilux, drawn in the goggles with an arrow and a range
- Six-microphone crown gives shot bearing within 5 degrees and elevation within 10 degrees together with the MANTLE array
- Hears a small quadcopter at 150 m below 40 dBA background and cues the wearer with a tone from its direction
- Ear cups give 30 dB of protection, clamp impulses within 2 ms and pass voices and footsteps through
- JESS calls and MALAR alerts placed in 3D audio within 10 degrees, so a teammate's voice comes from where the teammate stands
- Liner logs every impact to 400 g with time and position and alerts the medic within 2 s above a set threshold
- Head tracking at 1,000 Hz keeps MALAR symbology steady within 0.2 degrees of the world

SPECIFICATIONS · DESIGN TARGETS

CROWN RING	4 wide-field cameras, visible and low-light, 110 degrees each, 360 degree horizontal cover, 60 fps, stitched within 40 ms
ACOUSTICS	6-microphone array, shot bearing within 5 degrees and elevation within 10 degrees when fused with MANTLE, small quadcopter heard at 150 m below 40 dBA background
HEARING PROTECTION	over-ear cups, 30 dB passive attenuation plus active cancellation, impulse clamping within 2 ms, hear-through for footsteps and voices to 100 m, 3D audio placement within 10 degrees
IMPACT LINER	12 sensors, linear acceleration to 400 g, rotational velocity to 50 rad/s, 5,000 Hz sampling, log of 5,000 events with cumulative dose per liner
BLAST GAUGE	peak overpressure to 700 kPa recorded per event and shared with the MANTLE casualty alert
HEAD TRACKING	9-axis inertial unit at 1,000 Hz, under 5 ms to MALAR, drift corrected by the crown cameras
WEIGHT AND POWER	520 g added to the issued shell, including liner, cups, crown and a 120 g battery; 3 h alone, 8 h on the MANTLE bus, the full march on the CADGE bus
FIT	three shell cut families and two liner sizes, mounts to standard rails and shroud; a Falcon Accuracy shell is offered in the same cuts, with the protection level chosen by the client
RUGGED	MIL-STD-810H, IP67, -32 to +55 C; AES-256 links, no cloud dependency

WHAT WE CAN VOUCH FOR TODAY

- A mass, balance and thermal budget for the crown, liner and cups on three issued shell cuts is available for design review under nondisclosure.
- Hearing protection and impulse clamping figures are measured on an acoustic test head in an anechoic chamber, and the method is released to the client with the results.
- Impact sensing is validated on a drop rig with instrumented headforms before any wearer trial, and the trial protocol is agreed with the client's medical staff.
- Camera and audio data stays on the helmet and in the client's network, and Falcon Accuracy commits in writing that no recording leaves the site.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

COVERT hears a shot from above the shoulders, and six microphones on one head fix a bearing but not a range or a clean elevation. MANTLE adds eight microphones 0.4 m lower and spread across the chest and back, so the pair resolves bearing within 5 degrees and elevation within 10 degrees out to 500 m. The vest also carries the battery the helmet runs on for 8 h and the casualty alert the impact liner reports into. One protects the head and records what hits it, the other protects the body and tells the medic.



CONCEPT VISUALIZATION · MANTLE

ALL FIGURES ARE DESIGN TARGETS

OPERATOR SYSTEMS · HARDWARE · 03 OF 05

MANTLE

MANTLE Smart Vest

A raptor mantling spreads its wings over what it guards; the vest spreads sensing over the wearer and warns first.

THE CARRIER THAT SENSES THE THREAT AND WARNS YOU FIRST.

SUMMARY

MANTLE turns the plate carrier a force already issues into a sensing node. It locates hostile fire, senses hostile drones and lasers, watches the wearer's vitals and pulses the direction of danger into the body within half a second of the first shot.

WHY FALCON ACCURACY BUILT IT

Under fire, the first second decides whether an operator finds cover or finds the source, and today that second goes to working out where the sound came from. When an operator goes down, the medic learns of it when someone shouts, often minutes later. Falcon Accuracy built MANTLE as a sensing layer that straps to the carrier the force already issues, so the warning arrives as a pulse on the body before the ear has finished hearing the shot, and the casualty alert sends itself. The force gains eight microphones and three more sensors on every operator, and a medic who knows position, vitals and probable injury within 2 s.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits MANTLE to the carriers, plates, pouches and body sizes the force issues, and to the CADGE frame where the force adopts it.

TRAIN Its acoustic and radio libraries train on the shot sounds and drone links recorded in the client's theater, inside the client's network.

SET Alert thresholds, heat-stress limits, the cancel-window length and voice cues are set to the unit's medical doctrine and language.

WORKS WITH

MALAR · COVERT · CADGE · JESS · PITCH · TIERCEL · HOOD · GYR · CREANCE

MANTLE MANTLE Smart Vest

DESCRIPTION

MANTLE is a sensing layer for the plate carrier a force already issues. Eight microphones locate a shot to within 5 degrees in under 0.5 s and pulse its bearing into the back through eight haptic pads. A receiver senses drone links to 1 km, and photodiodes warn of lasers ranging the wearer. Plate sensors log strikes and blast, and a chest sensor tracks heart rate, breathing and heat strain. If the wearer goes down, a 10 s countdown runs in the ear, and unless it is canceled, position, vitals and probable injury reach the medic and command 2 s later. PITCH pushes predicted danger zones before the wearer enters them, an encrypted beacon marks the wearer friendly to goggles and aircraft, and a 1.3 kg back-panel battery feeds goggles, helmet and radio for 8 h over one cable.

CAPABILITIES

- Locates a shot to 5 degrees in under half a second out to 500 m, with elevation within 10 degrees when a COVERT crown is worn
- Eight haptic pads pulse the direction of threat into the body within 0.5 s of the first shot
- Senses hostile drone links to 1 km and lasers aimed at the wearer in four quadrants
- Casualty alert after a 10 s cancel window, with position, vitals and probable injury to medic and command within 2 s
- Predicted danger zones pushed from PITCH before the operator enters them
- Encrypted friendly beacon read by MALAR goggles and TIERCEL aircraft to 2 km
- One back-panel battery and cable bus feed goggles, helmet and radio for 8 h
- Clip-on chemical and radiological cartridges report on the same bus

SPECIFICATIONS · DESIGN TARGETS

SHOT LOCATION	8-microphone array, bearing within 5 degrees, under 0.5 s, detection to 500 m; elevation within 10 degrees with the COVERT crown
HAPTICS	8 pads across the back and shoulders, under 0.5 s from first shot to pulse, three pulse patterns for shot, drone and laser
SENSORS	70 MHz to 6 GHz drone-link receiver to 1 km, 4-quadrant laser warning, plate strike and blast gauges, chest biometrics for heart rate, breathing rate and core temperature estimate
CASUALTY ALERT	10 s cancel window with one-press cancel, then position, vitals and probable injury to medic and command within 2 s; a sent alert is withdrawn by voice
FRIENDLY BEACON	encrypted radio beacon with rolling code, read by MALAR and TIERCEL to 2 km, silenced at a touch or by a HOOD emission-control order
OPTIONS	clip-on chemical and radiological cartridges on the same rail, 180 g each
WEIGHT AND POWER	sensing layer 860 g including its 14 h battery; optional 1.3 kg, 200 Wh back-panel battery feeds goggles, helmet and radio over one cable for 8 h, recharged from CADGE or GYR in the field
RUGGED	accepts client plates to NIJ Level IV; MIL-STD-810H, IP67, flame-resistant shell, -32 to +55 C; AES-256 links

WHAT WE CAN VOUCH FOR TODAY

- The acoustic array geometry and bearing algorithm are proven in simulation against recorded impulses, and the simulation set is released with the design review.
- A bench rig with eight loudspeakers on a 10 m ring measures bearing error and time to pulse, and Falcon Accuracy publishes the rig drawings so the client can repeat the test.
- The casualty alert chain, from the chest sensor to the medic's display, is demonstrated end to end on the bench with timing logs.
- Vitals and position stay inside the client's network, and the alert path is reviewed with the client's medical and legal staff before any trial.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

MANTLE, COVERT, MALAR and a JESS radio add 3.8 kg to an operator who already carries 40 kg of plates, water and batteries, and every sensor on the body loses value when the body is too tired to act on it. CADGE puts that weight on a frame that stands on the ground with the wearer and powers all of it from one 0.9 kWh battery. The chest sensor in the vest tells the frame when heart rate climbs, so the assist profile rises with the wearer's fatigue. The pair turns 45 kg of load into a march at 4 km/h for 10 h.



CONCEPT VISUALIZATION · CADGE

ALL FIGURES ARE DESIGN TARGETS

OPERATOR SYSTEMS · HARDWARE · 04 OF 05

CADGE

CADGE Load-Carriage Exoskeleton

The padded frame on which several hawks are carried to the field at once; the exoskeleton is the frame that carries the operator's load.

PUTS 45 KILOGRAMS ON THE GROUND, NOT ON THE SPINE.

SUMMARY

CADGE is a powered hip-and-knee exoskeleton with a load frame. It carries 45 kg of pack, battery and plates to the ground, assists the wearer uphill and under load, runs 10 h on one battery and feeds every wearable on the operator over the cable bus.

WHY FALCON ACCURACY BUILT IT

A dismounted operator carries 40 to 60 kg, and the weight shows as slower marches, injured backs and knees, and a force that arrives tired. The robots that could carry the load cannot climb every stair or enter every building with the squad. Falcon Accuracy built CADGE so the load rides on a frame that stands on the ground with the operator, with actuators at the hip and knee adding to the wearer's own effort and never replacing it. The force gains operators who climb with 45 kg at the pace they climb with 15 kg, one battery for goggles, helmet, vest and radio, and a litter team of two that carries a casualty 5 km.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits CADGE to the packs, plate carriers, boots and vehicle seats the force already uses, with rails cut to the force's own containers.

TRAIN Its gait and assist models train on the force's own operators, marching on the terrain and slopes of the client's theater.

SET Assist levels, torque limits, march profiles and fatigue alerts are set to the force's load-carriage doctrine and medical limits.

WORKS WITH

MANTLE · MALAR · COVERT · CUFF · JESS · GYR · PITCH · CREANCE

CADGE CADGE Load-Carriage Exoskeleton

DESCRIPTION

CADGE is a powered load-carriage exoskeleton. A frame from hip belt to boot plate carries 45 kg of pack, battery and plates, and puts 80 percent of it on the ground on level terrain, 60 percent on a 20 degree slope. Actuators at each hip and knee add up to 60 Nm to the wearer's own effort, reading intent from inertial and force sensors at 500 Hz. The wearer walks at 6 km/h assisted, runs at 12 km/h unassisted, kneels, goes prone and climbs ladders. One 0.9 kWh battery gives 10 h at 4 km/h, or 8 h while feeding goggles, helmet, vest and radio over the cable bus. The frame weighs 12.4 kg, comes off in 15 s and runs under 45 dBA at 1 m. Two wearers in litter mode carry a 100 kg casualty 5 km.

CAPABILITIES

- Carries 45 kg on the frame, with 80 percent of the load to the ground on level terrain and 60 percent on a 20 degree slope
- Hip and knee actuators add up to 60 Nm each in the direction of the wearer's own effort, read from intent sensors at 500 Hz
- Walks at 6 km/h assisted and runs at 12 km/h with the clutches open within 50 ms
- Cuts the metabolic cost of carrying 40 kg at 4 km/h by 15 to 25 percent, measured by oxygen uptake
- 10 h on one 0.9 kWh battery, swapped in 20 s, recharged from GYR or 24 V vehicle power in the field
- Feeds goggles, helmet, vest and radio over one cable bus for the whole march
- Litter mode lets two wearers carry a 100 kg casualty 5 km with 70 percent of the load on the frames
- Learns the wearer's gait in 10 min and reports fatigue and load to the medic through MANTLE

SPECIFICATIONS · DESIGN TARGETS

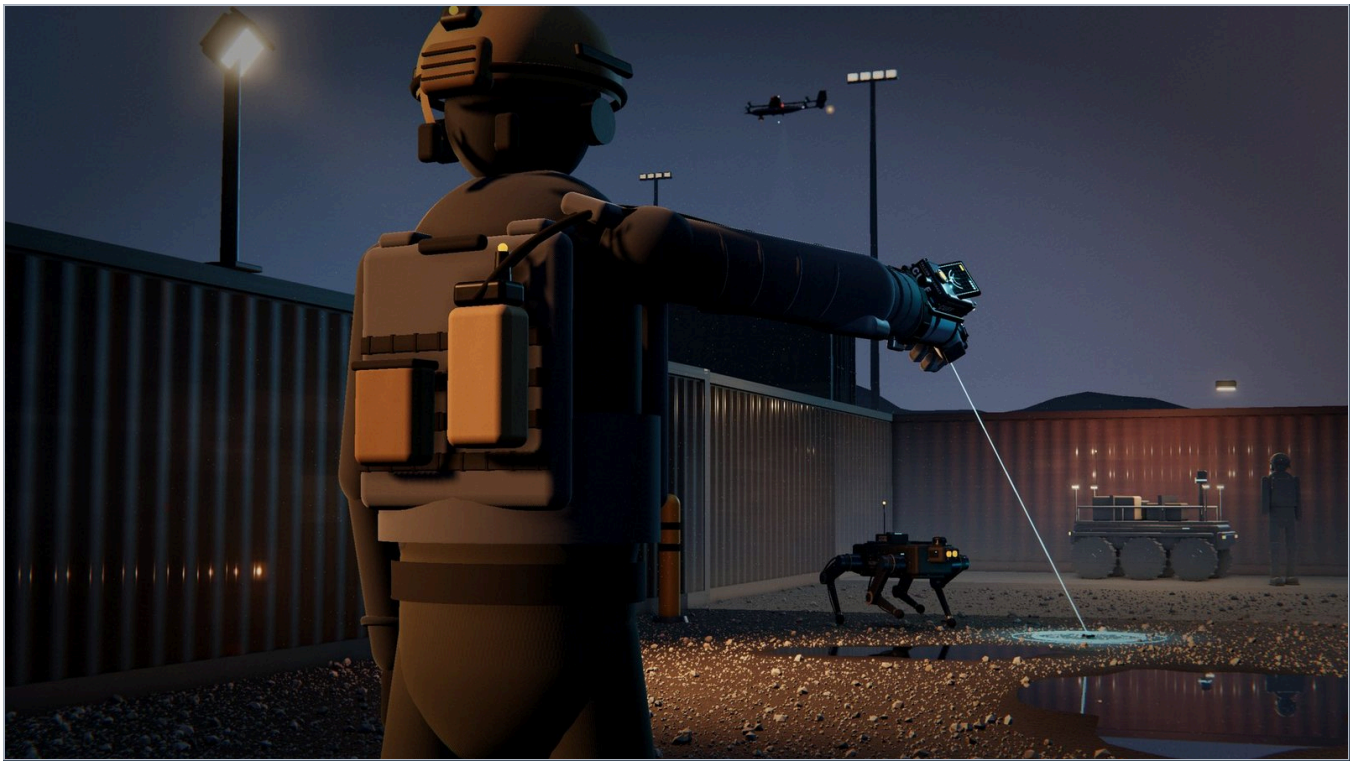
LOAD	45 kg rated on the frame rails, 80 percent ground transfer on level terrain, 60 percent on a 20 degree slope; rails cut to the force's own packs
ACTUATION	4 brushless actuators, 2 hip and 2 knee, 60 Nm peak and 30 Nm continuous each, clutch release within 50 ms, under 45 dBA at 1 m
SPEED AND MOBILITY	6 km/h assisted, 12 km/h with clutches open, 0.5 m step, kneeling, prone and ladder climbing, 1 m fording
CONTROL	500 Hz intent detection from 6 inertial units and 4 force plates, gait learned in 10 min, assist profiles for march, climb, lift and litter
ENERGY	0.9 kWh battery, 10 h at 4 km/h with 45 kg on level ground, 5 h on 20 degree slopes, swap in 20 s, 20 to 80 percent recharge in 45 min from GYR or 24 V vehicle power
POWER EXPORT	200 W over the cable bus to MALAR, COVERT, MANTLE and JESS, same connector as the MANTLE back-panel battery
MASS AND SIZING	12.4 kg with battery, 3 frame sizes for wearers 1.58 to 1.95 m tall, 4 quick releases, doffed in 15 s
SAFETY	torque limits set per joint, assist stops within 100 ms on a fall or a fault, frame locks and carries the load with power off
RUGGED	MIL-STD-810H, IP67, -32 to +55 C, 1 m fording; AES-256 link to the squad net

WHAT WE CAN VOUCH FOR TODAY

- A load path, strength and fatigue analysis of the frame at 45 kg across 1 million steps is available for design review under nondisclosure.
- The ground-transfer and metabolic figures are design targets from a gait simulation, and Falcon Accuracy publishes the model and the trial method, including oxygen-uptake measurement, before any wearer trial.
- Actuator torque, clutch release time and noise are measured on a bench rig the client can witness.
- Gait data stays on the frame and in the client's network, and nothing is uploaded to Falcon Accuracy.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

CADGE carries what the operator must keep on the body, and the robots GYR, LURCHER and FALCONER carry and do the rest, so a dismounted operator now moves with up to 4 machines and no hand free for a controller. CUFF makes the hand itself the controller. The frame already powers the wrist unit over the cable bus and MALAR already knows where the operator looks, so a pointed finger becomes a grid reference within 1 m at 100 m and a closed fist becomes a stop order that reaches every machine within 300 ms. The pair gives a squad that moves under load with its robots obeying the hand signals the squad already uses.



CONCEPT VISUALIZATION · CUFF

ALL FIGURES ARE DESIGN TARGETS

OPERATOR SYSTEMS · HARDWARE · 05 OF 05

CUFF

CUFF Haptic Command Glove

The cuff is the long leather sleeve of the falconer's glove, the part that takes the bird's grip; CUFF is the glove through which the operator takes hold of the machines.

POINT, AND THE ROBOT GOES. CLOSE YOUR FIST, IT STOPS.

SUMMARY

CUFF is a sensing glove and wrist unit that commands LURCHER, FALCONER, GYR and TIERCEL by pointing, gesture and touch. Fingertip and palm haptics bring the robot's grip, footing and link back into the hand, and every command is confirmed, logged and reversible.

WHY FALCON ACCURACY BUILT IT

Every robot a force adds comes with its own hand controller, and a dismounted operator has no hand free to hold one. The tablet that commands a drone takes the operator's eyes off the street for 10 s at a time, and nothing tells the operator what the robot feels. Falcon Accuracy built CUFF so the hand the operator already uses for signals becomes the controller, with the pointing finger and the MALAR gaze fixing a point on the ground and a closed fist stopping every machine. The force gains one way to command every robot it owns, a grip the operator can feel from 500 m away and a complete log of who told which machine to do what.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits CUFF to the combat gloves, watch mounts and radios the force already issues, with liner sizes measured at the unit.

TRAIN Its gesture models train on the force's own hand signals, on left-handed and right-handed operators and on the gloves worn in the client's climate.

SET The gesture vocabulary, confirm rules, stop behavior and which operator may command which machine are set to the force's own doctrine, and every command is logged in the client's network.

WORKS WITH

MALAR · COVERT · CADGE · JESS · LURCHER · FALCONER · GYR · TIERCEL · PITCH · CREANCE

CUFF CUFF Haptic Command Glove

DESCRIPTION

CUFF is a thin sensing glove and wrist unit worn on the operator's leading hand. Fourteen joint sensors and a 9-axis inertial unit read the hand at 200 Hz, and 40 gestures are recognized within 150 ms under a combat glove at -32 C. A pointed finger and the MALAR gaze fix a ground point within 1 m at 100 m, so a LURCHER, GYR or TIERCEL goes where the operator points. Ten haptic actuators return FALCONER's grip force within 20 ms over a direct link, a LURCHER's footing as a palm pulse and link health as a wrist tap. A move near people takes a 0.5 s hold to confirm, a closed fist stops every machine within 300 ms, and every command is logged with the operator's name, time and position. Hand signals reach teammates' goggles as icons.

CAPABILITIES

- Commands LURCHER, FALCONER, GYR and TIERCEL through one glove, up to 4 machines selected by thumb or by gaze in MALAR
- Point-and-go fixes a ground point within 1 m at 100 m from the finger and the MALAR gaze
- 40 gestures recognized within 150 ms, under a combat glove and at -32 C
- FALCONER's grip force returned to the fingertips within 20 ms over a direct link, resolved in 10 steps to 50 N
- Palm and wrist haptics report footing, tilt and link health without a glance at any display
- Closed fist stops every machine within 300 ms, and moves near people take a 0.5 s hold to confirm
- Every command logged with the operator's credential, time and position inside the client's network
- Standard hand signals sent to teammates' MALAR goggles as icons within 0.5 s

SPECIFICATIONS · DESIGN TARGETS

SENSING	14 joint-bend sensors, 5 fingertip pressure sensors, 9-axis inertial unit, 200 Hz, hand pose within 2 degrees per joint
GESTURES	40 in the base vocabulary, recognized within 150 ms, false triggers under 1 per hour of wear in motion trials
POINTING	ground point within 1 m at 100 m and 5 m at 500 m when fused with MALAR gaze and inertial heading
HAPTICS	10 actuators, 5 fingertips, 3 palm and 2 wrist band, 3 ms actuation latency, grip force returned in 10 steps to 50 N
WRIST UNIT	50 mm daylight-readable display at 1,000 nits, physical confirm button, 110 g, 16 h battery, holds the operator's credential
GLOVE	85 g, 0.8 mm liner worn under the force's issued combat glove, cold-weather overglove to -32 C, washable
CONTROL AND SAFETY	0.5 s hold to confirm moves near people, fist stop within 300 ms over JESS, every command logged, machines return to a safe state within 2 s on lost link
LINKS	JESS mesh to 5 km handheld to handheld, direct short-range link to FALCONER within 500 m for grip feedback; AES-256; MIL-STD-810H, IP67

WHAT WE CAN VOUCH FOR TODAY

- The gesture set and confirm rules are specified in a control-authority document reviewed with the client before any machine moves on a command from the glove.
- Gesture recognition and false-trigger rates are measured on recorded hand-motion data from the client's own operators, and the results are released to the client.
- Haptic latency and fist-stop time are measured end to end on a bench with a LURCHER or GYR test stand, and the timing logs are shared.
- Command logs are kept inside the client's network and are readable by the client's own auditors, and Falcon Accuracy holds no copy.

NEXT SECTOR · 02 COMMUNICATIONS AND COORDINATION · P. 36

Voice, picture and data to command, on whatever link holds. This closes Operator Systems. Sector 02, Communications and Coordination, opens on page 36 with JESS, ELEONORA, HAMULI, PECTEN and PASSAGE.

02

COMMUNICATIONS AND COORDINATION

VOICE, PICTURE AND DATA TO COMMAND, ON WHATEVER LINK HOLDS.

Communications decide whether the rest of the system exists. MALAR draws the command picture only if the picture reaches the goggles, a MANTLE casualty alert saves a life only if it reaches the medic, and PITCH fuses only what the network delivers. In the theaters your force works in, the link is contested on four fronts at once. Terrain masks it, jammers find it, every transmission marks the position of the transmitter, and the data that matters often sits on a network of a different classification from the one the operator is on. Falcon Accuracy treats these as one engineering problem. Each product in this sector removes one single point of failure from the path between the operator's voice and the commander's display, and each one measures itself so a signaler can see where the path is thin.



IN THIS SECTOR · 5 PRODUCTS · PAGES 38 TO 47

JESS ELEONORA HAMULI PECTEN PASSAGE

The chain runs from the squad outward. JESS forms the squad net, cleans voice, turns speech into structured reports and moves away from jamming within 2 s. ELEONORA gives the squad one shared picture on that net, with tasks, translated chat, positions and medevac requests that reach the medic within 3 s. HAMULI bonds satellite and cellular links into one path to command and shifts traffic within 500 ms when a link fades. PECTEN carries 10 Gbps between a command post and its emitters on an infrared beam, so the post itself radiates no backhaul signal. PASSAGE moves the picture across classification lines in one direction, enforced in hardware, with a human deciding every release downward. All five keep data inside the client's network and keep a human in every decision that matters. The sector holds five products. They are JESS Tactical Mesh Radio, ELEONORA Squad Coordination App, HAMULI Bonded Backhaul Terminal, PECTEN Optical Link Terminal and PASSAGE Data Diode Gateway.

IN THIS SECTOR · 5 PRODUCTS



JESS p. 38

JESS Tactical Mesh Radio

Clear voice under fire. The net re-forms in 200 milliseconds.



ELEONORA p. 40

ELEONORA Squad Coordination App

One picture for the squad. Shared tasks, translated chat, positions, medevac.



HAMULI p. 42

HAMULI Bonded Backhaul Terminal

Satellite and cellular, bonded into one line to command.



PECTEN p. 44

PECTEN Optical Link Terminal

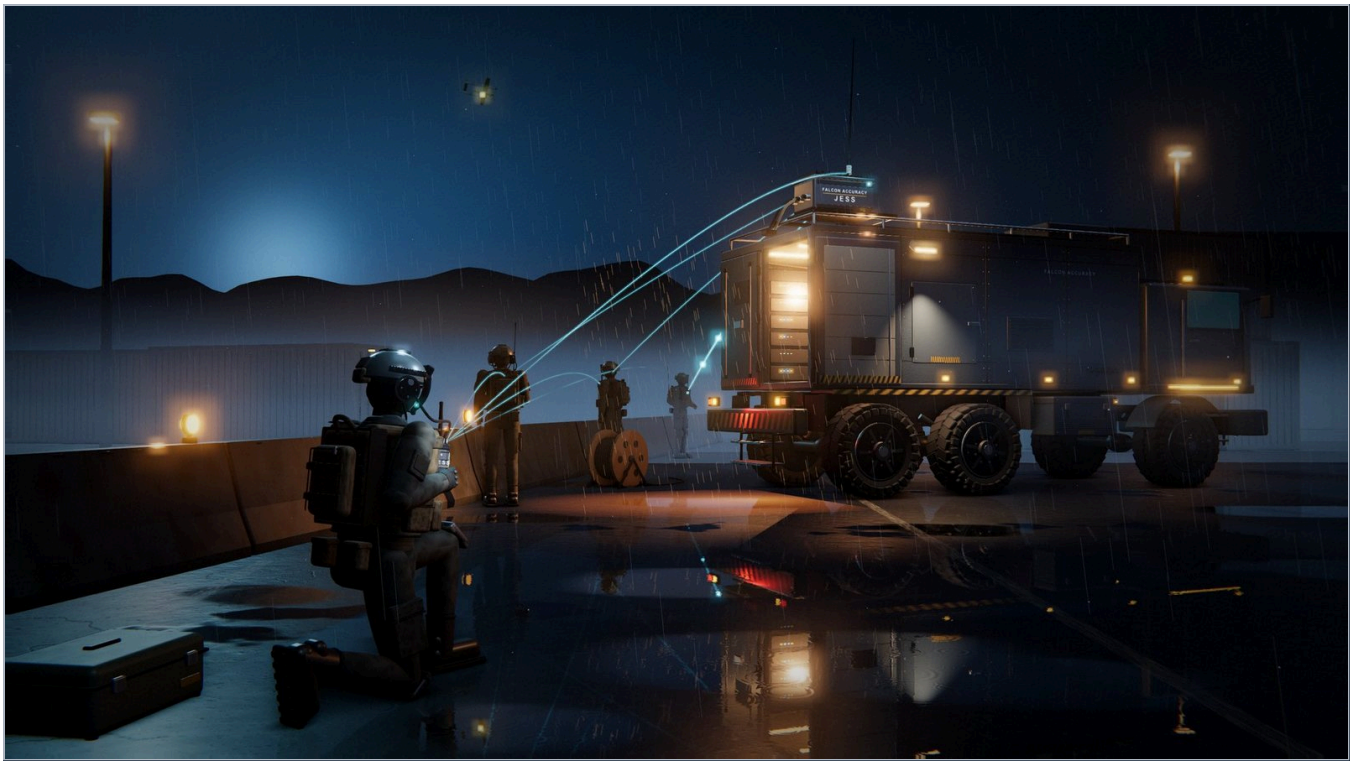
Ten gigabits between posts. No radio for anyone to hear.



PASSAGE p. 46

PASSAGE Data Diode Gateway

Data crosses the classification line one way, enforced in hardware.



CONCEPT VISUALIZATION · JESS

ALL FIGURES ARE DESIGN TARGETS

COMMUNICATIONS AND COORDINATION · HARDWARE · 01 OF 05

JESS

JESS Tactical Mesh Radio

The jess is the soft leather strap on the falcon's leg through which the falconer holds the bird; JESS is the link between the operator and command.

CLEAR VOICE UNDER FIRE. THE NET RE-FORMS IN 200 MILLISECONDS.

SUMMARY

JESS is the line between the operator and command. A self-healing mesh radio with speech intelligence in the handset, it cleans voice of battle noise, writes the report while the operator speaks, and moves the net to a clear channel within 2 s of detecting a jammer.

WHY FALCON ACCURACY BUILT IT

A squad net that drops a node loses the voice of the operator who needs it most, and a spoken report takes minutes to be typed into the command picture. Jamming finds a single channel in seconds, and noise under contact makes half the words unreadable. Falcon Accuracy built JESS as the first link in its system, because MALAR, MANTLE, ELEONORA and TIERCEL all ride on it. The operator speaks once, the report lands on the map within 2 s, and the net rebuilds itself before anyone has to repeat a call.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits JESS to the pouches, vehicles and legacy radios the force already uses, through gateway ports on the vehicle node and a one-cable bus to MALAR and MANTLE.

TRAIN Falcon Accuracy trains the speech and translation models on the client's languages, accents, call signs and report formats, inside the client's network.

SET Falcon Accuracy sets the waveform to the force's spectrum allocations, the priority rules for contact and casualty calls, and the emission-control policy that HOOD issues to every node.

WORKS WITH

MALAR · MANTLE · ELEONORA · HAMULI · PECTEN · TIERCEL · GYR · PITCH · HOOD · CREANCE

JESS JESS Tactical Mesh Radio

DESCRIPTION

JESS is a handheld and vehicle radio family that forms its own mesh and rebuilds routes within 200 ms when a node drops. A speech model in the handset strips battle, rotor and wind noise, and the in-ear headset gives 32 dB of hearing protection with hear-through microphones. When an operator speaks a contact or casualty report, JESS assembles the structured message, confirms it back and places it on the command map within 2 s. Coalition partners hear each other translated within 1.5 s. Contact calls take priority, and when bandwidth collapses the net falls back to compressed text. When a node detects jamming, the subnet moves to a clear channel within 2 s. HAMULI carries the subnet beyond line of sight, and PITCH triages the flow so each operator hears only what concerns them.

CAPABILITIES

- Self-forming, self-healing mesh of 64 nodes per subnet; routes re-form within 200 ms
- Voice cleaned of battle, rotor and wind noise in the handset before transmission
- Spoken contact and casualty reports become structured messages on the command map within 2 s
- Offline translation across 12 coalition language pairs within 1.5 s
- Detects jamming and moves the subnet to a clear channel within 2 s
- Contact calls take priority; compressed text keeps the net alive below 20 kbps
- Headset gives 32 dB of hearing protection with hear-through sound and a whisper microphone
- Vehicle node bridges two of the force's legacy radio nets into the mesh and hands the subnet to HAMULI

SPECIFICATIONS · DESIGN TARGETS

HANDHELD	390 g with battery, 2 W or 5 W output, 12 h voice and data; headset 85 g
VEHICLE NODE	3.4 kg, 20 W output on 24 V vehicle power, 15 km to a handheld; gateway ports for two of the force's legacy radios
MESH	up to 64 nodes per subnet, 8 hops, 40 Mbps aggregate, under 60 ms voice latency, routes rebuilt within 200 ms
RANGE	5 km handheld to handheld, 15 km handheld to vehicle, 40 km through a TIERCEL airborne relay; a GYR node adds one ground hop
BANDS	L and S band (1.35 to 2.5 GHz) plus a C band (4.4 to 5.0 GHz) module
SPEECH	4 TOPS handset processor; noise removal, report assembly within 2 s, translation of 12 language pairs offline within 1.5 s
HEARING	32 dB in-ear protection, hear-through microphones, bone-conduction whisper microphone
SECURITY AND ANTI-JAM	AES-256, FIPS 140-3 modules, over-the-air rekey, low-probability-of-intercept waveform, jamming detected and the subnet moved within 2 s, no cloud
INTERFACES	one-cable power and data bus to MALAR and MANTLE; Ethernet and serial on the vehicle node for HAMULI, PECTEN and ELEONORA tablets
ENVIRONMENT	MIL-STD-810H, IP68, -32 to +55 C

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy walks the client's signal staff through a design review of the mesh waveform, routing and over-the-air rekey, with the link budget behind every range figure on this sheet.
- A network simulation of a 64-node subnet under node loss and jamming runs on the client's own terrain data, and the 200 ms re-route and 2 s channel move are measured in it.
- The handset speech model is demonstrated on the bench against recorded battle, rotor and wind noise, scored for word accuracy before and after cleaning.
- A written acceptance-trial protocol tests every range, latency and endurance figure on the client's own range before any unit is accepted.
- Speech and translation models train on the client's recordings inside the client's network, and no audio leaves it.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

JESS puts the spoken report on the command map within 2 s, but the squad itself still coordinates by voice and memory. The team leader's tasks, each operator's position and the medic's request need one place where the whole squad can see them and act on them. ELEONORA is that place, built on the JESS mesh so it runs with no server beyond the squad. The radio carries the words, and the app keeps the squad's picture current between them.



CONCEPT VISUALIZATION · ELEONORA

ALL FIGURES ARE DESIGN TARGETS

COMMUNICATIONS AND COORDINATION · SOFTWARE · 02 OF 05

ELEONORA

ELEONORA Squad Coordination App

Eleonora's falcon nests in colonies on sea cliffs and hunts in company, many birds working one stretch of air as a team; ELEONORA puts the whole squad on one shared picture.

ONE PICTURE FOR THE SQUAD. SHARED TASKS, TRANSLATED CHAT, POSITIONS, MEDEVAC.

SUMMARY

ELEONORA is the squad's shared workspace on the JESS mesh. Team leaders assign tasks, operators see each other's positions, chat crosses languages within 1.5 s, and a medevac request reaches the medic and command within 3 s of the first tap. It runs on the handset, the MALAR display and a vehicle tablet with no server beyond the squad.

WHY FALCON ACCURACY BUILT IT

A squad on a modern network still coordinates by voice and memory. Tasks live in the team leader's head, positions are read out as grid references, coalition partners wait for an interpreter, and a casualty request goes through three retellings before an aircraft is tasked. JESS puts the transport in place, and MALAR and MANTLE already generate positions, reports and casualty alerts. Falcon Accuracy built ELEONORA so this data lands in one shared picture that every member of the squad can read and act on. The team leader gives an order once, every operator sees what is theirs, and the medic sees the casualty before anyone has to describe the wound.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits ELEONORA to the handsets, tablets, map data and symbology standard the force already issues, and to the medevac and report formats its medics and command posts use today.

TRAIN Falcon Accuracy trains the translation and speech models on the force's and its partners' languages, dialects, call signs and brevity codes, and loads the map layers of the client's theater, inside the client's network.

SET Falcon Accuracy sets task templates, medevac lines, chat retention, who may see which layer, and the priority rules to the force's own doctrine and rules of engagement, with the team leader deciding every task.

WORKS WITH

JESS · MALAR · MANTLE · HAMULI · PASSAGE · GYR · TIERCEL · PITCH · CREANCE

ELEONORA ELEONORA Squad Coordination App

DESCRIPTION

ELEONORA runs on the JESS handset, the MALAR display and a 10 inch vehicle tablet, with no server beyond the squad. Positions from MALAR and MANTLE refresh on a shared map every 2 s and show their age after 30 s without a fix. The team leader draws a task on the map, assigns it to an operator or a GYR, and sees the acknowledgment within 1 s. Chat, voice notes and photos cross the mesh translated into each operator's language within 1.5 s, with the original kept beside the translation. A nine-line medevac request is prefilled from a MANTLE casualty alert and reaches the medic and command within 3 s of the leader's tap. HAMULI syncs the picture to PITCH, and every task, message and request is signed, logged and merged when a node rejoins the mesh.

CAPABILITIES

- Shared squad map with positions from MALAR and MANTLE refreshed every 2 s, aged visibly after 30 s
- Tasks drawn on the map, assigned to an operator or a GYR and acknowledged within 1 s
- Chat, voice notes and photos translated into each operator's language within 1.5 s, original kept
- Nine-line medevac request prefilled from a MANTLE casualty alert and sent to medic and command within 3 s
- No server beyond the squad; 72 h of data held on each handset and merged when nodes rejoin
- TIERCEL clips and marked contacts shared to the squad as 50 kB thumbnails before any video crosses
- Battery, water and medical consumables per operator rolled up for the team leader every 60 s
- One interface on the handset display, the MALAR lens and a 10 inch vehicle tablet, synced to PITCH through HAMULI

SPECIFICATIONS · DESIGN TARGETS

PLATFORMS	JESS handset display, MALAR lens, 10 inch rugged vehicle tablet, the force's issued secure handsets
CAPACITY	12 to 48 operators per team picture, 4 teams in one platoon view, 200 live tasks
POSITIONS	every 2 s on the mesh, every 10 s in low-bandwidth mode, shown with age after 30 s without a fix
TRANSLATION	12 language pairs offline on the handset, text within 1.5 s, voice notes within 3 s, original kept
MEDEVAC	nine-line request prefilled from a MANTLE alert within 3 s, read receipt from the medic within 1 s of opening
BANDWIDTH	2 kbps keeps positions and tasks alive, 200 kbps adds photos and 10 s clips
STORAGE AND SYNC	72 h of squad data on each handset, AES-256 at rest, merge within 5 s of a node rejoining
LOGGING	every task, message and request timestamped and signed; export to PITCH and the after-action review
SECURITY	zero-trust device enrollment, remote wipe within 1 s of the order, no cloud, data stays inside the client's network

WHAT WE CAN VOUCH FOR TODAY

- A clickable interface prototype on a handset and a tablet is walked through with the client's team leaders and medics in a design review.
- Translated chat across three languages is demonstrated on the bench on recorded squad traffic and scored for meaning preserved.
- The sync protocol is simulated at 2 kbps and 200 kbps with nodes leaving and rejoining, and merge time is measured against the 5 s target.
- A written acceptance-trial protocol covers medevac request time, position refresh and 72 h of offline operation on the client's range.
- Positions, messages and models stay inside the client's network, and no analytics leave the device.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

ELEONORA keeps a squad coordinated within the reach of the mesh, which is 15 km to a vehicle or 40 km through a TIERCEL relay. Beyond that line the picture at command goes stale and a medevac request waits for a relay to appear. HAMULI takes the whole subnet, with its ELEONORA sync and JESS voice, and carries it to command over satellite and cellular links bonded into one path. The squad keeps working as it did, and the only change is that command now sees it.



CONCEPT VISUALIZATION · HAMULI

ALL FIGURES ARE DESIGN TARGETS

COMMUNICATIONS AND COORDINATION · HARDWARE · 03 OF 05

HAMULI

HAMULI Bonded Backhaul Terminal

Hamuli are the small hooks along each barb of a feather that lock it to the barb beside it, so a thousand barbs hold as one vane; HAMULI locks six links into one path to command and holds that path when a link fades.

SATELLITE AND CELLULAR, BONDED INTO ONE LINE TO COMMAND.

SUMMARY

HAMULI carries the squad's JESS mesh and ELEONORA picture beyond line of sight. It bonds two satellite links and up to four cellular links into one encrypted path, moves traffic between them within 500 ms when one degrades, and sets up on a vehicle roof or a tripod in 8 min.

WHY FALCON ACCURACY BUILT IT

The JESS mesh reaches 15 km to a vehicle and 40 km through a TIERCEL relay, and then the squad is on its own. A single satellite terminal fails in rain, under a tree line or when a jammer finds its uplink, and a single cellular link fails when the tower is down or the traffic is watched. Falcon Accuracy built HAMULI so that no one link carries the squad. The terminal spreads each session across every path it has, measures each path 10 times per second and shifts traffic before the operator notices. The command picture stays current while the squad moves, and the planner stops choosing between satellite and cellular.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits HAMULI to the vehicles, masts, satellite capacity and carrier contracts the force already holds, and to its command-post network through the companion switch.

TRAIN Falcon Accuracy trains the bonding engine on link measurements from the client's theater, such as rain fade, terrain masking and the carriers actually present, so the scheduler predicts a path before it fails.

SET Falcon Accuracy sets priority classes, data caps, the carriers permitted, and the emission-control policy to the force's doctrine and national spectrum rules, with the signaler able to override any path by hand.

WORKS WITH

JESS · ELEONORA · PECTEN · PASSAGE · PITCH · HOOD · TIERCEL · GYR

HAMULI HAMULI Bonded Backhaul Terminal

DESCRIPTION

HAMULI is a 12 kg terminal that bonds two satellite modems and four cellular modems into one encrypted tunnel to the command network. A flat electronically steered panel tracks low-orbit satellites at 150 Mbps down and 20 Mbps up, a 60 cm dish adds a geostationary path, and the cellular modems use SIM profiles the client controls. The bonding engine measures every path 10 times per second and moves packets within 500 ms of a path degrading, so a JESS voice call or an ELEONORA sync continues. Shaping puts ELEONORA positions and medevac requests ahead of video. A HOOD order lowers power or silences an exposing path within 1 s. It sets up in 8 min on a vehicle roof, a 3 m mast or a tripod and runs 6 h on its battery.

CAPABILITIES

- Bonds 2 satellite and 4 cellular links into one AES-256 tunnel; sessions survive the loss of any single link
- Path quality measured 10 times per second; traffic moves within 500 ms of a link degrading
- Electronically steered flat panel tracks low-orbit satellites at 150 Mbps down and 20 Mbps up at 80 km/h on the move
- Traffic shaping puts ELEONORA positions, medevac requests and JESS voice ahead of video
- Carries the whole JESS subnet and ELEONORA picture to PITCH with under 120 ms added over low-orbit paths
- HOOD emission orders lower power, change path or silence the terminal within 1 s
- Sets up in 8 min on a vehicle roof, 3 m mast or tripod; 6 h on battery, then 24 V vehicle power or 150 W solar
- Serves a command post of 48 wired and 100 wireless devices through its companion switch and access point

SPECIFICATIONS · DESIGN TARGETS

MASS AND SIZE	12 kg terminal, 62 x 48 x 9 cm panel; tripod 3 kg; vehicle roof mount 4 kg
SATELLITE	electronically steered flat panel, low-orbit constellation 150 Mbps down and 20 Mbps up, acquisition within 90 s; optional 60 cm geostationary dish 20 Mbps down and 5 Mbps up
CELLULAR	4 modems, 5G and LTE bands 600 MHz to 6 GHz, client-controlled SIM profiles, 4 carriers at once
BONDING	per-packet scheduling across 6 paths, path probes 10 per second, failover within 500 ms, forward error correction for 5 percent loss
THROUGHPUT	up to 300 Mbps aggregate down, 60 Mbps up; shaping and priority classes set by the signaler
LOCAL NETWORK	48 Gigabit Ethernet ports through the companion switch, wireless access point for 100 devices, JESS vehicle node port
POWER	90 W typical, 160 W peak; 6 h internal battery, 24 V vehicle input, 150 W solar input
SETUP	8 min from case to first packet by one signaler; 2 min to move from tripod to roof mount
SECURITY	AES-256 tunnel, FIPS 140-3 modules, zero-trust device enrollment, no cloud; traffic and keys stay inside the client's network
ENVIRONMENT	MIL-STD-810H, IP67, -32 to +55 C, operates at 80 km/h on the move

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy presents a design review of the bonding scheduler and the link budgets behind each satellite and cellular path on this sheet.
- A network simulation driven by recorded rain fade, terrain masking and jamming episodes measures failover time against the 500 ms target.
- The bonding engine is demonstrated on the bench on commercial modems with injected loss and delay, with a JESS voice call held through a link failure.
- A written acceptance-trial protocol measures setup time, throughput and on-the-move tracking on the client's own vehicles.
- SIM profiles, keys and traffic logs stay inside the client's network, and Falcon Accuracy holds none of them.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

HAMULI reaches command from anywhere with sky or a cell, but every satellite and cellular transmission radiates, and the HOOD signature map shows how far. A force that wants its staff to survive moves those emitters 3 km from the command post, and then needs a line to them that carries the terminal's full 300 Mbps without radiating in turn. PECTEN is that line, an infrared beam between two apertures that is received only inside its 30 cm footprint. The pair lets a post keep its reach while adding no backhaul signal to the spectrum.



CONCEPT VISUALIZATION · PECTEN

ALL FIGURES ARE DESIGN TARGETS

COMMUNICATIONS AND COORDINATION · HARDWARE · 04 OF 05

PECTEN

PECTEN Optical Link Terminal

The pecten is the comb of vessels inside a falcon's eye that feeds the retina and lets the eye hold a distant target; PECTEN holds an infrared beam on a terminal kilometers away.

TEN GIGABITS BETWEEN POSTS. NO RADIO FOR ANYONE TO HEAR.

SUMMARY

PECTEN is a pair of free-space optical terminals that carry 10 Gbps between a command post and its antenna site, relay mast or neighbor up to 5 km away. The infrared beam emits no radio energy and is received only inside its 30 cm footprint, so a command post can push its radiating terminals kilometers away and stay quiet.

WHY FALCON ACCURACY BUILT IT

Every satellite terminal, cellular modem and radio at a command post radiates, and the HOOD signature map shows how far. A force that wants its staff to survive moves those emitters away from the post, and then needs a line to them that carries the full traffic without radiating in turn. Fiber takes a day to lay and is cut by the first vehicle that crosses it. Falcon Accuracy built PECTEN to replace that fiber with a beam that two terminals hold on each other through wind and heat shimmer. A HAMULI terminal, a JESS vehicle node and a HOOD receiver can then sit 3 km from the staff, and the post itself radiates no backhaul signal.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits PECTEN to the masts, vehicles, fiber and switches the force already uses at its command posts and relay sites.

TRAIN Falcon Accuracy trains the pointing and link-margin models on the client's climate, such as its rain rates, dust, heat shimmer and fog seasons, and sizes the backup channel for the theater.

SET Falcon Accuracy sets emission-control behavior, failover rules and which traffic rides the beam or the radio backup to the force's doctrine and signal plan.

WORKS WITH

HAMULI · PASSAGE · JESS · HOOD · PITCH · SCREEN

PECTEN PECTEN Optical Link Terminal

DESCRIPTION

PECTEN is a 9 kg terminal with a 10 cm aperture that carries 10 Gbps to a second terminal 5 km away in clear air, or 1 Gbps at 2 km in 10 mm/h rain. A gimbal and a fast steering mirror hold the 1,550 nm beam within 20 microradians of the far aperture through mast sway and heat shimmer. Acquisition takes under 60 s. The beam is eye-safe, carries no radio energy and spreads to under 30 cm at 5 km, so a receiver outside that footprint collects no usable signal. In fog, a 2 Mbps JESS waveform keeps control and ELEONORA positions alive and reports the outage within 1 s. Terminals mount on a 3 m mast, tripod or vehicle roof, draw 45 W and connect by fiber or 10 Gigabit Ethernet to HAMULI and PASSAGE.

CAPABILITIES

- 10 Gbps full duplex out to 5 km in clear air; 1 Gbps at 2 km in 10 mm/h rain
- Beam held within 20 microradians of the far aperture through mast sway and heat shimmer
- Acquires the far terminal from a compass bearing within 60 s; re-acquires after a 10 s blockage within 2 s
- Emits no radio energy; the beam footprint under 30 cm at 5 km is the only place the link can be received
- Eye-safe 1,550 nm infrared, outside the band of image intensifiers
- Fog fallback over a 2 Mbps JESS waveform keeps control, text and ELEONORA positions alive; outage reported within 1 s
- Fits a 3 m mast, tripod or vehicle roof; 45 W, 10 Gigabit Ethernet and fiber ports
- Chains of up to 4 hops carry a command post's traffic around a ridge to emitters 3 km or more away

SPECIFICATIONS · DESIGN TARGETS

TERMINAL	9 kg, 10 cm aperture, 28 x 22 x 40 cm; mast, tripod or roof mount
RATE AND RANGE	10 Gbps to 5 km in clear air; 2.5 Gbps to 5 km in light haze; 1 Gbps at 2 km in 10 mm/h rain; link margin reported every second
WAVELENGTH AND SAFETY	1,550 nm infrared, eye-safe at the aperture, outside the band of the eye and of image intensifiers
POINTING	two-axis gimbal plus fast steering mirror, 20 microradian hold, 60 s acquisition from a compass bearing, 2 s re-acquisition
BACKUP CHANNEL	JESS vehicle waveform at 2 Mbps for control, text and ELEONORA positions in fog
INTERFACES	2 x 10 Gigabit Ethernet, 2 x single-mode fiber, 1 management port; AES-256 line encryption
POWER	45 W typical, 70 W with window heaters; 24 V vehicle power, 150 W solar input, 8 h internal battery
SETUP	two signalers, 15 min per end including coarse alignment by compass and map
ENVIRONMENT	MIL-STD-810H, IP67, -32 to +55 C, operates in winds to 20 m/s on a guyed 3 m mast

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy presents a design review of the optical link budget, the pointing loop and the eye-safety analysis behind each range and weather figure on this sheet.
- Beam wander and mast sway are simulated against recorded wind and temperature data from the client's theater.
- The pointing loop is demonstrated on the bench holding a target through induced vibration, with the hold angle measured.
- A written acceptance-trial protocol measures rate, range and re-acquisition on the client's masts across one season.
- Link telemetry stays inside the client's network, and traffic is encrypted end to end.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

PECTEN and HAMULI deliver the traffic to the command post, and there it meets the last barrier. The coalition picture arrives on one network while the staff who need it work on another of higher classification, so a watch officer re-types tracks or walks a disk across the room. PASSAGE moves that picture across in one direction within 50 ms, with the return path absent in hardware and a human deciding every release downward. The chain from the operator's whisper to the high-side display is then complete, and every crossing is logged.



CONCEPT VISUALIZATION · PASSAGE

ALL FIGURES ARE DESIGN TARGETS

COMMUNICATIONS AND COORDINATION · HARDWARE · 05 OF 05

PASSAGE

PASSAGE Data Diode Gateway

A passage falcon is a young wild bird taken on its first migration, in transit one way; PASSAGE moves data between networks in one direction only.

DATA CROSSES THE CLASSIFICATION LINE ONE WAY, ENFORCED IN HARDWARE.

SUMMARY

PASSAGE moves data between networks of different classification in one direction only, with the return path absent in hardware. It carries the coalition picture into the national network, or a sanitized picture outward, within 50 ms, checks every item against the force's own release rules, and logs each transfer for a human reviewer.

WHY FALCON ACCURACY BUILT IT

A command post runs two or three networks at different classifications, and the picture that matters often sits on the wrong one. Today a watch officer re-types a track or walks a disk across the room, and the high side sees the coalition picture 20 min late. Software guards that connect the two sides can be misconfigured or compromised. Falcon Accuracy built PASSAGE with a one-way optical path and no receive circuitry on the sending side, so the direction is a property of the hardware rather than of a rule. PITCH on the high side then sees the low-side picture within 50 ms, and nothing flows back down without a second unit and a human release decision.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits PASSAGE to the networks, racks, vehicles, data formats and security operations center the force already runs, and to its existing accreditation process.

TRAIN Falcon Accuracy trains the content filters and classifiers on the force's own documents, markings and partner formats, inside the client's network, so holds fall below 1 in 1,000 legitimate transfers.

SET Falcon Accuracy sets release rules, marking policy, two-person review thresholds and retention periods to the force's own security doctrine and national regulations, and a human decides every downward release.

WORKS WITH

PITCH · HAMULI · PECTEN · ELEONORA · JESS · HOOD · SCREEN

PASSAGE PASSAGE Data Diode Gateway

DESCRIPTION

PASSAGE is a 1U rack unit for the command post or a 4 kg case unit for a vehicle. Data enters a low-side proxy, crosses one optical fiber whose receiver exists only on the high side, and leaves a high-side proxy within 50 ms at up to 1 Gbps. The proxies rebuild each item in a fixed schema, so a track, an ELEONORA task, a chat line or a 2 GB imagery file crosses only as a verified structure, and anything that fails is held for the watch officer. Downward transfers run through a second unit and a release workstation where a human reviewer approves every item and the rule that permitted it is recorded. Filters written to the force's marking rules strip metadata and redact fields, and every transfer is hashed and logged inside the client's network.

CAPABILITIES

- One-way transfer enforced in hardware; the sending side carries no receiver and the return path does not exist
- Up to 1 Gbps at 50 ms end to end; tracks, ELEONORA tasks and chat cross as verified schema objects
- Files to 2 GB rebuilt and checked against the force's own marking and release rules; anything unknown is held for a watch officer
- Downward release requires a second unit and a human reviewer; every approval and the rule behind it are logged
- 1U rack unit for the command post, 4 kg case unit for a vehicle or a HAMULI site, 25 W, fanless
- SHA-256 hash and write-once log of every transfer kept 7 years inside the client's network
- Optional status return over a second diode carries only 32-byte transfer hashes at 1 kbps, and its proxy rejects any other payload
- Protocol breaks for 12 standard track, message, imagery and file formats, with new formats added inside the client's network

SPECIFICATIONS · DESIGN TARGETS

FORM FACTORS	1U 19 inch rack unit, 6 kg; case unit 4 kg, 32 x 24 x 12 cm; both fanless
THROUGHPUT AND LATENCY	1 Gbps sustained, 50 ms end to end for messages under 64 kB, 2 GB files in under 30 s
ENFORCEMENT	single optical fiber, transmitter on the low side only, receiver on the high side only; no copper or wireless path between the two sides
PROXIES	fixed-schema rebuild of track, message, task, imagery and file objects; 12 built-in formats, more added inside the client's network
CONTENT RULES	marking checks, field redaction, metadata stripping, file type allow list, malware scan on the low side before crossing
DOWNWARD RELEASE	second unit plus release workstation, two-person review option, every decision logged with the rule applied
LOGGING	SHA-256 hash of every transfer, write-once log kept 7 years, exported to PITCH audit and the client's security operations center
STATUS RETURN (OPTIONAL)	second diode, 32-byte hashes only, 1 kbps
POWER AND ENVIRONMENT	25 W, 24 V or mains; MIL-STD-810H, -20 to +55 C for the case unit
SECURITY	FIPS 140-3 modules, zero-trust management from the high side only, tamper-evident seals, no cloud; data stays inside the client's network

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy presents a design review of the one-way hardware path, the proxy schemas and the failure modes to the client's accreditation authority.
- The optical path is demonstrated on the bench with the return fiber physically absent, and crossing latency and throughput are measured.
- The release workflow is simulated on the client's own sample documents and tracks, with the hold rate measured against the 1 in 1,000 target.
- A written acceptance-trial protocol covers throughput, filter accuracy, logging integrity and the two-person release option.
- Filters, logs and models stay inside the client's network, and Falcon Accuracy never holds classified content.

NEXT SECTOR · 03 AIR ISR AND AUTONOMY · P. 48

Eyes above the force, from the doorway to the stratosphere. This closes Communications and Coordination. Sector 03, Air ISR and Autonomy, opens on page 48 with EYAS, TIERCEL, WAITON, SAILS and BARBARY.

03

AIR ISR AND AUTONOMY

EYES ABOVE THE FORCE, FROM THE DOORWAY TO THE STRATOSPHERE.

Air ISR is where a force buys time. A patrol that sees the crossing 90 minutes before it arrives plans the approach. A convoy with a camera 120 meters above the lead vehicle sees the second bend. A brigade with a relay at 20 kilometers keeps its radios talking across 300 kilometers of broken ground. Falcon Accuracy builds this sector as a ladder of altitude and endurance rather than a single aircraft. Every rung carries only sensors, radios and computers. Every aircraft detects on board and sends detections first, so the picture reaches PITCH over a thin link and an operator chooses what to look at next. A human approves every tasking, every decision is logged, and video and models stay inside the client's network.



IN THIS SECTOR · 5 PRODUCTS · PAGES 50 TO 59

EYAS TIERCEL WAITON SAILS BARBARY

The five products share one autonomy stack, one payload interface and one operator display, so an operator trained on one converts to the next in 2 days. EYAS Indoor Reconnaissance Drone flies the rooms and tunnels the larger aircraft cannot enter. TIERCEL ISR Drone Pair gives the squad 90 minutes of wide and close view from a backpack. WAITON Tethered Overwatch Drone holds a camera 120 meters above a vehicle for as long as the vehicle has power. SAILS Long-Endurance ISR Aircraft covers 12 hours and a 120 kilometer radius from a trailer catapult. BARBARY High-Altitude Relay Glider closes the sector from 20 kilometers, carrying the JESS net and the SAILS feed across a theater for weeks at a time. Together they are the air layer of one system that sees, recommends and protects, while your people decide.

IN THIS SECTOR · 5 PRODUCTS



EYAS p. 50
EYAS Indoor Reconnaissance Drone
Flies the room before the team enters it.



TIERCEL p. 52
TIERCEL ISR Drone Pair
Two aircraft, one mind, launched from a backpack in two minutes.



WAITON p. 54
WAITON Tethered Overwatch Drone
Eyes 120 meters up, powered by the vehicle below.



SAILS p. 56
SAILS Long-Endurance ISR Aircraft
Twelve hours over the area from a catapult on a trailer.



BARBARY p. 58
BARBARY High-Altitude Relay Glider
A relay at 20 kilometers that stays up for weeks.



CONCEPT VISUALIZATION · EYAS

ALL FIGURES ARE DESIGN TARGETS

AIR ISR AND AUTONOMY · HARDWARE · 01 OF 05

EYAS

EYAS Indoor Reconnaissance Drone

An eyas is a young falcon still in the nest, the smallest of the family and the one that has not yet flown in the open; EYAS is the smallest aircraft in the catalog and flies indoors.

FLIES THE ROOM BEFORE THE TEAM ENTERS IT.

SUMMARY

EYAS is a 180 gram ducted quadcopter that flies through doorways, stairwells, tunnels and culverts and maps them as it goes. It detects people and open routes on board and sends a floor plan, not a video stream, to the operator's MALAR display. The operator decides whether the team goes in.

WHY FALCON ACCURACY BUILT IT

Clearing a building or a tunnel puts a dismounted team within arm's reach of whatever waits inside, and the first person through the door still learns the layout by walking it. Cameras on poles see one room at a time and tie up an operator. Falcon Accuracy built EYAS so a team can map a structure in minutes from outside, with the aircraft doing the flying and the operator choosing the route. The team enters with the floor plan, the position of every person inside and the blocked routes already drawn on its goggles.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits EYAS to the MALAR goggles, JESS radios and pouch layouts the force already issues, and cuts the cage and battery for the doorways, tunnels and climate of the client's area.

TRAIN Falcon Accuracy trains its mapping and detection models on the building types, interiors, furniture and tunnel profiles of the client's theater, including the client's own training sites.

SET Falcon Accuracy sets flight limits, no-fly zones inside the structure, return rules and what the aircraft shares with the team to the force's own building-clearance drills and rules.

WORKS WITH

MALAR · JESS · TIERCEL · PITCH · LURCHER · CREANCE

EYAS EYAS Indoor Reconnaissance Drone

DESCRIPTION

EYAS is a 180 gram quadcopter with four ducted rotors in a 220 millimeter cage that survives contact with walls and door frames at 2 meters per second. It flies 20 minutes on one battery and swaps batteries in 15 seconds. A forward low-light camera, a 160 x 120 thermal core and a downward time-of-flight sensor feed an onboard computer that builds a 3D map at 5 centimeters resolution while it flies, without a satellite fix and in full darkness. It marks people, animals, open doors, stairs and blocked routes and sends the map, not video, over a 300 meter link that climbs to a TIERCEL or JESS relay. Tasked by pointing at a doorway on the MALAR display, it flies the structure itself and returns to the operator's hand. The team sees the plan before it steps inside.

CAPABILITIES

- Flies through a 60 cm doorway and up a stairwell on its own, with collision-tolerant ducted rotors
- Builds a 3D map at 5 cm resolution in flight, without satellites and in full darkness
- Marks people, animals, open doors, stairs and blocked routes on the map as it flies
- Sends the map, marks and still frames over a 300 m link; video only when the operator asks
- 20 min per battery and a 15 s battery swap; two aircraft per operator
- Tasked from the MALAR display by pointing at a doorway; returns to the operator's hand
- Under 55 dBA at 3 m, so the structure hears a fan rather than an aircraft
- Link climbs through a TIERCEL or JESS relay so the team controls it from 300 m outside the building

SPECIFICATIONS · DESIGN TARGETS

AIRCRAFT	180 g including battery, 220 mm ducted cage, 4 rotors, folds to 220 x 120 x 60 mm
ENDURANCE	20 min per battery; battery swap in 15 s; kit carries 8 batteries
SENSORS	low-light camera usable to 1 lux, 160 x 120 thermal core, forward and downward time-of-flight ranging to 8 m, 9-axis inertial unit
MAPPING	3D map at 5 cm resolution, 400 m2 of floor per flight, built on board at 10 Hz
DETECTION	people and animals marked on board to 15 m; open and blocked routes classified in flight
LINK	300 m through two interior walls to the operator, extended through a TIERCEL or JESS relay; AES-256; map and marks first, video on request
CONTROL	one operator on the MALAR display or a 600 g pocket controller; 2 aircraft per operator
ENVIRONMENT	indoor and sheltered outdoor flight, winds to 5 m/s at the doorway, -10 to +45 C, IP53; under 55 dBA at 3 m
KIT	2 aircraft, controller, 8 batteries and charger in a 1.9 kg pouch

WHAT WE CAN VOUCH FOR TODAY

- A design review of the airframe, duct and battery layout against the 180 g mass and 20 min endurance targets, with the mass budget shown line by line.
- A flight-dynamics and mapping simulation through three building types the client names, showing coverage per flight and link margin through walls.
- A bench test of the mapping stack on recorded indoor sensor data, with map resolution and detection rates reported.
- A written acceptance-trial protocol for a 20 min flight, a 60 cm doorway entry and a 400 m2 map in a client building.
- A written data-handling commitment that maps and video stay on the controller and inside the client's network, with nothing sent to Falcon Accuracy.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

EYAS answers the question inside the walls, but its 20 minute flight and 300 meter link end at the doorway. The squad also needs to see the street, the roofline and the two blocks beyond before it commits a team to the building. TIERCEL gives that outer view from a backpack, and its high aircraft carries the JESS relay that extends the EYAS link into the structure. One operator runs the inside and the outside picture from the same controller.



CONCEPT VISUALIZATION · TIERCEL

ALL FIGURES ARE DESIGN TARGETS

AIR ISR AND AUTONOMY · HARDWARE · 02 OF 05

TIERCEL

TIERCEL ISR Drone Pair

The tiercel is the male falcon, a third smaller than the female and quicker in the air; it names the small, fast surveillance aircraft.

TWO AIRCRAFT, ONE MIND, LAUNCHED FROM A BACKPACK IN TWO MINUTES.

SUMMARY

TIERCEL is a pair of small vertical take-off aircraft that fly as a team, one high to watch wide and relay the net, one low to read detail. Give them a task, not a flight plan, and they send back only what matters. The operator decides what they look at next.

WHY FALCON ACCURACY BUILT IT

A squad on foot sees to the next wall, and the drones it is issued today need a trained pilot, a flight plan and a clear channel for video. Falcon Accuracy built TIERCEL so the aircraft do the flying and the squad does the thinking. Two aircraft that share one task cover a crossing from two angles, keep the JESS net alive over the ridge and send detections rather than hours of video. The squad leader gets a picture 1.5 kilometers out within 2 minutes of stopping, and the operator's hands stay on the task rather than on the sticks.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits TIERCEL with hot-and-high rotors, dust-sealed motors or heated batteries for the client's climate, and fits the backpack, controller and charging pad to the carriers, vehicles and GYR decks the force already has.

TRAIN Falcon Accuracy trains its detection models on the vehicles, uniforms and terrain of the theater across seasons, using the client's own recorded flights.

SET Falcon Accuracy sets flight limits, airspace boundaries, lost-link behavior and what the aircraft may send to the force's airspace rules and reporting doctrine.

WORKS WITH

MALAR · JESS · PITCH · HOOD · GYR · EYAS · WAITON · BARBARY · CREANCE

TIERCEL TIERCEL ISR Drone Pair

DESCRIPTION

TIERCEL is a pair of 4.2 kilogram electric aircraft that lift vertically and cruise for 90 minutes. Both ride in one 14 kilogram backpack and fly within 2 minutes of opening it. The high aircraft orbits wide and relays the JESS net; the low one inspects what it flags. Each carries a 4K camera with 10x zoom and a thermal core; an onboard computer detects and tracks vehicles and people at 1.5 kilometers. Tasked in plain terms, such as watching a crossing, they plan the pattern themselves. Only detections and short clips cross the link until the operator asks for video. Without satellites they navigate by terrain matching and land within 30 centimeters on a GYR deck. A PITCH Edge node runs two pairs, a two-case kit runs 12 aircraft under one operator, and every approved task is logged.

CAPABILITIES

- High aircraft watches wide and relays the JESS net to 40 km; low aircraft inspects what it flags
- Both aircraft airborne within 2 min from a 14 kg backpack
- Tasked in plain terms to watch, search or follow; no waypoints
- Onboard detection and tracking of vehicles and people at 1.5 km, track handoff between aircraft in under 500 ms
- Sends detections and short clips; full video only when the operator asks
- Flies without satellites by terrain matching and lands within 30 cm on a GYR deck or a WAITON roof pad
- HOOD pod of 650 g fits in place of the zoom camera for passive radio sensing
- One operator runs 4 aircraft from a PITCH Edge node and 12 from a two-case kit; a human approves every task and every task is logged

SPECIFICATIONS · DESIGN TARGETS

AIRCRAFT	4.2 kg each, 1.6 m folding wing, electric VTOL, 90 min endurance, 20 km direct link
KIT	14 kg backpack with two aircraft, controller and two spare battery sets; both aircraft airborne within 2 min
PAYLOAD	4K camera with 10x optical zoom, 640 x 512 thermal core, laser rangefinder, 10 m position fix on a marked object; HOOD pod (650 g) fits in place of the zoom camera, endurance 78 min
COMPUTE	20 TOPS neural processor per aircraft, detection and tracking to 1.5 km
AUTONOMY	visual-inertial navigation with terrain matching, 30 cm precision landing, track handoff under 500 ms
RELAY	high aircraft carries a JESS node, 40 km handheld to handheld through the aircraft
CONTROL	4 aircraft per PITCH Edge node, 12 per PITCH two-case kit, one operator; BARBARY relay extends control beyond line of sight
ENVIRONMENT	winds to 12 m/s, IP54, -20 to +50 C, under 58 dBA at 150 m; AES-256 links

WHAT WE CAN VOUCH FOR TODAY

- A design review of the airframe, propulsion and battery against the 4.2 kg mass and 90 min endurance targets, with the mass and power budgets shown line by line.
- A flight simulation of the two-aircraft pattern over client terrain, showing coverage, link margin to 40 km and handoff timing.
- A bench test of the detection and tracking stack on recorded aerial video from the client's theater, with detection range and false-alarm rates reported.
- A written acceptance-trial protocol covering launch time, endurance, detection at 1.5 km and the 30 cm landing.
- A written data-handling commitment that video, detections and models stay inside the client's network and retrain there.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

TIERCEL flies for 90 minutes and then lands to swap batteries, so a squad that needs eyes overhead for a 10 hour halt or a convoy move must cycle aircraft and operators all day. A vehicle carries fuel and power that a 4.2 kilogram aircraft cannot. WAITON puts the same camera and detection stack on a tether above that vehicle and lets the vehicle's own power keep it aloft for the whole halt. TIERCEL then does what it does best, ranging out to inspect what WAITON flags.



CONCEPT VISUALIZATION · WAITON

ALL FIGURES ARE DESIGN TARGETS

AIR ISR AND AUTONOMY · HARDWARE · 03 OF 05

WAITON

WAITON Tethered Overwatch Drone

Waiting on is the falcon holding station high above the falconer until the game is flushed below it; WAITON holds station above its vehicle for as long as the vehicle has power.

EYES 120 METERS UP, POWERED BY THE VEHICLE BELOW.

SUMMARY

WAITON is a tethered multirotor that rises from a roof-mounted box to 120 meters and stays there while the vehicle drives at up to 40 km/h. Power and data run down the tether, so it never lands for a battery and its video travels on fiber rather than radio. It sees 8 kilometers, classifies on board and hands flagged tracks to TIERCEL and PITCH.

WHY FALCON ACCURACY BUILT IT

A convoy or a halted company sees to the next bend and no farther, and the free-flying drones that could look over it land every 90 minutes and need a clear radio channel. A vehicle has fuel for days and a roof nobody uses. Falcon Accuracy built WAITON to turn that roof into a mast 120 meters tall that goes where the vehicle goes. The crew gains a thermal and radar view 8 kilometers out that lasts the whole halt or the whole move, with video and control on a fiber tether rather than a radio link, and a watch officer who decides what to do with every track.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits the WAITON roof box to the roof rails, power buses and vehicle types the force already drives, from pickups to armored carriers, and sizes the winch and tether to the client's vehicles.

TRAIN Falcon Accuracy trains its radar and camera classifiers on the vehicles, people, animals and terrain of the client's theater, including the dust, rain and heat shimmer of its seasons.

SET Falcon Accuracy sets the station height, the wind and speed limits, the cue thresholds to PITCH and the recovery rules to the force's convoy doctrine and airspace rules.

WORKS WITH

TIERCEL · JESS · PITCH · HOOD · GYR · SCREEN · SAILS · MANTLE

WAITON WAITON Tethered Overwatch Drone

DESCRIPTION

WAITON is a 9 kilogram multirotor that lives in a 60 kilogram roof box on a 24 volt vehicle. It climbs to 120 meters in 90 seconds on a 3 millimeter tether that carries 1.2 kilowatts of power and 1 gigabit per second of data, and holds station over the vehicle at up to 40 kilometers per hour. Its gimbal carries a 4K camera with 30x zoom, a 640 x 512 thermal core and a small radar that tracks a vehicle at 8 kilometers and a person at 3 kilometers. It classifies tracks on board, sends them to PITCH, cues TIERCEL to inspect and slews the crew's display. When winds pass 18 meters per second or the crew calls it down, it reels in and lands in the box in 60 seconds. A human approves every cue it sends.

CAPABILITIES

- Climbs to 120 m in 90 s from a roof box; reels in and lands in the box in 60 s
- Holds station above the vehicle at up to 40 km/h on the move and in winds to 18 m/s
- Power and data on the tether, so it never lands for a battery and video travels on fiber rather than radio
- Radar tracks a vehicle at 8 km and a person at 3 km; the thermal core and 30x zoom camera confirm each track
- Classifies tracks on board and sends them to PITCH within 2 s; cues TIERCEL to inspect what it flags
- Landing and charging pad on the roof box for one TIERCEL aircraft
- Carries a JESS relay node that lifts the vehicle's net to 25 km
- A watch officer approves every cue; every track and decision is logged

SPECIFICATIONS · DESIGN TARGETS

AIRCRAFT	9 kg, 1.1 m across, 8 rotors in 4 coaxial pairs, 120 m station height, 60 s recovery
ROOF BOX	60 kg including winch, power converter and TIERCEL pad; 24 V vehicle supply, 1.6 kW draw in the climb, 1.1 kW on station
TETHER	3 mm, 130 m, 1.2 kW power and 1 Gbps optical data, rated to 1.2 kN
SENSORS	4K camera with 30x optical zoom, 640 x 512 thermal core, laser rangefinder, radar tracking a vehicle at 8 km and a person at 3 km with a 90 degree sector scan each second
COMPUTE	40 TOPS on the aircraft, 2,000 tracks, person and vehicle classification to 3 km, cue to PITCH within 2 s
RELAY	JESS node at 120 m, 25 km handheld to handheld through the aircraft
MOBILITY	station keeping at up to 40 km/h on roads and 20 km/h cross-country; automatic recovery above 18 m/s wind or on crew command
ENVIRONMENT	IP55, -30 to +50 C, rain to 10 mm/h; under 60 dBA on the ground below at 120 m
SECURITY	no radio link for video or control, AES-256 on the vehicle bus; hover and controlled descent on a 5 min reserve battery if the tether parts

WHAT WE CAN VOUCH FOR TODAY

- A design review of the tether, winch and power chain against the 120 m height, 1.2 kW and 40 km/h targets, with wind-load and cable-drag calculations.
- A simulation of station keeping over a client convoy route at 40 km/h in an 18 m/s crosswind.
- A bench test of the radar and camera detection stack on recorded roadside data, with range and false-alarm rates reported.
- A written acceptance-trial protocol covering climb time, 8 h on station over a moving vehicle, a vehicle track at 8 km and a 60 s recovery.
- A written data-handling commitment that video and tracks stay on the vehicle and inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

WAITON sees 8 kilometers from 120 meters, enough for a convoy but not for a brigade boundary, a coastline or a 100 kilometer supply route. Persistent watch over a wide area needs an aircraft that cruises for hours at altitude and carries a heavier sensor. SAILS is that aircraft, catapult launched from the same vehicle class that carries WAITON, with 12 hours of endurance and a 120 kilometer radius. WAITON guards the launch and recovery site while SAILS is out.



CONCEPT VISUALIZATION · SAILS

ALL FIGURES ARE DESIGN TARGETS

AIR ISR AND AUTONOMY · HARDWARE · 04 OF 05

SAILS

SAILS Long-Endurance ISR Aircraft

The sails are the falconer's word for the falcon's long wings, the surfaces that carry it for hours on the wind; SAILS is the aircraft that stays up for 12 hours on a 5.2 meter wing.

TWELVE HOURS OVER THE AREA FROM A CATAPULT ON A TRAILER.

SUMMARY

SAILS is a 55 kilogram fixed-wing aircraft launched from a trailer catapult and recovered by parachute or net, with 12 hours of endurance and a 120 kilometer radius. It carries a stabilized camera turret and a wide-area mapping camera, detects on board and sends tracks to PITCH. A crew of two flies it, and a watch officer decides what it looks at.

WHY FALCON ACCURACY BUILT IT

A brigade boundary, a coastline or a 100 kilometer supply route needs watching for a day at a time, and small electric aircraft last 90 minutes. Crewed aircraft cost flight hours the force does not have for routine watch. Falcon Accuracy built SAILS to give a battalion or brigade its own 12 hour watch from a trailer it tows itself, with no runway. The staff gets a wide-area picture and a close look on demand, the aircraft detects on board so a thin link carries it, and the decision on what to look at stays with the watch officer.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits the SAILS trailer to the tow hooks, vehicles and 24 V power the force already has, and fits the ground station into the client's command vehicles and PITCH kits.

TRAIN Falcon Accuracy trains its detection and mapping models on the vehicles, boats, roads and terrain of the client's theater across seasons, using the client's own recorded flights after each sortie.

SET Falcon Accuracy sets airspace boundaries, altitude blocks, lost-link behavior, recovery sites and what the aircraft sends to the force's airspace rules and reporting doctrine.

WORKS WITH

PITCH · JESS · HOOD · BARBARY · WAITON · TIERCEL · CREANCE · SCREEN

SAILS SAILS Long-Endurance ISR Aircraft

DESCRIPTION

SAILS is a 55 kilogram aircraft with a 5.2 meter wing and a heavy-fuel engine that cruises at 110 kilometers per hour for 12 hours. A pneumatic catapult on a towed trailer launches it in 30 seconds, and it comes home by parachute onto a 50 by 50 meter field or into a net on the trailer. The nose turret carries a 4K camera with 40x zoom, a 1280 x 1024 thermal core and a laser rangefinder, and the belly carries a mapping camera that covers 200 square kilometers per hour at 15 centimeters resolution. It detects and tracks vehicles, boats and people at 5 kilometers and sends tracks, not video, over a 120 kilometer link or through BARBARY. A crew of two launches, flies and recovers it, and PITCH shows the watch officer where to look next.

CAPABILITIES

- 12 h endurance at 110 km/h cruise, 120 km radius on the direct link, farther through BARBARY
- Launched in 30 s from a pneumatic catapult on a towed trailer; no runway
- Recovered by parachute and airbag onto a 50 by 50 m field, or into the trailer net
- Onboard detection and tracking of vehicles, boats and people at 5 km; the turret confirms a vehicle at 15 km
- Mapping camera covers 200 km2 per hour at 15 cm resolution and refreshes the CREANCE terrain twin
- Sends tracks and clips first, full video on request; the link falls back to text tracks at 50 kbps
- Payload bay takes a HOOD receiver pod or a JESS relay node in place of the mapping camera
- Crew of two; PITCH proposes the next look, a watch officer approves it, and every tasking is logged

SPECIFICATIONS · DESIGN TARGETS

AIRCRAFT	55 kg maximum take-off mass, 5.2 m wing, 2.4 m long, folds into two trailer cases in 10 min
PERFORMANCE	110 km/h cruise, 160 km/h dash, 12 h endurance, service ceiling 5,000 m, 120 km radius on the direct link
PROPULSION	heavy-fuel engine with a 1.5 kW generator, under 55 dBA on the ground from 1,000 m altitude
LAUNCH AND RECOVERY	pneumatic catapult on a 1,200 kg trailer, 30 s launch, 4 min reload; parachute and airbag recovery onto 50 x 50 m, or trailer net in winds to 12 m/s
SENSORS	turret with 4K camera, 40x optical zoom, 1280 x 1024 thermal core and laser rangefinder; belly mapping camera, 200 km2/h at 15 cm
COMPUTE	60 TOPS, detection and tracking to 5 km, 5,000 tracks, cue to PITCH within 2 s
PAYLOAD BAY	12 kg, 150 W; HOOD pod (6 kg, 30 MHz to 18 GHz) or JESS relay node in place of the mapping camera
LINK	120 km line of sight at 20 Mbps, 50 kbps text fallback, BARBARY relay beyond line of sight; AES-256; lost link returns the aircraft to the recovery point
CREW AND KIT	2 operators, the trailer plus one tow vehicle, 2 aircraft per trailer; first launch 45 min after the halt
ENVIRONMENT	winds to 15 m/s at launch, rain, -30 to +50 C, IP55 on the ground segment

WHAT WE CAN VOUCH FOR TODAY

- A design review of the airframe, engine and fuel system against the 55 kg mass and 12 h endurance targets, with the mass, fuel and power budgets shown line by line.
- A flight-performance and link simulation over client terrain showing endurance, radius and line-of-sight coverage with and without BARBARY.
- A bench test of the detection stack on recorded aerial video from the client's theater, with detection range and false-alarm rates reported.
- A written acceptance-trial protocol covering a 30 s catapult launch, a 12 h sortie, detection at 5 km, a 200 km2 map and a net recovery.
- A written data-handling commitment that video, maps, tracks and models stay inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

SAILS sends detections home over a 120 kilometer line-of-sight link, but over broken ground every ridge between the aircraft and the ground station blocks that link, and it ends at the radio horizon. A force spread across 300 kilometers needs a relay that none of its vehicles or small aircraft can carry. BARBARY lifts a relay payload to 20 kilometers and holds station for weeks on solar power, so SAILS, TIERCEL and every JESS vehicle node below it share one net. With BARBARY above, the sector becomes a single picture rather than five separate feeds.



CONCEPT VISUALIZATION · BARBARY

ALL FIGURES ARE DESIGN TARGETS

AIR ISR AND AUTONOMY · HARDWARE · 05 OF 05

BARBARY

BARBARY High-Altitude Relay Glider

The Barbary falcon holds the high desert cliffs of North Africa and hunts above the heat and haze where little else flies; BARBARY holds station at 20 kilometers, above the weather and the horizon.

A RELAY AT 20 KILOMETERS THAT STAYS UP FOR WEEKS.

