



CANADIAN SHIELD

SPECIFICATION SHEET
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CDNS UAV PLATFORMS · AIR

THE LAUNCH PLATFORM

PNEUMATIC LAUNCH ON SHOP AIR FOR THE Ø90 BORE

Ground equipment that throws a moulded round with air alone: a charged bank, a normally closed breech and a Ø90 tube, and a person arms every shot.



Ø90 mm
BORE, EVERY TUBE

30 bar
CHARGE
PRESSURE, AIR
ONLY

3.00 m
STROKE

<5 ms
BREECH OPEN,
NORMALLY CLOSED

18,191 N
PEAK BASE FORCE,
PER BARREL

±170°
AZIMUTH; -3° TO
+75° ELEVATION

AT A GLANCE

AIR, A VALVE AND A TUBE. A PERSON ON THE ARM KEY.

A compressor, a certified air bank, a fast normally closed valve and a steel tube, laid by a two-axis mount and armed by a person for every shot. Nothing in it burns and nothing on it transmits.

AIR, NOT CHEMISTRY

NOTHING IN THE ENERGY PATH BURNS

The launch energy is compressed air from an electric compressor. There is no propellant, no primer and no cartridge anywhere on the platform or in the round it launches.

A PERSON ARMS EVERY SHOT

FOUR PERMISSIVES AND A LOCAL FIRE COMMAND

An emergency stop, an area-clear key, a muzzle-cover switch and a relief-proven switch stand in series ahead of the arm relay, and fire is a local operator action. The cue is a permissive only, never a trigger.

FAIL CLOSED

TAKE THE POWER AWAY AND THE BREECH IS SHUT

Every breech valve is normally closed. Loss of control power, of the console bus, of the arm relay or of any interlock returns the platform to its safe state.

ONE BORE

INDIFFERENT TO THE HEAD IN THE BREECH

Every head crosses one mechanical nose interface, and the platform delivers the same 30 bar over the same stroke to each of them. No head carries power or signal from the launcher.

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01 · SPECIFICATION

THE REFERENCE DESIGN, FIGURE BY FIGURE. PER BARREL WHERE THE ENGINEERING IS PER BARREL.

The four-tube reference design, figure by figure, with the basis of each beside it.

01 REFERENCE DESIGN

PARAMETER	VALUE	BASIS
Tubes	4, on a common cradle	the reference design in the design definition
Bore	Ø90.00 mm	design value, the round's bore
Stroke	3,000 mm	design value
Charge pressure	30 bar, shop-air class	design value
Round	Goose CS-110 or Encapsulator CS-111, 1.600 kg	design value for the round mass; one round in one tube
Head interface	One mechanical nose interface for every head	design definition, head variants interface
Power or signal to the head	None	design definition, head variants interface

02 LAUNCH, PER BARREL

PARAMETER	VALUE	BASIS
Velocity at the muzzle	189.2 m/s	design value, interior ballistics
Muzzle energy	28.64 kJ	calculated: $\frac{1}{2}mv^2$
Peak base force	18,191 N	calculated; lands at the start of the stroke, before the round moves
Mean base force	9,546 N	calculated
Peak acceleration of the round	1,159 g	calculated; governs the launcher structure
Bore area	63.62 cm ²	the Ø90 bore

03 BARREL AND BREECH

PARAMETER	VALUE	BASIS
Barrel stock	Drawn-over-mandrel steel tube, without a weld seam	drawing general notes
Breech valve	Normally closed solenoid, energize to open, one per barrel	design definition; control-logic schematic
Valve opening time	<5 ms	calculated, so the peak load does not shift
Valve pressure rating	30 bar	design definition, breech and fast valve
Barrels fired	One commanded at a time	the published safety page

PARAMETER	VALUE	BASIS
Breech drive	Hard-wired into the interlock chain, never commanded over the console bus	design definition, CAN and interlock architecture

