



INDUSTRIAL · CS-C001

A WIRE NOTHING CAN JAM

Guidance-fibre consumable cassettes — a physical tether option, alongside or instead of radio.

SELECT · PAYOUT · RECOVER OR SEVER

4 CAPACITY TIERS ON ONE CASSETTE GRAMMAR — FS-S, FS-M, FS-L, FS-XL	1 SEAT, LATCH AND MOUNTING INTERFACE SHARED ACROSS EVERY TIER	0 ELECTROMAGNETIC SIGNATURE ON THE FIBRE LINK ITSELF	2 CONFIRMED INDUSTRIAL-LINE CONSUMERS — CARGO MOVER, PERSONNEL MOVER
--	---	--	--

OVERVIEW

THE FLEET'S HARD-WIRED OPTION, CASSETTE BY CASSETTE.

Part of the **5-system Industrial line** — shares its envelope and doctrine with Self-Charging Dock, Relay Chain, Cargo Mover.

4	1	0	2
CAPACITY TIERS ON ONE CASSETTE GRAMMAR — FS-S, FS-M, FS-L, FS-XL	SEAT, LATCH AND MOUNTING INTERFACE SHARED ACROSS EVERY TIER	ELECTROMAGNETIC SIGNATURE ON THE FIBRE LINK ITSELF	CONFIRMED INDUSTRIAL-LINE CONSUMERS — CARGO MOVER, PERSONNEL MOVER

The Fibre Spool Line is a consumable component family, not a vehicle: guidance-fibre payout cassettes — FS-S, FS-M, FS-L and FS-XL — built to give a fleet vehicle a physical, hard-wired tether for command, telemetry or guidance. Where a radio link can be jammed, spoofed or simply unwelcome on site, a fibre link cannot — because nothing about it broadcasts.

It sits on the Industrial line as a support system, the same way the Self-Charging Dock (CS-700) and the Deployable Relay Chain (CS-710) do: not a work platform in its own right, but the consumable and infrastructure layer other platforms draw on. Cargo Mover (CS-600) and Personnel Mover (CS-610) both carry an optional fibre fly-by-wire "fibre tail" for their most demanding profiles, and the cassette in this line is the part that makes that option real — a line-replaceable unit, swapped at the dock, not a bespoke fit per airframe.

One cassette grammar, one seat geometry, four capacity tiers. Pick the tier the mission's route length needs before launch; the spool, the tension path and the exit eye that gets the fibre off it cleanly are engineered once and shared up the whole ladder.

THE PHYSICAL ARGUMENT

A radio link can be denied. A fibre link has to be cut.

HOW IT WORKS

MECHANISM

HOW IT WORKS

HUB, TENSION ELEMENT, EXIT EYE — THAT’S THE WHOLE MACHINE.