SUMMARY

BARBARY is a solar-electric glider with a 32 meter wing that climbs to 20 kilometers and holds station for 30 days in summer on sunlight alone. It carries 12 kilograms of relay and sensing payload that joins JESS vehicle nodes, SAILS links and PITCH kits across a 400 kilometer circle. Three operators launch it from a 300 meter strip, and it relays only what the force's own nodes send through it.

WHY FALCON ACCURACY BUILT IT

A force spread across a theater loses its net at every ridge and at the radio horizon, and satellite time is rented, contested and slow to task. Towers take days to raise and mark the position of whoever builds them. Falcon Accuracy built BARBARY to give the force its own relay above the weather, launched from its own ground and flown for weeks without fuel. Every JESS vehicle node, SAILS aircraft and PITCH kit under its footprint shares one picture, and the force decides what flies, where it holds and what it carries.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits the BARBARY relay payload to the JESS, SAILS and PITCH kits the force already runs, and fits the ground container to the client's strips, power and vehicles.

TRAIN Falcon Accuracy trains its flight planner on the client's seasonal winds, airspace structure and station areas, and its optional camera and HOOD models on the client's theater.

SET Falcon Accuracy sets station areas, altitude blocks, handover rules, what traffic the relay carries and the lost-link recovery zones to the force's airspace rules and communications doctrine.

WORKS WITH

JESS · PITCH · SAILS · TIERCEL · HOOD · WAITON · SCREEN

BARBARY BARBARY High-Altitude Relay Glider

DESCRIPTION

BARBARY is a 160 kilogram solar-electric glider with a 32 meter wing, four electric motors and a 20 kilowatt-hour battery that carries it through the night. It takes off from a 300 meter strip, climbs to 20 kilometers in 6 hours and holds a 10 kilometer station circle above the weather and the airline lanes. In summer at mid-latitudes it stays up for 30 days; in winter it flies 7 days and lands for a crew check. Its 12 kilogram payload is a JESS relay node, a data relay for SAILS and TIERCEL and an optional wide-area camera, serving a 400 kilometer circle on the ground. It logs every link it carries. Three operators launch, fly and recover it, and PITCH schedules handovers between two aircraft so one can land for maintenance while the other holds the station.

CAPABILITIES

- Climbs to 20 km in 6 h from a 300 m strip and holds a 10 km station circle above the weather
- 30 days aloft in summer at mid-latitudes on solar power, 7 days in winter
- 12 kg relay payload joins JESS vehicle nodes, SAILS and TIERCEL links and PITCH kits across a 400 km circle
- Two aircraft hand the station over so one lands for maintenance while the other holds it
- Optional 4 kg wide-area camera maps 2,000 km2 per hour at 1 m resolution
- Optional HOOD receiver pod listens across the theater from 20 km; BARBARY itself relays only the force's own traffic
- Every link carried is logged; flight and payload decisions rest with the ground crew and the watch officer
- BARBARY Loft balloon variant lifts the same payload to 20 km within 2 h of arrival for a 14 day flight

SPECIFICATIONS · DESIGN TARGETS

AIRCRAFT	160 kg maximum take-off mass, 32 m wing, 12 kg payload, 4 electric motors, solar cells over 60 m2 of wing
PERFORMANCE	20 km station altitude, 6 h climb, 10 km station circle, 95 km/h true airspeed at altitude
ENDURANCE	30 days in summer and 7 days in winter at 45 degrees latitude, 20 kWh battery for the night
LAUNCH AND RECOVERY	300 m paved or hard dirt strip, dolly take-off, landing on the same strip in winds to 8 m/s
RELAY PAYLOAD	JESS vehicle-node relay to 200 km, 100 Mbps data trunk to SAILS, TIERCEL and PITCH kits, 2 directional and 1 omnidirectional antenna
OPTIONS	4 kg wide-area camera, 2,000 km2/h at 1 m; HOOD receiver pod, 30 MHz to 18 GHz, receive only
GROUND SEGMENT	3 operators, one 6 m container with the ground station, antennas and spares for 2 aircraft
VARIANT	BARBARY Loft, a 20 km stratospheric balloon carrying the same 12 kg payload for 14 days, launched from a 100 m clearing within 2 h, with a steered descent to a recovery zone the crew chooses
SECURITY	AES-256 on every link, no relayed data stored on the aircraft, lost link glides to a preset recovery zone; every link logged on the ground station
ENVIRONMENT	-70 C at altitude, launch and landing in -20 to +45 C, winds to 8 m/s on the strip

WHAT WE CAN VOUCH FOR TODAY

- A design review of the wing, solar array and battery against the 20 km altitude and 30 day summer endurance targets, with the day and night energy budget shown month by month for the client's latitude.
- A station-keeping simulation over the client's airspace using 10 years of recorded upper-air wind data.
- A bench test of the relay payload joining JESS, SAILS and PITCH nodes over a ground link at the design data rates.
- A written acceptance-trial protocol covering the climb to 20 km, 7 days on station, relay coverage across 200 km and the landing.
- A written data-handling commitment that relayed traffic is not stored on the aircraft and that link logs stay inside the client's network.

NEXT SECTOR · 04 LOW-ALTITUDE AIRSPACE AWARENESS · P. 60

See the small sky. Know what is in it. Tell the right person in two seconds. This closes Air ISR and Autonomy. Sector 04, Low-Altitude Airspace Awareness, opens on page 60 with WAKE and STANNEL.

SECTOR 04 OF 18

04

LOW-ALTITUDE AIRSPACE AWARENESS

SEE THE SMALL SKY. KNOW WHAT IS IN IT. TELL THE RIGHT PERSON IN TWO SECONDS.

Small drones changed what a base, a port and a patrol have to watch. A quadcopter bought for 600 dollars flies at 60 km/h, carries a camera that reads a license plate at 300 m and is heard, if at all, 200 m out. The guard force that handles it today uses a pair of binoculars, a radio and good luck, and learns about most flights when a video appears online the next day. Falcon Accuracy treats the air below 1,000 m as one more layer of the perimeter, with sensors that detect and a picture that classifies, locates the pilot and tells the watch officer what is there.



IN THIS SECTOR · 2 PRODUCTS · PAGES 62 TO 65

WAKE **STANNEL**

SECTOR 04 · LOW-ALTITUDE AIRSPACE AWARENESS

The sector runs in that order. WAKE Drone Detection Mast hears a drone's radio link out to 5 km and sees its airframe on radar out to 3 km, then confirms the type with a camera. STANNEL Low-Altitude Air Picture turns those detections into a small number of classified tracks, keeps the force's own aircraft apart from unknown ones, and hands the watch officer the evidence, the pilot location and the people to notify. Both feed PITCH, so the low sky sits in the same picture as the ground and the spectrum.

IN THIS SECTOR · 2 PRODUCTS



WAKE p. 62

WAKE Drone Detection Mast

Hears the link. Sees the airframe. Names the type in two seconds.



STANNEL p. 64

STANNEL Low-Altitude Air Picture

Three hundred detections. Three tracks. One clear picture.



CONCEPT VISUALIZATION · WAKE

ALL FIGURES ARE DESIGN TARGETS

LOW-ALTITUDE AIRSPACE AWARENESS · HARDWARE · 01 OF 02

WAKE

WAKE Drone Detection Mast

Waking is the falconer's all-night watch beside a newly taken hawk; WAKE is the mast that keeps the all-night watch over the low sky.

HEARS THE LINK. SEES THE AIRFRAME. NAMES THE TYPE IN TWO SECONDS.

SUMMARY

WAKE is a trailer or tripod mast that detects small drones by their radio links out to 5 km and by radar out to 3 km, confirms them with a thermal camera and names the type within 2 s. It stands in 20 min and feeds STANNEL and PITCH over JESS.

WHY FALCON ACCURACY BUILT IT

A base can see a vehicle at 6 km with SCREEN radar and still miss a 1.2 kg quadcopter at 400 m, because small drones fly low, reflect little and sound like wind. Guards learn about them when a video appears online the next day. Falcon Accuracy built WAKE so the first warning comes from the drone's own radio link, which is loud, distinctive and present from the moment it powers on, and the radar and camera then confirm what the radio heard. The force gains a detection layer that stands in 20 min, runs unattended for three days and tells the watch officer the drone type, its bearing and where its pilot is standing.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits WAKE to the force's trailers, tripods and tower mounts and to the SCREEN radar and camera positions already on site, so the mast fills the gaps in the existing picture rather than repeating it.

TRAIN The waveform library and the radar classifier are trained on the drone types actually recorded in the client's theater and on the birds, weather and traffic of each site during a two-week baseline.

SET Alert thresholds, protected zones and who is told first are set to the guard force's own procedures and language, and the national frequency plan is loaded into every receiver.

WORKS WITH

STANNEL · PITCH · SCREEN · HOOD · JESS · BLOCK

WAKE WAKE Drone Detection Mast

DESCRIPTION

WAKE is a 6 m telescoping mast on a 750 kg trailer or a 40 kg tripod set. At the top, a four-channel receiver covers 70 MHz to 6 GHz and recognizes drone control and video links from a library of 400 waveforms, giving a bearing within 3 degrees and a detection range of 5 km on a consumer quadcopter. Four flat radar panels give a 360 degree picture of the air out to 3 km for a 1 kg airframe and separate birds from rotors by their motion within 2 s. A thermal and daylight camera on a pan-tilt head slews to the track and confirms the type at 1.5 km. Everything runs on the mast's own computer, and a detection reaches STANNEL and PITCH over JESS within 1 s.

CAPABILITIES

- Radio detection of drone control and video links from 70 MHz to 6 GHz, 5 km on a consumer quadcopter, bearing within 3 degrees
- Radar detection of a 1 kg airframe at 3 km with 360 degree coverage each second; birds separated from rotorcraft within 2 s
- Thermal and daylight confirmation of the type at 1.5 km on a pan-tilt head that slews within 1 s of a cue
- Drone type named from a 400-waveform library within 2 s; unknown links flagged for the analyst
- Pilot location estimated from the control-link bearings of two or more masts within 50 m at 2 km
- Detections reach STANNEL and PITCH over JESS within 1 s; the mast works alone and stores 30 days of tracks if the network is down
- Raises in 20 min, runs 72 h unattended on battery and fuel cell, survives 120 km/h winds

SPECIFICATIONS · DESIGN TARGETS

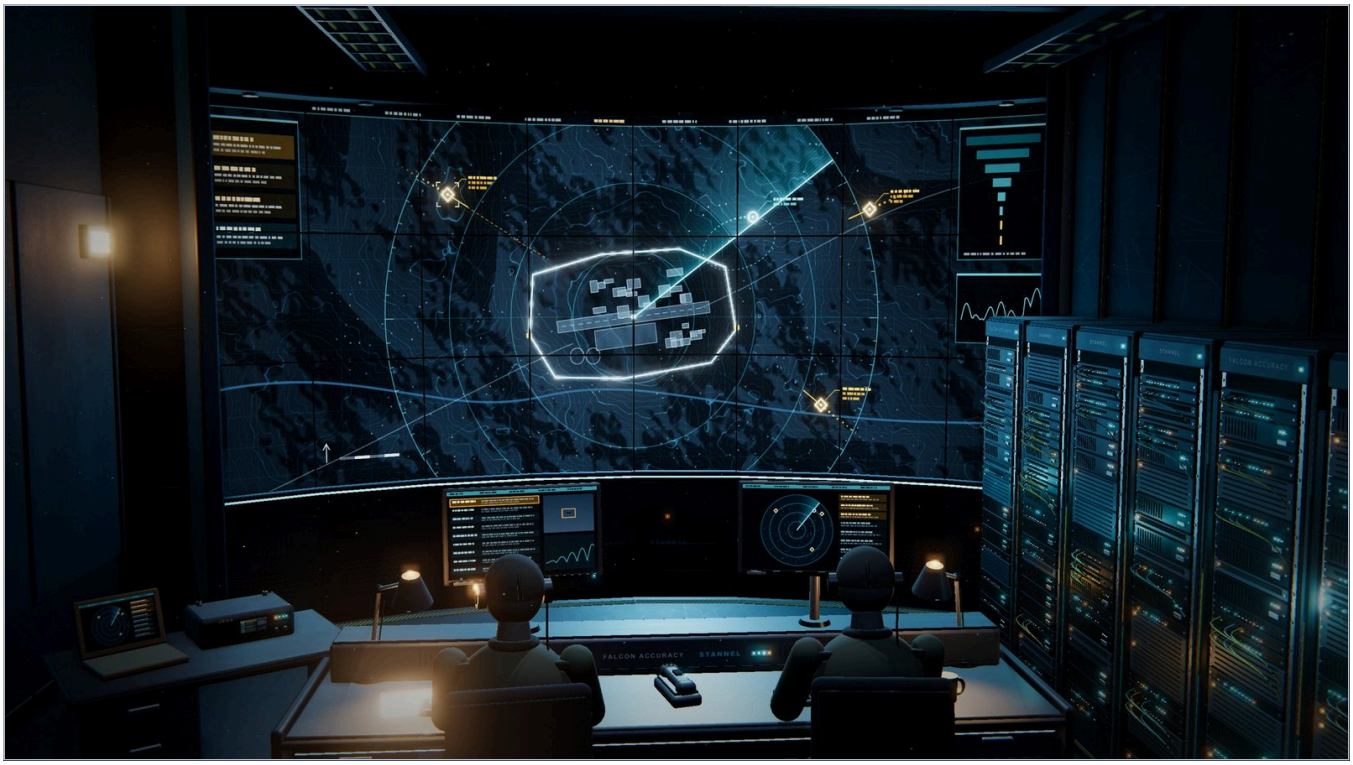
MAST	6 m telescoping, trailer 750 kg or tripod set 40 kg in three cases
RADIO RECEIVER	4 channels, 70 MHz to 6 GHz, 400-waveform library, bearing within 3 degrees, 5 km on a consumer quadcopter
RADAR	four panels, 360 degree coverage per second, 1 kg airframe at 3 km, 5 kg airframe at 5 km, bird separation within 2 s
CAMERA	640 x 512 thermal core and 4K daylight camera with 30x zoom on a pan-tilt head, type confirmation at 1.5 km
COMPUTER	on-mast classification, 30 days of local track storage, JESS and Ethernet links
POWER	72 h on battery and fuel cell, 24 h on battery alone, solar top-up 400 W
SETUP	20 min with two people, 10 min for the tripod set
ENVIRONMENT	minus 30 to plus 55 C, 120 km/h wind, IP66

WHAT WE CAN VOUCH FOR TODAY

- A design review of the receiver, radar and mast with the ranges above as acceptance figures a buyer can test on a range
- A bench demonstration of radio-link recognition on recorded drone waveforms within 90 days of contract
- A written trial protocol for the two-week site baseline and the acceptance test, including bird and weather false-alarm limits
- Detection data stays inside the client's network, and every detection, classification and alert is logged with its time and evidence

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

A mast that detects everything that flies produces a wall of alerts, and a guard force that hears 200 alerts a night stops listening by the third. Detection on its own is noise. STANNEL exists because the force needs detections turned into a small number of classified tracks with a pilot location, a confidence and a notification list, so the watch officer looks at three things, not three hundred, and the force's own drones never appear as strangers.



CONCEPT VISUALIZATION · STANNEL

ALL FIGURES ARE DESIGN TARGETS

LOW-ALTITUDE AIRSPACE AWARENESS · SOFTWARE · 02 OF 02

STANNEL

STANNEL Low-Altitude Air Picture

Stannel is the old English name for the small falcon that hangs on the wind over one field, head held still, and reads everything that moves beneath it; STANNEL holds the low sky the same way.

THREE HUNDRED DETECTIONS. THREE TRACKS. ONE CLEAR PICTURE.

SUMMARY

STANNEL fuses WAKE masts, SCREEN radar, HOOD receivers and sightings from MALAR and TIERCEL into one picture of the air below 1,000 m. It classifies each track, estimates where the pilot stands, keeps the force's own aircraft apart from unknown ones and tells the right people with the evidence attached.

WHY FALCON ACCURACY BUILT IT

Every sensor on a base sees a different piece of the same drone, and each one raises its own alarm. The watch officer ends up with four displays, four alarms and no single answer about what is overhead. Falcon Accuracy built STANNEL as the air layer of PITCH, so every detection below 1,000 m lands in one picture with one track number, one classification and one notification list. The force gains a watch officer who understands the low sky in 10 s instead of hunting through displays, friendly drones that are never mistaken for strangers, and a log that shows later exactly what was seen, when, and who was told.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits STANNEL to the sensors, displays and air-traffic feeds the site already has through FURCULA gateways and to the PITCH node or the two-case kit the force prefers.

TRAIN The classifier is trained on the drones, birds and aircraft recorded at the client's own sites during the WAKE baseline and on the force's own drone fleet so friendly types are known by sight as well as by token.

SET Alert thresholds, protected zones, the notification lists and who may confirm them are set to the guard force's rules and chain of approval, in its language.

WORKS WITH

WAKE · PITCH · SCREEN · HOOD · RAKE · WAITON · TIERCEL · MALAR · LEASH · FURCULA · LONGWING

STANNEL STANNEL Low-Altitude Air Picture

DESCRIPTION

STANNEL runs on a PITCH node or on its own two-case kit and takes feeds from WAKE, SCREEN radar in air mode, HOOD, RAKE, WAITON, TIERCEL and MALAR sightings. It fuses them into tracks within 1 s, classifies each track as bird, consumer quadcopter, fixed-wing drone, helicopter or aircraft with a calibrated confidence, and estimates the pilot's position from control-link bearings. The force's own aircraft carry their identity through LEASH, so TIERCEL and RAKE never appear as unknowns. For each unknown track STANNEL shows the time to the fence, the assets beneath it, the nearest guard patrol and the people to notify, from the watch officer to the local air traffic unit, and sends the notifications the watch officer confirms. Every track and notification is logged with the picture as it stood at that second.

CAPABILITIES

- Fuses WAKE, SCREEN, HOOD, RAKE, WAITON, TIERCEL and MALAR detections into tracks within 1 s of receipt
- Classifies each track as bird, consumer quadcopter, fixed-wing drone, helicopter or aircraft with a calibrated confidence refreshed every second
- Estimates the pilot's position from two or more control-link bearings within 50 m at 2 km and shows the nearest guard patrol
- The force's own aircraft identified through LEASH, so no friendly drone is ever shown as an unknown
- Time to fence, assets beneath the track and a notification list shown for every unknown track within 2 s of classification
- One-action confirmation sends notifications to the guard force, the watch officer and the local air traffic unit, each logged with the picture at that second
- Works offline on a two-case kit for a forward site and resynchronizes with PITCH when the link returns

SPECIFICATIONS · DESIGN TARGETS

CAPACITY	2,000 simultaneous air tracks and 40 sensor feeds per node
LATENCY	detection to track under 1 s; classification refresh 1 s; notification list within 2 s
CLASSIFICATION	five classes with calibrated confidence; target false classification below 2 percent after the site baseline
PILOT LOCATION	within 50 m at 2 km from two bearings, within 25 m from three
FRIENDLY IDENTITY	LEASH tokens for TIERCEL, RAKE, WAITON and client aircraft; manual entry for visitors
FORM	module on a PITCH node, or two-case kit with 8 operator positions and 4 h of battery
LOGGING	every track, classification and notification with the picture as it stood, retained per client policy
INTERFACES	JESS, Ethernet, the client's air-traffic feed through a FURCULA gateway

WHAT WE CAN VOUCH FOR TODAY

- A working demonstration of fusion and classification on recorded sensor data from a test site within 120 days of contract
- A design review of the notification workflow and the log with the client's legal and operations staff before any trial
- A written acceptance test that measures track latency, classification error and friendly-identity errors on a live range day
- All air picture data stays inside the client's network and every notification is logged with its evidence

NEXT SECTOR · 05 AIR AND MISSILE WARNING · P. 66

See early, warn fast, shelter people, recover the same day. This closes Low-Altitude Airspace Awareness. Sector 05, Air and Missile Warning, opens on page 66 with LONGWING, KETTLE, BECK, MEWS, SOOTY and IMPING.

05

AIR AND MISSILE WARNING

SEE EARLY, WARN FAST, SHELTER PEOPLE, RECOVER THE SAME DAY.

Against aircraft, drones and missiles, the time between detection and arrival is measured in minutes, sometimes fewer than 5, and what a force does with those minutes decides who is hurt. Most warning chains lose the minutes in hand-offs. A radar sees the track, one office phones another, a siren sounds without saying where to go, and the nearest shelter is a 10 minute walk away. After an attack, a runway can stay closed for a day while engineers walk it. Falcon Accuracy builds the protective half of air and missile defense. Every product in this sector is unarmed. It senses, warns, shelters, misleads the adversary's surveillance and recovers, and it destroys and intercepts nothing.



IN THIS SECTOR · 6 PRODUCTS · PAGES 68 TO 79

LONGWING KETTLE BECK MEWS SOOTY IMPING

SECTOR 05 · AIR AND MISSILE WARNING

The products work as one chain. LONGWING Early Warning Radar tracks aircraft, drones and missiles from the ground and estimates time of arrival and the area at risk. KETTLE Launch Warning Constellation sees the heat of a launch from orbit before any ground radar can. BECK Civil Alert Network turns a confirmed warning into an alert on every phone, siren, radio and road sign in the region within 10 seconds and names the nearest shelter. MEWS Protective Shelter Module puts that shelter within reach in a day. SOOTY Decoy and Camouflage Kit hides the force's real equipment and shows full-size copies elsewhere, so the adversary's effort lands on fabric. IMPING Airfield Recovery System surveys a damaged runway in 30 minutes and gets aircraft flying again. A watch officer confirms every warning, two people release every public alert, every decision is logged, and all data stays inside the client's network.

IN THIS SECTOR · 6 PRODUCTS



LONGWING p. 68
LONGWING Early Warning Radar
Sees 400 km out. Buys the minutes that fill the shelters.



KETTLE p. 70
KETTLE Launch Warning Constellation
Sees the heat of a launch from orbit. Warns within 30 seconds.



BECK p. 72
BECK Civil Alert Network
Every phone, siren, radio and road sign, within 10 seconds.



MEWS p. 74
MEWS Protective Shelter Module
Placed by crane in a day. Shelters 45 people for 72 hours.



SOOTY p. 76
SOOTY Decoy and Camouflage Kit
Hide what is real. Show what is not.



IMPING p. 78
IMPING Airfield Recovery System
Surveys the runway in 30 minutes. Aircraft fly again the same day.



CONCEPT VISUALIZATION · LONGWING

ALL FIGURES ARE DESIGN TARGETS

AIR AND MISSILE WARNING · HARDWARE · 01 OF 06

LONGWING

LONGWING Early Warning Radar

Longwing is the falconer's name for the true falcons, the long-winged birds that hunt the open sky and see their quarry from the greatest range; LONGWING is the radar that sees farthest.

SEES 400 KM OUT. BUYS THE MINUTES THAT FILL THE SHELTERS.

SUMMARY

LONGWING is a transportable long-range early-warning radar on two trailers, one carrying the antenna and one the power. It tracks aircraft at 400 km, ballistic missiles at 800 km and drones and cruise missiles to the radar horizon, estimates when each will arrive and which area is at risk, and hands every confirmed track to PITCH and BECK. A watch officer confirms every warning before it leaves the cabin.

WHY FALCON ACCURACY BUILT IT

A warning is worth the minutes it buys, and most forces get their minutes from fixed radars that an adversary mapped years ago or from a partner's network they do not control. A fixed site also cannot follow the force to a new base, port or city. Falcon Accuracy built LONGWING so a force owns its own long-range watch, moves it on two trailers and has it tracking within 4 hours of arrival. The force gains its own estimate of time of arrival and area at risk, passed straight to the people who sound the alarm, with a watch officer deciding each warning.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits LONGWING to the tractors, generators, fuel and transport routes the force already uses, and feeds the radars it already owns into the same track picture.

TRAIN Falcon Accuracy trains the track classifier on the client's theater, including its terrain clutter, weather, bird migration, civil air traffic and the drone and missile tracks recorded on its own ranges.

SET Falcon Accuracy sets warning thresholds, alert areas and confirmation steps to the client's air defense doctrine and civil protection rules, and every threshold change is approved and logged.

WORKS WITH

KETTLE · BECK · MEWS · SOOTY · PITCH · HOOD · JESS · LAGGAR · CALAMUS · LURE

LONGWING LONGWING Early Warning Radar

DESCRIPTION

LONGWING is a transportable S-band early-warning radar carried on two trailers. The antenna trailer raises a 7 by 4 meter active array on an 8 meter mast that turns at 6 revolutions per minute, and the power trailer carries two 250 kilowatt generators, 72 hours of fuel and the crew cabin. A crew of six has it tracking within 4 hours of arrival. It tracks an aircraft of 2 square meters radar cross-section at 400 kilometers, a ballistic missile at 800 kilometers, a medium drone at 150 kilometers and a low-flying cruise missile at the radar horizon, about 40 kilometers for an object flying at 50 meters. For each track it estimates time of arrival within 20 seconds and draws the area at risk. A watch officer confirms every warning before it reaches PITCH and BECK. LONGWING cues no weapon.

CAPABILITIES

- Tracks an aircraft of 2 square meters radar cross-section at 400 km and a ballistic missile at 800 km
- Tracks a medium drone at 150 km, a small one-way drone at 60 km and a low-flying cruise missile at the radar horizon, about 40 km for an object flying at 50 m
- Estimates time of arrival within 20 s and draws the area at risk as an ellipse that tightens with each 10 s update
- Holds 1,000 tracks at once, with 360 degree coverage every 10 s and a staring mode on a 90 degree sector every 2 s
- A crew of 6 has it tracking within 4 h of arrival and packed for the road within 2 h
- A watch officer confirms every warning before it reaches PITCH or BECK; the radar proposes and never releases an alert by itself
- Takes a launch point and heading from KETTLE and searches that sector first, so the track starts as soon as the missile clears the horizon
- Cues no weapon; its tracks feed warning, shelter and recovery decisions only, each logged with its evidence

SPECIFICATIONS · DESIGN TARGETS

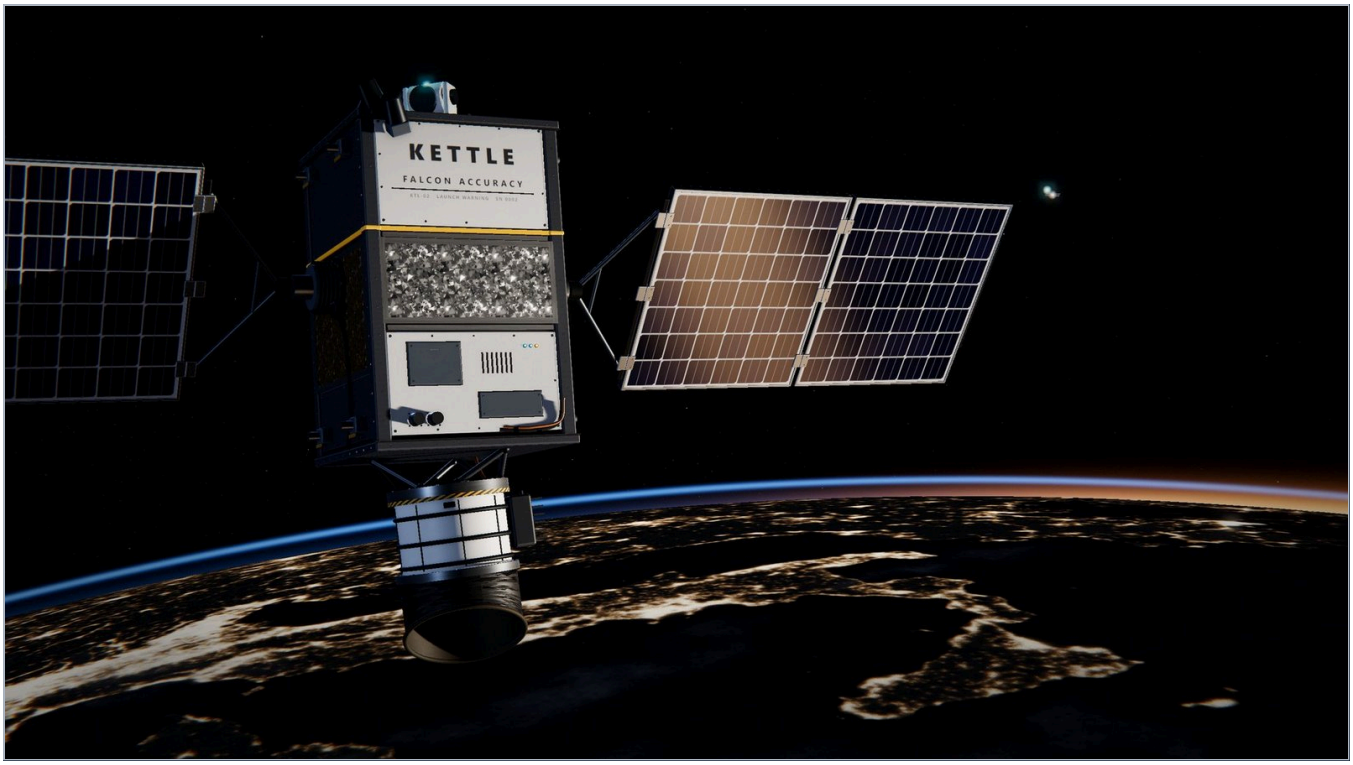
ANTENNA TRAILER	7 m by 4 m S-band active array on an 8 m mast, 24 t, towed at 60 km/h by a heavy tractor
POWER TRAILER	two 250 kW diesel generators, one on standby, 72 h of fuel, crew cabin with 2 watch positions, 18 t
DETECTION	aircraft of 2 square meters at 400 km, ballistic missile at 800 km, medium drone at 150 km, small drone at 60 km
LOW-ALTITUDE COVERAGE	to the radar horizon, about 40 km for an object flying at 50 m and 25 km at 15 m
COVERAGE	360 degrees every 10 s at 6 rpm, elevation 0 to 70 degrees, staring sector of 90 degrees every 2 s
TRACKING	1,000 simultaneous tracks, time of arrival within 20 s, area at risk updated every 10 s
SETUP	crew of 6, 4 h from arrival to first track, 2 h to pack, site leveled within 3 degrees
LINKS	confirmed tracks to PITCH and BECK within 2 s over fiber or JESS, LAGGAR satellite terminal option for remote sites, AES-256
ENVIRONMENT	operates -32 to +50 C in winds to 90 km/h, survives 140 km/h stowed, MIL-STD-810H in transit

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can produce a coverage model for any site the client names, showing detection range by altitude and the radar horizon over its own terrain, within 15 working days.
- Detection ranges and time-of-arrival accuracy are design targets with a written trial protocol flown against LURE target drones and the client's own aircraft.
- The trailer layout, mass, power budget and 4 hour setup sequence can be shown in a design review the client's engineers attend.
- The warning logic runs today in simulation on recorded and synthetic tracks, with every proposed warning and every watch officer decision logged.
- Track data stays inside the client's network; nothing is sent to Falcon Accuracy.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

LONGWING sees a ballistic missile only once it climbs above the radar horizon, and from a launch site 1,000 kilometers away that takes time the warning chain cannot spare. The earliest sign of a launch is its heat, and heat is visible from orbit within seconds of ignition. KETTLE watches the theater for it and hands LONGWING a launch point and heading, so the radar searches the right sector and the watch officer holds the warning before the first radar track appears.



CONCEPT VISUALIZATION · KETTLE

ALL FIGURES ARE DESIGN TARGETS

AIR AND MISSILE WARNING · HARDWARE · 02 OF 06

KETTLE

KETTLE Launch Warning Constellation

A kettle is a flock of raptors circling high on a column of rising warm air; KETTLE is the ring of satellites that circles high above the theater and watches for heat rising from the ground.

SEES THE HEAT OF A LAUNCH FROM ORBIT. WARNS WITHIN 30 SECONDS.

SUMMARY

KETTLE is a constellation of 24 small infrared satellites that watch a theater for the heat of a rocket launch or a large fire. It reports the point, time and heading of a launch to a watch officer within 30 seconds, through LAGGAR ground stations the force owns. The same data feeds wildfire and industrial fire alerts to civil protection through BECK.

WHY FALCON ACCURACY BUILT IT

A radar on the ground sees a launch only once the rocket climbs above its horizon, and by then the minutes for warning are already shorter. Launch warning from space has belonged to a handful of states, and a force that borrows the warning does not control when it arrives. Falcon Accuracy built KETTLE from small satellites launched four at a time, so a force owns a heat watch over its own theater at a cost that a civil protection budget can share. The force gains warning at the moment of launch, and the region gains a fire watch that reports a new fire within 5 minutes.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits KETTLE to the LAGGAR stations, networks and civil protection centers the client already runs, and sizes the first plane to the theater it must watch.

TRAIN Falcon Accuracy trains the launch and fire classifiers on the client's theater, including its industrial flares, sun glint, seasonal fires and the heat signatures of its own test ranges.

SET Falcon Accuracy sets alert thresholds, confirmation steps and the split between military and civil alerts to the client's doctrine and its civil protection law.

WORKS WITH

LONGWING · BECK · LAGGAR · RINGING · TAITA · BATE · PITCH · CALAMUS

KETTLE KETTLE Launch Warning Constellation

DESCRIPTION

KETTLE is a constellation of 24 infrared satellites of 65 kilograms each, in four planes of six at 1,000 kilometers, launched four at a time by RINGING. Each carries a staring mid-wave infrared imager and a short-wave infrared imager that see the heat of a rocket launch within 10 seconds of ignition and a new fire of 100 square meters at night. With the full constellation, at least one satellite watches a 2,000 by 2,000 kilometer theater 95 percent of the time. Optical crosslinks pass each alert to the satellite in view of a LAGGAR station, and the watch officer sees the launch point within 1 kilometer, the time and the heading within 30 seconds of ignition. The watch officer confirms each warning. Fire detections reach civil protection through BECK within 5 minutes.

CAPABILITIES

- Sees the heat of a rocket launch within 10 s of ignition and reports point, time and heading to the watch officer within 30 s
- Places a launch point within 1 km, the time within 1 s and the heading within 5 degrees
- Sees a new fire of 100 square meters at night and 400 square meters by day, and maps its front on every pass
- At least one satellite watches a 2,000 km by 2,000 km theater 95 percent of the time with all 24 satellites in orbit
- Optical crosslinks relay each alert to the satellite in view of a LAGGAR station, so the warning lands on the force's own ground
- Feeds BECK with launch warnings after watch officer confirmation and with fire alerts for civil protection within 5 min
- Detection runs on the satellite; alerts and image chips come down first, full frames on request
- Every alert, confirmation and release logged; data lands on the client's own ground stations and stays inside its network

SPECIFICATIONS · DESIGN TARGETS

CONSTELLATION	24 satellites in 4 planes of 6 at 1,000 km; full constellation covers a 2,000 km by 2,000 km theater 95 percent of the time
SATELLITE	65 kg, 0.6 m by 0.6 m by 0.8 m bus, two deployed solar arrays, 250 W peak, 5-year design life
SENSORS	staring mid-wave infrared and short-wave infrared imagers, 300 m ground sample at nadir, one frame each second
DETECTION	rocket launch within 10 s of ignition; new fire of 100 square meters at night, 400 square meters by day
ONBOARD COMPUTE	40 TOPS, launch and fire classifier, false-alert filter for sun glint, cloud edges and industrial flares
TIMING	alert to the watch officer within 30 s of ignition; launch point within 1 km, heading within 5 degrees
LINKS	optical crosslinks at 1 Gbps; X-band downlink at 150 Mbps to LAGGAR stations; AES-256
LAUNCH	4 satellites per RINGING launch, 6 launches for the full constellation; the first plane gives partial coverage
END OF LIFE	onboard propulsion for collision avoidance and controlled deorbit within 5 years of end of mission

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can show the orbit design and an hour-by-hour coverage simulation of the client's theater across a full year in a design review.
- The launch and fire classifiers can be tested today on recorded infrared scenes of launches, wildfires and industrial flares, with false-alert rates reported in full.
- Satellite mass, power and thermal budgets can be presented to the client's engineers before any hardware is ordered.
- A trial protocol measures alert time from ignition to the watch officer's display during a scheduled BATE suborbital test launch.
- All imagery and alerts land on LAGGAR stations the client owns and stay inside its network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

LONGWING and KETTLE give a watch officer a confirmed warning, a time of arrival and an area at risk, and none of it protects anyone while it stays in a cabin. The gap is the hand-off from the military picture to the public, where minutes are lost to phone calls between offices. BECK closes it, turning the confirmed area at risk into an alert on every phone, siren, radio and road sign within 10 seconds, released by two named people.



CONCEPT VISUALIZATION · BECK

ALL FIGURES ARE DESIGN TARGETS

AIR AND MISSILE WARNING · SOFTWARE · 03 OF 06

BECK

BECK Civil Alert Network

A beck is the small signal of the hand that calls a hawk back to the fist at once; BECK is the signal that calls people to shelter within seconds.

EVERY PHONE, SIREN, RADIO AND ROAD SIGN, WITHIN 10 SECONDS.

SUMMARY

BECK is the software and siren network that turns one confirmed warning into an alert on every phone, siren, radio and road sign in a region within 10 seconds. It names the nearest shelter, speaks the region's languages and reaches people who cannot hear or cannot read a standard alert. Two authorized people release each alert, and every alert is logged.

WHY FALCON ACCURACY BUILT IT

A warning that stays in a radar cabin protects no one, and many regions still pass it by telephone from one office to the next before a siren sounds. Each hand-off costs a minute, and a siren alone says neither where the danger is nor where to go. Falcon Accuracy built BECK so a confirmed warning from LONGWING or KETTLE becomes a public alert in one step, with the shelter, the language and the accessible format already chosen. The authority keeps the decision with two named people, and every person in the region gets the minutes the sensors bought.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits BECK to the mobile networks, radio stations, sirens and road signs the region already has, and adds BECK sirens and displays only where a coverage model shows a gap.

TRAIN Falcon Accuracy trains message templates, speech and translations on the region's languages, place names and accessibility needs, and rehearses them with the authority's own staff.

SET Falcon Accuracy sets alert areas, release roles, templates and all-clear rules to the civil protection authority's law and procedures.

WORKS WITH

LONGWING · KETTLE · MEWS · PITCH · CALAMUS · JESS · HAMULI · FORMEL

BECK BECK Civil Alert Network

DESCRIPTION

BECK is a civil alert network of software, sirens and displays. A watch officer receives a confirmed warning from LONGWING, KETTLE or the national authority, BECK proposes the alert area and the message from a pre-approved template, and a second authorized officer releases it with a hardware token. Within 10 seconds the alert reaches every phone in the area by cell broadcast, which needs no app and no phone number, every BECK siren and roadside display, and the region's radio stations by automatic interrupt. Each cell area receives the name of its nearest shelter. Messages go out in up to 12 languages, as text, speech, flashing beacons and sign-language video on displays. Sirens run 72 hours on battery. Every draft, release, correction and all-clear is logged in CALAMUS.

CAPABILITIES

- Puts a released alert on every phone in the area by cell broadcast, on every siren and display and on every radio station within 10 s
- Proposes the alert area from the LONGWING or KETTLE area at risk, and the message from a pre-approved template, within 5 s
- Two-person release, a drafting officer and a releasing officer, each with a hardware token, so no single person can send an alert
- Names the nearest open shelter for each cell area and shows live MEWS occupancy on roadside and public displays
- Up to 12 languages per alert, with text, synthesized speech, a distinct vibration pattern, flashing beacons and sign-language video
- Sirens deliver 123 dB at 30 m with tone and voice, run 72 h on battery and connect by two independent paths
- Correction, all-clear and silent exercise modes; a full regional test runs without reaching the public
- Collects no phone numbers or locations; every draft, release and all-clear is logged with its author

SPECIFICATIONS · DESIGN TARGETS

REACH	cell broadcast to every phone on every network in the alert area with no app or registration; FM and digital radio interrupt; roadside and public displays
TIMING	proposal within 5 s of a confirmed warning; release to phones, sirens, radio and displays within 10 s
RELEASE	two-person rule with hardware tokens, roles set by the civil protection authority, signed release log kept in CALAMUS
SIREN	electronic, 123 dB at 30 m, 360 degrees, tone and voice, 72 h battery, solar option, health report every 60 s
DISPLAY	2 m by 1 m outdoor LED panel readable at 50 m in daylight, flashing beacon, 72 h battery
LANGUAGES AND ACCESS	up to 12 languages per alert, plain-language templates, speech, sign-language video, distinct vibration pattern
LINKS	two independent paths per siren, such as fiber and a JESS radio, with HAMULI satellite backup at remote sites
CAPACITY	a region of 10 million people, 5,000 sirens and displays, 200 alert areas drawn at once
HOSTING	on the authority's own servers at two separated sites, both active; no personal data collected

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can demonstrate the drafting, two-person release and logging workflow today in a test environment with a simulated cell broadcast center and sirens.
- A trial protocol measures the time from release to phone, siren and display in a silent exercise across one district the authority chooses.
- Message templates and translations are reviewed with the authority, disability organizations and language services before any alert goes live.
- Siren coverage is modeled on the region's terrain and buildings and handed to the authority before a single siren is placed.
- BECK collects no phone numbers or locations, and every log stays on the authority's own servers.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

An alert that tells people to take shelter is only as good as the shelter within walking distance. Many bases, hospitals and schools have none closer than 10 minutes, and a hardened room takes a year to build. MEWS arrives on a truck and is placed by crane in a day where the BECK siting study shows the gap, and its occupancy count flows back to BECK so the alert names a shelter with room in it.



CONCEPT VISUALIZATION · MEWS

ALL FIGURES ARE DESIGN TARGETS

AIR AND MISSILE WARNING · HARDWARE · 04 OF 06

MEWS

MEWS Protective Shelter Module

The mews is the building where falconers keep their hawks safe through the molt and the weather; MEWS keeps people safe for as long as the warning lasts.

PLACED BY CRANE IN A DAY. SHELTERS 45 PEOPLE FOR 72 HOURS.

SUMMARY

MEWS is a factory-built protective shelter, precast or in container format, that protects people from blast and fragments and keeps them supplied with filtered air, power, water and communications for 72 hours. A crane places it in a day at a base, a hospital or a school, and its occupancy count reaches the watch officer and BECK.

WHY FALCON ACCURACY BUILT IT

A warning that arrives 3 minutes ahead helps only if there is somewhere to go within 3 minutes, and most bases, hospitals and schools have no hardened room that close. Building one takes months and a construction contract. Falcon Accuracy built MEWS as a factory-made module that arrives on a truck, is placed by crane and is ready the same day, sized to the people who need it and to their walking time. A site gets shelter where the warning says it is needed, and the watch officer sees how many people are inside.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits MEWS to each site's ground, cranes, power and water, and places every module from a walking-time survey of the buildings it serves.

TRAIN Falcon Accuracy trains wardens and occupants on the client's own warning times and languages through timed shelter drills at each site.

SET Falcon Accuracy sets the protection level, capacity, entry rules and air thresholds to the client's protection standard and its rules for bases, hospitals and schools.

WORKS WITH

BECK · LONGWING · KETTLE · FORMEL · SCREEN · JESS · BRAIL · CALAMUS

MEWS MEWS Protective Shelter Module

DESCRIPTION

MEWS is a protective shelter built in the factory and placed by crane in one day. The precast version arrives in 3 meter reinforced concrete segments of 24 t, and four segments joined end to end shelter 45 seated people. The container version fits a steel and composite liner inside a 40-foot frame of 16 t and shelters 30. Both are designed to resist blast and fragments to the protection level the client specifies, verified by an accredited test. Behind a baffled entrance and a protective door, a filtration unit holds 50 pascals of overpressure and carbon dioxide under 0.5 percent. A 30 kilowatt-hour battery, 600 liters of water, a BECK display and a JESS radio keep it running 72 hours with no outside supply. Hospital and school variants follow the same frame.

CAPABILITIES

- Placed by a mobile crane and ready for occupancy within 1 day on a prepared gravel bed
- Precast version shelters 45 seated people in four 3 m segments; container version shelters 30 in a 40-foot frame
- Designed to resist blast and fragments to the client's specified protection level, verified by an accredited test before delivery
- Filtered air at 50 Pa overpressure, with carbon dioxide held under 0.5 percent for 45 people over 72 h
- Runs 72 h with no outside supply on a 30 kWh battery, 600 L of water, 2 chemical toilets and a first-aid store
- BECK display, JESS radio and a satellite messenger keep the people inside informed and in contact for 72 h
- Anonymous occupancy count and air quality reported to the watch officer every 30 s, with no cameras inside
- Hospital variant holds 8 beds with oxygen and medical power; school variant has child-height benches and a teacher console

SPECIFICATIONS · DESIGN TARGETS

PRECAST SEGMENT	3 m long, 3 m by 3 m outside, 24 t, 300 mm reinforced concrete walls and roof; four segments shelter 45 seated
CONTAINER VERSION	40-foot frame with steel and composite liner, 16 t, shelters 30 seated
PROTECTION	blast and fragment resistance to the client's specified level, verified by accredited test; optional 1 m earth cover
ENTRY	baffled entrance, protective door with manual and powered opening, emergency hatch, step-free ramp, 1 wheelchair space per 15 places
AIR	filtration unit with particulate and gas filters, 50 Pa overpressure, carbon dioxide under 0.5 percent, oxygen and temperature sensors
ENDURANCE	72 h with no outside supply; 30 kWh battery with grid and generator inputs; 600 L of water; 2 chemical toilets
COMMUNICATIONS	BECK display, JESS radio node, satellite messenger, public address; occupancy and air data to FORMEL every 30 s
PLACEMENT	prepared gravel bed, 100 t mobile crane for precast segments, crew of 4, ready within 1 day
VARIANTS	hospital module with 8 beds, oxygen and medical power; school module with child-height benches; command module with 6 desks
ENVIRONMENT	-30 to +50 C, ventilation noise under 45 dBA inside, 30-year design life

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present structural calculations and a protection analysis against the client's protection standard in a design review with the client's engineers and its accredited test house.
- A siting study for any base, hospital or school the client names shows the walking time from every building to the nearest module, within 10 working days.
- The air system can be bench tested for overpressure, carbon dioxide and 72 h power draw before the first segment is cast.
- Occupancy data is an anonymous count with no camera and no identity, and it stays inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

MEWS protects the people, but the radars, vehicles and shelters themselves stay large, warm and visible to an adversary's surveillance. Moving them costs hours, and hiding them from the eye alone fails against a thermal camera or a radar. SOOTY hides the real items across every band a sensor reads and stands full-size copies elsewhere, so the adversary's effort is spent on fabric while the force keeps working.



CONCEPT VISUALIZATION · SOOTY

ALL FIGURES ARE DESIGN TARGETS

AIR AND MISSILE WARNING · HARDWARE · 05 OF 06

SOOTY

SOOTY Decoy and Camouflage Kit

The sooty falcon wears a slate-gray plumage that vanishes against desert rock in the evening light; SOOTY hides the real vehicle and shows a false one in its place.

HIDE WHAT IS REAL. SHOW WHAT IS NOT.

SUMMARY

SOOTY is a kit of multispectral camouflage nets for the force's real vehicles and inflatable decoys that reproduce the visual, thermal and radar signature of its own vehicles and radars. Paired with JINK, which carries the radio signature, it draws the adversary's surveillance and effort to empty positions while the real ones stay hidden.

WHY FALCON ACCURACY BUILT IT

The radars, shelters and vehicles that protect a force are large, warm and easy to find, and an adversary that finds them knows where to look next. Concealment alone fails once a position is spotted, and a decoy that looks right only to the eye fails against a thermal camera or a radar. Falcon Accuracy built SOOTY so each real item hides across the visual, near-infrared, thermal and radar bands and each decoy matches the real item in all of them, while JINK matches its radio signature. The adversary spends its time and effort on inflated fabric, and the commander sees each time a decoy draws a look.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits SOOTY nets and decoys to the vehicles, radars and shelters the force actually owns, measured one by one.

TRAIN Falcon Accuracy trains net patterns and decoy heat profiles on the client's theater, its soils, vegetation and seasons, and on the surveillance sensors seen there.

SET Falcon Accuracy sets layout rules, decoy ratios and approval steps to the force's doctrine for concealment and deception.

WORKS WITH

JINK · LONGWING · HOOD · BRANCHER · PITCH · JESS · CALAMUS

SOOTY SOOTY Decoy and Camouflage Kit

DESCRIPTION

SOOTY pairs camouflage with decoys. Its multispectral nets cover a real vehicle or radar trailer in 10 minutes with a crew of two and bring its visual, near-infrared, thermal and radar signature close to the surrounding ground, with thermal contrast under 2 degrees C and radar return reduced by 10 decibels in the X and Ku bands. Its inflatable decoys reproduce the force's own trucks, shelters and a LONGWING antenna trailer at full size. A blower inflates one in 8 minutes, heated panels reproduce the engine and electronics heat pattern, and internal reflectors match the real radar return within 3 decibels. JINK nodes add the radio signature. A drone-link receiver in each decoy reports an aircraft within 1 kilometer. The commander approves every layout, and each placement is logged.

CAPABILITIES

- A net covers a real vehicle or radar trailer up to 12 m by 4 m in 10 min with a crew of 2
- Nets bring thermal contrast under 2 degrees C against the background and cut radar return by 10 dB in the X and Ku bands
- Full-size inflatable decoys of the force's trucks, shelters and a LONGWING antenna trailer, inflated in 8 min by a blower
- Heated panels reproduce engine and electronics heat within 2 degrees C of the real item; internal reflectors match its radar return within 3 dB
- JINK nodes on the decoys carry the radio signature, so a decoy matches the real item in every band a sensor reads
- A drone-link receiver in each decoy reports an aircraft within 1 km, so the commander sees which decoys draw a look
- Layouts planned on PITCH with the force's emission plan, approved by the commander and logged
- Reproduces only the force's own vehicles, radars and shelters

SPECIFICATIONS · DESIGN TARGETS

NET	multispectral panel 12 m by 4 m, 28 kg, visual and near-infrared patterns for woodland, desert or snow, thermal and radar absorbing layers
NET PERFORMANCE	thermal contrast under 2 degrees C, radar return reduced 10 dB in X and Ku bands, colors matched to the client's terrain
DECOY	full-size inflatable, truck 120 kg, radar trailer 160 kg, 2 cases each, inflated in 8 min, repacked in 15 min
THERMAL	heated panels on 24 V, engine and electronics pattern within 2 degrees C of the real item, 12 h per battery set
RADAR	internal corner and dihedral reflectors, return within 3 dB of the real item at X band
SENSING	drone-link receiver 70 MHz to 6 GHz, aircraft within 1 km reported over JESS
WIND	decoys held in winds to 60 km/h with ground anchors; nets rated to 100 km/h
KIT	6 nets, 4 decoys, 2 blowers, anchors and a planning tablet on one truck with a crew of 4
RECORDS	every layout, approval and drone report logged; layouts and signature data stay inside the client's network

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can measure a net sample and a decoy in a thermal chamber and on a radar range, and hand over the full signature report.
- A field trial protocol has the client's own reconnaissance crews and drones search a test area holding real and decoy items, with every call scored.
- Decoy designs are built from signature measurements of the client's own vehicles and radars, and those measurements stay inside its network.
- Heater power budgets and packed volumes can be shown in a design review before any decoy is made.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

Warning, shelter and deception reduce harm, yet an airfield can still be hit, and a closed runway grounds every aircraft on it. The slowest part of reopening it is learning what is wrong, with engineers walking the pavement for hours. IMPING surveys the runway in 30 minutes, computes the shortest strip that lets aircraft fly and guides repair crews to it, so the force is flying again the same day.



CONCEPT VISUALIZATION · IMPING

ALL FIGURES ARE DESIGN TARGETS

AIR AND MISSILE WARNING · HARDWARE · 06 OF 06

IMPING

IMPING Airfield Recovery System

Imping is the falconer's repair of a broken flight feather, a sound feather spliced onto the old shaft so the hawk flies again the same day; IMPING repairs a runway so aircraft fly again.

SURVEYS THE RUNWAY IN 30 MINUTES. AIRCRAFT FLY AGAIN THE SAME DAY.

SUMMARY

IMPING is a rapid airfield recovery system. Its drones and a ground robot survey a damaged runway in 30 minutes and map craters, debris and hazards for specialist teams, then it computes the minimum operating strip that lets aircraft fly again. Repair crews fill each crater in under 2 hours with rapid-setting fill and a folding mat.

WHY FALCON ACCURACY BUILT IT

After damage to an airfield, the first hours go to finding out what is wrong, with engineers walking 3 kilometers of runway and reporting by radio. Every hour of survey is an hour the aircraft stay on the ground. Falcon Accuracy built IMPING to replace the walk with a 30 minute survey, a computed operating strip and a repair kit sized to it. The airfield commander sees the shortest path back to flying and decides, and the specialist teams know where every hazard lies before anyone steps onto the pavement.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits IMPING to the airfield's runways, the force's loaders and trucks and the repair materials its engineers already stock.

TRAIN Falcon Accuracy trains the crater and debris models on the client's own pavements, climate and aircraft, using prepared training craters at its airfields.

SET Falcon Accuracy sets operating strip rules, hazard standoffs and opening authority to the force's airfield doctrine and the commander's orders.

WORKS WITH

VARVEL · PITCH · FORMEL · JESS · CALAMUS · LONGWING · PLUME

IMPING IMPING Airfield Recovery System

DESCRIPTION

IMPING recovers a damaged runway. Three survey drones launch from a trailer and fly a 3,000 by 45 meter runway and its taxiways in 30 minutes, mapping craters and spall to 5 centimeters with lidar and cameras, while a wheeled ground robot checks crater edges and flags unknown objects for specialist clearance teams without touching them. The software computes the minimum operating strip for the aircraft the client flies, such as 1,500 by 18 meters, and the repair list that opens it fastest. Each crater up to 6 meters across is filled with rapid-setting fill that bears aircraft loads 60 minutes after placement and is covered with a folding mat, in under 2 hours per crater with a crew of 8. The airfield commander declares the strip open.

CAPABILITIES

- Three drones survey a 3,000 m by 45 m runway and its taxiways in 30 min, mapping craters and spall to 5 cm
- A wheeled ground robot checks crater edges and pavement heave and flags unknown objects for specialist clearance teams without touching them
- Computes the minimum operating strip for the client's aircraft and the repair list that opens it fastest within 2 min of survey end
- A crew of 8 repairs a crater up to 6 m across in under 2 h with rapid-setting fill and a folding mat
- Rapid-setting fill bears aircraft loads 60 min after placement; the robot checks the finished surface within 25 mm over 3 m
- Updates the map and the strip after each repair, so the commander sees the operating length grow
- Shares the map, repair log and strip with PITCH, FORMEL and the tower over JESS
- The airfield commander declares the strip open; every measurement, decision and repair is logged

SPECIFICATIONS · DESIGN TARGETS

SURVEY DRONES	3 quadcopters, 6 kg each, lidar, 4K and thermal cameras, 30 min per 3,000 m by 45 m runway, craters mapped to 5 cm
GROUND ROBOT	4-wheel electric, 180 kg, 6 km/h, ground-penetrating radar, cameras and profile laser, 8 h endurance
SOFTWARE	minimum operating strip computed within 2 min for the client's aircraft types, repairs ranked by time to open
REPAIR MATERIALS	rapid-setting fill bearing aircraft loads 60 min after placement; folding composite mat 18 m by 16 m, laid by a loader
CRATER REPAIR	up to 6 m across in under 2 h by a crew of 8 with the force's own loaders and trucks
QUALITY CHECK	surface profile within 25 mm over 3 m, measured by the robot before each repair is marked complete
HAZARDS	unknown objects marked on the map with a 50 m standoff ring for specialist teams; the robot stays at least 5 m away
DEPLOYMENT	trailer with drone dock and robot ramp, 2,200 kg, first survey within 15 min of arrival
LINKS	JESS mesh and airfield fiber; map to PITCH and FORMEL; all data inside the client's network
ENVIRONMENT	survey flights day and night in winds to 40 km/h and light rain; -20 to +50 C

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can run the survey software today on recorded drone imagery of damaged pavement and report crater measurement error against a hand survey.
- The minimum operating strip calculation can be shown in simulation on the client's own runway layout and aircraft types, with every result checked by its airfield engineers.
- A trial protocol times survey and repair on a prepared training crater at the client's airfield, with 30 minutes and 2 hours as the pass marks.
- Every map, repair record and opening decision stays inside the client's network.

NEXT SECTOR · 06 GROUND ROBOTICS · P. 80

Machines take the risk. People keep the decision. This closes Air and Missile Warning. Sector 06, Ground Robotics, opens on page 80 with LURCHER, FALCONER, GYR, APLOMADO, VARVEL and BRAIL.

06

GROUND ROBOTICS

MACHINES TAKE THE RISK. PEOPLE KEEP THE DECISION.

Ground robots exist to take the first step so that a person does not have to. The first door, the culvert under the road, the stretch of track nobody has driven since yesterday and the 300 meters back to the vehicles with a casualty on the litter are the minutes in which a patrol loses people. Falcon Accuracy builds machines for exactly those minutes. Each one carries sensors, tools, cargo or a litter and nothing else. Each one walks, drives or rolls on its own, reports over JESS into the PITCH picture, and stops to wait whenever the next action needs a human decision. The operator approves every contact with a suspect object, every route a convoy follows and every evacuation, and every one of those decisions is logged inside the client's network.



IN THIS SECTOR · 6 PRODUCTS · PAGES 82 TO 93

LURCHER **FALCONER** **GYR** **APLOMADO** **VARVEL** **BRAIL**

SECTOR 06 · GROUND ROBOTICS

The six machines in this sector are built as one team with one control stack, one battery and connector standard and one tailoring program. LURCHER walks point, into buildings and under roads, and maps what it finds. FALCONER brings human-shaped hands forward, so it swaps drone batteries, opens doors and loads cargo without a person stepping out of cover. GYR carries the squad's 300 kilograms and feeds power to every other machine here. APLOMADO drives ahead of the convoy with ground-penetrating radar and marks what lies beneath the road. VARVEL goes up to the suspect object with an arm, an x-ray panel and a chemical sensor, and marks it for the force's specialists. BRAIL reaches a fallen operator, takes the litter aboard and brings them back with vitals streaming to the medic. The sector reads in that order, from the scout to the stretcher.

IN THIS SECTOR · 6 PRODUCTS



LURCHER p. 82
LURCHER Quadruped Robot
Walks point so no one else has to.



FALCONER p. 84
FALCONER Humanoid Robot
Handles the drones, carries the load, takes the risk.



GYR p. 86
GYR Robotic Mule
Carries the squad's weight, follows without a word.



APLOMADO p. 88
APLOMADO Route Clearance Sensor Vehicle
Reads the road before the first wheel rolls.



VARVEL p. 90
VARVEL Hazard Inspection Robot
Looks inside the hazard, marks it, keeps every person 300 meters back.



BRAIL p. 92
BRAIL Casualty Evacuation Robot
Reaches the casualty first and brings them back with vitals in view.



CONCEPT VISUALIZATION · LURCHER

ALL FIGURES ARE DESIGN TARGETS

GROUND ROBOTICS · HARDWARE · 01 OF 06

LURCHER

LURCHER Quadruped Robot

A lurcher is the falconer's running dog, the sighthound cross that works ahead of the hawk and flushes the quarry, so it is the quadruped that walks point.

WALKS POINT SO NO ONE ELSE HAS TO.

SUMMARY

LURCHER is a 48 kilogram electric quadruped that goes first into buildings, culverts, tunnels and compounds. It climbs stairs, crouches under obstacles, maps what it finds and puts people, vehicles and openings on the PITCH picture within a second. The operator decides where it goes; LURCHER decides where to put its feet.

WHY FALCON ACCURACY BUILT IT

The first person through a door, down a culvert or over a wall takes the most risk a patrol faces that day, and in most forces that person is the youngest. Falcon Accuracy built LURCHER to take that step instead. A legged machine goes where wheels and tracks stop, up stairs, over rubble and under a 0.5 meter gap, and it carries the same sensors the operator would have carried with their own eyes. What changes for the force is simple. The first contact in a building happens between the adversary and a 48 kilogram machine, and the squad sees the room before it enters it.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits LURCHER's rails and connectors to the radios, sensors and cartridges the force already issues, chooses foot pads and leg geometry for the client's ground, from rubble and mud to sand and snow, and sizes the battery to the force's patrol length.

TRAIN It trains the perception models on the client's own buildings, vehicles, uniforms and terrain across seasons, and on recordings from the force's own patrols.

SET It sets patrol distances, quiet-mode rules, no-go zones and lost-link behavior to the force's doctrine, with the operator deciding every entry and every return.

WORKS WITH

FALCONER · GYR · VARVEL · BRAIL · JESS · PITCH · MALAR · TIERCEL · HOOD

LURCHER LURCHER Quadruped Robot

DESCRIPTION

LURCHER is a four-legged electric robot, 1.1 meters long and 0.72 meters tall, that walks at 1.5 meters per second, climbs 35 degree stairs and 0.3 meter steps, and crouches to 0.45 meters under obstacles. A lidar, five stereo camera pairs and a thermal core map a 2,000 square meter building in under 10 minutes without satellites; an onboard processor detects people, vehicles and drones at 30 frames per second. Detections and the map reach the operator's MALAR display and the PITCH picture over JESS within 1 second. One operator runs four units through PITCH Edge, and a unit that loses its link for 60 seconds walks back to its last rally point alone. It patrols for 4 hours, swaps its battery in 2 minutes and runs at under 60 decibels from 10 meters.

CAPABILITIES

- Walks point up to 300 m ahead of the squad and streams map and detections over JESS within 1 s
- Climbs 35 degree stairs and 0.3 m steps; crouches to 0.45 m to pass under obstacles
- Maps a 2,000 square meter building in under 10 min with lidar and five stereo pairs, without satellites
- Detects people, vehicles and drones onboard at 30 fps; the thermal core sees a person at 300 m
- Carries 15 kg on two rails, such as a JESS relay, a HOOD backpack receiver or chemical and radiological cartridges
- Four units per operator through PITCH Edge; returns to the last rally point alone after 60 s without link
- 4 h patrol endurance, battery swap in 2 min, under 60 dBA at 10 m at patrol pace
- Self-rights within 10 s after a fall; IP67, -20 to +50 C

SPECIFICATIONS · DESIGN TARGETS

MASS AND PAYLOAD	48 kg with battery, 15 kg payload on two rails
SIZE	1.1 m long, 0.5 m wide, 0.72 m tall standing, 0.45 m crouched
SPEED AND TERRAIN	1.5 m/s patrol, 3 m/s dash, 35 degree stairs, 0.3 m step, 30 degree side slope, 0.5 m fording
ENDURANCE	4 h patrol on a 1.4 kWh pack, hot swap in 2 min, full recharge at a GYR deck in 90 min
SENSORS	360 degree lidar, five stereo camera pairs, 640 x 512 thermal core, 4-microphone array, white and infrared illuminators
COMPUTE AND AUTONOMY	100 TOPS, detection at 30 fps, visual-inertial navigation without satellites, building map in under 10 min, return to rally point after 60 s without link
RADIO	onboard JESS node, 5 km to a handheld, one relay hop, AES-256
NOISE	under 60 dBA at 10 m at 1.5 m/s
CONTROL	4 units per operator through PITCH Edge; tablet, MALAR gaze and voice; every autonomous action logged
ENVIRONMENT	MIL-STD-810H, IP67, -20 to +50 C, self-righting

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can walk a client through the complete leg actuator, battery and sensor head design package, with structural and thermal margins stated.
- Gait, stair climbing and self-righting can be demonstrated in simulation on the client's own stair and door geometry before any prototype is built.
- The acceptance trial protocol is written with pass marks the client's crews run themselves, such as 35 degree stairs, 4 h endurance and under 60 dBA at 10 m.
- Maps, video and detections stay inside the client's network, and every autonomous action is logged with time, position and the operator who authorized it.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

LURCHER sees and maps, but it has no hands. Every patrol it leads still ends at a closed door, a drone that needs a fresh battery or a case that must be lifted onto a deck, and each of those tasks pulls a person forward into the ground the robot was sent to check. FALCONER exists to do that handling. Where LURCHER finds and reports, FALCONER opens, lifts, swaps and carries, on the same radios, batteries and control stack, so the pair works one building or one landing pad under one operator.



CONCEPT VISUALIZATION · FALCONER

ALL FIGURES ARE DESIGN TARGETS

GROUND ROBOTICS · HARDWARE · 02 OF 06

FALCONER

FALCONER Humanoid Robot

The falconer is the handler who flies the hawk, carries the kit to the field and does the work by hand, so it is the humanoid robot built for tasks shaped for human hands.

HANDLES THE DRONES, CARRIES THE LOAD, TAKES THE RISK.

SUMMARY

FALCONER is a 1.85 meter, 85 kilogram humanoid robot built to do the handler's work on a landing pad, at a gate or inside a building, where the tools, doors, ladders and cases are shaped for people. It swaps TIERCEL batteries, opens doors, loads GYR and carries 25 kilograms in its hands. An operator gives the task; FALCONER plans the steps and stops before any contact the operator has not approved.

WHY FALCON ACCURACY BUILT IT

Most of a force's equipment is shaped for a human body, from a door handle to a battery latch to a ladder rung, and a robot without hands cannot work it. The usual answer is to send a person. Falcon Accuracy built FALCONER so that the handler's tasks on a drone pad, a loading ramp or a doorway are done by a machine that fits the same spaces and the same grips. The force keeps its existing kit unchanged and takes the operator out of the exposed position. One operator in cover runs the robot by task, and the robot asks before every contact that doctrine marks as sensitive.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits FALCONER's hands and tool adapters to the latches, handles, cases and drone batteries the force already issues, and tunes its gait and footprint to the ramps, ladders and doorways of the client's vehicles and sites.

TRAIN It trains the grasp and task models on the client's own equipment and on recordings of the force's own crews doing the same tasks, in the client's language.

SET It sets the list of contacts that need approval, the hand-off rules to teleoperation and the lost-link behavior to the force's doctrine, with the operator deciding every task.

WORKS WITH

LURCHER · GYR · TIERCEL · BRAIL · VARVEL · JESS · PITCH · MALAR

FALCONER FALCONER Humanoid Robot

DESCRIPTION

FALCONER is a humanoid electric robot, 1.85 meters tall and 85 kilograms, with four-fingered hands and opposing thumbs. It walks at 1.4 meters per second, climbs 35 degree stairs and vertical ladders, lifts 40 kilograms from floor to waist and carries 25 kilograms for 2 kilometers. On a landing pad it swaps a TIERCEL battery in 90 seconds, on a LURCHER it swaps the pack in 3 minutes, and at a GYR it loads and lashes cases. Two stereo camera pairs, a thermal core, a chest lidar and tactile fingertips let it find a handle in the dark and feel a latch close. The operator gives tasks in plain terms, such as opening the east door, and FALCONER plans the steps and waits for approval before any contact the force marks as sensitive. It runs 3 hours per pack.

CAPABILITIES

- Swaps a TIERCEL battery in 90 s and a LURCHER pack in 3 min, hands only
- Opens doors, turns valves and climbs a vertical ladder with fittings shaped for people
- Lifts 40 kg floor to waist, carries 25 kg for 2 km at 1.4 m/s
- Tasked in plain terms; plans its own steps and stops before any contact the force marks as sensitive
- Full-body teleoperation from MALAR and a glove rig at under 150 ms over JESS for the delicate moments
- Stereo, thermal and lidar sensing with tactile fingertips; finds a handle at 0.1 lux
- Shares the LURCHER and GYR battery, connector and control stack; recharges or swaps at GYR
- 3 h endurance per pack; stands back up within 15 s after a fall

SPECIFICATIONS · DESIGN TARGETS

SIZE AND MASS	1.85 m tall, 0.6 m across the shoulders, 85 kg with battery
HANDS	four fingers and a thumb, 16 degrees of freedom per hand, 50 N fingertip pinch, tactile sensing in every fingertip
LIFT AND CARRY	40 kg floor to waist, 25 kg carried for 2 km, 10 kg at full 0.8 m reach
LOCOMOTION	1.4 m/s walk, 35 degree stairs, vertical ladder, 0.3 m step, 20 degree side slope
ENDURANCE	3 h on a 2.2 kWh pack, self swap at a GYR deck in 3 min
SENSORS	two stereo camera pairs and a 640 x 512 thermal core in the head, chest lidar, 4-microphone array, white and infrared illuminators
COMPUTE AND CONTROL	150 TOPS, task-level autonomy with approval gates, teleoperation under 150 ms over JESS, every action logged
RADIO	onboard JESS node, 5 km to a handheld, one relay hop
ENVIRONMENT	MIL-STD-810H, IP65, -20 to +50 C, self-righting within 15 s

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the full actuator, hand and balance design package with stated torque, thermal and battery margins at a design review.
- Grasping of the client's own latches, handles and battery packs can be demonstrated in simulation against scanned models of the client's kit before a prototype is built.
- The acceptance trial protocol lists tasks the client's crews time and score, such as a 90 s TIERCEL battery swap and a 2 km carry of 25 kg.
- Teleoperation latency and the approval-gate log are measured on the client's own JESS mesh during the trial, with all recordings kept inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

FALCONER carries 25 kilograms in its hands and walks at 1.4 meters per second, which is enough for a task and not enough for a day. A squad moves with 300 kilograms of water, batteries, radios and spares, and the two walking robots each burn a 1.4 or 2.2 kilowatt hour pack on a patrol. GYR is the vehicle that carries all of it and recharges all of it. It is the moving base the walking machines return to, the deck TIERCEL lands on, and the relay hop that keeps every robot in the sector on the JESS mesh.



CONCEPT VISUALIZATION · GYR

ALL FIGURES ARE DESIGN TARGETS

GROUND ROBOTICS · HARDWARE · 03 OF 06

GYR

GYR Robotic Mule

GYR is the gyrfalcon, the largest and strongest of the falcons, which hunts low over open ground, so it is the load-carrying mule.

CARRIES THE SQUAD'S WEIGHT, FOLLOWS WITHOUT A WORD.

SUMMARY

GYR is a quiet electric six-wheel robot, under 55 decibels at 10 meters, that carries 300 kilograms of what the squad used to carry, follows the formation on its own and recharges drones, robots and radios in the field. A fold-out litter rail brings a casualty back, and the same autonomy stack, shipped as the JERKIN kit, retrofits the trucks a force already owns.

WHY FALCON ACCURACY BUILT IT

A dismounted squad carries water, batteries, radios and spares that slow every move and tire every operator before contact. Falcon Accuracy built GYR to take that weight and to become the moving base of the whole ground robot team, with power, a relay and a landing deck. A quiet electric drive keeps it with the squad at under 55 decibels, and its autonomy stack goes onto issued trucks as the JERKIN convoy kit. What changes for the force is that the squad walks lighter, the drones and robots keep flying and walking, and no truck in the convoy needs a driver behind the leader.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits GYR with sand tires, snow tracks or forest-width axles for the client's terrain and machines the cargo rails and charge docks to the force's own packs, containers and batteries.

TRAIN It trains its perception on the roads, dust, mud or snow of the theater and on the force's own vehicles and convoy habits.

SET It sets follow distances, convoy spacing, noise rules and lost-link behavior to the force's movement doctrine, with the squad leader deciding every halt and every move.

WORKS WITH

LURCHER · FALCONER · APLOMADO · VARVEL · BRAIL · JERKIN · TIERCEL · JESS · PITCH · MANTLE · MALAR

GYR GYR Robotic Mule

DESCRIPTION

GYR is a 6x6 electric uncrewed ground vehicle built to walk with infantry. It carries 300 kilograms on rails cut to the force's packs and cans, and drives 80 kilometers on a charge at under 55 decibels from 10 meters, or 380 kilometers with the range extender. It follows the squad at a chosen distance by wrist tag and vision, holds formation, waits when told, and returns to the last rally point alone if the link drops. The deck carries a JESS relay node and a pad that recharges TIERCEL aircraft, and 3 kilowatts of exportable power recharges LURCHER, FALCONER, goggles, vests and radios overnight. A fold-out litter rail turns it into a casualty carrier. Its autonomy stack ships as the JERKIN kit, a three-day retrofit that lets the trucks a force already owns follow a crewed leader.

CAPABILITIES

- 300 kg payload on rails cut to the force's own equipment
- Follows the squad by wrist tag and vision, holds formation, waits when told
- Returns to the last rally point alone if the link drops
- Recharges TIERCEL aircraft, LURCHER and FALCONER packs, goggles, vests and radios from 3 kW of exportable power
- TIERCEL lands within 30 cm on the rear deck; a JESS relay node adds one ground hop
- Fold-out litter rail for casualty carriage; hands over to BRAIL at the collection point
- 80 km electric or 380 km with the range extender at 20 km/h; under 55 dBA at 10 m
- Shares its autonomy stack with the JERKIN kit, which lets up to 8 issued trucks follow a crewed leader at 60 km/h

SPECIFICATIONS · DESIGN TARGETS

PAYLOAD AND MASS	300 kg payload, 420 kg curb mass, 6x6 electric drive
RANGE AND SPEED	80 km electric, 380 km with range extender, 20 km/h
NOISE	under 55 dBA at 10 m at 5 km/h on electric drive; under 65 dBA at 10 m with the range extender running
MOBILITY	0.4 m step, 30 degree side slope, 0.6 m fording
POWER	3 kW exportable, TIERCEL landing and charging pad, charge dock for LURCHER and FALCONER packs, JESS relay node
FOLLOWING	wrist tag and vision, follow distance set from 5 to 50 m, formation hold, return to rally point on lost link
CASUALTY	fold-out litter rail accepts the force's issued litters, 1 casualty plus kit
CONVOY	the same 200 TOPS autonomy stack ships as the JERKIN kit for issued trucks, up to 8 followers at 60 km/h, fitted in 3 days
ENVIRONMENT	MIL-STD-810H, IP67, -20 to +50 C

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the drivetrain, battery and deck design package with stated payload, range and noise margins at a design review.
- Follow, formation and lost-link behavior can be demonstrated in simulation on the client's own terrain data before a prototype is built.
- The acceptance trial protocol is written with pass marks the client's crews measure, such as 300 kg over a 0.4 m step, 80 km on a charge and under 55 dBA at 10 m.
- The JERKIN convoy retrofit that carries GYR's autonomy stack is scoped vehicle by vehicle from the client's fleet list, with the integration plan reviewed before any truck is touched.
- Position, video and convoy logs stay inside the client's network, and every autonomous move is logged.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

GYR and the JERKIN kit, which carries its autonomy stack onto issued trucks, let a convoy follow a leader with nobody at the wheel, but the lead vehicle still drives onto whatever was buried in the road overnight. A route that is driven every day is a route somebody can prepare. APLOMADO goes first, 300 meters to 2 kilometers ahead of the crewed vehicle, sweeps the lane with ground-penetrating radar and compares the road surface with its own record of yesterday's pass. The convoy that follows GYR follows a lane APLOMADO has already read.



CONCEPT VISUALIZATION · APLOMADO

ALL FIGURES ARE DESIGN TARGETS

GROUND ROBOTICS · HARDWARE · 04 OF 06

APLOMADO

APLOMADO Route Clearance Sensor Vehicle

The aplomado falcon hunts low over open ground, working a line ahead of its partner and reading what moves beneath it; APLOMADO drives ahead of the convoy and reads what lies beneath the road.

READS THE ROAD BEFORE THE FIRST WHEEL ROLLS.

SUMMARY

APLOMADO is an uncrewed 4x4 that drives 300 meters to 2 kilometers ahead of a convoy, sweeps a 3.2 meter lane with ground-penetrating radar and metal detection, and compares the road surface with its record of the last pass. It paints every anomaly on the road, places it on the PITCH map within 0.1 meters and stops to wait for a human decision. It senses and marks; it does not touch what it finds.

WHY FALCON ACCURACY BUILT IT

A convoy's most exposed vehicle is the one in front, and on a route driven every day it is the one most likely to meet something placed overnight. Falcon Accuracy built APLOMADO so that the first set of wheels on the road belongs to a machine with nobody aboard. Radar, metal detection and change detection run at 15 kilometers per hour, which is the pace a convoy already travels on such roads, so the sweep costs the move no time. What changes for the force is that every flag arrives as a position, a radar slice and a picture before anyone is within 300 meters of it, and the crew decides what happens next from cover.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits APLOMADO's boom width, wheelbase and marker system to the roads, tracks and vehicle widths the force drives, and its mast to the force's own radios and existing route-survey sensors.

TRAIN It trains the radar and change-detection models on the soils, road surfaces, seasons and clutter of the client's own routes, from a baseline survey the client's crews drive.

SET It sets lead distance, stop rules, flag thresholds and hand-off procedures to the force's route doctrine, with the convoy commander deciding every advance.

WORKS WITH

VARVEL · GYR · LURCHER · TIERCEL · HOOD · JESS · PITCH

APLOMADO APLOMADO Route Clearance Sensor Vehicle

DESCRIPTION

APLOMADO is a 2,800 kilogram hybrid-electric 4x4 with no crew compartment and a sensor boom ahead of the front wheels. The boom carries a 3.2 meter wide ground-penetrating radar array and a metal detection array, reading to 0.6 meters in dry soil and 0.3 meters in wet clay at 15 kilometers per hour. A thermal core and a 4K camera compare the road with earlier passes and flag disturbed ground within 1 second. At each flag it paints a dot within 0.1 meters of the anomaly, sends position, radar slice and image to PITCH within 2 seconds, and stops until a human confirms, dismisses or hands the flag to VARVEL. Two crew replace the boom and front axle modules in 40 minutes; it scans for 8 hours on one fuel load and transits at 60 kilometers per hour.

CAPABILITIES

- Sweeps a 3.2 m lane at 15 km/h with 32-channel ground-penetrating radar and metal detection, to 0.6 m in dry soil
- Change detection against earlier passes flags disturbed ground within 1 s of the frame
- Paints each anomaly on the road within 0.1 m and places it on the PITCH map with radar slice and image within 2 s
- Drives 300 m to 2 km ahead of the crewed vehicle, stops at every flag and waits for a human decision
- Hands a confirmed flag to VARVEL and holds GYR-led convoys at 300 m
- Holds 2 m position error after 1 km without satellites by wheel, inertial and visual odometry
- 8 h scanning per fuel load, 60 km/h transit, 300 km range, no crew aboard
- Boom and front axle are modules two crew replace in 40 min; the mast carries a JESS relay and an optional HOOD receiver

SPECIFICATIONS · DESIGN TARGETS

VEHICLE	4x4 hybrid-electric, 2,800 kg, 5.2 m long with boom, 2.3 m wide, 2.6 m tall with mast folded
SUBSURFACE SENSING	3.2 m wide 32-channel ground-penetrating radar, 200 MHz to 3 GHz, plus 3.2 m metal detection array; 0.6 m depth in dry soil, 0.3 m in wet clay at 15 km/h
SURFACE SENSING	forward 640 x 512 thermal core and 4K camera with change detection against earlier passes; 360 degree lidar; 6 m mast cameras
SPEED AND RANGE	15 km/h scanning, 60 km/h transit, 8 h scanning per fuel load, 300 km transit range
MARKING AND POSITION	paint dot within 0.1 m of the anomaly; map position within 0.1 m with corrections, 2 m after 1 km without satellites
AUTONOMY AND CONTROL	follows a route plan 300 m to 2 km ahead of the operator vehicle, stops at every flag; a human confirms, dismisses or hands off each one; every decision logged
DATA	radar slice, image and position per flag to PITCH over JESS within 2 s; data stays inside the client's network
MODULES	boom and front axle replaced in 40 min by two crew; mast with JESS relay and optional HOOD vehicle receiver
MOBILITY AND ENVIRONMENT	0.8 m fording, 30 degree slope, MIL-STD-810H, IP67, -30 to +55 C

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the radar array, boom and drivetrain design package with stated detection depth, speed and position margins at a design review.
- Detection and change-detection performance can be demonstrated on a buried-object test lane the client builds to its own specification, with every flag scored against the ground truth.
- The acceptance trial protocol has the client's crews drive the baseline, bury the test objects and score the flags, so the pass marks are theirs.
- Radar data, imagery and flags stay inside the client's network, and every stop, confirmation and hand-off is logged with time and position.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

APLOMADO flags an anomaly, paints the spot and stops, but it does not know what the object is, and at 15 kilometers per hour it never will. Someone has to look closely, and close is where the risk is. VARVEL is the machine that walks the last 50 meters, places an x-ray panel, samples the air and the surface, and leaves a numbered marker and a map position so that the specialists arrive knowing what they face. APLOMADO finds, VARVEL names, and no person stands beside the object until a human decides it is time.