04 AIR SYSTEM

PARAMETER	VALUE	BASIS
Working pressure	30 bar	design value
Accumulator bank	191 L	design value, sized for eight shots with a 50 % reserve
Stored energy, bank charged	0.89 MJ	calculated; the dominant hazard on the system
Pressure vessel	Certified to TC/CSA/ISO 11119	mandatory in the design definition and on the drawings
Canadian Registration Number	Carried on the vessel and on its relief device	the published platform page
Relief valve set point	33 bar, 110 % of working pressure	set point on the pneumatic diagram; relief valve to ISO 4126-1
Relief capacity	Full compressor flow, proven by a switch in the arm chain	design definition, safety architecture
Isolation and venting	Manual isolation valve, vent and drain	the pneumatic diagram; the published safety page
Pressure reading	A transducer on the bank, a safety-critical input to the controller	design definition, electrical load analysis

05 COMPRESSOR AND POWER

PARAMETER	VALUE	BASIS
Compressor	Electric, 17 kW shaft power	calculated from the pneumatic work
Compressor free-air delivery	31 L/s	calculated at 50 % mechanical efficiency
Site supply	480 V three-phase, to the compressor	the supply the electrical design is drawn to
Control power	24 VDC bus for every other load	design definition, power and charging
Power and control separation	The three-phase and 24 VDC buses kept physically apart	design definition, bus architecture

06 SAFETY FUNCTIONS

PARAMETER	VALUE	BASIS
Arm permissives	Four in series: a dual-channel emergency stop, an area-clear key, a muzzle-cover switch and a relief-proven switch	design definition, interlock chain

PARAMETER	VALUE	BASIS
Fail direction	Every link fail-open; any fault returns the platform to safe	design definition; interlock state machine
Control states	SAFE, ARMED, FIRING and FAULT	interlock state machine
Fault recovery	Manual reset, with every permissive re-established	interlock state machine
Fire command	Local operator action only	design definition, interlock chain
Arm action	Mandatory for every shot; no automated or remote-only fire path	design definition, safety architecture
Fire-control cue	A permissive only, never a trigger; never overrides the local arm	design definition, interlock chain
Emergency stop	Dual-channel, with cross-fault detection at the arm relay	control-logic schematic
Energetic material	None, on any head, in any revision	schematic safety-function summary

07 MOUNT, AIMING AND MAGAZINE

PARAMETER	VALUE	BASIS
Azimuth	$\pm 170^\circ$	design value, tied to the alignment software
Elevation	-3° to $+75^\circ$	design value, tied to the alignment software
Peak slew acceleration	$60^\circ/\text{s}^2$	design value
Axis drives	Servo drives with encoders on both axes	design definition, electrical load analysis
Boresight	An alignment module holding a stored boresight offset	design definition; the published safety page
Envelope check	A solution outside the mount's limits is refused before the drives move	the published platform and engagement pages
Magazine	Auto-index, motor and encoder, no pyrotechnics	design definition, auto-index magazine
Magazine capacity	24 rounds	reference design: two four-tube salvos with 16 in reserve
Structure	A pedestal for a fixed site, or a vehicle cradle	design definition, structure and cradle

08 INTERFACES

PARAMETER	VALUE	BASIS
Fire-control interface	A wired connector, capped, its conductors held in reserve until the interface is defined	design definition; the published platform page
Cue	Bearing, range and height, over the fire-control interface or entered by hand	the published engagement page
Operator console link	CAN 2.0B bus between the console and the launcher	design definition, CAN bus topology
The platform's own sensing	A pressure transducer on the bank and a boresight reference on the mount	design definition; the published platform page
Radio aboard	None; the slim upright rods on the receiver deck are not radio aerals	the published platform page

09 SUSTAINMENT

PARAMETER	VALUE	BASIS
Breech seal	Watched as a wear item on its own schedule	the published safety page
Pressure vessel life	Its own life and inspection interval; a vessel out of interval stops the launcher	the published safety page
Hydrostatic test intervals	Documented for the certified vessel	design definition, safety architecture

02 · GROUND EQUIPMENT

THE ROUND LEAVES. THE PLATFORM STAYS AND HOLDS THE AIR.

A launch platform is the ground half of CDNS UAV Platforms. It stores the air, points the tube and lets the round go, and it is never counted among the UAVs it launches.

Goose CS-110 is a UAV. The machine that throws it is ground equipment: a frame, a bank of compressed air, a fast valve and a tube, standing on ground the customer chose and worked by a crew the customer trained. What it delivers is one thing, a fixed quantity of compressed air released fast behind a cup that fills the bore. Thirty bar acts across Ø90 mm and drives the round the length of the tube, and at the muzzle the platform's work is done.

