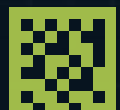


DEFENSE MANUFACTURING

MISSION CRITICAL PRECISION

A field guide to traceability, compliance, and end-to-end supply-chain visibility for defense manufacturers and their suppliers.

PREPARED FOR —
SUPPLY CHAIN · OPERATIONS · QUALITY & COMPLIANCE LEADERS
DEFENSE CONTRACTORS & MANUFACTURERS, TIER 1-3



WHAT'S INSIDE

In defense manufacturing, the data attached to a part is as important as the part itself.

This guide is written for the people accountable for getting both right — supply chain directors, operations and plant managers, and quality and compliance leaders working across Tier 1–3 defense programs.

It lays out where traceability and compliance risk concentrate in a defense production environment, then maps a practical, hardware-grounded approach to closing those gaps: durable compliant marking, accurate data capture, real-time inventory visibility, and hands-free workflows — connected end to end.

Throughout, the Zebra Technologies portfolio is positioned by the job it does on your floor, not by spec sheet alone. Delivered and integrated locally by Ahearn & Soper Inc.

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This document is unclassified marketing collateral. It contains no controlled technical data and is intended to support solution planning and procurement discussions.

01

THE CHALLENGE

THE MARGIN FOR ERROR IS ZERO

Defense supply chains don't behave like commercial ones. Production runs are low-volume and high-mix. Programs span years, sometimes decades, under strict configuration control. And the cost of a single mislabeled, unreadable, or untraceable part is measured not just in scrap and rework, but in stop-ship orders, quality escapes, failed audits, and put-at-risk contracts.

That pressure shows up everywhere on the floor. A serial number that can't be read at receiving stalls inspection. A label that degrades in a heat-treat or solvent process breaks the genealogy of a flight-critical component. A manual count that drifts from the system of record turns a routine audit into a week of reconciliation. None of these are exotic failures — they are the everyday friction of running a compliant operation with tools that weren't built for it.

The organizations that pull ahead treat data capture as infrastructure, not paperwork. They make the right action the easy action: a mark that survives the process, a scan that works the first time on a damaged code, an inventory number that is true because it was captured at the point of work. The four pressure points below are where that infrastructure either holds or fails.

PRESSURE 01

UNBROKEN TRACEABILITY

Every component must be traceable from raw material to finished good — with a verifiable genealogy that survives every process step and audit query.

PRESSURE 02

REGULATED COMPLIANCE

DFARS, ITAR, and DoD marking standards govern how parts are identified, how data is handled, and how records are retained — with little tolerance for gaps.

PRESSURE 03

PUNISHING ENVIRONMENTS

Heat, abrasion, solvents, drops, dust, and cold defeat consumer-grade hardware and labels — exactly where reliability matters most.

PRESSURE 04

A STRETCHED WORKFORCE

Skilled labor is scarce and procedures are complex. Tools must reduce error and shorten training, not add steps for already-pressed operators.

THE OPERATING PRINCIPLE

If the data captured on the floor isn't durable, accurate, and instantly available, the supply chain is running on assumptions — and assumptions don't survive an audit.

TRACEABILITY & COMPLIANCE

Compliance in defense manufacturing is ultimately a data problem. The regulations differ in scope, but they converge on the same operational demand: identify the right thing, capture it accurately, protect the information, and be able to prove all of it on request.

You don't need to be a compliance lawyer to design for it — but you do need hardware and workflows that make conformance the default. Below is the landscape that most directly shapes how parts are marked, scanned, and recorded on a defense floor.

- **Item Unique Identification (IUID).** DoD property is marked with machine-readable 2D identifiers under **MIL-STD-130**, with valuation and reporting governed by **DFARS 252.211-7003**. Marks must remain legible for the life of the item.
- **ITAR-controlled technical data.** Defense articles and associated technical data fall under the International Traffic in Arms Regulations (22 CFR 120–130). Where labels or device data touch controlled information, access and handling must be controlled accordingly.
- **Safeguarding CUI.** **DFARS 252.204-7012**, the underlying **NIST SP 800-171** controls, and the **CMMC** framework set expectations for protecting controlled unclassified information — including the data that flows through connected shop-floor devices.
- **Quality & record retention.** AS9100 and customer flow-downs demand defect traceability, configuration control, and audit-ready records that tie a physical part to its complete history.

Read together, these requirements translate into four concrete demands on the technology you put in operators' hands: marks that **last**, capture that is **accurate**, devices that are **secure and centrally managed**, and a record trail that is **complete and retrievable**. Sections 04 and 05 show how the portfolio answers each one.

REFRAME

Compliance stops being a tax on operations when the act of doing the work correctly is the same act that produces the evidence.

References to specific regulations are provided for orientation only and do not constitute legal or compliance advice. Confirm applicable clauses and flow-downs with your contracting and quality authorities.

END-TO-END VISIBILITY

Point solutions create islands of data. A connected floor creates a single source of truth — one continuous record that follows material from the receiving dock to the shipping bay.