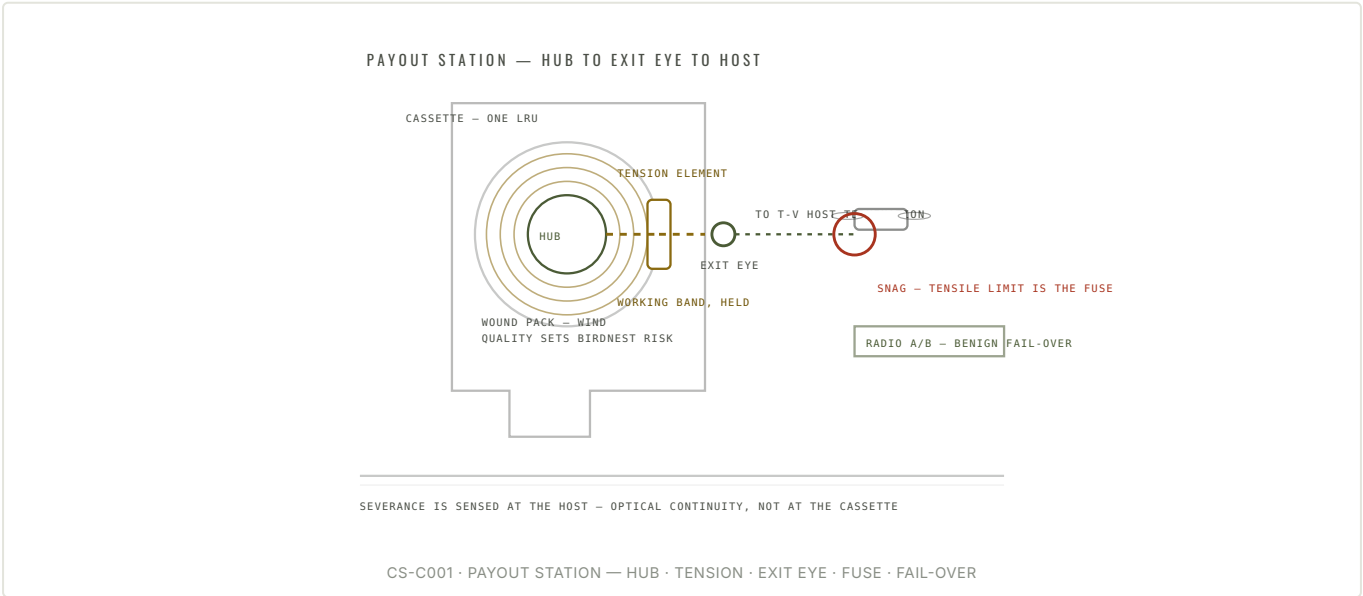
THE SIGNATURE MECHANISM · PAYOUT STATION

HUB, TENSION ELEMENT, EXIT EYE

Inside every cassette sits a wound fibre pack on a core, a tension element that keeps the paying fibre in its working band, and an exit eye — the last, radiused contact point that sets the fibre's departure cone as it leaves for the host termination. Three parts, one job: get fibre off the pack without ever letting it go slack or pulling it tight.

Two engineering questions are still open by design, and we say so rather than pretend otherwise. First, whether the pack pays out by rotating the whole spool or by staying static while fibre lifts off a bobbin end — each has a real trade-off, and the cassette housing reserves volume for either. Second, whether tension is held by a passive drag path or by an actively managed dancer-and-brake — again, both are drawn, neither is decided. What is fixed is the discipline: wind-pattern quality at the factory is what keeps a spool from birdnesting — a tangled, self-locking loop at the eye — under load on a moving vehicle.

Severance is engineered as a controlled event, not an accident. The fibre's own tensile limit is the fuse: a genuine snag parts the fibre before it can drag the vehicle off its line. Loss of optical continuity is sensed at the host end the instant it happens — and on every radio-equipped Industrial-line consumer, that loss fails over benignly to the dual radio links that were running in parallel the whole time.



1 · PAY OUT

Fibre lifts off the wound pack, hub or bobbin, toward the tension element.

2 · HOLD BAND

The tension element keeps the run inside its working band — never slack, never tight.

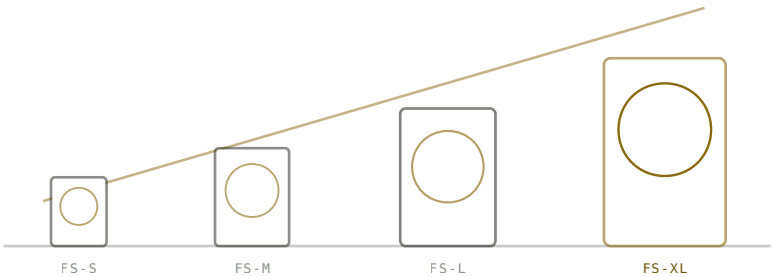
3 · EXIT CLEAN

The radiused exit eye sets the departure cone into the host termination.

4 · FUSE, IF NEEDED

A genuine snag parts the fibre at its tensile limit — detected instantly, radio takes over.