The engineering sizes a four-tube reference design, and it treats the number of tubes as a choice rather than a requirement, traded against depth of fire and mass. The frames on this sheet show the same pneumatic chain in its array build.

DOCTRINE**CARRIERS, NOT MUNITIONS. A PERSON ARMS EVERY SHOT.**

There is no warhead, no fuze, no primer, no propellant and no initiator anywhere in this system. The cue is a permissive, never a trigger: it cannot bypass the interlock chain or the arm action, and no automated or remote-only fire path exists.

03 · THE PNEUMATIC CHAIN

COMPRESSOR, BANK, VALVE, TUBE.
AIR IS ALL THAT IS IN THE ENERGY PATH.

Air is made, stored, held behind one valve per barrel and released into one bore. Nothing on the chain is a cartridge.



An electric compressor of 17 kW shaft power, on a 480 V three-phase supply, charges a 191 L accumulator bank to 30 bar. The bank is a certified pressure vessel. A relief valve set at 33 bar, 110 % of working pressure, stands above it, and a transducer reads it for the controller. A manual isolation valve, vent and drain take the stored air out of the machine.

Downstream, each barrel has its own normally closed solenoid breech valve, energized to open and rated at the bank's working pressure. Its port is sized so the valve is never the restriction, and it opens in under 5 ms so the peak load does not shift.

ELEMENT	REFERENCE DESIGN	BASIS
Compressor	Electric, 17 kW shaft power, 31 L/s free air	Calculated
Accumulator bank	191 L at 30 bar, certified to TC/CSA/ISO 11119	Design value
Stored energy	0.89 MJ	Calculated
Relief valve	33 bar set point	110 % of working pressure
Breech valve	Normally closed, <5 ms, one per barrel	Calculated opening time
Tube	Ø90 mm bore, 3,000 mm stroke	Design value

04 · BREECH AND BARREL

PEAK LOAD IS A PRESSURE PROBLEM.
NOT A VALVE PROBLEM.

The peak base force lands at the very start of the stroke, before the round has moved. Pressure, bore and mass fix it; valve speed does not.

Because the peak occurs at the instant the valve opens, it is set by the charge pressure acting across the bore on the mass of the round. A slower valve costs muzzle velocity, not peak load. The breech is therefore built for its seal's life at 30 bar rather than for a soft opening, and the barrel group and its interfaces are sized against the peak.

The barrels are drawn-over-mandrel steel tube, without a weld seam, on a common cradle. Each takes 18,191 N at the peak and 9,546 N on average over the stroke.

PER BARREL	VALUE	BASIS
Peak base force	18,191 N	Calculated, at the start of the stroke
Mean base force	9,546 N	Calculated
Peak acceleration of the round	1,159 g	Calculated
Velocity at the muzzle	189.2 m/s	Design value
Muzzle energy	28.64 kJ	Calculated

05 · STORED ENERGY

0.89 MJ IN A CHARGED BANK.
THE DOMINANT HAZARD ON THE SYSTEM.

The charged accumulator is the largest hazard on the system, larger than the round and larger than the compressor, and the design is arranged around it.



The bank holds its energy before anyone is near a tube, so the pressure system is treated as the dangerous part of the machine, and every procedure on it follows from that. The relief valve is sized for full compressor flow, so a control fault cannot drive the bank past its set point.

- ✓ **A certified vessel.** TC/CSA/ISO 11119, with documented hydrostatic test intervals.
- ✓ **Relief above the working point.** 33 bar over a 30 bar working pressure, sized for full compressor flow.
- ✓ **No arm without relief.** A relief-proven switch sits in the arm chain.
- ✓ **Charge with the zone clear.** Nobody is inside the exclusion zone while the bank comes up to pressure.
- ✓ **Out by hand.** A manual isolation valve, vent and drain.

06 · THE INTERLOCK CHAIN

FOUR PERMISSIVES IN SERIES. THEN A PERSON AT THE CONSOLE.

The arm relay is the single node that guards the fire path, and every link in front of it is fail-open.

Four permissives stand in series ahead of the arm relay. Any one of them open leaves the relay de-energized and the platform safe; to a series chain, a cut wire and a pressed stop are the same event. With all four made the relay energizes, and fire is a local operator action at the console. A human arm action is mandatory for every shot.