The model is simple: capture identity once, verify it at every handoff, and never break the chain. Each stage below has a distinct job, and a Zebra device class built to do it. Together they keep the physical world and the system of record in lockstep.

STAGE 01 RECEIVE Verify and record incoming material against the PO. Catch discrepancies and damaged codes before they enter the line. DS SERIES SCANNERS MC SERIES COMPUTERS	STAGE 02 PRODUCE Apply durable, compliant identification — including RFID — to components and assemblies as they are built. ZT SERIES INDUSTRIAL ZD SERIES DESKTOP	STAGE 03 ASSEMBLE Guide complex, error-prone assembly and picking with hands-free, voice-directed work instructions. MT 5400 WEARABLE DS SERIES HANDS-FREE	STAGE 04 SHIP Validate outbound orders, print mobile labels at the point of need, and confirm a complete, traceable shipment. MC 9400 COMPUTER ZQ SERIES MOBILE
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OUTCOME

ONE RECORD

Every scan and print writes to the same system of record — no re-keying, no reconciliation between disconnected tools.

OUTCOME

VERIFY AT HANDOFFS

Identity is confirmed each time material changes hands or stage, so errors surface at the source instead of at audit.

OUTCOME

AUDIT ON DEMAND

A complete, time-stamped genealogy is retrievable in seconds — turning audit prep from a project into a query.

Each device class is chosen for the work it does on a defense floor. Printing and scanning establish and read identity; mobile and wearable computing put that identity to work in real time.

IDENTIFICATION & LABELING — PRINTERS

INDUSTRIAL

ZT SERIES

High-volume, mission-critical production labeling.

Heavy-duty industrial printing for large-scale production, with on-demand RFID encoding for advanced asset and inventory tracking. Built to run reliably at the throughput and duty cycles a continuous defense line demands.

HIGH-VOLUME DUTY CYCLE

RFID ENCODING

DURABLE LABEL MEDIA

MISSION-CRITICAL RELIABILITY

DESKTOP

ZD SERIES

Compliance labeling at quality-control stations.

Compact desktop printers for quality-control stations and documentation. Flexible enough to deploy across multiple production lines wherever compliant, on-demand labeling is needed close to the work.

DESKTOP FOOTPRINT

COMPLIANCE LABELING

FLEXIBLE LINE DEPLOYMENT

QC DOCUMENTATION

MOBILE

ZQ SERIES

Label generation at the point of need.

Rugged mobile printers for warehouse and shipping operations, generating labels in real time exactly where the work happens — eliminating trips to a fixed station and the errors that come with them.

MOBILE / WEARABLE

REAL-TIME PRINTING

RUGGED BUILD

WAREHOUSE & SHIPPING

DATA CAPTURE — SCANNERS

SCANNING

DS SERIES

Fast, accurate part identification.

Fast, accurate barcode capture engineered to read damaged, dirty, or difficult-to-read codes that defeat lesser scanners. Available in handheld and hands-free configurations for receiving, kitting, and inspection.

1D / 2D CAPTURE

READS DAMAGED CODES

HANDHELD & HANDS-FREE

FIRST-PASS ACCURACY

Product capabilities are summarized for planning purposes. Ahearn & Soper will confirm exact models, specifications, accessories, and media to match your environment and program requirements.

REAL-TIME VISIBILITY — MOBILE COMPUTERS

MOBILE COMPUTER

MC 3400

Inventory management
on the production floor.

A rugged mobile computer for real-time inventory management and data collection on the production floor — purpose-built for the cycle counts, put-aways, and lookups that keep the system of record honest.

REAL-TIME INVENTORY

RUGGED FOR FLOOR USE

ADVANCED DATA COLLECTION

PRODUCTION-FLOOR FORM FACTOR

MOBILE COMPUTER

MC 9400

Enterprise-grade
performance, toughest
environments.

When other devices fail, the MC 9400 keeps working. Enterprise-grade scanning and computing engineered for the harshest warehouse and shipping environments, validating and tracking outbound orders shift after shift.

SURVIVES 8-FT DROPS TO CONCRETE

EXTREME-TEMPERATURE OPERATION

ALL-DAY BATTERY

FAST SCAN IN ANY LIGHTING

HANDS-FREE PRODUCTIVITY — WEARABLES

WEARABLE

MT 5400

Voice-directed assembly
& picking.

A wearable computer that frees operators' hands for the work itself. Voice-directed picking and assembly with real-time, on-screen work instructions reduce errors through guided workflows and shorten training time on complex procedures.

HANDS-FREE OPERATION

VOICE-DIRECTED WORKFLOWS

GUIDED WORK INSTRUCTIONS

FASTER OPERATOR ONBOARDING

THE INTEGRATION ADVANTAGE

Sourced from one portfolio, these devices share a common platform — so scanning, printing, mobile computing, and wearables connect into existing defense manufacturing systems instead of becoming new silos.