ONE SEAT GEOMETRY, FOUR CAPACITY TIERS



RUNG LENGTHS AWAIT FIBRE SELECTION – PUBLISHED WHEN SET, NOT BEFORE
SILHOUETTES SCHEMATIC – NOT TO SCALE

CS-C001 · THE CAPACITY LADDER — ONE SEAT GEOMETRY, FOUR TIERS

SPECIFICATIONS

CAPABILITIES & SPECIFICATIONS

FIBRE SPOOL LINE CS-C001

CAPACITY LADDER

FS-S	Smallest — short precision runs
FS-M	Compact — standard runs
FS-L	Extended — corridor runs
FS-XL	Longest on the ladder — whether it closes on mass at all is an open engineering question, not a guarantee
Wound pack	Grows tier to tier on a shared core geometry; rung lengths await fibre selection and are published when set
Cassette seat	One seat, latch and mounting interface across all four tiers — keyed, tool-free, dock-compatible; jointly owned with CS-700

DESIGNATION & ROLE

Designation	CS-C001 · Fibre Spool Line — Industrial-line support system / consumable product line
Role	Guidance-fibre payout cassette — a physical, hard-wired tether option for comms and/or guidance, complementary to radio and GNSS on this line
Line context	Cargo Mover (CS-600) and Personnel Mover (CS-610) both carry the cassette as an optional fibre fly-by-wire fit; radio and GNSS remain permitted and primary throughout the Industrial line

PAYOUT ARCHITECTURE

Payout architecture	Rotating spool (fibre leaves tangentially) vs. static bobbin (fibre pays over the flange end) — a genuine open design fork, drawn both ways, decided by neither drawing nor this page
Tension control	Passive drag path or an actively managed dancer arm / servo brake — the cassette housing reserves volume for either; the working band keeps the run out of slack (birdnest risk) and out of overtight (microbend damage)
Core diameter	Design rule: sized to exceed twice the fibre's minimum bend radius — the bend-radius figure itself waits on fibre selection

TERMINATION & SEVERANCE

Termination — vehicle end (T-V)	Blind-mate at the cassette seat; optical faces capped until seated — no human handling of a live optical face at hookup
Termination — ground/portal end (T-G)	Field-mateable termination kit for the console or dock end, where the contamination problem is hardest and procedure is the backup
Severance behavior	The fibre's own tensile limit acts as the controlled fuse; loss of optical continuity is sensed at the host, not the cassette; on radio-equipped Industrial-line consumers this fails over benignly to dual radio links running in parallel
Single-use vs. reusable	Open fork: single-use (factory-wound, flown once, written off) vs. reusable (recover, inspect, rewind, recertify) — whether a rewind fibre can be honestly recertified against hidden microbend damage is unresolved

MATERIALS & ENVIRONMENT

Illustrative mass/volume	A ~2 km-class fibre run has been quoted elsewhere in the fleet's own planning work at roughly 200 g and 0.1 L — cited here as an illustrative planning figure only, never promoted to a line specification
Environment	The fibre jacket is not biodegradable. Spent fibre is recovered wherever the mission allows it; where it is not recovered it is persistent, not compostable — no degradable-fibre claim is made anywhere on this line

NETWORK & DOCK INTEGRATION

Dock integration	Cassette exchange — empty-off, full-on — is a turnaround task on the Self-Charging Dock (CS-700); the interface is jointly owned, neither package moves it unilaterally
------------------	---

COMPLIANCE

Standing	Nothing on this page is a specification, offer, commitment or price. No fibre length, tension, bend-radius or capacity figure is a specification.
----------	---

SOURCE: DRAWING PACKAGE CSH-DWG-FIBRESPOOL-001. NO FIBRE MATERIAL LIMIT IS INVENTED HERE — EVERY SUCH FIELD REMAINS AN OPEN ENGINEERING QUESTION IN THE DESIGN RECORD ITSELF.

TIER LENGTHS — THE GOVERNING RULE

We do not publish rung lengths for FS-S through FS-XL, because on this line that number is not yet a property of the design — it is the output of work still open. A length claim without the variables below attached would be a number for its own sake, so we decline to make one.

THE TRADES, STATED

RADIO STAYS ON. THE WIRE IS THE BACKUP.

Radio and GNSS are permitted, and remain the default, right across the Industrial line — that doctrine does not change here. The Fibre Spool Line doesn't argue with it; it completes it, for the worksites where a purely radio link isn't the whole answer.

A precision lift beside live high-voltage infrastructure, an RF-quiet site next to sensitive equipment, a heavy-EMI industrial yard, a corridor where a crew simply wants proof of a hard-wired link for the record — none of those are jammed battlefields, and we do not price the fibre tail like a defence necessity. It is a mission-selected option: fit it when the worksite calls for a wire, run without it when radio alone is the right answer, and let a snag fail over benignly to radio rather than end the mission.

