CDNS UAV PLATFORMS · AIR

ENCAPSULATOR CS-111

THE CAPTURE NOSE ON THE GOOSE ROUND

The Goose round with a capture bay in the nose: the same tube and magazine, a mechanical release, and a target brought down intact.

1.6 kg	~189 m/s	5.0 ms	~11.8 bar	−30 °C
ALL-UP MASS, HELD TO GOOSE CS-110	EXIT VELOCITY, SHARED	DEPLOYMENT WINDOW: 1 M STANDOFF AT ~200 M/S	PAYLOAD SELF-PRESSURE IN THE LAUNCH	ENVIRONMENTAL DESIGN CASE

AT A GLANCE

SAME TUBE, SAME MAGAZINE. A DIFFERENT ANSWER AT THE TARGET.

Encapsulator CS-111 changes the nose and nothing behind it. The figures below size the launch load and the capture event; the cards say why a buyer who needs what was overhead recovered whole would load it.

SAME LINE

NO SECOND LAUNCHER, NO SECOND MAGAZINE

The capture round matches the kinetic round's mass, bore, exit velocity and magazine pitch, so it rides the same tube and indexes in the same magazine.

INTACT

THE TARGET COMES DOWN WHOLE

The designed effect is rotor fouling, and the designed outcome is an aircraft brought down intact and recoverable, so what was overhead can be examined, traced and attributed.

NOTHING ENERGETIC

NO GAS GENERANT, NO PYROTECHNIC

Every capture path the design carries is non-energetic, and where an airbag-style gas generant would deploy faster, the design declines it. There is no pyrotechnic anywhere in the round or in the launch chain that throws it.

A PERSON ARMS

A HUMAN ARM ACTION FOR EVERY SHOT

The launcher lays the shot from a cue, a person arms it, and a partner's cue is a permissive that can never bypass the interlock chain.

IN THIS SHEET

01 · SPECIFICATION

THE CAPTURE ROUND, FIGURE BY FIGURE. WITH THE BASIS EACH ONE RESTS ON.

The specification of Encapsulator CS-111: the round it shares with Goose, the capture bay, the launch load, the release, the capture event, the effect, guidance, environment and handling.

01 THE ROUND IT SHARES WITH GOOSE

PARAMETER	VALUE	BASIS
All-up mass	1.6 kg	design value; unchanged from CS-110, so the magazine, indexing pitch and launch energy are shared
Bore	Ø90 mm, 63.6 cm²	design value, shared with CS-110
Exit velocity	~189 m/s	design value, the shared launch case
Launch	30 bar over ~3 m	design launch case, shop-air class, shared with CS-110
Launch energy delivered	28.6 kJ	calculated, the shared launch case
Airframe aft of the nose bulkhead	Goose CS-110, unchanged	the design boundary: all new hardware is forward of the bulkhead
External envelope, mass and indexing features	Identical to CS-110	design requirement for a mixed kinetic and capture magazine
Magazine	Interchangeable with the kinetic round	the two index together in one magazine
Propulsion aboard	None	a pneumatically launched, ballistic carrier
Pyrotechnics in the launch chain	None	stored-air launch

02 THE CAPTURE BAY

PARAMETER	VALUE	BASIS
Nose bulkhead	Carries the payload's inertial load into the hull sidewall	design function; keeps that load off the dispersal head
Bay elements	Stored energy source, capture medium, dispersal head, mechanical release	the common bay architecture

03 THE LAUNCH LOAD ON THE PAYLOAD

PARAMETER	VALUE	BASIS
Average launch acceleration	~5,953 m/s², ~607 g	calculated, $189^2/(2 \times 3.0)$, averaged over the stroke
Peak launch shock	1,159 g	calculated at the start of the stroke; every head must survive it
Self-pressure of a 180 mm liquid column	~11.8 bar	calculated at about 1.1 g/cm³ and the average acceleration

PARAMETER	VALUE	BASIS
Pressure-threshold release	Excluded	the payload reaches release pressure during the launch stroke

04 THE RELEASE

PARAMETER	VALUE	BASIS
Release	Positive mechanical action	never pressure-triggered
Mechanism the capture noses share	Collapse trigger	the nose collapses mechanically on contact and the collapse itself releases the net or canopy
Name of the mechanism	Standoff release, or deployment trigger	it opens a bay and initiates nothing
Power aboard	None	no battery and no proximity sensor