CONCEPT VISUALIZATION · VARVEL

ALL FIGURES ARE DESIGN TARGETS

GROUND ROBOTICS · HARDWARE · 05 OF 06

VARVEL

VARVEL Hazard Inspection Robot

The varvel is the small engraved ring at the end of the jess that carries the owner's name, so it is the robot that names the hazard and leaves its mark on it.

LOOKS INSIDE THE HAZARD, MARKS IT, KEEPS EVERY PERSON 300 METERS BACK.

SUMMARY

VARVEL is a 75 kilogram tracked robot with a 2 meter manipulator arm that walks the last 50 meters to a suspect object so that no person has to. Its wrist carries a zoom camera, a thermal core, a chemical sensor and a radiological probe, the arm places a digital x-ray panel to image the object from the outside, and it then paints a marking ring, plants a numbered radio tag and logs the find to the PITCH map. VARVEL inspects and marks; it never attempts to move, open or disturb what it finds.

WHY FALCON ACCURACY BUILT IT

After a flag is raised on a road or in a building, someone has to find out what the object is, and that walk is among the most dangerous tasks a force asks of anyone. Falcon Accuracy built VARVEL to make that walk and to bring back an x-ray image, a chemical reading and a radiological reading from an object nobody has touched. The robot is built to inspect and mark only, because the decision about what happens next belongs to the force's own specialists under their own procedures. What changes for the force is that the specialists arrive already knowing the object's contents, position and surroundings, and that the last 300 meters of the approach were walked by a 75 kilogram machine.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits VARVEL's chemical library, tag format and arm tooling to the sensors, markers and procedures the force's specialist teams already use, and sizes its modules to the force's vehicles and GYR decks.

TRAIN It trains the object recognition and x-ray reading aids on the client's own case records and reference objects, in the client's language.

SET It sets stand-off distances, approval gates, radio-silence rules and hand-off reports to the force's doctrine, with the operator approving every contact.

WORKS WITH

APLOMADO · LURCHER · GYR · JESS · PITCH · MALAR · MANTLE · TIERCEL

VARVEL VARVEL Hazard Inspection Robot

DESCRIPTION

VARVEL is a 75 kilogram tracked robot, 1.3 meters long, with climbing flippers for 35 degree stairs and a six-axis arm that reaches 2 meters and lifts 12 kilograms at 1 meter. The wrist carries a 10x zoom camera, a thermal core, a chemical sensor that identifies 40 common hazardous compounds within 20 seconds, and a radiological probe. The arm places a 35 x 43 centimeter digital x-ray panel, and the image reaches the operator within 30 seconds. VARVEL then paints a ring around the object, plants a numbered radio tag that MALAR and PITCH show as a hazard symbol, and logs the position within 0.1 meters. A 500 meter fiber spool keeps it radio-silent near the object; otherwise it works to 1 kilometer over JESS through a LURCHER or GYR hop. The operator approves every contact.

CAPABILITIES

- Six-axis arm with 2 m reach and 12 kg lift at 1 m, with force feedback to the operator's hand controller
- Digital x-ray panel of 35 x 43 cm placed by the arm; image on the operator's display within 30 s
- Chemical sensor identifies 40 common hazardous compounds within 20 s from air or surface samples; radiological probe on the same wrist
- Camera with 10x optical zoom and a thermal core; reads a label at 20 m
- Paints a marking ring and plants a numbered radio tag that MALAR and PITCH show as a hazard symbol, logged within 0.1 m
- Radio-silent on a 500 m fiber spool; 1 km over JESS through a LURCHER or GYR relay hop
- Climbs 35 degree stairs on flippers, 6 km/h, 4 h endurance; splits into three modules of under 30 kg
- The operator approves every contact and every placement; the robot never moves, opens or disturbs the object

SPECIFICATIONS · DESIGN TARGETS

MASS AND SIZE	75 kg, 1.3 m long, 0.7 m wide, 0.55 m tall with arm stowed; three modules of under 30 kg each
ARM	six axes plus gripper, 2 m reach, 12 kg at 1 m, 5 kg at full reach, 0.5 mm positioning repeatability, force feedback
IMAGING	4K camera with 10x optical zoom, 640 x 512 thermal core, 35 x 43 cm digital x-ray panel with pulsed source, image within 30 s
CHEMICAL AND RADIOLOGICAL	40-compound library with identification within 20 s from air or surface samples, gamma and neutron probe with dose readout
MARKING	paint ring and numbered radio tag, position logged within 0.1 m, tag visible in MALAR and on the PITCH map for 30 days
MOBILITY	tracks with flippers, 6 km/h, 35 degree stairs, 0.4 m step, 0.3 m fording
CONTROL	500 m fiber spool, or JESS to 1 km with one relay hop; video latency under 150 ms; tablet, or MALAR with a glove rig; every contact approved and logged
ENDURANCE	4 h on a 1.4 kWh pack shared with LURCHER, swap in 2 min
ENVIRONMENT	MIL-STD-810H, IP66, -20 to +50 C

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the arm, sensor wrist and x-ray placement design package with stated reach, lift and imaging margins at a design review.
- Arm placement and x-ray panel positioning can be demonstrated in simulation against the client's own reference objects before a prototype is built.
- The acceptance trial protocol has the client's specialist teams set the stand-off, the objects and the pass marks, such as an x-ray image within 30 s and a tag within 0.1 m.
- Images, readings and tags stay inside the client's network, and every approved contact is logged with time, position and operator.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

The first five machines exist to keep people away from the hazard, and when that fails and someone goes down, the most dangerous minutes of the day begin, because two more operators now go forward to carry one back. BRAIL closes that gap. It reads the MANTLE casualty alert, drives to the position along ground LURCHER or APLOMADO has already checked, takes the litter on a deck lowered to 0.25 meters, and streams the casualty's vitals to the medic the whole way back. The sector that opened with a scout closes with a stretcher.



CONCEPT VISUALIZATION · BRAIL

ALL FIGURES ARE DESIGN TARGETS

GROUND ROBOTICS · HARDWARE · 06 OF 06

BRAIL

BRAIL Casualty Evacuation Robot

The brail is the soft strap a falconer binds around a hawk's wing to carry it without harm; BRAIL is the robot that lifts a casualty onto its litter deck without harm and carries them back.

REACHES THE CASUALTY FIRST AND BRINGS THEM BACK WITH VITALS IN VIEW.

SUMMARY

BRAIL is a 380 kilogram tracked robot with a powered litter deck that drives to a fallen operator, takes the litter aboard at 0.25 meters off the ground and carries the casualty back at 10 kilometers per hour over rough ground. A cuff and a chest sensor stream heart rate, breathing, oxygen and blood pressure to the medic's display and to PITCH the whole way. The medic decides the route and the destination; BRAIL drives it.

WHY FALCON ACCURACY BUILT IT

When an operator goes down, two more go forward to carry them, and a 90 kilogram casualty on a litter is a 400 meter walk that no squad finishes quickly under observation. Falcon Accuracy built BRAIL so that the carrying is done by a machine and the people stay in cover or stay on task. The robot reads the MANTLE casualty alert for position, drives there along ground LURCHER or APLOMADO has already checked, and brings the casualty to the medic with vitals already on the medic's display. What changes for the force is that the time from alert to a casualty under care drops to minutes, and no second operator goes forward to carry the first.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits BRAIL's deck and straps to the litters, monitors and cylinders the force's medics already issue, and its track width to the doorways and vehicle ramps of the client's sites.

TRAIN It trains the route and terrain models on the client's own ground and on the force's own casualty drills, with voice prompts in the client's language.

SET It sets collection points, route approval rules, vitals alert thresholds and lost-link behavior to the force's medical doctrine, with the medic deciding every move.

WORKS WITH

MANTLE · GYR · LURCHER · FALCONER · APLOMADO · JESS · PITCH · MALAR

BRAIL BRAIL Casualty Evacuation Robot

DESCRIPTION

BRAIL is a 380 kilogram electric tracked robot, 0.9 meters wide, built around a powered litter deck. The deck lowers to 0.25 meters so one person slides the issued litter onto its rollers, and a strap winch pulls 180 kilograms aboard in 15 seconds. The deck self-levels to 20 degrees and the suspension holds vertical acceleration under 0.5 g at 10 kilometers per hour. A cuff and a chest sensor read heart rate, breathing, oxygen saturation and temperature every second and blood pressure every 3 minutes, and the medic sees them on a MALAR display and in PITCH. A heated blanket, a fluid warmer, a cylinder rack and a two-way voice link ride with the casualty. BRAIL drives to a MANTLE casualty alert, waits for the medic to approve the route, and runs 6 hours or 60 kilometers.

CAPABILITIES

- Drives to a MANTLE casualty alert position on its own, along ground LURCHER or APLOMADO has checked, and waits for the medic's route approval
- Deck lowers to 0.25 m; a strap winch takes a 180 kg load aboard in 15 s with one person
- Self-leveling deck to 20 degrees; under 0.5 g vertical acceleration at 10 km/h on rough track
- Vitals every second and blood pressure every 3 min on the medic's display and in PITCH over JESS
- Heated and cooled blanket, fluid warmer, rack for the force's own oxygen cylinder, two-way voice to the casualty
- Carries 1 litter casualty with kit or 2 seated walking casualties; 0.9 m wide to pass a doorway
- 10 km/h on rough ground, 25 km/h on road, 6 h or 60 km; climbs 30 degree slopes and 0.4 m steps
- Returns to the casualty collection point alone if the link drops; every move logged

SPECIFICATIONS · DESIGN TARGETS

MASS AND PAYLOAD	380 kg curb, 250 kg payload, 1 litter casualty with kit or 2 seated
SIZE	2.1 m long, 0.9 m wide, deck height 0.25 m for loading and 0.7 m for travel
LOADING	roller deck accepts the force's issued litters, strap winch 180 kg in 15 s, one-person operation
RIDE	self-leveling deck to 20 degrees, active suspension under 0.5 g vertical at 10 km/h on rough track
VITALS	cuff and chest sensor, heart rate, breathing rate, oxygen saturation and temperature every 1 s, blood pressure every 3 min, streamed to the medic and PITCH
CARE FITTINGS	heated and cooled blanket, fluid warmer, cylinder rack, fold-over canopy, two-way voice and camera to the medic
SPEED AND ENDURANCE	10 km/h rough, 25 km/h road, 6 h or 60 km, battery swap in 3 min at GYR
AUTONOMY	drives to the alert position, route approval by the medic, return to the collection point on lost link, every move logged
SENSORS	360 degree lidar, four stereo pairs, thermal core, JESS node with one relay hop
ENVIRONMENT	MIL-STD-810H, IP67, -20 to +50 C, 30 degree slope, 0.4 m step, 0.5 m fording

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the deck, suspension and drivetrain design package with stated load, ride and endurance margins at a design review.
- Ride quality and self-leveling can be demonstrated in simulation on the client's own terrain data, with vertical acceleration reported against the 0.5 g target.
- The acceptance trial protocol has the client's medics load, ride and time the robot with a weighted litter, with pass marks such as 15 s loading and 10 km/h over the test track.
- Vitals integration is built against the monitors the force already issues, and all casualty data stays inside the client's network with every move logged.

NEXT SECTOR · 07 MARITIME AND LITTORAL · P. 94

One picture from the harbor floor to the horizon. This closes Ground Robotics. Sector 07, Maritime and Littoral, opens on page 94 with HAGGARD, BOWSE, MAIL and PINION.

SECTOR 07 OF 18

07

MARITIME AND LITTORAL

ONE PICTURE FROM THE HARBOR FLOOR TO THE HORIZON.

A harbor is the one position a force cannot relocate. Its ships lie still at the pier, its fuel and stores sit on the quay, and the water that brings them in also brings a skiff at 40 knots, a diver under the surface or a shape left on the bottom. Watching that water today takes crews on boats and divers in the water, and both tire long before the threat does. Falcon Accuracy builds the maritime sector on the rule it applies everywhere else, a sensor on every platform, one picture in PITCH, and a watch officer who decides. Every craft in this sector is unarmed. It carries radar, cameras, sonar and radios, it reports, it shadows and it marks, and it leaves the response to the people the force has trained for it.



IN THIS SECTOR · 4 PRODUCTS · PAGES 96 TO 103

HAGGARD **BOWSE** **MAIL** **PINION**

SECTOR 07 · MARITIME AND LITTORAL

The sector works as a layered watch. Fixed sonar buoys and pier radars hold the harbor mouth around the clock and raise a track within 3 seconds. An uncrewed boat goes to the track, shadows it for 48 hours if needed and looks below the surface with its own sonar. An underwater vehicle inspects what the boat and the buoys flag, on the bottom or on a hull, and surfaces the evidence. A retrofit kit brings the crewed boats the force already owns into the same picture, so a port is watched by every hull it has, not only the ones it buys. Data stays inside the force's network, every tasking is logged, and every detection range in this sector is a figure a trials crew can measure in the client's own water. The products are HAGGARD Uncrewed Patrol Boat, BOWSE Underwater Inspection Vehicle, MAIL Harbor Sensor Network and PINION Boat Autonomy Kit.

IN THIS SECTOR · 4 PRODUCTS



HAGGARD p. 96

HAGGARD Uncrewed Patrol Boat

Patrols the approach for 48 hours. Sees above and below the waterline.



BOWSE p. 98

BOWSE Underwater Inspection Vehicle

Finds what lies on the bottom, marks it, and lets you decide.



MAIL p. 100

MAIL Harbor Sensor Network

Hears a diver at 700 m. Sees a skiff at 12 km.



PINION p. 102

PINION Boat Autonomy Kit

Fits the boats you already own. Three days from quay to patrol.



CONCEPT VISUALIZATION · HAGGARD

ALL FIGURES ARE DESIGN TARGETS

MARITIME AND LITTORAL · HARDWARE · 01 OF 04

HAGGARD

HAGGARD Uncrewed Patrol Boat

A haggard is a falcon trapped in adult plumage, a bird that has already hunted alone through more than one season; HAGGARD is the boat that patrols the approach alone for 48 hours.

PATROLS THE APPROACH FOR 48 HOURS. SEES ABOVE AND BELOW THE WATERLINE.

SUMMARY

HAGGARD is an 8.5 meter uncrewed patrol boat that keeps watch over a harbor approach, an anchorage or a coastal lane for 48 hours at a time. Its radar, cameras and hull sonar build one picture above and below the waterline and send it to PITCH, while a watch officer ashore decides what the boat does next.

WHY FALCON ACCURACY BUILT IT

A harbor approach or a coastal lane is watched today by crewed boats that cost a crew of four for every hour on the water and come home when the crew tires. Small fast craft, swimmers and objects on the bottom arrive at any hour and are hard to tell from fishing traffic and debris at range. Falcon Accuracy built HAGGARD to put a persistent sensor platform on the water for 48 hours at a time, with the same picture, radios and classifier as the rest of the family. The force gets a boat that watches above and below the waterline, reports only what matters, and leaves every closure and every hail to a watch officer ashore.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits HAGGARD to the force's davits, trailers, quay power and fuel, and to the radios and chart systems the harbor already runs.

TRAIN Falcon Accuracy trains the vessel classifier and the sonar library on the hulls, traffic, tides and marine life recorded in the client's own waters across the seasons.

SET Falcon Accuracy sets patrol lines, approach distances, hailing scripts and lost-link behavior to the force's standing orders and the port's rules.

WORKS WITH

BOWSE · MAIL · PINION · PITCH · JESS · TIERCEL · HOOD · SARCEL

HAGGARD HAGGARD Uncrewed Patrol Boat

DESCRIPTION

HAGGARD is an 8.5 meter uncrewed patrol boat that holds a harbor approach, an anchorage or a coastal lane for 48 hours. It sprints at 35 knots and loiters at 6 knots on quiet electric drive. The mast radar tracks a small boat at 12 kilometers and a personal watercraft at 6 kilometers, the stabilized camera ball identifies a vessel type at 5 kilometers and a person in the water at 1.5 kilometers, and the hull sonar hears a diver at 400 meters while a side-scan images the bottom in a 150 meter swath. An onboard PITCH Edge node classifies 200 contacts within 2 seconds and sends tracks and short clips over JESS to a watch officer ashore, who approves any closure under 500 meters. The stern deck lands a TIERCEL aircraft and launches a BOWSE vehicle.

CAPABILITIES

- Radar tracks a small boat at 12 km and a personal watercraft at 6 km, full 360 degree scan each second
- Cameras identify a vessel type at 5 km and a person in the water at 1.5 km, day and night
- Forward sonar detects a diver at 400 m and a small underwater vehicle at 600 m; side-scan images the bottom in a 150 m swath at 6 knots
- Patrols 48 h on a task given in plain terms, such as holding a line or shadowing a contact
- Keeps the international collision rules at sea; a human approves any closure under 500 m
- Stern pad lands a TIERCEL aircraft within 30 cm; stern cradle launches and recovers one BOWSE vehicle
- Sends tracks and short clips over JESS to 15 km, 40 km through a TIERCEL relay; full video only when the watch officer asks
- Returns alone to a holding point, then to the harbor, if the link stays down for 10 min

SPECIFICATIONS · DESIGN TARGETS

HULL	8.5 m aluminum deep-V, 2.8 m beam, 4.2 t full load, 600 kg mission payload
PROPULSION	diesel-electric hybrid, 35 knots sprint, 6 knots electric loiter under 60 dBA at 10 m
ENDURANCE	48 h at 6 knots; 400 nautical miles at 20 knots; sea state 4 operating, sea state 6 survival
RADAR	X-band, small boat at 12 km, personal watercraft at 6 km, 200 tracks, 1 s scan; air mode sees a small quadcopter at 3 km
CAMERAS	stabilized gimbal with 4K 30x zoom and 640 x 512 thermal core, vessel type at 5 km, person in water at 1.5 km
SONAR	forward-looking active sonar, diver at 400 m, small underwater vehicle at 600 m; hull side-scan, 150 m swath at 6 knots
COMPUTE	200 TOPS onboard, PITCH Edge node, 200 contacts tracked, classification within 2 s
COMMS	JESS vehicle radio 20 W, 15 km to shore, 40 km through a TIERCEL relay; AES-256; optional satellite backhaul
DECK	TIERCEL landing pad with charging, BOWSE stern cradle, 6-person life raft, hailer and light bar
BUILD	IP67 electronics, -20 to +50 C, launched from a trailer or davit by a two-person shore team

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can show the hull form, hydrostatics and power budget in a naval architecture design review the client's engineers attend.
- Radar, camera and sonar ranges are design targets with a written trial protocol the client can run on its own water, in its own sea states.
- The autonomy stack can be demonstrated today in simulation on the client's harbor chart against 1,000 traffic encounters under the international collision rules, with every decision logged.
- All video, sonar and track data recorded by HAGGARD stays on the client's network; nothing is sent to Falcon Accuracy.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

The HAGGARD hull sonar sees a shape on the bottom across a 150 meter swath and hears a diver at 400 meters, but a boat on the surface cannot tell a mine-like object from a lost anchor, and a force should not send a diver down to find out. The gap is the last 10 meters, a close look at the object or the hull with no person in the water. BOWSE closes it. It launches from the HAGGARD stern cradle, inspects the contact at 0.5 meter standoff, fixes it within 1 meter and brings the images back so a clearance officer can decide.



CONCEPT VISUALIZATION · BOWSE

ALL FIGURES ARE DESIGN TARGETS

MARITIME AND LITTORAL · HARDWARE · 02 OF 04

BOWSE

BOWSE Underwater Inspection Vehicle

To bowse is to drink, the falconer's word for a hawk taking water; BOWSE is the vehicle that takes to the water to inspect a hull or the seabed.

FINDS WHAT LIES ON THE BOTTOM, MARKS IT, AND LETS YOU DECIDE.

SUMMARY

BOWSE is a 1.9 meter, 62 kilogram uncrewed underwater vehicle that surveys a harbor bottom for mine-like objects and inspects ship hulls, piers and intakes. It images each contact with sonar and cameras, classifies it on board, fixes its position within 1 meter and surfaces the evidence for a clearance officer, who decides what happens next.

WHY FALCON ACCURACY BUILT IT

When a sonar return looks like a mine-like object, or a ship has been alongside in a foreign port, someone has to look closely, and today that someone is a diver. Divers are few, slow and at risk, and a hull of 150 meters takes a team most of a day. Falcon Accuracy built BOWSE to do the looking and the measuring, and to leave the judgment and the action to the clearance team. The force gets a 1 meter fix, a sonar image and a camera image for every contact, a hull compared against its own baseline, and no person in the water until a human decides there is a reason.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits BOWSE to the force's small boats, quays and the HAGGARD cradle, and to the chart and mine-countermeasures data formats its clearance teams already use.

TRAIN Falcon Accuracy trains the classifier on the seabed types, clutter, debris and hull forms recorded in the client's own ports and on the inert training shapes the force lays.

SET Falcon Accuracy sets survey patterns, review thresholds and marker rules to the force's clearance doctrine and the port authority's rules.

WORKS WITH

HAGGARD · MAIL · PINION · PITCH · JESS · TERTIAL

BOWSE BOWSE Underwater Inspection Vehicle

DESCRIPTION

BOWSE is a 1.9 meter, 62 kilogram uncrewed underwater vehicle launched by two operators from a quay, a small boat or the HAGGARD stern cradle. On a survey it runs 10 hours at 3 knots and images the seabed at 2 centimeter detail across a 150 meter swath, covering 2.5 square kilometers in a sortie. An onboard classifier ranks mine-like objects within 5 seconds of the pass and keeps each sonar snippet. On a hull it hovers 0.5 meters off the plating, inspects a 150 meter ship in 90 minutes, flags attached objects from 10 centimeters and highlights every change since the last baseline. It fixes each contact within 1 meter and, on an operator's approval, drops a 200 gram acoustic marker beside it. BOWSE never touches the object; the clearance officer reads the evidence and decides.

CAPABILITIES

- Side-scan sonar images the seabed at 2 cm detail across a 150 m swath, 2.5 square kilometers per 10 h sortie
- Onboard classifier ranks mine-like objects within 5 s of the pass and keeps the sonar snippet for review
- Hovers 0.5 m off a hull and inspects a 150 m ship in 90 min, flagging attached objects from 10 cm
- Compares every hull pass with the ship's stored baseline and highlights what changed
- Fixes each contact within 1 m and drops a 200 g acoustic marker beside it on an operator's approval
- Navigates 10 h without satellites by Doppler log and inertial unit, drift under 0.1 percent of distance run
- Launches from the HAGGARD stern cradle, a quay or a two-person team in a small boat
- Never touches the object; classification and position go to the clearance officer, who decides

SPECIFICATIONS · DESIGN TARGETS

VEHICLE	1.9 m long, 0.32 m diameter hover-capable hull, 62 kg in air, 300 m depth rating
ENDURANCE AND SPEED	10 h at 3 knots survey, 5 knots sprint; battery swap in 10 min
SONAR	interferometric side-scan, 2 cm pixel size across a 150 m swath; forward-looking imaging sonar from 0.5 to 60 m
CAMERAS AND LIGHTS	4K color camera, 20,000 lumen LED array, stereo pair measuring to 2 mm at 0.5 m standoff
NAVIGATION	Doppler velocity log, inertial unit, acoustic positioning from the launch platform; contact fixed within 1 m
COMPUTE	40 TOPS, onboard mine-like-object classifier and change detection against stored hull baselines
COMMS	acoustic modem 2 kbps to 2 km for status and snippets; full data offload by cable within 15 min of recovery
MARKERS	200 g acoustic markers, 8 per sortie, 30 day pinger life, released only on operator approval
ENVIRONMENT	water 0 to +35 C, hover in currents to 2 knots, IP68 topside case 48 kg; AES-256 data at rest

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the pressure hull, thruster layout, mass, buoyancy and power budgets in a design study the client's engineers review.
- Classifier performance is measured on a seabed test lane where the force lays inert shapes that Falcon Accuracy does not see beforehand, and the full score sheet is handed over.
- Hull-inspection coverage can be shown in a test tank and then on a hull the client chooses, under the client's own safety rules.
- All sonar imagery, camera imagery and hull baselines stay on the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

HAGGARD and BOWSE are mobile, so they are only where the task has sent them, and a harbor mouth is open the moment they leave it. A port needs a watch that stays on station through every tide and every shift change and tells the boats where to go. MAIL is that fixed layer. Its buoys hear a diver at 700 meters and its radars see a skiff at 12 kilometers, and through PITCH it cues HAGGARD to the track while BOWSE checks the bottom the diver crossed.



CONCEPT VISUALIZATION · MAIL

ALL FIGURES ARE DESIGN TARGETS

MARITIME AND LITTORAL · HARDWARE · 03 OF 04

MAIL

MAIL Harbor Sensor Network

The mail is the falcon's breast plumage, the dense coat that keeps the weather off the bird; MAIL is the coat of buoys and masts that keeps watch on the harbor's door.

HEARS A DIVER AT 700 M. SEES A SKIFF AT 12 KM.

SUMMARY

MAIL is a network of moored sonar buoys, pier radars and thermal cameras that watches a harbor mouth, an anchorage or a pier line around the clock. Its site-trained model tells divers and small craft from seals, wakes and debris, cues HAGGARD and the harbor's own boats through PITCH, and keeps the watch officer's decision log.

WHY FALCON ACCURACY BUILT IT

Boats and divers patrol, but a harbor mouth is open the moment they leave it, and most intrusions arrive at night in weather when a lookout sees least. Existing harbor radars see the surface and nothing below it, and a diver detection sonar without a trained classifier alarms on every seal. Falcon Accuracy built MAIL as the fixed layer that stays on station, hears below the surface and learns the harbor so that an alarm means something. The watch officer gets one picture of the water from the seabed to the horizon and a cue ready to send to HAGGARD or a crewed boat, with the decision logged.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits MAIL buoys and masts to the harbor's moorings, piers, power and vessel-traffic displays, and feeds the cameras and radars the port already owns into the same picture.

TRAIN Falcon Accuracy trains the classifier on that harbor's marine life, tides, traffic and noise during a 14 day baseline, and on the force's own divers and boats in rehearsal.

SET Falcon Accuracy sets alert zones, response ladders and hailing procedures to the port authority's rules and the guard force's standing orders.

WORKS WITH

HAGGARD · BOWSE · PINION · PITCH · JESS · SCREEN · HOOD · RAMAGE

MAIL MAIL Harbor Sensor Network

DESCRIPTION

MAIL is a fixed watch for a harbor mouth, an anchorage or a pier line. Each moored sonar buoy detects an open-circuit diver at 700 meters, a closed-circuit diver at 400 meters and a small underwater vehicle at 800 meters, and its hydrophones hear an outboard engine at 5 kilometers. Pier or trailer radars track a small boat at 12 kilometers and a personal watercraft at 6 kilometers, and every track slews the nearest thermal camera. A classifier learns the harbor's seals, wakes, tides and traffic during a 14 day baseline, so nuisance alarms fall below one per buoy per day. Alerts reach the watch officer within 3 seconds, and through PITCH the officer sends HAGGARD or a PINION-fitted boat, with every tasking logged. Six buoys and two masts close a 1.5 kilometer entrance.

CAPABILITIES

- Each buoy's sonar detects an open-circuit diver at 700 m, a closed-circuit diver at 400 m and a small underwater vehicle at 800 m
- Pier radars track a small boat at 12 km and a personal watercraft at 6 km; every track slews the nearest thermal camera
- Hydrophones hear an outboard engine at 5 km and place it within 50 m across 3 buoys
- Site-trained classifier holds nuisance alarms below 1 per buoy per day after a 14 day baseline
- Cues HAGGARD and PINION-fitted boats through PITCH; a watch officer approves every tasking
- Six buoys and two radar masts close a 1.5 km harbor mouth; an expeditionary kit stands a 1 km anchorage watch in 48 h
- Buoys run on solar with 10 days of reserve and report over the JESS mesh, with no cable to the seabed
- Every alert, tasking and decision logged; data stays inside the port's network

SPECIFICATIONS · DESIGN TARGETS

SONAR BUOY	1.4 m diameter, 180 kg, active diver detection sonar with 360 degree coverage, track update every 2 s
DETECTION	open-circuit diver 700 m, closed-circuit diver 400 m, small underwater vehicle 800 m, targets tracked down to 0.3 knots
PASSIVE	4 hydrophones per buoy, outboard engine heard at 5 km, placed within 50 m by 3 buoys
RADAR	X-band on pier or trailer mast, small boat at 12 km, personal watercraft at 6 km, 1 s scan, 500 tracks; air mode sees a small quadcopter at 3 km
CAMERAS	pan-tilt 4K and 640 x 512 thermal, swimmer at 500 m, small boat identified at 4 km, auto-slew from radar and sonar
COVERAGE	6 buoys and 2 masts for a 1.5 km entrance; expeditionary kit of 4 buoys and 1 radar trailer stands up in 48 h
POWER AND COMMS	solar with 10 day reserve per buoy, JESS mesh node, AES-256, shore node with PITCH Edge
MOORING	single-point mooring to 60 m depth, currents to 3 knots, sea state 5 operating, serviced from a 10 m workboat
NUISANCE ALARMS	under 1 per buoy per day after a 14 day baseline; alert to the watch officer within 3 s of detection

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can model sonar detection ranges against the client's own harbor depths and sound-speed profile before any buoy is moored, and show the client the model.
- The classifier baseline is run at the client's harbor over 14 days and the nuisance-alarm rate is measured there, with the raw alarm log handed over.
- Buoy mooring, power budget and radar siting are reviewed with the port's marine engineers in a design review before procurement.
- MAIL tasks nothing by itself; every cue to a boat or an aircraft is proposed to a watch officer and logged.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

With MAIL on the mouth, HAGGARD on patrol and BOWSE below, the picture still lacks the hulls a force owns most of, its crewed patrol boats. Those boats carry a coxswain, a radio and little else, and the watch officer sees each one as a dot from its own position report. PINION fits each boat with the HAGGARD mast and classifier in 3 days, so every hull in the harbor adds its radar and camera to the same picture and takes a task from the same watch officer, with its crew aboard or ashore.



CONCEPT VISUALIZATION · PINION

ALL FIGURES ARE DESIGN TARGETS

MARITIME AND LITTORAL · HARDWARE · 04 OF 04

PINION

PINION Boat Autonomy Kit

The pinion is the outer wing of the falcon, the part that steers every turn in flight; PINION fits a crewed boat with the steering, sensors and autonomy of the family.

FITS THE BOATS YOU ALREADY OWN. THREE DAYS FROM QUAY TO PATROL.

SUMMARY

PINION is a retrofit kit that turns a crewed patrol boat of 7 to 15 meters into a sensing and autonomy node of the same family as HAGGARD. A mast module, a helm interface and a sealed compute case fit in three days at the quay, so the boat shares the PITCH picture with its crew aboard or runs an uncrewed patrol under a watch officer ashore.

WHY FALCON ACCURACY BUILT IT

A force rarely buys a fleet of new boats, but it already owns dozens of crewed patrol craft that carry a coxswain, a radio and little else. Each one is a hull the picture cannot see through and a crew that cannot see the picture. Falcon Accuracy built PINION so that every boat the force owns joins the same net as HAGGARD in 3 days, with its crew aboard or ashore. The force multiplies its watch without a new hull, keeps its coxswains in charge of their own boats, and trains once for one system.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits PINION brackets, actuators and power to each boat class the force owns after a survey of the hull, the helm and the electrical system.

TRAIN Falcon Accuracy trains the classifier on the client's own waters and traffic, and the autonomy on each boat's measured turning and stopping behavior.

SET Falcon Accuracy sets approval distances, hailing scripts, follow distances and remote-helm rules to the force's standing orders.

WORKS WITH

HAGGARD · MAIL · BOWSE · PITCH · JESS · HOOD · TIERCEL · MANTLE

PINION PINION Boat Autonomy Kit

DESCRIPTION

PINION is a retrofit kit that gives a crewed 7 to 15 meter patrol boat the sensors and autonomy of HAGGARD. Two technicians fit it in 3 days at the quay. A 48 kilogram mast module carries the HAGGARD radar, camera ball and JESS node, electric actuators clamp to the existing throttle and wheel, and an 18 kilogram case holds a 200 TOPS computer with a PITCH Edge node. In crewed mode the coxswain sees the shared picture. In remote mode a watch officer ashore drives the boat to 15 kilometers, or 40 through a TIERCEL relay. In uncrewed mode it patrols like HAGGARD under the same approvals. The coxswain takes the helm back within 1 second by moving the wheel, and a mechanical lever disconnects the actuators. Wrist tags raise a man-overboard alert within 5 seconds.

CAPABILITIES

- Fits a 7 to 15 m patrol boat in 3 days at the quay, no drydock, with a mast module, helm actuators and one compute case
- Mast carries radar to 12 km, a camera ball to 5 km and a JESS node, the same sensors and classifier as HAGGARD
- Three modes, crewed with the shared picture, remote from a watch officer ashore, and uncrewed patrol with the same approvals as HAGGARD
- The coxswain takes the helm back within 1 s by moving the wheel or throttle; a mechanical lever disconnects the actuators
- Holds station 200 m off a crewed leader or a HAGGARD boat; one watch officer supervises 4 kitted boats and 2 HAGGARD
- Crew wrist tags raise a man-overboard alert within 5 s and drop the position on the picture
- Optional over-the-side sonar pole adds diver detection at 300 m without a through-hull fitting
- Every maneuver, hail and handover logged; data stays inside the force's network

SPECIFICATIONS · DESIGN TARGETS

FIT	patrol boats 7 to 15 m with outboard, inboard or waterjet drive; 3 day install by 2 technicians, no drydock
MAST MODULE	48 kg, 2.4 m, X-band radar (small boat at 12 km), 4K 30x zoom and 640 x 512 thermal gimbal, GNSS, JESS 20 W node, HOOD receiver option
HELM INTERFACE	electric actuators on the existing throttle and steering, 1 s manual takeover, mechanical disconnect lever
COMPUTE CASE	18 kg, 200 TOPS, PITCH Edge node, 200 contacts tracked, 24 V at 600 W average
MODES	crewed assist, remote helm from shore to 15 km (40 km through a TIERCEL relay), uncrewed patrol with human approval of any closure under 500 m
SONAR OPTION	over-the-side pole transducer, diver at 300 m, fitted in 1 h
CREW SAFETY	12 wrist tags, man-overboard alert within 5 s, autopilot proposes a return track for the coxswain's approval
ENVIRONMENT	MIL-STD-810H, IP67 mast and case, -20 to +50 C, remote operation to sea state 4
SECURITY	AES-256 links, signed software, remote helm enabled only by two-person authorization

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can fit a demonstration kit to one of the client's boats under a written trial protocol and hand the boat back unchanged within a day.
- Helm takeover and the mechanical disconnect are tested on a bench rig built around the boat's own control types before any sea trial.
- Autonomy and collision-avoidance behavior can be shown today in simulation on the client's harbor chart with 1,000 traffic encounters, every decision logged.
- No data from the boat's sensors leaves the force's network.

NEXT SECTOR · 08 UNDERSEA SYSTEMS · P. 104

Know the seabed, watch the cables, bring the crew home. This closes Maritime and Littoral. Sector 08, Undersea Systems, opens on page 104 with SARCEL, TERTIAL, KITING, RAMAGE and GONYS.

SECTOR 08 OF 18

08

UNDERSEA SYSTEMS

KNOW THE SEABED, WATCH THE CABLES, BRING THE CREW HOME.

The seabed carries the cables and pipelines a nation runs on, its data, its power and its gas, and most of that seabed has never been surveyed at a detail that shows a dragged anchor scar or a span of unsupported pipe. A route is mapped once when the cable is laid and rarely after. The owner learns of damage when the traffic stops, hours after the vessel that caused it has gone. Survey ships cost a full crew for weeks, divers see little in dark water, and the ocean itself changes by the week in ways that move every sonar range a force plans on. Falcon Accuracy builds the undersea sector to close those gaps with sensors, not weapons. Every product here is unarmed. It maps, measures, listens, warns and rescues, and it leaves every response to the people the force has trained for it.



IN THIS SECTOR · 5 PRODUCTS · PAGES 106 TO 115

SARCEL TERTIAL KITING RAMAGE GONYS

The sector works as one chain, from the open sea to the harbor floor and down to a submarine in distress. SARCEL maps cable and pipeline routes for 72 hours at a time, and TERTIAL does the same for a harbor basin. KITING gliders measure the water for months, RAMAGE tells the watch officer within 60 seconds when a vessel anchors or drags over a line, and GONYS brings a submarine crew up from 600 meters, 12 at a time. Every alert feeds PITCH, a human decides every response, every decision is logged, and all data stays inside the client's network.

IN THIS SECTOR · 5 PRODUCTS



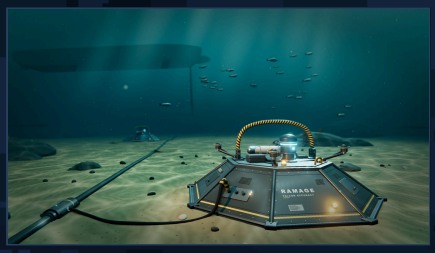
SARCEL p. 106
SARCEL Long-Range Survey AUV
Surveys the cable routes a nation runs on, 3,000 meters down.



TERTIAL p. 108
TERTIAL Harbor Survey AUV
Launched by two from the quay, a basin mapped in 7 hours.



KITING p. 110
KITING Ocean Glider Fleet
Months at sea, measuring the water every sonar and diver works in.



RAMAGE p. 112
RAMAGE Seabed Infrastructure Array
Hears an anchor drop near the cable, reported within 60 seconds.



GONYS p. 114
GONYS Submarine Rescue Vehicle
Reaches a disabled submarine at 600 meters. Brings 12 home each trip.



CONCEPT VISUALIZATION · SARCEL

ALL FIGURES ARE DESIGN TARGETS

UNDERSEA SYSTEMS · HARDWARE · 01 OF 05

SARCEL

SARCEL Long-Range Survey AUV

The sarcel is the outer pinion feather of a hawk's wing, the long flight feather that carries the bird on its longest flights; SARCEL is the vehicle built for the longest survey runs.

SURVEYS THE CABLE ROUTES A NATION RUNS ON, 3,000 METERS DOWN.

SUMMARY

SARCEL is a 6 meter autonomous underwater vehicle that maps the seabed and inspects cables and pipelines to 3,000 meters. It runs 72 hours on a survey line with synthetic aperture sonar, a multibeam echosounder, a magnetometer and a camera, and brings back a survey-grade map with every change since the last pass marked. It carries sensors only.

WHY FALCON ACCURACY BUILT IT

A nation's data, power and gas cross the seabed in cables and pipelines that were surveyed once, when they were laid, and rarely since. Most of the seabed beyond the harbor has never been mapped at a detail that shows an anchor scar or a span of unsupported pipe. Survey ships with towed sonar cost a full crew for weeks and stop when the weather turns. Falcon Accuracy built SARCEL to fly the route alone for 72 hours at a time, so the force and the asset owner know the state of every kilometer and plan repair, protection and diving on fact.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits SARCEL to the force's survey ships, stern ramps and deck power, to a container cradle for vessels of opportunity, and to the chart and pipeline data formats the asset owner already uses.

TRAIN Falcon Accuracy trains the change-detection model on the seabed types, sediment, marine growth and cable and pipeline routes recorded in the client's own waters, starting from the as-laid survey of each route.

SET Falcon Accuracy sets survey lines, altitude, standoff from the asset, abort depths and reporting thresholds to the force's survey doctrine and the asset owner's inspection rules.

WORKS WITH

TERTIAL · KITING · RAMAGE · GONYS · HAGGARD · BOWSE · PITCH · WEATHER · CALAMUS

SARCEL SARCEL Long-Range Survey AUV

DESCRIPTION

SARCEL is a 6 meter, 0.53 meter diameter autonomous underwater vehicle in survey yellow, rated to 3,000 meters. It flies 72 hours at 4 knots with every sensor running, or transits up to 1,000 kilometers at 3 knots to reach a distant route. Synthetic aperture sonar images the seabed at 3 centimeter detail across a 400 meter swath, a multibeam echosounder maps depth to 10 centimeters, a magnetometer follows a buried cable or pipeline within 0.5 meters, and a camera photographs it from 5 meters. An onboard model flags exposed spans, anchor scars, debris and changes since the last survey within 10 seconds of the pass. SARCEL launches from a ship's stern ramp or a container cradle on a vessel of opportunity, and HAGGARD can meet it at sea and tow it home. It carries sensors only.

CAPABILITIES

- Synthetic aperture sonar images the seabed at 3 cm detail across a 400 m swath, about 200 square kilometers per 72 h sortie
- Multibeam echosounder maps depth with 10 cm vertical precision across a 120 degree fan
- Magnetometer tracks a cable or pipeline buried 2 m deep and holds the survey line within 0.5 m of it
- Onboard model flags exposed spans, anchor scars, debris and changes since the last survey within 10 s of the pass
- 72 h on a survey line at 4 knots, or a 1,000 km economy transit at 3 knots with the survey payload off
- Navigates without satellites by inertial unit and Doppler log, drift under 0.05 percent of distance run
- Launches and recovers over a ship's stern ramp in sea state 4; HAGGARD meets it at sea and tows it home at 6 knots
- Carries sensors only; a survey officer approves every mission plan, and every change to it is logged

SPECIFICATIONS · DESIGN TARGETS

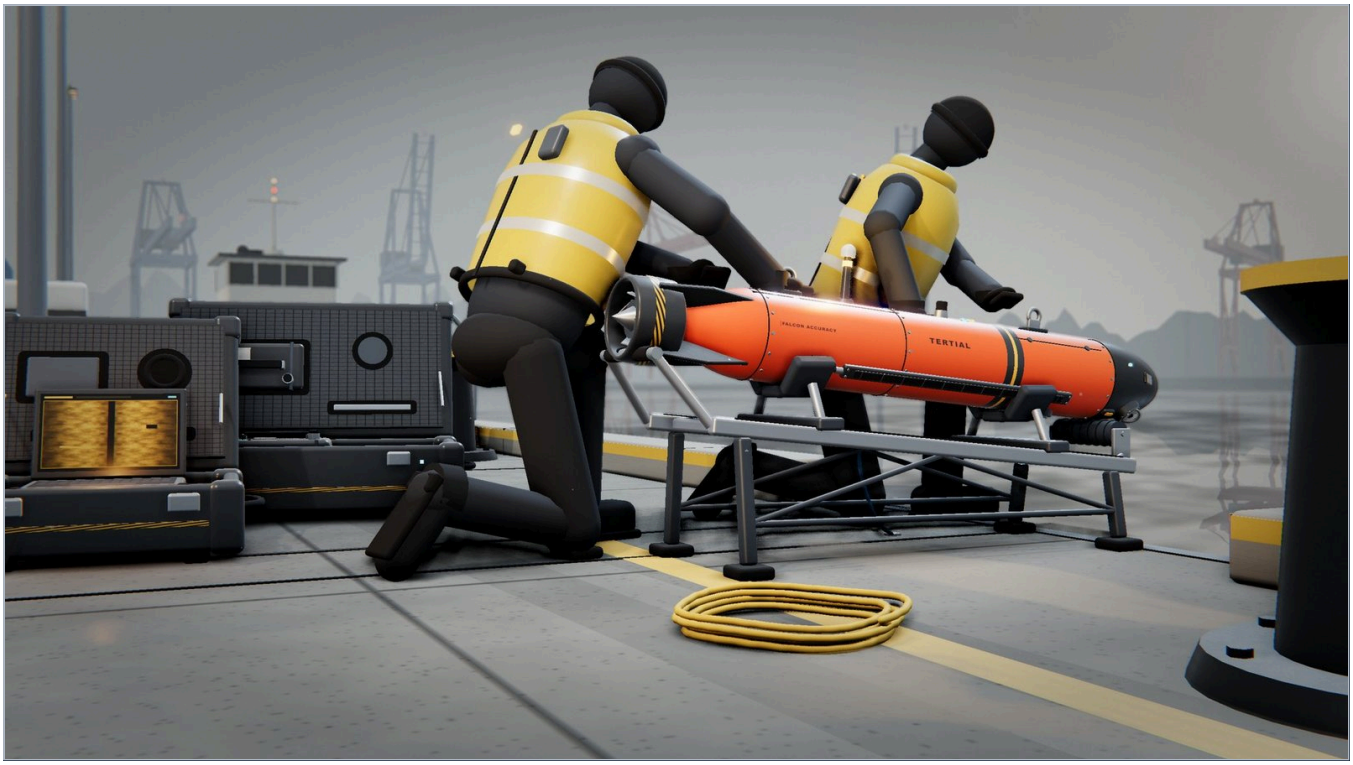
VEHICLE	6.0 m long, 0.53 m diameter, 1,300 kg in air, free-flooding nose and tail sections, survey yellow with graphite panels
DEPTH AND SPEED	rated to 3,000 m; 4 knots survey, 6 knots sprint, 3 knots economy transit
ENDURANCE	72 h at 4 knots with all sensors; 1,000 km at 3 knots with the survey payload off; 70 kWh pressure-tolerant battery, swapped in 2 h
SONAR	synthetic aperture sonar with 3 cm by 3 cm pixels across 2 x 200 m; 400 kHz multibeam echosounder, 10 cm vertical precision
MAGNETOMETER AND CAMERA	3-axis magnetometer tracks a cable buried 2 m deep within 0.5 m; 12 MP stills from 5 m altitude at 2 frames per second with LED strobe
NAVIGATION	inertial unit, Doppler velocity log and pressure sensor, drift under 0.05 percent of distance run; acoustic positioning from the launch ship; satellite fix at each surfacing
COMPUTE	60 TOPS, change detection against the stored route baseline, 16 TB encrypted storage
COMMS	acoustic modem 9 kbps to 5 km for status and snippets; satellite and radio at the surface; full offload by fiber within 30 min of recovery
LAUNCH AND RECOVERY	stern ramp or 20 ft container cradle on a vessel of 40 m or more, sea state 4; tow bridle for HAGGARD recovery at 6 knots
SAFETY	drop weight releases at a set depth or on fault; strobe, flag and radio beacon on surfacing; AES-256 data at rest

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the hull, buoyancy, pressure housings and 70 kWh energy budget in a design review with the client's naval engineers.
- Survey coverage and change-detection performance can be simulated today on the client's own as-laid route data, with the full method handed over.
- A written trial protocol sets out how sonar detail, magnetometer tracking and endurance are measured on a test line the client chooses.
- All sonar, bathymetry and camera data stays inside the client's network; nothing is sent to Falcon Accuracy.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

SARCEL maps the open route from a ship, 72 hours at a time, but a harbor basin is too shallow, crowded and close to the quay for a 6 meter vehicle and the ship that carries it. The same question, what lies on the floor and what has changed, still has to be answered there after every storm, dredging campaign and alert. TERTIAL brings SARCEL's change detection to a 40 kilogram vehicle that two people launch by hand, and its ranked list sends BOWSE and the divers only to the few objects that matter.



CONCEPT VISUALIZATION · TERTIAL

ALL FIGURES ARE DESIGN TARGETS

UNDERSEA SYSTEMS · HARDWARE · 02 OF 05

TERTIAL

TERTIAL Harbor Survey AUV

The tertials are the innermost flight feathers, the short ones closest to the falcon's body; TERTIAL works the water closest to home, the harbor basin.

LAUNCHED BY TWO FROM THE QUAY, A BASIN MAPPED IN 7 HOURS.

SUMMARY

TERTIAL is a 1.6 meter, 40 kilogram survey vehicle that two people launch by hand from a quay or a small boat. It maps a 2 square kilometer harbor basin with side-scan sonar in about 7 hours, photographs what it finds and ranks every object on the floor, so divers and BOWSE inspect only what matters.

WHY FALCON ACCURACY BUILT IT

A harbor floor collects lost anchors, scrap, tires and the occasional object that matters, and after a storm, a dredging campaign or an alert someone has to know which is which. Today divers search by hand in water they cannot see through, and a survey ship is too large for the basin. Falcon Accuracy built TERTIAL so a team of two can survey the whole basin in a working day, rank every contact and send divers or BOWSE to the few that need a close look. The force replaces days of blind diving with one sortie and a ranked list.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits TERTIAL to the force's small boats, quays and dive support vehicles, and exports its contact lists into the chart and dive planning tools the harbor already uses.

TRAIN Falcon Accuracy trains the classifier on the bottom types, debris and lost gear of the client's own harbors, and on the inert training shapes the force lays in rehearsal.

SET Falcon Accuracy sets survey patterns, ranking thresholds and the rule for which contacts go to a diver to the force's clearance and diving procedures.

WORKS WITH

SARCEL · BOWSE · HAGGARD · MAIL · PINION · RAMAGE · PITCH · JESS

TERTIAL TERTIAL Harbor Survey AUV

DESCRIPTION

TERTIAL is a 1.6 meter, 40 kilogram survey vehicle with a 0.19 meter diameter hull, carried in two cases and launched by two people from a quay, a pontoon or a small boat. It flies preplanned lines at 3 knots and 3 meters above the bottom for up to 10 hours. Dual-frequency side-scan sonar images the floor at 2.5 centimeter detail across a 60 meter swath, so a 2 square kilometer basin is mapped in about 7 hours, and a down-looking camera photographs each high-ranked contact on a second pass. The onboard classifier sorts every object over 30 centimeters into debris, lost gear, mine-like and unknown, compares the basin with its last survey, and hands the dive supervisor a ranked list with a 2 meter fix for each item. Divers and BOWSE then inspect only what ranks high.

CAPABILITIES

- Two people launch it by hand from a quay, a pontoon or a 6 m boat, with no crane
- Side-scan sonar images the floor at 2.5 cm detail across a 60 m swath at 3 knots
- Maps a 2 square kilometer basin in about 7 h, with up to 10 h per battery
- Classifier sorts every object over 30 cm into debris, lost gear, mine-like and unknown within 5 s of the pass
- Compares each survey with the last and marks every object that is new, moved or gone
- Second pass photographs high-ranked contacts from 2 m altitude with a down-looking camera and strobe
- Hands the dive supervisor a ranked list with a 2 m fix for each item; a human decides who goes down, and the decision is logged

SPECIFICATIONS · DESIGN TARGETS

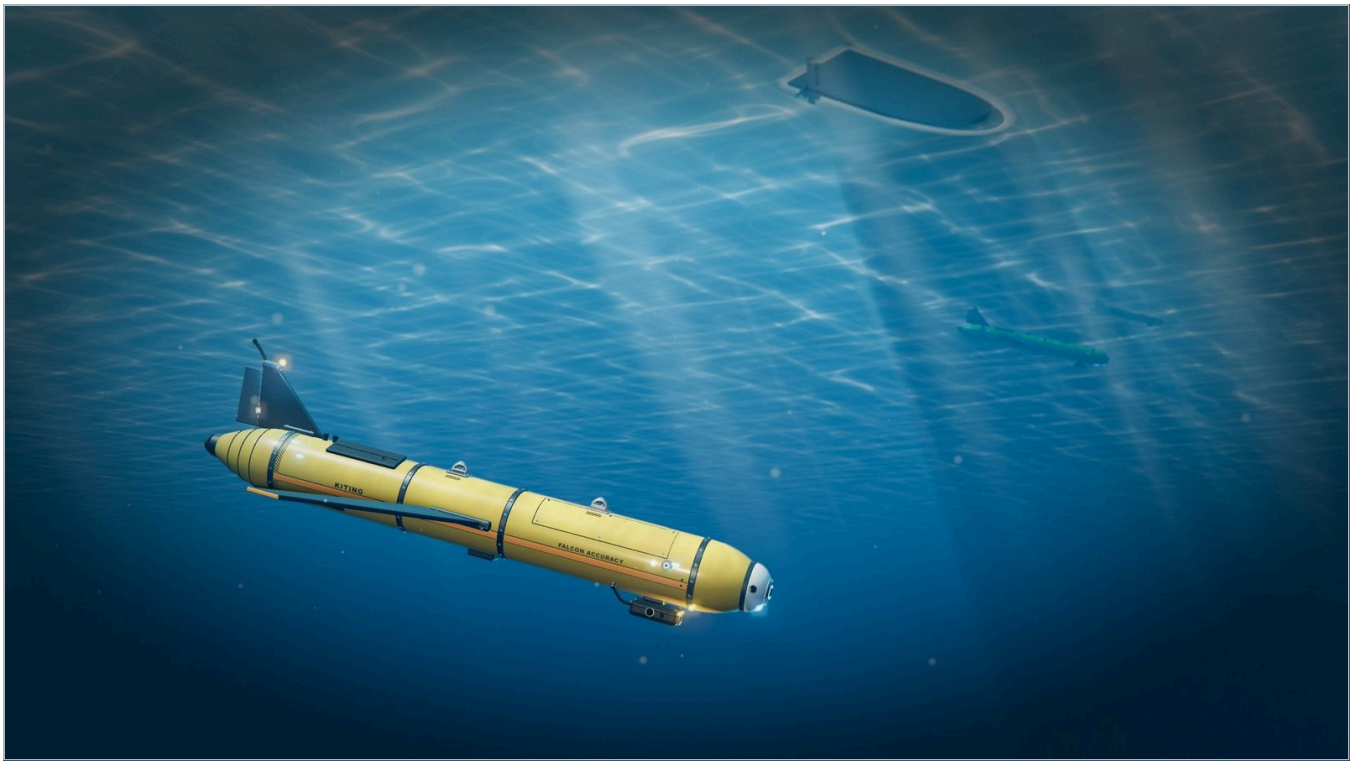
VEHICLE	1.6 m long, 0.19 m diameter, 40 kg in air, 200 m depth rating, survey orange with graphite nose
SPEED AND ENDURANCE	3 knots survey, 5 knots transit, 10 h per battery; battery pack swapped in 15 min
SONAR	dual-frequency side-scan, 2.5 cm pixels across a 60 m swath at high frequency, 150 m swath at low frequency for wide search
CAMERA	down-looking 12 MP with LED strobe, contacts photographed from 2 m altitude where visibility exceeds 2.5 m
NAVIGATION	inertial unit, Doppler velocity log and satellite fix at each surfacing; each contact fixed within 2 m
COMPUTE	20 TOPS, onboard classifier and change detection against the last survey of the basin
COMMS	radio to 2 km at the surface, acoustic modem to 1 km for status; full offload by cable within 10 min of recovery
TRANSPORT	40 kg vehicle case and 25 kg support case with control laptop and spare battery
ENVIRONMENT	water -2 to +35 C, currents to 2 knots; recovery strobe and radio beacon; AES-256 data at rest

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can show the hull, battery and sonar layout with mass and buoyancy budgets in a design review the client's engineers attend.
- Classifier ranking is scored on a test basin where the force lays inert shapes and clutter that Falcon Accuracy does not see beforehand, and the score sheet is handed over.
- Basin coverage time can be modeled today on the client's own harbor chart before any vehicle is built.
- All sonar and camera data stays on the client's network, and the ranked list goes only to the client's dive supervisor.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

SARCEL and TERTIAL see the seabed through sound, and sound bends with the water's temperature and salinity, which change by the week. A sonar crew that plans on climate averages can misjudge its own detection range by half. KITING keeps a fleet of gliders profiling the water column for months, so every sonar range in this sector, and every dive plan, rests on the ocean as it is this week.



CONCEPT VISUALIZATION · KITING

ALL FIGURES ARE DESIGN TARGETS

UNDERSEA SYSTEMS · HARDWARE · 03 OF 05

KITING

KITING Ocean Glider Fleet

Kiting is the way a falcon hangs on the wind with barely a wingbeat, holding its place for long minutes on almost no effort; KITING gliders ride their own buoyancy for months on almost no power.

MONTHS AT SEA, MEASURING THE WATER EVERY SONAR AND DIVER WORKS IN.

SUMMARY

KITING is a fleet of winged, buoyancy-driven underwater gliders that stay at sea for 3 to 6 months, diving to 1,000 meters and back about four times a day. They measure temperature, salinity, currents and ambient sound, surface to send each profile by satellite, and give the force's sonar crews, divers and planners an ocean model built on real data.

WHY FALCON ACCURACY BUILT IT

Sonar range, diver safety and the drift of anything lost at sea all depend on the water, its temperature layers, its currents and its background noise, and those change by the week. Most forces plan on climate averages or on a single measurement taken when a ship last passed. Falcon Accuracy built KITING to keep sensors in the water for months at a cost close to a buoy, sampling the column from the surface to 1,000 meters along tracks the planners choose. The sonar crew then predicts detection range on this week's ocean, and the dive supervisor plans on currents measured yesterday.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits KITING to the boats, piers and satellite terminals the force already runs, and lands every profile on the client's own servers and ocean models.

TRAIN Falcon Accuracy trains the sound-speed and current models on the client's own seas, their seasons, river outflows and shipping noise, starting from the force's historical survey records.

SET Falcon Accuracy sets glider tracks, dive depths, surfacing intervals and data release rules to the force's oceanographic plan and the national rules for operating in its waters.

WORKS WITH

SARCEL · TERTIAL · RAMAGE · GONYS · MAIL · HAGGARD · PITCH · WEATHER

DESCRIPTION

KITING gliders are 2 meter, 60 kilogram winged vehicles with no propeller. Each changes its buoyancy by pumping oil between an internal reservoir and an external bladder, so it sinks, glides forward on its wings, rises and repeats, covering about 20 kilometers a day on a battery that lasts 3 to 6 months. On every dive to 1,000 meters it profiles temperature, salinity and pressure, records ambient sound from 10 hertz to 30 kilohertz, and measures the depth-averaged current from its own drift. Every 6 hours it surfaces, sends the compressed profiles over an encrypted satellite link to the client's own server and takes new waypoints from its pilots. Two pilots fly a fleet of 12 from one station, and the data feeds sound-speed and current models in PITCH and WEATHER.

CAPABILITIES

- Stays at sea 3 to 6 months on one battery, covering about 20 km a day and up to 3,600 km per mission
- Profiles temperature, salinity and pressure from the surface to 1,000 m on every dive, about 4 dives a day
- Records ambient sound from 10 Hz to 30 kHz to map the background noise that sets sonar detection range
- Measures depth-averaged current on each dive and surface current at each surfacing, within 3 cm/s
- Surfaces every 6 h to send profiles over an encrypted satellite link and take new waypoints from its pilots
- Two pilots fly a fleet of 12 from one station; an optional current profiler adds current layer by layer
- Profiles feed sound-speed and current models in PITCH and WEATHER within 30 min of each surfacing

SPECIFICATIONS · DESIGN TARGETS

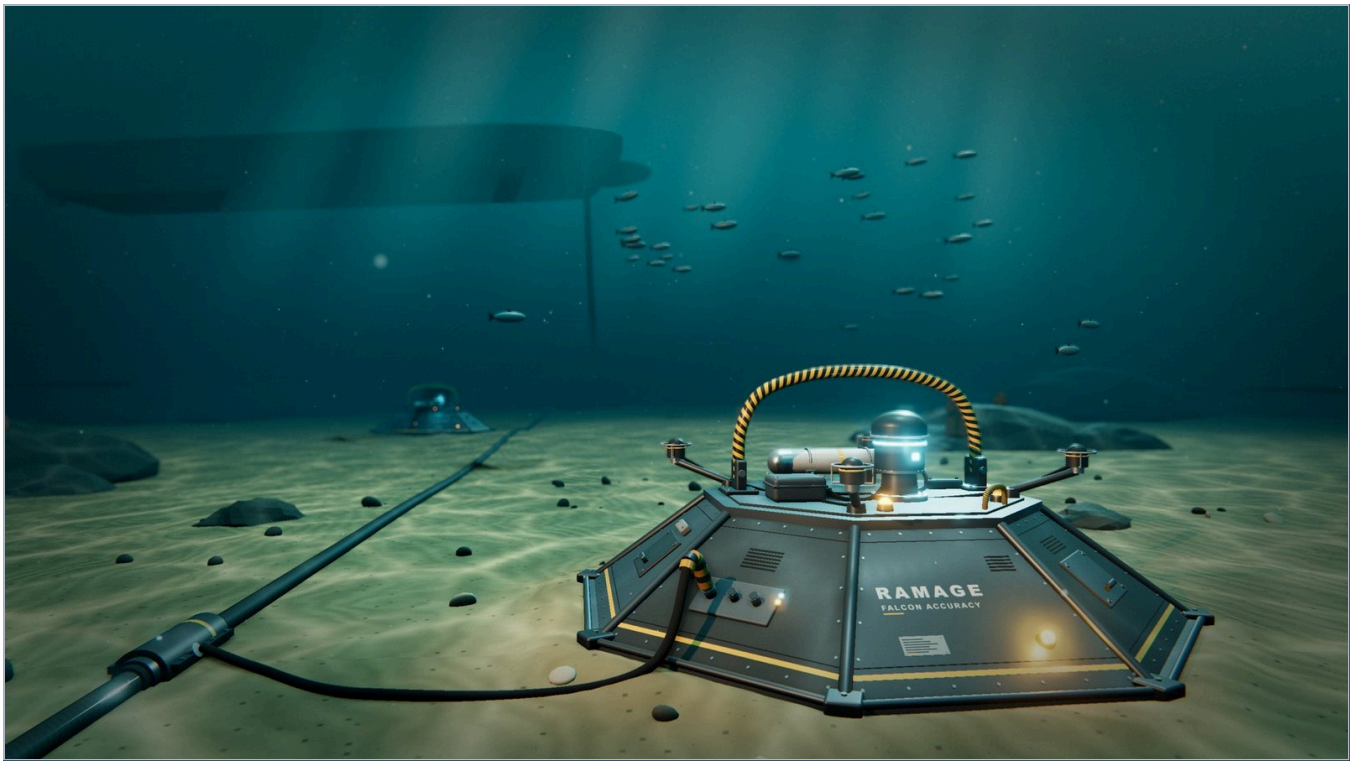
GLIDER	2.0 m hull, 1.2 m wingspan, 60 kg in air, rated to 1,000 m, survey yellow hull with graphite wings
PROPULSION	variable buoyancy engine, no propeller, 0.25 m/s horizontal speed, under 2 W average power
ENDURANCE	3 to 6 months on a primary lithium battery, up to 3,600 km; rechargeable pack for 6 week missions
SENSORS	conductivity, temperature and depth sensor; dissolved oxygen; passive acoustic recorder 10 Hz to 30 kHz; optional Doppler current profiler
ACCURACY	temperature within 0.002 C, salinity within 0.01 practical salinity units, depth-averaged current within 3 cm/s
COMMUNICATIONS	encrypted satellite link at each surfacing, 6 h cycle by default; radio to 5 km for launch and recovery
FLEET	12 gliders per pilot station, 2 pilots per shift, waypoints and dive depths changed at any surfacing
LAUNCH AND RECOVERY	two people from a 7 m boat with a recovery pole; recovery beacon and strobe
DATA	profiles land on the client's own server, never on an outside portal; AES-256 in transit and at rest

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the buoyancy engine, wing and hull design, energy budget and endurance model in a design review.
- Glider tracks and mission endurance can be simulated today on the client's own sea area with its historical currents.
- A trial protocol compares KITING profiles with a ship's calibrated profiler at the same time and place, and the comparison is handed over.
- All profiles and sound recordings land on the client's servers and stay inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

Surveys show the state of a cable on the day they run, and gliders describe the water around it, but neither is on watch when an anchor drops at 3 in the morning. A cable needs a sensor that never leaves it. RAMAGE turns the cable's own fiber and a line of seabed nodes into that watch, uses KITING sound-speed profiles to keep its detection ranges honest, and proposes a SARCEL inspection wherever it raises an alert.



CONCEPT VISUALIZATION · RAMAGE

ALL FIGURES ARE DESIGN TARGETS

UNDERSEA SYSTEMS · HARDWARE · 04 OF 05

RAMAGE

RAMAGE Seabed Infrastructure Array

Ramage is the old falconer's word for a young hawk that has left the nest and moves from branch to branch, and for birdsong among the branches; RAMAGE listens along every branch of a seabed network.

HEARS AN ANCHOR DROP NEAR THE CABLE, REPORTED WITHIN 60 SECONDS.

SUMMARY

RAMAGE watches undersea cables and pipelines from the landing station to the deep sea. It listens on a fiber inside the cable itself and through seabed sensor nodes beside it, and alerts the watch officer when a vessel anchors, drags or lingers near the line or when an underwater vehicle approaches it. Every alert carries the position, the evidence and the vessel's track, and a human decides what happens next.

WHY FALCON ACCURACY BUILT IT

A cable or pipeline is damaged most often by an anchor dragged across it, and today the owner learns of it when the traffic stops, hours after the vessel has gone. The seabed is dark and wide, patrols are rare, and the fiber that carries the traffic can itself hear what touches the seabed near it. Falcon Accuracy built RAMAGE to turn that fiber and a line of seabed nodes into a watch that reports an anchor, a dragging chain, a vessel holding over the line or a vehicle closing on it within a minute. The watch officer gains time to call the vessel, send a boat and warn the owner while the event is still under way.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits RAMAGE to each cable or pipeline after a review of its route, landing stations and spare fibers with the owner, and connects the alerts to the vessel traffic and coast watch displays the force already runs.

TRAIN Falcon Accuracy trains the event models on the route's own shipping, fishing seasons, weather and seabed noise during a 30 day baseline, and on controlled anchor drops the force stages on a test section.

SET Falcon Accuracy sets watch zones, loiter rules, alert levels and who is told what to the force's standing orders, the coast authority's rules and the agreement with the asset owner.

WORKS WITH

SARCEL · TERTIAL · KITING · PITCH · MAIL · HAGGARD · TAITA · SAILS · CALAMUS · JESS

RAMAGE RAMAGE Seabed Infrastructure Array

DESCRIPTION

RAMAGE watches a cable or pipeline in two layers. At the landing station an interrogator sends light pulses down a spare fiber in the cable and turns it into a line of listening points, hearing anchors, chains and fishing gear that touch the seabed within 1 kilometer of the cable along the first 80 kilometers, placed within 10 meters. Beyond that reach, seabed nodes every 10 kilometers carry four hydrophones and a magnetometer, hear a ship's propeller at 8 kilometers and a small underwater vehicle at 1.5 kilometers, and report through gateway buoys. A model trained on the route's own traffic matches each event to the nearest ship broadcasting its identity and flags vessels that slow, stop or go silent over the line. Alerts reach the watch officer within 60 seconds through PITCH, and a human decides every response.

CAPABILITIES

- Turns one spare fiber inside the cable into a listening line over the first 80 km from each landing station, placing events within 10 m
- Hears an anchor drop, a dragged chain or bottom fishing gear within 1 km of the cable
- Seabed nodes every 10 km hear a ship's propeller at 8 km and a small underwater vehicle at 1.5 km
- Flags any vessel that slows below 3 knots, stops or stops broadcasting its identity within 2 km of the line for 20 min
- Alert with position, sound clip and vessel track reaches the watch officer within 60 s through PITCH
- Proposes a response such as a radio call, a HAGGARD visit or a SARCEL inspection; a human decides, and every step is logged
- Watches cable strain and temperature on the same fiber and locates a fault within 50 m

SPECIFICATIONS · DESIGN TARGETS

FIBER SENSING	interrogator at each landing station on one spare fiber, 80 km reach, events placed within 10 m, 2 rack units per interrogator
SEABED NODES	1.1 m trawl-resistant frame, 4 hydrophones, 3-axis magnetometer and pressure sensor, rated to 3,000 m, laid every 10 km
NODE DETECTION	ship propeller at 8 km, small underwater vehicle at 1.5 km, large steel hull passing within 300 m in water to 150 m deep
NODE POWER AND LINKS	3 year battery; acoustic modem to 5 km to the next node or a gateway buoy; gateway buoy with solar power, satellite link and JESS radio
VESSEL PICTURE	fuses identity broadcasts with MAIL and HAGGARD radar tracks and TAITA images; flags loiter under 3 knots within 2 km for 20 min
ALERT LATENCY	under 60 s from event to watch officer; nuisance alerts below 1 per 100 km per day after a 30 day baseline
CABLE HEALTH	strain and temperature along the sensed fiber, fault located within 50 m
COVERAGE	one system watches up to 400 km of route; nodes laid from a cable or survey ship at 20 nodes a day
RECORDS	every event, alert and decision logged in CALAMUS with its evidence; AES-256; data stays inside the client's network

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can model fiber reach and node spacing on the client's own route survey and seabed noise data before any equipment is ordered.
- A bench demonstration of fiber sensing on a 50 km fiber spool can show impact events placed within 10 m.
- A written trial protocol sets out controlled anchor drops and vehicle passes on a test section of the client's choosing, with every alert timed.
- RAMAGE proposes and never acts; every alert, proposal and decision is logged, and all data stays inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

With SARCEL, TERTIAL, KITING and RAMAGE, the force knows its seabed, its water and what moves over its cables. The hardest undersea task is a crew trapped in a submarine on the bottom, and there the same knowledge decides how fast a rescue begins. GONYS is that rescue, and it starts from the sector's own data, the SARCEL survey of the site and the KITING currents at depth, so its pilots dive to a known bottom through known water.



CONCEPT VISUALIZATION · GONYS

ALL FIGURES ARE DESIGN TARGETS

UNDERSEA SYSTEMS · HARDWARE · 05 OF 05

GONYS

GONYS Submarine Rescue Vehicle

The gonys is the ridge under a falcon's lower bill where its two halves join into one; GONYS joins a rescue vehicle to a submarine's hatch as one sealed passage.

REACHES A DISABLED SUBMARINE AT 600 METERS. BRINGS 12 HOME EACH TRIP.

SUMMARY

GONYS is a crewed rescue submersible that mates with a distressed submarine's escape hatch down to 600 meters and brings its crew up in groups of 12. Flown in by cargo aircraft or carried on a ship of opportunity, it transfers survivors under pressure into a decompression chamber on deck. It is a rescue system and nothing else.

WHY FALCON ACCURACY BUILT IT

A submarine that cannot surface leaves its crew a few days of air, and every hour of a rescue is spent first getting a rescue vehicle onto the right ship in the right sea. Escape by suit works only in shallow water, and crews who have breathed pressurized air for days need decompression the moment they reach the surface. Falcon Accuracy built GONYS to travel by air in standard containers, fit on a ship found in the nearest port, reach 600 meters and pass survivors into a chamber without ever bringing them to surface pressure. The force gains a rescue chain designed to begin its first dive within 72 hours anywhere a heavy cargo aircraft can land.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits GONYS to the escape hatch types of the client's submarines, the cargo aircraft and airfields it can reach, and the ships of opportunity in its ports, with deck plans drawn for each ship class in advance.

TRAIN Falcon Accuracy trains the pilots, attendants and hyperbaric medics on the client's own submarine classes in a full-scale mating rig and a simulator built from the client's sea areas and seasons.

SET Falcon Accuracy sets mobilization plans, dive limits, decompression tables and the rescue command chain to the force's submarine escape and rescue doctrine and its medical rules.

WORKS WITH

SARCEL · KITING · HAGGARD · PITCH · JESS · CALAMUS · RANGLE · CREANCE

GONYS GONYS Submarine Rescue Vehicle

DESCRIPTION

GONYS is a 9.5 meter, 28 t rescue submersible crewed by two pilots and one rescue attendant. The whole system packs into 16 standard containers that fly in two heavy cargo aircraft and fit on a ship of opportunity of 70 meters or more within 24 hours of arrival. Lowered by its own launch frame, GONYS descends to the submarine, finds the hatch with sonar and cameras, and seals its mating skirt against the hatch seat at angles up to 45 degrees, even with the submarine heeled. Survivors climb into a cabin that holds 12 and stays at the submarine's internal pressure, up to 5 bar. On deck, GONYS mates with a decompression chamber complex for 72 people, so no survivor passes through surface pressure. One round trip from 600 meters takes about 3 hours.

CAPABILITIES

- Mates with a submarine's escape hatch down to 600 m at angles up to 45 degrees of heel or trim
- Brings up 12 survivors per trip; one round trip from 600 m takes about 3 h
- Holds the rescue cabin at the submarine's internal pressure up to 5 bar and passes survivors under pressure into the deck chamber
- Deck decompression complex holds 72 people, with a medical lock for a hyperbaric medical team
- Flies in 16 standard 20 ft containers on two heavy cargo aircraft; mobilized on a ship of opportunity within 24 h of arrival
- Finds the hatch with forward imaging sonar to 150 m and 4 cameras, and holds position within 5 cm on 6 thrusters
- Carries a 50 kg stores pod to pass carbon-dioxide absorbent, water and medical supplies to the crew before transfer begins
- 96 h of emergency life support for 15 people; the pilots command every dive and every step is logged

SPECIFICATIONS · DESIGN TARGETS

SUBMERSIBLE	9.5 m long, 3.2 m beam, 28 t in air, rated to 600 m with a 1.5 safety factor on the pressure hull
CREW AND CAPACITY	2 pilots and 1 rescue attendant; 12 survivors per trip; 96 h emergency life support for 15 people
MATING	skirt seals to standard escape hatch seats at up to 45 degrees of heel or trim, in currents to 1.5 knots
PRESSURE	rescue cabin held at up to 5 bar to match the submarine's internal pressure; transfer under pressure to the deck chamber
DECK CHAMBER COMPLEX	72 people, 2 entry locks and a medical lock, decompression run by a hyperbaric medical team
PROPULSION AND SENSING	6 electric thrusters, 3 knots, 10 h battery; forward imaging sonar to 150 m; 4 cameras; 20,000 lumen lights
LAUNCH AND RECOVERY	own launch frame and winch, operating to sea state 5, fits ships of opportunity of 70 m or more
TRANSPORT	16 standard 20 ft containers on two heavy cargo aircraft; mobilized on the ship within 24 h; design target of a first dive within 72 h of the call
COMMUNICATIONS	underwater telephone and acoustic data link to the support ship to 4 km; video and dive log to the rescue command post

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the pressure hull, mating skirt, life support and transfer-under-pressure design in a design review with the client's submarine escape and rescue specialists.
- Mating at heel and trim angles can be shown today in simulation against the hatch geometry of the client's own submarine classes.
- A written mobilization exercise protocol times the move from airfield to a ship of opportunity in the client's chosen port, with every step logged.
- Dive logs, video and medical records from every exercise stay inside the client's network.

NEXT SECTOR · 09 SPACE AND FLIGHT · P. 116

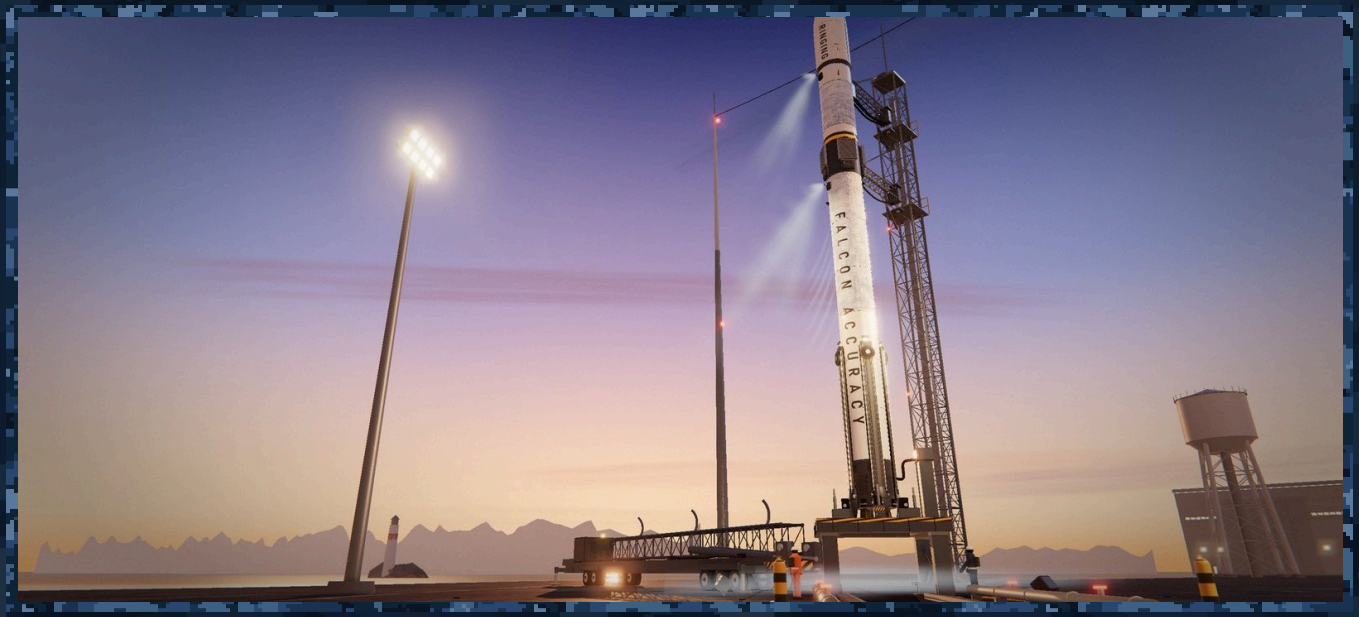
From the pad to orbit and back, on the force's own range. This closes Undersea Systems. Sector 09, Space and Flight, opens on page 116 with RINGING, CASTING, MAKEHAWK, TAITA, LAGGAR, TOWER, NICTITANS, BATE and LURE.

09

SPACE AND FLIGHT

FROM THE PAD TO ORBIT AND BACK, ON THE FORCE'S OWN RANGE.

A force that depends on someone else's satellites waits for someone else's pass, and a force that depends on someone else's rockets waits in someone else's queue. The Space and Flight sector gives the force its own road to orbit, its own way to place, watch and bring home what it flies there, and its own range on which to test all of it first. Two launch vehicles cover the masses a force is likely to own, 300 kg for one plane of imaging cubesats and 8 t for larger satellites or several batches at once, and both land their first stages to fly again. Orbit is also crowded. A satellite the force paid for can be lost to a fragment nobody warned it about, and a sample or a sensor that flew in orbit is worth little until it is back on a laboratory bench.



IN THIS SECTOR · 9 PRODUCTS · PAGES 118 TO 135

RINGING CASTING MAKEHAWK TAITA LAGGAR TOWER NICTITANS BATE LURE

The nine products work as one chain. RINGING and CASTING put the force's satellites in orbit, and MAKEHAWK carries up to 12 of them on to their own orbits. TAITA watches the theater, and LAGGAR brings each pass down beside the command post. TOWER warns up to 72 h before a close approach. NICTITANS brings 150 kg of samples home, BATE qualifies every payload before it flies, and LURE trains the crews who guard the range. Every machine is unarmed, a named human makes every launch, burn and deorbit decision, every command is logged, and all data stays inside the client's network.

IN THIS SECTOR · 9 PRODUCTS



RINGING p. 118

RINGING Launch Vehicle

300 kg to orbit. The first stage comes home on four legs.



CASTING p. 120

CASTING Reusable Medium-Lift Launch Vehicle

8 t to orbit. The first stage flies again within 30 days.



MAKEHAWK p. 122

MAKEHAWK Orbital Transfer Vehicle

Twelve satellites, twelve orbits, then it takes itself out of the sky.



TAITA p. 124

TAITA ISR Cubesat Constellation

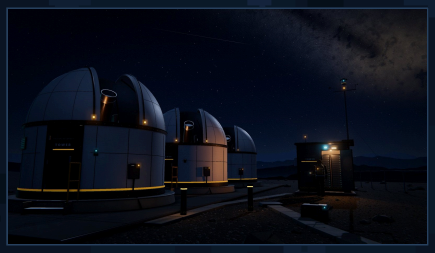
36 satellites overhead, tasked from the PITCH display in one tap.



LAGGAR p. 126

LAGGAR Transportable Ground Station

Two cases, 20 minutes, and the downlink belongs to the force.



TOWER p. 128

TOWER Space Domain Awareness Network

Watches the orbits your satellites fly and warns before a close approach.



