CANADIAN SHIELD
A DIVISION OF SIG | SUSTAINABLE INFRASTRUCTURE GROUP

AIR · CS-150

HOURS ON STATION, HUNDREDS OF KILOMETRES OUT

The bird that flies its whole leg without asking a satellite for a name.

LONG-LEG RECONNAISSANCE · STANDOFF SENSING · WIDE-AREA SURVEY

PATENT PENDING

EXPORT-CONTROLLED — INTERNATIONAL TRANSFER SUBJECT TO CANADIAN GOVERNMENT PERMITS

PASSIVE-SENSOR CARRIER — NO WARHEAD, NO FUZE, NO ENERGETIC MATERIAL

~3.0 H	~217 KM	4	0
ENDURANCE AT THE WORKING POINT (SWEEP 2.1–3.8 H)	STILL-AIR TRACK AT THE WORKING POINT (SWEEP 152–271 KM)	SENSOR MODULE VARIANTS ON ONE BELLY-BAY INTERFACE	ANTENNAS, RF EMITTERS OR GNSS RECEIVERS ABOARD

OVERVIEW

A LONG-LEG ISR AIRFRAME. NOTHING ABOARD TO ASK FOR A FIX.

Part of the **4-system Air line** — shares its envelope and doctrine with Kestrel, Owl, Raven.

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Loon CS-150 is the Air family's answer to one question: how far can a sensor go if it never asks anything for permission along the way? The airframe is a high-aspect-ratio, battery-electric fixed wing built to trade speed and agility for hours on station — and its guidance is built to the same no-radio discipline as the rest of the fleet, carried to its logical extreme. The entire sortie flies on preset legs, inertial dead reckoning, terrain-referenced fixes and celestial fixes, with no GNSS receiver anywhere on the airframe.

Loon is one of eight Goose-family airframes, and the one measured in hours and hundreds of kilometres rather than minutes. Kestrel is the cheap, tube-launched scout priced to lose. Owl circles quietly over a perimeter after dark. Raven is the family's deliberate RF exception, carrying the network so the others don't have to. Loon carries none of that trade — it is the far-ranger, built to stand off and watch for as long as the battery and the airframe's lift-to-drag ratio allow.

It carries sensors, never effectors. The belly bay takes one common mechanical, power and data interface across four module variants — EO/IR standoff, wide-area mapping, passive acoustic and environmental/civil survey — and every one of them only receives. Nothing on the airframe stores or releases energy at a target, and nothing ever will.

THE CLAIM

FLY THE LEG. NEVER ASK FOR A FIX.

Every navigation input Loon needs is loaded before the rail releases it, or sensed passively in flight — a stored terrain and imagery reference, a star, the airframe's own inertial memory. Nothing it needs to fly is broadcast at it, and nothing it carries broadcasts back.

HOW IT WORKS

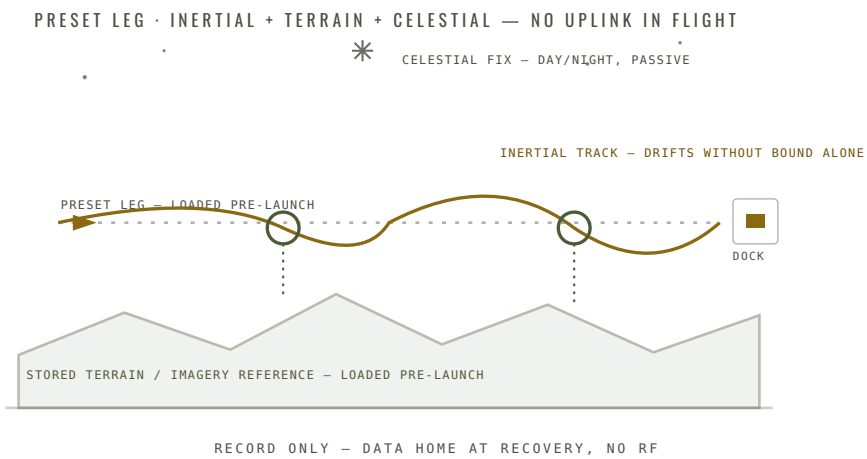
MECHANISM

THREE PASSIVE FIXES, ONE PRESET LEG

Loon's flight plan is a set of waypoint legs loaded into the airframe before the rail releases it — headings, altitudes, timing, and the terrain and imagery reference the nav stack will need in flight. Nothing arrives afterward. Nothing needs to.