05 THE CAPTURE EVENT

PARAMETER	VALUE	BASIS
Closing speed, design case	~200 m/s	calculated: head-on against a 3 kg multirotor at ~15 m/s gives ~204 m/s
Deployment window at 1 m standoff	5.0 ms	calculated at ~200 m/s closing
Window at 5 m and at 20 m	25 ms and 100 ms	calculated at ~200 m/s closing
Free-expanding chemistry at 1 m	~1,000 to 3,000 times too slow	calculated against commercial two-part cream times of 5–15 s
Fill rate for a 12 L envelope in 5 ms	~2,400 L/s	calculated; the rate class of an automotive airbag inflator
Capture paths	Non-energetic only	free-expanding chemistry is ruled out as the primary medium by the timing arithmetic; no gas generant and no pyrotechnic initiator
Post-contact agent	Contact-transfer adhesive, optional	a persistence layer after contact, never the expanding medium

06 THE EFFECT

PARAMETER	VALUE	BASIS
Designed effect	Rotor fouling	one or two rotors fouled and the disc unbalanced
Outcome	Target brought down intact and recoverable	design requirement; capture only, with no destructive effect designed
Energetic material	None	no warhead, fuze, gas generant or pyrotechnic initiator

07 GUIDANCE AND ENGAGEMENT

PARAMETER	VALUE	BASIS
Guidance tier	Tier 2, fibre, recommended primary	design recommendation; a preset round flies the arc it was given and cannot see a moving target

PARAMETER	VALUE	BASIS
Tier 2 line	Optical fibre paid out of the tube	a wire, not a link; nothing on it radiates
Laying	Solved at the launcher before the shot	as for the kinetic round
Arming	A human arm action for every shot	a partner cue is a permissive only

08 ENVIRONMENT AND HANDLING

PARAMETER	VALUE	BASIS
Environmental design case	−30 °C	design value, the winter case
Exclusion zone	The full muzzle arc and downrange	kept clear while the launcher is armed and firing; the area-clear key must be made before the launcher will arm
Stored-gas path	A high-pressure gas bottle in each round	the path the design arithmetic favours; a pressure vessel in the magazine, in the tube and downrange
Magazine	No pyrotechnics	no cook-off or hazardous-storage constraint from the launch chain
After the engagement	A fouled airframe still falls	a secondary hazard the design carries

02 · THE SAME ROUND

AFT OF THE BULKHEAD, GOOSE. FORWARD OF IT, A CAPTURE BAY.

Encapsulator CS-111 is a nose variant on the Goose line, not a new airframe. Everything from the tail fins forward to the nose bulkhead is Goose CS-110, unchanged; everything forward of it is new.

That boundary is the whole architectural idea. The launcher, the magazine, the ballistics and the guidance were paid for by the kinetic round, and the capture round inherits them rather than repeating them. What is new is the nose bulkhead and the bay in front of it: a stored energy source, the capture medium, a dispersal head and a mechanical release.

Four figures are held identical to CS-110 on purpose: the 1.6 kg all-up mass, the Ø90 mm bore, the ~189 m/s exit and the magazine pitch. With those held, the capture round matches the kinetic round's external envelope, mass and indexing features, and the two index side by side in one magazine. The choice of effect moves from procurement to the breech.

1.6 kg	Ø90 mm	~189 m/s	0
ALL-UP MASS, HELD TO CS-110	BORE, ON 63.6 CM²	EXIT VELOCITY, SHARED	WARHEADS, FUZES, GAS GENERANTS OR INITIATORS

03 · THE BAY

FOUR ELEMENTS FORWARD OF THE BULKHEAD. THE SAME FOUR WHATEVER THE MEDIUM.

Everything new on the round sits forward of the nose bulkhead, in a bay built around four elements that stay the same whatever capture medium is packed into it.

The nose bulkhead carries the payload's inertial load into the hull sidewall rather than into the dispersal head, so the launch cannot press the payload into its own release.

STORED ENERGY

THE DEPLOYMENT SOURCE

Compressed gas, or a compressed spring stack, held until the release lets it go.

CAPTURE MEDIUM

PACKED UNTIL IT IS RELEASED

Packed or contained in the bay. The timing arithmetic rules free-expanding chemistry out as the primary medium.