NICTITANS p. 130

NICTITANS Reentry Capsule

150 kg home from orbit, in your hands within 2 hours.



BATE p. 132

BATE Suborbital Test Rocket

60 kg to 120 km, back on its legs in 10 minutes.



LURE p. 134

LURE High-Speed Target Drone

The aircraft you train against, 800 km/h at 20 m, back tomorrow.



CONCEPT VISUALIZATION · RINGING

ALL FIGURES ARE DESIGN TARGETS

SPACE AND FLIGHT · HARDWARE · 01 OF 09

RINGING

RINGING Launch Vehicle

Ringing up is the falcon's spiral climb to the height from which it hunts; RINGING is the climb to orbit.

300 KG TO ORBIT. THE FIRST STAGE COMES HOME ON FOUR LEGS.

SUMMARY

RINGING is a two-stage liquid-propellant launch vehicle that places 300 kg in a 500 km orbit from a 40 m by 40 m concrete pad. Its first stage flies back and lands on four legs within 10 m of a pad marker, ready to fly again within 14 days. The force launches its own satellites, on its own schedule, from its own ground.

WHY FALCON ACCURACY BUILT IT

A force that buys launches on the open market waits in a queue it does not control and tells the market what it is launching. A small vehicle owned and operated by the force closes that gap, and reuse of the first stage brings the cost per flight down to where a 12-satellite plane can be replaced rather than nursed. Falcon Accuracy sized RINGING to one TAITA plane per flight and to a pad that fits inside an existing airbase or coastal range. The launch conductor and the range safety officer hold the final decisions, and every command from tanking to touchdown is logged.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits RINGING to the client's own range, with the pad, pad erector and landing zone surveyed into an existing airbase or coastal site, the road and rail route checked for the 27 m vehicle in its transport cradle, and the payload adapter cut to the satellites the force already owns.

TRAIN Its trajectory, wind and recovery models train on the client's range weather records, sea state and airspace structure, and the launch team's checklists and callouts are written in the client's language.

SET Launch-commit criteria, exclusion corridors, go and no-go authority and payload classification handling are set to the client's range-safety rules and doctrine, and no flight proceeds without the launch conductor's recorded go.

WORKS WITH

TAITA · BATE · LAGGAR · PITCH · SCREEN · JESS · KETTLE · PATAGIUM

RINGING RINGING Launch Vehicle

DESCRIPTION

RINGING stands 27 m tall and 1.6 m across and lifts off at 38 t on five first-stage engines. It carries 300 kg to a 500 km orbit with the first stage recovered, or 380 kg with the stage expended. After separation at 65 km the first stage turns, slows and lands on four legs within 10 m of a marker on a pad 8 km downrange, steered by grid fins and its throttling center engine, ready to fly again within 14 days. The fairing takes one satellite on a 600 mm bolt circle or 12 TAITA cubesats in dispensers, and its halves return under parachutes qualified on BATE. The pad erector raises the vehicle in 2 h. The launch conductor gives the go, and an officer-armed system shuts the engines down if the vehicle leaves its corridor.

CAPABILITIES

- 300 kg to a 500 km sun-synchronous orbit with the first stage recovered; 380 kg with the stage expended
- First stage lands on four legs within 10 m of the pad marker, 10 flights per stage, 14-day turnaround
- One flight lifts a full TAITA plane of 12 cubesats with their dispensers
- Orbit insertion within 10 km in altitude and 0.1 degrees in inclination
- Pad erector stands the vehicle vertical on its mount in 2 h; 7-day campaign from arrival to launch
- Fairing halves recovered under parachutes for reuse
- Automatic flight safety, armed by the range safety officer before liftoff, shuts the engines down if the vehicle leaves its corridor; the officer holds the same command
- Launch, flight and recovery data stay inside the client's network, and every command is logged

SPECIFICATIONS · DESIGN TARGETS

VEHICLE	two stages, 27 m tall, 1.6 m diameter, 38 t at liftoff
PROPULSION	five liquid-propellant engines on the first stage, 520 kN at liftoff, center engine throttles for landing; one vacuum engine on the second stage, 45 kN
PAYLOAD	300 kg to a 500 km sun-synchronous orbit with first-stage recovery; 380 kg with the stage expended
FAIRING	1.6 m diameter, 3.4 m long, 1.4 m by 2.6 m usable volume; 600 mm bolt circle or dispensers for 12 TAITA 12U satellites; halves recovered by parachute
FIRST-STAGE RETURN	separation at 65 km, four grid fins, four landing legs with a 6 m footprint, touchdown within 10 m of the marker on a 30 m by 30 m pad 8 km downrange
REUSE	10 flights per first stage, 14-day turnaround, engine borescope and leg inspection between flights
INSERTION ACCURACY	10 km in altitude, 0.1 degrees in inclination; second stage deorbits itself within 5 years
GROUND SEGMENT	40 m by 40 m concrete pad, fixed pad erector, vehicle delivered horizontal by road, vertical in 2 h, 7-day campaign, launch crew of 12
FLIGHT SAFETY	automatic engine shutdown on corridor departure, armed by the range safety officer before liftoff; range safety officer command over an encrypted link; launch-commit criteria set by the client
ENVIRONMENT	launches in surface winds to 12 m/s, upper winds measured by balloon sounding 2 h before launch; rated for coastal salt air

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the reference mission in simulation, from liftoff to orbit insertion and first-stage touchdown, with mass, thrust and propellant margins shown at every phase.
- Falcon Accuracy commits to an acceptance trial protocol that measures payload mass delivered, insertion accuracy and landing distance from the marker on the first three flights.
- Falcon Accuracy can show the pad, landing zone and transport survey method for a candidate site within 30 days of access.
- Every flight record, from tanking to touchdown, is written to logs that stay inside the client's network, and Falcon Accuracy can demonstrate the logging chain on the bench.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

RINGING is sized to one TAITA plane, 300 kg to a 500 km orbit, and that is the right vehicle for keeping a constellation whole. A force that also owns a radar or communications satellite of several metric tons has no RINGING flight that can carry it. CASTING lifts 8 t from the same kind of coastal range, under the same launch conductor and range safety rules, and brings its first stage back on a sea platform. The two vehicles share a flight safety design, a telemetry chain and a launch team trained once for both.



CONCEPT VISUALIZATION · CASTING

ALL FIGURES ARE DESIGN TARGETS

SPACE AND FLIGHT · HARDWARE · 02 OF 09

CASTING

CASTING Reusable Medium-Lift Launch Vehicle

Casting off is the falconer's throw that sends the hawk from the fist into the air, and a well-made hawk comes back to fly again; CASTING throws the payload to orbit and brings its first stage home to fly again.

8 T TO ORBIT. THE FIRST STAGE FLIES AGAIN WITHIN 30 DAYS.

SUMMARY

CASTING is a two-stage reusable launch vehicle that places 8 t in a 400 km low Earth orbit from a coastal pad. Its first stage lands on four deployable legs on an uncrewed sea platform 600 km downrange and flies again within 30 days, and both fairing halves come back under parafoils. One flight lifts the client's large satellites, a rideshare of smaller ones or up to three MAKEHAWK tugs carrying TAITA batches.

WHY FALCON ACCURACY BUILT IT

RINGING gives the force one TAITA plane per flight, but a force that also owns imaging, radar and communications satellites of several metric tons needs a vehicle that lifts them. Buying that lift on the open market puts the force back in the queue it built RINGING to leave, and it tells the market what the force is launching. Falcon Accuracy sized CASTING to carry the heaviest satellite a client is likely to own, or several batches of small ones in one flight, and made the first stage land at sea so most of the vehicle comes home. The launch conductor and the range safety officer hold every go decision, and every command from tanking to touchdown on the platform is logged.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits CASTING to the client's own coastal range, with the pad, hangar and sea landing area surveyed into an existing airbase or naval site, the port checked for the platform and its recovery ship, and the payload adapters cut to the satellites the force already owns.

TRAIN Its trajectory, wind and landing models train on the client's range weather records, sea states and shipping and air traffic patterns, and the launch and recovery checklists are written in the client's language.

SET Launch-commit criteria, exclusion areas at sea and in the air, go and no-go authority and payload classification handling are set to the client's range-safety rules and doctrine, and no flight proceeds without the launch conductor's recorded go.

WORKS WITH

RINGING · MAKEHAWK · TAITA · NICTITANS · TOWER · LAGGAR · BATE · HAGGARD · PITCH · CALAMUS · ENEW

CASTING CASTING Reusable Medium-Lift Launch Vehicle

DESCRIPTION

CASTING stands 56 m tall and 3.7 m across and lifts off at 360 t on nine first-stage engines. It places 8 t in a 400 km orbit with the first stage recovered, 5.5 t in a 500 km sun-synchronous orbit, or 10.5 t with the stage expended. After separation at 70 km the first stage flies to an uncrewed sea platform 600 km downrange, opens four grid fins, deploys four legs and lands within 5 m of the deck center. It flies again within 30 days, up to 15 times. Fairing halves return under parafoils. The 4 m fairing takes one large satellite, a six-port rideshare ring or three MAKEHAWK tugs. The launch conductor gives the go, and an officer-armed system shuts the engines down if the vehicle leaves its corridor.

CAPABILITIES

- 8 t to a 400 km orbit at 51 degrees with the first stage recovered; 5.5 t to a 500 km sun-synchronous orbit; 10.5 t with the stage expended
- First stage lands on four deployable legs within 5 m of the center of an uncrewed sea platform 600 km downrange
- Flies again within 30 days of landing, up to 15 flights per first stage
- Both fairing halves descend under parafoils and are lifted from the sea for reuse
- One flight lifts a single satellite of up to 8 t, a six-port rideshare ring, or three MAKEHAWK tugs with 36 small satellites
- Orbit insertion within 5 km in altitude and 0.05 degrees in inclination
- Automatic flight safety, armed by the range safety officer before liftoff, shuts the engines down if the vehicle leaves its corridor; the officer holds the same command
- Launch, flight and recovery data stay inside the client's network, and every command from tanking to touchdown is logged

SPECIFICATIONS · DESIGN TARGETS

VEHICLE	two stages, 56 m tall, 3.7 m diameter, 360 t at liftoff
PROPULSION	nine liquid-propellant engines on the first stage, 4,900 kN at liftoff, three engines throttle for landing; one vacuum engine on the second stage, 450 kN
PAYLOAD	8 t to a 400 km orbit at 51 degrees and 5.5 t to a 500 km sun-synchronous orbit with first-stage recovery; 10.5 t with the stage expended
FAIRING	4 m diameter, 11 m long, 3.6 m by 8.5 m usable volume; 1,575 mm interface, six-port rideshare ring or up to three MAKEHAWK tugs; halves recovered under parafoils
FIRST-STAGE RETURN	separation at 70 km, four grid fins, four deployable legs with an 18 m footprint, touchdown within 5 m of the center of a 90 m by 50 m uncrewed sea platform 600 km downrange
REUSE	30 days from landing to next flight, 15 flights per first stage, platform back in port within 4 days, engine borescope and leg inspection between flights
INSERTION ACCURACY	5 km in altitude, 0.05 degrees in inclination; second stage reenters over an empty ocean area within 3 h of the last payload release
GROUND SEGMENT	coastal pad of 120 m by 80 m, horizontal integration hangar, rail-mounted pad erector, 14-day campaign from payload arrival to launch, launch crew of 40
FLIGHT SAFETY	automatic engine shutdown on corridor departure, armed by the range safety officer before liftoff; range safety officer command over an encrypted link; launch-commit criteria set by the client
ENVIRONMENT	launches in surface winds to 15 m/s; platform landings to sea state 5, 4 m significant wave height; rated for coastal salt air

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the reference mission in simulation, from liftoff through orbit insertion to first-stage touchdown on the sea platform, with mass, thrust and propellant margins shown at every phase.
- Falcon Accuracy can run a sea-landing simulation campaign of 1,000 descents across the client's recorded sea states and winds, with touchdown distance and leg loads reported for each.
- Falcon Accuracy commits to an acceptance trial protocol that measures payload mass delivered, insertion accuracy, landing distance from the platform center and turnaround time on the first three flights.
- Every flight record stays inside the client's network, and Falcon Accuracy can demonstrate the logging chain from the launch console to the archive on the bench.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

A launch vehicle drops everything it carries into one orbit, and a batch of 12 small satellites needs 12 different places. Left alone, each satellite spends months of its own small propellant supply reaching its slot, or never reaches it. MAKEHAWK rides CASTING as a single payload, carries the batch from the drop-off orbit to each satellite's own altitude and slot, and keeps enough reserve to take itself out of orbit when the last one is released.



CONCEPT VISUALIZATION · MAKEHAWK

ALL FIGURES ARE DESIGN TARGETS

SPACE AND FLIGHT · HARDWARE · 03 OF 09

MAKEHAWK

MAKEHAWK Orbital Transfer Vehicle

A make-hawk is a steady, experienced hawk flown beside young ones to show them their work; MAKEHAWK flies new satellites to their own orbits and leaves each one at work.

TWELVE SATELLITES, TWELVE ORBITS, THEN IT TAKES ITSELF OUT OF THE SKY.

SUMMARY

MAKEHAWK is a space tug that rides a CASTING launch with up to 12 small satellites on board and carries each one from the drop-off orbit to its own altitude and slot. Chemical thrusters make the fast moves, electric thrusters make the slow ones, and a flight director approves every burn and every release. When the last satellite is free, MAKEHAWK spends the reserve it has carried since launch and takes itself out of orbit.

WHY FALCON ACCURACY BUILT IT

A launch vehicle leaves every satellite in the same orbit, and small satellites carry too little propulsion to move far on their own. A batch then spends months drifting toward its slots, or works from an orbit chosen for the launch rather than for the mission. Falcon Accuracy built MAKEHAWK to take that last leg off the satellites, so a TAITA plane or a set of the client's own satellites reaches its working orbits within 30 days of launch. The tug carries its own disposal reserve from the first day, so it leaves no dead hull in the orbits the force depends on.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits MAKEHAWK's ports to the satellites and dispensers the force already owns or has on order, and its command links to LAGGAR and the client's existing ground stations.

TRAIN Its delivery planner trains on the client's own constellation design, launch windows and orbital shells, with drag models tuned to the solar activity forecast for the mission years, and the flight procedures are written in the client's language.

SET Release order, slot targets, collision-risk thresholds and disposal area are set to the client's space operations rules and national licensing conditions, and no burn or release proceeds without the flight director's recorded approval.

WORKS WITH

CASTING · TAITA · TOWER · LAGGAR · RINGING · PITCH · CALAMUS · CORACOID

MAKEHAWK MAKEHAWK Orbital Transfer Vehicle

DESCRIPTION

MAKEHAWK is a 2.1 m by 1.6 m tug with 12 deployment ports that rides CASTING as one payload, 1,100 kg empty and up to 2.3 t with 1,200 kg of satellites aboard, each up to 150 kg. Chemical thrusters give it 250 m/s for fast moves. Two electric thrusters give a further 1,000 m/s for slow moves, about 3 m/s per day with a full load. It places each satellite within 1 km of its target altitude and 0.5 degrees of its slot, and spreads a 12-satellite TAITA plane around its orbit within 30 days. A named flight director approves every burn and every release. A 60 m/s reserve takes MAKEHAWK to a controlled reentry over an empty ocean area within 30 days of its last release.

CAPABILITIES

- Carries up to 12 satellites of up to 150 kg each, 1,200 kg in total, from the CASTING drop-off orbit to each one's own orbit
- Places each satellite within 1 km of its target altitude and 0.5 degrees of its slot in the orbital plane
- Chemical thrusters give 250 m/s for fast moves, such as a 150 km altitude change in under 2 h
- Electric thrusters give a further 1,000 m/s for slow moves at about 3 m/s per day with a full load
- Spreads a 12-satellite TAITA plane to its working slots within 30 days of launch
- Takes TOWER conjunction warnings and proposes avoidance burns for the flight director to approve
- Holds a 60 m/s disposal reserve from launch and reenters over an empty ocean area within 30 days of its last release
- Every burn, release and command is approved by a named flight director, logged and kept inside the client's network

SPECIFICATIONS · DESIGN TARGETS

VEHICLE	2.1 m by 1.6 m by 1.4 m bus with 12 deployment ports, 1,100 kg empty, 2.3 t fully loaded
PAYLOAD	up to 12 satellites of up to 150 kg each, 1,200 kg in total; ports take cubesat dispensers from 6U to 16U or 381 mm separation rings
PROPULSION	chemical thrusters for 250 m/s, four of 22 N; two electric thrusters for 1,000 m/s, 80 mN together
POWER	two deployed solar arrays of 3.2 m by 1.1 m, 2.4 kW peak, 4 kWh battery
DELIVERY ACCURACY	1 km in altitude, 0.02 degrees in inclination, 0.5 degrees of along-track slot
MISSION	up to 12 months from launch to last release; a TAITA plane spread to its slots in 30 days
DISPOSAL	60 m/s reserve held from launch; controlled reentry over an empty ocean area within 30 days of the last release
NAVIGATION AND LINKS	GNSS receiver, two star trackers, S-band command and telemetry through LAGGAR or the client's ground stations, AES-256
HUMAN IN THE LOOP	every burn and release planned on the ground and approved by a named flight director; safe mode holds attitude and waits for the ground

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can show the full delivery plan for a 12-satellite TAITA plane in simulation, burn by burn, with the propellant used and the margin left for disposal.
- Falcon Accuracy can demonstrate a deployment port releasing a mass model on the bench, with separation speed and tip-off rate measured.
- Falcon Accuracy commits to an acceptance protocol that measures each satellite's delivered orbit against its target and confirms the disposal reentry on the first mission.
- Falcon Accuracy can walk the client's flight directors through the approval and logging chain for every burn and release, running inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

MAKEHAWK's 12 ports match one TAITA plane, so a replacement batch rides CASTING beside the client's larger satellites and reaches its slots within 30 days. Once released, each TAITA satellite starts the work the force bought it for, imaging the theater and detecting vehicles, vessels and new structures on board. The tug sets the constellation in place, and TAITA is what watches from it.



CONCEPT VISUALIZATION · TAITA

ALL FIGURES ARE DESIGN TARGETS

SPACE AND FLIGHT · HARDWARE · 04 OF 09

TAITA

TAITA ISR Cubesat Constellation

The Taita falcon is a small, fast falcon that lives on high cliffs and watches the ground far below; TAITA is the small, fast constellation that watches from orbit.

36 SATELLITES OVERHEAD, TASKED FROM THE PITCH DISPLAY IN ONE TAP.

SUMMARY

TAITA is a constellation of 36 imaging cubesats in three planes with a median revisit of 30 min at 35 degrees latitude. The watch officer tasks a point or area from the PITCH display, and the tasked image and its detections return to that display within a median of 70 min. Detection runs on the satellite, so the first thing to land is the answer rather than the file.

WHY FALCON ACCURACY BUILT IT

Forces that rely on borrowed imagery get yesterday's picture of someone else's priorities, and the request itself tells a third party where they are looking. TAITA puts a constellation the force owns above its theater, tasked from the same PITCH display on which the gap was noticed. Falcon Accuracy built detection into the satellite so an 8 min pass carries thousands of detections rather than a handful of raw frames, and sized the satellite to a 12U bus so one RINGING flight replaces a whole plane. Tasking authority stays with named officers, every task is logged, and imagery moves from LAGGAR into the client's network without touching any third-party system.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits TAITA to the client's latitude band, with the three planes inclined from 55 degrees to sun-synchronous to put the most passes over the client's theater, and fits the data formats to the PITCH deployment, GIS and imagery archives the force already runs.

TRAIN Detection and change models train on imagery of the client's own vehicles, vessels, buildings and seasons, labeled by the client's analysts inside the client's network.

SET Tasking authority, collection priorities, restricted areas and retention periods are set to the client's doctrine and law, and every tasking carries the name of the officer who approved it.

WORKS WITH

RINGING · LAGGAR · PITCH · TIERCEL · HOOD · CREANCE · BATE · MAKEHAWK · TOWER · MOUNTEE

TAITA TAITA ISR Cubesat Constellation

DESCRIPTION

TAITA is a constellation of 36 cubesats on a 12U bus, 22 kg each, in three planes at 500 km. Each carries a 20 cm telescope imaging at 1.8 m panchromatic and 3.6 m in four multispectral bands, a thermal imager at 60 m, and a 30 TOPS processor that detects vehicles, vessels, aircraft and new structures before the data comes down. A tasking from PITCH goes up at the next LAGGAR pass; the satellite points up to 30 degrees off nadir, collects a 12 km by 12 km frame, and sends detections as 512 by 512 pixel chips first and full frames on request. With 36 satellites, median revisit at 35 degrees latitude is 30 min and median task-to-display time is 70 min. Each satellite stores 2 TB and downlinks at 150 Mbps in X band.

CAPABILITIES

- 36 satellites in three planes of 12, each plane lifted by one RINGING flight
- 1.8 m panchromatic and 3.6 m four-band multispectral imaging from 500 km, thermal infrared at 60 m
- Onboard detection of vehicles, vessels, aircraft and new structures; detection chips land before full frames
- Tasking from the PITCH display by a named officer; median task-to-display time 70 min, revisit every 30 min at 35 degrees latitude
- Imagery and detections pass from LAGGAR into PITCH inside the client's network with no third-party ground segment
- Change detection against the previous pass flags new vehicles, vessels and earthworks within 5 min of downlink
- Optional HOOD receive-only payload maps emitters from orbit in place of the multispectral imager
- 5-year design life with a controlled deorbit within 5 years of end of life

SPECIFICATIONS · DESIGN TARGETS

CONSTELLATION	36 satellites, three planes of 12 at 500 km, inclined to the client's theater from 55 degrees to sun-synchronous; first plane gives 90 min median revisit, full constellation 30 min at 35 degrees latitude
SATELLITE	12U bus, 22 kg, 20 cm aperture telescope, two deployed solar arrays of 2 m by 0.6 m, 120 W peak
IMAGING	1.8 m panchromatic, 3.6 m in blue, green, red and near infrared, 60 m thermal infrared; 12 km by 12 km frame, 30 degrees off-nadir pointing, 20 frames per pass
ONBOARD COMPUTE	30 TOPS neural processor; detects vehicles, vessels, aircraft and new structures as 512 by 512 pixel chips; change detection against the last pass
TASKING	from PITCH by a named officer, uplinked at the next LAGGAR pass in S band; median task-to-display 70 min, 95th percentile 3 h
DATA	2 TB storage per satellite, X-band downlink at 150 Mbps, AES-256; up to 9 GB per 8 min pass
POINTING AND POSITION	star tracker and reaction wheels, 0.01 degree pointing knowledge; image location within 10 m without ground control points
PROPULSION AND LIFE	cold-gas thrusters for phasing and collision avoidance, 5-year design life, controlled deorbit within 5 years of end of life
HUMAN IN THE LOOP	tasking authority, collection rules and area restrictions set by the client; every task, collection and download logged

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can show the constellation coverage simulation for the client's theater, with revisit and task-to-display statistics by latitude, before any satellite is built.
- Falcon Accuracy can demonstrate the onboard detection model on recorded imagery on a bench processor of the same class, with precision and recall reported per object type.
- Falcon Accuracy commits to an acceptance trial that measures ground sample distance, image location accuracy and task-to-display time against the stated targets on the first plane.
- Falcon Accuracy can walk the client's analysts through the labeling and retraining workflow that runs inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

A TAITA satellite sees the theater for about 8 min on each pass and then flies on, carrying its detections until a station comes into view. If that station belongs to someone else or sits on another continent, the picture is hours old when it reaches the watch officer. LAGGAR puts the receiver beside the command post, so the satellite downlinks while it is still over the force and the detections reach PITCH within 60 s of the pass ending. The constellation gives the force its own eyes, and LAGGAR brings what they see down into the force's own network.



CONCEPT VISUALIZATION · LAGGAR

ALL FIGURES ARE DESIGN TARGETS

SPACE AND FLIGHT · HARDWARE · 05 OF 09

LAGGAR

LAGGAR Transportable Ground Station

The laggar falcon of open dry country waits on a high post for the quarry to show and moves the moment it does; LAGGAR waits under an open sky for the satellite pass and takes the downlink the moment it starts.

TWO CASES, 20 MINUTES, AND THE DOWNLINK BELONGS TO THE FORCE.

SUMMARY

LAGGAR is a satellite ground station that two operators carry in two cases and have tracking a TAITA pass within 20 min of opening them. Its 1.2 m reflector receives 150 Mbps in X band and sends tasking in S band, and the same antenna receives telemetry from BATE and LURE on the range. Imagery passes from the antenna to PITCH without leaving the client's network.

WHY FALCON ACCURACY BUILT IT

A constellation is only as fast as its downlink, and a force that depends on fixed stations on another continent waits hours for a pass that happened overhead. LAGGAR puts the receiver with the force, so a TAITA satellite dumps its detections while it is still over the theater. Falcon Accuracy built it in two cases because that is what fits in a vehicle or a helicopter alongside the command post it serves. The station is also the range telemetry receiver for BATE and LURE, so one piece of equipment and one trained crew serve orbit and the range. The watch officer sees the pass on the PITCH display, and every pass and every command is logged.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits LAGGAR to the vehicles, shelters and power the force already has, with mounts for a pickup bed, a container roof or a tripod on bare ground, and connects it to the client's PITCH deployment and existing antennas.

TRAIN Its pass scheduler and link models train on the client's sites, terrain masks and recorded radio environment, and the operator checklists are written in the client's language.

SET Frequencies, transmit windows, key management and the classification path from the gateway into the client's network are set to the client's spectrum licenses and security rules, and every pass is logged under the operator's name.

WORKS WITH

TAITA · BATE · LURE · RINGING · PITCH · JESS · HOOD · KETTLE · BARBULE

LAGGAR LAGGAR Transportable Ground Station

DESCRIPTION

LAGGAR packs into two cases of 32 kg and 26 kg. The first holds a 1.2 m reflector in six petals and a two-axis pedestal that tracks at 8 degrees per second from 5 degrees elevation. The second holds the modem, gateway server and a 6 h battery. Two operators have it tracking within 20 min. It receives TAITA imagery at 150 Mbps in X band, up to 9 GB per 8 min pass, and sends tasking and commands in S band. The gateway decrypts, verifies and hands detections to PITCH over a JESS vehicle node or 100 m of fiber, and nothing crosses a third-party ground segment. It schedules passes itself from the constellation ephemeris and runs unattended for 72 h on vehicle power. On a range it tracks BATE and LURE telemetry at 20 Mbps to 120 km.

CAPABILITIES

- Two cases, 58 kg total, carried by two operators and tracking within 20 min
- 1.2 m six-petal reflector, X-band receive at 150 Mbps, S-band tasking and command uplink
- Up to 9 GB per 8 min TAITA pass, verified and handed to PITCH inside the client's network
- Range telemetry for BATE and LURE at 20 Mbps to 120 km on the same antenna
- Self-scheduled passes from the constellation ephemeris, 72 h unattended on vehicle power
- 6 h of passes on the internal battery; 24 V vehicle, 110 to 230 V mains or solar input
- Uplink windows scheduled with HOOD so the station transmits only inside the force's emission policy
- Every pass, command and file transfer logged with the operator's name

SPECIFICATIONS · DESIGN TARGETS

CASES	antenna case 32 kg, 1.1 m by 0.6 m by 0.5 m; electronics case 26 kg, 0.8 m by 0.5 m by 0.4 m; both wheeled, two-person carry
ANTENNA	1.2 m reflector in six petals, two-axis pedestal, 8 degrees per second slew, tracks from 5 degrees elevation, aligns by GNSS and inertial north-finding with a beacon fix on the first pass as backup
RECEIVE	X band at 150 Mbps, AES-256, up to 9 GB per 8 min pass; S-band telemetry
TRANSMIT	S-band tasking and command at 20 W, transmit windows scheduled with HOOD
RANGE TELEMETRY	20 Mbps from BATE and LURE to 120 km, with the range safety officer's command uplink
GATEWAY	integrity check and decryption, detections to PITCH within 60 s of pass end, full frames on request; connects by JESS vehicle node or 100 m of fiber
POWER	400 W average, 900 W tracking peak; 6 h internal battery; 24 V vehicle, 110 to 230 V mains or 600 W solar input; 72 h unattended on vehicle power
SETUP	two operators, 20 min from closed cases to tracking, 10 min to pack; levels on ground to 10 degrees of slope
ENVIRONMENT	operates in winds to 20 m/s, survives 30 m/s packed, -30 to +55 C, IP65 deployed, MIL-STD-810H in transit

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can demonstrate the link budget for the X-band downlink and the S-band uplink against the TAITA transmitter at 5, 20 and 90 degrees of elevation.
- Falcon Accuracy commits to a setup trial in which two operators with 2 days of training take the station from closed cases to a tracked pass, timed, at a site of the client's choosing.
- Falcon Accuracy can show the gateway's integrity check, decryption and hand-off to PITCH on the bench, with the logs it produces.
- Falcon Accuracy can demonstrate pass scheduling against a published ephemeris in simulation, including conflict handling when two satellites rise within the same 10 min.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

LAGGAR keeps the force in touch with its own satellites, but it cannot see what else shares their orbits. A TAITA satellite at 500 km flies through a shell crowded with other satellites and fragments, and a 10 cm fragment at a closing speed of 10 km/s ends a mission as surely as a failed part. TOWER watches those orbits from domes on high ground, screens every client satellite against what it tracks and sends an analyst-confirmed warning up to 72 h before a close approach. The satellite operator then plans the avoidance burn and sends it up through LAGGAR.



CONCEPT VISUALIZATION · TOWER

ALL FIGURES ARE DESIGN TARGETS

SPACE AND FLIGHT · HARDWARE · 06 OF 09

TOWER

TOWER Space Domain Awareness Network

To tower is the falcon's steep climb to a great height, where it holds and watches the whole sky around it; TOWER watches the sky around the client's satellites from domes on high ground.

WATCHES THE ORBITS YOUR SATELLITES FLY AND WARNS BEFORE A CLOSE APPROACH.

SUMMARY

TOWER is a network of optical telescopes in automatic domes at remote sites that tracks satellites and debris in the orbits the client's satellites fly. It screens every client satellite against what it tracks four times a day and sends a collision warning up to 72 h before a close approach. An analyst confirms every warning before it leaves the operations center, and all data stays inside the client's network.

WHY FALCON ACCURACY BUILT IT

A satellite the force paid for is most likely to be lost to something nobody told it about, such as a fragment or a dead satellite in a crossing orbit. Public warnings arrive late, cover what someone else chooses to watch and tell a third party which satellites the force cares about. Falcon Accuracy built TOWER so the force watches its own orbits with its own telescopes and gets warnings early enough to plan an avoidance burn. The telescopes observe reflected sunlight and emit nothing, an analyst confirms every warning, and the satellite operator decides whether to maneuver.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits TOWER sites to high, dark ground the client already holds or can lease, places the domes on existing power and fiber, and feeds the warnings to the satellite operations displays and PITCH deployment the force already runs.

TRAIN Its detection and orbit models train on the client's own observations of the shells its satellites fly and on the sky brightness and weather at each site, and the analysts' warning formats are written in the client's language.

SET Warning thresholds, screening windows, catalog priorities and who may release a warning are set to the client's space operations rules, and every warning carries the name of the analyst who confirmed it.

WORKS WITH

TAITA · MAKEHAWK · CASTING · RINGING · NICTITANS · LAGGAR · PITCH · CALAMUS · PASSAGE · TERRET

TOWER TOWER Space Domain Awareness Network

DESCRIPTION

TOWER links six remote sites, each with two 0.5 m tracking telescopes and one wide-field survey camera in 4.5 m automatic domes, to one operations center. On a clear night each site makes up to 3,000 track measurements, detects a sunlit 20 cm object at 1,000 km range and a magnitude 17 object at geostationary distance, and fixes position to 1 arcsecond. The center keeps orbits on up to 6,000 objects in the shells the client flies and screens each client satellite against them every 6 h, 7 days ahead. When a close approach crosses the client's threshold, an analyst reviews it and releases a warning with miss distance, probability and time, up to 72 h ahead, to the satellite operator, who decides whether to maneuver. All data stays inside the client's network.

CAPABILITIES

- Six sites, each with two 0.5 m tracking telescopes and one wide-field survey camera in 4.5 m automatic domes
- Detects a sunlit 20 cm object at 1,000 km range and a magnitude 17 object at geostationary distance
- Up to 3,000 track measurements per site per clear night, each fixed to 1 arcsecond
- Keeps orbits on up to 6,000 objects in the orbital shells the client's satellites fly
- Screens every client satellite every 6 h, 7 days ahead, and issues confirmed warnings up to 72 h before closest approach
- An analyst confirms every warning, and the satellite operator decides whether to maneuver
- Passive optical sensing only; the telescopes observe reflected sunlight and emit nothing
- Sites run unattended, and two analysts per shift run the network from one operations center inside the client's network

SPECIFICATIONS · DESIGN TARGETS

SITES	six, chosen by survey for dark sky, altitude and 200 or more clear nights a year; each a 30 m by 20 m pad with power, fiber or satellite backhaul and a perimeter fence
TELESCOPES	two 0.5 m tracking telescopes per site on direct-drive mounts slewing at 15 degrees per second; one wide-field survey camera of 0.28 m aperture with a 6 degree field
DOMES	4.5 m automatic domes that close in under 60 s for cloud, rain or wind over 15 m/s, driven by an on-site weather station
SENSITIVITY	sunlit 20 cm object at 1,000 km range; magnitude 17 at geostationary distance
MEASUREMENT	up to 3,000 tracks per site per clear night; position to 1 arcsecond, time to 1 ms
CATALOG AND SCREENING	up to 6,000 objects; every client satellite screened every 6 h over a 7-day window
WARNINGS	released by an analyst up to 72 h before closest approach with miss distance, collision probability and time; threshold set by the client, default 1 in 10,000
OPERATIONS	unattended sites, one operations center with two analysts per shift; warnings to PITCH and the client's satellite operations display
DATA	AES-256 from site to center; observations and catalog kept inside the client's network; every warning and analyst decision logged in CALAMUS
ENVIRONMENT	-25 to +45 C at the site, winds to 40 m/s with the dome closed, sites to 3,000 m altitude

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can model network coverage and revisit for the client's candidate sites and satellites, with clear-night statistics from local weather records, before any site is chosen.
- Falcon Accuracy can demonstrate the detection and orbit determination pipeline on the bench with recorded observations from a 0.5 m telescope, with position accuracy reported against reference orbits.
- Falcon Accuracy commits to an acceptance trial that measures detection sensitivity, position accuracy and warning lead time at the first two sites over 30 clear nights.
- Falcon Accuracy can show the analyst review and release workflow and its logs running inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

TOWER watches what stays in orbit, and some of what the force sends up has to come back. A materials sample, a sensor that has flown 60 days or a recorder too full to downlink is worth most on a laboratory bench, and no satellite can deliver it there. NICTITANS carries 150 kg back through reentry to a desert range or the sea, and TOWER's tracks of the capsule in its last orbits refine the landing point before the mission director approves the deorbit burn.



CONCEPT VISUALIZATION · NICTITANS

ALL FIGURES ARE DESIGN TARGETS

SPACE AND FLIGHT · HARDWARE · 07 OF 09

NICTITANS

NICTITANS Reentry Capsule

The nictitans is the falcon's third eyelid, a clear membrane that sweeps across the eye to shield it in the fastest stoop; NICTITANS shields its cargo through the fastest descent there is, the return from orbit.

150 KG HOME FROM ORBIT, IN YOUR HANDS WITHIN 2 HOURS.

SUMMARY

NICTITANS is a reentry capsule that flies up to 150 kg of experiments, sensor samples or cargo in orbit for up to 60 days and brings it back. It reenters behind a heat shield, and a drogue, two main parachutes and four airbags set it down on a desert range or the sea, where a recovery team reaches it within 2 h. Samples come back at the temperature the client set, inside the client's own chain of custody.

WHY FALCON ACCURACY BUILT IT

Some of what a force sends to orbit is only useful once it is back on a bench, such as a materials sample, a sensor that has flown 60 days or a recorder holding more data than a downlink can carry. Today that return depends on someone else's crewed station and schedule, or it does not happen. Falcon Accuracy built NICTITANS to fly the force's own experiments on a CASTING launch and land them on the force's own range, with the custody chain unbroken from loading to the laboratory. The mission director approves the deorbit burn, the range safety officer clears the landing area, and every command is logged.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits NICTITANS racks, cold section and connectors to the experiments and sample containers the client already uses, and the recovery kit to the helicopters, vehicles and boats the force already operates.

TRAIN Its descent and landing models train on the client's range winds, terrain and sea states, and the recovery team's checklists are written in the client's language.

SET Landing areas, weather limits, custody rules and the handling of returned material are set to the client's range-safety rules and laboratory procedures, and no deorbit burn proceeds without the mission director's recorded approval.

WORKS WITH

CASTING · LAGGAR · BATE · TOWER · HAGGARD · PITCH · CALAMUS · NANKEEN

NICTITANS NICTITANS Reentry Capsule

DESCRIPTION

NICTITANS is a 1.9 m capsule, 780 kg at landing, that rides CASTING to orbit. Its pressurized bay holds up to 150 kg, with 28 V at 400 W in orbit and a cold section held between +2 and +8 C. It flies free for up to 60 days. On the mission director's approval the service module lowers the orbit and separates, and the capsule enters behind its heat shield with peak deceleration under 9 g. A drogue and two main parachutes slow it, either main alone keeps touchdown under 9 m/s, and four airbags hold the landing load under 12 g. It lands inside a 30 km by 10 km ellipse on a desert range or floats for 48 h at sea, and a recovery team reaches it within 2 h.

CAPABILITIES

- Returns up to 150 kg of experiments, samples or cargo in a 0.4 cubic meter pressurized bay
- Flies free in orbit for up to 60 days with 28 V at 400 W for the experiments and telemetry through LAGGAR
- Cold section holds samples between +2 and +8 C from loading to recovery
- Peak reentry deceleration under 9 g; four airbags hold the landing load under 12 g
- Drogue and two main parachutes; either main alone keeps touchdown under 9 m/s
- Lands inside a 30 km by 10 km ellipse on a desert range, or splashes down and floats for 48 h with a beacon and a strobe
- Recovery team reaches the capsule within 2 h of landing, guided by its GNSS position and beacon
- Deorbit burn approved by a named mission director; payload data and custody records stay inside the client's network

SPECIFICATIONS · DESIGN TARGETS

CAPSULE	1.9 m base diameter, 1.5 m tall, 780 kg at landing; 1,350 kg at launch with the service module
PAYLOAD	150 kg in a 0.4 cubic meter pressurized bay, 28 V at 400 W in orbit, cold section +2 to +8 C, late loading 24 h before launch
ORBIT	up to 60 days free flight at 300 to 500 km; telemetry and commands in S band through LAGGAR
REENTRY	heat shield on the base, insulated backshell, peak deceleration under 9 g, bay wall held under +40 C
DESCENT	drogue at about 12 km, two mains at 3 km; 7 m/s on both mains, under 9 m/s on one; parachutes qualified on BATE
LANDING	four airbags, landing load under 12 g, 30 km by 10 km ellipse on land; flotation collar keeps it afloat 48 h in sea state 4
RECOVERY	GNSS position relay, 406 MHz beacon, strobe and sea dye marker; recovery team on scene within 2 h
REUSE	capsule structure flies 5 times, with a new heat shield, parachutes and airbags each flight
HUMAN IN THE LOOP	mission director approves the deorbit burn, range safety officer clears the landing area; every command logged

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the reentry trajectory and landing dispersion in simulation for the client's chosen desert range and sea area, with deceleration and bay temperature shown throughout.
- Falcon Accuracy commits to a parachute qualification campaign on BATE, with the drogue and each main opened at the speeds and altitudes the capsule will see.
- Falcon Accuracy can demonstrate airbag landing on the bench with a mass model dropped at 9 m/s, measuring the load on the payload bay.
- Falcon Accuracy can show the custody record for returned material, from loading to laboratory handover, kept inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

A capsule comes home on its parachutes, and a parachute that has only been dropped from an aircraft has never opened in thin air at high speed. BATE carries the NICTITANS drogue and main packs to 120 km, releases its payload module and opens them anywhere from 30 km down at speeds to 250 m/s. Every parachute, beacon and airbag that brings a capsule home makes that flight first, and so does every sensor bound for TAITA or a CASTING payload.



CONCEPT VISUALIZATION · BATE

ALL FIGURES ARE DESIGN TARGETS

SPACE AND FLIGHT · HARDWARE · 08 OF 09

BATE

BATE Suborbital Test Rocket

To bate is the hawk's sudden leap from the fist, wings beating, a short flight that ends back where it began; BATE is the rocket that leaps to 120 kilometers and lands back on its legs.

60 KG TO 120 KM, BACK ON ITS LEGS IN 10 MINUTES.

SUMMARY

BATE is a single-stage reusable rocket that lifts a 60 kg payload to 120 km, gives it 3 min above 80 km, and lands back on four legs within 10 min of liftoff. The payload module separates at apogee and returns under the parachute being qualified, or stays attached and lands with the vehicle. Sensors, radios and parachutes earn a flight record here before they fly on RINGING or TAITA.

WHY FALCON ACCURACY BUILT IT

A sensor that has only seen a vibration table and a vacuum chamber has never seen them at the same time, and the first time it does is usually on the way to orbit. BATE gives every payload a real ascent, 3 min of near-vacuum and a real descent for a fraction of the cost of a lost satellite. Falcon Accuracy built it to land on legs and fly again in 48 h so a test campaign of ten flights fits in one month on the client's own range. The test director and the range safety officer make every go decision, the vehicle shuts down and recovers itself if it leaves the corridor, and every flight's data stays inside the client's network.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits BATE to the client's range, pad and recovery area, and cuts the payload rails and connectors to the sensors, radios and parachute packs the force already means to qualify.

TRAIN Its wind, trajectory and recovery models train on the client's range weather records and terrain, and the test cards and callouts are written in the client's language.

SET Flight corridors, exclusion zones, acceleration limits and test documentation are set to the client's range-safety rules and qualification standards, and no flight proceeds without the test director's recorded go.

WORKS WITH

RINGING · TAITA · LAGGAR · HOOD · JESS · SCREEN · BARBULE

BATE BATE Suborbital Test Rocket

DESCRIPTION

BATE is a 9 m single-stage rocket, 0.6 m across, with one 45 kN engine and four legs. It carries 60 kg to 120 km, gives the payload 3 min above 80 km, and lands within 10 m of the marker 10 min after liftoff. The payload module can separate at apogee to test the client's parachute from 30 km down, or stay attached. Ascent acceleration is set from 4 g to 12 g. The 0.6 m by 1.2 m bay supplies 28 V at 300 W, records 2 TB and streams 20 Mbps telemetry through LAGGAR. It launches from a skid-mounted pad, flies again in 48 h and is built for 25 flights. The test director holds the go, and an officer-armed system shuts the engine down and recovers the vehicle by parachute if it leaves its corridor.

CAPABILITIES

- 60 kg payload to 120 km apogee with 3 min above 80 km; 100 kg to 80 km
- Lands on four legs within 10 m of the marker; flies again in 48 h; 25 flights per vehicle
- Payload module separates at apogee and descends under the parachute under test, deployed anywhere from 30 km down
- Ascent profile programmable between 4 g and 12 g with a chosen vibration spectrum
- Payload bay 0.6 m by 1.2 m with 28 V at 300 W, a 2 TB recorder and 20 Mbps telemetry through LAGGAR
- Skid-mounted launch pad set up in 4 h on any 20 m by 20 m hardstand
- Automatic shutdown and parachute recovery, armed by the range safety officer before liftoff, if the vehicle leaves its corridor; the officer holds the same command
- Flight data delivered to the client within 1 h of landing and kept inside the client's network

SPECIFICATIONS · DESIGN TARGETS

VEHICLE	single stage, 9 m tall, 0.6 m diameter, 2.1 t at liftoff, four landing legs with a 3 m footprint
PROPULSION	one liquid-propellant engine, 45 kN at liftoff, throttles to 25 percent for landing
PERFORMANCE	60 kg to 120 km, 100 kg to 80 km; 3 min above 80 km at 120 km apogee, where pressure is below 1 Pa; flight time about 10 min
PAYLOAD BAY	0.6 m diameter by 1.2 m long, 28 V at 300 W, 2 TB recorder, 20 Mbps telemetry to LAGGAR, standard rail mounts; separable module with parachute test deployment from 30 km down
LOADS	ascent acceleration programmable 4 g to 12 g; payload module reentry up to 15 g; parachute deployment speeds to 250 m/s
LANDING	within 10 m of the marker on a 20 m by 20 m hardstand; payload module within 2 km under parachute, located by beacon
REUSE	48 h turnaround, 25 flights per vehicle, engine borescope and leg inspection between flights
GROUND SEGMENT	skid-mounted launch pad and erector, 4 h setup, crew of 6; LAGGAR as telemetry and command station
FLIGHT SAFETY	automatic engine shutdown and vehicle parachute on corridor departure, armed by the range safety officer before liftoff; range safety officer command over an encrypted link; surface winds to 10 m/s for launch

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the ascent, separation and landing trajectory in simulation with propellant and thermal margins shown for the 60 kg and 100 kg cases.
- Falcon Accuracy commits to an acceptance trial that measures apogee, time above 80 km, landing distance from the marker and turnaround time over three consecutive flights.
- Falcon Accuracy can show a payload qualification protocol, from bench fit check to flight data package, written to the client's own standards.
- Falcon Accuracy can demonstrate the flight-safety logic, shutdown and parachute sequence on a bench avionics set driven by simulated trajectories.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

BATE and LURE share a range, a LAGGAR telemetry link and a range safety officer who can end a flight by shutdown and parachute. BATE qualifies the hardware, and LURE qualifies the crews. The air-defense teams that protect the pad and the ground station need a fast, low aircraft to detect, track and cue against, and a quadcopter over the fence does not teach them that. LURE flies the 800 km/h profile at 20 m above the sea, scores every detection and track the crews make, and returns for the next run.



CONCEPT VISUALIZATION · LURE

ALL FIGURES ARE DESIGN TARGETS

SPACE AND FLIGHT · HARDWARE · 09 OF 09

LURE

LURE High-Speed Target Drone

The lure is the padded target a falconer swings for the falcon to chase in training; LURE is the aircraft air-defense crews train against.

THE AIRCRAFT YOU TRAIN AGAINST, 800 KM/H AT 20 M, BACK TOMORROW.

SUMMARY

LURE is an unarmed jet-powered target drone, 110 kg at launch, that flies the profiles air-defense crews need to see, from 800 km/h at 20 m above the sea to a 150 km/h loiter with a small radar return. It launches from a pneumatic rail, flies for 60 min, and comes down under a parachute and airbags for 30 flights. A scoring receiver logs every detection and track the crews make and the time each one took.

WHY FALCON ACCURACY BUILT IT

Air-defense crews see the real thing rarely and under the worst conditions, and a slow quadcopter over the fence is not the fast, low aircraft their radars and procedures were written for. LURE gives SCREEN, HOOD, WAKE and PITCH crews a repeatable aircraft that flies fast and low, changes its radar and heat signature between runs, and returns for the next run. It carries nothing but signature devices, a training emitter and sensors, and every pass is scored by the drone itself. The range safety officer holds the flight, the instructor sets the profile, and every run writes to the CREANCE after-action record.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits LURE to the client's ranges, recovery areas and air-defense sensors, and fits its emitter and reflectors to the radars and receivers the force already operates.

TRAIN Its flight profiles and signature settings train on the speeds, altitudes and radar returns of the aircraft recorded in the client's theater, and the briefing cards are written in the client's language.

SET Airspace rules, geofences, break-off distances and scoring criteria are set to the client's training doctrine and national regulations, and every run is logged under the instructor and the range safety officer.

WORKS WITH

SCREEN · HOOD · PITCH · CREANCE · LAGGAR · JESS

LURE LURE High-Speed Target Drone

DESCRIPTION

LURE is a 3.6 m jet aircraft with a 2.2 m span and 110 kg launch mass. A trailer-mounted pneumatic rail launches it in 25 m. It flies from 20 m above the sea to 9,000 m, holding 800 km/h for 5 min or 500 km/h for an hour. Radar reflectors set its return between 0.1 and 10 square meters, heated panels set its heat signature, and a training emitter imitates drone control links inside the force's training band. Four aircraft fly a raid profile under one operator. A scoring receiver logs every SCREEN track, HOOD fix, WAKE detection and PITCH cue to 2 m and 0.1 s. It recovers by parachute and airbags for 30 flights, and the range safety officer can end any flight by engine shutdown and parachute.

CAPABILITIES

- 800 km/h dash for 5 min, 500 km/h cruise for 60 min, from 20 m over the sea to 9,000 m
- Radar return adjustable from 0.1 to 10 square meters; heat signature adjustable with heated panels
- Training emitter imitates drone control links inside the force's allocated training band for HOOD crews
- Four aircraft fly a raid profile under one operator
- Scoring receiver logs tracks, fixes and cues to within 2 m and 0.1 s
- Pneumatic rail launch in 25 m with no pyrotechnics; parachute and airbag recovery; 30 flights per airframe
- Geofenced flight with engine shutdown and parachute on the range safety officer's command
- Every run exported to the CREANCE after-action record within 5 min of landing, inside the client's network

SPECIFICATIONS · DESIGN TARGETS

AIRCRAFT	3.6 m long, 2.2 m span, 110 kg at launch, one small turbojet of 0.9 kN
SPEED AND ALTITUDE	800 km/h dash for 5 min, 500 km/h cruise, 150 km/h loiter; 20 m above the sea to 9,000 m
ENDURANCE AND RANGE	60 min at cruise; 120 km control radius through LAGGAR, 50 km from the one-case control station
SIGNATURE	passive radar reflectors 0.1 to 10 square meters, heated panels for infrared, training emitter 400 MHz to 6 GHz within the force's allocation
SCORING	receiver logs range and timing of every track, fix and cue to 2 m and 0.1 s
LAUNCH AND RECOVERY	pneumatic rail on a 6 m trailer, 25 m run, 8 min between launches; parachute and two airbags, landing within 100 m of the chosen point in winds to 10 m/s; 30 flights per airframe
CONTROL	preset profile with operator override, geofence, lost-link return and parachute; up to 4 aircraft per operator
ENVIRONMENT	winds to 15 m/s at launch, -20 to +50 C, IP54 in transit; AES-256 links
HUMAN IN THE LOOP	instructor sets the profile, range safety officer holds the flight, every run logged

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the flight envelope, launch and recovery analysis in simulation for the 800 km/h low-level profile and the 9,000 m profile.
- Falcon Accuracy commits to an acceptance trial that measures speed, altitude hold, radar return range and recovery accuracy over five consecutive flights.
- Falcon Accuracy can demonstrate the scoring receiver and its CREANCE export on the bench against recorded SCREEN and WAKE data.
- Falcon Accuracy can show the geofence, lost-link and range-safety logic on a bench avionics set driven by simulated flights.

NEXT SECTOR · 10 ROCKET SYSTEMS · P. 136

Launchers, engines and ranges the force owns, from the pad to orbit. This closes Space and Flight. Sector 10, Rocket Systems, opens on page 136 with CORACOID, MOUNTEE, PATAGIUM, ENEW, RACHIS, NANKEEN, CRINES, BARBULE, TERRET and PUTOVER.

SECTOR 10 OF 18

10

ROCKET SYSTEMS

LAUNCHERS, ENGINES AND RANGES THE FORCE OWNS, FROM THE PAD TO ORBIT.

A force that owns satellites still depends on whoever owns the launch, the engines, the range and the upper-air data. A satellite lost on a Monday is replaced when a foreign manifest has room, from a foreign range, under a foreign range safety officer. Heavy satellites and station modules need more lift than RINGING and CASTING give, a single small satellite needs a launcher that needs no pad at all, and a force that loses its range needs another one within days. Every vehicle in the Rocket Systems sector is unarmed civil space hardware that carries satellites, experiments, instruments or relief cargo, built in white composite and launched from pads, balloons and ships.



IN THIS SECTOR · 10 PRODUCTS · PAGES 138 TO 157

CORACOID MOUNTEE PATAGIUM ENEW RACHIS NANKEEN CRINES BARBULE TERRET PUTOVER

The ten products work as one chain. CORACOID lifts 38 t to low Earth orbit, and MOUNTEE puts 50 kg in orbit from under a stratospheric balloon. PATAGIUM stands up a complete launch site from 20 containers in 10 days, and ENEW takes RINGING and CASTING to the equator. RACHIS engines power the family. NANKEEN gives 200 kg of experiments 6 min of microgravity, and CRINES measures the upper air every day. BARBULE tracks every flight against its safety corridor, TERRET releases up to 24 satellites in a programmed order, and PUTOVER lands 10 t of relief supplies on a prepared pad within 90 min. A named human makes every launch, release and landing decision, every command is logged, and all data stays inside the client's network.

IN THIS SECTOR · 10 PRODUCTS



CORACOID p. 138
CORACOID Heavy-Lift Reusable Launch Vehicle
38 t to orbit. All three cores come home.



MOUNTEE p. 140
MOUNTEE Balloon-Launched Micro-Launcher
No pad, no tower. 50 kg to orbit from 20 km.



PATAGIUM p. 142
PATAGIUM Expeditionary Launch Site
Twenty containers, ten days, a launch site on your own ground.



ENEW p. 144
ENEW Equatorial Launch Platform
Launch from the equator, far from every coast.



RACHIS p. 146
RACHIS Reusable Rocket Engine Family
Two sizes, one design, about 50 flights between overhauls.



NANKEEN p. 148
NANKEEN Microgravity Research Rocket
200 kg of experiments, 6 minutes of microgravity, home by parachute.



CRINES p. 150
CRINES Meteorological Rocketsonde
Winds, temperature and density from 20 to 90 km, every day.



BARBULE p. 152
BARBULE Launch Range Tracking Network
Every launch tracked, every corridor checked, every flight recorded.



TERRET p. 154
TERRET Rideshare Satellite Dispenser
Twenty-four satellites on one ring, each release confirmed.



PUTOVER p. 156
PUTOVER Point-to-Point Cargo Rocket
10 t of relief supplies on a prepared pad within 90 minutes.



CONCEPT VISUALIZATION · CORACOID

ALL FIGURES ARE DESIGN TARGETS

ROCKET SYSTEMS · HARDWARE · 01 OF 10

CORACOID

CORACOID Heavy-Lift Reusable Launch Vehicle

The coracoid is the stout bone that braces each wing against the breastbone and carries the full load of every downstroke; CORACOID braces two side boosters against one core and carries the heaviest loads the force sends to orbit.

38 T TO ORBIT. ALL THREE CORES COME HOME.

SUMMARY

CORACOID is a three-core heavy launch vehicle that places 38 t in a 400 km low Earth orbit. Its two side boosters fly back and land at the launch site, and its center core lands on an uncrewed sea platform. One flight lifts a large satellite, a station module or a whole constellation batch.

WHY FALCON ACCURACY BUILT IT

Some of what a force needs in orbit is too heavy for any medium launcher, such as a large radar satellite, a module for an orbital station or three constellation planes at once. Buying that lift abroad puts the most valuable payloads in the longest foreign queue. Falcon Accuracy built CORACOID from three cores of one design, so the force trains one team, stocks one set of spares and recovers all three cores for reuse. The launch conductor and the range safety officer hold every go decision, and every command from tanking to the last touchdown is logged.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits CORACOID to the client's own coastal range, with the launch mount, hangar, two landing pads and the sea landing area surveyed into an existing naval or air base, the port checked for the platform and its recovery ship, and the payload adapters cut to the satellites and modules the force already owns or has on order.

TRAIN Its trajectory, wind and landing models train on the client's range weather records, CRINES upper-air profiles, sea states and shipping and air traffic patterns, and the launch and recovery checklists are written in the client's language.

SET Launch-commit criteria, exclusion areas at sea and in the air, go and no-go authority and payload classification handling are set to the client's range-safety rules and doctrine, and no flight proceeds without the launch conductor's recorded go.

WORKS WITH

RACHIS · TERRET · BARBULE · CRINES · CASTING · MAKEHAWK · TOWER · LAGGAR · PITCH · CALAMUS

CORACOID CORACOID Heavy-Lift Reusable Launch Vehicle

DESCRIPTION

CORACOID stands 74 m tall and 13.8 m across its three 4.6 m cores, and lifts off at 1,450 t on 21 RACHIS 900 engines. It places 38 t in a 400 km orbit with all three cores recovered, or 50 t with the center core expended. The side boosters separate at 60 km, fly back and land on two pads 1.5 km from the launch mount. The center core lands on an uncrewed sea platform 650 km downrange. A 6.5 m fairing, 18 m long, takes a single 38 t satellite, a station module or three TERRET rings with 72 small satellites. Cores fly again within 45 days, up to 12 times each. The launch conductor gives the go, and an officer-armed system shuts the engines down if the vehicle leaves its corridor.

CAPABILITIES

- 38 t to a 400 km orbit at 51 degrees with all three cores recovered; 50 t with the center core expended
- Two side boosters fly back and land on pads 1.5 km from the launch mount, each within 5 m of its marker
- Center core lands within 5 m of the center of an uncrewed sea platform 650 km downrange
- 6.5 m by 18 m fairing takes a single 38 t satellite, a station module or three TERRET rings with 72 small satellites
- Cores fly again within 45 days of landing, up to 12 flights each, with engine inspection between flights
- Orbit insertion within 5 km in altitude and 0.05 degrees in inclination
- Automatic flight safety, armed by the range safety officer before liftoff, shuts the engines down if the vehicle leaves its corridor; the officer holds the same command, with the corridor tracked by BARBULE
- Launch, flight and recovery data stay inside the client's network, and every command from tanking to the last touchdown is logged

SPECIFICATIONS · DESIGN TARGETS

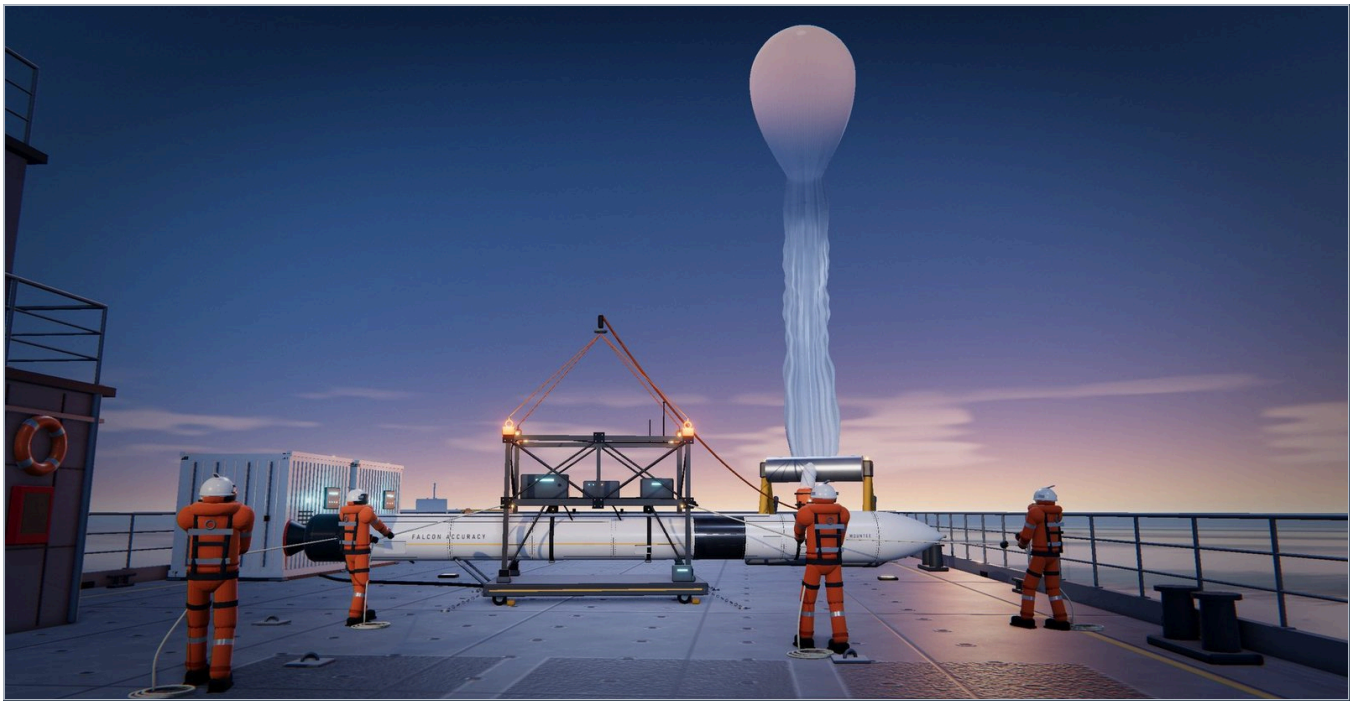
VEHICLE	three 4.6 m cores side by side, 13.8 m wide, 74 m tall with the second stage and fairing, 1,450 t at liftoff
PROPULSION	21 RACHIS 900 engines, seven per core, 18,900 kN at liftoff, three engines per core throttle for landing; one RACHIS 900 vacuum engine on the second stage, restartable three times
PAYLOAD	38 t to a 400 km orbit at 51 degrees with all cores recovered; 50 t with the center core expended; 14 t to geostationary transfer orbit with the center core expended
FAIRING	6.5 m diameter, 18 m long, 5.8 m by 14 m usable volume; 2,624 mm and 1,575 mm interfaces; halves recovered under parafoils
CORE RETURN	side boosters separate at 60 km and land on two 60 m by 60 m pads 1.5 km from the mount; center core lands on a 100 m by 60 m uncrewed sea platform 650 km downrange; touchdown within 5 m
REUSE	45 days from landing to next flight, 12 flights per core, sea platform back in port within 5 days
INSERTION ACCURACY	5 km in altitude, 0.05 degrees in inclination; second stage reenters over an empty ocean area within 3 h of the last payload release
GROUND SEGMENT	coastal launch complex of 300 m by 200 m, horizontal integration hangar for three cores, 21-day campaign from payload arrival to launch, launch crew of 60
FLIGHT SAFETY	automatic engine shutdown on corridor departure, armed by the range safety officer before liftoff; range safety officer command over an encrypted link; corridor display by BARBULE; launch-commit criteria set by the client
ENVIRONMENT	launches in surface winds to 15 m/s with upper winds measured by CRINES; sea platform landings to sea state 5; rated for coastal salt air

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the reference mission in simulation, from liftoff through side-booster return and center-core landing to orbit insertion, with mass, thrust and propellant margins shown at every phase.
- Falcon Accuracy can run a landing simulation campaign of 1,000 descents for each core type across the client's recorded winds and sea states, with touchdown distance and leg loads reported for each.
- Falcon Accuracy commits to an acceptance trial protocol that measures payload mass delivered, insertion accuracy, landing distance from each marker and turnaround time on the first three flights.
- Every flight record stays inside the client's network, and Falcon Accuracy can demonstrate the logging chain from the launch console to the archive on the bench.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

CORACOID is the answer for the heaviest loads, and it needs a full coastal complex, two landing pads and a sea platform to fly. Some needs are the opposite, a single small satellite over a new theater within days and from wherever the force happens to be. MOUNTEE leaves the range behind and lets a stratospheric balloon do the first 20 km, so a crew of 12 launches from a ship deck or a field. The two vehicles share RACHIS engines, BARBULE tracking and the same launch conductor rules.



CONCEPT VISUALIZATION · MOUNTEE

ALL FIGURES ARE DESIGN TARGETS

ROCKET SYSTEMS · HARDWARE · 02 OF 10

MOUNTEE

MOUNTEE Balloon-Launched Micro-Launcher

The mountee is a hawk's steady rise to height before it makes its flight; MOUNTEE rises under a balloon to 20 km before its rocket lights.

NO PAD, NO TOWER. 50 KG TO ORBIT FROM 20 KM.

SUMMARY

MOUNTEE is a two-stage micro-launcher that rides a stratospheric balloon to 20 km, separates and puts up to 50 kg in a 500 km orbit. It launches from a ship deck or a cleared field with no pad, no tower and no fixed range. A crew of 12 can put a single replacement satellite in orbit within 72 h of arriving at the site.

WHY FALCON ACCURACY BUILT IT

A force that loses one small satellite, or needs one over a new theater, should not wait for a heavy launch or build a pad to get it. Much of a rocket's work near the ground goes into pushing through dense air, and a balloon does that part slowly, quietly and cheaply. Falcon Accuracy built MOUNTEE so that a crew of 12 can launch from a ship deck or a remote field with nothing more than the balloon, the gondola and two control containers. The mission director releases the rocket only inside a cleared airspace box, and every command is logged.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits MOUNTEE to the ships and open ground the force already has, with deck fittings surveyed onto an existing support vessel, launch fields chosen inside the client's own territory and the payload adapter cut to the small satellites the force already owns.

TRAIN Its ascent, drift and release models train on the client's own upper-wind records and CRINES profiles, so the release point is predicted for the client's seasons, and the crew checklists are written in the client's language.

SET Airspace boxes, release criteria, go and no-go authority and payload classification handling are set to the client's range-safety rules and airspace procedures, and no release proceeds without the mission director's recorded approval.

WORKS WITH

RACHIS · BARBULE · CRINES · PATAGIUM · TAITA · LAGGAR · PITCH · CALAMUS

MOUNTEE MOUNTEE Balloon-Launched Micro-Launcher

DESCRIPTION

MOUNTEE is an 11 m, two-stage rocket, 0.75 m across and 2.6 t fueled, slung under a gondola beneath a 400,000 cubic meter stratospheric balloon. The balloon lifts the stack from a ship deck or a cleared field to 20 km in about 2 h, drifting no more than 60 km. There, above 95 percent of the atmosphere, the gondola tilts the rocket to its launch angle and releases it, and the first stage ignites 300 m below the gondola. Three RACHIS 30 engines on the first stage and one on the second put up to 50 kg in a 500 km orbit. The gondola returns under its parachute for reuse. A crew of 12 runs the launch from two containers, and the mission director releases the rocket only inside a cleared airspace box.

CAPABILITIES

- Up to 50 kg to a 500 km sun-synchronous orbit; 70 kg to a 400 km orbit at 45 degrees
- Launches from a ship deck of 30 m by 20 m or a cleared field of 200 m by 200 m, with no pad or tower
- Balloon lifts the stack to 20 km in about 2 h, with drift held within 60 km of the release point
- Release and ignition only inside a cleared airspace box approved by the mission director
- Gondola and its avionics return under a parachute and fly again up to 20 times
- Crew of 12 with two containers; 72 h from arrival at the site to launch
- Fairing takes one 50 kg satellite on a 381 mm ring or up to four 3U cubesats
- Every command and decision logged; flight data stays inside the client's network

SPECIFICATIONS · DESIGN TARGETS

ROCKET	two stages, 11 m long, 0.75 m diameter, 2.6 t fueled
PROPULSION	three RACHIS 30 engines on the first stage, 90 kN; one RACHIS 30 vacuum engine on the second stage, 32 kN, restartable
PAYLOAD	50 kg to a 500 km sun-synchronous orbit; 70 kg to a 400 km orbit at 45 degrees; fairing usable volume 0.7 m by 1.1 m
BALLOON	400,000 cubic meter zero-pressure envelope, ascent to 20 km in about 2 h; envelope cut free after release and recovered under its own parachute
GONDOLA	carries the 2.6 t rocket, tilts it to its launch angle and releases it; returns under a parachute, 20 flights
RELEASE	at 20 km altitude, first-stage ignition 300 m below the gondola, only inside a cleared airspace box
LAUNCH SITES	ship deck of 30 m by 20 m or cleared field of 200 m by 200 m; surface winds to 5 m/s for balloon inflation
GROUND SEGMENT	two 6 m containers for mission control and payload processing; crew of 12; 72 h from arrival to launch
INSERTION ACCURACY	15 km in altitude, 0.15 degrees in inclination; second stage deorbits itself within 2 years
FLIGHT SAFETY	automatic engine shutdown on corridor departure, armed by the mission director before release; mission director command over an encrypted link; tracking by BARBULE mobile sets or LAGGAR

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can show the full flight in simulation, from balloon ascent and drift through release, ignition and orbit insertion, with mass and propellant margins at every phase.
- Falcon Accuracy can run a drift study for the client's candidate launch sites against 10 years of recorded upper winds, showing the release point spread for each month.
- Falcon Accuracy commits to an acceptance protocol that measures ascent time, drift, release point and insertion accuracy on the first three flights.
- Falcon Accuracy can demonstrate the gondola release and tilt sequence on the bench with a mass model, and show the logging chain that keeps every command inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

MOUNTEE replaces one small satellite, and a whole TAITA plane still needs a RINGING flight from a real pad. A fixed range is one known place that weather, damage or politics can close for months. PATAGIUM packs the pad, gantry, propellant farm and control room into 20 containers, so the force can stand up a RINGING site on its own ground in 10 days and keep MOUNTEE crews supplied from the same base.



CONCEPT VISUALIZATION · PATAGIUM

ALL FIGURES ARE DESIGN TARGETS

ROCKET SYSTEMS · HARDWARE · 03 OF 10

PATAGIUM

PATAGIUM Expeditionary Launch Site

The patagium is the fold of skin that lies packed against a bird's body and spreads into the leading edge of the wing when it opens; PATAGIUM lies packed in 20 containers and opens into a full launch site.

TWENTY CONTAINERS, TEN DAYS, A LAUNCH SITE ON YOUR OWN GROUND.

SUMMARY

PATAGIUM is a complete launch site for RINGING that ships in 20 standard containers and stands up on a prepared concrete slab in 10 days. It brings its own launch mount, mobile gantry, propellant farm, power and mission control. A force that loses a satellite, or the use of its fixed range, launches a replacement from its own territory.

WHY FALCON ACCURACY BUILT IT

A fixed launch range is one known place, and a force that depends on it loses all launch capacity when weather, damage or politics close it. Building a second range takes years. Falcon Accuracy packed everything RINGING needs on the ground into standard containers that move by road, rail or sea and set up on a slab the client prepares in advance. The launch conductor and the range safety officer run every launch from the site's own control room, and every command is logged inside the client's network.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits PATAGIUM to the client's own ground, surveying candidate slabs on bases the force already holds, checking road, rail and port routes for the containers and cranes, and connecting the site to the power, fiber and SCREEN perimeter the base already runs.

TRAIN Its setup plans, launch-window and wind models train on each candidate site's terrain, weather records and CRINES profiles, and the crew's setup and launch checklists are written in the client's language.

SET Safety distances, launch-commit criteria, go and no-go authority and site security rules are set to the client's range-safety regulations and doctrine, and no launch proceeds without the launch conductor's recorded go.

WORKS WITH

RINGING · MOUNTEE · RACHIS · BARBULE · CRINES · LAGGAR · TAITA · SCREEN · PITCH · CALAMUS

PATAGIUM PATAGIUM Expeditionary Launch Site

DESCRIPTION

PATAGIUM ships in 20 standard 6 m containers, about 260 t in all, by road, rail or sea. On a prepared 60 m by 60 m concrete slab, a crew of 30 sets it up in 10 days. The site holds a steel launch mount with a flame deflector, a mobile gantry that rolls back 40 m before launch, a propellant farm sized for three RINGING flights, two 500 kW generators and a mission control container with eight consoles. A RINGING vehicle and its satellite travel with the site, so a replacement satellite reaches orbit 17 days after the containers arrive. BARBULE mobile trackers and a LAGGAR station plug into the same network. The launch conductor gives the go, and all launch data stays inside the client's network.

CAPABILITIES

- Complete RINGING launch site in 20 standard 6 m containers, about 260 t in all
- Set up on a prepared 60 m by 60 m slab by a crew of 30 in 10 days; packed again in 7 days
- Replacement satellite in orbit 17 days after the containers arrive, with the RINGING vehicle and payload shipped alongside
- Mobile gantry gives enclosed access at five levels and rolls back 40 m before launch
- Propellant farm stores enough for three flights, with remote-operated valves and leak detection
- Mission control container with eight consoles, tied to BARBULE mobile trackers and a LAGGAR station on one network
- Own power from two 500 kW generators, or the local grid where one exists
- Every command from tanking to liftoff logged; all launch data stays inside the client's network

SPECIFICATIONS · DESIGN TARGETS

SHIPMENT	20 standard 6 m containers, about 260 t in all, no container over 24 t; road, rail or sea
SLAB	60 m by 60 m reinforced concrete prepared by the client to a Falcon Accuracy drawing, plus a 30 m by 30 m pad 8 km downrange for RINGING first-stage return
SETUP	10 days with a crew of 30 and two 50 t mobile cranes; packing in 7 days
LAUNCH MOUNT	steel mount with flame deflector and water deluge, rated for RINGING at 38 t
GANTRY	mobile, 32 m tall, five enclosed work levels, rolls back 40 m on rails before launch
PROPELLANT FARM	storage for three RINGING flights, remote-operated valves, leak detection and suppression, 150 m from mission control
MISSION CONTROL	one container, eight consoles, site weather station, CRINES data feed, encrypted links to BARBULE and LAGGAR
POWER	two 500 kW generators with 72 h of fuel on site, or a grid connection
CAMPAIGN	replacement satellite in orbit 17 days after the containers arrive; then one RINGING flight every 14 days
ENVIRONMENT	-20 to +50 C, setup in winds to 25 m/s, survives 45 m/s packed

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can show the full container packing list, the 10-day setup sequence and the crane lifts in a time-lapse simulation on a model of the client's candidate slab.
- Falcon Accuracy can survey up to three candidate sites and deliver slab drawings, safety distances and transport routes within 45 days of access.
- Falcon Accuracy commits to a setup trial in which the client's crew of 30, after 3 weeks of training, takes the site from closed containers to launch-ready, timed, on the client's slab.
- Falcon Accuracy can demonstrate the mission control logging chain on the bench, with every command written to logs that stay inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

PATAGIUM moves the pad across the client's own territory, but it cannot move the territory closer to the equator or farther from populated coasts. Some orbits pay for every degree of latitude, and some flight paths should cross nothing but ocean. ENEW carries RINGING and CASTING class vehicles to the equator on a semi-submersible platform and launches them with nobody aboard, adding up to 15 percent payload where it matters most.



CONCEPT VISUALIZATION · ENEW

ALL FIGURES ARE DESIGN TARGETS

ROCKET SYSTEMS · HARDWARE · 04 OF 10

ENEW

ENEW Equatorial Launch Platform

In old falconry, to enew is to drive a bird off the land and down onto the water; ENEW takes the force's launches off the land and out onto open water at the equator.

LAUNCH FROM THE EQUATOR, FAR FROM EVERY COAST.

SUMMARY

ENEW is a self-propelled semi-submersible launch platform with a command ship that carries RINGING and CASTING class vehicles to the equator and launches them from open sea. Launching at the equator adds up to 15 percent payload to low-inclination and geostationary transfer orbits. The crew launches from the command ship 5 km away, and every drop zone lies over empty ocean.

WHY FALCON ACCURACY BUILT IT

A coastal range fixes the latitude of every launch and puts populated coast under the early flight path. The equator gives a launch vehicle the most help from the Earth's spin and the widest choice of orbits, and open ocean gives it the safest corridor. Falcon Accuracy built ENEW so the force can use both without owning land near the equator. The platform is uncrewed at liftoff, the launch conductor works from the command ship, and every command is logged inside the client's network.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits ENEW to the client's own ports, dry docks and vessels, sizing the hangar and erector to the RINGING and CASTING vehicles the force operates, and connecting the command ship to the PITCH deployment and ground stations the force already runs.

TRAIN Its voyage, launch-window and sea-keeping models train on the client's ocean routes, sea-state records and CRINES profiles for the chosen launch point, and the crew procedures are written in the client's language.

SET Launch points, exclusion areas at sea and in the air, crew evacuation rules and go and no-go authority are set to the client's range-safety rules and maritime law, and no launch proceeds without the launch conductor's recorded go.

WORKS WITH

RINGING · CASTING · BARBULE · CRINES · TERRET · RACHIS · LAGGAR · HAGGARD · PITCH · CALAMUS

ENEW ENEW Equatorial Launch Platform

DESCRIPTION

ENEW is a 140 m by 80 m semi-submersible platform that sails at 12 knots from its home port to a launch point on the equator, then floods its pontoons to settle 14 m deeper and become a stable pad. A deck hangar holds one CASTING or two RINGING vehicles, rolled out and raised by a transporter-erector 6 h before launch. A 190 m command ship carries the payload processing bay, a mission control room with 24 consoles and quarters for 240. Before tanking, the platform crew moves to the ship, which stands off 5 km, and the launch runs remotely. Launching from the equator adds up to 15 percent payload to low-inclination orbits. BARBULE trackers on both vessels follow every flight.

CAPABILITIES

- Launches one CASTING or two RINGING vehicles per voyage from a point on the equator
- Up to 15 percent more payload to low-inclination and geostationary transfer orbits than from a range at 30 degrees latitude
- Platform sails at 12 knots, settles 14 m deeper on its pontoons for launch and holds position within 25 m
- Uncrewed at liftoff; the launch runs from a command ship standing off 5 km
- Command ship carries payload processing, a 24-console mission control room and quarters for 240
- Launches in sea state 4, inside a 10-day window planned from CRINES profiles and the client's forecasts
- BARBULE tracking radars and telemetry antennas on both vessels follow every flight
- Every command logged; flight and voyage data stay inside the client's network

SPECIFICATIONS · DESIGN TARGETS

PLATFORM	semi-submersible, 140 m by 80 m, self-propelled at 12 knots, 30,000 t at launch draft
LAUNCH DRAFT	pontoons flooded to settle 14 m deeper in 8 h; dynamic positioning within 25 m
HANGAR	one CASTING or two RINGING vehicles; transporter-erector raises a vehicle in 6 h
COMMAND SHIP	190 m, 12 knots, 30 m by 15 m payload processing bay with clean room, 24-console mission control, quarters for 240
LAUNCH	platform uncrewed at liftoff; command ship standing off 5 km; launch conductor's go over two encrypted links
PAYLOAD GAIN	up to 15 percent to low-inclination and geostationary transfer orbits compared with a range at 30 degrees latitude
VOYAGE	about 10 days from a home port 2,500 nautical miles from the launch point; 60 days endurance at sea
WEATHER LIMITS	launch in sea state 4 and surface winds to 15 m/s
TRACKING	BARBULE radar and telemetry sets on both vessels; LAGGAR terminal on the command ship

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can show the payload gain for each of the client's chosen orbits in simulation, comparing the equator with the client's existing range.
- Falcon Accuracy can present a sea-keeping study of the platform at launch draft in the client's recorded sea states, with deck motion reported against the erector's limits.
- Falcon Accuracy commits to an acceptance protocol that measures station-keeping accuracy, ballast time and remote launch control on a sea trial before the first launch.
- Falcon Accuracy can walk the client's launch team through the crew evacuation and remote launch sequence, with every command logged inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

Every vehicle that leaves a PATAGIUM slab or an ENEW deck depends on its engines, and engines are the part most often bought abroad and delivered late. RACHIS gives the sector one engine design in two sizes, so one production line, one test stand and one maintenance crew serve MOUNTEE, NANKEEN, PUTOVER and CORACOID. Each engine flies about 50 times between overhauls, so the line builds for growth rather than replacement.



CONCEPT VISUALIZATION · RACHIS

ALL FIGURES ARE DESIGN TARGETS

ROCKET SYSTEMS · HARDWARE · 05 OF 10

RACHIS

RACHIS Reusable Rocket Engine Family

The rachis is the stiff central shaft of a flight feather, the part that carries every load the vane puts on it; RACHIS engines carry every Falcon Accuracy launcher.

TWO SIZES, ONE DESIGN, ABOUT 50 FLIGHTS BETWEEN OVERHAULS.

SUMMARY

RACHIS is a family of 3D-printed, throttling, restartable rocket engines in two sizes, RACHIS 30 for small launch vehicles and upper stages and RACHIS 900 for large boosters. Both fly about 50 times between overhauls and restart in flight for landings and orbit changes. The force builds and services its own engines and can supply third-party satellite launch vehicles, only for unarmed launch vehicles and under the export rules that apply.