In the air, an inertial core carries the dead-reckoning solution — attitude, heading, velocity — the way it has for endurance aircraft for decades. Left alone over a multi-hour leg, that solution drifts without bound; Loon's answer is to bound it passively, from below and above. Below, a terrain- or visual-map-matching sensor checks the ground it's actually flying over against the reference it loaded before launch. Above, a celestial fix — day or night — gives an independent, sky-referenced correction. Baro and mag aiding fill the gaps between fixes. None of it transmits. None of it asks a satellite for anything.

The sensor payload records everything it sees; nothing streams. Data comes home the way the airframe does — physically, at the recovery dock, over a wired or contact link with no RF component. It is a real latency cost against a live downlink, and Loon pays it deliberately: a standoff sensor that never radiates is a standoff sensor that can't be found by anything listening for one.



CS-150 · LEG FLOWN ON INERTIAL + TERRAIN + CELESTIAL FIXES — NEVER A SATELLITE

SPECIFICATIONS

CAPABILITIES & SPECIFICATIONS

LOON CS-150

DIMENSIONS & MASS

All-up mass	**10 kg, declared working point**
Wingspan	**~2.8 m**
Wing aspect ratio	**12**
Mean chord	**~0.24 m**
Wing loading	**~15 kg/m²**
Configuration	**Fixed-wing, high-aspect-ratio electric-cruise airframe, open rail launch**

PERFORMANCE

Cruise speed	**20 m/s (72 km/h)**
Lift-to-drag (L/D)	**15, sweep 12–18 across the assumption set**
Electrical cruise draw	**226 W**
Hotel load	**25 W — avionics + payload, recording only**
Endurance	**~3.0 h at the working point, sweep 2.1–3.8 h across the assumption set**
Still-air track / radius	**~217 km track · ~100 km operating radius with margin, sweep 152–271 km**

LAUNCH & NAVIGATION

Launch method	**Open rail — ~18 m/s exit speed · ~5.5 g average over a ~3 m stroke**
Navigation stack	**Inertial / attitude / waypoint autopilot core + terrain / visual-map matching + celestial fixes + baro/mag aiding**
GNSS	**None — no GNSS receiver anywhere on the airframe**
Inputs after launch	**Passive fixes only — nothing is transmitted to the airframe in flight**
Recovery	**Belly landing, net capture or parachute — site-dependent, trade open**

PAYLOAD & DATA

Sensor payload	**Modular belly bay — one common mechanical, power and data interface**
Module variants	**4 — EO/IR standoff, wide-area mapping, passive acoustic, environmental/civil survey**
Effectors	**None — sensor carrier only; no effector variant exists**
Data return	**Record on-board; offload at recovery dock, wired or physical media — no RF**

MATERIALS & CONSTRUCTION

Body / airframe	**Moulded GF-nylon fuselage & wing skins**
Wing spar	**Open structural question — PET+CF or bought-in carbon tube**
Tooling	**Dies cut in Canadian Shield's own 5-axis shop**

SIGNATURE & POWER

Battery pack	**~4.0 kg class Li-ion, wing-root / CG station**
Pack specific energy	**~200 Wh/kg**
Usable energy	**~680 Wh**
Emissions	**None, any tier — no antenna, no RF emitter, no GNSS receiver anywhere on the airframe**

COMPLIANCE

Patent status	**Patent pending**
Export control	**Export-controlled — international transfer subject to Canadian government permits; export posture is counsel-first**
Munitions classification	**Passive-sensor carrier, not a munition — no warhead, no fuze, no energetic material; no effector variant exists**
RF relay scope	**Raven CS-130 — the family's deliberate RF exception, not this airframe**

ALL PERFORMANCE FIGURES ARE STATED AT THE DECLARED ~10 KG WORKING POINT AND ITS ASSUMPTION SET; ENDURANCE AND RANGE CARRY THEIR SWEEPS IN THE VALUE, AND NO SINGLE-POINT RANGE OR ENDURANCE FIGURE IS PUBLISHED FOR THIS AIRFRAME. RECOVERY METHOD AND WING-SPAR MATERIAL ARE OPEN TRADES.

THE TRADES, STATED

NO RADIO. NO GPS. NOW PROVE IT AT RANGE.

The fleet's thesis is that the link is the vulnerability, and every Goose-family airframe proves it near its launcher, in minutes. Loon is where the thesis has to hold at range — hours out, well past the horizon of anything a jammer or a spoofer could reach it with, because there is nothing aboard to jam or spoof in the first place.