The control states are SAFE, ARMED, FIRING and FAULT. A permissive that opens returns the platform to SAFE, and a fault latches until a person resets it with every permissive re-established. The breech valves are hard-wired into the interlock chain rather than commanded over the console bus, so a bus fault cannot keep a valve from closing.

PERMISSIVE	WHAT IT CONFIRMS
Emergency stop, dual channel	Two normally closed channels agree that no stop is pressed, with cross-fault detection at the arm relay
Area-clear key	A named person has walked the zone and turned the key
Muzzle-cover switch	The cover is off the muzzle
Relief-proven switch	The relief path is proven before the platform will arm

THE BOUNDARY

THE CUE IS A PERMISSIVE. IT NEVER OVERRIDES THE LOCAL ARM.

With the fire-control interface open or absent, the arm relay is unaffected and a local arm is still required. No automated or remote-only fire path exists.

07 · MOUNT AND AIMING

AZIMUTH TO $\pm 170^\circ$. ELEVATION FROM -3° TO $+75^\circ$.

The traversing and elevating mount is the whole of the platform's aim, and its envelope is checked before the drives are asked for anything.



The mount carries the barrel group on a common cradle and drives it in two axes, each on a servo drive with an encoder, to a peak slew acceleration of $60^\circ/\text{s}^2$. An alignment module holds a stored boresight offset that ties the bore to the mount's aim. A cue of bearing, range and height becomes a laying solution, and a solution outside the mount's limits is refused rather than clipped: the sequence stops at the lay, and the crew re-sites the platform or passes the cue on.

Under the mount sits a pedestal for a fixed site or a cradle on a vehicle, chosen per deployment. The bore, the pressure and the stroke do not change with it.

THE TRAVERSE **$\pm 170^\circ$ OF AZIMUTH**

Driven and encoded, and referenced to the stored boresight offset.

THE ELEVATION **-3° TO $+75^\circ$**

From a shallow lay to a steep arc, set by the solution for each cue.

THE MAGAZINE**AUTO-INDEX, NO PYROTECHNICS**

A motor and an encoder feed the breech. The reference design carries 24 rounds: two four-tube salvos with 16 in reserve.

08 · POWER AND INTERFACES

THREE-PHASE TO THE COMPRESSOR. A WIRE FOR THE CUE, A BUS TO THE CONSOLE.

The platform draws three-phase power, runs its controls on 24 VDC, and takes its cue at one capped connector.

The compressor is the only load on the 480 V three-phase supply. Everything else, the axis drives, the magazine, the breech valves, the pressure transducer, the console and the interlock chain, runs on a 24 VDC control bus kept physically apart from the three-phase side.

The operator console talks to the launcher on a CAN 2.0B bus. The fire-control interface is a wired connector left capped, its conductors held in reserve until the interface is defined. A cue reaches the console through it or is entered by hand, and either way it is a permissive.

INTERFACE	WHAT CROSSES IT	BASIS
Site power	480 V three-phase, to the compressor	The supply the electrical design is drawn to
Control power	24 VDC, to every other load	Design definition
Operator console	CAN 2.0B bus to the launcher	Design definition
Fire-control interface	Bearing, range and height as a permissive, never a trigger; capped until the interface is defined	Design definition; the published engagement page
Nose interface	Structure only; no power or signal to any head	Design definition

09 · THE BOUNDARY

THE CUE ARRIVES ON A WIRE. IT IS A PERMISSIVE, NEVER A TRIGGER.

Detect, track, classify and cue are Canadian Shield's own, built in-house. The platform's boundary is the connector where the cue arrives.



Detect, track, classify and cue sit outside the launcher and the round: the cue arrives on a wire as a permissive, never a trigger. The platform's own sensing is a pressure transducer on the bank and a boresight reference on the mount, and nothing on the platform transmits by radio.

- ✓ **A cue may propose.** Bearing, range and height, from the fire-control interface or entered by hand.
- ✓ **A cue may never authorize.** The arm action is a person's, for every shot.
- ✓ **A cue may never bypass.** The four series permissives sit between any signal and the breech.

10 · SUSTAINMENT

TWO ITEMS DECIDE THE MACHINE'S LIFE. THE BREECH SEAL AND THE VESSEL.