WHY FALCON ACCURACY BUILT IT

A launcher is only as sovereign as its engines, and engines are the part most often bought abroad, held up by export rules or delivered late. Falcon Accuracy designed RACHIS in two sizes so that one production line, one test stand and one maintenance crew serve every vehicle in this sector, from MOUNTEE to CORACOID, and third-party satellite launch vehicles as well, supplied only for unarmed launch vehicles under the export rules that apply. Printing most of each engine in metal cuts the part count and the build time. Every engine carries a health record from its first test firing, and the test director decides when an engine is fit to fly again.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits RACHIS production and servicing to the client's own industrial base, placing the printers, machining cells and test stand in facilities the force or its national industry already owns, and fits the engine mounts and data interface to the launchers the force already flies.

TRAIN The health-monitoring models train on the client's own test-stand and flight firings, engine by engine, so wear thresholds reflect the client's climate, duty cycles and maintenance practice, and the maintenance manuals are written in the client's language.

SET Acceptance criteria, overhaul intervals, the wear limits that ground an engine and who may release it to fly are set to the client's airworthiness and range-safety rules, and every release carries the test director's recorded approval.

WORKS WITH

CORACOID · MOUNTEE · NANKEEN · PUTOVER · PATAGIUM · YARAK · PLUME · CALAMUS

RACHIS RACHIS Reusable Rocket Engine Family

DESCRIPTION

RACHIS comes in two sizes built to the same design rules. RACHIS 30 gives 30 kN at sea level, weighs 55 kg, throttles from 50 to 100 percent and restarts up to 10 times in flight. RACHIS 900 gives 900 kN at sea level, weighs 1,150 kg, throttles from 40 to 100 percent and restarts three times. Each comes in a sea-level and a vacuum version. Most of each engine is printed in metal, which cuts the part count by about 70 percent and the build time to 6 weeks. Both are rated for about 50 flights between overhauls, with a 30 min borescope and sensor check after each flight. A health monitor records 120 channels on every firing and flags wear for the test director, who decides whether the engine flies again.

CAPABILITIES

- RACHIS 30 gives 30 kN at sea level and 32 kN in vacuum; RACHIS 900 gives 900 kN at sea level and 980 kN in vacuum
- Throttles from 50 to 100 percent on RACHIS 30 and from 40 to 100 percent on RACHIS 900, for landings and gentle ascent loads
- Restarts in flight up to 10 times on RACHIS 30 and three times on RACHIS 900
- About 50 flights between overhauls, with a 30 min borescope and sensor check after each flight
- Most of each engine printed in metal, cutting the part count by about 70 percent and the build time to 6 weeks
- Sea-level and vacuum versions of each size, so one design serves boosters, first stages and upper stages
- Health monitor records 120 channels per firing and flags wear trends for the test director
- Powers MOUNTEE, NANKEEN, PUTOVER and CORACOID, and fits third-party satellite launch vehicles through a documented interface, supplied only for unarmed launch vehicles

SPECIFICATIONS · DESIGN TARGETS

RACHIS 30	30 kN at sea level, 32 kN in vacuum, 55 kg, 1.0 m tall, 0.45 m nozzle exit; vacuum version 1.4 m tall
RACHIS 900	900 kN at sea level, 980 kN in vacuum, 1,150 kg, 3.1 m tall, 1.3 m nozzle exit; vacuum version 4.2 m tall
THROTTLE	50 to 100 percent on RACHIS 30; 40 to 100 percent on RACHIS 900
RESTARTS	up to 10 in flight on RACHIS 30; three on RACHIS 900
REUSE	about 50 flights between overhauls; 30 min post-flight borescope and sensor check; overhaul in 10 days
VERSIONS	sea-level and vacuum versions of each size
MANUFACTURE	metal additive manufacturing for most of each engine, about 70 percent fewer parts, 6 weeks from print to acceptance firing
HEALTH MONITORING	120 channels per firing, wear trends logged against each engine serial number
ACCEPTANCE	every engine fired on the test stand before delivery; every firing logged inside the client's network
INTERFACE	documented mechanical, electrical and data interface for third-party satellite launch vehicles, supplied only for unarmed launch vehicles under the export rules that apply

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the brochure performance of both engine sizes in simulation across the full throttle range, with thrust, mass and restart figures traced to design margins.
- Falcon Accuracy can show the production flow from metal printing to acceptance firing on a model of the client's facility, with part counts and build times for each engine size.
- Falcon Accuracy commits to an acceptance test protocol that measures thrust, throttle range, restarts and post-firing condition for every engine before delivery.
- Falcon Accuracy can demonstrate the health-monitoring record and its logs on the bench, kept inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

A new engine earns trust by flying often, and an orbital launch is an expensive place to collect flight hours. NANKEEN flies four RACHIS 30 engines on a suborbital arc to 260 km several times a month, and every firing adds to the health record of the engine family. In return the client's laboratories get 6 min of microgravity for 200 kg of materials, biology and sensor experiments, back on the bench the same day.



CONCEPT VISUALIZATION · NANKEEN

ALL FIGURES ARE DESIGN TARGETS

ROCKET SYSTEMS · HARDWARE · 06 OF 10

NANKEEN

NANKEEN Microgravity Research Rocket

The nankeen, a small falcon of open country, hangs almost motionless over one patch of ground, wings working against the wind; NANKEEN holds 200 kg of experiments almost motionless in free fall for 6 minutes.

200 KG OF EXPERIMENTS, 6 MINUTES OF MICROGRAVITY, HOME BY PARACHUTE.

SUMMARY

NANKEEN is a suborbital research rocket that lifts 200 kg of experiments to 260 km and gives them about 6 min of microgravity. The experiment module returns under a parachute to the range, where the research team has it back within 90 min. Materials, biology and sensor laboratories get a flight in weeks rather than years.

WHY FALCON ACCURACY BUILT IT

Research in materials, biology and sensors often needs minutes of weightlessness, and a drop tower gives seconds while an orbital flight means a long wait for a slot. A suborbital flight sits between the two at a fraction of the cost of an orbital one. Falcon Accuracy built NANKEEN so the client's own laboratories fly experiments from the client's own range, watch them live and have them back on the bench the same day. The flight director and the range safety officer make every go decision, and all experiment data stays inside the client's network.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits NANKEEN's experiment decks, power and data connectors to the racks and sample containers the client's laboratories already use, and the recovery kit to the helicopters and vehicles the force already operates.

TRAIN Its trajectory and landing models train on the client's range winds, terrain and CRINES profiles, and the experiment teams' procedures and the recovery checklists are written in the client's language.

SET Landing areas, weather limits, sample custody and the handling of returned material are set to the client's range-safety rules and laboratory procedures, and no flight proceeds without the flight director's recorded go.

WORKS WITH

RACHIS · BARBULE · CRINES · BATE · NICTITANS · LAGGAR · PATAGIUM · CALAMUS

NANKEEN NANKEEN Microgravity Research Rocket

DESCRIPTION

NANKEEN is a 14 m single-stage rocket, 1.1 m across, that lifts off at 7.5 t on four RACHIS 30 engines from a launch tower on the range. It carries an experiment module of up to 200 kg to an apogee of 260 km and gives it about 6 min below 0.0001 g. During that time the scientists watch video and command their experiments live over a 10 Mbps link. The module returns under a drogue and a main parachute and lands on airbags inside a 15 km ellipse, where a helicopter team reaches it within 90 min. The booster descends under its own parachute and flies again after inspection, up to 10 times. Live samples can be loaded 60 min before launch.

CAPABILITIES

- Up to 200 kg of experiments to a 260 km apogee with about 6 min below 0.0001 g
- Four experiment decks of 1.0 m diameter with 28 V at 600 W in total and a 2 TB recorder
- Live video and experiment commanding over a 10 Mbps link throughout the flight
- Late access 60 min before launch for live biological samples
- Module lands under parachutes and airbags inside a 15 km ellipse and is recovered by helicopter within 90 min
- Booster returns under its own parachute and flies up to 10 times
- Ascent load under 8 g and landing load under 15 g
- Every command logged; experiment data stays inside the client's network

SPECIFICATIONS · DESIGN TARGETS

VEHICLE	single stage, 14 m long, 1.1 m diameter, 7.5 t at liftoff
PROPULSION	four RACHIS 30 engines, 120 kN at liftoff
PERFORMANCE	200 kg to a 260 km apogee with about 6 min below 0.0001 g; 100 kg to 320 km with about 7 min
EXPERIMENT MODULE	four decks of 1.0 m diameter, 28 V at 600 W, 2 TB recorder, deck temperature held between +4 and +37 C to the client's setting
TELEMETRY	10 Mbps downlink with live video and experiment uplink commands, through BARBULE or LAGGAR
LOADS	ascent under 8 g, reentry under 15 g, landing under 15 g on airbags
RECOVERY	drogue and main parachute, four airbags, 15 km landing ellipse, helicopter recovery within 90 min
REUSE	booster under its own parachute, 10 flights; module structure 20 flights
LAUNCH	20 m launch tower on a 30 m by 30 m pad; 5-day campaign; launch crew of 15
FLIGHT SAFETY	automatic engine shutdown on corridor departure, armed by the range safety officer before liftoff; range safety officer command over an encrypted link

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the reference flight in simulation with the microgravity level shown second by second, and the landing dispersion for the client's range.
- Falcon Accuracy can demonstrate an experiment deck on the bench with power, recording and live commanding running through a ground console.
- Falcon Accuracy commits to an acceptance protocol that measures apogee, microgravity duration and level, landing distance and recovery time on the first three flights.
- Falcon Accuracy can show the custody record for each experiment, from loading to return to the laboratory, kept inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

NANKEEN, MOUNTEE and every larger launch fly through the band from 20 to 90 km, where balloons stop and satellites see little detail. Upper winds there decide launch-commit calls, balloon drift and landing dispersion, and guessing them costs either margin or delays. CRINES measures that band every day from a small tower and puts the profile in front of the forecasters within 60 min.



CONCEPT VISUALIZATION · CRINES

ALL FIGURES ARE DESIGN TARGETS

ROCKET SYSTEMS · HARDWARE · 07 OF 10

CRINES

CRINES Meteorological Rocketsonde

The crines are the fine hair-like feathers around a falcon's cere, the first part of the bird to feel the air it flies into; CRINES feels the upper air every day before the force flies into it.

WINDS, TEMPERATURE AND DENSITY FROM 20 TO 90 KM, EVERY DAY.

SUMMARY

CRINES is a 2.5 m research rocket launched from a vertical tower that measures winds, temperature and density from 20 to 90 km. Near the top of its climb it releases a sensor that descends under a parachute and reports every second. Daily launches feed weather and space-weather forecasts for launches, aviation and operations.

WHY FALCON ACCURACY BUILT IT

Weather balloons stop near 30 km and satellites see the upper air only in coarse layers, yet every launch, every stratospheric balloon and every reentry flies through the band from 20 to 90 km. Range teams that launch without measured upper winds either wait for a wide margin or accept a larger landing dispersion. Falcon Accuracy built CRINES as a small, low-cost research rocket that a crew of three launches every day from a fixed tower. Its profiles go into the client's own forecast models, and the forecasters decide what to publish.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits CRINES to the client's existing ranges and weather stations, placing the tower and shelter on sites the force already holds and feeding the profiles into the forecast systems and WEATHER deployment the force already runs.

TRAIN Its profile processing and quality checks train on the client's own balloon soundings, satellite soundings and seasons, and the crew checklists and data reports are written in the client's language.

SET Launch times, hazard areas, aircraft hold rules and the distribution of each profile are set to the client's range-safety rules and meteorological procedures, and every launch carries the name of the crew chief who released it.

WORKS WITH

CORACOID · MOUNTEE · NANKEEN · BARBULE · PATAGIUM · ENEW · WEATHER · PITCH · CALAMUS

CRINES CRINES Meteorological Rocketsonde

DESCRIPTION

CRINES is a 2.5 m research rocket, 0.12 m across and 38 kg at launch, sent up from a 7 m vertical rail tower on a small concrete pad. Its booster takes it to about 95 km in under 2 min. Near apogee it releases a 1.2 kg sensor that descends under a high-altitude parachute, together with an inflatable falling sphere that gives the density profile above 60 km. The sensor reports position, temperature and pressure every second to a ground receiver, which turns them into wind, temperature and density profiles from 90 km down to 20 km. The spent booster falls inside a cleared area of 5 km radius. A crew of three launches once a day, and the profile reaches the forecasters within 60 min of launch.

CAPABILITIES

- Wind, temperature and density profiles from 90 km down to 20 km on every flight
- Wind to 2 m/s and temperature to 1.5 C below 60 km; density to 5 percent from 90 km to 60 km
- Daily launch by a crew of three from a 7 m vertical tower; two launches 15 min apart when needed
- Profile delivered to the forecasters within 60 min of launch
- Feeds launch-commit wind checks for CORACOID, RINGING and CASTING and drift planning for MOUNTEE
- Upper-air data for space-weather and reentry forecasting, such as density changes after a solar storm
- Spent booster falls inside a cleared area of 5 km radius; the sensor descends over the range or sea area downwind
- Profiles stay inside the client's network and go straight into its own forecast models and WEATHER

SPECIFICATIONS · DESIGN TARGETS

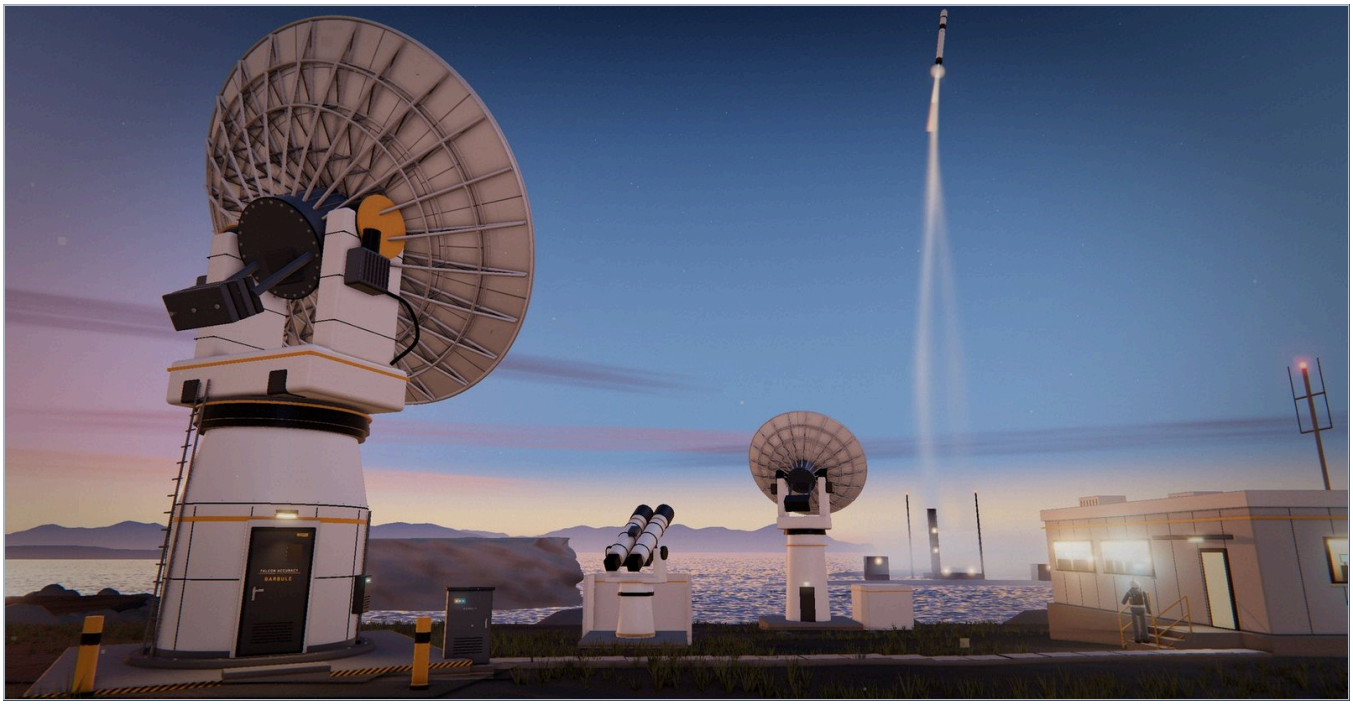
ROCKET	2.5 m long, 0.12 m diameter, 38 kg at launch
PERFORMANCE	apogee about 95 km, reached in under 2 min
SENSORS	parachute-borne sonde of 1.2 kg with GNSS position, temperature and pressure; inflatable 1 m falling sphere for density above 60 km
MEASUREMENT	90 km down to 20 km, one reading per second, descent of about 50 min
ACCURACY	wind 2 m/s and temperature 1.5 C below 60 km; density 5 percent from 90 to 60 km
LAUNCHER	7 m vertical rail tower on a 6 m by 6 m concrete pad, tilts up to 5 degrees to allow for wind
GROUND STATION	receiver and processing in one shelter; profile to forecasters within 60 min of launch
CREW AND CADENCE	three people, one launch a day, two in a day with 15 min between them
SAFETY	booster lands inside a cleared area of 5 km radius; launch held when range radar shows aircraft in the hazard area
DATA	profiles in standard meteorological formats to the client's forecast models and WEATHER, inside the client's network

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can show the flight and sonde descent in simulation for the client's range, with the expected measurement accuracy at each altitude band.
- Falcon Accuracy can demonstrate the ground receiver and profile processing on the bench with recorded sonde data, producing a profile in the client's forecast format.
- Falcon Accuracy commits to an acceptance trial of 30 launches that compares CRINES profiles with balloon soundings below 30 km and reports the agreement.
- Falcon Accuracy can show the hazard-area and aircraft hold procedure, and the logs it produces inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

CRINES describes the air a vehicle will fly through, and BARBULE watches the vehicle as it does. Radars, optical trackers and telemetry antennas fuse into one track, and the range safety officer sees at every moment where the vehicle would come down if its engines stopped. The officers decide, and every flight leaves a complete record for the engineers who prepare the next one.



CONCEPT VISUALIZATION · BARBULE

ALL FIGURES ARE DESIGN TARGETS

ROCKET SYSTEMS · HARDWARE · 08 OF 10

BARBULE

BARBULE Launch Range Tracking Network

Barbules are the tiny hooks that lock every barb of a feather into one unbroken vane; BARBULE locks radars, optical trackers and telemetry antennas into one unbroken track of every launch.

EVERY LAUNCH TRACKED, EVERY CORRIDOR CHECKED, EVERY FLIGHT RECORDED.

SUMMARY

BARBULE is the tracking network of the force's launch range, with radars, optical trackers and telemetry antennas that follow every launch from liftoff to orbit or landing. It shows the range safety officer where the vehicle is, where it would come down at that moment and whether it is inside its corridor. The officers decide, and every second of the flight is recorded.

WHY FALCON ACCURACY BUILT IT

A launch range is only safe if someone can see at every moment where the vehicle is and where it would come down if its engines stopped. One kind of sensor is not enough, because radars, cameras and telemetry each lose a vehicle at different moments. Falcon Accuracy built BARBULE to fuse all three into one track that the range safety officer can trust, and to keep a complete record of every flight for the engineers. The officer holds the decision to end a flight by engine shutdown, and every decision is logged.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits BARBULE to the client's existing range, placing the radars, trackers and antennas on sites the force already holds, reusing existing towers, fiber and power, and connecting the console outputs to the range control and PITCH deployment the force already runs.

TRAIN Its fusion and landing-point models train on the client's own flight records, terrain, sea clutter and radio environment, and the console procedures and callouts are written in the client's language.

SET Corridors, hazard areas, shutdown criteria and who may command a shutdown are set to the client's range-safety rules, and every command carries the name of the officer who sent it.

WORKS WITH

CORACOID · MOUNTEE · PATAGIUM · ENEW · NANKEEN · CRINES · TERRET · PUTOVER · RINGING · CASTING · BATE · LAGGAR · PITCH · CALAMUS

BARBULE BARBULE Launch Range Tracking Network

DESCRIPTION

BARBULE links two instrumentation radars, four optical trackers and three telemetry antennas to one range control center. The radars follow the vehicle's transponder to 2,000 km, with its echo as a backup to 400 km. The optical trackers film it through long lenses to 150 km at 500 frames per second. The 7 m telemetry antennas receive up to 40 Mbps of vehicle data to 3,000 km. The center fuses all three into one track 20 times a second and recomputes every 50 ms where the vehicle would come down if its engines stopped, drawn against the approved corridor on the range safety officer's display. If the vehicle strays, the officer decides whether to command engine shutdown. Every frame, sample and decision is recorded inside the client's network.

CAPABILITIES

- One fused track from two radars, four optical trackers and three telemetry antennas, updated 20 times a second
- Radar tracking to 2,000 km on the vehicle's transponder and to 400 km on its echo
- Optical tracking to 150 km at 500 frames per second for ascent, stage separation and parachute events
- Telemetry reception up to 40 Mbps per vehicle to 3,000 km, two vehicles at once
- Predicted landing point recomputed every 50 ms and shown against the approved corridor
- Range safety officer decides on engine shutdown, and the command goes out on two encrypted links
- Trailer-mounted sets of each sensor for PATAGIUM sites and shipborne sets for ENEW
- Every frame, sample and decision recorded and archived inside the client's network

SPECIFICATIONS · DESIGN TARGETS

RADARS	two C-band instrumentation radars with 9 m antennas; transponder track to 2,000 km, echo track to 400 km; range accuracy 5 m
OPTICAL TRACKERS	four mounts with 1.5 m focal length lenses, visible and infrared cameras at 500 frames per second, tracking to 150 km
TELEMETRY	three 7 m S-band antennas, up to 40 Mbps per vehicle to 3,000 km, two vehicles at once
FUSION	one track 20 times a second; predicted landing point every 50 ms
CONSOLES	range safety officer, flight director and range control; corridor and hazard areas loaded before each flight
FLIGHT SAFETY LINK	engine shutdown command on two independent encrypted transmitters, sent only on the officer's action
RECORDING	all radar, optical and telemetry data time-stamped to 1 microsecond; flight archive ready within 4 h of landing
MOBILE SETS	trailer-mounted radar, optical tracker and 3.7 m telemetry antenna, each set up in 6 h
DATA	AES-256 between sites; archive inside the client's network; every decision logged in CALAMUS
ENVIRONMENT	-30 to +55 C, operating in winds to 25 m/s, rated for coastal salt air

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can show the tracking coverage of the client's range in simulation for each launch azimuth, with gaps and handovers between sensors marked.
- Falcon Accuracy can demonstrate the fusion and landing-point display on the bench by replaying a recorded flight with radar, optical and telemetry data.
- Falcon Accuracy commits to an acceptance trial that measures track accuracy and landing-point latency against an instrumented aircraft and the first BATE or NANKEEN flights.
- Falcon Accuracy can walk the client's range safety officers through the shutdown decision chain and its logs, running inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

Once a launcher reaches orbit, BARBULE and LAGGAR stay with it until the payloads are free. For a rideshare flight that moment is 24 separate releases, and each one has to clear the others and be proven. TERRET releases its satellites in the order the flight director approved, confirms each separation within 2 s and passes the confirmations down the same telemetry chain BARBULE receives.



CONCEPT VISUALIZATION · TERRET

ALL FIGURES ARE DESIGN TARGETS

ROCKET SYSTEMS · HARDWARE · 09 OF 10

TERRET

TERRET Rideshare Satellite Dispenser

Terrets are the small rings that join a falcon's jesses to the leash and let it go free the moment the falconer slips them; TERRET is the ring that holds 24 satellites and lets each one go in turn.

TWENTY-FOUR SATELLITES ON ONE RING, EACH RELEASE CONFIRMED.

SUMMARY

TERRET is a rideshare ring that carries up to 24 small satellites on any of the force's larger launchers and releases them in a programmed sequence. Each separation is confirmed by switch, accelerometer and camera, and reported to the flight director within 2 s. The ring then stays on the upper stage and reenters with it.

WHY FALCON ACCURACY BUILT IT

Small satellites usually fly as rideshare passengers on someone else's schedule and are released in someone else's order. A force with its own launchers still needs a structure that holds two dozen satellites of different sizes, keeps them apart after release and proves that each one left. Falcon Accuracy built TERRET as a standard ring between the upper stage and the main payload, so any CORACOID, CASTING or ENEW flight can turn spare capacity into small satellites. The flight director approves the release plan before launch, and every release is logged.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits TERRET's ports to the satellites and dispensers the force already owns or has on order, and its electrical and telemetry interface to the upper stages of the launchers the force flies.

TRAIN Its release planner trains on the client's constellation designs and the separation records of earlier flights, so spacing and timing reflect the client's own satellites, and the integration procedures are written in the client's language.

SET Release order, spacing, attitude limits and the classification of each passenger satellite are set to the client's space operations rules and licensing conditions, and no release plan flies without the flight director's recorded approval.

WORKS WITH

CORACOID · CASTING · ENEW · MAKEHAWK · TAITA · BARBULE · LAGGAR · TOWER · CALAMUS

TERRET TERRET Rideshare Satellite Dispenser

DESCRIPTION

TERRET is a 1,575 mm ring, 0.9 m tall and 380 kg empty, that bolts between a launcher's upper stage and its main payload, or flies alone. Its 24 ports take satellites of up to 120 kg each and 2,400 kg in total, on 381 mm separation rings or in cubesat dispensers from 3U to 16U. A sequencer releases them in the order and at the times the flight director approved before launch, at 0.5 to 1.5 m/s, with at least 10 s between releases so no two satellites meet. Each separation is confirmed by a switch, an accelerometer and a camera frame, and reported within 2 s through the launcher's telemetry. The ring stays on the upper stage and reenters with it. Up to three rings fly on one CORACOID.

CAPABILITIES

- Up to 24 satellites, 120 kg each and 2,400 kg in total, on one 1,575 mm ring
- Ports take 381 mm separation rings and cubesat dispensers from 3U to 16U
- Releases in a programmed order at 0.5 to 1.5 m/s with at least 10 s between releases
- Each separation confirmed by switch, accelerometer and camera, and reported within 2 s
- Flies on CORACOID, CASTING and vehicles launched from ENEW; up to three rings stacked on one CORACOID
- Holds a release when the upper stage's attitude is outside limits and waits for the flight director
- Ring stays on the upper stage and reenters with it, so the dispenser adds no hardware to orbit
- Release plan approved by a named flight director; every release logged inside the client's network

SPECIFICATIONS · DESIGN TARGETS

RING	1,575 mm interface top and bottom, 0.9 m tall, 380 kg empty, aluminum and composite
CAPACITY	24 ports, up to 120 kg per satellite, 2,400 kg in total
INTERFACES	381 mm separation rings or cubesat dispensers from 3U to 16U; 28 V charging and data to each port until release
RELEASE	0.5 to 1.5 m/s separation speed, tip-off under 2 degrees per second, at least 10 s between releases
CONFIRMATION	separation switch, accelerometer and one camera frame per port; report within 2 s through launcher telemetry
SEQUENCER	release order and timing loaded before launch and approved by the flight director; holds when attitude is outside limits
LAUNCHERS	CORACOID with up to three rings stacked; CASTING with one ring; vehicles launched from ENEW
DISPOSAL	ring stays on the upper stage and reenters with it
INTEGRATION	satellites mounted and checked 10 days before launch; ring ships in one container

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can show a full 24-satellite release sequence in simulation, with the separation distance between every pair of satellites over the first 24 h.
- Falcon Accuracy can demonstrate one port releasing a mass model on the bench, with separation speed, tip-off rate and the confirmation report measured.
- Falcon Accuracy commits to an acceptance protocol that confirms every separation on the first flight and compares each satellite's first tracked orbit with the plan.
- Falcon Accuracy can walk the client's flight directors through the release approval and its logs, kept inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

The reusable stages, RACHIS engines and BARBULE tracking that put satellites in orbit can also put relief on the ground. When an earthquake or a flood cuts the roads, ports and runways, the first 48 h decide how many people live. PUTOVER uses the sector's whole chain to land 10 t of supplies on a pad an engineer team builds in a day, anywhere within 12,000 km in under 90 min.



CONCEPT VISUALIZATION · PUTOVER

ALL FIGURES ARE DESIGN TARGETS

ROCKET SYSTEMS · HARDWARE · 10 OF 10

PUTOVER

PUTOVER Point-to-Point Cargo Rocket

A hawk puts over when it passes a full crop on so the meal can feed the whole bird; PUTOVER passes a full load of relief supplies on to the people who need it.

10 T OF RELIEF SUPPLIES ON A PREPARED PAD WITHIN 90 MINUTES.

SUMMARY

PUTOVER is a reusable two-stage cargo rocket that delivers up to 10 t of relief supplies to a prepared pad up to 12,000 km away within 90 min of liftoff. Its booster lands back at the launch site, and its cargo stage lands on its own legs at the destination. It is built for disaster response and remote logistics where roads, ports and runways are cut.

WHY FALCON ACCURACY BUILT IT

After an earthquake, a flood or a storm, the first 48 h decide how many people live, and the roads, ports and runways that relief depends on are often the first things lost. A cargo aircraft needs an intact runway, and a ship needs days. Falcon Accuracy built PUTOVER to land 10 t on a 60 m pad that an engineer team can prepare in a day, anywhere within 12,000 km, in under 90 min. The mission director approves every flight and every landing site, the pad crew confirms the site is clear, and every command is logged.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits PUTOVER to the client's own relief and logistics chain, sizing the bay to the pallets, containers and cold boxes the force and its civil agencies already use, and surveying pre-approved pad sites on bases, ports and airfields the client already holds.

TRAIN Its trajectory, landing and load-planning models train on the client's geography, weather, CRINES profiles and past relief operations, and the pad crew and loadmaster checklists are written in the client's language.

SET Approved landing sites, cleared areas, weather limits and cargo priorities are set to the client's civil protection rules, airspace procedures and doctrine, and no flight proceeds without the mission director's recorded go.

WORKS WITH

RACHIS · PATAGIUM · BARBULE · CRINES · CROP · JERKIN · IMPING · PITCH · CALAMUS

PUTOVER PUTOVER Point-to-Point Cargo Rocket

DESCRIPTION

PUTOVER stands 62 m tall and 6 m across, and lifts off at 1,000 t on 13 RACHIS 900 engines. The booster separates at 70 km and flies back to land at the launch site. The cargo stage, on three RACHIS 900 engines, flies a high arc and returns behind a heat shield across its base. It lands on four legs within 10 m of the marker on a 60 m by 60 m prepared pad, with up to 10 t in a 300 cubic meter bay. Delivery takes under 90 min to anywhere within 12,000 km. A side door and a built-in crane unload the pallets in 2 h. The stage refuels at a pad with a PATAGIUM propellant farm and flies home, or returns by ship. The mission director approves every landing site.

CAPABILITIES

- Up to 10 t of relief cargo in a 300 cubic meter bay on standard air cargo pallets
- Delivery anywhere within 12,000 km in under 90 min from liftoff to touchdown
- Cargo stage lands on four legs within 10 m of the marker on a 60 m by 60 m prepared pad
- Booster returns to the launch site; both stages fly again, up to 20 times each
- Side door and built-in crane unload pallets to the ground in 2 h with no pad equipment
- Temperature-held section keeps vaccines, blood and medicines between +2 and +8 C
- Mission director approves every flight and landing site; the pad crew confirms the site clear before descent
- Flight records and cargo manifests logged; all data stays inside the client's network

SPECIFICATIONS · DESIGN TARGETS

VEHICLE	two stages, 62 m tall, 6 m diameter, 1,000 t at liftoff
PROPULSION	13 RACHIS 900 engines on the booster, 11,700 kN at liftoff; three RACHIS 900 engines on the cargo stage, restartable for landing
CARGO	up to 10 t in a 300 cubic meter bay with a 5.4 m by 4.5 m floor; temperature-held section at +2 to +8 C
RANGE AND TIME	up to 12,000 km in under 90 min from liftoff to touchdown
LANDING	four legs, within 10 m of the marker on a 60 m by 60 m prepared concrete or compacted pad; 1 km cleared area during descent
UNLOADING	3 m by 3 m side door, built-in 2 t crane, 10 t unloaded in 2 h
REUSE	booster lands at the launch site; both stages up to 20 flights, 10 days between flights
RETURN	cargo stage refuels at a pad with a PATAGIUM propellant farm and flies home, or returns by ship
PAD PREPARATION	engineer team of 12 prepares a pad in 24 h; landing beacon kit in two cases
FLIGHT SAFETY	automatic engine shutdown on corridor departure, armed by the range safety officer before liftoff; landing site approved by the mission director; tracking by BARBULE

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present a reference relief flight in simulation, from liftoff through booster return to cargo-stage touchdown, with mass, propellant and heat-shield margins shown at every phase.
- Falcon Accuracy can show the pad preparation drawing and the 24 h build sequence, and can run it as a timed exercise with the client's engineer team on bare ground.
- Falcon Accuracy commits to an acceptance protocol that measures cargo mass delivered, flight time, landing distance from the marker and unloading time on the first three flights.
- Falcon Accuracy can demonstrate the cargo manifest and flight logging chain on the bench, kept inside the client's network.

NEXT SECTOR · 11 ELECTRONIC WARFARE AND SPECTRUM · P. 158

Hear everything. Show little. Hold your fix. This closes Rocket Systems. Sector 11, Electronic Warfare and Spectrum, opens on page 158 with HOOD, BRANCHER, SYRINX, JINK and NARES.

11

ELECTRONIC WARFARE AND SPECTRUM

HEAR EVERYTHING. SHOW LITTLE. HOLD YOUR FIX.

A force is usually found by its emissions before it is seen. Every radio, radar and drone link is a point that an adversary's direction finders can place within a few hundred meters, and the same adversary attacks the spectrum the force depends on, starting with satellite navigation and timing. This sector answers both problems without transmitting into them. Its receivers listen from packs, vehicles, aircraft and surveyed masts, place each emitter with an error a range can measure, and show the commander how far his own transmissions carry. Its one transmitting product, a decoy set, reproduces the force's own signature under a script that a human approves and a log records. Nothing here jams, and nothing here reads message content.



IN THIS SECTOR · 5 PRODUCTS · PAGES 160 TO 169

HOOD BRANCHER SYRINX JINK NARES

The five products work as one chain. HOOD rides with the force and listens outward and inward. BRANCHER holds the same watch from masts that never move and learns the normal spectrum of a site in 14 days. SYRINX is the analyst's workstation where an unknown emitter becomes a confirmed library entry that reaches every receiver within 60 seconds, with the model retrained inside the client's network. JINK reproduces the measured signature of a real unit from a position the commander chooses, so the real unit can go quiet. NARES keeps position and time trustworthy under jamming and spoofing, which every other product in the chain needs for its geolocation and its scripts. The sector holds HOOD Spectrum Sensing System, BRANCHER Direction-Finding Mast Network, SYRINX Signal Analysis Workstation, JINK Emission Decoy System and NARES Navigation Protection Kit.

IN THIS SECTOR · 5 PRODUCTS



HOOD p. 160

HOOD Spectrum Sensing System

Hear the emitters. Show them as little as the mission allows.



BRANCHER p. 162

BRANCHER Direction-Finding Mast Network

A ring of listening masts. Every emitter placed, day and night.



SYRINX p. 164

SYRINX Signal Analysis Workstation

Name every emitter. Teach every receiver by morning.



JINK p. 166

JINK Emission Decoy System

Sound like the unit. Stand where the unit is not.



NARES p. 168

NARES Navigation Protection Kit

A trusted fix under jamming. A spoof caught within two seconds.



CONCEPT VISUALIZATION · HOOD

ALL FIGURES ARE DESIGN TARGETS

ELECTRONIC WARFARE AND SPECTRUM · HARDWARE · 01 OF 05

HOOD

HOOD Spectrum Sensing System

The hood is the leather cover that keeps a falcon calm and unseen until the falconer lifts it, so HOOD is the system that hears the whole spectrum while keeping the force's own emissions small.

HEAR THE EMITTERS. SHOW THEM AS LITTLE AS THE MISSION ALLOWS.

SUMMARY

HOOD turns the force's packs, vehicles and TIERCEL aircraft into passive listening posts that find radars, radios, jammers and drone pilots. At the same time it watches the force's own emissions, models how far each one carries and tells each JESS node when it is too loud. It transmits nothing.

WHY FALCON ACCURACY BUILT IT

A dismounted force is heard long before it is seen, and the adversary's drone pilot is heard long before his aircraft is. Most units have neither a passive picture of the emitters around them nor a measured picture of their own radio footprint, so emission control stays a standing order that nobody can check. Falcon Accuracy built HOOD to make every pack, vehicle and aircraft a receive-only listening post and to turn emission control into a per-node instruction with a number behind it. What changes is that the commander sees the drone pilot on his map within 50 meters at 3 kilometers, and sees his own force the way the adversary's receivers would.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits HOOD receivers to the force's packs, vehicle roof rails, GYR decks and TIERCEL aircraft, and connects them to the radios and command displays the force already runs.

TRAIN It trains the emitter library on recordings from the client's theater, including the force's own radios and radars and the civilian traffic around its sites, so the first week in the field is not spent learning the ordinary.

SET It sets the commander's emission-control policy and the national frequency plan into every node, with the power, band and silence thresholds the force's doctrine requires.

WORKS WITH

JESS · TIERCEL · SAILS · PITCH · GYR · BLOCK · BEWIT · BRANCHER · SYRINX · JINK · NARES

HOOD HOOD Spectrum Sensing System

DESCRIPTION

HOOD does two jobs. Outward, it listens. Receivers in backpacks, on vehicles and in a TIERCEL pod pick up radars, radios, jammers and drone controllers to 6 GHz, and to 18 GHz from the vehicle. Timing across three or more nodes places each emitter on the PITCH map and fixes a drone pilot within 50 meters at 3 kilometers. Known emitters are named in under a second, and unknowns are clustered and recorded for SYRINX analysts. Inward, HOOD watches the force. It models how far each friendly transmission carries, predicts where an adversary could fix it, and tells JESS nodes to lower power, change band or go quiet under the commander's policy. A signature map refreshes every 5 seconds, BRANCHER masts correct it with measured ranges, and PITCH plans routes and timings around it. HOOD itself transmits nothing.

CAPABILITIES

- Hears drone controllers to 8 km, and radars, radios and jammers to 18 GHz from the vehicle receiver
- Geolocates emitters by time difference across packs, vehicles and aircraft, with typical error of 1 to 2 percent of range
- Finds the drone pilot within 50 m at 3 km, a grid a patrol can act on
- Names known emitters in under 1 s and clusters unknowns, with 60 s of recording, for SYRINX analysts
- Friendly signature map, refreshed every 5 s, shows where the adversary can hear the force
- Power, band and silence orders to every JESS node under the commander's emission policy, carried out within 1 s, each order logged
- Fuses locally over JESS when PITCH is out of reach, so the picture survives a lost backhaul
- Receive only; the HOOD node itself transmits nothing and reports over the JESS radios the force already carries

SPECIFICATIONS · DESIGN TARGETS

RECEIVERS	backpack 2.1 kg (30 MHz to 6 GHz); vehicle 9 kg (30 MHz to 18 GHz); TIERCEL pod 650 g (30 MHz to 6 GHz) in place of the zoom camera, 78 min endurance with the pod; SAILS pod 6 kg (30 MHz to 18 GHz) in the payload bay; BLOCK tower module (30 MHz to 6 GHz)
GEOLOCATION	time difference across 3 or more nodes, typical error 1 to 2 percent of range; drone pilot within 50 m at 3 km
DETECTION	drone control and video links heard to 8 km line of sight; known emitter named in under 1 s; signature map refresh every 5 s
RECORDING	60 s of raw signal around each new emitter, 500 GB per node, encrypted at rest, released to SYRINX over JESS or by hand-carried drive; every recording stays inside the client's network
EMISSION CONTROL	per-node power, band and silence orders over JESS, carried out by each node within 1 s; policy set by the commander, every order logged
TIMING	satellite-disciplined clock with NARES protection, 20 ns alignment between nodes; 30 min holdover within specification without satellites
MOUNTS	pack frame, vehicle roof rail, GYR deck, TIERCEL and SAILS payload bays, BLOCK tower head
RUGGED	MIL-STD-810H, IP67, -40 to +60 C; receive only, no transmitter fitted

WHAT WE CAN VOUCH FOR TODAY

- A receiver design review with the link budget for each band and each carrier, from the 2.1 kg pack to the 9 kg vehicle unit
- A time-difference geolocation simulation on the client's own terrain model that shows the expected error ellipse for any three-node layout
- A written acceptance-trial protocol with reference emitters at surveyed points from 1 to 10 km and the error measured against survey
- A data-handling statement that every recording and every signature map stays inside the client's network, with no cloud service in the design

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

HOOD rides with the force, so its picture moves when the force moves. An emitter that keys up for 3 seconds near a base after midnight is heard only if a pack or vehicle happens to be awake within range. BRANCHER puts the same receive-only listening on surveyed masts that never move, holds the spectrum baseline through the night, and gives HOOD's inward model measured range data in place of estimates. Together the pair puts a mobile picture and a persistent one on the same PITCH map.



CONCEPT VISUALIZATION · BRANCHER

ALL FIGURES ARE DESIGN TARGETS

ELECTRONIC WARFARE AND SPECTRUM · HARDWARE · 02 OF 05

BRANCHER

BRANCHER Direction-Finding Mast Network

A brancher is the young falcon that has left the nest and sits in the branches around it, watching everything that moves; BRANCHER is the ring of fixed masts around a site that watches everything on the spectrum.

A RING OF LISTENING MASTS. EVERY EMITTER PLACED, DAY AND NIGHT.

SUMMARY

BRANCHER is a network of surveyed direction-finding masts around a base, along a border sector or across a training area. Three or more masts place a radio, radar, jammer or drone controller within 1 percent of range, learn the site's normal spectrum in 14 days and flag a new emitter within 10 seconds. The masts transmit nothing and hold the watch through the night, after the mobile HOOD nodes have moved on.

WHY FALCON ACCURACY BUILT IT

HOOD nodes move with the force, so an emitter that keys up for 3 seconds near a base after midnight is heard only if a pack or vehicle happens to be awake within range, and it is rarely placed. A base, a border sector or a training area needs a baseline of its spectrum and a fix on every emitter, with the persistence a fence gives against intruders. Falcon Accuracy built BRANCHER so that fixed, calibrated masts hold that watch, and so the force can measure how far its own radios really carry instead of estimating it. What changes is that the watch officer knows what normally transmits around the site, sees a new emitter within 10 seconds, and has a grid to send a patrol to.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits BRANCHER heads to the towers, rooftops, trailers and tripods the force already owns and joins the network through its existing JESS nodes, fiber or site network.

TRAIN It trains the network's emitter library and baseline on 14 days of the site's own spectrum, including the client's radars and radios and the civilian traffic of the theater.

SET It sets alert rules, confirmation steps and the national frequency plan to the force's doctrine, so each new emitter reaches the watch officer the way the force's procedures require.

WORKS WITH

HOOD · PITCH · JESS · SCREEN · SYRINX · JINK · NARES

DESCRIPTION

BRANCHER is a direction-finding network built from masts that never move. Each head carries a 9-element array for 30 MHz to 6 GHz, an optional 18 GHz extension and a NARES-protected clock aligned to 10 nanoseconds with its neighbors. Three or more masts combine angle of arrival and time difference to place an emitter within 1 percent of range inside the ring and 3 percent outside it to 40 kilometers. Four masts 10 kilometers apart cover 300 square kilometers and track 2,000 emitters, refreshed every second. After a 14-day baseline of the site's radars, radios and civilian traffic, it flags a new emitter within 10 seconds and hands the grid to the watch officer, who confirms it before PITCH shows a threat. The heads also measure how far the force's own radios carry and correct HOOD's signature map.

CAPABILITIES

- Hears a 5 W handheld radio at 25 km from a 12 m mast and places it within 3 percent of range outside the ring, 1 percent inside it
- Bearing within 1 degree RMS from 100 MHz to 6 GHz and within 2 degrees from 30 to 100 MHz
- Four masts 10 km apart cover 300 square km and track 2,000 emitters at once, refreshed every 1 s
- Learns the site's spectrum baseline in 14 days and flags a new emitter within 10 s of its first transmission
- Hears a drone controller at 12 km and a radar's sidelobes at 40 km line of sight
- Measures how far the force's own radios carry and feeds the measurement back to HOOD's signature map
- Each mast runs on solar with 96 h of reserve, and two operators raise a 12 m mast in 30 min
- Receive only; the watch officer confirms each emitter before PITCH shows it as a threat, and every confirmation is logged

SPECIFICATIONS · DESIGN TARGETS

ANTENNA HEAD	9-element circular direction-finding array, 30 MHz to 6 GHz, 14 kg; optional 6 to 18 GHz extension head, 6 kg
BEARING ACCURACY	1 degree RMS above 100 MHz, 2 degrees RMS from 30 to 100 MHz, calibrated against a surveyed reference emitter
GEOLOCATION	hybrid angle-of-arrival and time-difference across 3 or more masts; within 1 percent of range inside the mast ring, within 3 percent outside it to 40 km
TIMING	satellite-disciplined clock with NARES protection, 10 ns alignment between masts; holdover within 1 microsecond for 24 h without satellites, with angle-of-arrival placing continuing throughout
CAPACITY	2,000 simultaneous emitters per network of up to 24 masts, 1 s refresh, 90 days of history per mast
MAST VARIANTS	12 m trailer mast (520 kg), 6 m tripod mast (48 kg in two cases), rooftop fixed head (14 kg)
POWER	60 W average, 400 W solar panel, 96 h battery reserve; backhaul over a JESS vehicle node, fiber or the force's existing site network
SETUP	12 m mast raised by two operators in 30 min; self-calibration on a reference emitter in 10 min
ENVIRONMENT	operating to 100 km/h wind, survival to 160 km/h, 25 mm ice load, -40 to +60 C, IP66; MIL-STD-810H
SECURITY	receive only, AES-256 backhaul, data stays inside the client's network, no cloud service

WHAT WE CAN VOUCH FOR TODAY

- A direction-finding design review with the array geometry, the calibration method and the bearing error budget by band
- A geolocation simulation on the client's own terrain model that shows the expected error ellipses for any proposed mast layout before a mast is bought
- A written acceptance-trial protocol with three masts, reference emitters at surveyed points from 1 to 25 km, and bearing and position error measured against survey
- A commitment that all recordings, baselines and emitter libraries stay inside the client's network, with no cloud service in the design

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

HOOD and BRANCHER name known emitters in under a second, and the unknowns they cluster are the emitters that matter most. Without a place to study them, the clusters pile up and the library goes stale. SYRINX gives analysts the recordings, measurements and comparison tools to turn an unknown into a confirmed library entry and push it to every node within 60 seconds. The receivers find; SYRINX teaches.



CONCEPT VISUALIZATION · SYRINX

ALL FIGURES ARE DESIGN TARGETS

ELECTRONIC WARFARE AND SPECTRUM · SOFTWARE · 03 OF 05

SYRINX

SYRINX Signal Analysis Workstation

The syrinx is the organ that shapes every call a falcon makes, the source that gives each voice its signature; SYRINX takes a signal apart to name the emitter that made it.

NAME EVERY EMITTER. TEACH EVERY RECEIVER BY MORNING.

SUMMARY

SYRINX is the analyst's workstation for the spectrum. It takes the unknown emitters that HOOD and BRANCHER cluster, shows their parameters and recordings, and lets two analysts turn a label into a library entry that every receiver holds within 60 seconds. The recognition model retrains inside the client's network overnight, and no recording leaves.

WHY FALCON ACCURACY BUILT IT

HOOD and BRANCHER name known emitters in under a second, but the emitters that matter most are often the ones nobody has heard before. Without a place to study them, unknown clusters pile up, the library goes stale and the force keeps rediscovering the same radio. Falcon Accuracy built SYRINX so analysts can look at a signal, compare it, label it with evidence and push that knowledge to every receiver the same day. What changes is that the network learns the theater as fast as the analysts do, and the commander's electronic order of battle rests on confirmed identifications rather than guesses.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits SYRINX to the receivers, recorders and file formats the force already uses and runs it on the PITCH hardware or the laptops the force issues.

TRAIN It seeds the library from the client's own recordings and the theater's military and civilian spectrum, and trains the fingerprinting model on the radios the force actually meets.

SET It sets confirmation rules, classification handling, report formats and the analysts' working language to the force's own intelligence procedures.

WORKS WITH

HOOD · BRANCHER · PITCH · JESS · JINK · CREANCE

SYRINX SYRINX Signal Analysis Workstation

DESCRIPTION

SYRINX runs on the PITCH rack, the two-case kit or a pair of ruggedized laptops. It pulls every unknown cluster from HOOD and BRANCHER, with spectrogram, pulse and modulation measurements and 60 seconds of recording, within 5 seconds of the analyst asking. A comparison view sets the unknown beside the closest library entries, each with a confidence figure. A fingerprinting model reads a transmitter's unintentional traits, such as oscillator drift and rise time, and recognizes a radio heard before 9 times in 10 with under 1 false match in 100 on the client's own set. A label enters the library only after a second analyst confirms it, and the update reaches every receiver over JESS within 60 seconds. The recognition model retrains overnight on the PITCH rack inside the client's network. SYRINX reads signal externals and never message content.

CAPABILITIES

- Shows any unknown cluster from HOOD or BRANCHER with its parameters, spectrogram and 60 s recording within 5 s of the analyst asking
- Fingerprints a transmitter by its unintentional traits and recognizes a radio heard before 9 times in 10, with under 1 false match in 100
- Two-analyst confirmation before a label enters the library; the update reaches every node over JESS within 60 s
- Retrains the recognition model overnight inside the client's network and reports accuracy before and after; nothing leaves
- Builds the electronic order of battle over 90 days, with each emitter's type, location history, schedule and the units it moves with
- Flags a change in an emitter's pattern of life, such as a new site or a new schedule, within 10 s of the picture updating
- Reads signal externals only and never decrypts or reads message content
- Every identification carries its evidence and a confidence figure, and every analyst decision is logged

SPECIFICATIONS · DESIGN TARGETS

DEPLOYMENT	a module on the PITCH rack core or two-case kit, or a field set of two ruggedized laptops (3.1 kg each) with a 4 TB encrypted store
INPUTS	HOOD and BRANCHER detections and recordings, the force's existing receivers through open adapters, and recorded files in standard formats
LIBRARY	50,000 emitter modes and 5,000 individual transmitter fingerprints; 90 days of recordings at up to 2 TB per week per network
RECOGNITION	known mode named in under 1 s; fingerprint re-identification 9 times in 10 with under 1 false match in 100 on the client's own set
ANALYST WORKFLOW	two-analyst confirmation before a label enters the library; library update to every node within 60 s over JESS
RETRAINING	overnight on the PITCH rack inside the client's network, with a before-and-after accuracy report; no data leaves the network
REPORTS	electronic order of battle, emitter cards and pattern-of-life summaries exported in the force's own report formats and language
SCOPE	signal externals only; no decryption and no message content
SECURITY	zero-trust access by role, every query and label logged, AES-256 at rest and in transit, FIPS 140-3 modules

WHAT WE CAN VOUCH FOR TODAY

- A workflow walkthrough on a clickable mock-up with the client's own analysts, and a written specification of the displays, confirmation steps and audit log
- A fingerprinting study plan that fixes the measurement set, the test against 1,000 recordings and the pass criteria before any model is trained
- A data-residency and retraining procedure that states how recordings are stored, who can see them and how a model retrains without leaving the network
- A demonstration on synthetic signals in a design review, with the limits of the method stated in writing

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

Once the force knows its emitters and, through HOOD's signature map, knows exactly how it sounds to the adversary, it can start to shape that picture. SYRINX holds the measured fingerprint of each friendly net, which is precisely what JINK needs to reproduce it from a false position. The real unit goes quiet on a HOOD order while a JINK set carries its signature elsewhere, and BRANCHER confirms the match from 5 kilometers. Knowledge of the force's own signature turns from a liability into a tool.



CONCEPT VISUALIZATION · JINK

ALL FIGURES ARE DESIGN TARGETS

ELECTRONIC WARFARE AND SPECTRUM · HARDWARE · 04 OF 05

JINK

JINK Emission Decoy System

A jink is the sharp sidestep a bird makes in flight to throw a pursuing falcon off its line; JINK throws a direction finder off the force by sounding like the unit from where the unit is not.

SOUND LIKE THE UNIT. STAND WHERE THE UNIT IS NOT.

SUMMARY

JINK is a set of small transmitting decoys that reproduce a unit's own radio signature, as measured by HOOD and BRANCHER, from a position the commander chooses. Six nodes imitate a company headquarters net, and a node on a GYR imitates a unit on the march. The real unit goes quiet, the decoys carry its pattern, and a drone-link receiver in each node reports when the deception draws a look.

WHY FALCON ACCURACY BUILT IT

HOOD shows the commander where the adversary can hear his force, and silence is the obvious answer, but a force cannot stay silent and still fight. A unit that goes quiet while another position starts to sound like it hands the adversary's direction finders a confident fix on the wrong place. Falcon Accuracy built JINK so that the measured signature of a real unit can be reproduced from a decoy site, under a script a human approves, with no real content on the air. What changes is that the adversary's spectrum picture becomes something the commander shapes rather than something he only suffers.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits JINK to the radios whose signatures the force wants reproduced, to its vehicles, tripods and GYR decks, and to the visual and thermal decoys the force already fields.

TRAIN It trains the signature library on HOOD and BRANCHER recordings of the client's own nets across missions, so a decoy sounds like the unit as it actually operates in the theater.

SET It sets the approval chain, the emission plan format, the units that may be imitated and the national frequency plan to the force's doctrine and the rules it fights under.

WORKS WITH

HOOD · BRANCHER · SYRINX · GYR · JESS · PITCH · NARES · SOOTY

JINK JINK Emission Decoy System

DESCRIPTION

JINK is a set of transmitting decoys that reproduce a real unit's radio signature. HOOD and BRANCHER measure the unit's externals, such as bands, power and traffic rhythm, and SYRINX holds its fingerprint. A JINK script reproduces that pattern within 2 decibels and 10 milliseconds, using dummy traffic under decoy-only keys, so no real message or position goes on the air. Six 6.2 kilogram nodes imitate a company headquarters net from tripods, vehicle mounts or a GYR deck moving at 20 kilometers per hour. Scripts come from the commander's emission plan on PITCH, an authorized human approves each one and every transmission is logged. HOOD silences the real unit 5 seconds before the decoys come up. A drone-link receiver in each node reports an aircraft within 1 kilometer, so the commander sees the deception draw a look.

CAPABILITIES

- Reproduces a unit's measured signature, in bands, power, traffic rhythm and node count, within 2 dB and 10 ms as heard by a BRANCHER mast at 5 km
- Six 6.2 kg nodes imitate a company headquarters net; 18 nodes imitate a battalion node structure
- Transmits scripted dummy traffic under decoy-only keys, so no real message, file or position goes on the air
- Scripts come from the commander's emission plan on PITCH; an authorized human approves each one and every transmission is logged
- A node on a GYR deck moves at up to 20 km/h to imitate a unit on the march
- Each node senses drone links to 1 km and reports the approach, so the commander sees that the deception has drawn attention
- Works with HOOD silence orders, so the real unit is quiet 5 s before the decoys come up
- Runs 72 h on battery at a 10 percent transmit duty cycle and wipes scripts and keys in under 1 s if tampered with

SPECIFICATIONS · DESIGN TARGETS

NODE	6.2 kg including battery, 30 MHz to 6 GHz, 4 channels at up to 20 W each, 72 h at a 10 percent transmit duty cycle
SET	6 nodes, 6 tripods, 2 vehicle mounts and a programming tablet in two cases, 58 kg; 3 sets imitate a battalion node structure
SIGNATURE MATCH	within 2 dB in power and 10 ms in timing of the unit's recorded externals, on the same channel plan, verified by a BRANCHER mast or a HOOD node at 5 km
MOBILITY	tripod, vehicle magnetic mount, or a GYR deck node moving at up to 20 km/h
CONTROL	scripts written in the commander's emission plan on PITCH, approved by an authorized human, started and stopped over JESS or by timer; every transmission logged, and scripts and the signature library stay inside the client's network
CONTENT	encrypted dummy traffic with decoy-only keys; no real message, file or position passes through a JINK node
SENSING	drone-link receiver 70 MHz to 6 GHz, 1 km, approach reported over JESS
PROTECTION	tamper wipe of scripts and keys in under 1 s; expendable design with no classified hardware aboard
ENVIRONMENT	MIL-STD-810H, IP67, -40 to +60 C; transmits only under the national frequency plan set at tailoring

WHAT WE CAN VOUCH FOR TODAY

- A signature-matching design review that explains how externals are measured, reproduced and verified, with the 2 dB and 10 ms targets and their test method
- A range-trial protocol under a licensed frequency plan, with the real unit and a JINK set each 5 km from a BRANCHER mast and the match scored by the mast and by an independent receiver
- A written control-and-approval design that states who may write a script, who approves it, how every transmission is logged and how a wipe is triggered
- A simulation on the client's terrain model of where a decoy must stand to be heard where the real unit would have been

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

An adversary who cannot find the force by its radios turns to denying the spectrum the force depends on, and satellite navigation is the first target. Every product in this sector also needs trusted time, because BRANCHER places emitters by nanosecond differences, JINK scripts run to the second and HOOD fuses on a shared clock. NARES keeps position and time trustworthy under jamming and spoofing, and hands the jammer's bearing back to HOOD and BRANCHER so the jammer itself joins the picture. The sector closes its loop by finding, learning, hiding and holding its fix.



CONCEPT VISUALIZATION · NARES

ALL FIGURES ARE DESIGN TARGETS

ELECTRONIC WARFARE AND SPECTRUM · HARDWARE · 05 OF 05

NARES

NARES Navigation Protection Kit

The nares are the falcon's nostrils, with the bony cones inside them that keep the air flowing true at 300 kilometers per hour; NARES keeps the force's position and time flowing true under jamming and spoofing.

A TRUSTED FIX UNDER JAMMING. A SPOOF CAUGHT WITHIN TWO SECONDS.

SUMMARY

NARES keeps the force's position and time trustworthy when satellite navigation is jammed or spoofed. A seven-element antenna array on the vehicle nulls up to 6 jammers, a 400 g puck protects the dismounted operator, and a rack unit holds time for BRANCHER masts and PITCH to within 1 microsecond over 24 hours. A spoofed signal is caught within 2 seconds, rejected and reported, and the jammer's bearing goes to HOOD.

WHY FALCON ACCURACY BUILT IT

Nearly every product in this catalog, from the JESS mesh to BRANCHER geolocation, assumes a trusted position and a trusted time, and both come from satellite signals that a jammer tens of kilometers away can deny and a spoofer can imitate. A force that loses its fix loses its geolocation, its timing, its friendly-force picture and often its confidence in every display. Falcon Accuracy built NARES so the fix degrades gracefully and honestly, nulling jammers, catching spoofing and holding time and position long enough to finish the task. What changes is that the operator sees at every moment how much to trust his position, and the jammer that denied him becomes a point on the PITCH map.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits NARES antennas to the mounting rings, roof rails, racks and navigation displays the force's vehicles and sites already have, and the puck to the MANTLE bus or the pack frame.

TRAIN It trains the spoof and jamming detectors on the interference recorded in the client's theater and tunes holdover on the client's own vehicles and terrain.

SET It sets alert thresholds, fallback behavior, confidence display rules and timing priorities to the force's navigation doctrine and the thresholds its operators are trained to act on.

WORKS WITH

JESS · PITCH · BRANCHER · HOOD · MALAR · MANTLE · GYR · TIERCEL · JINK

NARES NARES Navigation Protection Kit

DESCRIPTION

NARES protects satellite navigation and timing for vehicles, packs and racks. The vehicle array nulls up to 6 jammers and holds a fix under jamming 35 decibels stronger than an unprotected receiver tolerates. Checks on power, direction of arrival, clock drift and inertial motion catch a spoofed signal within 2 seconds, reject it and tell the operator in plain language. Without satellites, a vehicle with an inertial unit and wheel odometry holds position within 10 meters after 60 seconds and 50 meters after 5 minutes, and the rack unit holds time within 1 microsecond for 24 hours so BRANCHER and HOOD keep placing emitters. A 400 gram puck, fed by the MANTLE bus, protects the dismounted operator. The array also gives the jammer's bearing within 5 degrees to HOOD and BRANCHER, so the source appears on the PITCH map.

CAPABILITIES

- Seven-element array nulls up to 6 jammers at once and holds a fix under jamming 35 dB stronger than an unprotected receiver tolerates
- Catches a spoofed signal within 2 s by power, direction, clock and inertial checks, rejects it and tells the operator in plain language
- Position holds within 10 m after 60 s and 50 m after 5 min with no satellites, on a vehicle with wheel odometry
- Time holds within 1 microsecond for 24 h without satellites, so BRANCHER masts and HOOD nodes keep placing emitters
- Gives the jammer's bearing within 5 degrees to HOOD and BRANCHER, so the source goes on the PITCH map
- A 400 g dismounted puck with 4 elements nulls 3 jammers and runs from the MANTLE back-panel battery
- One trusted position and time output feeds the vehicle, JESS radios, PITCH and the force's existing navigation displays
- Every fix carries a confidence figure the operator can see, the operator decides what to trust, and every alert is logged

SPECIFICATIONS · DESIGN TARGETS

VEHICLE KIT	7-element array, 180 mm diameter, 1.4 kg antenna; 2.2 kg receiver unit on 12 to 32 V vehicle power, 18 W
DISMOUNTED PUCK	4 elements, 110 mm, 400 g including receiver, 3 nulls; 6 h internal battery or fed from the MANTLE bus
FIXED-SITE TIMING UNIT	1U rack, atomic clock, holdover within 1 microsecond for 24 h; feeds BRANCHER masts, HOOD nodes and PITCH racks
ANTI-JAM	fix held under jamming 35 dB (vehicle) or 25 dB (puck) stronger than an unprotected receiver tolerates; 6 nulls (vehicle), 3 nulls (puck)
SPOOF DETECTION	power, direction-of-arrival, clock-drift and inertial consistency checks; spoofed signal rejected within 2 s; authenticated signals used where a constellation provides them
HOLDOVER	10 m after 60 s and 50 m after 5 min on a vehicle with inertial unit and wheel odometry; dismounted fix carried by MALAR visual-inertial tracking when present
JAMMER BEARING	within 5 degrees from the array, reported to HOOD and BRANCHER over JESS
OUTPUTS	standard navigation and timing interfaces to vehicles, JESS, PITCH and existing displays; every fix carries a confidence figure, every alert is logged and the logs stay inside the client's network
RECEIVER	multi-constellation, multi-frequency, 100 Hz position and time output
ENVIRONMENT	MIL-STD-810H, IP67, -40 to +60 C; receive only, no transmitter fitted

WHAT WE CAN VOUCH FOR TODAY

- An anti-jam performance budget by band and jammer count, with the array geometry and a test method a range can reproduce
- A spoof-detection design review that lists each consistency check, its detection time target and its false-alarm limit
- A range-trial protocol under a licensed test authority, with controlled jamming and spoofing against the kit and an unprotected reference and the fix error and detection time measured
- A holdover test plan on the client's own vehicles over a 5 min satellite-denied route

NEXT SECTOR · 12 CYBER DEFENSE · P. 170

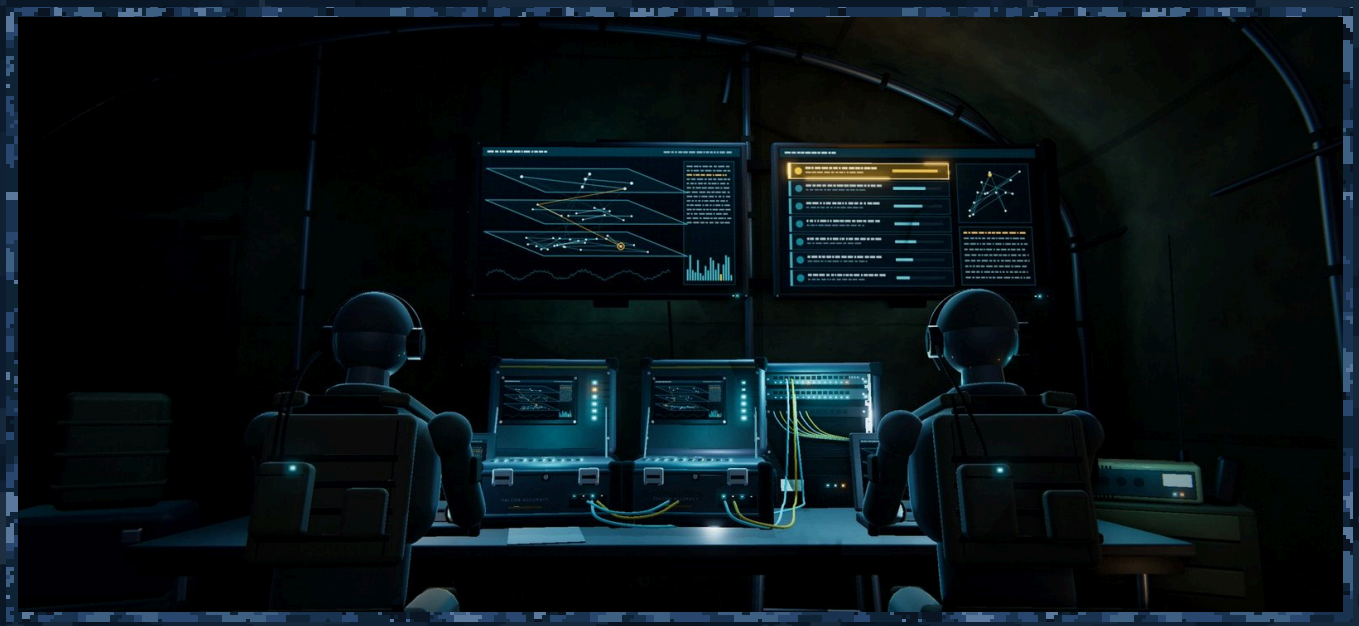
See the network. Prove every device. Let the intruder trip the alarm. This closes Electronic Warfare and Spectrum. Sector 12, Cyber Defense, opens on page 170 with KEEN, HALSBAND, CERE, QUARRY and BEWIT.

12

CYBER DEFENSE

SEE THE NETWORK. PROVE EVERY DEVICE. LET THE INTRUDER TRIP THE ALARM.

A tactical network is flat, moves every few days and is run by a cyber cell of three people who also carry radios. It links goggles, vests, radios, aircraft, vehicles, robots and the decision core, and every one of those devices arrived through a supply chain the force does not control. An intruder who captures one radio or one laptop today can reach most of that network, and the first sign is usually a system that stops working. Falcon Accuracy treats cyber defense as part of force protection and builds it under the same rules as the rest of the catalog. Every product is defensive. Every action waits for a human decision and is logged. Every byte of telemetry, every model and every recording stays on hardware inside the client's network.



IN THIS SECTOR · 5 PRODUCTS · PAGES 172 TO 181

KEEN **HALSBAND** **CERE** **QUARRY** **BEWIT**

The five products form one stack and are fitted, trained and set to the force like everything else Falcon Accuracy builds. KEEN Network Detection Platform watches traffic and endpoints and hands the watch officer one ranked queue of cases with the evidence attached. HALSBAND Zero-Trust Access Fabric grants each session on proof of operator, device and role, re-checks it every 5 minutes and keeps enforcing for 30 days with no link to headquarters. CERE Integrity Attestation System measures firmware and boards at receipt and every 24 hours in service, so a device that changes loses its access until a person clears it. QUARRY Deception Grid plants decoy hosts and credentials that only an intruder would touch. BEWIT Secure Smartphone puts the whole stack in the operator's hand.

IN THIS SECTOR · 5 PRODUCTS



KEEN p. 172

KEEN Network Detection Platform

Every packet, every endpoint, one ranked queue for the watch officer.



HALSBAND p. 174

HALSBAND Zero-Trust Access Fabric

No session without proof. Proof renewed every 5 minutes.



CERE p. 176

CERE Integrity Attestation System

Prove what is inside the box before it joins the net.



QUARRY p. 178

QUARRY Deception Grid

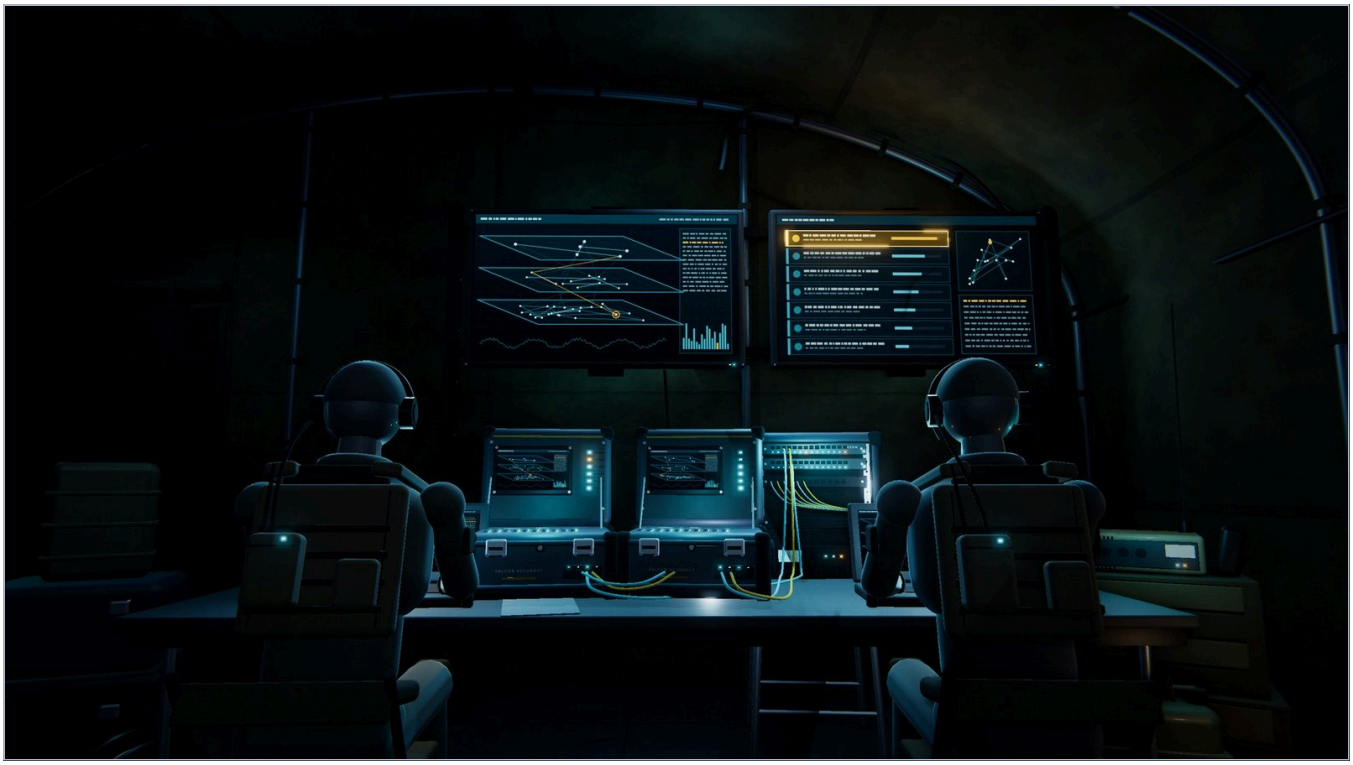
Decoys that only an intruder touches. One touch, one alarm.



BEWIT p. 180

BEWIT Secure Smartphone

A handset built to survive the drop and the hostile network.



CONCEPT VISUALIZATION · KEEN

ALL FIGURES ARE DESIGN TARGETS

CYBER DEFENSE · SOFTWARE · 01 OF 05

KEEN

KEEN Network Detection Platform

A keen hawk is sharp-set and in hunting condition, alert to every movement in its field; KEEN brings that attention to every packet and endpoint on the network.

EVERY PACKET, EVERY ENDPOINT, ONE RANKED QUEUE FOR THE WATCH OFFICER.

SUMMARY

KEEN watches the network from the tactical edge to the headquarters rack and runs a lightweight agent on every endpoint. Models trained on the client's own traffic group related alerts into cases, rank them and write down the evidence. A watch officer decides what happens next, and every decision is logged.

WHY FALCON ACCURACY BUILT IT

A tactical network changes every time the unit moves, and alerts arrive faster than a cyber cell of three can read them. Most forces either drown the watch officer in alerts or switch detection off at the edge. Falcon Accuracy built KEEN so one trained analyst can hold a 2,000 endpoint network, because the platform does the grouping, the ranking and the writing and leaves the decision to a person. The force gains detection that runs at the edge with no link to headquarters and a case file written in the watch officer's own language.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits KEEN sensors to the switches, radios, vehicle networks and servers the force already runs, including gateways for legacy protocols and JESS mesh traffic, and packages the kit in the cases the unit already transports.

TRAIN Falcon Accuracy trains the baseline and triage models on the client's own traffic, applications, duty cycles and the intrusion attempts recorded in the client's theater, and writes every case summary in the client's language.

SET Falcon Accuracy sets asset criticality, alert thresholds, escalation paths and the containment actions a watch officer may approve to the force's own cyber doctrine and rules.

WORKS WITH

HALSBAND · CERE · QUARRY · BEWIT · PITCH · JESS · HOOD

KEEN KEEN Network Detection Platform

DESCRIPTION

KEEN is a detection platform for tactical and headquarters networks. Passive sensors read traffic at 10 gigabits per second each, and a 40 megabyte agent on every endpoint records process starts, logons, file writes and connections. It learns the force's normal traffic in a 14 day baseline and scores every session and process against it. A triage model groups related alerts into one case, writes a plain-language summary with evidence and ranks it by the asset touched. The watch officer sees the top case within 30 seconds, and nuisance alerts fall below 5 per analyst per shift. Containment, such as isolating a host or revoking a session through HALSBAND, waits for a human decision and is logged. A two-case kit serves 2,000 endpoints for 30 days with no link, and nothing it records leaves the client's network.

CAPABILITIES

- Passive network sensors read 10 Gbps each on span ports and taps, with no device added to the traffic path
- Endpoint agent of 40 MB records process starts, logons, file writes and connections at under 2 percent CPU load
- 14 day baseline learns the force's normal traffic and device behavior before scoring begins
- Triage model groups related alerts into one case with a plain-language summary and the evidence behind it
- Cases ranked by the asset touched; the top case reaches the watch officer's display within 30 s of first signal
- Nuisance alerts under 5 per analyst per 8 h shift after the baseline
- Proposed containment, such as isolating a host or revoking a HALSBAND session, waits for a human decision; every action logged
- Runs disconnected for 30 days on a two-case kit; detections sync to PITCH when a link returns

SPECIFICATIONS · DESIGN TARGETS

SENSORS	passive, 10 Gbps per sensor on span ports or taps, 20 sensors per kit; full packet capture held 7 days, metadata 180 days
ENDPOINT AGENT	40 MB install, under 2 percent CPU and 150 MB memory; workstations, servers, rugged tablets and BEWIT handsets
COVERAGE	2,000 endpoints and 20 sensors per two-case kit; rack build to 50,000 endpoints and 200 sensors
DETECTION	14 day baseline; session scored within 5 s of close; process event scored within 2 s
TRIAGE	related alerts grouped into one case; summary and evidence written within 30 s; ranking by asset criticality set by the client
QUALITY TARGETS	under 5 nuisance alerts per analyst per 8 h shift after the baseline; detection rate measured against the client's own red-team exercise at acceptance
RESPONSE	host isolation, HALSBAND session revocation and account lock proposed to the watch officer; executes only on a logged human decision
FORM FACTOR	two-case kit 38 kg, 600 W; or rack of 4 servers; 30 days disconnected, sync to PITCH when a link returns
SECURITY	AES-256 at rest and in transit, hardware security module, role-based access, no outbound telemetry
ENVIRONMENT	kit MIL-STD-810H transport and operation, -20 to +50 C

WHAT WE CAN VOUCH FOR TODAY

- A design review of the sensor and agent architecture with the client's network engineers, including the full list of events the agent records.
- A detection test on a lab network built from the client's own device types, measured against a scripted red-team exercise, with results shared in full.
- A triage-quality trial on 90 days of the client's historical logs, reporting grouping accuracy and nuisance rate against the verdicts of the client's own analysts.
- A written commitment that all telemetry, models and case files stay on hardware inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

KEEN shows the watch officer a session that should not exist, but all it can do is propose that the session be closed. On a flat network the account behind that session can still reach every other host while the case is being read. HALSBAND turns the picture into enforcement, so each session is granted for one resource and one role, and the KEEN risk score is one of the checks a HALSBAND node runs every 5 minutes. Detection and access control share the same identities and the same log, so the watch officer sees the case and the refusal in one place.



CONCEPT VISUALIZATION · HALSBAND

ALL FIGURES ARE DESIGN TARGETS

CYBER DEFENSE · HARDWARE · 02 OF 05

HALSBAND

HALSBAND Zero-Trust Access Fabric

The halsband is the collar a trained hawk wears, the sign that it belongs to a falconer's hand and flies under rules; HALSBAND is the fabric that admits only operators and devices that carry proof.

NO SESSION WITHOUT PROOF. PROOF RENEWED EVERY 5 MINUTES.

SUMMARY

HALSBAND replaces the flat tactical network, where anyone on the net can reach anything, with sessions granted to a proven operator, a proven device and a mission role. Rugged gateway nodes on vehicles, in command posts and at the headquarters edge enforce the policy and keep enforcing it when the link to headquarters drops.

WHY FALCON ACCURACY BUILT IT

Tactical networks were built flat so that anything could talk to anything in a hurry, and that is exactly what an intruder on a captured radio or a stolen laptop needs. Access control built for an office assumes a constant link to a central server, which a convoy or a forward post does not have. Falcon Accuracy built HALSBAND so that proof of identity, device health and role is checked at the edge, by the node in the vehicle, and keeps working for 30 days with no link back. The force gets a network where a captured device opens one door for a few minutes instead of every door for good.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits HALSBAND nodes to the force's vehicle racks, command post cases, radios, satellite terminals and existing directory and identity systems, with gateways that bring legacy systems that cannot carry an identity under the same policy.

TRAIN Falcon Accuracy trains access policy on the client's actual mission roles, task organizations and the access patterns recorded over a 30 day baseline, and renders policy and refusal messages in the client's language.

SET Falcon Accuracy sets session lengths, re-check intervals, emergency access procedures and the actions a watch officer may approve to the force's own doctrine, classification rules and command relationships.

WORKS WITH

KEEN · CERE · BEWIT · JESS · PITCH · MALAR · MANTLE

HALSBAND HALSBAND Zero-Trust Access Fabric

DESCRIPTION

HALSBAND is an access fabric for tactical networks. Every operator, device and service holds a hardware-backed identity, and a session is granted for one resource, one role and a set time. A gateway node in each vehicle and command post checks the identity, the CERE attestation and the KEEN risk score before it opens a session, then re-checks every 5 minutes. A failing session closes within 2 seconds, the operator reads the reason on the display, and every grant and refusal is logged. Policy is written in plain terms, such as "medics reach the casualty system", and compiled to every node. Nodes hold a 30 day copy of policy and identities, so access continues with no headquarters link. The 1.8 kilogram vehicle node draws 25 watts, bridges radio, satellite and wired links and adds under 3 milliseconds.