The overlap with the rest of the house is physical, not rhetorical. The same fibre spool, termination and cassette grammar that gives Cargo Mover and Personnel Mover their optional fibre tail is the platform this whole line stands on — engineered once by Canadian Shield's sovereign manufacturing base, drawn on wherever the fleet needs a wire it can trust.

FAMILY CONTEXT

One cassette. Every dock, every ladder rung.

DEPLOYMENT

PICK THE CASSETTE. FLY THE ROUTE. COME HOME.

A Fibre Spool Line job is a loop around someone else's mission, not a mission of its own: the cassette is chosen, the fibre pays out while the host does its work, and the run ends clean — either recovered or, on a genuine snag, cut on purpose rather than by accident.

1 · SELECT

THE ROUTE SETS THE TIER

Before launch, the crew reads the mission's expected route length and worksite conditions — RF-quiet, heavy-EMI, beside live infrastructure, or simply "we want the wire on the record" — and seats the matching FS tier at the dock. Radio and GNSS are checked and live regardless; the fibre is an addition, not a substitution.

2 · PAYOUT

THE FIBRE STAYS BEHIND, THE RADIO STAYS ON

The host works its profile as normal — flying, driving or holding station — while the cassette pays fibre off the pack, held in its tension working band. Radio and GNSS keep running in parallel throughout; the fibre is a second, physical channel, not the only one.

3 · RECOVER OR SEVER

CLEAN END, EITHER WAY

At mission end the run either comes home for inspection under the reuse fork, or — on a genuine snag — parts at its own tensile limit, sensed instantly at the host, with radio already carrying the link. The empty cassette swaps out at the dock for the next leg; the depot re-arms while the crew moves to the next job.

Scenario illustrates the design intent of the operating loop. Payout architecture, tension control, reuse policy and tier rung lengths are exactly what the engineering and test program exists to close — and none of them is presented here as settled before it is.

THE FAMILY

RELATED SYSTEMS

CS-700 · INDUSTRIAL

SELF-CHARGING DOCK

A docking and replenishment station that lets a working fleet return, recharge and redeploy without a hand touching it.

CS-710 · INDUSTRIAL

RELAY CHAIN

A deployable chain of relay nodes — command, telemetry and position augmentation for civil fleets working past the edge of the network.

CS-600 · INDUSTRIAL

CARGO MOVER

An uncrewed VTOL cargo family — four sizes of the same machine, from toolbox to bulk lift.

CS-610 · INDUSTRIAL

PERSONNEL MOVER

A crew-carrying VTOL work machine. Two tiers — PM-8 single-seat, PM-12 two-seat.

Fibre Spool Line CS-C001: patent pending · a civil consumable product line on the Industrial line, where radio and GNSS are permitted and remain the primary link — the fibre tether is an optional, mission-selected, hard-wired alternative or backup, never a replacement. No fibre length, tension, bend-radius or capacity figure is a specification. The fibre jacket is not biodegradable — spent fibre is recovered wherever the mission allows it, and no degradable-fibre claim is made anywhere on this line.



A WIRE NOTHING CAN JAM

FIBRE SPOOL LINE · INDUSTRIAL · CS-C001

Guidance-fibre consumable cassettes — a physical tether option, alongside or instead of radio.

01 REQUEST A TECHNICAL EXCHANGE

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

02 REQUEST THE INDUSTRIAL FAMILY DATA PACK

Drawings, tolerances and test basis for Fibre Spool Line 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

sales@cdnshield.ca

GENERAL

info@cdnshield.ca

WEB

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.

Fibre Spool Line CS-C001

Fibre Spool Line CS-C001: patent pending · a civil consumable product line on the Industrial line, where radio and GNSS are permitted and remain the primary link — the fibre tether is an optional, mission-selected, hard-wired alternative or backup, never a replacement. No fibre length, tension, bend-radius or capacity figure is a specification. The fibre jacket is not biodegradable — spent fibre is recovered wherever the mission allows it, and no degradable-fibre claim is made anywhere on this line. Product specification R1.0 · 2026-08-15 · © Canadian Shield, a division of SIG (Sustainable Infrastructure Group).