Most of what the platform needs is what any pneumatic and electrical machine needs. Two items set its working life.

The breech seal sits at the fastest and most violent transition in the system, and it is watched as a wear item on a schedule of its own. The pressure vessel has a life and an inspection interval that belong to the vessel, with documented hydrostatic test intervals, and a vessel outside its interval stops the launcher until it is back inside it.

The rest is the ordinary care of a pneumatic and electrical machine: filters, drains, fittings, bonding, encoder checks and the mount drives, on intervals written for this machine.

11 · WHO IT IS FOR

THE PEOPLE WHO OWN THE GROUND. AND THE AUTHORITY TO FIRE.

A launch platform is bought by the people who own the ground, the air supply and the authority to fire it.

Who it is for.

- A force protecting a fixed site that already has three-phase power and compressed air.
- An air-defence cell that wants the ground half of an intercept.
- A ministry that wants depth in the magazine with no propellant licensing attached to the stores.
- An engineering authority that reads the pressure-system requirements first.
- A buyer who will site the platform, train the crew and hold the arm key.

What it is not.

- Not a UAV: it is ground equipment, never counted among the UAVs it launches.
- Not a sensor: the launcher and the round carry no sensing for finding a target. Detect, track, classify and cue are Canadian Shield's own, built in-house, and sit outside them; the cue arrives on a wire as a permissive, never a trigger.
- Not a remote-fire system: a person arms every shot.
- Not an energetic system: no warhead, no fuze, no primer, no propellant and no initiator.
- Not an offer: enquiries are screened, and international transfer is subject to Canadian government permits taken per shipment.

12 · CONFIGURATIONS

ONE PNEUMATIC CHAIN. SEVERAL FRAMES TO CARRY IT.

A build is named by what carries the tubes and how it stands on the ground. The bore, the charge pressure and the stroke do not change with it.

REFERENCE DESIGN

FOUR TUBES ON A COMMON CRADLE

The build the design definition sizes: four Ø90 mm tubes on a common cradle, a 191 L air bank at 30 bar and a 24-round auto-index magazine. Every figure on this sheet is this build's.

ARRAY ON A SKID FRAME

A TUBE ARRAY BESIDE ITS AIR

A tube array on a scissor-elevating cradle over a skid frame, with horizontal air receivers along its flank, a control cabinet at one end, screw-jack levelling feet, lifting and tie-down points and forklift pockets. The frames on this sheet show this build.

FIXED SITE

ON A PEDESTAL

The mount on a pedestal, bolted to prepared ground rather than jacked onto it, for a position that stays where it is.

ON A VEHICLE

ON A VEHICLE CRADLE

The mount carried on a cradle fitted to a vehicle. The cradle is a seat for the mount, not for a crew, and fixed or vehicle is chosen per deployment.

13 · DOCTRINE AND SAFETY

CARRIERS, NOT MUNITIONS. A HUMAN ARM ACTION FOR EVERY SHOT.

The lines the platform holds on every build and for every customer.

- ✓ Carriers, not munitions: no warhead, no fuze, no primer, no propellant and no initiator anywhere on the platform or in the rounds it launches.
- ✓ Human safety comes first, on every line: a person arms every shot, and no automated or remote-only fire path exists.
- ✓ No radio and no GPS: nothing on the platform transmits by radio, and the cue arrives on a wire as a permissive, never a trigger, that can never bypass the interlock chain or the arm action.
- ✓ The breech is normally closed: loss of power, of the console bus, of the arm relay or of any interlock shuts it.

THE CONVERSATION

BRING THE GROUND, THE POWER AND THE AIRSPACE. THE ANSWER COMES BACK IN WRITING.

A first conversation needs the site, the three-phase power and compressed air already on it, the airspace the platform would cover, and who would hold the arm key.

Start a screened enquiry at cdnshield.ca/enquiries.

DOCUMENT	CDN-PROD-SPC-004 · The Launch Platform · Specification sheet
REVISION	R1.0 · issued 2026-09-10
WEB VERSION	cdnshield.ca/cdns-uav-platforms/spec-sheets/launch-platform · carries the current revision
RELATED SHEETS	Goose CS-110 · Encapsulator CS-111 · CS-120
ISSUED BY	Canadian Shield · cdnshield.ca

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