CAPABILITIES

- Hardware-backed identity for every operator, device and service, bound to a secure element rather than a password
- Per-session access to one resource, one role and a time limit, re-checked every 5 min
- Gateway nodes check CERE attestation and the KEEN risk score before opening a session; a failing session closes within 2 s
- Plain-language policy compiled to every node; a policy change reaches 200 nodes within 60 s over JESS
- Nodes hold policy and identities for 30 days disconnected, so access continues with no headquarters link
- Bridges JESS mesh, satellite, cellular and wired links under one policy, adding under 3 ms per hop
- Operator tokens for MALAR, MANTLE and BEWIT devices; a lost device is revoked across connected nodes within 10 s of a logged human decision
- Every grant, refusal and policy change logged and exported to KEEN and PITCH

SPECIFICATIONS · DESIGN TARGETS

VEHICLE NODE	1.8 kg, 25 W on 12 to 28 V, 4 Ethernet and 2 radio ports, 1 Gbps, under 3 ms added latency
COMMAND POST NODE	6 kg, 90 W, 10 Gbps, 5,000 concurrent sessions
PACK NODE	380 g, 6 W, one squad of 16 devices, 24 h on its battery
IDENTITY	secure element in every device and node; operator token on a card or in the BEWIT handset; mutual authentication per session
SESSION	default 8 h with a re-check every 5 min against identity, CERE attestation and KEEN risk score; a failing re-check closes the session within 2 s
POLICY	written in plain terms, compiled and signed at headquarters, distributed to 200 nodes within 60 s over JESS; 30 day disconnected copy on every node
REVOCATION	lost device or compromised credential revoked across connected nodes within 10 s; queued for disconnected nodes
LOGGING	every grant, refusal and policy change recorded with time, identity, device and node; exported to KEEN and PITCH
SECURITY	AES-256, FIPS 140-3 modules, hardware security module in each node, tamper wipe under 1 s
ENVIRONMENT	MIL-STD-810H, IP67, -32 to +55 C

WHAT WE CAN VOUCH FOR TODAY

- A design review of the identity model and policy language with the client's signals and security staff, including how legacy systems are brought under policy.
- A bench demonstration of a vehicle node and a pack node enforcing policy on a lab network, with the 30 day disconnected mode compressed into a 48 h test.
- Latency and throughput tests on the client's own radio and satellite links, recorded and shared in full.
- A written commitment that identities, policy and logs stay on hardware inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

HALSBAND proves who the operator is and which device is asking, and that is as far as identity can go. A radio whose firmware was changed somewhere in the supply chain presents a valid certificate and passes every HALSBAND check. CERE closes that gap by measuring the boot chain and firmware of the device itself, at receipt and every 24 hours in service, and HALSBAND refuses a device whose measurement has moved. The pair means both the person and the box are proven before a session opens.



CONCEPT VISUALIZATION · CERE

ALL FIGURES ARE DESIGN TARGETS

CYBER DEFENSE · HARDWARE · 03 OF 05

CERE

CERE Integrity Attestation System

The cere is the bare skin at the base of a falcon's beak whose color tells the falconer at a glance whether the bird is well; CERE reads the health of every board and firmware image before it joins the network.

PROVE WHAT IS INSIDE THE BOX BEFORE IT JOINS THE NET.

SUMMARY

CERE verifies that the firmware, boot chain and components of every device match the signed record from the maker and the force's own acceptance scan, and keeps verifying while the device is in service. A bench station in the depot checks what arrives, and an attestation agent checks what is already fielded.

WHY FALCON ACCURACY BUILT IT

A force buys radios, controllers and computers from many makers through long supply chains, and a changed firmware image or an added part looks exactly like the original from the outside. Once fielded, nobody looks inside the box again until it fails. Falcon Accuracy built CERE so the force can measure what it received and measure it again every day in service, with the result tied to network access. The force gains a signed history for every serial number and a network that notices when a device stops being what was accepted.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits CERE adapters and reference libraries to the device families the force already owns, from radios and vehicle controllers to servers and cameras, and packages the bench station for the client's depot or deployed maintenance tent.

TRAIN Falcon Accuracy trains the optical comparison and anomaly models on the client's own accepted builds, board revisions and repair history, and writes inspector guidance in the client's language.

SET Falcon Accuracy sets inspection depth, re-attestation intervals, quarantine rules and who may clear a held device to the force's own acquisition, maintenance and security doctrine.

WORKS WITH

HALSBAND · KEEN · BEWIT · JESS · PITCH · TIERCEL · GYR · LURCHER · FALCONER

CERE CERE Integrity Attestation System

DESCRIPTION

CERE answers one question for every device the force fields, whether it is still what was accepted. At receipt, a bench station reads firmware over service ports and test points, compares it against a signed reference and photographs the board at 50 micrometers per pixel to check every component against the accepted build. A device with a difference is held, and the inspector sees it and decides. In service, an agent measures the boot chain and firmware at every start and every 24 hours and sends a signed result to HALSBAND, which refuses a changed device until a human clears it. Radios, vehicle controllers, servers, cameras, BEWIT handsets and robot computers take the same checks. References come from the maker's signed manifest, the client's own acceptance scan or both, and everything stays inside the client's network.

CAPABILITIES

- Receipt inspection reads firmware over service ports and board test points and compares each image against a signed reference within 10 min per device
- Optical board scan at 50 micrometers per pixel flags added, missing or swapped components against the accepted build
- Runtime agent measures the boot chain and firmware at every start and every 24 h; a changed measurement reaches HALSBAND and KEEN within 5 s
- A device with a changed measurement loses network access through HALSBAND until an inspector clears it, and the decision is logged
- Covers radios, vehicle controllers, servers, cameras, handsets and robot computers through one record format
- Signed component passport per serial number follows the device from receipt to disposal
- Works from the maker's signed manifest, from the client's own acceptance scan, or from both when no manifest exists
- Bench station and references run on a standalone depot network; nothing leaves the depot

SPECIFICATIONS · DESIGN TARGETS

BENCH STATION	2 cases, 46 kg, 350 W; adapters for the force's radio, vehicle controller, computer and camera families
FIRMWARE READ	service ports and board test points; image compared against the signed reference; under 10 min per device
OPTICAL SCAN	50 micrometers per pixel, boards to 400 x 300 mm; component presence and position compared against the accepted build
RUNTIME ATTESTATION	agent on the device or its host computer; measurement at boot and every 24 h; signed report within 5 s
ENFORCEMENT	a changed measurement routes to HALSBAND, which refuses access, and to KEEN, which opens a case; cleared only by a logged human decision
PASSPORT	one signed record per serial number; receipt, every attestation and every repair logged; export to the client's inventory system
THROUGHPUT	40 devices per 8 h shift per bench station with one inspector
SECURITY	references and results signed with keys held in a hardware security module inside the client's network; depot network standalone
ENVIRONMENT	station MIL-STD-810H transport, operates 0 to +45 C; agent runs on devices rated -32 to +55 C

WHAT WE CAN VOUCH FOR TODAY

- A design review of the measurement and signing chain with the client's security and maintenance staff.
- A bench demonstration on sample boards and firmware images supplied by the client, with every result shown to the inspector in full.
- A trial protocol for runtime attestation on 50 fielded devices over 90 days, measuring false holds and time to detect a known change.
- A written commitment that references, keys and results stay inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

With KEEN, HALSBAND and CERE in place, an intruder needs a clean, attested device and a legitimate credential, which is exactly what a stolen handset or a turned insider provides. Among thousands of legitimate sessions that intruder looks like one more member of the force, and the KEEN models can only rank the sessions somewhere in the queue. QUARRY removes the guesswork by planting hosts, accounts and files that nobody with real work ever opens, so a single touch is a signal the watch officer can trust. The grid hands that touch to KEEN as the top case, with the intruder's path recorded.



CONCEPT VISUALIZATION · QUARRY

ALL FIGURES ARE DESIGN TARGETS

CYBER DEFENSE · SOFTWARE · 04 OF 05

QUARRY

QUARRY Deception Grid

The quarry is the game a falcon is flown at; QUARRY plants bait that only an intruder would hunt, and the hunt itself gives the intruder away.

DECOYS THAT ONLY AN INTRUDER TOUCHES. ONE TOUCH, ONE ALARM.

SUMMARY

QUARRY plants decoy hosts, accounts, files and credentials across the force's networks that look real and have no legitimate use. Any contact with a decoy is a high-confidence signal, routed to KEEN and the watch officer with the intruder's path recorded. The grid holds no real data and acts against no one.

WHY FALCON ACCURACY BUILT IT

Attestation, access control and detection raise the cost of getting in, but a patient intruder with a stolen credential and a clean device still looks like a member of the force. Finding that intruder among thousands of legitimate sessions is slow and uncertain. Falcon Accuracy built QUARRY so that the intruder's own curiosity sets off the alarm, because nobody with real work ever opens a decoy. The force gains a signal it can trust, a recording of how the intruder works and a watch officer who knows where to look first.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits QUARRY templates to the device types, directory structure, file shares and naming conventions the force actually runs, so each decoy looks like one more of the force's own hosts.

TRAIN Falcon Accuracy trains decoy content and behavior on the client's own document styles, duty cycles and the intrusion techniques recorded in the client's theater, in the client's language.

SET Falcon Accuracy sets decoy density, placement rules, the systems that are off limits for decoys and the response a watch officer may approve to the force's own doctrine and legal rules.

WORKS WITH

KEEN · HALSBAND · CERE · BEWIT · PITCH · CREANCE

QUARRY QUARRY Deception Grid

DESCRIPTION

QUARRY fills the network with things that look valuable and have no real use. Each node runs 200 decoy hosts that imitate the force's own servers, workstations, controllers and cameras, with shares, documents and services answering within 20 milliseconds. Decoy accounts sit in the directory, decoy credentials in files and memory on real endpoints through the KEEN agent, and decoy entries in configuration where an intruder would look. Legitimate work never needs them, so one logon, connection or file open is a signal, with false alarms below one per week per 1,000 endpoints. The touch reaches KEEN within 2 seconds as the top case, with the intruder's path and tools recorded. Decoys move every 7 days so the pattern does not settle. The grid only observes and records, holds no client data and commands no other system.

CAPABILITIES

- 200 decoy hosts per node imitating the force's own servers, workstations, controllers and cameras, answering within 20 ms
- Decoy accounts, credentials, files and configuration entries planted on real endpoints through the KEEN agent
- One touch opens a top-ranked KEEN case within 2 s, with the intruder's path and tools recorded
- False alarms below one per week per 1,000 endpoints, because legitimate work never needs a decoy
- Decoys reshuffled every 7 days; new decoys generated from the client's inventory and naming conventions
- Recordings replay as scenarios for the force's cyber cell and as test cases for KEEN models
- Observe and record only; the grid holds no real data and takes no action against any system
- Runs on 2 rack units or in a vehicle case alongside KEEN; 30 days disconnected

SPECIFICATIONS · DESIGN TARGETS

DECOY HOSTS	200 per node from 20 device templates built from the client's inventory; response within 20 ms
DECOY CREDENTIALS AND FILES	planted through the KEEN agent on up to 2,000 endpoints per node; refreshed every 7 days
ALERTING	touch to KEEN case within 2 s; path, commands and transferred files recorded on the decoy
QUALITY TARGETS	false alarms below 1 per week per 1,000 endpoints; decoys not identified by the client's red team in a 60 min scripted test at acceptance
ISOLATION	decoys hold no client data; outbound connections from decoys blocked at the node; the grid issues no commands to real systems
FORM FACTOR	2 rack units, 300 W; or a 12 kg vehicle case alongside the KEEN kit; 30 days disconnected
SCENARIOS	any recording exported within 5 min as a training scenario or a KEEN test case
SECURITY	AES-256, role-based access; every placement and every recording logged

WHAT WE CAN VOUCH FOR TODAY

- A design review of decoy templates and placement rules with the client's network and legal staff.
- A lab demonstration in which the client's own red team is given 60 minutes on a decoy-seeded lab network and the grid's recordings are shown in full.
- A false-alarm trial on one live segment of the client's network for 30 days, recording every touch and its verdict.
- A written commitment that decoys carry no client data and that recordings stay inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

Every layer so far protects the network on the wire and in the rack. The weakest endpoint is the handset an operator carries off the base, onto whichever cellular network is nearest, with credentials in its memory and a pocket to be lost from. BEWIT puts the HALSBAND identity, the CERE measured boot, the KEEN agent and QUARRY decoy credentials into one 290 gram device that treats every network as hostile. The stack that defends the headquarters rack is the same stack in the operator's hand.



CONCEPT VISUALIZATION · BEWIT

ALL FIGURES ARE DESIGN TARGETS

CYBER DEFENSE · HARDWARE · 05 OF 05

BEWIT

BEWIT Secure Smartphone

The bewit is the small leather strap that fastens the bell to a falcon's leg so the falconer always hears where the bird is; BEWIT keeps the operator in reach of command on any network.

A HANDSET BUILT TO SURVIVE THE DROP AND THE HOSTILE NETWORK.

SUMMARY

BEWIT is a rugged handset with a hardware security element, two isolated operating environments and a radio stack that treats every cellular, satellite and mesh network as hostile. It carries the HALSBAND identity, the CERE attestation and the KEEN agent, so the device in the operator's hand runs the same stack as the headquarters rack.

WHY FALCON ACCURACY BUILT IT

The phone an operator carries is the one endpoint that leaves the network, roams onto whichever cellular network is nearest, holds credentials and sits in a pocket when it is lost. A commercial handset with a management app does not change that. Falcon Accuracy built BEWIT so the handset carries the same identity, attestation and detection stack as the headquarters rack and treats every network as hostile by default. The force gains a device it can lose without losing the network.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits BEWIT to the force's chest rigs, vehicle docks and charging racks, pairs it with the MALAR goggles, MANTLE cable bus and JESS radios the force issues, and loads the coordination app and maps the force already uses.

TRAIN Falcon Accuracy trains its rogue network detection on the cellular and radio environment recorded in the client's theater and sets its interface, keyboards and speech features to the client's languages.

SET Falcon Accuracy sets environment separation, camera and radio policy by site, wipe rules and the applications an operator may run to the force's own security doctrine.

WORKS WITH

HALSBAND · CERE · KEEN · QUARRY · JESS · MALAR · MANTLE · PITCH · HOOD

BEWIT BEWIT Secure Smartphone

DESCRIPTION

BEWIT is a 290 gram handset for operators who leave the wire. A secure element holds the HALSBAND identity, and CERE measures the boot chain at every start. Two isolated environments share the handset, a mission side for the squad app, maps and the PITCH picture, and a personal side that never touches mission data, switched in 1 second. All traffic runs through a tunnel to the nearest HALSBAND node over cellular, satellite or JESS mesh, and the handset reports rogue base stations and location requests to HOOD within 5 seconds. A lost handset wipes 10 seconds after revocation or 10 failed unlocks. The 6.1 inch display reads at 1,000 nits, the battery runs 18 hours and swaps in 15 seconds, and the case survives a 1.5 meter drop and 30 minutes under 1.5 meters of water.

CAPABILITIES

- Hardware security element holds the HALSBAND identity; boot chain measured by CERE at every start
- Two isolated environments, mission and personal, with a 1 s switch and no data path between them
- All traffic tunneled to the nearest HALSBAND node over cellular, satellite or the JESS mesh sleeve
- Rogue base stations and location requests detected and reported to HOOD within 5 s
- Remote wipe within 10 s of a watch officer's logged revocation; local wipe after 10 failed unlocks
- 1,000 nit display readable in sunlight and usable with gloves; 18 h mission battery swapped in 15 s
- Runs the squad coordination app, maps, MALAR video and the PITCH picture, with the KEEN agent on board
- Survives a 1.5 m drop onto concrete and 30 min at 1.5 m depth; -32 to +55 C

SPECIFICATIONS · DESIGN TARGETS

MASS AND SIZE	290 g, 165 x 78 x 12 mm; JESS mesh sleeve 90 g
DISPLAY	6.1 inch, 1,000 nits, glove and wet-finger touch, night mode under 2 nits
SECURITY	secure element, boot measured by CERE, two isolated environments, AES-256 storage, FIPS 140-3 modules
IDENTITY	HALSBAND operator token on the secure element; re-check every 5 min; revocation and wipe within 10 s on any link
RADIOS	cellular, dual-band wireless LAN, satellite messaging, JESS mesh through the sleeve; all traffic through the HALSBAND tunnel
SPECTRUM DEFENSE	rogue base station and location request detection reported to HOOD within 5 s; radio silent mode on command
BATTERY	18 h mission use, hot swap in 15 s, charges from the MANTLE back-panel battery over the cable bus
RUGGED	MIL-STD-810H, 1.5 m drop onto concrete, IP68 at 1.5 m for 30 min, -32 to +55 C
CAMERA AND SENSORS	48 megapixel camera, 9-axis inertial unit; camera and microphones disabled by policy at set sites

WHAT WE CAN VOUCH FOR TODAY

- An industrial design review with mockups in the client's chest rigs and vehicle docks, handled by operators in gloves.
- A bench demonstration of the two isolated environments, the HALSBAND tunnel and the remote wipe on development hardware.
- A drop, immersion and temperature test plan to the stated figures, run at an independent test house and witnessed by the client.
- A written commitment that no telemetry, location or content leaves the handset to anyone but the client's own HALSBAND node.

NEXT SECTOR · 13 SOVEREIGN AI AND PREDICTION · P. 182

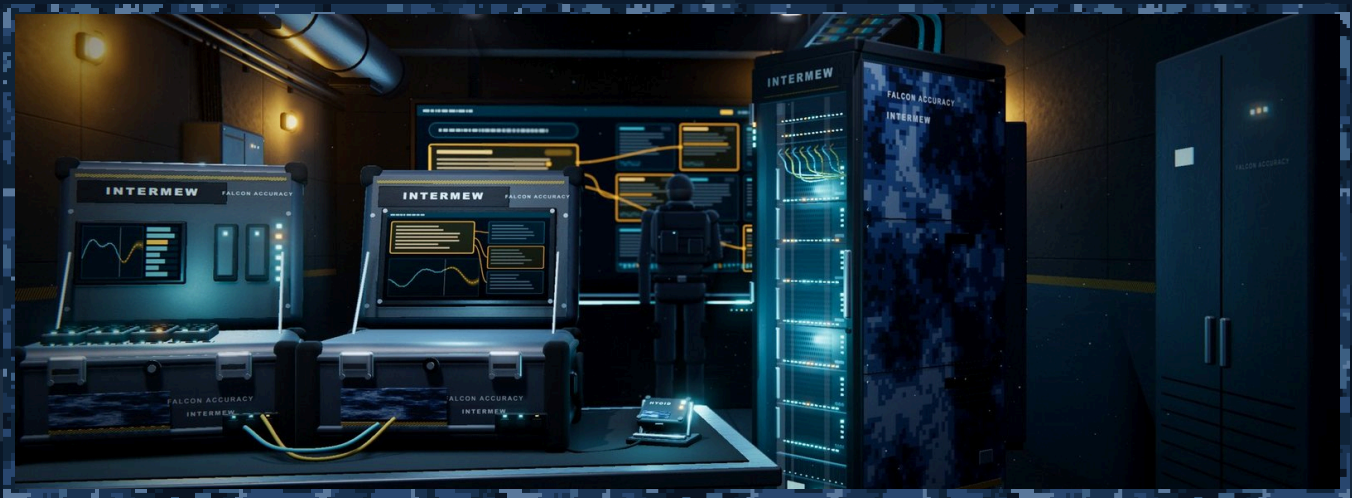
The force's own language model, its own forecasts, its own rules. This closes Cyber Defense. Sector 13, Sovereign AI and Prediction, opens on page 182 with INTERMEW, OSSICLE, UNHOODED, HYOID and CANCELEER.

13

SOVEREIGN AI AND PREDICTION

THE FORCE'S OWN LANGUAGE MODEL, ITS OWN FORECASTS, ITS OWN RULES.

A staff that runs on someone else's language model sends its questions, its doctrine and its reports to someone else's servers, and it gets back answers it cannot trace to a source. Public models also know little about the force's own manuals, units, vehicles and languages, and they predict nothing about its own logistics, fleet or ground. Meanwhile the staff still writes every brief by hand, the mechanic still searches a 2,000-page manual on a tailgate, and no one can say which model version wrote which paragraph or who approved it. The Sovereign AI and Prediction sector closes those gaps with models that are trained, run and governed entirely inside the client's network.



IN THIS SECTOR · 5 PRODUCTS · PAGES 184 TO 193

INTERMEW OSSICLE UNHOODED HYOID CANCELEER

The five products work as one chain. INTERMEW is the Falcon Accuracy defense language model, built in three sizes and tuned on the client's doctrine, manuals, reports and languages, and it answers only with citations to the client's own documents. OSSICLE turns the force's history into calibrated forecasts of demand, failure, readiness, weather impact and incident risk, each with its uncertainty band and its drivers. UNHOODED puts INTERMEW at every staff desk to draft, summarize and translate, and HYOID carries the edge model on a 15 W module to the operator, the vehicle and the motor pool. CANCELEER is where commanders, legal advisers and auditors set what every model may do and approve each version before it reaches operators. A human decides at every step, every output is labeled as AI-generated, every query and answer is logged, and no model or document leaves the client's network.

IN THIS SECTOR · 5 PRODUCTS



INTERMEW p. 184

INTERMEW Defense Language Model

The force's own language model. Air-gapped, cited, and under human command.



OSSICLE p. 186

OSSICLE Forecasting Engine

Calibrated forecasts with their bands, their drivers and their track record.



UNHOODED p. 188

UNHOODED Staff Assistant

Drafts, summaries and translations from your archive, each one reviewed by name.



HYOID p. 190

HYOID Edge Language Module

INTERMEW Edge in a 15 W module. Offline, spoken, cited.



CANCELEER p. 192

CANCELEER AI Governance Console

Set what every model may do. Approve every version. Review every answer.



CONCEPT VISUALIZATION · INTERMEW

ALL FIGURES ARE DESIGN TARGETS

SOVEREIGN AI AND PREDICTION · SOFTWARE · 01 OF 05

INTERMEW

INTERMEW Defense Language Model

An intermewed falcon has molted in the falconer's own mews and grown its new feathers there, at home and under the falconer's care; INTERMEW models are grown, tuned and retrained inside the client's own network and never leave it.

THE FORCE'S OWN LANGUAGE MODEL. AIR-GAPPED, CITED, AND UNDER HUMAN COMMAND.

SUMMARY

INTERMEW is the Falcon Accuracy defense language model, a family of three sizes for the edge, the field and the headquarters. Each one is tuned inside the client's network on its doctrine, manuals, reports and languages, runs with no outside connection, and answers with a citation to the client's own documents. It writes text for a human to read and never acts on its own.

WHY FALCON ACCURACY BUILT IT

A force cannot hand its doctrine, its reports and its questions to a public model, and a public model cannot cite a manual it has never read. INTERMEW exists so that the force owns the model, the weights, the training data and the logs, and so that every answer can be traced to a page the force wrote. Falcon Accuracy built it in three sizes because a headquarters, a deployed command post and a vehicle have very different power and space. The change for the force is a staff and a crew that can ask their own archive a question in their own language and check the answer against its source in seconds.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits INTERMEW to the racks, vehicles and power the force already has, with the headquarters size in an existing server room, the field size in a two-case kit for a deployed command post and the edge size on HYOID modules for vehicles and operators, and connects it to the document stores and identity system already in service.

TRAIN ROUSE tunes the model inside the client's network on the client's own doctrine, manuals, reports, glossaries and transcripts, in its working languages and the dialects of its theater, and the client's staff write the 2,000-question evaluation set it is accepted against.

SET Allowed tasks, topics, markings, roles, refusal wording and retention are set in CANCELEER to the client's doctrine and law, and no new version reaches operators until a named commander, legal adviser and model officer approve it.

WORKS WITH

HYOID · UNHOODED · OSSICLE · CANCELEER · LORES · PITCH · CALAMUS · ROUSE · TOMIAL · HALSBAND · PASSAGE · ENSEAM

INTERMEW INTERMEW Defense Language Model

DESCRIPTION

INTERMEW comes in three sizes that share one policy engine and one log format. INTERMEW Headquarters has 120 billion parameters and a 256,000-token context on an 8-accelerator rack. INTERMEW Field has 14 billion parameters and a 64,000-token context in a 42 kg two-case kit. INTERMEW Edge has 3 billion parameters and a 16,000-token context on the 15 W HYOID module. Falcon Accuracy delivers base weights on signed media, and ROUSE tunes them inside the client's network on its doctrine, manuals and reports in four working languages, such as Arabic, French, English and Spanish. Every factual sentence cites a passage in the client's store, and the model declines any task outside the policy set in CANCELEER. It writes text for a human, has no write path to any machine or order system, and logs every exchange to CALAMUS.

CAPABILITIES

- Three sizes on one design, 120 billion parameters at headquarters, 14 billion in the field and 3 billion at the edge
- Context of 256,000 tokens at headquarters, enough for a 350-page manual in one pass; 64,000 in the field and 16,000 at the edge
- Works in four working languages at full depth, such as Arabic, French, English and Spanish, with dialect tuning on the client's own transcripts and up to 8 more languages added at tuning
- A citation on every factual sentence; acceptance target of 90 percent correct and fully cited answers on the client's own 2,000-question evaluation set at headquarters
- Declines tasks outside the policy set in CANCELEER, with a 98 percent refusal target on a 1,000-prompt out-of-policy test set written with the client
- First token within 1 s and 30 tokens per second per answer on the field kit; 64 concurrent staff sessions at headquarters
- Runs air-gapped and is retrained by ROUSE inside the client's network every 4 weeks or on request, each version approved in CANCELEER
- Writes text for a human to read and has no write path to any machine or order system; every query, answer and citation logged to CALAMUS

SPECIFICATIONS · DESIGN TARGETS

SIZES	Headquarters 120 billion parameters; Field 14 billion; Edge 3 billion; one tokenizer, policy engine and log format across all three
CONTEXT	256,000 tokens Headquarters; 64,000 Field; 16,000 Edge
HARDWARE	Headquarters on an 8-accelerator 42U rack at 10 kW; Field in a two-case kit, 42 kg, 2 accelerators, 1.4 kW; Edge on the HYOID module at 15 W peak
LATENCY	first token within 1 s on Field and Headquarters and 2 s on Edge; 30 tokens per second per answer on Field, 25 on Headquarters, 12 on Edge
CONCURRENCY	64 staff sessions on Headquarters, 16 on Field, 1 on Edge
LANGUAGES	4 working languages at full depth, such as Arabic, French, English and Spanish; up to 8 more added at tuning; dialect packs from the client's own transcripts
ACCURACY TARGETS	90 percent correct and fully cited on the client's own 2,000-question evaluation set at Headquarters, 85 percent on Field, 75 percent on Edge; citation precision 95 percent
POLICY	tasks, topics, markings and roles set in CANCELEER; 98 percent refusal target on a 1,000-prompt out-of-policy test set
TUNING	base weights on signed media; continued training by ROUSE inside the client's network on a 4-week cycle; every version signed and approved in CANCELEER
SECURITY AND LOGGING	no external network path; AES-256 at rest; FIPS 140-3 modules; zero-trust access through HALSBAND; every query, answer, citation and model version logged to CALAMUS

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can walk the client's staff through the INTERMEW design in a two-day review, covering the three sizes, the tuning pipeline, the citation method and the policy engine, with every data path shown.
- A sealed-lab demonstration on a synthetic doctrine library of 50,000 documents can show cited answers, refusals outside policy and the full query log, with no network connection in the room.
- A written trial protocol defines how accuracy, citation precision, refusal rate and latency are measured on the client's own evaluation set, inside the client's network, before acceptance.
- Falcon Accuracy commits in writing that weights, training data, queries and logs stay inside the client's network, that every output is labeled as AI-generated and that a human decides on every use of it.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

INTERMEW reads and writes, and it answers from what the force already knows. A staff also needs to know what is likely to happen next, such as how much fuel a brigade burns in week three or whether a gearbox lasts the month, and a language model is the wrong tool for that number. OSSICLE builds those forecasts from the force's own history with calibrated bands, and INTERMEW writes the plain-language drivers beside each one.



CONCEPT VISUALIZATION · OSSICLE

ALL FIGURES ARE DESIGN TARGETS

SOVEREIGN AI AND PREDICTION · SOFTWARE · 02 OF 05

OSSICLE

OSSICLE Forecasting Engine

The scleral ossicles are the ring of small bones that holds a falcon's eye rigid so it stays focused far ahead; OSSICLE keeps the force's forecasts in focus days and weeks ahead.

CALIBRATED FORECASTS WITH THEIR BANDS, THEIR DRIVERS AND THEIR TRACK RECORD.

SUMMARY

OSSICLE is the forecasting engine of the Falcon Accuracy system. It gives calibrated probabilistic predictions of logistics demand, equipment failure, unit readiness, weather impact on operations and incident risk, each with an uncertainty band, the drivers behind it and a backtest score. It feeds PITCH, CROP, YARAK and WEATHER, and a human decides what to do with every forecast.

WHY FALCON ACCURACY BUILT IT

Staffs plan on single numbers, and a single number hides how wrong it can be. OSSICLE exists so that every forecast arrives with the range it is likely to fall in, the factors that moved it and a record of how well the same model did on the force's own past. Falcon Accuracy built one engine for five kinds of forecast so that logistics, maintenance, readiness, weather and safety staffs read uncertainty the same way. The change for the force is planning against a band whose reliability has been measured, with the decision left to the officer who owns it.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits OSSICLE to the supply, maintenance, personnel, training and weather systems the force already runs through FURCULA adapters, and runs it on the PITCH or ROUSE racks already in the client's building.

TRAIN Each forecast model trains inside the client's network on the client's own consumption, failure, readiness, weather and incident history for its theater, and is backtested on 24 months of that history before acceptance.

SET Forecast horizons, band widths, alert thresholds, weather limits for each aircraft, boat and vehicle type, and the officer who owns each forecast are set to the client's doctrine, and no threshold changes without a logged approval.

WORKS WITH

PITCH · CROP · YARAK · WEATHER · INTERMEW · UNHOODED · CANCELEER · CALAMUS · ROUSE · FURCULA · SCREEN

OSSICLE OSSICLE Forecasting Engine

DESCRIPTION

OSSICLE refreshes up to 20,000 forecast series every hour on one rack. It predicts daily demand per unit and class of supply to 90 days for CROP, component failure 10 to 30 days ahead for YARAK, unit readiness 1 to 30 days ahead for PITCH, and the hourly probability over 10 days that weather keeps flights, boat transits and road moves inside their limits, which sets WEATHER rehearsal conditions. Incident risk gives the weekly likelihood of safety and security incidents, such as heat injuries, road accidents and perimeter alarms, by site and route. Every forecast carries 80 and 95 percent bands, its five strongest drivers in plain language written by INTERMEW, and its backtest score on 24 months of the client's own history. No forecast triggers any action, and every one is logged.

CAPABILITIES

- Refreshes up to 20,000 forecast series every hour on one rack, and reruns any single series on demand in under 60 s
- Logistics demand per unit and class of supply from 1 to 90 days, delivered to CROP with 80 and 95 percent bands
- Failure probability per component 10 to 30 days ahead, delivered to YARAK with the sensor evidence behind each forecast
- Unit readiness 1 to 30 days ahead from personnel, equipment, supply and training data, delivered to PITCH
- Weather impact as the hourly probability that flights, boat transits and road moves stay inside the client's limits, 10 days ahead, delivered to WEATHER
- Incident risk per site and route by week, such as heat injuries, road accidents and perimeter alarms, for safety and security staffs
- Every forecast shows its band, its five strongest drivers in plain language and its backtest score; 90 percent bands target 88 to 92 percent coverage on held-out history
- Decision support only; a named officer decides on every forecast, and every forecast, version and use is logged to CALAMUS

SPECIFICATIONS · DESIGN TARGETS

CAPACITY	20,000 series per rack refreshed hourly; any single series rerun in under 60 s
HORIZONS	demand 1 to 90 days; failure 10 to 30 days; readiness 1 to 30 days; weather impact hourly for 10 days; incident risk weekly for 8 weeks
UNCERTAINTY	80 and 95 percent bands on every forecast; the full probability distribution available to analysts
CALIBRATION TARGET	95 percent bands contain the outcome 93 to 97 percent of the time on 24 months of held-out client history
BACKTEST	rolling-origin test on 24 months of the client's own history before acceptance; score and band coverage shown beside every forecast
EXPLANATIONS	the five strongest drivers per forecast, written in plain language by INTERMEW in the client's working languages
DRIFT	alarm when 30-day band coverage falls more than 5 points below target; the series is marked and routed to ROUSE for retraining
INPUTS	40 source types through FURCULA adapters, including CROP and YARAK records, PITCH reports, the client's weather and climate records and its personnel and training systems
FORM FACTOR AND LOGGING	runs on the PITCH rack core or the ROUSE rack; no external network path; every forecast, model version and use logged to CALAMUS

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can demonstrate the five forecast types on a synthetic two-year history in a sealed lab, with bands, drivers and backtest scores shown for every series.
- A design review covers the forecasting methods, the calibration test and the drift alarm, and states in writing what each forecast can and cannot predict.
- A written trial protocol measures band coverage and backtest scores on the client's own held-out history, inside the client's network, before acceptance.
- Falcon Accuracy commits that OSSICLE takes no action on its own, that a named officer decides on every forecast, and that all data and models stay inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

OSSICLE produces numbers with bands, and a staff still has to turn them, and everything else it reads, into briefs and decisions. That writing is where staff hours disappear. UNHOODED puts INTERMEW at every desk to draft the brief, summarize the report and translate the annex, quoting OSSICLE forecasts with their bands and citing every source, and a named reviewer signs before anything leaves.



CONCEPT VISUALIZATION · UNHOODED

ALL FIGURES ARE DESIGN TARGETS

SOVEREIGN AI AND PREDICTION · SOFTWARE · 03 OF 05

UNHOODED

UNHOODED Staff Assistant

A falcon is unhooded when the falconer wants it to see the field, and only then; UNHOODED opens the client's archive to the staff officer who asks, and shows only what that officer is cleared to see.

DRAFTS, SUMMARIES AND TRANSLATIONS FROM YOUR ARCHIVE, EACH ONE REVIEWED BY NAME.

SUMMARY

UNHOODED is the staff assistant built on INTERMEW. It drafts briefs, summarizes reports, translates and answers questions across the client's archives with a citation on every claim. Every draft is labeled as AI-generated and goes to a named reviewer before anyone else sees it.

WHY FALCON ACCURACY BUILT IT

A headquarters staff spends much of its day writing summaries of what others wrote, and the archive that holds last year's lessons is too large to search by hand. UNHOODED exists so that the first draft, the summary and the translation come from a model that read the source, while the judgment and the signature stay with a person. LORES already reads for the intelligence cell, and UNHOODED does the same work for the logistics, maintenance, personnel, legal, training and plans staffs. The change for the force is more officer hours spent on decisions and fewer on transcription, with every AI paragraph marked and owned by a reviewer.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits UNHOODED to the workstations, document stores, templates and identity system the staff already uses, and runs it on the INTERMEW hardware already in the headquarters or command post.

TRAIN ROUSE tunes the drafting and translation behavior inside the client's network on the client's own past briefs, reports, glossaries and translations, in its working languages, and the evaluation set is written by the client's own staff officers.

SET Templates, the reviewer for each document type, marking rules, retention and the tasks the assistant may do are set in CANCELEER to the client's staff procedures and law, and the assistant declines anything outside them.

WORKS WITH

INTERMEW · LORES · OSSICLE · HYOID · CANCELEER · CALAMUS · PITCH · PANNEL · ROUSE · HALSBAND

UNHOODED UNHOODED Staff Assistant

DESCRIPTION

UNHOODED runs on INTERMEW Field or Headquarters and serves the staff through a browser on their existing computers. An officer asks for a brief, a summary or a translation, and UNHOODED drafts it from up to 10 million of the client's doctrine, manuals, reports, minutes and after-action reviews, with every factual sentence linked to its source. A 300-page report is summarized in under 2 minutes, and translation among the four working languages runs at 2,000 words per minute with the original shown beside it. Every draft carries an AI-generated label and a model version stamp that stay through every edit, and it goes to a named reviewer who accepts, edits or rejects it. Nothing is released until the reviewer signs, answers inherit the highest marking of their sources, and every request, draft and signature is logged to CALAMUS.

CAPABILITIES

- Drafts briefs, summaries, staff notes, minutes and report sections in the force's own templates within 60 s, with a citation on every factual sentence
- Summarizes a 300-page report in under 2 minutes, with key points ranked and each linked to its page
- Translates among four working languages at 2,000 words per minute, with the original shown side by side and terms held to the client's own glossary
- Answers questions across up to 10 million documents within 10 s; sentences without a source are marked unsupported
- Labels every draft as AI-generated, with model version and sources, and routes it to a named reviewer who accepts, edits or rejects it
- Serves 400 staff at once on INTERMEW Headquarters and 40 on a Field kit, through a browser on existing workstations
- Answers inherit the highest marking of their sources, and the assistant declines to draw on compartments the officer does not hold
- Every request, draft, edit, approval and rejection logged to CALAMUS; reviewer edits feed ROUSE tuning only after approval in CANCELEER

SPECIFICATIONS · DESIGN TARGETS

PLATFORM	INTERMEW Headquarters or Field; browser access from existing workstations; no client installation
CAPACITY	400 concurrent staff on Headquarters, 40 on a Field kit; archive of up to 10 million documents
DRAFTING	brief or report section in the force's own template within 60 s; 300-page report summarized in under 2 minutes
TRANSLATION	4 working languages at 2,000 words per minute; client glossary enforced; original text shown beside the translation
ANSWERS	first cited sentence within 3 s, full answer within 10 s; unsupported sentences marked
LABELING	AI-generated label, model version and source list on every draft, kept through every edit and export
REVIEW	a named reviewer per document type; nothing released until the reviewer signs; reviewer and time recorded on the document
MARKINGS AND ACCESS	highest source marking inherited; role and compartment access through HALSBAND; redaction keeps provenance
LOGGING	every request, draft, edit and signature logged to CALAMUS with the model version used

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can demonstrate drafting, summary, translation and cited answers on a synthetic staff archive of 100,000 documents in a sealed lab, with every draft carrying its label and its reviewer.
- A design review covers labeling, review routing and marking inheritance with the client's staff, legal and security officers, and the workflow is handed over in writing.
- A written trial protocol measures citation precision, translation quality rated by the client's own linguists, and drafting time on the client's own documents before acceptance.
- Falcon Accuracy commits that every draft is labeled as AI-generated, that a named human signs before release and that all documents and logs stay inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

UNHOODED serves the headquarters, where racks, power and a network are plentiful. The crew on a tailgate and the mechanic in a motor pool have none of those, and they need the same archive more urgently. HYOID carries INTERMEW Edge on a 15 W module into the vest pouch and the vehicle bracket, so the question asked at the desk can be asked offline in the field, with the same citations and the same log.



CONCEPT VISUALIZATION · HYOID

ALL FIGURES ARE DESIGN TARGETS

SOVEREIGN AI AND PREDICTION · HARDWARE · 04 OF 05

HYOID

HYOID Edge Language Module

The hyoid is the small bone at the root of a falcon's tongue that carries it and gives it movement; HYOID is the small module that gives the operator and the vehicle a voice to ask with and an answer to hear.

INTERMEW EDGE IN A 15 W MODULE. OFFLINE, SPOKEN, CITED.

SUMMARY

HYOID is a rugged 15 W module that runs INTERMEW Edge with no network at all. On MALAR goggles, a BEWIT handset or a vehicle it answers spoken questions, translates speech, writes reports from dictation and guides maintenance from the vehicle's own manuals, citing the page. Every exchange is logged on the module and merged into CALAMUS when a link returns.

WHY FALCON ACCURACY BUILT IT

The operator and the mechanic need answers where there is no network, and a model that only runs in a headquarters rack is no help on a tailgate. HYOID exists so that the force's own language model travels with the crew, in a module small enough for a vest pouch or a vehicle bracket. Falcon Accuracy held it to 15 W so that it runs on the vest, handset and vehicle power the force already carries. The change for the force is a crew that can ask a question, translate a conversation or write a report in its own language, offline, with the source page in hand.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits HYOID to the goggles, handsets, vests, intercoms and vehicle power the force already issues, with a pouch, sleeve or bracket cut to each, and loads the manuals for the vehicles and equipment each unit actually holds.

TRAIN ROUSE tunes INTERMEW Edge inside the client's network on the client's own manuals, phrasebooks, report formats and voice recordings, in its working languages and the dialects of its theater.

SET Allowed tasks, report formats, the languages enabled for each unit, push-to-talk behavior and log retention are set in CANCELEER to the client's doctrine, and the module declines anything outside them.

WORKS WITH

INTERMEW · MALAR · BEWIT · COVERT · JESS · UNHOODED · YARAK · CERE · ROUSE · CANCELEER · CALAMUS

HYOID HYOID Edge Language Module

DESCRIPTION

HYOID weighs 210 g, measures 98 by 64 by 20 mm and draws 15 W at peak and about 5 W in voice use. It runs INTERMEW Edge with a 16,000-token context and holds up to 50,000 pages of the client's manuals, procedures and phrasebooks indexed on 512 GB of encrypted storage. An operator presses to talk through MALAR or a BEWIT handset and hears an answer within 2 s, with the source page shown in the lens or on the handset. Speech-to-speech translation between the four working languages takes under 2 s per phrase. Spoken notes become a report in the force's own format, labeled as AI-generated, for the operator to review and send. In a vehicle it guides maintenance step by step from that vehicle's manual. It runs fully offline, and every exchange is logged.

CAPABILITIES

- Runs INTERMEW Edge offline at 15 W peak and about 5 W in voice use, with no network connection required
- Answers spoken questions through MALAR, a BEWIT handset or a vehicle intercom within 2 s, with the source page shown
- Speech-to-speech translation between the four working languages in under 2 s per phrase, with the text shown on the handset for checking
- Turns spoken notes into a report in the force's own format within 30 s, labeled as AI-generated, for the operator to review and send
- Guides maintenance step by step from up to 50,000 pages of the client's manuals, each step citing its page and figure
- Fits a vest pouch, a BEWIT sleeve or a vehicle bracket, powered by a vest battery, the handset or 12 to 28 V vehicle power
- Model and index updated only from signed media or a ROUSE release approved in CANCELEER; tamper wipe within 1 s
- Every question, answer and report logged on the module and merged into CALAMUS within 60 s of a link returning

SPECIFICATIONS · DESIGN TARGETS

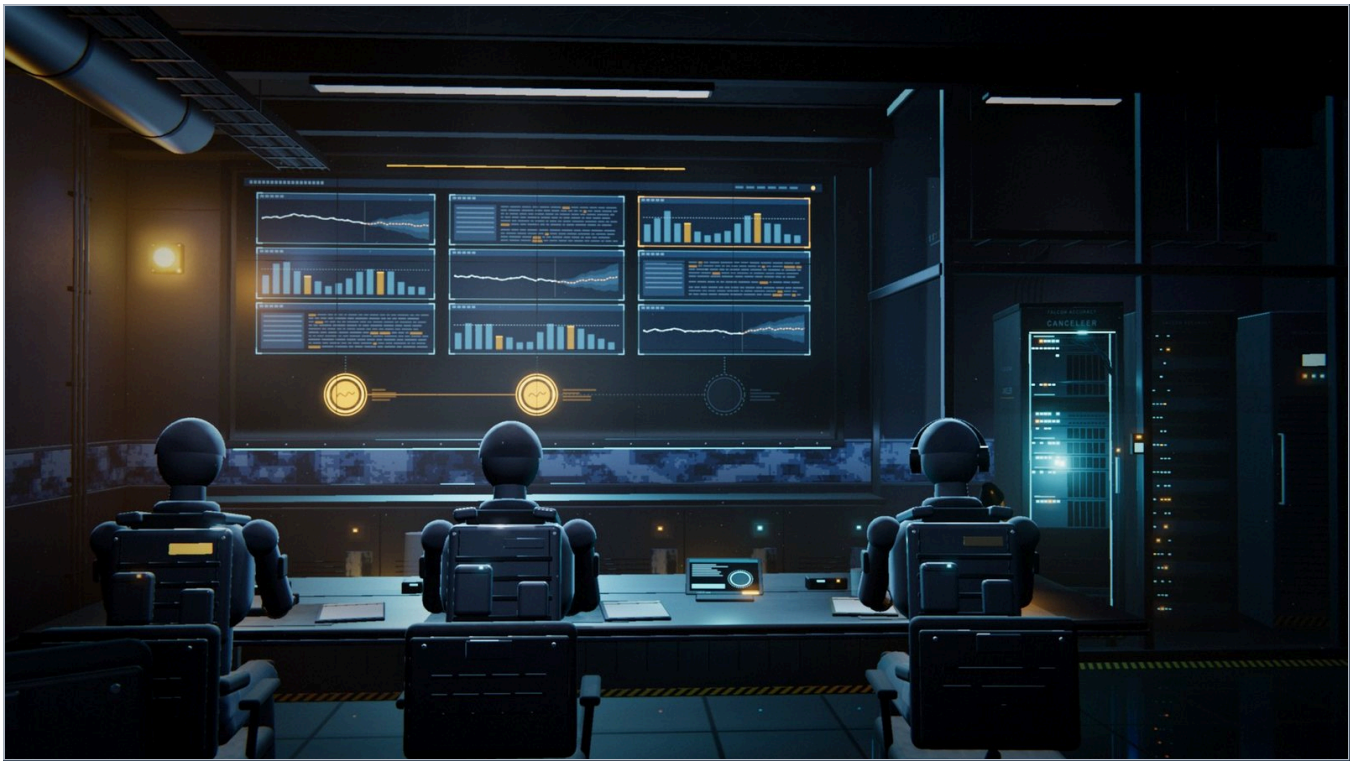
SIZE AND MASS	98 x 64 x 20 mm, 210 g
POWER	15 W peak, about 5 W in voice use; from a vest battery, a BEWIT handset or 12 to 28 V vehicle power; 8 h on an optional 45 Wh pouch battery
COMPUTE	40 TOPS accelerator, 16 GB memory, 512 GB encrypted storage
MODEL	INTERMEW Edge, 3 billion parameters, 16,000-token context; up to 50,000 pages of client documents indexed
LATENCY	spoken answer within 2 s; translated phrase in under 2 s; dictated report drafted within 30 s
LANGUAGES	4 working languages at full depth, such as Arabic, French, English and Spanish; dialect packs from the client's own transcripts
INTERFACES	USB-C to MALAR and BEWIT; vehicle bracket with intercom audio and 12 to 28 V power; JESS for log sync
SECURITY	secure element, boot measured by CERE, AES-256 storage, FIPS 140-3 modules, tamper wipe within 1 s
ENVIRONMENT	IP67; MIL-STD-810H shock and vibration; operates -20 to +55 C; passively cooled
LOGGING	every exchange stored on the module and merged into CALAMUS within 60 s of a link returning

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can demonstrate a 3-billion-parameter model answering spoken questions offline on a 15 W development board in a sealed lab, with cited answers and on-module logging.
- A design review covers the module enclosure, the power budget, the interfaces to MALAR, BEWIT and vehicles, and the update and tamper-wipe paths.
- A written trial protocol measures answer latency, translation quality rated by the client's own linguists, battery endurance and temperature range at acceptance.
- Falcon Accuracy commits that the module runs with no external connection, that every report is labeled as AI-generated for the operator to review, and that every exchange is logged inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

By this point the force runs one model family on racks, kits and hundreds of HYOID modules, and each of them will be retrained many times. Without one place to set policy and approve versions, the models drift apart and no one can say which version answered which question. CANCELEER closes the sector by binding every model to a policy the commander sets, the evidence it passed and the signatures that released it.



CONCEPT VISUALIZATION · CANCELEER

ALL FIGURES ARE DESIGN TARGETS

SOVEREIGN AI AND PREDICTION · SOFTWARE · 05 OF 05

CANCELEER

CANCELEER AI Governance Console

A canceleer is the turn a falcon makes on the wing during its stoop to check and correct its line before it commits; CANCELEER is where the force checks and corrects every model before it reaches operators.

SET WHAT EVERY MODEL MAY DO. APPROVE EVERY VERSION. REVIEW EVERY ANSWER.

SUMMARY

CANCELEER is the one place where commanders, legal advisers and auditors govern every Falcon Accuracy model. They set what each model may do, see its evaluation and red-team results, review the logs and approve each new version before it reaches operators. No model changes without their recorded signatures.

WHY FALCON ACCURACY BUILT IT

A force that fields language and forecasting models needs a commander who decides what they may do, a legal adviser who confirms it is lawful and an auditor who can check it was done, and today those three work from scattered emails and spreadsheets. CANCELEER exists so that policy, evidence and approval sit in one place and bind every model the force runs. Falcon Accuracy built it so that the evaluation results a version passed and the signatures that released it are on record before it serves anyone. The change for the force is AI it can account for, version by version and answer by answer.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits CANCELEER to the identity system, approval chains and review bodies the force already has, and runs it on the PITCH or ROUSE racks already in the client's building.

TRAIN Nothing in CANCELEER is trained; its evaluation sets are written by the client's own staff officers, linguists and legal advisers on the client's theater, documents and languages, and TOMIAL adds red-team cases drawn from the threats the client faces.

SET Policies, signatories, release criteria, audit sample rates and retention are set to the client's doctrine, national law and AI policy, and no criterion can be loosened without the same signatures a release needs.

WORKS WITH

INTERMEW · OSSICLE · UNHOODED · HYOID · ROUSE · TOMIAL · CALAMUS · HALSBAND · LORES · PITCH · ENSEAM

CANCELEER CANCELEER AI Governance Console

DESCRIPTION

CANCELEER runs on the PITCH rack core or the ROUSE rack and governs INTERMEW, OSSICLE, UNHOODED, HYOID and every other Falcon Accuracy model the force runs. A policy editor sets, for each model, role and marking, which tasks are allowed, which topics are refused and which outputs need a named reviewer, and each policy change needs two logged approvals. Every release candidate from ROUSE arrives with its scores on the client's evaluation sets, its TOMIAL red-team findings, its calibration and its accuracy in each working language. The commander, the legal adviser and the model officer each sign before the version reaches operators, and any version rolls back across all connected nodes within 10 minutes. Auditors search every logged query and answer in CALAMUS, review a daily 1 percent sample, and see each flagged answer with its sources.

CAPABILITIES

- Policy editor sets allowed tasks, refused topics, review requirements and markings for each model, role and unit; each change takes two logged approvals
- Release gate requires signatures from a named commander, legal adviser and model officer before any version reaches operators
- Shows each release candidate's accuracy, citation precision, refusal rate, calibration and per-language scores on the client's own evaluation sets
- Shows TOMIAL red-team findings beside the version they apply to, with fixes and retest dates
- Suspends or rolls back any version on every connected rack, kit and HYOID module within 10 minutes; disconnected nodes update when they reconnect
- Audit search across every logged query and answer in CALAMUS, with a daily 1 percent sample routed to named auditors
- Drift and incident board flags falling accuracy, rising refusals or OSSICLE band coverage below target within 24 h
- Every policy, approval, rollback and audit finding logged to CALAMUS; the console acts on no machine and issues no order

SPECIFICATIONS · DESIGN TARGETS

SCOPE	INTERMEW, OSSICLE, UNHOODED, HYOID and every other Falcon Accuracy model in service; up to 200 model versions tracked
POLICY	per model, role, unit and marking; allowed tasks, refused topics, reviewer requirements and retention; two logged approvals per change; in force on connected nodes within 5 minutes
RELEASE GATE	signatures from commander, legal adviser and model officer; evaluation, red-team and calibration evidence attached to each version
EVALUATION	client evaluation sets of up to 10,000 items per model; scores per working language; results shown side by side with the version in service
ROLLBACK	any version suspended or rolled back on all connected nodes within 10 minutes; disconnected nodes update on reconnection
AUDIT	search across all logged queries and answers in CALAMUS within 5 s; daily 1 percent sample to named auditors; findings tracked to closure
MONITORING	drift and incident board refreshed hourly; alerts within 24 h on falling accuracy, rising refusals or forecast coverage below target
ROLES	commander, legal adviser, auditor, model officer and read-only inspector; identity through HALSBAND; every read logged
FORM FACTOR	runs on the PITCH rack core or the ROUSE rack; browser access from existing workstations; no external network path

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can demonstrate the policy editor, the three-signature release gate and a 10-minute rollback on a lab network of one rack, one field kit and two edge modules.
- A design review with the client's commanders, legal advisers and auditors covers roles, signatories, release criteria and audit sampling, and the governance model is handed over in writing.
- A written trial protocol measures policy enforcement, refusal rates and rollback time on the client's own models and evaluation sets before acceptance.
- Falcon Accuracy commits that no model version reaches operators without the client's recorded signatures and that every policy, approval and log stays inside the client's network.

NEXT SECTOR · 14 COMMAND AND DECISION · P. 194

One picture, tested plans, coordinated machines, every decision on record. This closes Sovereign AI and Prediction. Sector 14, Command and Decision, opens on page 194 with PITCH, LORES, SLIP, LEASH and CALAMUS.

SECTOR 14 OF 18

14

COMMAND AND DECISION

ONE PICTURE, TESTED PLANS, COORDINATED MACHINES, EVERY DECISION ON RECORD.

Your headquarters already receives more than it can read and sees more than it can fuse. Sensors arrive on separate displays, reports arrive in a pile, each plan is tested against one assumed enemy response, and 40 aircraft and 20 robots each want an operator of their own. The Command and Decision sector is the part of the Falcon Accuracy system that closes those gaps at staff level. It fuses every feed into one picture in under 1 second, reads the day's reports with a citation on every claim, runs each course of action 10,000 times before dawn, assigns and separates the machines that carry the chosen plan out, and writes every recommendation, approval and order into one signed record. A human decides at each step, and the data stays inside your network.



IN THIS SECTOR · 5 PRODUCTS · PAGES 196 TO 205

PITCH **LORES** **SLIP** **LEASH** **CALAMUS**

Every product in the sector runs on the same three hardware tiers, a hardened rack, a two-case kit for a deployed headquarters and a 1.1 kg pack node, and each is tailored in the same order, fitted to the systems you already run, trained on your own terrain, archive and incident history, and set to your doctrine and law. The sector holds five products. PITCH Neural Decision Core fuses, predicts and recommends. LORES Intelligence Triage Assistant reads and cites. SLIP Course-of-Action Engine tests each plan against an adversary that adapts. LEASH Fleet Coordination Layer turns the chosen plan into assigned, separated and bounded machines. CALAMUS Decision Record binds all of it to its evidence and its author.

IN THIS SECTOR · 5 PRODUCTS



PITCH p. 196

PITCH Neural Decision Core

Every sensor, one picture, threats flagged, the next move predicted.



LORES p. 198

LORES Intelligence Triage Assistant

Reads every report in the network. Answers only with its sources.



SLIP p. 200

SLIP Course-of-Action Engine

Plans tested against an adversary that adapts, then watched live.



LEASH p. 202

LEASH Fleet Coordination Layer

Aircraft, robots and vehicles tasked as one flight, deconflicted every second.



CALAMUS p. 204

CALAMUS Decision Record

Every recommendation, approval and order, bound to its evidence and author.



CONCEPT VISUALIZATION · PITCH

ALL FIGURES ARE DESIGN TARGETS

COMMAND AND DECISION · SOFTWARE · 01 OF 05

PITCH

PITCH Neural Decision Core

The pitch is the height a falcon climbs to before it stoops, the vantage from which it sees the whole field and chooses its moment, so it names the decision core.

EVERY SENSOR, ONE PICTURE, THREATS FLAGGED, THE NEXT MOVE PREDICTED.

SUMMARY

PITCH is the brain of the Falcon Accuracy system. It fuses every feed the force owns into one live picture, flags threats across all of them, predicts what happens next and recommends courses of action with the evidence behind each one. The decision stays with the human.

WHY FALCON ACCURACY BUILT IT

A force that has bought sensors over 20 years sees them on 20 displays, and the watch officer becomes the only fusion engine in the room. PITCH exists so that one picture carries every feed, and so that the first judgment about what matters is made by a model trained on the client's own ground and then checked by a human. The change for the force is that the staff spends its time on the decision instead of the collation, and that every recommendation arrives with its evidence and its confidence stated. Nothing executes without an authorized human.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits PITCH to the form the force needs, from a hardened operations room to a two-case kit in a vehicle to a 1.1 kg node in a pack, and connects the radars, radios, cameras and command systems the force already runs through open adapters.

TRAIN Fusion and prediction models train inside the client's network on the client's own terrain, order of battle, incident history and sensor recordings, with a 30-day baseline on live feeds before acceptance.

SET Escalation ladder, approval thresholds, symbology, alert routing and the operator's language are set to the force's own doctrine, and every setting is versioned in CALAMUS.

WORKS WITH

MALAR · MANTLE · JESS · TIERCEL · HOOD · SCREEN · GYR · CREANCE · LURCHER · FALCONER · LORES · SLIP · LEASH · CALAMUS · LONGWING · RAMAGE · OSSICLE

PITCH PITCH Neural Decision Core

DESCRIPTION

PITCH takes in everything the force senses. Goggles, vests, radios, aircraft, HOOD receivers and SCREEN radars feed it through open adapters. It builds one picture of 50,000 tracks in under 1 s, flags threats across every feed and explains why each was flagged. Prediction models forecast movement corridors 30 to 90 minutes ahead with calibrated confidence, and fuel, water, battery and spare-part needs for 14 days. It proposes ranked courses of action, such as launching TIERCEL, warning MANTLE wearers or dispatching a guard patrol, each with evidence and expected outcome. Nothing executes without an authorized human, and every decision is logged. It runs in a hardened room, a two-case kit, or as PITCH Edge, a 1.1 kg pack node that runs disconnected for 30 days and syncs when a link returns. Models retrain inside the client's network and never leave.

CAPABILITIES

- Fuses every drone, wearable, radar, radio and legacy sensor feed into one picture of 50,000 tracks, refreshed in under 1 s
- Flags threats across every feed within 2 s of detection, with the reason given in plain language
- Predicts movement corridors 30 to 90 minutes ahead with calibrated confidence, refreshed every 5 s
- Forecasts fuel, water, battery and spare-part needs 14 days ahead for each unit
- Ranks courses of action with plain-language evidence and expected outcome, and hands the shortlist to SLIP for wargaming
- Deconflicts airspace and manages fleet energy for up to 12 aircraft per two-case kit through LEASH
- Human in the loop; nothing executes without an authorized decision, and every decision is written to CALAMUS
- Runs disconnected for 30 days in a room, a case or a 1.1 kg pack node; models retrain inside the client's network

SPECIFICATIONS · DESIGN TARGETS

CAPACITY	50,000 live tracks and 200 sensor feeds per core; 16 operators and 4 aircraft per Edge node; 12 aircraft per two-case kit
LATENCY	under 1 s sensor to operator display; threat flagged within 2 s of detection; 5 s prediction refresh
ADAPTERS	open interfaces for the force's existing radars, radios, cameras and command systems; a new feed type is mapped in under 5 working days
BUILT IN	airspace deconfliction, fleet energy management, 14-day fuel, water, battery and spare-part forecast
FORM FACTOR	rack core, 4U, 1.2 kW; two-case kit, 42 kg, 850 W; PITCH Edge 1.1 kg, 40 TOPS, 18 W, passively cooled
SYNC	Edge nodes run disconnected for 30 days and merge their tracks and logs within 60 s of a link returning
SECURITY	zero-trust access, hardware security module, FIPS 140-3 modules, AES-256 at rest and in transit, tamper wipe under 1 s
ENVIRONMENT	MIL-STD-810H shock, vibration and temperature; operates -20 to +50 C

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can walk a client's staff through the PITCH design in a two-day review, with the fusion, prediction and recommendation pipeline laid out block by block and every data path shown.
- A simulation on synthetic sensor feeds can show the 50,000-track picture, the 2 s threat flag and the 5 s prediction refresh running on the two-case kit's hardware class.
- A written trial protocol defines how the sub-1 s latency, the calibration of the confidence figures and the 30-day disconnected run are measured at acceptance.
- Falcon Accuracy commits in writing that training data, models and logs stay inside the client's network, that a human authorizes every action and that every decision is logged.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

PITCH fuses what the force senses, and sensors describe the present. Half of what a staff knows arrives instead as text, such as patrol reports, JESS transcripts, documents found on an objective and open sources, and none of it is a track. LORES is the reader for that half. It extracts units, places, times and stated intentions into the same picture PITCH holds, with every claim cited to its passage, so the estimate the staff plans against is built from both what was seen and what was said.



CONCEPT VISUALIZATION · LORES

ALL FIGURES ARE DESIGN TARGETS

COMMAND AND DECISION · SOFTWARE · 02 OF 05

LORES

LORES Intelligence Triage Assistant

The lores are the patches between a falcon's eye and its beak, feathered dark to cut the glare so the eye sees the quarry and nothing else; LORES cuts the glare from a thousand pages so the analyst sees the one line that matters.

READS EVERY REPORT IN THE NETWORK. ANSWERS ONLY WITH ITS SOURCES.

SUMMARY

LORES is a reading assistant for the intelligence staff, built on language models that run inside the client's network. It ingests reports, transcripts, documents and imagery captions, ranks what is new and relevant, and answers the analyst's questions with a citation on every claim. An analyst approves anything that becomes a fact in PITCH.

WHY FALCON ACCURACY BUILT IT

A deployed intelligence cell receives more text in a day than it can read in a week, and the item that matters sits in the middle of the pile. LORES exists so that machines do the reading and the analyst does the judging, with every machine claim traceable to a passage within seconds. Because the models run inside the client's network, the archive and the questions asked of it never leave the headquarters. The change for the force is that a two-person cell triages a 2,000-item day in the first hour and spends the rest of it on the 20 items that count.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits LORES to the report formats, message systems, document stores and marking schemes the staff already uses, through import adapters, and to the rack or vehicle space available, with the two-case kit for a deployed headquarters.

TRAIN The models are adapted inside the client's network on the client's own archive of reports, transcripts and glossaries, in its working languages and the dialects recorded in its theater, and the ranking model learns from 30 days of analyst approvals and rejections before acceptance.

SET Priority questions, marking rules, retention periods, compartments and the approval chain are set to the client's intelligence doctrine and law, and the assistant declines to answer outside the compartments the analyst holds.

WORKS WITH

PITCH · JESS · TIERCEL · HOOD · MALAR · SLIP · CALAMUS · INTERMEW

LORES LORES Intelligence Triage Assistant

DESCRIPTION

LORES runs on a rack or a two-case kit and never calls outside the network. It ingests 20,000 pages per hour of reports, JESS transcripts, scanned documents, open-source text and TIERCEL detection captions, and extracts units, places, times, equipment and stated intentions into a structured store. Each new item is scored against the commander's priority questions and the live picture, so the top 20 items of a 2,000-item day sit at the top of the display within 5 minutes of arrival. An analyst asks in plain language and receives an answer within 10 seconds, with every sentence linked to the passage that supports it, and any sentence without a source is marked unsupported. Answers inherit the highest marking of their sources. Nothing enters PITCH as a fact until an analyst approves it, and every approval is logged.

CAPABILITIES

- Ingests 20,000 pages per hour of reports, transcripts, scanned documents and open-source text, with OCR at 98 percent character accuracy on clean print
- Extracts units, places, times, equipment and stated intentions into a structured store linked to the PITCH map within 60 s of arrival
- Ranks every new item against the commander's priority questions; the day's top 20 items surface within 5 minutes of arrival
- Answers plain-language questions within 10 s, every sentence cited to its source passage, unsupported sentences marked in gray
- Works in the client's languages with offline translation, and shows the source in its original language beside the translation
- Flags contradictions between sources and changes to a previously accepted fact, with both passages shown side by side
- Language models run on 2 to 8 accelerators inside the client's network, with no external connection and updates by signed media only
- Analyst approval before any item becomes a PITCH fact; every question, answer and approval logged to CALAMUS

SPECIFICATIONS · DESIGN TARGETS

MODELS	8 billion parameter triage model and 70 billion parameter analysis model, both running on the client's own hardware
COMPUTE	2 accelerators for the triage model, 8 for the analysis model; the two-case kit runs the triage model at 600 W
INGESTION	20,000 pages per hour of text and scans; JESS voice transcripts; TIERCEL and PITCH detection captions; open-source text through a one-way import gateway
ANSWER LATENCY	first cited sentence within 3 s, full answer within 10 s on a 5-million-document store
CITATIONS	every sentence linked to its passage, page and marking; unsupported sentences marked; source shown in the original language
LANGUAGES	the client's working languages plus the languages recorded in the theater, offline translation, dialect packs trained on the client's own transcripts
MARKINGS	each answer inherits the highest marking of its sources; role-based access by compartment; redaction with provenance kept
LOGGING	every query, answer, citation and approval logged to CALAMUS with the model version used
FORM FACTOR AND SECURITY	rack 4U or two-case kit, 42 kg; zero-trust access, FIPS 140-3 modules, AES-256 at rest; no external network path; MIL-STD-810H for the kit

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can demonstrate the full retrieval and citation pipeline on a synthetic corpus of 100,000 documents in a sealed lab network, with every answer traced to its passages.
- A design review covers model choice, accelerator sizing, ingestion adapters and the no-external-path architecture, with the data-flow diagram handed to the client's security staff.
- A written trial protocol measures citation precision, unsupported-sentence marking and the 10 s answer latency on the client's own documents, inside the client's network.
- Falcon Accuracy commits that no document, query or model weight leaves the client's network, that updates arrive only on signed media, and that an analyst approves every fact.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

With the picture fused by PITCH and the estimate read and cited by LORES, the staff knows what is in front of it. The next gap is what to do about it, and a plan tested against one assumed enemy response is a guess with a map. SLIP takes the PITCH shortlist of courses of action and the approved LORES estimate as its starting state and runs each course 10,000 times against an adversary model that moves, observes and jams. The pair turns an intelligence estimate into a measured spread of outcomes before the commander chooses.



CONCEPT VISUALIZATION · SLIP

ALL FIGURES ARE DESIGN TARGETS

COMMAND AND DECISION · SOFTWARE · 03 OF 05

SLIP

SLIP Course-of-Action Engine

The slip is the moment a falconer releases the hawk at quarry, chosen only when the flight is judged right; SLIP is the engine that tests every course of action before the commander releases one.

PLANS TESTED AGAINST AN ADVERSARY THAT ADAPTS, THEN WATCHED LIVE.

SUMMARY

SLIP is the planning and wargame engine of the command sector. It builds courses of action from the PITCH picture and the LORES estimate, runs each one 10,000 times against an adversary model that maneuvers, observes and jams, and shows the commander where each plan breaks and why. Once a plan is chosen, SLIP tracks it live and warns when a decision point is close.

WHY FALCON ACCURACY BUILT IT

A staff that plans by hand tests one plan against one assumed enemy, and the first surprise arrives after the force has moved. SLIP exists so that 4 plans meet 10,000 varied adversary responses before dawn, and so that the commander sees the spread of outcomes rather than a single estimate. Because it watches the chosen plan against the live picture, the decision point is announced before it arrives instead of recognized after. The commander chooses, and the engine shows the cost of each choice.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits SLIP to the planning table, laptops and map data the staff already uses, runs it on the PITCH hardware the force already has, and exports orders in the force's own format.

TRAIN The adversary and mobility models train inside the client's network on the client's incident history, terrain, weather records and the estimates its own analysts approved in LORES.

SET Planning steps, scoring criteria, decision-point conventions, order templates and the planners' language are set to the force's own planning doctrine, and the commander's approval is required before any plan leaves the engine.

WORKS WITH

PITCH · LORES · LEASH · CALAMUS · CREANCE · TIERCEL · JESS

SLIP SLIP Course-of-Action Engine

DESCRIPTION

SLIP turns the planning table into an engine. It takes the terrain twin, the PITCH picture and the adversary estimate from LORES, and lets planners sketch up to 6 courses of action as routes, timings, tasks and sensor coverage. Each course runs 10,000 times in under 20 minutes on the two-case kit against an adversary model that moves, observes, jams and reinforces, with weather, fuel, radio coverage, detection ranges and casualty evacuation time in every run. The display shows where each plan breaks, how often, and which assumption caused it. SLIP writes the synchronization matrix and decision points, each branch trigger stated as a measurable event. In execution it checks the plan against the PITCH picture every 5 s and warns the commander 15 minutes before a trigger is reached. Every assumption, run and choice is logged to CALAMUS.

CAPABILITIES

- Builds up to 6 courses of action on a 1 m terrain twin from routes, timings, tasks and sensor coverage drawn by the planner
- Runs each course 10,000 times in under 20 minutes on the two-case kit against an adversary model that moves, observes, jams and reinforces
- Models weather, fuel, battery state, radio coverage, detection ranges and casualty evacuation time in every run
- Scores courses on the commander's own criteria, such as time on objective, exposure to observation and evacuation time, with the spread shown rather than a single mean
- Writes the synchronization matrix, decision points and branch triggers as measurable events, exported in the force's own order format
- Tracks the chosen plan against the PITCH picture every 5 s and warns 15 minutes before a decision point is reached
- Adversary model trained on the client's own incident history and the approved LORES estimate; planners can edit any assumption and rerun in 2 minutes
- A human chooses the course of action; every assumption, run, score and choice is logged to CALAMUS

SPECIFICATIONS · DESIGN TARGETS

COURSES OF ACTION	up to 6 compared at once, each with up to 200 friendly and 500 adversary entities
RUNS	10,000 stochastic runs per course in under 20 minutes on the two-case kit; under 2 minutes on the rack core
TERRAIN TWIN	1 m terrain and imagery from TIERCEL mapping and the client's own map data; line of sight, radio propagation and mobility modeled; shared with CREANCE
MODELED FACTORS	weather, fuel and battery state, JESS and legacy radio coverage, sensor detection ranges, airspace and route conflicts, casualty evacuation time
ADVERSARY MODEL	learned from the client's incident history and the approved LORES estimate; 3 posture settings from cautious to assertive; every parameter visible and editable
OUTPUTS	synchronization matrix, decision points, branch triggers, risk register and an order skeleton in the force's own format, exported within 5 minutes
LIVE TRACKING	plan compared with the PITCH picture every 5 s; warning 15 minutes before a trigger is reached; one branch replanned in under 3 minutes
FORM FACTOR	runs on the PITCH rack core or two-case kit; a 65 inch planning table display or the planners' own laptops; 8 planners at once
SECURITY AND LOGGING	the same zero-trust access and FIPS 140-3 modules as PITCH; every run and choice logged to CALAMUS

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can demonstrate the course-of-action builder and the 10,000-run comparison on a synthetic theater in a sealed lab, with the run spread, the break points and their causes shown on the planning display.
- A design review covers the adversary model, the modeled factors and their sources, and the limits of what the engine can and cannot predict, stated in writing.
- A written trial protocol compares SLIP's break-point predictions with the outcomes of the client's own recorded exercises on CREANCE before acceptance.
- Falcon Accuracy commits that the engine recommends and the commander decides, that every assumption is visible and editable, and that all runs and choices are logged inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

A plan that survives the wargame still has to be flown and driven by 40 aircraft and 20 robots that share one airspace and a few roads. SLIP writes the tasks and the timings, but without a layer that assigns, separates and bounds the machines, the plan dissolves into 60 operators talking over each other. LEASH is that layer. It takes the approved plan from SLIP and the live picture from PITCH, proposes an assignment for each task within 5 seconds, and keeps every machine inside an envelope the commander set, so the execution stays as disciplined as the plan.



CONCEPT VISUALIZATION · LEASH

ALL FIGURES ARE DESIGN TARGETS

COMMAND AND DECISION · SOFTWARE · 04 OF 05

LEASH

LEASH Fleet Coordination Layer

The leash runs from the falconer's fist through the swivel to the jesses and holds the hawk under control until it is sent; LEASH holds every aircraft, robot and vehicle to its assignment and its envelope.

AIRCRAFT, ROBOTS AND VEHICLES TASKED AS ONE FLIGHT, DECONFLICTED EVERY SECOND.

SUMMARY

LEASH is the coordination layer between the approved plan and the machines that carry it out. It turns tasks from PITCH and SLIP into assignments for TIERCEL aircraft, GYR mules, LURCHER and FALCONER robots and crewed vehicles, keeps them apart in the air and on the roads, manages their energy and holds every machine inside an envelope the commander set. One operator supervises many machines, and a human approves every task.

WHY FALCON ACCURACY BUILT IT

A force with 40 aircraft and 20 robots has 60 things sharing the same airspace and roads, and today each one has its own operator and its own display. LEASH exists so that the approved plan is carried out by machines that are assigned, separated and kept inside their limits by one layer, supervised by a handful of operators instead of sixty. Because every machine carries an envelope and stops at its edge, autonomy never outruns the commander's intent. The change for the force is a flight of 12 aircraft and a lane of 20 robots run by 2 operators through a 12 hour watch.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits LEASH to the aircraft, boats, robots and vehicles the force already operates through adapters and to the airspace control positions it already staffs, and runs it on the PITCH hardware the force already has.

TRAIN Energy, mobility and flight-time models train on the client's own machines, climate and terrain, and the assignment model learns from 30 days of the operators' own accepted and rejected proposals.

SET Separation minima, envelopes, lost-link behaviors, approval chains and span-of-control limits are set to the force's airspace and robot doctrine and national rules, and no setting can be loosened without a logged approval.

WORKS WITH

PITCH · SLIP · TIERCEL · GYR · LURCHER · FALCONER · JESS · HOOD · CALAMUS

LEASH LEASH Fleet Coordination Layer

DESCRIPTION

LEASH runs on the PITCH core and schedules up to 500 machines per instance. It receives approved tasks, matches them to the aircraft, robots and vehicles, and proposes an assignment within 5 s for the operator to accept. Airspace corridors and blocks refresh every second, with 30 meters of vertical and 100 meters of lateral separation between aircraft, and ground routes are deconflicted with convoys and crewed vehicles. Every machine carries a permission envelope of geofence, altitude band, time window and lost-link behavior, and a machine that reaches the edge of its envelope stops and asks. LEASH schedules battery swaps and charging on GYR pads so that 8 of a 12-aircraft TIERCEL flight stay airborne through a 12 hour watch. One operator supervises 12 aircraft or 20 ground robots, and every task and approval is logged to CALAMUS.

CAPABILITIES

- Schedules up to 500 aircraft, robots and vehicles per instance and proposes an assignment for each approved task within 5 s
- Airspace corridors and blocks refreshed every 1 s with 30 m vertical and 100 m lateral separation between aircraft; conflicts shown 60 s ahead
- Ground routes deconflicted among GYR, LURCHER, FALCONER, convoys and crewed vehicles, with crossing points timed to 10 s
- Permission envelope per machine, with geofence, altitude band, time window and lost-link behavior; a machine at its edge stops and asks
- Energy management schedules battery swaps and GYR pad charging so that 8 of a 12-aircraft flight stay airborne through a 12 h watch
- One operator supervises 12 aircraft or 20 ground robots; handover between operators completes in under 10 s with the full task list
- Civil and friendly aircraft notices entered by the airspace officer appear as blocks within 5 s; launch and recovery corridors for the force's own aircraft are reserved only after human approval
- Human approval for every task; every assignment, envelope change and approval logged to CALAMUS

SPECIFICATIONS · DESIGN TARGETS

CAPACITY	500 machines per instance; 12 aircraft or 20 ground robots per operator position; 40 operator positions per rack core
DECONFLICTION	1 s refresh; 30 m vertical and 100 m lateral separation; conflict warning 60 s ahead; ground crossing points timed to 10 s
ENVELOPES	geofence, altitude band, speed limit, time window, sensor and radio permissions, lost-link behavior; changes take effect within 2 s and are logged
TASKING	plain-language or map-drawn tasks from PITCH, SLIP or the operator; assignment proposed within 5 s; machine acknowledgment within 3 s over JESS
ENERGY	battery and fuel state of every machine; swap and charging schedule on GYR pads and vehicle chargers; 8 of 12 TIERCEL aircraft airborne through a 12 h watch
INTERFACES	TIERCEL, GYR, LURCHER, FALCONER and RAKE native; open adapter for the force's existing aircraft, boats and robots, mapped in under 10 working days
LOST LINK	each machine holds its last approved envelope and returns to a named point; LEASH shows the predicted position for 30 minutes
FORM FACTOR	runs on the PITCH rack core, two-case kit or Edge node; an Edge node coordinates 4 aircraft and 6 ground robots
SECURITY AND LOGGING	zero-trust access, signed task messages, AES-256 over JESS; every task and approval logged to CALAMUS

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can demonstrate LEASH coordinating 60 simulated aircraft and 40 simulated ground robots in a sealed lab, with the 1 s deconfliction refresh, the envelopes and the stop-and-ask behavior shown live.
- A design review covers the envelope model, the lost-link logic and the handover between operators, with the failure modes listed in writing.
- A written trial protocol measures separation, assignment latency, envelope enforcement and operator span of control on the client's own range with TIERCEL and GYR units.
- Falcon Accuracy commits that a human approves every task, that no machine acts outside an approved envelope, and that every assignment is logged inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

PITCH recommended, LORES cited, SLIP scored and LEASH assigned, and each step produced a decision a human made on evidence a model presented. That trail is what a commander, a legal adviser and a trainer will each ask for later, and if it lives in four separate logs it is already half lost. CALAMUS closes the sector by binding every detection, recommendation, approval and task from the four products above into one signed chain. LEASH and CALAMUS together mean that every machine task carries the name of the person who approved it, which is what makes supervised autonomy defensible.



CONCEPT VISUALIZATION · CALAMUS

ALL FIGURES ARE DESIGN TARGETS

COMMAND AND DECISION · SOFTWARE · 05 OF 05

CALAMUS

CALAMUS Decision Record

The calamus is the hollow base of a feather, the quill that became the pen; CALAMUS writes every recommendation, approval and order into one signed record.

EVERY RECOMMENDATION, APPROVAL AND ORDER, BOUND TO ITS EVIDENCE AND AUTHOR.

SUMMARY

CALAMUS is the tamper-evident record behind every Falcon Accuracy system. It binds each sensor detection, model recommendation, human approval and machine task into one signed chain, so that the commander, the legal adviser and the trainer can replay any minute of an operation and see who decided what on which evidence. It runs inside the client's network and is readable only by the roles the client sets.

WHY FALCON ACCURACY BUILT IT

Every Falcon Accuracy product promises that a human decides and that the decision is logged, and a promise like that needs a record that a court, a commander and a trainer all trust. CALAMUS exists so that the log is one chain rather than ten files, signed at the moment of writing and readable long after the operation ends. Because it records the model version behind every recommendation, it also governs the models themselves. The change for the force is that the question of who knew what and decided when is answered in minutes, from evidence rather than from memory.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits CALAMUS to the identity system, document formats and review bodies the force already has, and runs it on the PITCH hardware already in place, with the witness appliance where the client's rules call for a second custodian.

TRAIN Nothing in CALAMUS is trained; its explanation cards are generated from the models the client trained in PITCH, LORES, SLIP and LEASH, in the client's own languages and terms.

SET Retention periods, compartments, redaction rules, review roles and export formats are set to the client's law and doctrine, and no entry can be deleted outside the retention rule without two logged approvals.

WORKS WITH

PITCH · LORES · SLIP · LEASH · SCREEN · HOOD · CREANCE · JESS · TIERCEL · BECK

DESCRIPTION

CALAMUS is the append-only ledger every Falcon Accuracy product writes to. Each entry binds the evidence hash, the model version and its confidence, the recommendation, who decided and in what role, the order that went out and the result reported back. A hardware security module signs each entry and chains it to the last, so an altered entry is detected at the next 10-minute verification sweep. The rack core accepts 1 million entries per day and an Edge node 50,000, and nodes that ran disconnected merge their chains within 60 seconds of a link returning. A review officer replays any period at 1x to 60x on the PITCH display, with the explanation card behind each recommendation. Exports for legal review, after-action review in CREANCE and model governance take the client's own formats, and retention follows the client's law.