DISPERSAL HEAD

SETS THE DEPLOYED SHAPE

The head decides whether the capture medium opens into a useful curtain or a useless knot.

MECHANICAL RELEASE

HOLDS THE BAY SHUT

A positive mechanical action that holds the bay shut through the launch stroke and needs no electrical power aboard to open.

04 · THE LAUNCH LOAD

THE PAYLOAD RIDES THE LAUNCH STROKE. IT ARRIVES AT THE BULKHEAD AS A LOAD.

Whatever is packed into the bay is accelerated by the same stroke as the round: about 607 g averaged over the stroke, and 1,159 g at the peak, which every head must survive.

QUANTITY	FIGURE	BASIS
Average launch acceleration	~5,953 m/s², ~607 g	$189^2/(2 \times 3.0)$, over the stroke
Peak launch shock	1,159 g	At the start of the stroke, all heads
Self-pressure at the base of a 180 mm liquid column	~11.8 bar	ρ·a·h at about 1.1 g/cm³

THE FINDING

A PAYLOAD THAT BEHAVES LIKE A LIQUID SELF-PRESSURIZES IN THE TUBE. A BURST DISC WOULD OPEN IN THE BARREL.

A threshold release would have to be rated above the pressure the payload reaches during the stroke, then driven past it milliseconds later inside a round with no electrical power. The release is a positive mechanical action instead, such as a latch or a collapsing nose.

05 · THE RELEASE

A STANDOFF RELEASE, NEVER A FUZE. A MECHANISM THAT OPENS A BAY.

Canadian Shield does not build fuzes. The mechanism at the front of CS-111 is a standoff release, or deployment trigger: it opens a bay, and there is nothing aboard for it to initiate.

An unpowered round carries no battery, so an active proximity sensor is not available without putting back the electronics the design removed. That leaves releases that are mechanical from end to end. The collapse trigger is the mechanism the capture noses share: the nose collapses mechanically on contact, and the collapse itself releases the net or canopy, with no initiator and no electrical path.

- ✓ No warhead and no fuze: a capture nose catches rather than destroys, and nothing on it operates a weapon.
- ✓ No gas generant and no pyrotechnic initiator: where an airbag-style gas-generant inflator would deploy faster, the design declines it and accepts the mass penalty.
- ✓ No battery and no proximity sensing forward of the bulkhead, and no electrical conductor across the nose interface.

06 · THE WINDOW

ONE METRE AT TWO HUNDRED METRES A SECOND. FIVE MILLISECONDS TO DEPLOY.

The payload has to be deployed before the round arrives, and the time available is set by the standoff and the closing speed. Head-on against a 3 kg multirotor, the design case is about 200 m/s.

RELEASE STANDOFF	TIME TO THE TARGET
At contact	0 ms
1 m	5.0 ms
5 m	25 ms
20 m	100 ms

Commercial two-part expanding chemistries work on cream times of 5 to 15 s, between one thousand and three thousand times too slow at a metre, and there is no standoff at which such a foam both expands in time and is still where the target will be. Filling a 12 L envelope in 5 ms takes about 2,400 L/s, the rate class of an automotive airbag. Airbags reach it with a pyrotechnic gas generant, which the carriers-not-munitions line rules out; the design arithmetic finds that stored cold gas can reach it without one.

07 · THE EFFECT

FOUL THE ROTORS. BRING THE AIRCRAFT DOWN WHOLE.

The capture nose does not wrap a whole airframe. It fouls one or two rotors and unbalances the disc, and that is still a capture.

Wrapping even a small multirotor whole takes far more mass than the bay can carry, so the effect the round is designed for is **rotor fouling**: the capture medium goes into the disc, the disc loses its balance and the aircraft comes down. On a small multirotor one or two fouled rotors are enough. The capture medium has to be in the disc rather than near it.

The mission ends with the target intact and recoverable. The airframe, and whatever it was carrying, can be examined, traced and attributed. A fouled airframe still falls, a round that misses still comes down on its arc, and human safety comes first on the ground beneath both.

NOTHING ENERGETIC

NOTHING THAT BURNS

No warhead, fuze, primer, propellant, gas generant or initiator, in the round or in the magazine.

AN OBJECT TO EXAMINE

RECOVERED, NOT SCATTERED

The aircraft comes down whole, so what was overhead can be traced and attributed.