The airframe rides the same manufacturing doctrine as the rest of the fleet: moulded GF-nylon fuselage and wing shells on dies cut in Canadian Shield's own 5-axis shop, a materials tier that keeps recycled PET honestly confined to non-structural work. The one open structural question — the material for a 2.8 m endurance wing spar — may become the first structural home for the group's own PET+CF material, or a bought-in carbon tube; either way, the tooling and the decision stay Canadian.

FAMILY CONTEXT

EIGHT AIRFRAMES. ONE DOCTRINE, STRETCHED TO ITS LIMIT.

Kestrel proves no-radio at a few kilometres and an hour's flight; Owl proves it after dark over a perimeter; Raven is the deliberate exception that makes the rule visible. Loon proves the same doctrine at hours and hundreds of kilometres — the family's furthest-reaching argument that a link you don't have can't be taken from you.

DEPLOYMENT

A LONG LEG, WALKED THROUGH.

One long leg, walked end to end — illustrative of how the airframe is used, not a mission record.

01 · ARRIVAL & PRESET LOAD

THE LEG LOADS BEFORE THE RAIL DOES

Loon arrives on its rail, or the rail arrives with it. At the ground station, the mission leg — waypoints, altitudes, timing, and the terrain and imagery reference the nav stack will match against — loads over a wired, pre-launch link. No radio check, because nothing on the airframe transmits.

02 · LAUNCH

A GENTLE THROW, NOT A SHOT

A low-energy rail throws the airframe to flying speed over a few metres — a fraction of the shock environment a tube-launched round sees, gentle enough that COTS electronics ride it without heroic qualification. The motor picks up, the wing loads up, and the leg begins exactly as loaded.

03 · TRANSIT & ORBIT

HOURS ON STATION, ALONE

Hours of cruise on inertial, terrain-referenced and celestial fixes, recording the belly-bay sensor the whole way — standoff sensing or wide-area survey, hands off. Nothing calls home. Nothing needs to be listening for it to work.

04 · RECOVERY & DATA PULL

THE PICTURE COMES HOME WITH THE AIRFRAME

At the end of the leg, the airframe returns to a recovery point — belly landing, net or parachute, depending on the site — and the recorded product comes off at the data-offload dock: physical media or a short wired link, no RF. The picture is hours old by design; it is also un-jammable and unfindable in flight.

THE FAMILY

RELATED SYSTEMS

CS-160 · SCOUT

KESTREL

The cheap, tube-launched scout priced to lose — no-radio proven at a few kilometres and an hour's flight.

CS-140 · NIGHT WATCH

OWL

Circles quietly over a perimeter after dark — the family's night watcher.

CS-130 · RF EXCEPTION

RAVEN

The family's deliberate RF exception — carries the network so the others don't have to.

Loon CS-150 · patent pending · export-controlled — international transfer requires Canadian government permits; export posture is counsel-first. A passive-sensor carrier — no warhead, no fuze, no energetic material anywhere on the airframe or in any module; no effector variant exists. No radio and no GPS — no antenna, no RF emitter, no GNSS receiver anywhere on the airframe; the recorded picture comes home with the airframe at recovery. Performance figures are stated at a declared ~10 kg working point with their assumption sweeps; no single-point range or endurance figure is published for this airframe.

HOURS ON STATION, HUNDREDS OF KILOMETRES OUT

LOON · AIR · CS-150

Eight airframes. One doctrine, stretched to its limit.

01 **REQUEST A TECHNICAL EXCHANGE**

A working session with engineering, not sales — bring your engagement problem, we bring the mechanism.

02 **REQUEST THE AIR FAMILY DATA PACK**

Drawings, tolerances and test basis for Loon and its siblings, gated behind export screening.

03 **DISCUSS A TRIAL QUANTITY**

Tell us end-user, jurisdiction, quantity band and timeline — we respond against your program, not a price list.

SALES	GENERAL	WEB
sales@cdnshield.ca	info@cdnshield.ca	cdnshield.ca

Direct lines, named points of contact and facility details are shared with qualified programs following screening — not withheld, sequenced.

Canadian Shield is a defence and industrial drone company, backed by SIG: four-domain uncrewed systems built for jammed, GPS-denied environments — no-radio by design, manufactured for cost and salvo depth.

Loon CS-150
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