CAPABILITIES

- Binds evidence hash, model version, confidence, recommendation, decider, order and reported result into one signed entry
- Hash-chained and signed by a hardware security module; an altered or missing entry is detected at the next verification sweep, run every 10 minutes
- Accepts 1 million entries per day on the rack core and 50,000 per day on an Edge node; disconnected chains merge within 60 s of a link returning
- Replays any period at 1x to 60x on the PITCH display, with an explanation card for each recommendation and the picture as the decider saw it
- Records model retraining events with the data set hash and version, so every recommendation is traceable to the model that made it
- Role-based reading by compartment; redaction keeps a provenance stub so a reviewer sees that something was removed, by whom and under which rule
- Exports for legal review, CREANCE after-action review and model governance in the client's own formats within 5 minutes; retention set to the client's law

SPECIFICATIONS · DESIGN TARGETS

THROUGHPUT	1 million entries per day per rack core; 50,000 per day per Edge node; 2,000 entries per second burst for 60 s
INTEGRITY	hardware security module signature per entry, hash chain, verification sweep every 10 minutes, witness copy on a second node
ENTRY CONTENTS	evidence hash, sensor and model versions, confidence, recommendation, decider identity and role, approval time, order, result, picture snapshot reference
REPLAY	any period at 1x to 60x on the PITCH display; picture as seen at the time; explanation card per recommendation; search by place, unit, time or decider
SYNC	disconnected Edge chains merge within 60 s of a link returning; conflicting entries are kept, not overwritten, and shown side by side
ACCESS AND REDACTION	role and compartment based; redaction leaves a provenance stub; every read is itself logged
EXPORTS	legal review, after-action review for CREANCE, model governance report, in the client's own formats within 5 minutes; retention and deletion rules set to the client's law
FORM FACTOR AND SECURITY	runs on the PITCH rack core, two-case kit and Edge node; optional sealed 1U witness appliance, 9 kg, 60 W; FIPS 140-3 modules, AES-256 at rest

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can demonstrate the signed chain, the tamper detection and the disconnected merge on a lab network of three nodes, with an altered entry found at the next sweep.
- A design review covers the entry schema, the key custody model and the witness appliance with the client's legal and security staff, and the schema is handed over in writing.
- A written trial protocol measures throughput, merge time, replay fidelity and export time at acceptance, on the client's own hardware.
- Falcon Accuracy commits that the record stays inside the client's network, that every read is logged, and that retention and deletion follow the client's law and no one else's.

NEXT SECTOR · 15 PERIMETER AND BASE SECURITY · P. 206

Sense the wire, cover the gaps, control the gate, answer in minutes. This closes Command and Decision. Sector 15, Perimeter and Base Security, opens on page 206 with SCREEN, BLOCK, HALLUX, RAKE and FORMEL.

15

PERIMETER AND BASE SECURITY

SENSE THE WIRE, COVER THE GAPS, CONTROL THE GATE, ANSWER IN MINUTES.

A base is attacked where it is weakest, and the weak points are known in advance. Dead ground the fixed cameras cannot see. The gate, which opens 400 times a day. The 20 minutes between an alarm at the wire and a guard arriving on foot. The watch officer who holds 300 alarms a night and has stopped looking at them. Falcon Accuracy builds base security as five layers that share one picture. The fixed layer senses the wire and the ground beneath it. A mobile layer stands a sensor mast in 20 minutes wherever a survey finds a gap. The gate layer inspects every vehicle in 90 seconds and keeps the guard behind cover. The response layer puts a camera over the alarm point within 2 minutes. The command layer gives the watch officer a ranked queue, a dispatch button and a log.



IN THIS SECTOR · 5 PRODUCTS · PAGES 208 TO 217

SCREEN BLOCK **HALLUX** RAKE **FORMEL**

Every layer runs its detection on the device, so the picture exists when the network does not, and every track feeds PITCH when it does. Nuisance alarms are the enemy of a guard force, so each site's classifier trains on that site's wildlife, weather and traffic during a two-week baseline before it is trusted with a single dispatch. A human watch officer decides every response, every decision is logged with the evidence that drove it, and all site data stays inside the client's network. The sector holds five products. SCREEN Perimeter Security System senses the fence and the buried line. BLOCK Sensor Tower raises radar, thermal and acoustic sensing on an 8-meter mast in 20 minutes. HALLUX Vehicle Inspection Lane inspects and admits vehicles at the gate. RAKE Perimeter Patrol Drone flies the fence line and holds over the alarm. FORMEL Security Operations Console puts all of it in front of one watch officer.

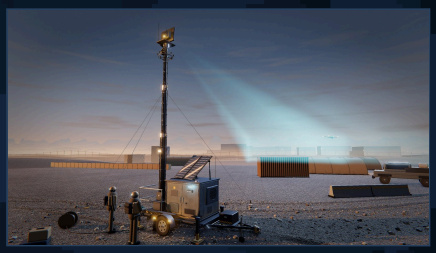
IN THIS SECTOR · 5 PRODUCTS



SCREEN p. 208

SCREEN Perimeter Security System

A fence that knows wind from wire cutters.



BLOCK p. 210

BLOCK Sensor Tower

Radar, thermal and ears on an 8-meter mast, standing in 20 minutes.



HALLUX p. 212

HALLUX Vehicle Inspection Lane

Every vehicle inspected in 90 seconds, the guard behind cover.



RAKE p. 214

RAKE Perimeter Patrol Drone

Over the alarm in 2 minutes, holding until the guards arrive.



FORMEL p. 216

FORMEL Security Operations Console

Every alarm ranked, every dispatch in 20 seconds, every decision logged.



CONCEPT VISUALIZATION · SCREEN

ALL FIGURES ARE DESIGN TARGETS

PERIMETER AND BASE SECURITY · HARDWARE · 01 OF 05

SCREEN

SCREEN Perimeter Security System

The screen perch is the high perch with a cloth drop beneath it on which a hawk is kept safe between flights; in military usage a screen is the security force that watches an approach and reports, so it is base security.

A FENCE THAT KNOWS WIND FROM WIRE CUTTERS.

SUMMARY

SCREEN wraps a base, airfield or critical site in layered sensing, from fence sensors and buried fiber to radar and thermal cameras. One site-trained model holds nuisance alarms below one per kilometer per day, and every confirmed alarm reaches the watch officer with a track and a thermal clip attached.

WHY FALCON ACCURACY BUILT IT

A perimeter fails in two ways, and the second is more common. An intruder cuts or climbs the wire, or the guard force stops believing the alarms because wind, animals and road traffic set them off 50 times a night. Falcon Accuracy built SCREEN to make both failures rare, with fence and buried sensing that place a cut or a footstep within 3 meters and a classifier trained on that site's own nuisance sources before it is allowed to wake a guard. The force gets a perimeter whose alarms mean something, a radar track on every approach out to 6 kilometers, and a thermal picture of the intruder before the first guard moves.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits sensor zones to each site's fence lines, gates and dead ground after an on-site survey, mounts the fence cable on the client's existing fabric and posts, and connects the site's existing cameras and access control through open adapters.

TRAIN The classifier trains on that site's wildlife, weather and traffic during a two-week baseline, and the thermal detector trains on the vehicles and clothing seen in the client's theater across its seasons.

SET Alarm rules, zone priorities, camera presets and response sequences are set to the guard force's own procedures and language, and the watch officer approves every change to a threshold.

WORKS WITH

BLOCK · HALLUX · RAKE · FORMEL · PITCH · HOOD · JESS

SCREEN SCREEN Perimeter Security System

DESCRIPTION

SCREEN protects bases, airfields and depots in layers. Fence sensors localize cutting and climbing to 3 meters, and at permanent sites buried fiber hears footsteps, digging and vehicles along 40 kilometers of line, within 10 meters. Radar tracks a person at 3 kilometers and a vehicle at 6, and in air mode a small quadcopter at 3 kilometers; each track slews the nearest thermal camera within 2 seconds. A two-week baseline teaches the classifier the site, road traffic from an approach and animals from people, so nuisance alarms fall below one per kilometer per day. Tracks feed PITCH and FORMEL, airborne contacts go to STANNEL, and a confirmed alarm launches RAKE. Radar and camera nodes run on solar with 72 hours of reserve and need no power or data trenching. An expeditionary kit stands a 2-kilometer perimeter in 48 hours.

CAPABILITIES

- Fence cut and climb localized to a 3 m zone within 2 s of the event
- Buried fiber hears footsteps, digging and vehicles over 40 km of line, placed within 10 m
- Radar tracks people at 3 km, vehicles at 6 km and small drones at 3 km, 360 degrees each second
- Every radar track slews the nearest thermal camera within 2 s and attaches a 10 s clip to the alarm
- Site-trained classifier holds nuisance alarms below 1 per km per day after a 14-day baseline
- Solar nodes with 72 h reserve and an encrypted mesh need no power or data trenching
- Confirmed alarms cue RAKE, feed FORMEL and PITCH, and hand air contacts to STANNEL
- Expeditionary kit stands a 2 km perimeter in 48 h with a crew of 6

SPECIFICATIONS · DESIGN TARGETS

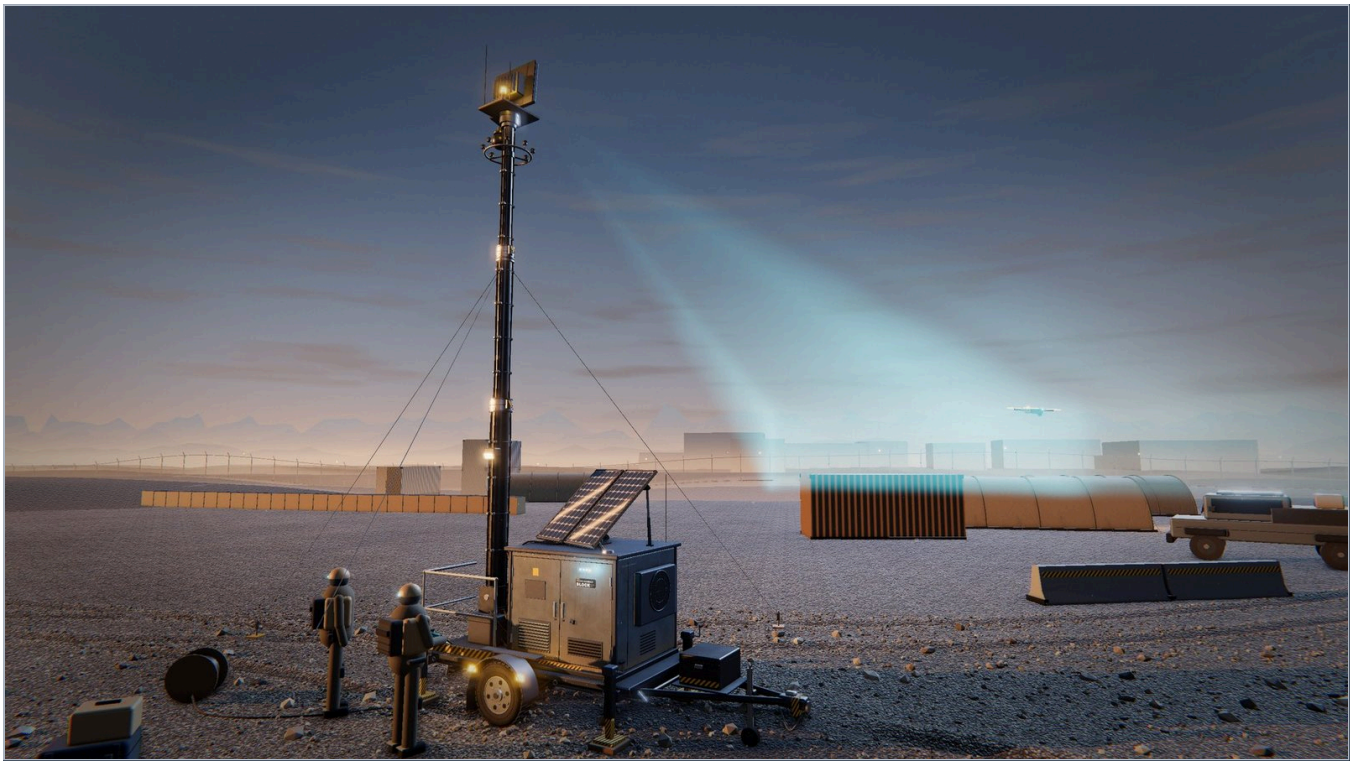
RADAR	X-band ground surveillance, 3 km person, 6 km vehicle, 360 degree scan each second; air mode detects a small quadcopter at 3 km
FENCE SENSING	fiber and accelerometer cable on the fence fabric, 3 m localization, cut and climb classified within 2 s
BURIED SENSING	buried fiber to 40 km at permanent sites, footsteps heard 5 m from the line, digging and vehicles, 10 m localization
CAMERAS	pan-tilt 640 x 512 thermal and 4K low-light, person detection to 2 km, auto-slew from radar within 2 s
NUISANCE ALARMS	under 1 per km per day after a 14-day baseline; classifier retrains on site every 30 days
POWER AND BUILD	radar and camera nodes on solar with 72 h reserve, 90 W peak per node, encrypted mesh, no power or data trenching
CAPACITY	400 fence zones, 60 radar and camera nodes and 40 km of buried fiber per site controller; 2 controllers in hot standby
INTEGRATION	tracks to PITCH and FORMEL within 1 s; cue to RAKE and STANNEL; open adapters for the site's existing cameras and access control
EXPEDITIONARY KIT	2 km of fence sensing, 4 radar and camera nodes and a site controller in 6 cases; 2 km perimeter standing in 48 h
ENVIRONMENT	MIL-STD-810H, IP67, -32 to +55 C; nodes rated to 160 km/h wind

WHAT WE CAN VOUCH FOR TODAY

- A radar and camera coverage simulation over the client's own site survey, with dead ground mapped to 1 m, delivered before any hardware is specified.
- A design review of the fence sensing layout against the client's fence fabric, post spacing and gates, with a written zone plan.
- A bench test of fence cut and climb localization on a 100 m test section at the client's chosen site, with results measured against the 3 m target.
- A written acceptance trial protocol with pass and fail thresholds for every figure on this sheet, including the 14-day nuisance alarm count.
- All baseline recordings, site models and alarm logs stay inside the client's network, and retraining runs on the site controller.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

SCREEN assumes a fence to sense and a survey that found every piece of dead ground. An expeditionary site has neither on its first night, and a permanent site grows a new blind spot every time a container stack or a berm goes up. BLOCK takes SCREEN's radar, thermal camera and classifier off the fixed posts and puts them on a mast that two guards raise in 20 minutes, so the gap is covered the same night it appears. Each tower joins the SCREEN mesh as one more node, and its tracks land in the same picture.



CONCEPT VISUALIZATION · BLOCK

ALL FIGURES ARE DESIGN TARGETS

PERIMETER AND BASE SECURITY · HARDWARE · 02 OF 05

BLOCK

BLOCK Sensor Tower

The block is the solid stand on which a falcon sits in the weathering yard, watching the ground around it; BLOCK is the mast that stands watch over the ground around a base.

RADAR, THERMAL AND EARS ON AN 8-METER MAST, STANDING IN 20 MINUTES.

SUMMARY

BLOCK is a trailer or pallet sensor tower that two guards raise in 20 minutes. Its 8-meter mast carries ground and air radar, a thermal and low-light camera, an acoustic array and a drone-link receiver, with the SCREEN classifier running on the tower itself. It covers dead ground, new sites and temporary camps that the fixed perimeter cannot reach.

WHY FALCON ACCURACY BUILT IT

A fixed perimeter is only as good as the survey that placed it, and sites change faster than surveys. A forward site stands up in a day with no fence, a depot stacks containers that blind a camera, and an airfield opens a new apron. Falcon Accuracy built BLOCK so the sensing SCREEN gives a permanent site can be stood anywhere in 20 minutes by the guards already on duty, without an engineer or a crane. The force gains a 3-kilometer radar bubble and a thermal picture over any gap the same night it appears, and each tower joins the base picture as one more node.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits BLOCK to the trailers, pallets, hitches and vehicle power the force already uses, mounts the force's existing cameras or radios on the spare head rails, and matches the mast height to the client's airfield limits.

TRAIN The classifier and the acoustic library train on the client's theater, including its vehicles, weather, wildlife and the engine and shot signatures recorded there, with a 7-day baseline at each new position.

SET Alarm thresholds, radar zones, camera presets and the power plan are set to the guard force's procedures, its airspace rules and its language, and every threshold change is approved by the watch officer and logged.

WORKS WITH

SCREEN · RAKE · FORMEL · PITCH · HOOD · JESS · TIERCEL

BLOCK BLOCK Sensor Tower

DESCRIPTION

BLOCK is a self-contained sensor tower on a single-axle trailer or a 1.2-meter pallet. Two guards raise the 8-meter mast and have tracks on the display within 20 minutes. The head carries an X-band radar that tracks a person at 3 kilometers and a vehicle at 6, with air mode seeing a small quadcopter at 3 kilometers, a thermal and low-light camera that confirms a person at 2 kilometers, an 8-microphone array that places shots and engines within 5 degrees, and a HOOD receiver that hears drone control links to 8 kilometers. The SCREEN classifier runs on the tower, so alarms are filtered before they leave it. Solar panels and a 10 kilowatt-hour battery give 7 days without fuel; a 2 kilowatt generator extends it to 30. Tracks reach FORMEL and PITCH over JESS or fiber within 1 second.

CAPABILITIES

- Raised and tracking within 20 min by 2 guards, with no crane and no engineer
- Radar tracks a person at 3 km, a vehicle at 6 km and a small drone at 3 km from an 8 m head
- Thermal and 4K low-light camera slews to any track within 2 s and confirms a person at 2 km
- 8-microphone array places shots and engines within 5 degrees and classifies them in under 1 s
- Drone-link receiver hears controllers to 8 km and hands bearings to STANNEL through PITCH
- SCREEN classifier on the tower holds nuisance alarms under 1 per tower per day after a 7-day baseline
- 7 days on solar and battery, 30 days with the 2 kW generator
- Joins the SCREEN mesh as one more node, or runs alone with a local display

SPECIFICATIONS · DESIGN TARGETS

MAST	telescopic 8 m, 3 m stowed, 60 kg head, rated to 120 km/h wind raised and 160 km/h stowed
RADAR	X-band, 3 km person, 6 km vehicle, 360 degree scan each second; air mode detects a small quadcopter at 3 km
CAMERA	pan-tilt 640 x 512 thermal plus 4K low-light with 30x optical zoom, person confirmed at 2 km, slew within 2 s of a radar track
ACOUSTIC	8-microphone array, shot and engine bearing within 5 degrees, classification under 1 s, detection to 1.5 km
RADIO SENSING	HOOD receiver module 30 MHz to 6 GHz, drone control links heard to 8 km, receive only
COMPUTE	40 TOPS processor at the mast base, SCREEN classifier, 30 days of local recording, AES-256 storage
POWER	1.2 kW solar, 10 kWh battery, 7 days without fuel; 2 kW generator option to 30 days; 24 V vehicle input
DEPLOYMENT	single-axle trailer, 1,400 kg, towed at 80 km/h; or 1.2 m pallet, 950 kg, by forklift or helicopter sling; 2 guards, 20 min to first track
LINKS	JESS mesh node, fiber or the site's own network; tracks to FORMEL and PITCH within 1 s
ENVIRONMENT	MIL-STD-810H, IP67, -32 to +55 C, lightning protection on the mast

WHAT WE CAN VOUCH FOR TODAY

- A radar coverage model for any position the client names on its own terrain, with mast height and dead ground shown, within 10 working days.
- A design review of the mast, trailer and power budget against the client's wind, temperature and transport limits.
- A timed deployment rehearsal protocol that two of the client's guards run at acceptance, with 20 minutes as the pass mark.
- An acoustic bench test on the client's own recorded engine and shot signatures before the library is loaded.
- All recordings and models stay on the tower and inside the client's network, and nothing is sent to Falcon Accuracy.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

Between them, SCREEN and BLOCK watch the fence and the ground beyond it, and the only place a vehicle can enter without cutting wire is the gate. A gate that opens 400 times a day is also where a guard spends 8 hours within 2 meters of unknown vehicles. HALLUX moves the inspection into a lane that senses the vehicle before any guard approaches it, and it hands the approach track of every vehicle to the same picture SCREEN and BLOCK feed, so a truck that turns off the road toward the wire is already a track when it leaves the lane.



CONCEPT VISUALIZATION · HALLUX

ALL FIGURES ARE DESIGN TARGETS

PERIMETER AND BASE SECURITY · HARDWARE · 03 OF 05

HALLUX

HALLUX Vehicle Inspection Lane

The hallux is the falcon's rear toe, the one that closes the grip and holds the quarry still; HALLUX holds every vehicle still at the gate long enough to inspect it.

EVERY VEHICLE INSPECTED IN 90 SECONDS, THE GUARD BEHIND COVER.

SUMMARY

HALLUX is an autonomous inspection lane for the base gate. It identifies the vehicle and its credential on approach, images the underbody, cargo and cab, compares them with that vehicle's stored reference and its manifest, and flags what has changed, while a guard behind cover decides whether to open the barrier. Throughput is 40 vehicles an hour per lane.

WHY FALCON ACCURACY BUILT IT

The gate is the one planned opening in the perimeter, and it is where a guard spends 8 hours within 2 meters of unknown vehicles. Inspection by flashlight and mirror finds little, slows traffic until supervisors wave vehicles through, and puts the guard within reach of a hostile driver. Falcon Accuracy built HALLUX to move the inspection into sensors and the guard behind cover, so a thorough inspection takes 90 seconds instead of 10 minutes and the decision is made on images rather than instinct. The force keeps the gate open for business and keeps its people out of the lane.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits HALLUX to the gate geometry, barrier blocks, access-control lists and credential cards the base already uses, and to the force's own fleet, whose reference images are captured in the first week.

TRAIN The imaging models train on the vehicle types, plates, scripts and cargo seen in the client's theater, and on the dust, rain and light at that gate.

SET Inspection depth per vehicle class, refusal rules, barrier behavior and the languages of the intercom are set to the guard force's procedures and the base commander's orders, and a guard decides every admission.

WORKS WITH

SCREEN · FORMEL · BLOCK · RAKE · PITCH · JESS · MALAR

HALLUX HALLUX Vehicle Inspection Lane

DESCRIPTION

HALLUX is a 40-meter lane of modular barriers, a sensor arch and a control cabin. Approach radar sees a vehicle at 300 meters; cameras read its plate and credential at 50 meters and pull its record. An underbody imager scans the chassis at 10 km/h and overlays that vehicle's stored image, marking added objects over 10 centimeters. Cab and cargo cameras count occupants and check load shape against the manifest, and a thermal camera flags people hidden in cargo. A drop-arm holds the vehicle; a rising wedge barrier rated to stop a 7,500-kilogram truck at 50 km/h closes if a driver forces the lane. A guard behind cover sees the findings on a display, opens or refuses with one button, and the decision is logged. Known vehicles clear in 90 seconds, 40 an hour per lane.

CAPABILITIES

- Vehicle and credential identified on approach at 50 m, with the reference record on the display before the vehicle stops
- Underbody imaging at 10 km/h compared with the vehicle's stored chassis image, added objects over 10 cm marked
- Cab and cargo cameras count occupants and compare load shape with the manifest within 20 s
- Thermal and carbon-dioxide sensing flags people hidden in cargo within 30 s
- Rising wedge barrier rated to stop a 7,500 kg truck at 50 km/h closes in 2 s on the guard's command or a forced drop-arm
- A guard behind cover decides every admission with one button, and every decision and image set is logged
- Known vehicles clear in 90 s, 40 vehicles an hour per lane; a second lane doubles it
- Approach radar hands every vehicle that turns away from the gate to SCREEN and FORMEL as a live track

SPECIFICATIONS · DESIGN TARGETS

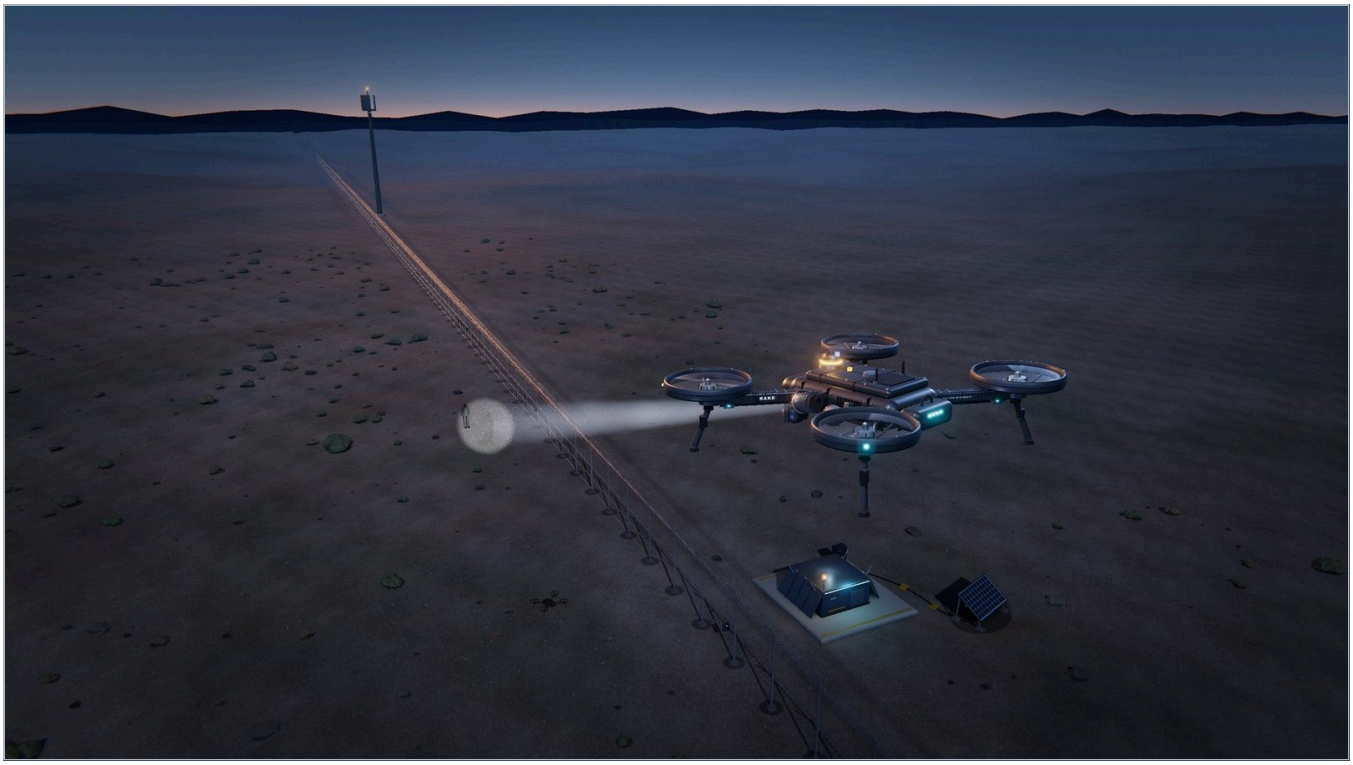
LANE	40 m from approach sensor to exit barrier, 3.5 m wide, modular concrete barrier walls, 2 lanes per control cabin
APPROACH SENSING	radar detects a vehicle at 300 m and reads its speed; plate and credential cameras identify at 50 m; 99 percent read rate on clean plates by day, 95 percent at night
UNDERBODY	line-scan imager and lidar at up to 10 km/h, 2 mm resolution, overlay against the stored reference, objects over 10 cm marked within 15 s of the pass
CAB AND CARGO	6 cameras and 1 thermal camera, occupant count, load shape against the manifest, hidden person detection within 30 s; optional chemical and radiological portal sensors on the arch
BARRIERS	drop-arm at entry and exit; rising wedge barrier rated to stop 7,500 kg at 50 km/h, closes in 2 s, manual release
THROUGHPUT	90 s for a known vehicle, 4 min for a first visit with reference capture, 40 vehicles per hour per lane
CONTROL	guard station behind cover with 2 displays, one-button open or refuse, intercom and loudspeaker in 4 languages, tie to FORMEL and the site's access-control list
RECORDS	images, findings and decisions kept for a client-set period inside the client's network, AES-256 storage, export package within 2 min
POWER AND BUILD	6 kW on site power with 8 h battery reserve; sensors MIL-STD-810H, IP67, -32 to +55 C; installed in 5 days on a prepared surface, expeditionary version in 24 h on barrier blocks

WHAT WE CAN VOUCH FOR TODAY

- A gate traffic study and lane layout drawn to the client's own gate survey, with throughput modeled for the base's actual daily traffic.
- A design review of barrier ratings and lane geometry against the client's vehicle fleet and the heaviest trucks that use the gate.
- A bench demonstration of underbody reference comparison on 20 of the client's own vehicles, with the 10 cm detection target measured.
- A written acceptance trial protocol covering throughput, read rates, detection targets and barrier closing time.
- All images, manifests and decisions stay inside the client's network, and Falcon Accuracy holds no copies.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

SCREEN, BLOCK and HALLUX produce a verified alarm with a position within 10 meters. What they cannot do is put eyes on it. A guard on foot covers 1 kilometer of fence line in 10 minutes, and a vehicle patrol needs a road. RAKE launches from its box within 30 seconds of a confirmed alarm, reaches any point on a 4-kilometer perimeter inside 2 minutes, and holds a thermal camera and a spotlight over the alarm until the guards arrive, so the watch officer dispatches people to something seen rather than something heard.



CONCEPT VISUALIZATION · RAKE

ALL FIGURES ARE DESIGN TARGETS

PERIMETER AND BASE SECURITY · HARDWARE · 04 OF 05

RAKE

RAKE Perimeter Patrol Drone

To rake is a falcon's fast, wide run along a line, sweeping the ground beneath it before it turns back to the falconer; the drone rakes the fence line and returns to its box.

OVER THE ALARM IN 2 MINUTES, HOLDING UNTIL THE GUARDS ARRIVE.

SUMMARY

RAKE is a quadrotor that lives in a weatherproof box on the perimeter and flies the fence line on a schedule or on an alarm. It carries thermal and 4K cameras, a spotlight and a loudspeaker, and nothing else. It launches within 30 seconds of a confirmed alarm, reaches any point on a 4-kilometer perimeter inside 2 minutes and holds the intruder in view until the guards close.

WHY FALCON ACCURACY BUILT IT

A verified alarm with a position is still only a point on a map until someone sees it. A guard on foot covers 1 kilometer of fence in 10 minutes, a vehicle patrol needs a road, and at night the intruder has the dark as cover. Falcon Accuracy built RAKE so the first responder is a camera that arrives in 2 minutes, lights the scene, speaks the warning in the intruder's language and follows if the intruder runs, with the watch officer watching live. The guards then move to something seen rather than something heard, and every flight is logged.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits RAKE boxes to the perimeter length, power points and airfield rules of each base, and ties the video to the goggles, radios and displays the guard force already carries.

TRAIN The detection models train on the people, vehicles, wildlife and fence materials of the client's theater, and the recorded warnings are spoken by the client's own guards in the languages of the region.

SET Patrol schedules, flight ceilings, no-fly zones over the base, follow limits and the rule for who approves an alarm launch are set to the base commander's orders and the national airspace rules.

WORKS WITH

SCREEN · BLOCK · HALLUX · FORMEL · PITCH · JESS · MALAR · TIERCEL · GYR

RAKE RAKE Perimeter Patrol Drone

DESCRIPTION

RAKE is a 6.5-kilogram electric quadrotor that lives in a 1.2-meter weatherproof box on the perimeter. On a schedule it flies the fence line at 20 meters, compares each pass with the last and flags new objects, cut fabric or a breached berm. On a confirmed alarm it is airborne within 30 seconds, reaches any point on a 4-kilometer perimeter inside 2 minutes and holds there. Thermal and 4K zoom cameras confirm a person at 800 meters, a 20,000-lumen spotlight lights the scene from 60 meters, and a loudspeaker plays the guard force's warning in 4 languages. It follows a running intruder at up to 60 km/h and streams video to FORMEL and the guards' goggles. A flight lasts 40 minutes; the box recharges it in 35. It is unarmed, and a human approves every unscheduled launch.

CAPABILITIES

- Airborne within 30 s of a confirmed alarm, over any point on a 4 km perimeter inside 2 min
- Scheduled fence-line patrol at 20 m compares each pass with the last and flags changes larger than 30 cm
- Thermal and 4K zoom cameras confirm a person at 800 m and read a vehicle plate at 150 m
- 20,000-lumen spotlight and a loudspeaker with recorded warnings in 4 languages; the aircraft is unarmed
- Follows a moving intruder at up to 60 km/h and hands the track to FORMEL and PITCH
- Returns and lands in its box within 20 cm in winds to 12 m/s, recharged in 35 min
- Flies the mapped fence line without satellites by visual-inertial navigation
- Four boxes cover a 12 km perimeter and keep a charged aircraft on standby while another recharges, and a human approves every unscheduled launch

SPECIFICATIONS · DESIGN TARGETS

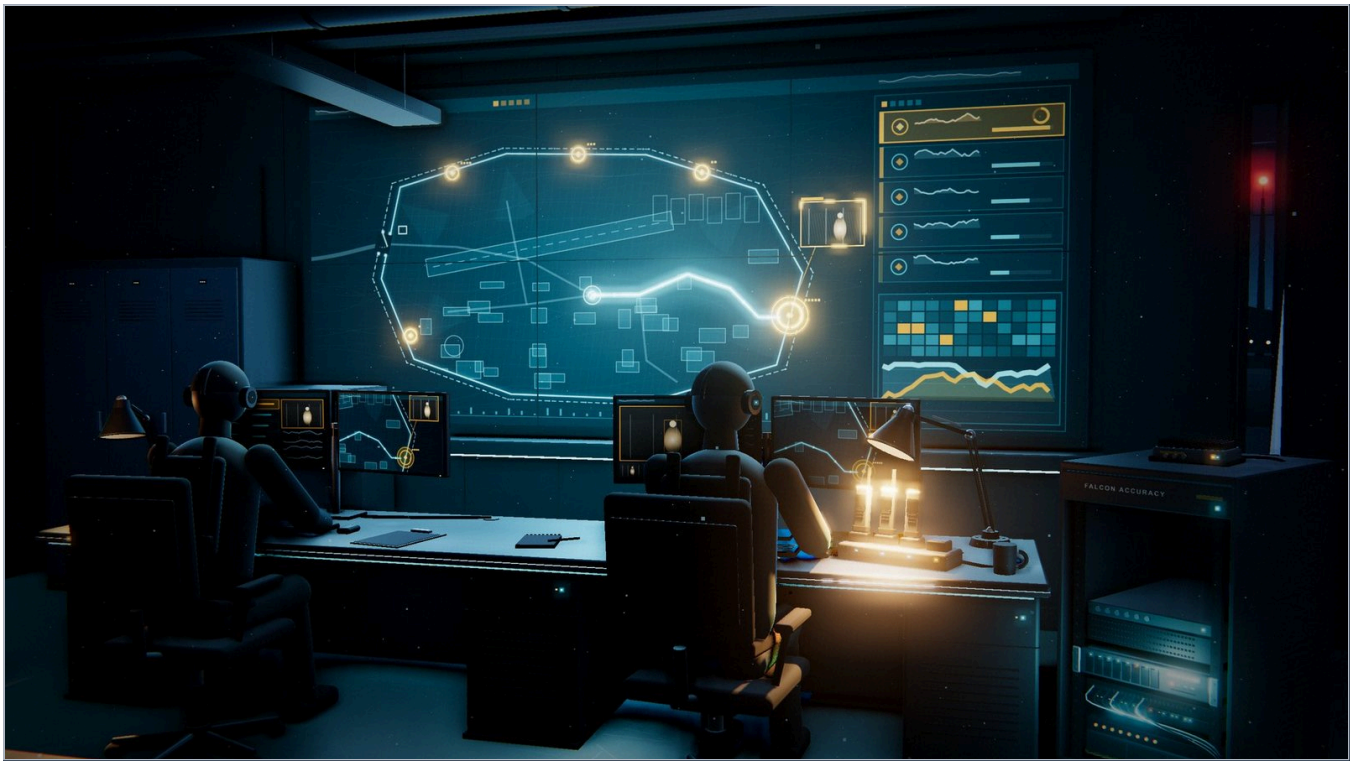
AIRCRAFT	6.5 kg quadrotor, 0.9 m across, electric, 40 min endurance, 60 km/h dash, winds to 12 m/s, light rain
BOX	1.2 m by 1.2 m by 0.8 m weatherproof dock, roof opens in 5 s, contact charging 35 min to full, heated to -20 C, solar or site power
SENSORS	640 x 512 thermal, 4K camera with 20x optical zoom, laser rangefinder; person confirmed at 800 m, plate read at 150 m
PAYLOADS	20,000 lumen spotlight to 60 m, loudspeaker 110 dB at 1 m with recorded warnings in 4 languages; unarmed, carries sensors, a light and a speaker only
AUTONOMY	fence-line route flown at 20 m and 10 m/s, change detection to 30 cm, visual-inertial navigation without satellites, 20 cm box landing, intruder follow at up to 60 km/h
RESPONSE	launch within 30 s of a confirmed alarm, any point of a 4 km perimeter within 2 min; 4 boxes cover 12 km with a charged aircraft on standby while another recharges
LINKS	JESS mesh or direct link to 5 km, video to FORMEL and MALAR goggles within 300 ms, AES-256
NOISE AND LIGHTS	under 62 dBA at 50 m in patrol, navigation lights switchable
CONTROL	scheduled patrols set by the watch officer; alarm launches proposed by FORMEL and approved by a human; every flight logged with its video
ENVIRONMENT	MIL-STD-810H, IP55 aircraft, IP67 box, -20 to +50 C

WHAT WE CAN VOUCH FOR TODAY

- A response-time model for the client's own perimeter, showing box positions and the time to every point on the fence, before any box is placed.
- A design review of the aircraft, box and charging cycle against the client's climate, wind and airfield constraints.
- A simulated alarm exercise run on CREANCE with the client's guard force, measuring launch approval and arrival times.
- A written acceptance trial protocol for launch time, arrival time, detection range, landing accuracy and the 40-minute endurance.
- All video and flight logs stay inside the client's network, and the aircraft holds nothing once it has landed and uploaded to the box.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

Four products now put alarms, tracks, video and vehicle records in front of one watch officer, and a guard force of 12 answers them. Without a single queue the officer watches eight displays and the loudest one wins. FORMEL ranks every alarm by the evidence behind it, attaches the RAKE and BLOCK video, proposes the nearest guard team and the route, and records who decided what and when. The human still presses the button; FORMEL puts the whole picture in view so the press comes inside 20 seconds.



CONCEPT VISUALIZATION · FORMEL

ALL FIGURES ARE DESIGN TARGETS

PERIMETER AND BASE SECURITY · SOFTWARE · 05 OF 05

FORMEL

FORMEL Security Operations Console

The formel is the female falcon, the larger bird that a falconer trusts with the hardest flights; FORMEL is the console a watch officer trusts with every alarm on the base.

EVERY ALARM RANKED, EVERY DISPATCH IN 20 SECONDS, EVERY DECISION LOGGED.

SUMMARY

FORMEL is the watch officer's console for base security. It takes alarms, tracks, video and gate records from SCREEN, BLOCK, HALLUX, RAKE and the site's existing systems, ranks each alarm by the evidence behind it, proposes the nearest guard team and route, and records who decided what and when. It runs on a site server or a PITCH Edge node inside the client's network.

WHY FALCON ACCURACY BUILT IT

Guard forces rarely fail for lack of sensors; they fail at the desk where 300 alarms a night meet one tired officer and eight displays. Alarms are acknowledged unseen, dispatches go to the wrong gate, and the record of what happened is a paper log. Falcon Accuracy built FORMEL so each alarm arrives already scored, with its video attached and a proposed response, and the officer's job becomes a decision rather than a search. The force gets dispatches inside 20 seconds, a guard force that is routed instead of called, and a log that stands up in an inquiry.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits FORMEL to the site's existing cameras, access control, fence systems and radios through open adapters, and runs it on the servers or the PITCH Edge nodes the force already operates.

TRAIN The scoring model trains on the site's own alarm history, baseline recordings and response times, so the queue reflects that base's nuisance sources and that guard force's real arrival times.

SET Zone priorities, score weights, escalation ladders, who may dispatch and who may launch RAKE are set to the guard force's procedures and the base commander's orders in the force's language, and every change to a rule is logged.

WORKS WITH

SCREEN · BLOCK · HALLUX · RAKE · PITCH · JESS · MALAR · MANTLE · CREANCE · LURCHER

FORMEL FORMEL Security Operations Console

DESCRIPTION

FORMEL runs on a site server or a PITCH Edge node and shows the watch officer one queue. Each alarm from SCREEN, BLOCK, HALLUX and RAKE arrives with its radar track, the nearest camera's 10-second clip and a score from 0 to 100 built from sensor agreement and the site classifier's confidence. The top alarm comes first, with the nearest guard team, route and arrival time proposed; one press dispatches over JESS to the team's radios and MALAR goggles, and a second press launches RAKE. Patrol schedules, gate shifts and barrier states live on the same display. Every alarm, decision, dispatch and closure is logged with its evidence, and an incident package exports within 2 minutes. It handles 2,000 sensors and 500 cameras per site and 12 sites per regional view. Data stays inside the client's network.

CAPABILITIES

- One ranked queue, each alarm scored 0 to 100 by sensor agreement and site-trained confidence
- Nearest camera clip of 10 s and the radar track attached within 5 s of the alarm
- Nearest guard team, route and arrival time proposed, with one-press dispatch to JESS radios and MALAR goggles
- RAKE launch proposed on confirmed alarms and approved by the officer with a second press
- Patrols, gate shifts, barrier states and HALLUX refusals on the same display
- Every alarm, decision, dispatch and closure logged with evidence, incident package exported within 2 min
- 2,000 sensors and 500 cameras per site, 12 sites per regional view, under 1 s refresh
- Runs on a site server or a PITCH Edge node, disconnected for 30 days, inside the client's network

SPECIFICATIONS · DESIGN TARGETS

INPUTS	SCREEN, BLOCK, HALLUX and RAKE native; open adapters for the site's existing cameras, access control, fence systems and radios; 200 feeds per site
CAPACITY	2,000 sensors and 500 cameras per site, 12 sites per regional view, 10 watch positions per site
LATENCY	alarm on the queue within 1 s of the sensor; clip and track attached within 5 s; dispatch to radios within 2 s of the press
SCORING	0 to 100 from sensor agreement, zone priority and the site classifier; weights set by the client and shown with every score
DISPATCH	nearest team, route and arrival time; voice and text over JESS; team position from radios and MANTLE vests; acknowledgment within 10 s shown on the queue
RECORDS	every alarm, decision, dispatch and closure logged with operator identity, time and evidence; incident package of video, tracks and log exported within 2 min; retention set by the client
DRILLS	replays any logged incident as a CREANCE exercise; monthly response-time report by zone and shift
PLATFORM	2 U site server or PITCH Edge 1.1 kg node, runs disconnected for 30 days and syncs when a link returns; zero-trust access, AES-256 at rest and in transit, FIPS 140-3 modules
DISPLAY	4K map and queue layout for a 2-display watch position, tablet view for the guard commander, text and voice summaries over JESS

WHAT WE CAN VOUCH FOR TODAY

- A watch-floor design review with the client's guard commander, mapping the base's current alarm volumes, shifts and response standard onto the queue design.
- A simulation of the queue against 30 days of the client's own alarm history, with the proposed scoring shown beside what the guards actually did.
- A tabletop exercise with the client's watch officers on a replayed incident before any rule is set.
- A written acceptance trial protocol for alarm latency, dispatch time, logging completeness and 30-day disconnected operation.
- FORMEL runs only inside the client's network, and alarm history, models and logs are never sent to Falcon Accuracy.

NEXT SECTOR · 16 LOGISTICS AND SUSTAINMENT · P. 218

Forecast the need, print the part, move the load with fewer crews. This closes Perimeter and Base Security. Sector 16, Logistics and Sustainment, opens on page 218 with YARAK, PLUME, CROP and JERKIN.

SECTOR 16 OF 18

16

LOGISTICS AND SUSTAINMENT

FORECAST THE NEED, PRINT THE PART, MOVE THE LOAD WITH FEWER CREWS.

Sustainment decides how long a force can keep operating, and today it runs on surprise. A truck fails on the road with no warning, the part it needs is 3 weeks away, and a second truck is stripped to keep the first one moving. Fuel and water are pushed forward on consumption rates written years ago, and the report that a unit is short arrives after it is short. Every convoy that carries the excess ties up two people per truck on the most exposed ground in the theater. The data to see all of this already exists on the vehicle bus, in the maintenance bay and in the reports the units file every day, and nothing reads it together.



IN THIS SECTOR · 4 PRODUCTS · PAGES 220 TO 227

YARAK PLUME CROP JERKIN

This sector reads it together. One platform listens to each vehicle and aircraft and forecasts which component fails in the next 30 days, at least 10 days before it does, with the evidence beside the forecast. One container cell scans, prints and inspects the qualified part at the forward site in hours. One model forecasts every class of supply for every unit 90 days out, with confidence bands, and plans the loads. One retrofit kit lets 8 trucks drive themselves behind a crewed leader, so the load reaches the unit with 2 people on the road instead of 18. A human approves every work order, every supply order and every convoy move, every decision is logged, and the records and models stay inside the client's network. The products are YARAK Predictive Maintenance Platform, PLUME Expeditionary Parts Cell, CROP Supply Prediction Model and JERKIN Autonomous Convoy Kit.

IN THIS SECTOR · 4 PRODUCTS



YARAK p. 220

YARAK Predictive Maintenance Platform

Know what fails next week. Fix it this week.



PLUME p. 222

PLUME Expeditionary Parts Cell

Scan the broken part. Print the new one by morning.



CROP p. 224

CROP Supply Prediction Model

See the stock-out seven days before the unit does.



JERKIN p. 226

JERKIN Autonomous Convoy Kit

Two crew, nine trucks, one road. The followers carry no one.



CONCEPT VISUALIZATION · YARAK

ALL FIGURES ARE DESIGN TARGETS

LOGISTICS AND SUSTAINMENT · SOFTWARE · 01 OF 04

YARAK

YARAK Predictive Maintenance Platform

Yarak is the state of a hawk in peak condition, keen and ready to fly, and the platform keeps a fleet in that state.

KNOW WHAT FAILS NEXT WEEK. FIX IT THIS WEEK.

SUMMARY

YARAK listens to every vehicle and aircraft in the fleet through small bus-and-vibration nodes and a drive-through inspection arch, then forecasts which component fails in the next 10 to 30 days and why. The maintainer approves each work order with the evidence beside it, and the commander sees an availability forecast instead of a count.

WHY FALCON ACCURACY BUILT IT

Fleets lose vehicles and aircraft to failures that announce themselves days earlier in vibration, temperature and bus data that no one reads. Maintenance runs on fixed intervals, so healthy parts are changed early and worn ones fail on the road. Falcon Accuracy built YARAK because the same on-device detection it runs in goggles and aircraft can read a gearbox as well as a street. The maintainer gains a ranked list of what to fix this week with the evidence beside it, and the commander gains an availability forecast for 7 and 30 days instead of a count of what is parked today.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits YARAK nodes to the trucks, tracked vehicles, generators, helicopters and transport aircraft the force already operates, with bus adapters and sensor brackets for each type and read-only aircraft taps agreed with the client's airworthiness authority.

TRAIN Falcon Accuracy trains the failure models on the client's own maintenance history and vehicle bus logs and on the heat, dust, altitude and road conditions of its theater, with maintainer displays in the force's language.

SET Falcon Accuracy sets alert thresholds, inspection intervals, work-order formats and the definition of an available vehicle to the force's maintenance doctrine and its existing approval chain.

WORKS WITH

PITCH · JESS · MALAR · CROP · PLUME · JERKIN · GYR · TIERCEL · OSSICLE

YARAK YARAK Predictive Maintenance Platform

DESCRIPTION

YARAK is predictive maintenance for the vehicles and aircraft a force already owns. A 120 gram node on each vehicle reads the data bus and three vibration channels, and a 400 gram aircraft node taps the flight data bus read-only. A drive-through arch reads brake, hub and tire temperatures within 2 C at 10 km/h. Models trained on the fleet's own history give each monitored component a remaining life and a confidence band, forecast 70 percent of unscheduled failures at least 10 days ahead, and hold false alerts under one per vehicle per month. The maintainer approves each work order with the evidence beside it and sees repair steps drawn in MALAR goggles. PITCH receives an availability forecast per unit at 7 and 30 days. Decisions are logged and data stays inside the client's network.

CAPABILITIES

- Forecasts 70 percent of unscheduled failures on monitored components at least 10 days ahead
- Holds false alerts under 1 per vehicle per month after 6 months of fleet data
- 120 g vehicle node reads the data bus and 3 vibration channels; 400 g aircraft node taps the flight data bus read-only
- Drive-through arch checks brakes, hubs, tires and underbody in 20 s at 10 km/h
- Work orders carry the evidence and a parts check against CROP stock and the PLUME library
- Repair steps drawn in MALAR goggles over the component itself
- 7 and 30 day availability forecast per unit delivered to PITCH
- Maintainer approves every work order; models retrain inside the client's network

SPECIFICATIONS · DESIGN TARGETS

VEHICLE NODE	120 g, reads the vehicle data bus, 3 vibration channels sampled at 10 kHz, odometer and fuel level, 30 days of local storage, vehicle power with a 72 h backup cell
AIRCRAFT NODE	400 g, 8 vibration channels at 20 kHz on gearboxes and drive shafts, read-only tap on the flight data bus, fitted in 4 h during a scheduled inspection, no connection to flight controls
INSPECTION ARCH	two 4 m masts with thermal cameras, acoustic array and underbody cameras; vehicle passes at 10 km/h in 20 s; brake, hub and tire temperatures within 2 C; erects in 2 h
FORECAST	remaining life per monitored component with 80 and 95 percent confidence bands, 30-day horizon, refreshed every 6 h and after every sortie or convoy
DESIGN TARGETS	70 percent of unscheduled failures on monitored components forecast at least 10 days ahead; false alerts under 1 per vehicle per month after 6 months of fleet data
CAPACITY	5,000 vehicles and 200 aircraft per instance on the client's racks or a PITCH two-case kit; a forward instance runs 30 days disconnected and syncs when a link returns
MAINTAINER TOOLS	work order with evidence, parts checked against CROP stock and the PLUME library, step overlay in MALAR goggles, voice notes over JESS written into the record
INTEGRATION	open adapters to the force's existing maintenance and parts systems; work orders exported in the force's own formats
READINESS OUTPUT	7 and 30 day availability forecast per unit to PITCH, with the reason behind each predicted shortfall
SECURITY	AES-256 at rest and in transit, zero-trust access, every recommendation and decision logged; data and models stay inside the client's network; nodes MIL-STD-810H, IP67, -40 to +70 C

WHAT WE CAN VOUCH FOR TODAY

- A data review of the client's existing maintenance records and vehicle bus logs for one fleet type, with a report on which failure modes the models can learn from the data already held and which need new sensors.
- A bench demonstration of the vehicle node reading a vehicle data bus and three vibration channels, with the data path from node to maintainer display shown end to end.
- A backtest of the forecast models on the client's own maintenance history, with the hit rate and the false-alert rate reported at 10 and 30 days before any node is fitted.
- A trial protocol for one battalion's vehicles over 6 months, with acceptance thresholds for hit rate, false alerts and availability agreed in writing before the trial starts.
- A written data handling plan under which raw telemetry, maintenance records and trained models stay inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

YARAK tells the maintainer that the cooling-fan bracket on truck 14 has 9 days of life left, and today that bracket is 3 weeks away through the supply chain, so the truck waits or a second truck is stripped for it. A forecast nobody can act on is only bad news that arrives earlier. PLUME stands at the same forward site, holds the bracket in its qualified library and prints and inspects it in 6 hours. Together they turn a prediction into a repair before the failure date arrives.



CONCEPT VISUALIZATION · PLUME

ALL FIGURES ARE DESIGN TARGETS

LOGISTICS AND SUSTAINMENT · HARDWARE · 02 OF 04

PLUME

PLUME Expeditionary Parts Cell

A plume is a single feather, the part a falconer replaces when one breaks so the hawk flies whole again; PLUME prints and inspects the single part that puts a machine back on the road.

SCAN THE BROKEN PART. PRINT THE NEW ONE BY MORNING.

SUMMARY

PLUME is a 20 foot container that scans, prints, machines and inspects replacement parts at a forward site, from a library of qualified designs that starts with 1,200 Falcon Accuracy family parts. Two technicians have it printing 6 hours after it is set down, and a technician and the client's engineering authority decide what is released.

WHY FALCON ACCURACY BUILT IT

A broken bracket can hold a vehicle or an aircraft for 3 weeks while a part travels the supply chain, and a force without that part borrows it from another machine. Falcon Accuracy built PLUME so that the part forecast from YARAK can become a repair the same week at the forward site. The cell prints only what has been qualified, inspects every part and records it, and leaves the release decision with a technician and the client's engineering authority. The change for the force is fewer machines waiting for parts and fewer machines stripped to keep others running.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits the container to the handling equipment, generators and transport the force already uses and matches the printers' materials to the alloys and polymers found in the force's own fleets.

TRAIN Falcon Accuracy trains the client's technicians in a 3-week course in their own language, qualifies the client's first 200 parts alongside them, and tunes the scan and repair models on the client's own part families.

SET Falcon Accuracy sets the criticality classes, release rules and inspection records to the client's engineering authority and to its airworthiness and safety regulations.

WORKS WITH

YARAK · CROP · JESS · GYR · TIERCEL · LURCHER · JERKIN

PLUME PLUME Expeditionary Parts Cell

DESCRIPTION

PLUME is a 20 foot container that prints, machines and inspects replacement parts at a forward site. Two polymer printers with a 400 mm cube build volume, one metal printer for stainless, aluminum and titanium alloys, a five-axis mill and a heat-treatment oven run on 45 kW. A structured-light scanner digitizes a broken part to 0.05 mm in 15 minutes, a design model proposes the repaired geometry and a technician approves it. The cell opens with 1,200 qualified parts from the Falcon Accuracy family, such as TIERCEL landing legs, GYR rail adapters and JESS antenna mounts, and adds the client's own parts through a qualification protocol its engineering authority signs. Every part leaves with a serial number, an inspection record and a print log. Two technicians have it printing 6 hours after the container is set down.

CAPABILITIES

- Prints a qualified polymer part in 2 to 12 h and a metal bracket in 18 to 36 h, finished and inspected
- Scans a broken part to 0.05 mm in 15 min and proposes the repaired geometry for a technician to approve
- 1,200 Falcon Accuracy family parts qualified at delivery, such as TIERCEL landing legs, GYR rail adapters and JESS antenna mounts
- Adds the client's own parts through a qualification protocol its engineering authority signs
- Serial number, inspection record and print log on every part
- Printing 6 h after the container is set down, with 60 days of feedstock aboard
- Receives the part forecast from YARAK and reports feedstock draw to CROP
- Technician approves every release; design files stay inside the client's network

SPECIFICATIONS · DESIGN TARGETS

CONTAINER	20 foot (6.1 m), 11,500 kg loaded, climate control, dust filtration, side awning; set down by a standard container handler, printing within 6 h
POLYMER PRINTERS	two, 400 x 400 x 400 mm build, 8 engineering polymers including fiber-reinforced grades, typical part in 2 to 12 h
METAL PRINTER	one, laser powder bed, 250 x 250 x 300 mm build, stainless, aluminum and titanium alloys, sealed inert atmosphere, powder handled in a glovebox; bracket in 18 to 36 h including heat treatment and finishing
FINISHING AND INSPECTION	five-axis mill with a 600 x 400 x 400 mm envelope, heat-treatment oven to 1,100 C, bead-blast cabinet, measuring arm accurate to 0.03 mm
SCANNING	structured-light scanner at 0.05 mm, 15 min per part; design model proposes the repaired geometry, technician approves before any print starts
LIBRARY	1,200 qualified Falcon Accuracy family parts at delivery, each with a criticality class and locked print parameters; client parts added through a qualification protocol signed by its engineering authority; no flight-critical or safety-critical part without that signature
THROUGHPUT AND FEEDSTOCK	40 to 60 parts per week on a typical mix; 300 kg of filament and 120 kg of metal powder carried for 60 days; reorder forecast supplied by CROP
POWER AND CREW	45 kW from site power or the towed generator set; 2 technicians after a 3-week course
DATA	library syncs over JESS or the force's own backhaul when a link exists and runs 60 days disconnected; design files and print logs stay inside the client's network
ENVIRONMENT	operates -20 to +50 C; container fit-out to MIL-STD-810H for road, rail and sea transport

WHAT WE CAN VOUCH FOR TODAY

- A design review of the container layout, power budget, airflow and powder handling with the client's engineering and safety authorities.
- A list of the 1,200 Falcon Accuracy family parts proposed for the starting library, each with its criticality class, material and print parameters.
- A bench demonstration on one polymer printer and one scanner of the full scan, repair, print, inspect and serialize sequence for a broken bracket, with the records produced shown to the client.
- A qualification protocol for adding the client's own parts, with test coupons, inspection steps and sign-off points for the client's engineering authority.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

PLUME prints what is in its library and what its feedstock allows, and most of what a force consumes, such as fuel, water, rations and batteries, is never printed. Someone still has to forecast all of it, decide where to hold it and know when the cell itself runs low on powder. CROP takes the part forecasts from YARAK and the feedstock draw from PLUME alongside every consumption report and gives the logistics officer one demand picture 90 days out. The cell knows what it can make, and the model knows what must still be ordered and moved.



CONCEPT VISUALIZATION · CROP

ALL FIGURES ARE DESIGN TARGETS

LOGISTICS AND SUSTAINMENT · SOFTWARE · 03 OF 04

CROP

CROP Supply Prediction Model

The crop is the falcon's food store, which the falconer reads to judge how much the bird has taken and when it must feed again, and the model reads a force's consumption the same way.

SEE THE STOCK-OUT SEVEN DAYS BEFORE THE UNIT DOES.

SUMMARY

CROP forecasts daily demand for every unit and every class of supply up to 90 days out, with confidence bands learned from the force's own history and the operation being planned. It warns of stock-outs a week ahead, proposes what to hold where and builds the load plans, while the logistics officer approves every order.

WHY FALCON ACCURACY BUILT IT

Supply is planned on consumption rates written years ago and corrected by reports that arrive after the shortage. Fuel, water, parts and batteries are then pushed forward in excess to be safe, which fills the roads with convoys that need protecting. Falcon Accuracy built CROP so that a logistics officer sees demand 90 days out with its confidence bands, learned from the force's own history and the operation being planned. The force moves less and moves it where it matters, and sees the stock-out before the unit does. The officer approves every order, and every record stays inside the client's network.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits CROP adapters to the stock, personnel and transport systems the force already runs and to the report forms its units already fill.

TRAIN Falcon Accuracy trains the demand models on the client's own consumption and movement history, on the climate, seasons and road network of its theater, and on the language of its reports.

SET Falcon Accuracy sets the classes of supply, days-of-supply policy, reorder points, priorities and approval chain to the force's logistics doctrine.

WORKS WITH

PITCH · JESS · YARAK · PLUME · JERKIN · GYR · OSSICLE

CROP CROP Supply Prediction Model

DESCRIPTION

CROP forecasts what a force consumes before the units report it. Through 40 open adapters it takes in consumption reports from PITCH and JESS, part and availability forecasts from YARAK, feedstock draw from PLUME, fuel telemetry from vehicle nodes, planned operations, weather and the stock held in the force's existing systems. For every unit and every class of supply, such as fuel, water, rations, batteries, spare parts and medical consumables, it forecasts daily demand to 90 days with 80 and 95 percent confidence bands. It warns of a stock-out 7 days ahead, flags consumption 3 standard deviations from forecast, proposes what to hold at each node and builds load plans for JERKIN convoys. The logistics officer approves every order and movement, and each recommendation is logged with its evidence. The model retrains monthly inside the client's network.

CAPABILITIES

- Forecasts daily demand per unit and class of supply to 90 days with 80 and 95 percent confidence bands
- Warns of a stock-out 7 days ahead for 80 percent of simulated events
- Flags consumption 3 standard deviations from forecast within one reporting cycle for a human to check
- Proposes what to hold at each node and builds JERKIN load plans
- Replans 500 nodes and 2,000 demand lines in under 60 s
- Takes YARAK part forecasts and PLUME feedstock draw into the same demand picture
- Extends the 14-day PITCH forecast to 90 days at theater level and feeds the result back to PITCH
- Logistics officer approves every order; records and models stay inside the client's network

SPECIFICATIONS · DESIGN TARGETS

HORIZON	daily demand per unit and class of supply from 1 to 90 days, with 80 and 95 percent confidence bands
CLASSES	fuel, water, rations, batteries, spare parts, medical consumables and printer feedstock; the client adds its own classes
INPUTS	40 source types through open adapters, including PITCH and JESS consumption reports, YARAK part and availability forecasts, PLUME output logs, vehicle fuel telemetry, planned operations, weather and the force's own stock and personnel systems
DESIGN TARGETS	10-day fuel and water forecast mean absolute error under 12 percent at battalion level after 90 days of the force's own history; stock-out warned 7 days ahead for 80 percent of simulated events
ANOMALIES	consumption 3 standard deviations from forecast flagged within 1 reporting cycle, such as a leak, a loss or a misreport, for a human to check
PLANNING	stockage proposal per node, resupply priorities and JERKIN load plans; 500 nodes and 2,000 demand lines replanned in under 60 s; what-if for a planned operation in under 2 min
FORM FACTOR	runs on the PITCH core, a PITCH two-case kit or the client's racks; a forward node runs 30 days disconnected and syncs when a link returns
HUMAN IN THE LOOP	the logistics officer approves every order and movement; every recommendation logged with its evidence and its confidence
SECURITY AND DATA	zero-trust access, AES-256 at rest and in transit; records and models stay inside the client's network and retrain there monthly

WHAT WE CAN VOUCH FOR TODAY

- A backtest on the client's past consumption and movement records, with forecast error reported per class of supply at 10, 30 and 90 days before any live use.
- A design review of the adapters needed for the client's existing stock, personnel and transport systems, with a data map agreed with the client's staff.
- A tabletop exercise with the client's logistics staff in which the model's recommendations for one past operation are set beside the plans the staff made at the time.
- A written data handling plan under which consumption records, plans and trained models stay inside the client's network.
- A trial protocol for one brigade over 90 days with acceptance thresholds for forecast error and stock-out warning agreed before the first forecast is issued.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

A forecast is only useful once the load reaches the unit, and the road is where a force spends its drivers and its hours. CROP builds the load plan and the schedule. JERKIN drives it, with 2 people in the leader cab and 8 trucks behind them that carry cargo and no one else. The delivery confirmation returns over the same JESS link into CROP, so the model learns what arrived against what it predicted.



CONCEPT VISUALIZATION · JERKIN

ALL FIGURES ARE DESIGN TARGETS

LOGISTICS AND SUSTAINMENT · HARDWARE · 04 OF 04

JERKIN

JERKIN Autonomous Convoy Kit

The jerkin is the male gyrfalcon, smaller than the female and flown the same way; JERKIN puts the autonomy of the GYR mule onto the trucks a force already owns, so one crewed cab leads a line of them.

TWO CREW, NINE TRUCKS, ONE ROAD. THE FOLLOWERS CARRY NO ONE.

SUMMARY

JERKIN is a retrofit kit of sensors, a 200 TOPS computer and drive-by-wire actuators that lets up to 8 trucks a force already owns follow one crewed leader at 60 km/h with no one in their cabs. It fits in 3 days, comes off in 1 day, and a human commands the convoy and decides at every halt.

WHY FALCON ACCURACY BUILT IT

Every truck in a convoy ties up a driver and a co-driver on a road where they are exposed, and the driver pool rather than the truck pool limits how much a force moves each day. Falcon Accuracy built JERKIN because the autonomy stack in GYR already follows a leader over rough ground, and the trucks a force owns can carry that stack. A convoy of 9 trucks moves with 2 people instead of 18, the followers drive with no lights, and a human still commands the convoy and decides at every halt. The force moves the same load with 16 fewer people on the road.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits the sensor bar and actuators to the truck types the force already owns, with brackets and bus interfaces for each model, and to the JESS radios already in its vehicles.

TRAIN Falcon Accuracy trains the perception models on the roads, dust, rain, snow and traffic of the client's theater and on the vehicles, animals and people met on its routes.

SET Falcon Accuracy sets gap distances, speed limits, lost-link behavior, remote-drive limits and convoy drills to the force's movement doctrine and its national road rules.

WORKS WITH

GYR · JESS · PITCH · CROP · YARAK · TIERCEL · HOOD

JERKIN JERKIN Autonomous Convoy Kit

DESCRIPTION

JERKIN turns the trucks a force already owns into a convoy that drives itself behind one crewed leader. A roof bar carries 2 lidars, 5 radars and 8 cameras feeding a 200 TOPS computer, and drive-by-wire actuators on the steering, brake and throttle leave the manual controls in place. Two technicians fit a truck in 3 days and remove it in 1 day. Up to 8 followers track the leader's path within 0.3 m at 60 km/h, hold a 30 to 80 m gap, see an obstacle at 200 m and stop within 45 m. If the JESS link drops for 2 s a follower halts and holds until a human decides. The convoy drives with no lights on thermal cameras, and the commander can steer any follower by remote for the last 300 m. Every command is logged.

CAPABILITIES

- Up to 8 uncrewed followers behind one crewed leader at 60 km/h
- Fits the trucks a force already owns in 3 days and comes off in 1 day
- Follows the leader's path within 0.3 m with a gap of 30 to 80 m set by the convoy commander
- Sees an obstacle at 200 m and stops within 45 m from 60 km/h
- Halts and holds within 60 m if the link is lost for 2 s; a human decides what happens next
- Drives without satellites and without lights on thermal cameras and lidar
- Commander steers any follower by remote at 10 km/h for the last 300 m into a bay
- Loads planned by CROP, trucks cleared by YARAK before departure, every command logged

SPECIFICATIONS · DESIGN TARGETS

SENSORS	2 lidars (one 200 m forward, one 360 degree), 5 radars at 77 GHz, 8 cameras of which 2 thermal, all on one roof bar
COMPUTE	200 TOPS, 24 V, 450 W, the same autonomy stack as GYR
DRIVE-BY-WIRE	actuators on the steering column, brake and throttle plus a gear-selector interface; manual controls remain in place and a driver override takes effect within 100 ms
CONVOY	up to 8 followers per crewed leader at 60 km/h; gap 30 to 80 m set by the convoy commander; path tracking within 0.3 m
SAFETY	obstacle seen at 200 m; stop within 45 m from 60 km/h on a dry road; follower halts within 60 m and holds if the leader link is lost for 2 s
REMOTE DRIVE	commander steers any follower at up to 10 km/h over JESS for the last 300 m, under 250 ms latency
NAVIGATION	follows the leader's track by vision, lidar and inertial sensing with no satellite fix needed; drives with no lights on thermal cameras
INSTALLATION	85 kg kit, 2 technicians, 3 days to fit, 1 day to remove; trucks from 4 to 20 t with power steering and air or hydraulic brakes
LINK AND SECURITY	JESS vehicle radio, AES-256, a follower accepts commands only from its paired leader, every command logged; obeys HOOD emission-control orders
ENVIRONMENT	MIL-STD-810H, IP67, -32 to +55 C; radar keeps the convoy moving in dust that blinds the cameras

WHAT WE CAN VOUCH FOR TODAY

- A design review of the sensor set and drive-by-wire interfaces for two of the client's truck types, with an installation plan and a mass and power budget, within 60 days of receiving the vehicle data.
- A simulation of the follower controller against route recordings from the client's own roads, with tracking error and stopping distance reported at 30, 45 and 60 km/h.
- A closed-course trial protocol with a safety driver in every follower for the first 1,000 km, with pass and fail thresholds agreed before the first drive.
- A written data handling plan under which convoy logs and perception models stay on the client's vehicles and inside the client's network.

NEXT SECTOR · 17 TRAINING AND SIMULATION · P. 228

The kit you fight with becomes the range you train on. This closes Logistics and Sustainment. Sector 17, Training and Simulation, opens on page 228 with CREANCE, WEATHER, RUFTER, RANGLE and PANNEL.

17

TRAINING AND SIMULATION

THE KIT YOU FIGHT WITH BECOMES THE RANGE YOU TRAIN ON.

A force that fields goggles, vests, mesh radios, drones and robots fights only as well as the hours its people have spent on them under load. Those hours are scarce. Time on a live aircraft costs a sortie per mistake, the ground a force must fight on is rarely the ground it can train on, and most of what an exercise teaches is lost in the 48 h after it ends because the review is built by hand from memory and a few clips. The training sector closes those three gaps with the same kit the force already carries, so nothing is learned on equipment it will not fight with.



IN THIS SECTOR · 5 PRODUCTS · PAGES 230 TO 239

CREANCE **WEATHER** **RUFTER** **RANGLE** **PANNEL**

Every product here records in one format and runs on the same PITCH kits the force already fields. The opposing force is a model trained on the client's theater, the terrain is the client's own, and every review is a set of findings an instructor accepts or rejects, so a human decides what the force learns and every decision is logged. All recordings, twins and scores stay inside the client's network. The sector holds five products. CREANCE is the live range, WEATHER the mission rehearsal twin, RUFTER the operator simulator, RANGLE the casualty care trainer and PANNEL the after-action review engine.

IN THIS SECTOR · 5 PRODUCTS



CREANCE p. 230

CREANCE Live Training Range

Fight it a thousand times before you fight it once.



WEATHER p. 232

WEATHER Mission Rehearsal Twin

Walk the objective a hundred times before the first night.



RUFTER p. 234

RUFTER Operator Simulator

A hundred sorties and a hundred crashes, no aircraft lost.



RANGLE p. 236

RANGLE Casualty Care Trainer

A casualty that breathes, bleeds and records every second of care.



PANNEL p. 238

PANNEL After-Action Review Engine

Find the three minutes that decided the exercise.



CONCEPT VISUALIZATION · CREANCE

ALL FIGURES ARE DESIGN TARGETS

TRAINING AND SIMULATION · HARDWARE · 01 OF 05

CREANCE

CREANCE Live Training Range

The creance is the long light line on which a young falcon makes its first flights to the fist, free to fly yet held by the falconer; the range lets a force train in earnest on real ground while the instructor holds the line.

FIGHT IT A THOUSAND TIMES BEFORE YOU FIGHT IT ONCE.

SUMMARY

CREANCE turns the client's own terrain into a live training range. The goggles render the opposing force, the vests register the simulated hits and an instructor runs the drill from a tablet on the JESS mesh. Planners then run the mission a thousand times on a terrain twin before anyone steps off.

WHY FALCON ACCURACY BUILT IT

Instrumented ranges exist at a few fixed sites, so most units train on the ground they have, with little feedback and a scripted opposing force that behaves the same way every time. The kit they train with is also not the kit they fight with. Falcon Accuracy built CREANCE so the MALAR goggles, MANTLE vests and JESS radios the force already wears become the training instruments, and any patch of ground becomes a range in 45 min. What changes is that the opposing force adapts between iterations, the casualty rules are real, and every drill ends with a timestamped review rather than a memory.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits CREANCE to the training equipment, simulators and ranges the client already owns, and to the MALAR, MANTLE and JESS sets the force already issues, so no trainee carries extra kit.

TRAIN Falcon Accuracy trains the opposing force model and the scenario library on the force's own areas of operation, on the opponent it actually faces and on its own recorded missions.

SET Falcon Accuracy sets the doctrine, planning format, safety rules and language of every drill to the force's own, and sets the casualty rules to its medical doctrine.

WORKS WITH

MALAR · MANTLE · JESS · PITCH · TIERCEL · SAILS · GYR · WEATHER · RUFTER · RANGLE · PANNEL

CREANCE CREANCE Live Training Range

DESCRIPTION

CREANCE is live augmented-reality training in the same MALAR goggles, MANTLE vests and JESS radios the force wears on operations. Trainees walk real ground while the goggles render opposing fighters, vehicles and drones in place, held within 0.3 m by ground anchors. The vests register simulated hits with a haptic pulse and a casualty state the medic must treat. A model runs the opposing force and changes tactics every iteration, and missions recorded by PITCH and TIERCEL replay as scenarios. In planning mode, CREANCE builds a 1 m terrain twin from SAILS mapping and satellite imagery, runs the plan 1,000 times in under 1 h and reports where it breaks. The instructor pauses, rewinds or injects events from a tablet. One kit equips 40 trainees and sets up in 45 min on the JESS mesh.

CAPABILITIES

- Live AR opposing fighters, vehicles and drones rendered on the force's own terrain, held within 0.3 m
- Vests register simulated hits with haptic feedback and a casualty state within 100 ms
- Adaptive opposing force changes tactics every iteration, with 200 synthetic entities per kit
- Planning mode runs the plan 1,000 times on a 1 m terrain twin in under 1 h
- Replay of real recorded PITCH and TIERCEL missions as training scenarios
- Instructor tablet pauses, rewinds and injects events, such as a drone sighting or a casualty, within 2 s
- Automatic after-action review exported within 5 min of end of exercise
- 40 trainees per kit, 45 min setup on the JESS mesh, no fixed infrastructure

SPECIFICATIONS · DESIGN TARGETS

CAPACITY	40 trainees and 200 synthetic entities per range kit; 4 kits link for 160 trainees
SETUP	45 min on the JESS mesh with 12 ground anchors, no fixed infrastructure
POSITION ACCURACY	0.3 m with visual-inertial tracking and ground anchors; 1.0 m beyond 400 m from the nearest anchor
RENDERING	opposing entities drawn in MALAR within 20 ms of head motion, occluded by real walls and ground from the 1 m terrain twin
HIT REGISTRATION	simulated hits computed from the opposing force model and the twin's line of sight, with the force's existing range instrumentation attached through an open adapter; 100 ms to haptic pulse and casualty state in the MANTLE vest
OPPOSING FORCE	behavior model with 12 tactic families, retrained between iterations inside the client's network
PLANNING TWIN	1 m terrain and imagery; line of sight, sensor ranges and radio propagation modeled; 1,000 runs of a plan in under 1 h on a PITCH two-case kit
REVIEW	full replay export within 5 min of end of exercise; every movement, simulated hit, call and decision timestamped to 10 ms
KIT	2 cases, 38 kg, instructor tablet, 12 anchors, 40 trainee tracking sets; 10 h on battery
ENVIRONMENT	MIL-STD-810H, IP67, -20 to +50 C

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy walks the client through the full system design in a 2-day review, including the tracking, rendering and hit-registration chain and its 0.3 m and 100 ms budgets.
- Falcon Accuracy runs the planning-mode simulation on a 4 km by 4 km terrain tile the client supplies and returns the 1,000-run report within 10 working days.
- Falcon Accuracy delivers the acceptance trial protocol in which every figure on this page is a pass or fail test on the client's own ground.
- Falcon Accuracy commits that exercise recordings, terrain and opposing force models stay on client hardware inside the client's network, with the client holding the keys.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

CREANCE trains a force on ground it can reach, and its planning mode checks a plan on a 1 m twin of that ground. The next mission is on ground the force cannot reach until the night itself, with interiors, traffic and sensor coverage that a 1 m terrain tile does not hold. WEATHER builds a 10 cm twin of that objective from the mapping SAILS already flies and the interiors EYAS already maps, and lets the squads, the robot operators and the command post rehearse inside it together. The plan that survives WEATHER is then run live on CREANCE, so the rehearsal and the drill test the same timings.



CONCEPT VISUALIZATION · WEATHER

ALL FIGURES ARE DESIGN TARGETS

TRAINING AND SIMULATION · SOFTWARE · 02 OF 05

WEATHER

WEATHER Mission Rehearsal Twin

To weather a hawk is to set it out on its block, where it sees the ground, the wind and the world before it is flown; WEATHER sets the force inside a twin of the objective before the real night.

WALK THE OBJECTIVE A HUNDRED TIMES BEFORE THE FIRST NIGHT.

SUMMARY

WEATHER builds a digital twin of the objective at 10 cm from SAILS mapping, TIERCEL and EYAS imagery and the force's own recordings, then lets squads, robot operators and the command post rehearse the mission inside it together, in the goggles and on the controllers they will carry. It reports where the plan breaks and hands the rehearsed plan to CREANCE for a live run.

WHY FALCON ACCURACY BUILT IT

The ground a force must fight on is rarely the ground it can train on. Planners rehearse on a map and a sand table, the robot and drone operators rehearse nowhere, and the command post meets the plan for the first time when the radios open. Falcon Accuracy built WEATHER so the whole force rehearses in one twin of the actual objective, built in hours from the mapping it already flies, with the opposing force, the sensors and the radio propagation modeled on the same terms as the live picture. What changes is that the squad leader has already walked the approach six times, the drone operator has already flown the orbit, and the watch officer has already seen the plan fail twice and knows which branch to take.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits WEATHER to the MALAR goggles, RUFTER stations and PITCH kits the force already has, and to the mapping aircraft and imagery sources it already uses.

TRAIN Falcon Accuracy trains the opposing force library and the traffic and civilian patterns on the client's theater and recorded incidents, in the client's language.

SET Falcon Accuracy sets the planning format, the branch rules and the approval chain to the force's own doctrine and thresholds.

WORKS WITH

CREANCE · RUFTER · PANNEL · PITCH · TIERCEL · SAILS · EYAS · MALAR · JESS · CRINES

WEATHER WEATHER Mission Rehearsal Twin

DESCRIPTION

WEATHER is a mission rehearsal system built on a twin of the objective. It assembles the twin from SAILS mapping, TIERCEL video, EYAS interior maps and satellite imagery, at 10 cm for structures and 1 m for terrain, within 6 h of receiving the data. Sensor ranges, line of sight, radio propagation, traffic and light are modeled. Squads rehearse on foot in MALAR goggles inside a 40 m by 40 m tent matched to the twin. Robot and drone operators join from RUFTER stations and the command post from PITCH on synthetic feeds. The opposing force plays the behaviors recorded in the client's theater and branches at every decision. WEATHER runs the plan 2,000 times overnight, ranks where it breaks and hands the surviving plan to CREANCE for a live run. A human decides what the plan becomes.

CAPABILITIES

- Twin of the objective at 10 cm for structures and 1 m for terrain, built within 6 h of receiving SAILS mapping, TIERCEL video, EYAS maps and imagery
- Sensor ranges, line of sight, radio propagation, traffic and light modeled on the same terms as the live PITCH picture
- Squads rehearse on foot in MALAR goggles inside a 40 m by 40 m tent matched to the twin, 24 trainees at once
- Robot and drone operators join from RUFTER stations and the command post joins from PITCH on synthetic feeds
- Opposing force branches at every decision, drawn from behaviors recorded in the client's theater
- 2,000 runs of the plan overnight, with the break points ranked and explained in plain language
- Rehearsed plan, routes and timings export to CREANCE for a live run and to PITCH as the mission plan within 2 min
- Twin refreshes within 20 min of new SAILS or TIERCEL imagery, with every change flagged to the planner

SPECIFICATIONS · DESIGN TARGETS

TWIN RESOLUTION	10 cm for structures and 1 m for terrain over 25 square kilometers; interiors from EYAS maps at 5 cm, or from TIERCEL video or hand sketches at 20 cm
BUILD TIME	under 6 h from receipt of mapping and imagery; refresh within 20 min of new imagery
REHEARSAL SPACE	40 m by 40 m tent or hangar, 24 trainees on foot in MALAR goggles, position error under 5 cm from ground anchors
LATENCY	under 20 ms head motion to display; under 100 ms between a squad, RUFTER stations and PITCH in the same rehearsal
SIMULATION	2,000 runs of a plan in under 8 h on a PITCH two-case kit; 100 runs in 25 min for a quick check
MODELS	sensor ranges, line of sight, radio propagation, traffic, civilian patterns, light and the forecast weather
OPPOSING FORCE	behavior library drawn from the client's recorded incidents, 12 tactic families, branching at every decision
EXPORT	plan, routes and timings to CREANCE and PITCH within 2 min; full rehearsal recording to PANNEL
HOSTING	PITCH two-case kit or client rack; every twin and recording stays inside the client's network

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy builds a demonstration twin from mapping and imagery the client supplies for a 1 square kilometer site and shows the rehearsal walkthrough within 15 working days.
- Falcon Accuracy publishes the twin's error budget, 10 cm for structures and 1 m for terrain, and the trial protocol that measures it against surveyed points.
- Falcon Accuracy runs the 2,000-run plan check on the demonstration twin and walks the client through the ranked break points.
- Falcon Accuracy commits that the twin, the opposing force library and every rehearsal recording stay inside the client's network and are deleted on the client's order.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

A WEATHER rehearsal shows that the drone orbit and the GYR route decide the timing of the whole plan, and those are the two tasks that put a new operator in charge of a 4.2 kg aircraft or a 420 kg vehicle. Live practice costs a sortie per mistake and cannot safely stage a link loss over a crowd. RUFTER gives the operator 100 h on the same controller and the same autonomy software, with every fault the instructor wants to see, before the live rehearsal. The operators then join WEATHER from their RUFTER stations, so the simulator and the twin are one session.