BESIDE THE KINETIC ROUND

ONE MAGAZINE, TWO ANSWERS

Collision where collision is the right answer; capture where the airframe should come down in one piece.

08 · COLD

DESIGNED FOR A CANADIAN WINTER. MINUS THIRTY AT THE BOTTLE AND THE SEALS.

The environmental design case is −30 °C. A steel nose does not notice the cold; stored energy, a packed capture medium and a release that has to move inside milliseconds do.

Gas output, seal compliance and the stiffness of a packed textile all move with temperature, and so would the cure of any post-contact adhesive. Each is carried at the design case rather than at room temperature, because a capability that only works above freezing is not a product for this ground.

09 · GUIDANCE

THE LAUNCHER LAYS THE SHOT. A FIBRE KEEPS A PERSON IN THE LOOP.

The kinetic round needs nothing after the muzzle. For the capture round the recommended primary tier is Tier 2: a fibre paid out of the tube, with a person in the loop.

A preset round flies the arc it was given and cannot see a moving target, and the systems engineering recommends the fibre tier for the capture round for that reason.

- ✓ A fibre is a wire, not a link: nothing on it radiates, and nothing in the fleet transmits by radio.
- ✓ The launcher still lays the shot: bearing, range and height become a laying solution before the arm key turns.
- ✓ No head carries power or signal lines from the launcher across the nose interface.
- ✓ A human arm action is mandatory for every shot, and a partner cue is a permissive that can never bypass the manual interlock chain.

10 · TWO EFFECTS

TWO NOSES, ONE MAGAZINE. THE CHOICE IS MADE AT THE BREECH.

Holding mass, bore, exit velocity and magazine pitch identical lets a magazine index both rounds, and leaves the choice of effect to each shot.

	GOOSE CS-110	ENCAPSULATOR CS-111
All-up mass	1.6 kg	1.6 kg, held identical
Bore	Ø90 mm on 63.6 cm²	Ø90 mm on 63.6 cm²
Exit velocity	~189 m/s	~189 m/s
Magazine pitch	One pitch	The same pitch
The nose	A solid steel slug	A stored energy source, a capture medium, a dispersal head and a mechanical release
At the target	Collision	Rotor fouling, the airframe down intact
Guidance tier	Tier 1, preset	Tier 2, fibre, recommended primary
Energetic material	None	None

11 · DOCTRINE AND SAFETY

A CAPTURE CARRIER, NEVER A MUNITION. A PERSON ARMS EVERY SHOT.

The lines that hold for the capture round on every launch platform and for every customer.

- ✓ Carriers, not munitions: no warhead, no fuze, no gas generant, no pyrotechnic initiator and no energetic material in the round or in the magazine, and nothing on it operates a weapon.
- ✓ Nothing in the fleet transmits by radio and nothing guides on a link; the capture round's fibre tier is a wire paid out of the tube, and nothing on it radiates.
- ✓ Human safety comes first, on every line: a person arms every shot, a partner cue is a permissive and never a trigger, and a fouled airframe still falls to the ground beneath it.
- ✓ A launched round is a hazard along its whole arc, whichever nose it carries: the full muzzle arc and the ground downrange are an exclusion zone, kept clear while the launcher is armed and firing, and a round that misses comes down on its arc with the energy it has left.
- ✓ On the stored-gas path the design arithmetic favours, each round carries a high-pressure gas bottle in the magazine, in the tube and downrange, with the storage, transport and handling rules of a pressure vessel.

THE CONVERSATION

TELL US WHAT LIES UNDER THE AIRSPACE. AND WHAT HAS TO COME DOWN WHOLE.

A first conversation needs the ground beneath the engagement, what crosses it, the sensing already in place and what has to be recovered intact afterwards. Every enquiry is screened.

Start a screened enquiry at cdnshield.ca/enquiries.

DOCUMENT	CDN-PROD-SPC-002 · Encapsulator CS-111 · Specification sheet
REVISION	R1.0 · issued 2026-09-10
WEB VERSION	cdnshield.ca/cdns-uav-platforms/spec-sheets/encapsulator · carries the current revision
RELATED SHEETS	Goose CS-110 · CS-120 · The Launch Platform
ISSUED BY	Canadian Shield · cdnshield.ca

Not an offer. Enquiries are screened, international transfer is subject to Canadian export permits taken per shipment, and all designs, systems and technologies shown are patent pending.