CONCEPT VISUALIZATION · RUFTER

ALL FIGURES ARE DESIGN TARGETS

TRAINING AND SIMULATION · HARDWARE · 03 OF 05

RUFTER

RUFTER Operator Simulator

The rufter is the plain hood a newly taken hawk wears through its first days of training, before it has earned the field; RUFTER is where a new operator flies the first hundred sorties, faults included, before the real machine.

A HUNDRED SORTIES AND A HUNDRED CRASHES, NO AIRCRAFT LOST.

SUMMARY

RUFTER is a simulator for the operators of TIERCEL, GYR, LURCHER, FALCONER and RAKE. It plugs in the force's own controllers and goggles, runs the same autonomy software as the machines, and trains operators through link loss, low battery, dust, wind and crowded airspace on the client's own terrain, with an instructor scoring every run.

WHY FALCON ACCURACY BUILT IT

Robot and drone operators are the scarce skill in a modern force, and their mistakes are the expensive ones. A new TIERCEL operator learns on a 4.2 kg aircraft that costs a sortie each time it is dropped, and a LURCHER operator meets the lost-link procedure only when the link is actually lost. Falcon Accuracy built RUFTER so an operator arrives at the live machine with 100 h on the same controller, the same display and the same autonomy behavior, including the failures that live training cannot safely stage. What changes is that the first live sortie is the 101st, and the instructor already knows which operator freezes when the link drops.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits RUFTER to the controllers, consoles, goggles and vehicles the force already operates, including client vehicles added from a data pack, and to the tents and vehicles it trains from.

TRAIN Falcon Accuracy trains the scenario library on the client's own terrain, airspace, weather and the drone and vehicle types recorded in its theater, with instructor prompts in the client's language.

SET Falcon Accuracy sets the scoring rubric, the lost-link and airspace procedures and the approval drills to the force's own doctrine and thresholds.

WORKS WITH

TIERCEL · GYR · LURCHER · FALCONER · SAILS · MALAR · JESS · PITCH · WEATHER · CREANCE · PANNEL

RUFTER RUFTER Operator Simulator

DESCRIPTION

RUFTER is a deployable simulator for the operators of robots and aircraft. Each station takes the force's own TIERCEL controller, the GYR, LURCHER and FALCONER tablets and MALAR goggles, and drives them with the same autonomy software the machines run. Physics, wind, dust and battery models reproduce the published performance of each machine within 5 percent. Scenarios run on the client's own terrain from WEATHER twins or SAILS mapping, and the instructor injects link loss, satellite denial, motor faults, crowds or hostile drones from a tablet. The station scores each run against the force's procedures and replays the three moments that cost most. Four stations and the instructor host fit in two cases, and one live machine flies or drives in the loop so the operator practices the handover to reality.

CAPABILITIES

- Takes the force's own controllers, consoles and MALAR goggles; the simulated machine runs the same autonomy software as the real one
- Models TIERCEL, GYR, LURCHER, FALCONER and RAKE with physics matched to published figures within 5 percent
- Scenarios on the client's own terrain from WEATHER twins or SAILS mapping, with wind to 15 m/s, dust, rain and night
- Instructor injects link loss, satellite denial, motor and sensor faults, crowds and hostile drones within 2 s
- Sessions of 16 stations across 4 kits, with JESS traffic, PITCH tasking and airspace deconfliction simulated
- Scores each run against the force's procedures and replays the three costliest moments within 1 min
- One live machine in the loop, so an operator practices the handover between simulation and the real aircraft or robot
- Four stations and the instructor host in two cases, running in a tent within 30 min

SPECIFICATIONS · DESIGN TARGETS

STATIONS	4 per kit, 16 across 4 linked kits; each takes the force's own controller, console or goggles over USB, Ethernet or JESS
MACHINES MODELED	TIERCEL, GYR, LURCHER, FALCONER and RAKE, physics matched to published performance within 5 percent; client vehicles added from a data pack
VISUALS	MALAR goggles or 32-inch display at 120 Hz, under 20 ms control to display
ENVIRONMENT MODELS	wind to 15 m/s with gusts, dust, rain, fog and night; satellite denial and jamming effects on navigation and link
SCENARIO SOURCE	WEATHER twins, SAILS mapping or a 1 m terrain tile; 200 synthetic entities per session
INSTRUCTOR HOST	tablet with 40 fault and event injections, pause, rewind and takeover; scoring rubric set to the force's procedures
LIVE MACHINE IN THE LOOP	one real TIERCEL, GYR or LURCHER per kit flown or driven alongside simulated machines, handover under 1 s
KIT	2 cases, 44 kg, 400 W; 6 h on battery or on vehicle power; MIL-STD-810H cases, operates -10 to +45 C
DATA	every run recorded in PANNEL format; recordings stay inside the client's network

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy demonstrates one station on a bench with a TIERCEL controller in the loop and shows the control-to-display latency measured under 20 ms.
- Falcon Accuracy publishes the physics validation plan that compares each simulated machine against the published figures of the real one within 5 percent.
- Falcon Accuracy delivers the acceptance trial protocol, including a transfer-of-training test on a live TIERCEL with 12 operators.
- Falcon Accuracy commits that every recording, score and scenario stays inside the client's network.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

RUFTER trains the operators who run the casualty-evacuation leg, from the MANTLE alert to the GYR or BRAIL litter to the aid station, but the leg still ends in a medic's hands. On most ranges those hands practice on a static form while an instructor describes what the casualty is doing. RANGLE makes the casualty do the describing, with sensed vital signs, bleeding that answers to a tourniquet and a timeline to the second. It wears a MANTLE training vest and fits the GYR litter rail and the BRAIL deck, so the chain the operators practiced in RUFTER is drilled end to end with real machines.



CONCEPT VISUALIZATION · RANGLE

ALL FIGURES ARE DESIGN TARGETS

TRAINING AND SIMULATION · HARDWARE · 04 OF 05

RANGLE

RANGLE Casualty Care Trainer

Rangle is the handful of small smooth stones a falconer gives a hawk to clear and settle its crop, the oldest remedy in the sport; the trainer teaches the medic the remedies that matter now.

A CASUALTY THAT BREATHES, BLEEDS AND RECORDS EVERY SECOND OF CARE.

SUMMARY

RANGLE is a sensorized training casualty with the mass of an equipped operator. It breathes, bleeds, loses its pulse on schedule and answers in the client's language, registers every tourniquet, dressing and airway placement to the second, and ties into the MANTLE casualty alert and the GYR litter so the chain from first alert to aid station is drilled rather than described.

WHY FALCON ACCURACY BUILT IT

A force that fields MANTLE receives a casualty alert with position, vitals and probable injury 2 s after a downed wearer's 10 s countdown runs out, and from then on everything depends on hands that have practiced. Most medic training uses a static form while an instructor describes what the casualty is doing, and the carry and the handover are rarely rehearsed at all. Falcon Accuracy built RANGLE so the casualty does the describing, with sensed vital signs, bleeding that stops when a tourniquet reaches pressure and a timeline to the second. What changes is that the medic's time to a controlled bleed is measured on every drill, and the chain from alert to litter to aid station is rehearsed with the same vests, radios and robots the force fights with.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits RANGLE to the medic kits, litters, vehicles and casualty-evacuation robots the force already uses, and sizes the form to the force's own builds and equipment loads.

TRAIN Falcon Accuracy trains the injury scenarios and the casualty's spoken responses on the injury patterns and languages of the client's theater.

SET Falcon Accuracy sets the care protocols, the timing standards and the scoring to the force's own medical doctrine.

WORKS WITH

MANTLE · JESS · GYR · BRAIL · MALAR · CREANCE · WEATHER · PANNEL

RANGLE RANGLE Casualty Care Trainer

DESCRIPTION

RANGLE is a 72 kg sensorized training casualty, articulated to be carried and dragged. It breathes, carries a pulse at the neck, wrist and thigh, bleeds from up to 4 simulated sites and speaks scripted responses in the client's language. Pressure zones under the skin register a tourniquet, a dressing or an airway placement within 0.5 s and log the time and pressure. An instructor tablet or a CREANCE or WEATHER scenario drives it, so a missed bleed drops the pulse on schedule and a tourniquet at pressure stops the flow within 10 s. Its MANTLE training vest sends the real alert to the medic and command, and GYR and BRAIL take it aboard, so the carry and handover are drilled with real machines. Each drill exports a second-by-second timeline to PANNEL within 2 min.

CAPABILITIES

- Breathes, carries a pulse at 3 sites and bleeds from up to 4 simulated sites, all driven by the scenario or the instructor
- Registers tourniquets, dressings and airway placements within 0.5 s, with time and pressure logged
- Reacts on schedule, so a missed bleed drops the pulse and a tourniquet at pressure stops the flow within 10 s
- Speaks scripted responses in the client's language and goes quiet on cue
- Sends the real MANTLE casualty alert to the medic and command, with position, vitals and probable injury
- Fits the GYR litter rail and the BRAIL litter deck for the carry and handover, at 72 kg
- Second-by-second timeline of care exported to PANNEL within 2 min of the drill
- 8 h on battery, IP65, cleaned and reset for the next drill in 10 min

SPECIFICATIONS · DESIGN TARGETS

FORM	72 kg, 1.78 m, articulated to carry and drag; 12 kg removable to match the force's own builds and loads
VITAL SIGNS	breathing 0 to 40 per min, pulse at neck, wrist and thigh from 0 to 180 per min, skin temperature at 4 sites
BLEEDING	up to 4 simulated sites from a 1.2 L reservoir, flow set by the scenario, stops within 10 s of a tourniquet reaching 250 mmHg
SENSING	40 pressure zones under the skin plus airway and chest sensors; intervention registered within 0.5 s with time and pressure
VOICE	scripted responses in the client's language, driven by the scenario or the instructor tablet
SCENARIO DRIVE	instructor tablet, or CREANCE and WEATHER scenarios over the JESS mesh
CHAIN	MANTLE training vest sends the casualty alert; fits the GYR litter rail and the BRAIL litter deck
POWER AND CARE	8 h on battery, IP65, reset and clean in 10 min; operates -10 to +45 C
DATA	every drill exported to PANNEL within 2 min; recordings stay inside the client's network

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy demonstrates the sensing skin on a bench, registering a tourniquet and an airway placement within 0.5 s with pressure logged.
- Falcon Accuracy publishes the vital-signs and bleeding model and reviews it with the client's medical staff before any scenario is written.
- Falcon Accuracy delivers the acceptance trial protocol in which every figure on this page is a pass or fail test with the force's own medics.
- Falcon Accuracy commits that drill recordings stay inside the client's network and that no trainee or casualty data leaves the client's hardware.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

Every RANGLE drill ends with a timeline of what the medic did and when, and that timeline is the review every other product in this sector needs. CREANCE, WEATHER and RUFTER each produce recordings in the same format, and PITCH logs live missions the same way. PANNEL is the one engine that aligns all of them, finds the moments that decided the outcome and hands the instructor a review within 5 min, so a drill, a rehearsal, a simulator run and a live patrol are judged by the same standard.



CONCEPT VISUALIZATION · PANNEL

ALL FIGURES ARE DESIGN TARGETS

TRAINING AND SIMULATION · SOFTWARE · 05 OF 05

PANNEL

PANNEL After-Action Review Engine

The pannel is the hawk's stomach, where the day's quarry is broken down into what the bird keeps; PANNEL digests every recording of an exercise into the few moments that decided it.

FIND THE THREE MINUTES THAT DECIDED THE EXERCISE.

SUMMARY

PANNEL takes every recording the force makes, from CREANCE drills, WEATHER rehearsals, RUFTER runs and RANGLE drills to live missions logged by PITCH, and builds one timeline of every movement, call and decision. It finds the moments that decided the outcome, explains them in plain language with the evidence attached, and gives the instructor a review within 5 min of end of exercise.

WHY FALCON ACCURACY BUILT IT

Most of what a force learns in an exercise is lost in the 48 h after it ends. The review is built by hand from memory, radio logs and a few clips, it reaches the trainees a day late, and it rarely reaches the next unit at all. Falcon Accuracy built PANNEL so the recordings the force already makes, on goggles, vests, radios, aircraft and PITCH, become one synchronized timeline and a ranked set of decisive moments within minutes, with the same engine reviewing a drill and a live patrol. What changes is that the review is ready before the trainees have taken off their vests, the instructor spends the hour coaching rather than reconstructing, and the commander sees the trend across 40 exercises.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits PANNEL to the recordings, cameras, radios and logs the force already produces, through open adapters, and to the PITCH kits it already runs.

TRAIN Falcon Accuracy trains the speech models on the client's languages, accents and call signs, and the decisive-moment models on the force's own recorded exercises and missions.

SET Falcon Accuracy sets the scoring rubrics, the release rules for individual records and the review format to the force's own standards and doctrine.

WORKS WITH

CREANCE · WEATHER · RUFTER · RANGLE · PITCH · MALAR · MANTLE · JESS · TIERCEL

PANNEL PANNEL After-Action Review Engine

DESCRIPTION

PANNEL is an after-action review engine. It ingests the recordings the force already makes, such as MALAR video and detections, MANTLE casualty events, JESS voice and messages, TIERCEL tracks, RUFTER and RANGLE logs and PITCH decisions, and aligns them to one timeline at 10 ms within 5 min of end of exercise. Speech is transcribed in the client's language and tied to a speaker and a position. Models find the decisive moments, such as a contact report sent 40 s late, and rank them by their effect on the outcome, each with a one-paragraph explanation and its clips. The instructor accepts, edits or rejects every finding, and nothing reaches a trainee's record without that decision. Reviews publish to a tablet, a wall display or the goggles, and the commander sees the trend across 40 exercises.

CAPABILITIES

- Aligns MALAR, MANTLE, JESS, TIERCEL, PITCH, RUFTER and RANGLE recordings to one timeline at 10 ms within 5 min of end of exercise
- Transcribes radio speech in the client's language and ties every call to a speaker, a position and a time
- Finds and ranks decisive moments by effect on the outcome, each explained in one paragraph with clips attached
- Instructor accepts, edits or rejects each finding; nothing reaches a trainee record without a human decision
- Replays any moment in 3D on the terrain twin from any position, including through a trainee's goggles
- Scores against the force's own standards and shows the trend across 40 exercises per unit
- Reviews a drill, a rehearsal, a simulator run and a live mission logged by PITCH the same way
- Publishes to a tablet, a wall display or MALAR goggles; every review stays inside the client's network

SPECIFICATIONS · DESIGN TARGETS

INPUTS	MALAR, MANTLE, JESS, TIERCEL, PITCH, CREANCE, WEATHER, RUFTER and RANGLE recordings, plus the force's existing cameras and logs through open adapters
TIMELINE	alignment to 10 ms across 200 sources; review ready within 5 min of end of exercise for a 4 h drill of 40 trainees
SPEECH	transcription in the client's languages with speaker and position tags, word error under 10 percent on clean JESS audio
ANALYSIS	decisive moments ranked by modeled effect on the outcome, each with a plain-language explanation and evidence clips
REPLAY	3D replay on the terrain twin from any position, including any trainee's goggle view, at 60 Hz
SCORING	rubrics set to the force's standards; unit trend across 40 exercises; individual records released only by the instructor
HOSTING	PITCH two-case kit in the field, client rack in garrison; a 4 h drill is reviewed on the two-case kit alone
SECURITY	every finding and every instructor decision logged; AES-256 at rest and in transit; nothing leaves the client's network

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy demonstrates the timeline alignment and transcription on a synthetic 4 h exercise recording and shows the review produced within 5 min.
- Falcon Accuracy publishes the method behind the decisive-moment ranking and reviews it with the client's instructors before any rubric is set.
- Falcon Accuracy delivers the acceptance trial protocol in which the review is compared, moment by moment, with the judgment of the client's own instructors on 10 recorded exercises.
- Falcon Accuracy commits that recordings, transcripts and findings stay inside the client's network, that individual records are released only by the instructor, and that every instructor decision is logged.

NEXT SECTOR · 18 TAILORING AND SERVICES · P. 240

Fitted, trained, set and kept in service by your own people. This closes Training and Simulation. Sector 18, Tailoring and Services, opens on page 240 with ENSEAM, FURCULA, ROUSE, TOMIAL and FEAK.

SECTOR 18 OF 18

18

TAILORING AND SERVICES

FITTED, TRAINED, SET AND KEPT IN SERVICE BY YOUR OWN PEOPLE.

Every product in this catalog is designed to be tailored, and tailoring is work with a schedule, a team and acceptance criteria rather than a line in a brochure. Four things decide whether a system still works on day 400. It has to join the radios and command software the force already owns. Its models have to keep learning on the force's own data without that data leaving the building. An independent team has to try to defeat it before an adversary does. The force's own instructors and technicians have to keep it running without a Falcon Accuracy engineer on site. This sector turns each of those jobs into a product with figures a buyer can hold it to. Every service runs inside the client's network, on client-issued accounts, with a named client officer deciding and every decision logged.



IN THIS SECTOR · 5 PRODUCTS · PAGES 242 TO 251

ENSEAM **FURCULA** **ROUSE** **TOMIAL** **FEAK**

The five products run as one lifecycle. ENSEAM Tailoring Program delivers FIT, TRAIN, SET as a 40-week program that ends in a signed acceptance trial on the force's own ground. FURCULA Integration Gateway joins legacy radios, sensors, vehicle buses and command software to the picture in 10 weeks per site. ROUSE Model Operations Service retrains, tests and releases models every 4 weeks on racks the client owns. TOMIAL Red-Team and Assurance Service puts every system and every release through an emulated adversary before a human signs it. FEAK Sustainment and Instructor Service keeps the fleet available for 10 years and certifies the force's own instructors and technicians to run it.

IN THIS SECTOR · 5 PRODUCTS



ENSEAM p. 242

ENSEAM Tailoring Program

Nine months from site survey to signed acceptance on your ground.



FURCULA p. 244

FURCULA Integration Gateway

Your legacy radios, sensors and software join the picture in ten weeks.



ROUSE p. 246

ROUSE Model Operations Service

Models retrain where the data lives and never leave the building.



TOMIAL p. 248

TOMIAL Red-Team and Assurance Service

Every release meets an emulated adversary before your force relies on it.



FEAK p. 250

FEAK Sustainment and Instructor Service

Kept in service for ten years by your own people.



CONCEPT VISUALIZATION · ENSEAM

ALL FIGURES ARE DESIGN TARGETS

TAILORING AND SERVICES · SERVICE · 01 OF 05

ENSEAM

ENSEAM Tailoring Program

To enseam a hawk is to bring it into flying condition for the season ahead, a program of weeks that ends with the first free flight of the season; ENSEAM brings a force's system into condition over 40 weeks and ends with a signed acceptance trial on its own ground.

NINE MONTHS FROM SITE SURVEY TO SIGNED ACCEPTANCE ON YOUR GROUND.

SUMMARY

ENSEAM is the 9-month program that delivers FIT, TRAIN, SET for any Falcon Accuracy system a force buys. One joint team fits the hardware to the issued kit and sites, trains the models on the client's own data inside the client's network, sets doctrine, rules and thresholds, and proves the result at a 10-day acceptance trial on the force's own ground.

WHY FALCON ACCURACY BUILT IT

Most fielded systems fail at the join, not in the box. A detector trained on another theater's vehicles, a radio that cannot talk to the force's legacy sets, or an alert threshold copied from another doctrine turns a capable product into one the force stops trusting within a month. Falcon Accuracy built ENSEAM so that tailoring is a product with a schedule, named deliverables and acceptance criteria rather than a promise in a brochure. The force gets a dated plan, weekly evidence and a system that passes trials on its own ground with its own operators.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits the program to the force's calendar, procurement rules and the sites it names, starting from the helmets, vehicles, radios and operations rooms the force already has, and scales the on-site team to the number of products in scope.

TRAIN Falcon Accuracy trains every model in the program on the client's own theater, the threats recorded there and the force's language, with data collected by the force's operators on their own ground.

SET Falcon Accuracy sets the acceptance criteria, thresholds and rules to the force's doctrine, with each criterion written alongside the client's officers and signed by the client's authority.

WORKS WITH

FURCULA · ROUSE · TOMIAL · FEAK · PITCH · JESS · CREANCE

ENSEAM ENSEAM Tailoring Program

DESCRIPTION

ENSEAM runs 40 weeks in three phases under one Falcon Accuracy lead and a client counterpart. FIT, weeks 1 to 12, surveys sites and kit for 10 days and fits mounts, cable buses, FURCULA adapters and radio plans to the force's helmets, vehicles, masts and operations rooms. TRAIN, weeks 13 to 28, collects 400 hours of labeled sensor data on the client's ground and retrains every model on a ROUSE rack inside the client's network, so no data leaves the building. SET, weeks 29 to 36, loads the force's doctrine, rules and thresholds in a 3-day workshop with its officers and runs a 5-day course for 40 operators. Weeks 37 to 40 hold a 10-day acceptance trial of 60 scripted events, and the client's authority signs each criterion. A human signs every gate, and every decision is logged.

CAPABILITIES

- Three phases over 40 weeks, FIT 12 weeks, TRAIN 16 weeks, SET 8 weeks, then a 4-week acceptance window
- 10-day site and kit survey lists every helmet, vehicle, mast and operations room in scope within 5 working days of the visit
- 400 h of sensor data collected and labeled by the force's own operators on the client's own ground
- Every model retrained inside the client's network on a ROUSE rack, with no data leaving the building
- Doctrine, rules and thresholds loaded in a 3-day workshop with the force's officers, one logged entry per rule
- 5-day course for 40 operators and 10-day course for 8 instructors, delivered in the force's language before the trial
- 10-day acceptance trial scores 60 scripted events against numbered criteria signed by the client's authority
- 12-page weekly evidence pack and a monthly steering review, with an owner and a date on every open risk

SPECIFICATIONS · DESIGN TARGETS

DURATION	40 weeks from kickoff to signed acceptance; a single-product program compresses to 24 weeks
PHASES	FIT weeks 1 to 12, TRAIN weeks 13 to 28, SET weeks 29 to 36, acceptance weeks 37 to 40
TEAM	one Falcon Accuracy program lead, 6 to 10 engineers on site during FIT and SET, 4 data engineers during TRAIN; the client names one counterpart per phase
SURVEY	10 days across up to 3 sites; every vehicle, helmet and rack type photographed, measured and listed within 5 working days
DATA	400 h of labeled sensor data and 50,000 labeled frames per detector class as the minimum before retraining starts
COURSES	5-day operator course for 40 operators and 10-day instructor course for 8 instructors, both in the force's language and doctrine terms
ACCEPTANCE	60 scripted events over 10 days; each criterion numbered, measured and signed; a failed criterion reruns within 14 days
REPORTING	12-page weekly evidence pack, monthly steering review, risk register with an owner and a date on every item
DATA HANDLING	all data, labels and models stay inside the client's network on client-held hardware; Falcon Accuracy staff use client-issued accounts; every access logged
SCOPE	any mix of Falcon Accuracy products; one program manual with a pack for every sector in the catalog

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can walk a client through the 40-week plan, the deliverable list and the acceptance template in a 1-day design review today.
- Falcon Accuracy can run a 2-day tabletop pilot of the SET phase on the client's own doctrine documents and return a draft rule set and threshold table.
- Falcon Accuracy commits that all program data, labels and models stay on client-held hardware inside the client's network, with every access logged.
- Falcon Accuracy can show the data-collection protocol, the label schema and the sample-size calculation behind the 400 h target for the client's own engineers to check.
- The schedule, team sizes and trial figures are design targets; the first program run with a client sets the baseline that later programs are measured against.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

Most of the schedule risk in ENSEAM sits in the FIT phase, where the force's legacy radios, command software and sensors have to join the PITCH picture before any model can be trained on their data. Done by hand, that join is an undocumented script written under time pressure that breaks at the next software update. FURCULA turns it into a product with a tested adapter library, two gateway units and a 10-week method, so FIT keeps to its 12 weeks and the data for TRAIN starts flowing in week 8.



CONCEPT VISUALIZATION · FURCULA

ALL FIGURES ARE DESIGN TARGETS

TAILORING AND SERVICES · SERVICE · 02 OF 05

FURCULA

FURCULA Integration Gateway

The furcula is the wishbone, the bone that ties the falcon's two shoulders into one frame that bears the whole wingbeat; FURCULA ties a force's legacy systems and the Falcon Accuracy family into one frame.

YOUR LEGACY RADIOS, SENSORS AND SOFTWARE JOIN THE PICTURE IN TEN WEEKS.

SUMMARY

FURCULA is the systems-integration service that connects the radios, sensors, vehicles and command software a force already owns to PITCH and the rest of the family. Falcon Accuracy engineers fit gateway units in the operations room and on vehicles, write and test the protocol adapters, and hand over a join that the force's own technicians can maintain.

WHY FALCON ACCURACY BUILT IT

A force does not replace its radios, battle-management software and sensors on the day it buys new ones; for 5 to 10 years the old and the new run side by side. Every integration done by hand under schedule pressure becomes an undocumented script that breaks at the next software update. Falcon Accuracy built FURCULA so that the join is a product, with a tested adapter library, hardware that fits the racks and vehicles the force has, and a 10-week method that ends in a documented, measured interface. The force keeps what works, gains one picture across old and new, and owns the result.

READINESS

●●○ BENCH PROTOTYPE

Critical functions run on a bench rig. Nothing has been fielded.

TAILORING

FIT Falcon Accuracy fits FURCULA to the racks, vehicle buses, legacy radios and command software the force already owns, surveyed on site, with cable kits and port maps cut to each vehicle type.

TRAIN Falcon Accuracy trains the adapters on 24 hours of the force's own recorded traffic per interface, including the message dialects and field conventions of the client's theater, and tunes the text and voice bridges to the force's language.

SET Falcon Accuracy sets the boundary rules, message filters and logging policy to the force's security doctrine and classification scheme, and the client's security authority signs the rule set before cutover.

WORKS WITH

ENSEAM · ROUSE · JESS · PITCH · HOOD · SCREEN · GYR

FURCULA FURCULA Integration Gateway

DESCRIPTION

FURCULA delivers the join between legacy systems and the Falcon Accuracy family in 10 weeks per site. A 5-day survey lists every radio, sensor, vehicle bus and software system in scope; two gateway units follow. The 2U rack unit carries 24 serial, Ethernet, audio and discrete ports and translates 40 protocols at once with under 50 milliseconds of added latency. The 1.2 kilogram vehicle unit bridges a vehicle bus, a legacy radio and a JESS node on vehicle power. A library of 60 adapters for message formats, data links, video streams and map layers covers most legacy kit, and a new adapter takes 15 working days from sample traffic to signed test. Every adapter runs behind a one-way or filtered boundary, every message is logged, and the force's technicians receive the adapter source and a 3-day course.

CAPABILITIES

- Interface survey lists every radio, sensor, vehicle bus and software system at a site within 5 days
- Rack gateway translates up to 40 protocols at once on 24 ports with under 50 ms of added latency
- Vehicle gateway of 1.2 kg bridges a vehicle bus, a legacy radio and a JESS node on 24 V power
- Adapter library of 60 message formats, video streams and map layers, with a new adapter in 15 working days
- Legacy voice radios join the JESS mesh through audio and push-to-talk ports, 4 radios per rack unit
- One-way and filtered boundaries between security domains, with every message logged and attributable
- Replay harness proves each adapter against 24 h of recorded traffic before it touches a live system
- Handover with adapter source, interface control documents and a 3-day course for 12 technicians

SPECIFICATIONS · DESIGN TARGETS

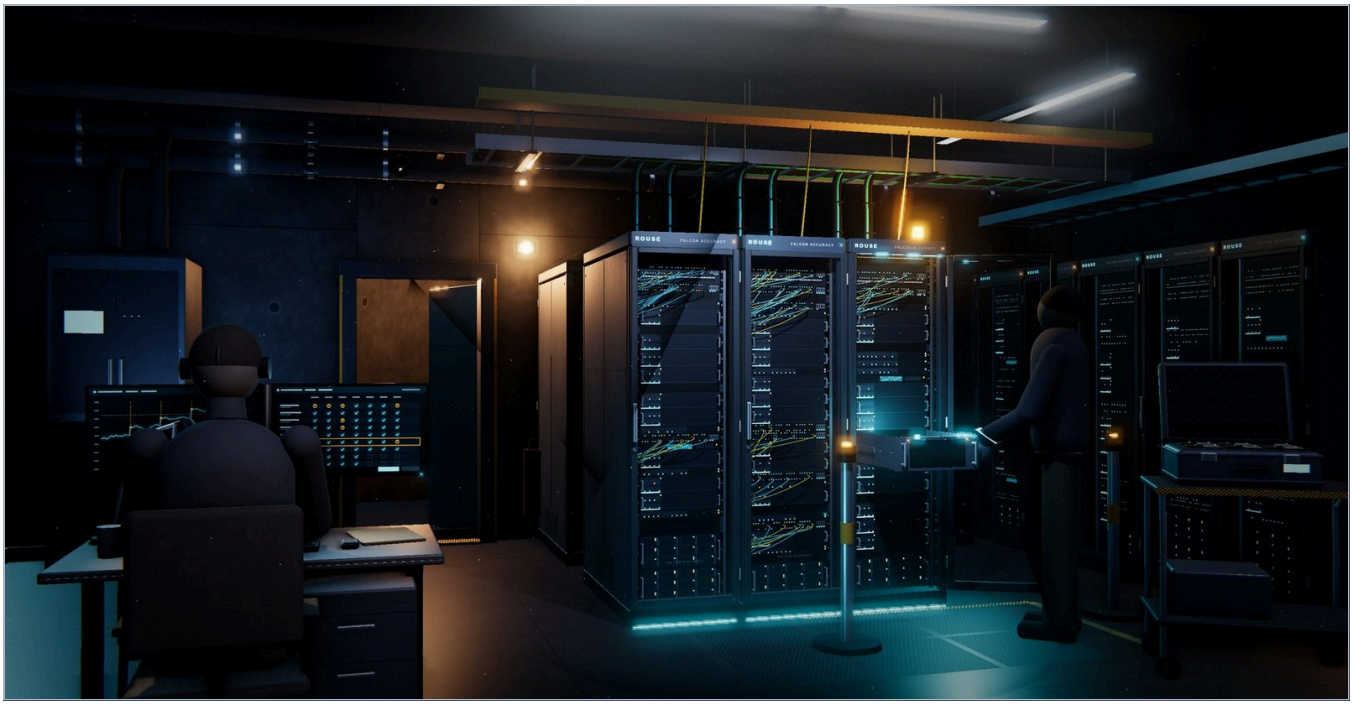
SERVICE	10 weeks per site, 5-day interface survey, 6 weeks of adapter build and bench test, 3 weeks of on-site cutover and acceptance
RACK GATEWAY	2U, 24 ports mixing serial, 1 and 10 Gbps Ethernet, audio and discrete I/O; 40 concurrent protocol translations; under 50 ms added latency; 120 W
VEHICLE GATEWAY	1.2 kg, 18 to 32 V vehicle power, 25 W, 8 ports, bridges one vehicle bus, one legacy radio and one JESS node; MIL-STD-810H, IP67, -32 to +55 C
ADAPTER LIBRARY	60 adapters at release covering message formats, data links, video streams, map layers and sensor telemetry; a new adapter in 15 working days
THROUGHPUT	20,000 messages per second per rack unit and 2,000 per vehicle unit; 8 concurrent video streams transcoded at 1080p
BOUNDARIES	one-way flow enforced in hardware on the rack unit; filtered two-way flow under a signed rule set; every message logged with source, time and rule
TESTING	replay harness with 24 h of recorded traffic per interface; 100 percent of messages checked against the interface control document before cutover
SECURITY	AES-256 on every link, FIPS 140-3 modules, hardware security module, zero-trust access, tamper detection; no cloud dependency; data stays inside the client's network
HANDOVER	adapter source, interface control documents, test records and a 3-day technician course for 12 technicians

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can demonstrate 6 adapters translating simulated legacy traffic into the PITCH track format on a bench today, with the added latency measured and displayed.
- Falcon Accuracy can run a 5-day interface survey at one client site and return an interface list, a risk list and an adapter plan within 10 working days.
- Falcon Accuracy can show the replay harness and the test record format that every adapter passes before cutover.
- Falcon Accuracy commits that recorded traffic used to build adapters stays on client-held hardware inside the client's network and is deleted or handed over at the client's choice.
- Gateway port counts, latency and throughput are design targets to be verified at acceptance on the client's own systems.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

Once FURCULA carries the force's own feeds into the picture, the force holds for the first time the data its models should learn from, and its security rules forbid that data from leaving the building. The gateways supply the data; ROUSE supplies the place to use it. A client-owned rack takes the labeled detections and operator corrections flowing in through the gateways and turns them into retrained, tested and staged models every 4 weeks, so TRAIN becomes a standing capability rather than a phase that ends in month 7.



CONCEPT VISUALIZATION · ROUSE

ALL FIGURES ARE DESIGN TARGETS

TAILORING AND SERVICES · SERVICE · 03 OF 05

ROUSE

ROUSE Model Operations Service

A hawk rouses when it shakes every feather back into place, ready to fly again; ROUSE retrains, tests and releases every model so it is back in place every 4 weeks.

MODELS RETRAIN WHERE THE DATA LIVES AND NEVER LEAVE THE BUILDING.

SUMMARY

ROUSE is the model-operations service that keeps every Falcon Accuracy model learning on the client's own data, inside the client's network. A rack in the client's building collects labeled data from fielded systems, retrains, tests and stages each model, and a named client officer approves every release. Nothing leaves the network.

WHY FALCON ACCURACY BUILT IT

A detector trained once is accurate on the day of acceptance and less accurate every month after, as vehicles, uniforms, seasons and emitters change. Most forces have no way to retrain without sending their data to a vendor, which their security rules forbid. Falcon Accuracy built ROUSE so that retraining runs on hardware the client owns, in a room the client controls, with the client's officers deciding what is released. The force gets models that track its theater as it changes, a release every 4 weeks, and a record of every change.

READINESS

●●○ BENCH PROTOTYPE

Critical functions run on a bench rig. Nothing has been fielded.

TAILORING

FIT Falcon Accuracy fits ROUSE to the rooms, power and racks the force already has, from a hardened operations building to a container, and to the backhaul the force runs, down to hand-carried drives where there is none.

TRAIN Falcon Accuracy trains the pipeline on the client's own theater data from day one, with label classes for the vehicles, uniforms, emitters and languages of the force's area, and adds seasons as they are recorded.

SET Falcon Accuracy sets release thresholds, drift limits, approval chains and retention periods to the force's doctrine and security rules, and names in the configuration the client officer who signs each release.

WORKS WITH

ENSEAM · FURCULA · TOMIAL · FEAK · PITCH · MALAR · TIERCEL · HOOD · SCREEN · CREANCE · JESS · INTERMEW

ROUSE ROUSE Model Operations Service

DESCRIPTION

ROUSE runs on one or two 42U racks in the client's building, with 8 training accelerators per rack and 400 terabytes of encrypted storage. Fielded MALAR, TIERCEL, SCREEN and HOOD systems return labeled detections and operator corrections over JESS or by hand-carried drive, 2 terabytes a day. Each model retrains on a 4-week cycle, runs against a held-out set of 20,000 frames and the TOMIAL adversarial set, and stages to 10 percent of nodes for 7 days before full release. A drift monitor compares live detections with the acceptance baseline every 24 hours and flags a 5-point fall in precision. A named client officer approves every release, and a rollback takes under 10 minutes. Two Falcon Accuracy engineers run the service on client-issued accounts for 12 months, then hand over.

CAPABILITIES

- Retrains every detector, speech and prediction model on a 4-week cycle on racks the client owns
- Ingests 2 TB a day of labeled detections and operator corrections over JESS or by hand-carried drive
- Held-out set of 20,000 frames and the TOMIAL adversarial set run against every candidate
- Staged release to 10 percent of nodes for 7 days before full release, with rollback in under 10 min
- Drift monitor compares live detections to the baseline every 24 h and flags a 5-point fall in precision
- A named client officer approves every release; every candidate, score and decision is logged
- Signed model packages reach PITCH, PITCH Edge and MALAR pucks over the mesh in under 1 h per 100 nodes
- Handover after 12 months to the force's own 4-person model team, trained and certified through FEAK

SPECIFICATIONS · DESIGN TARGETS

HARDWARE	one or two 42U racks per site, 8 training accelerators per rack, 400 TB encrypted storage, 12 kW per rack, installed in the client's building
INGEST	2 TB per day over JESS backhaul or hand-carried encrypted drives; label schema shared with CREANCE and PITCH
CYCLE	retrain every 4 weeks or on a drift flag; a full detector retrain completes in 18 h on one rack
TESTING	20,000-frame held-out set per model class, TOMIAL adversarial set, calibration check, side-by-side comparison with the fielded model
RELEASE	staged to 10 percent of nodes for 7 days, then full release; signed packages; rollback in under 10 min
DRIFT	live precision and recall sampled every 24 h against the acceptance baseline; flag at 5 points, hold at 10 points
APPROVAL	a named client officer signs every release; every candidate, score and decision logged and exportable
SECURITY	air-gapped by default, zero-trust access, hardware security module, FIPS 140-3 modules, AES-256 at rest and in transit; no data, weights or logs leave the client's network
STAFFING	2 Falcon Accuracy engineers on site for 12 months, then the force's own 4-person team with a quarterly review

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can demonstrate the retrain, test, stage and rollback cycle on a single bench rack with synthetic data today, with every step logged.
- Falcon Accuracy can show the drift monitor raising a flag on a prepared data set in which precision falls by 5 points.
- Falcon Accuracy commits that no data, labels, weights or logs leave the client's network, and that its engineers work only on client-issued accounts.
- Falcon Accuracy can hand the client's security staff the rack design, the access model and the logging schema for review before any hardware is ordered.
- Retrain times, ingest rates and cycle lengths are design targets to be verified at acceptance on the client's own racks.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

Retraining changes behavior, and a model that passed acceptance in month 9 is not the model running in month 15. Someone independent has to try to defeat each release before it reaches 300 nodes in the field. TOMIAL gives every ROUSE candidate a 5-day run against an adversarial set and every new system a 6-week assessment, and its red team is walled off from the engineers who built them, so the officer signing a release signs on evidence rather than on the engineering team's own tests.



CONCEPT VISUALIZATION · TOMIAL

ALL FIGURES ARE DESIGN TARGETS

TOMIAL

TOMIAL Red-Team and Assurance Service

The tomial tooth is the notch in a falcon's beak that finds the one weak point in whatever the bird holds; TOMIAL finds the weak point in every system and release before an adversary does.

EVERY RELEASE MEETS AN EMULATED ADVERSARY BEFORE YOUR FORCE RELIES ON IT.

SUMMARY

TOMIAL is the red-team and assurance service that tests every Falcon Accuracy system, and every ROUSE model release, against an emulated adversary on a closed range before a human signs it for use. The team works to rules the client signs, inside the client's network, and hands over findings with fixes and retest dates.

WHY FALCON ACCURACY BUILT IT

A system tested only by the people who built it has been tested only in the ways they expected it to be used. Adversaries jam links, spoof navigation, feed false detections to models, probe networks and wear down tired operators, and a force finds out on operations unless someone tries first. Falcon Accuracy built TOMIAL so that an independent team, walled off from the engineering teams, challenges every product and every model release on a closed range and reports what broke. The force gets a numbered list of findings, fixes with dates, and evidence it can show its own authorities.

READINESS

● ○○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits the range to the units, vehicles and sites the force already has, so the red team tests the force's own fielded configuration rather than a clean reference build.

TRAIN Falcon Accuracy trains the adversary set on the client's theater, including the jamming, emitters, drone types and intrusion attempts recorded there, and runs the operator cell in the force's language.

SET Falcon Accuracy sets the rules of engagement, severity scale, pass marks and retest periods to the force's doctrine and security rules, and the client's authority signs them before the first test.

WORKS WITH

ROUSE · ENSEAM · FEAK · FURCULA · PITCH · JESS · HOOD · CREANCE · MALAR · TIERCEL · CANCELEER

TOMIAL TOMIAL Red-Team and Assurance Service

DESCRIPTION

TOMIAL runs a 6-week assessment on each new system and a 5-day regression on each ROUSE release candidate. A 6-person red team, walled off from engineering and working to rules the client signs, emulates adversary behavior on a closed range of the client's own fielded units and a CREANCE kit. The cyber cell probes the range network, gateways and access fabric, reports each finding with a severity and a defensive fix, and leaves no tooling behind. The spectrum cell injects jamming, spoofed navigation and false emitters at the power levels HOOD recorded in the client's theater. The model cell runs 5,000 adversarial frames and 200 scenarios against each detector and predictor and measures the miss and false-alarm rates induced. Every finding is rated, fixed and retested within 30 days, and the client's authority signs the release.

CAPABILITIES

- 6-week assessment on every new system and a 5-day regression on every ROUSE release candidate
- Red team of 6 walled off from engineering, working to rules of engagement the client signs
- Closed range built from the client's own fielded units and a CREANCE kit, with nothing tested on live operations
- Cyber cell tests network, gateways and zero-trust access against a 400-behavior tactics library, defensive findings only
- Spectrum cell injects jamming, spoofed navigation and false emitters at theater-recorded power levels
- Model cell runs 5,000 adversarial frames and 200 scenarios per detector and predictor and reports induced miss and false-alarm rates
- Operator cell tests fatigue, alert overload and procedure drift over a 72 h exercise with 20 operators
- Every finding rated, dated, fixed and retested within 30 days before the client's authority signs the release

SPECIFICATIONS · DESIGN TARGETS

ASSESSMENT	6 weeks per system, 2 weeks of planning, 3 weeks on the range, 1 week of report and briefing
REGRESSION	5 days per ROUSE release candidate, 5,000-frame adversarial set, 200 scenarios, side by side with the fielded model
TEAM	6 people in cyber, spectrum, model and operator cells, separated from engineering by a documented wall and separate accounts
RANGE	the client's own fielded units plus a CREANCE kit on a closed network with no link to live operations; radio injection inside a shielded enclosure or on a licensed range
TACTICS LIBRARY	400 adversary behaviors across cyber, spectrum, deception and operator stress, updated every quarter
SPECTRUM	jamming and spoofing injected at the power levels, bands and waveforms HOOD has recorded in the client's theater, under the client's spectrum license
REPORTING	findings rated on a 4-level scale, each with a fix, an owner and a retest date within 30 days; 40-page report and a 2 h briefing to the client's authority
RULES	client-signed rules of engagement, no persistent tooling, all test data and logs remain inside the client's network, every action logged and attributable

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the tactics library structure, the severity scale and the report template in a 1-day design review today.
- Falcon Accuracy can run a 2-day tabletop red-team exercise against a client's planned configuration and return a prioritized list of test cases.
- Falcon Accuracy can demonstrate the adversarial set generator producing 5,000 frames from a sample data set and scoring a detector on a bench.
- Falcon Accuracy commits that the red team works only on a closed range, leaves no tooling behind, and keeps all findings and logs inside the client's network.
- Induced error rates, range sizes and timelines are design targets to be verified on the client's own units.

BRIDGE · WHY THE NEXT PRODUCT FOLLOWS

Assurance produces findings, and findings need hands at the forward sites to close them, spares to close them with, and instructors to retrain the operators each fix affects. TOMIAL writes the list; FEAK closes it. Each finding becomes a repair level, a spares line or a delta course in the sustainment plan, and because FEAK certifies the force's own technicians and instructors by year 3, the force closes the next list without waiting for a Falcon Accuracy team.



CONCEPT VISUALIZATION · FEAK

ALL FIGURES ARE DESIGN TARGETS

TAILORING AND SERVICES · SERVICE · 05 OF 05

FEAK

FEAK Sustainment and Instructor Service

A hawk feaks after every meal, wiping its beak clean so it is ready for the next flight; FEAK keeps every fielded system clean and ready for 10 years and teaches a force's own people to do the same.

KEPT IN SERVICE FOR TEN YEARS BY YOUR OWN PEOPLE.

SUMMARY

FEAK is the sustainment and train-the-trainer service that keeps every fielded Falcon Accuracy system available and current over a 10-year life. It stocks spares forward, repairs at the force's own workshops, pushes software and model updates on a schedule the force sets, and certifies the force's instructors and technicians so that by year 3 the force runs its own courses and most of its own repairs.

WHY FALCON ACCURACY BUILT IT

Capability decays faster than hardware. Batteries age, seals fail, a software update changes a menu and nobody retrains the operators, and the instructor who knew the system leaves. Forces that depend on a vendor for every repair and every course lose availability the day the vendor's team rotates out. Falcon Accuracy built FEAK so that sustainment is a product with stock levels, repair times and course dates, and so that the force's own instructors and technicians own the system by year 3. The force gets measured availability and the independence to keep it.

READINESS

● ○ ○ CONCEPT DESIGN

Drawings and simulations only. No hardware has been built.

TAILORING

FIT Falcon Accuracy fits FEAK to the workshops, depots, transport routes and spares systems the force already runs, and sizes the forward packs to the fleet and to the distances between its sites.

TRAIN Falcon Accuracy trains instructors and technicians on the force's own fielded configuration, in the force's language, with scenarios drawn from the client's theater and failure cases drawn from the force's own repair records.

SET Falcon Accuracy sets availability targets, repair levels, update windows and recertification periods to the force's maintenance doctrine and operating tempo, and reports against them monthly.

WORKS WITH

ENSEAM · ROUSE · TOMIAL · FURCULA · CREANCE · MALAR · MANTLE · JESS · TIERCEL · GYR · LURCHER · FALCONER

FEAK FEAK Sustainment and Instructor Service

DESCRIPTION

FEAK covers every fielded Falcon Accuracy system under one sustainment plan sized to the fleet. A forward spares pack per 40 systems holds the 30 highest-use parts and closes 90 percent of repairs within 48 hours; the rest go to a depot with a 21-day turnaround. Falcon Accuracy technicians work from the force's workshops for the first 24 months and certify the force's technicians to three repair levels, from field swap to board-level repair. The instructor course certifies 12 instructors in 15 days, with lesson plans, CREANCE scenarios and exam banks the force keeps, and recertifies them every 24 months. Software and model updates from ROUSE reach the fleet on a schedule the force sets, each with a one-page change note and rollback. A fleet dashboard reports availability, mean time to repair and training currency every month.

CAPABILITIES

- Forward spares pack per 40 systems closes 90 percent of repairs within 48 h, with a 21-day depot turnaround for the rest
- Three repair levels certified for the force's technicians within 24 months, from field swap to board-level repair
- Instructor course certifies 12 instructors in 15 days with lesson plans, CREANCE scenarios and exam banks the force keeps
- Recertification every 24 months and a 5-day delta course after every major software release
- Software and model updates from ROUSE pushed on the force's schedule, each with a one-page change note and a rollback
- Fleet dashboard reports availability, mean time to repair and training currency per unit every month
- Battery, seal and connector life tracked per serial number, with replacement dates flagged 90 days ahead
- By year 3 the force runs its own courses and 80 percent of its repairs, with Falcon Accuracy on a quarterly review

SPECIFICATIONS · DESIGN TARGETS

TERM	10-year sustainment plan sized to the fleet and reviewed yearly; Falcon Accuracy technicians on site for the first 24 months
SPARES	forward pack per 40 systems holding the 30 highest-use parts; 90 percent of repairs within 48 h; depot turnaround 21 days
REPAIR LEVELS	level 1 field swap in under 30 min, level 2 workshop module repair in under 4 h, level 3 board repair at depot; the force certified to level 2 by month 12 and level 3 by month 24
INSTRUCTOR COURSE	15 days, 12 instructors per course, in the force's language; graduates teach the 5-day operator course and the 3-day technician course
CURRENCY	recertification every 24 months; 5-day delta course after each major release; training records per person in the fleet dashboard
UPDATES	signed software and model packages from ROUSE on a schedule the force sets, with a one-page change note and a rollback for each
DASHBOARD	availability, mean time to repair, spares fill rate and training currency per unit, refreshed monthly and exportable
AVAILABILITY TARGET	90 percent of fielded systems available on any given day after month 12, measured per fleet and reported monthly
DATA	all serial, repair and training records stay inside the client's network; Falcon Accuracy access through client-issued accounts; every access logged

WHAT WE CAN VOUCH FOR TODAY

- Falcon Accuracy can present the sustainment plan template, the spares model and the instructor course outline in a 1-day design review today.
- Falcon Accuracy can run the spares model on a client's planned fleet and sites and return forward-pack sizes and a 48 h coverage estimate.
- Falcon Accuracy can deliver a pilot 3-day technician course on bench units with the client's own instructors observing and grading the material.
- Falcon Accuracy commits that repair, serial and training records stay inside the client's network and belong to the force.
- Repair times, fill rates and availability figures are design targets to be set against the fleet's own records after the first 12 months.

NEXT · THE TAILORING PROGRAM · P. 252

This is the last product entry. Every product in this catalog is delivered through one program: FIT to the kit, vehicles and sites the force already has, TRAIN on the client's theater, threats and language, and SET to the client's doctrine, rules and thresholds. The program opens on page 252.

THE SLOGAN, AS A METHOD

THE TAILORING PROGRAM

Every product is delivered through one program. Falcon Accuracy fits it to the kit, vehicles and sites the force already has, trains it on the client's theater, threats and language, and sets it to the client's doctrine, rules and thresholds. Always in that order.

FIT

Fit to the kit, vehicles and sites the force already has.

TRAIN

Train on the client's theater, threats and language.

SET

Set to the client's doctrine, rules and thresholds.

DELIVERY, STEP BY STEP

01 SITE SURVEY AND THREAT LIBRARY

Falcon Accuracy engineers walk the force's sites, vehicles and kit lockers with the force's own officers over 10 days and list every helmet, vehicle, boat, mast, radar site, shelter site, airfield, launch site, radio, server room, document store and operations room in scope within 5 working days of the visit, down to the connector and the pouch. With the force's intelligence staff, the same team writes the threat library for this theater, so every detector is trained against the emitters, drone and missile tracks, launch heat signatures, craft, seabed activity and tactics recorded there rather than a generic set. Both documents belong to the force.

02 FIT

Mounts, cable buses, brackets, gateways and radio plans are built for the helmets, carriers, vehicles, boats, survey vessels, masts, airfields, launch ranges, ground stations, server rooms and operations rooms the force already has. FURCULA joins legacy radios, sensors, vehicle buses and command software to the picture in 10 weeks per site, with under 50 milliseconds of added latency and a library of 60 adapters. Nothing that still works is replaced. FIT runs weeks 1 to 12 of the ENSEAM program.

03 BASELINE AND DATA COLLECTION

Before any model is trusted with a dispatch, each site and fleet runs a baseline on its own ground. SCREEN learns a site's wildlife, weather and traffic over 14 days, BRANCHER learns its normal spectrum in the same 14 days, RAMAGE learns each cable route's shipping and fishing traffic over 30 days, YARAK listens to the vehicle bus, CRINES profiles the upper air over each launch site, OSSICLE backtests every forecast on 24 months of the force's own history, and the force's own operators collect and label 400 hours of sensor data and 50,000 frames per detector class. Terrain, imagery, recordings and incident history gather on racks inside the client's network. No data leaves it.

04 TRAIN

Every detector, speech, language and prediction model, from the LONGWING track classifier and the KITING sound-speed model to INTERMEW and OSSICLE, trains on the client's theater, threats and language on a ROUSE rack in the client's building, weeks 13 to 28 of the program. Each candidate runs against a held-out set of 20,000 frames and the TOMIAL adversarial set of 5,000 frames and 200 scenarios, and ships with a written precision and recall report measured on the client's own data. INTERMEW is also scored on a 2,000-question evaluation set that the client's own staff write. The client's counterpart signs the gate, and the weights never leave the building.

05 ACCEPTANCE TRIAL

A 10-day acceptance trial on a range the force chooses scores 60 scripted events against numbered criteria, with the force's own operators wearing, flying, driving, sailing and launching the kit. Every figure in this catalog is a design target until it passes here. Each criterion is measured and signed by the client's authority, a failed criterion reruns within 14 days, and the signed trial record belongs to the force.

06 SET AND IN-SERVICE RETRAINING

The thresholds, escalation ladders, symbology, call signs and release rules loaded with the force's officers in a 3-day workshop are confirmed against the trial record, one logged entry per rule, and the client's authority signs the configuration into service. From then on ROUSE retrains every model on a 4-week cycle on racks the client owns, stages each release to 10 percent of nodes for 7 days, and a named client officer approves it. CANCELEER holds each language and forecasting model release until a named commander, legal adviser and model officer sign it. TOMIAL runs a 5-day regression on every release, and FEAK certifies the force's instructors and technicians so that by year 3 the force runs its own courses and 80 percent of its own repairs. Nothing leaves the client's network.

PRINCIPLES

BUILT TO BE TRUSTED

The design principles every Falcon Accuracy product shares, stated plainly for commanders, procurement staff and legal readers.

A HUMAN DECIDES

Every product senses, proposes, warns or reports. No machine in this catalog moves a convoy, releases data downward, dispatches a guard team, releases a public alert, commits a launch or stops a drone without an authorized person's approval, and every approval is logged with the evidence that drove it.

UNARMED AND DEFENSIVE BY DESIGN

Every machine carries sensors, cameras, radios, antennas, computers, cargo, litters, decoys or tools. None carries a weapon. Airspace products detect, classify and locate small drones and their pilots, and the response stays with people the force has trained for it. Warning products track, warn, shelter and recover, and they destroy and intercept nothing. Rockets carry satellites, experiments, instruments and relief cargo, and they launch from pads, balloons and ships. Cyber products monitor, detect, attest, deceive and respond. Language and forecasting models write and predict for a person to review, and they act on no machine and target nothing. Spectrum receivers transmit nothing and read no message content.

DATA STAYS INSIDE THE CLIENT'S NETWORK

Footage, recordings, maps, logs, labels and model weights live on hardware the client owns. Models train and retrain there, Falcon Accuracy staff work on client-issued accounts, and every access is logged. Nothing leaves the client's network, not for support and not for product improvement.

WORKS WHEN THE NETWORK DOES NOT

Detection runs on the device, from the goggles to the satellite. Every product keeps sensing, warning and logging when the link drops and reconciles its record when the link returns. JESS re-forms the mesh within 200 milliseconds, and HALSBAND keeps enforcing access policy for 30 days with no link to headquarters.

EVERY DECISION ON RECORD

CALAMUS binds each sensor detection, model recommendation, human approval and machine task into one signed, tamper-evident chain. The commander, the legal adviser and the trainer can replay any minute of an operation and see who decided what on which evidence. Only the roles the client sets can read it.

FIGURES YOU CAN TEST

Every performance figure in this catalog is a design target with a unit that a buyer can measure on a range. Falcon Accuracy writes each one into the acceptance trial protocol as a numbered criterion, reports pass or fail against it, and reruns a failed criterion within 14 days rather than restating it.

STATEMENT OF HONESTY

Every product in this catalog is a concept. Nothing shown here has been built, tested or certified. Every figure is a design target that Falcon Accuracy verifies with the client at an acceptance trial on the client's own range, and a figure that fails there is reported as failed. The images are concept renders from our own 3D models, not photographs of hardware. Falcon Accuracy claims no client, contract, certification, award or production run.

GLOSSARY

WORDS FROM THE FALCON'S WORLD

Every codename is one word from the falcon's world, taken from the falconer's working vocabulary, the names of the falcon species or the falcon's own anatomy and flight. Each word was chosen because it describes what its product does, and each was checked against real defense products and company names before it was kept. No word is used twice across the 96 products in the catalog, from MALAR on the operator to GONYS 600 meters down, CORACOID on the pad, NICTITANS on its way home from orbit and INTERMEW, the language model that grows its new feathers inside the client's own network. The glossary gives each codename its meaning in the falcon's world and the reason it fits.

MALAR

MALAR SMART GOGGLES · P. 26

The dark stripe beneath a falcon's eye that cuts glare and keeps its sight sharp in hard light; the goggles keep the operator's sight sharp at night.

COVERT

COVERT SMART HELMET · P. 28

Coverts are the rows of small, tough feathers that overlap and shield the roots of a falcon's flight feathers; the helmet shields the head and everything the operator carries on it.

MANTLE

MANTLE SMART VEST · P. 30

A raptor mantling spreads its wings over what it guards; the vest spreads sensing over the wearer and warns first.

CADGE

CADGE LOAD-CARRIAGE EXOSKELETON · P. 32

The padded frame on which several hawks are carried to the field at once; the exoskeleton is the frame that carries the operator's load.

CUFF

CUFF HAPTIC COMMAND GLOVE · P. 34

The cuff is the long leather sleeve of the falconer's glove, the part that takes the bird's grip; CUFF is the glove through which the operator takes hold of the machines.

JESS

JESS TACTICAL MESH RADIO · P. 38

The jess is the soft leather strap on the falcon's leg through which the falconer holds the bird; JESS is the link between the operator and command.

ELEONORA

ELEONORA SQUAD COORDINATION APP · P. 40

Eleonora's falcon nests in colonies on sea cliffs and hunts in company, many birds working one stretch of air as a team; ELEONORA puts the whole squad on one shared picture.

HAMULI

HAMULI BONDED BACKHAUL TERMINAL · P. 42

Hamuli are the small hooks along each barb of a feather that lock it to the barb beside it, so a thousand barbs hold as one vane; HAMULI locks six links into one path to command and holds that path when a link fades.

PECTEN

PECTEN OPTICAL LINK TERMINAL · P. 44

The pecten is the comb of vessels inside a falcon's eye that feeds the retina and lets the eye hold a distant target; PECTEN holds an infrared beam on a terminal kilometers away.

GLOSSARY

WORDS FROM THE FALCON'S WORLD, CONTINUED

PASSAGE

PASSAGE DATA DIODE GATEWAY · P. 46

A passage falcon is a young wild bird taken on its first migration, in transit one way; PASSAGE moves data between networks in one direction only.

EYAS

EYAS INDOOR RECONNAISSANCE DRONE · P. 50

An eyas is a young falcon still in the nest, the smallest of the family and the one that has not yet flown in the open; EYAS is the smallest aircraft in the catalog and flies indoors.

TIERCEL

TIERCEL ISR DRONE PAIR · P. 52

The tiercel is the male falcon, a third smaller than the female and quicker in the air; it names the small, fast surveillance aircraft.

WAITON

WAITON TETHERED OVERWATCH DRONE · P. 54

Waiting on is the falcon holding station high above the falconer until the game is flushed below it; WAITON holds station above its vehicle for as long as the vehicle has power.

SAILS

SAILS LONG-ENDURANCE ISR AIRCRAFT · P. 56

The sails are the falconer's word for the falcon's long wings, the surfaces that carry it for hours on the wind; SAILS is the aircraft that stays up for 12 hours on a 5.2 meter wing.

BARBARY

BARBARY HIGH-ALTITUDE RELAY GLIDER · P. 58

The Barbary falcon holds the high desert cliffs of North Africa and hunts above the heat and haze where little else flies; BARBARY holds station at 20 kilometers, above the weather and the horizon.

WAKE

WAKE DRONE DETECTION MAST · P. 62

Waking is the falconer's all-night watch beside a newly taken hawk; WAKE is the mast that keeps the all-night watch over the low sky.

STANNEL

STANNEL LOW-ALTITUDE AIR PICTURE · P. 64

Stannel is the old English name for the small falcon that hangs on the wind over one field, head held still, and reads everything that moves beneath it; STANNEL holds the low sky the same way.

LONGWING

LONGWING EARLY WARNING RADAR · P. 68

Longwing is the falconer's name for the true falcons, the long-winged birds that hunt the open sky and see their quarry from the greatest range; LONGWING is the radar that sees farthest.

KETTLE

KETTLE LAUNCH WARNING CONSTELLATION · P. 70

A kettle is a flock of raptors circling high on a column of rising warm air; KETTLE is the ring of satellites that circles high above the theater and watches for heat rising from the ground.

BECK

BECK CIVIL ALERT NETWORK · P. 72

A beck is the small signal of the hand that calls a hawk back to the fist at once; BECK is the signal that calls people to shelter within seconds.

MEWS

MEWS PROTECTIVE SHELTER MODULE · P. 74

The mews is the building where falconers keep their hawks safe through the molt and the weather; MEWS keeps people safe for as long as the warning lasts.

GLOSSARY

WORDS FROM THE FALCON'S WORLD, CONTINUED

SOOTY

SOOTY DECOY AND CAMOUFLAGE KIT · P. 76

The sooty falcon wears a slate-gray plumage that vanishes against desert rock in the evening light; SOOTY hides the real vehicle and shows a false one in its place.

IMPING

IMPING AIRFIELD RECOVERY SYSTEM · P. 78

Imping is the falconer's repair of a broken flight feather, a sound feather spliced onto the old shaft so the hawk flies again the same day; IMPING repairs a runway so aircraft fly again.

LURCHER

LURCHER QUADRUPED ROBOT · P. 82

A lurcher is the falconer's running dog, the sighthound cross that works ahead of the hawk and flushes the quarry, so it is the quadruped that walks point.

FALCONER

FALCONER HUMANOID ROBOT · P. 84

The falconer is the handler who flies the hawk, carries the kit to the field and does the work by hand, so it is the humanoid robot built for tasks shaped for human hands.

GYR

GYR ROBOTIC MULE · P. 86

GYR is the gyrfalcon, the largest and strongest of the falcons, which hunts low over open ground, so it is the load-carrying mule.

APLOMADO

APLOMADO ROUTE CLEARANCE SENSOR VEHICLE · P. 88

The aplomado falcon hunts low over open ground, working a line ahead of its partner and reading what moves beneath it; APLOMADO drives ahead of the convoy and reads what lies beneath the road.

VARVEL

VARVEL HAZARD INSPECTION ROBOT · P. 90

The varvel is the small engraved ring at the end of the jess that carries the owner's name, so it is the robot that names the hazard and leaves its mark on it.

BRAIL

BRAIL CASUALTY EVACUATION ROBOT · P. 92

The brail is the soft strap a falconer binds around a hawk's wing to carry it without harm; BRAIL is the robot that lifts a casualty onto its litter deck without harm and carries them back.

HAGGARD

HAGGARD UNCREWED PATROL BOAT · P. 96

A haggard is a falcon trapped in adult plumage, a bird that has already hunted alone through more than one season; HAGGARD is the boat that patrols the approach alone for 48 hours.

BOWSE

BOWSE UNDERWATER INSPECTION VEHICLE · P. 98

To bowse is to drink, the falconer's word for a hawk taking water; BOWSE is the vehicle that takes to the water to inspect a hull or the seabed.

MAIL

MAIL HARBOR SENSOR NETWORK · P. 100

The mail is the falcon's breast plumage, the dense coat that keeps the weather off the bird; MAIL is the coat of buoys and masts that keeps watch on the harbor's door.

PINION

PINION BOAT AUTONOMY KIT · P. 102

The pinion is the outer wing of the falcon, the part that steers every turn in flight; PINION fits a crewed boat with the steering, sensors and autonomy of the family.

WORDS FROM THE FALCON'S WORLD, CONTINUED

SARCEL

SARCEL LONG-RANGE SURVEY AUV · P. 106

The sarcel is the outer pinion feather of a hawk's wing, the long flight feather that carries the bird on its longest flights; SARCEL is the vehicle built for the longest survey runs.

TERTIAL

TERTIAL HARBOR SURVEY AUV · P. 108

The tertials are the innermost flight feathers, the short ones closest to the falcon's body; TERTIAL works the water closest to home, the harbor basin.

KITING

KITING OCEAN GLIDER FLEET · P. 110

Kiting is the way a falcon hangs on the wind with barely a wingbeat, holding its place for long minutes on almost no effort; KITING gliders ride their own buoyancy for months on almost no power.

RAMAGE

RAMAGE SEABED INFRASTRUCTURE ARRAY · P. 112

Ramage is the old falconer's word for a young hawk that has left the nest and moves from branch to branch, and for birdsong among the branches; RAMAGE listens along every branch of a seabed network.

GONYS

GONYS SUBMARINE RESCUE VEHICLE · P. 114

The gonys is the ridge under a falcon's lower bill where its two halves join into one; GONYS joins a rescue vehicle to a submarine's hatch as one sealed passage.

RINGING

RINGING LAUNCH VEHICLE · P. 118

Ringing up is the falcon's spiral climb to the height from which it hunts; RINGING is the climb to orbit.

CASTING

CASTING REUSABLE MEDIUM-LIFT LAUNCH VEHICLE · P. 120

Casting off is the falconer's throw that sends the hawk from the fist into the air, and a well-made hawk comes back to fly again; CASTING throws the payload to orbit and brings its first stage home to fly again.

MAKEHAWK

MAKEHAWK ORBITAL TRANSFER VEHICLE · P. 122

A make-hawk is a steady, experienced hawk flown beside young ones to show them their work; MAKEHAWK flies new satellites to their own orbits and leaves each one at work.

TAITA

TAITA ISR CUBESAT CONSTELLATION · P. 124

The Taita falcon is a small, fast falcon that lives on high cliffs and watches the ground far below; TAITA is the small, fast constellation that watches from orbit.

LAGGAR

LAGGAR TRANSPORTABLE GROUND STATION · P. 126

The laggar falcon of open dry country waits on a high post for the quarry to show and moves the moment it does; LAGGAR waits under an open sky for the satellite pass and takes the downlink the moment it starts.

TOWER

TOWER SPACE DOMAIN AWARENESS NETWORK · P. 128

To tower is the falcon's steep climb to a great height, where it holds and watches the whole sky around it; TOWER watches the sky around the client's satellites from domes on high ground.

GLOSSARY

WORDS FROM THE FALCON'S WORLD, CONTINUED

NICTITANS

NICTITANS REENTRY CAPSULE · P. 130

The nictitans is the falcon's third eyelid, a clear membrane that sweeps across the eye to shield it in the fastest stoop; NICTITANS shields its cargo through the fastest descent there is, the return from orbit.

BATE

BATE SUBORBITAL TEST ROCKET · P. 132

To bate is the hawk's sudden leap from the fist, wings beating, a short flight that ends back where it began; BATE is the rocket that leaps to 120 kilometers and lands back on its legs.

LURE

LURE HIGH-SPEED TARGET DRONE · P. 134

The lure is the padded target a falconer swings for the falcon to chase in training; LURE is the aircraft air-defense crews train against.

CORACOID

CORACOID HEAVY-LIFT REUSABLE LAUNCH VEHICLE · P. 138

The coracoid is the stout bone that braces each wing against the breastbone and carries the full load of every downstroke; CORACOID braces two side boosters against one core and carries the heaviest loads the force sends to orbit.

MOUNTEE

MOUNTEE BALLOON-LAUNCHED MICRO-LAUNCHER · P. 140

The mountee is a hawk's steady rise to height before it makes its flight; MOUNTEE rises under a balloon to 20 km before its rocket lights.

PATAGIUM

PATAGIUM EXPEDITIONARY LAUNCH SITE · P. 142

The patagium is the fold of skin that lies packed against a bird's body and spreads into the leading edge of the wing when it opens; PATAGIUM lies packed in 20 containers and opens into a full launch site.

ENEW

ENEW EQUATORIAL LAUNCH PLATFORM · P. 144

In old falconry, to enew is to drive a bird off the land and down onto the water; ENEW takes the force's launches off the land and out onto open water at the equator.

RACHIS

RACHIS REUSABLE ROCKET ENGINE FAMILY · P. 146

The rachis is the stiff central shaft of a flight feather, the part that carries every load the vane puts on it; RACHIS engines carry every Falcon Accuracy launcher.

NANKEEN

NANKEEN MICROGRAVITY RESEARCH ROCKET · P. 148

The nankeen, a small falcon of open country, hangs almost motionless over one patch of ground, wings working against the wind; NANKEEN holds 200 kg of experiments almost motionless in free fall for 6 minutes.

CRINES

CRINES METEOROLOGICAL ROCKETSONDE · P. 150

The crines are the fine hair-like feathers around a falcon's cere, the first part of the bird to feel the air it flies into; CRINES feels the upper air every day before the force flies into it.

BARBULE

BARBULE LAUNCH RANGE TRACKING NETWORK · P. 152

Barbules are the tiny hooks that lock every barb of a feather into one unbroken vane; BARBULE locks radars, optical trackers and telemetry antennas into one unbroken track of every launch.

WORDS FROM THE FALCON'S WORLD, CONTINUED

TERRET

TERRET RIDESHARE SATELLITE DISPENSER · P. 154

Terrets are the small rings that join a falcon's jesses to the leash and let it go free the moment the falconer slips them; TERRET is the ring that holds 24 satellites and lets each one go in turn.

PUTOVER

PUTOVER POINT-TO-POINT CARGO ROCKET · P. 156

A hawk puts over when it passes a full crop on so the meal can feed the whole bird; PUTOVER passes a full load of relief supplies on to the people who need it.

HOOD

HOOD SPECTRUM SENSING SYSTEM · P. 160

The hood is the leather cover that keeps a falcon calm and unseen until the falconer lifts it, so HOOD is the system that hears the whole spectrum while keeping the force's own emissions small.

BRANCHER

BRANCHER DIRECTION-FINDING MAST NETWORK · P. 162

A brancher is the young falcon that has left the nest and sits in the branches around it, watching everything that moves; BRANCHER is the ring of fixed masts around a site that watches everything on the spectrum.

SYRINX

SYRINX SIGNAL ANALYSIS WORKSTATION · P. 164

The syrinx is the organ that shapes every call a falcon makes, the source that gives each voice its signature; SYRINX takes a signal apart to name the emitter that made it.

JINK

JINK EMISSION DECOY SYSTEM · P. 166

A jink is the sharp sidestep a bird makes in flight to throw a pursuing falcon off its line; JINK throws a direction finder off the force by sounding like the unit from where the unit is not.

NARES

NARES NAVIGATION PROTECTION KIT · P. 168

The nares are the falcon's nostrils, with the bony cones inside them that keep the air flowing true at 300 kilometers per hour; NARES keeps the force's position and time flowing true under jamming and spoofing.

KEEN

KEEN NETWORK DETECTION PLATFORM · P. 172

A keen hawk is sharp-set and in hunting condition, alert to every movement in its field; KEEN brings that attention to every packet and endpoint on the network.

HALSBAND

HALSBAND ZERO-TRUST ACCESS FABRIC · P. 174

The halsband is the collar a trained hawk wears, the sign that it belongs to a falconer's hand and flies under rules; HALSBAND is the fabric that admits only operators and devices that carry proof.

CERE

CERE INTEGRITY ATTESTATION SYSTEM · P. 176

The cere is the bare skin at the base of a falcon's beak whose color tells the falconer at a glance whether the bird is well; CERE reads the health of every board and firmware image before it joins the network.

QUARRY

QUARRY DECEPTION GRID · P. 178

The quarry is the game a falcon is flown at; QUARRY plants bait that only an intruder would hunt, and the hunt itself gives the intruder away.

GLOSSARY

WORDS FROM THE FALCON'S WORLD, CONTINUED

BEWIT

BEWIT SECURE SMARTPHONE · P. 180

The bewit is the small leather strap that fastens the bell to a falcon's leg so the falconer always hears where the bird is; BEWIT keeps the operator in reach of command on any network.

INTERMEW

INTERMEW DEFENSE LANGUAGE MODEL · P. 184

An intermewed falcon has molted in the falconer's own mews and grown its new feathers there, at home and under the falconer's care; INTERMEW models are grown, tuned and retrained inside the client's own network and never leave it.

OSSICLE

OSSICLE FORECASTING ENGINE · P. 186

The scleral ossicles are the ring of small bones that holds a falcon's eye rigid so it stays focused far ahead; OSSICLE keeps the force's forecasts in focus days and weeks ahead.

UNHOODED

UNHOODED STAFF ASSISTANT · P. 188

A falcon is unhooded when the falconer wants it to see the field, and only then; UNHOODED opens the client's archive to the staff officer who asks, and shows only what that officer is cleared to see.

HYOID

HYOID EDGE LANGUAGE MODULE · P. 190

The hyoid is the small bone at the root of a falcon's tongue that carries it and gives it movement; HYOID is the small module that gives the operator and the vehicle a voice to ask with and an answer to hear.

CANCELEER

CANCELEER AI GOVERNANCE CONSOLE · P. 192

A canceleer is the turn a falcon makes on the wing during its stoop to check and correct its line before it commits; CANCELEER is where the force checks and corrects every model before it reaches operators.

PITCH

PITCH NEURAL DECISION CORE · P. 196

The pitch is the height a falcon climbs to before it stoops, the vantage from which it sees the whole field and chooses its moment, so it names the decision core.

LORES

LORES INTELLIGENCE TRIAGE ASSISTANT · P. 198

The lores are the patches between a falcon's eye and its beak, feathered dark to cut the glare so the eye sees the quarry and nothing else; LORES cuts the glare from a thousand pages so the analyst sees the one line that matters.

SLIP

SLIP COURSE-OF-ACTION ENGINE · P. 200

The slip is the moment a falconer releases the hawk at quarry, chosen only when the flight is judged right; SLIP is the engine that tests every course of action before the commander releases one.

LEASH

LEASH FLEET COORDINATION LAYER · P. 202

The leash runs from the falconer's fist through the swivel to the jesses and holds the hawk under control until it is sent; LEASH holds every aircraft, robot and vehicle to its assignment and its envelope.

GLOSSARY

WORDS FROM THE FALCON'S WORLD, CONTINUED

CALAMUS

CALAMUS DECISION RECORD · P. 204

The calamus is the hollow base of a feather, the quill that became the pen; CALAMUS writes every recommendation, approval and order into one signed record.

SCREEN

SCREEN PERIMETER SECURITY SYSTEM · P. 208

The screen perch is the high perch with a cloth drop beneath it on which a hawk is kept safe between flights; in military usage a screen is the security force that watches an approach and reports, so it is base security.

BLOCK

BLOCK SENSOR TOWER · P. 210

The block is the solid stand on which a falcon sits in the weathering yard, watching the ground around it; BLOCK is the mast that stands watch over the ground around a base.

HALLUX

HALLUX VEHICLE INSPECTION LANE · P. 212

The hallux is the falcon's rear toe, the one that closes the grip and holds the quarry still; HALLUX holds every vehicle still at the gate long enough to inspect it.

RAKE

RAKE PERIMETER PATROL DRONE · P. 214

To rake is a falcon's fast, wide run along a line, sweeping the ground beneath it before it turns back to the falconer; the drone rakes the fence line and returns to its box.

FORMEL

FORMEL SECURITY OPERATIONS CONSOLE · P. 216

The formel is the female falcon, the larger bird that a falconer trusts with the hardest flights; FORMEL is the console a watch officer trusts with every alarm on the base.

YARAK

YARAK PREDICTIVE MAINTENANCE PLATFORM · P. 220

Yarak is the state of a hawk in peak condition, keen and ready to fly, and the platform keeps a fleet in that state.

PLUME

PLUME EXPEDITIONARY PARTS CELL · P. 222

A plume is a single feather, the part a falconer replaces when one breaks so the hawk flies whole again; PLUME prints and inspects the single part that puts a machine back on the road.

CROP

CROP SUPPLY PREDICTION MODEL · P. 224

The crop is the falcon's food store, which the falconer reads to judge how much the bird has taken and when it must feed again, and the model reads a force's consumption the same way.

JERKIN

JERKIN AUTONOMOUS CONVOY KIT · P. 226

The jerkin is the male gyrfalcon, smaller than the female and flown the same way; JERKIN puts the autonomy of the GYR mule onto the trucks a force already owns, so one crewed cab leads a line of them.

CREANCE

CREANCE LIVE TRAINING RANGE · P. 230

The creance is the long light line on which a young falcon makes its first flights to the fist, free to fly yet held by the falconer; the range lets a force train in earnest on real ground while the instructor holds the line.

WEATHER

WEATHER MISSION REHEARSAL TWIN · P. 232

To weather a hawk is to set it out on its block, where it sees the ground, the wind and the world before it is flown; WEATHER sets the force inside a twin of the objective before the real night.

WORDS FROM THE FALCON'S WORLD, CONTINUED

RUFTER

RUFTER OPERATOR SIMULATOR · P. 234

The rufter is the plain hood a newly taken hawk wears through its first days of training, before it has earned the field; RUFTER is where a new operator flies the first hundred sorties, faults included, before the real machine.

RANGLE

RANGLE CASUALTY CARE TRAINER · P. 236

Rangle is the handful of small smooth stones a falconer gives a hawk to clear and settle its crop, the oldest remedy in the sport; the trainer teaches the medic the remedies that matter now.

PANNEL

PANNEL AFTER-ACTION REVIEW ENGINE · P. 238

The pannel is the hawk's stomach, where the day's quarry is broken down into what the bird keeps; PANNEL digests every recording of an exercise into the few moments that decided it.

ENSEAM

ENSEAM TAILORING PROGRAM · P. 242

To enseam a hawk is to bring it into flying condition for the season ahead, a program of weeks that ends with the first free flight of the season; ENSEAM brings a force's system into condition over 40 weeks and ends with a signed acceptance trial on its own ground.

FURCULA

FURCULA INTEGRATION GATEWAY · P. 244

The furcula is the wishbone, the bone that ties the falcon's two shoulders into one frame that bears the whole wingbeat; FURCULA ties a force's legacy systems and the Falcon Accuracy family into one frame.

ROUSE

ROUSE MODEL OPERATIONS SERVICE · P. 246

A hawk rouses when it shakes every feather back into place, ready to fly again; ROUSE retrains, tests and releases every model so it is back in place every 4 weeks.

TOMIAL

TOMIAL RED-TEAM AND ASSURANCE SERVICE · P. 248

The tomial tooth is the notch in a falcon's beak that finds the one weak point in whatever the bird holds; TOMIAL finds the weak point in every system and release before an adversary does.

FEAK

FEAK SUSTAINMENT AND INSTRUCTOR SERVICE · P. 250

A hawk feaks after every meal, wiping its beak clean so it is ready for the next flight; FEAK keeps every fielded system clean and ready for 10 years and teaches a force's own people to do the same.

CONTACT

Falcon Accuracy works with government and allied forces under the export rules that apply to each. Write to contact@falconaccuracy.com with the force, the sector and the question. Every request is reviewed before any technical exchange, and the reply comes from an engineer.

contact@falconaccuracy.com

HOW A FIRST EXCHANGE RUNS

01 WRITE

One message with the force, the mission and the theater, the kit already in service and the codenames of interest.

02 REVIEW

Falcon Accuracy reviews the request under applicable export rules before any technical exchange.

03 ANSWER

A written answer names the products that fit, their readiness tiers and what can be shown today for each.

04 DESIGN REVIEW

Engineers walk the client through the design targets and the range tests that verify them.

05 TRIAL PROTOCOL

A trial protocol is agreed in writing, with every figure as a pass or fail measure on the client's range.

WHAT TO INCLUDE IN A FIRST MESSAGE

- The force, the mission and the theater.
- The kit, vehicles and sites already in service.
- The products of interest, by codename.
- The range or site where an acceptance trial could run.
- The language the force works in.

ABOUT THIS CATALOG

The printable catalog carries all 96 product sheets in 18 sectors, from the operator's kit through air and missile warning, undersea systems, space, rocket systems and the force's own defense language model to the services that tailor them, with the system diagram, the tailoring method, the trust principles and the glossary in A4 format for procurement, legal and technical readers who work from paper. It states the same design targets and the same honesty statement as this site, and each product sheet names the figures the acceptance trial measures.

> **STATEMENT OF HONESTY**
>
> Every product in this catalog is a concept. Nothing shown here has been built, tested or certified. Every figure is a design target that Falcon Accuracy verifies with the client at an acceptance trial on the client's own range, and a figure that fails there is reported as failed. The images are concept renders from our own 3D models, not photographs of hardware. Falcon Accuracy claims no client, contract, certification, award or production run.

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Falcon Accuracy builds AI-driven sensing, warning, decision and protection systems and tailors each one to the force, the mission and the theater it serves.

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