CAPABILITY MEETS REQUIREMENT

Each compliance demand translates into a specific technical capability. This is how the portfolio answers the requirements outlined in Section 02.

REQUIREMENT	WHAT IT DEMANDS	HOW THE PORTFOLIO DELIVERS
DURABLE MARKING MIL-STD-130 · IUID	Machine-readable identifiers that stay legible for the life of the item, through process and handling.	ZT / ZD printing on durable media plus on-demand RFID encoding for permanent, scannable identity.
ACCURATE CAPTURE QUALITY · GENEALOGY	First-pass reads on every code — including damaged or poorly printed marks — to keep records true.	DS Series scanners read difficult codes; capture at the point of work avoids manual re-keying.
ITEM VALUATION & REPORTING DFARS 252.211-7003	Reliable association of unique IDs with the records used for valuation and reporting.	Encoded identity flows directly into the system of record via connected mobile computers.
SECURE DATA HANDLING DFARS 7012 · 800-171 · CMMC	Controlled, centrally managed devices and protected data in transit and at rest.	Enterprise-grade devices support secure transmission and centralized management of the fleet.
AUDIT-READY RECORDS AS9100 · FLOW-DOWNS	Complete, retrievable genealogy linking each part to its full history on demand.	Every scan and print writes to one record, making traceability a query rather than a project.
CONTROLLED ENVIRONMENTS ITAR-AWARE OPERATIONS	Reliable operation where access to facilities and technical data is restricted.	Rugged, self-contained devices reduce reliance on external infrastructure on sensitive floors.

Mapping is illustrative of capability fit and is not a certification of compliance. Your specific obligations depend on contract clauses, the data involved, and your accredited assessments.

WHAT A CONNECTED FLOOR DELIVERS

A leading defense contractor transformed its supply chain by integrating mobile computing, scanning, and printing into a single connected workflow. The gains showed up where they matter — in errors avoided, hours recovered, and confidence at audit.

40%

Reduction in shipping errors. Fewer mis-ships, returns, and the costly investigations that follow them.

60%

Faster inventory cycle counts. Counts that once consumed shifts now close in a fraction of the time.

99.9%

Scanning accuracy. Near-perfect first-pass capture keeps the system of record true to the floor.

35%

Improvement in picking productivity. Hands-free, guided workflows move more work with fewer errors.

The pattern behind these numbers is consistent: when identity is captured accurately at the source and shared across every device, the manual reconciliation, rework, and second-guessing that quietly drain a defense operation simply have nowhere to take root. Accuracy compounds into speed, and speed into capacity — without adding headcount or cutting corners on compliance.

THE TAKEAWAY

Reliability isn't a feature you buy once. It's the cumulative result of every part being marked, read, and recorded correctly — every time, across the whole floor.

Figures reflect results reported from a representative defense-manufacturing deployment and are presented for illustration. Individual results vary by environment, baseline, and implementation scope.

Modernizing a defense floor is a managed program, not a forklift swap. A phased approach de-risks the rollout, proves value early, and keeps production running throughout.

ASSESS 01	ARCHITECT 02	DEPLOY 03	OPTIMIZE 04
MAP THE GAPS Walk the floor stage by stage. Identify where traceability breaks, where capture fails, and which compliance obligations apply.	DESIGN THE FIT Match device classes, media, and workflows to each stage and integrate with existing systems of record — no new silos.	PILOT, THEN SCALE Prove the workflow on one line or cell, capture the baseline-to-result delta, then roll out with confidence.	SUSTAIN & IMPROVE Manage the fleet centrally, monitor device health, and tune workflows as programs and volumes evolve.

The difference between a clean rollout and a stalled one is usually the partner. Ahearn & Soper handles the work that sits between the hardware and the result — environment assessment, media and consumable selection, integration with your existing systems, device staging and deployment, and ongoing support — so your team stays focused on building, not troubleshooting.

LOWER RISK PILOT-FIRST Prove value on a contained scope before committing the full floor.	FASTER VALUE PRE-STAGED Devices arrive configured and ready, compressing time to productive use.	SUSTAINED LOCAL SUPPORT Service and expertise close at hand keep uptime high over the program.
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THE PARTNERSHIP

ZEBRA + AHEARN & SOPER

Proven hardware is necessary but not sufficient. Defense manufacturers succeed when world-class devices are matched to the right workflows, integrated cleanly, and supported for the life of the program. That combination is what this partnership delivers.

ZEBRA TECHNOLOGIES

THE PROVEN PLATFORM

A complete, integrated portfolio — industrial and mobile printing, advanced scanning, rugged mobile computing, and wearables — engineered for the demanding requirements defense contractors trust.

AHEARN & SOPER INC.

THE IMPLEMENTATION PARTNER

Decades of data-capture and supply-chain expertise, delivered locally: assessment, integration, deployment, media, and responsive support that keeps the floor running.

WHAT YOU GET TOGETHER

- **End-to-end coverage** — one portfolio spanning receive, produce, assemble, and ship, so every stage shares one source of truth.
- **Compliance-aware design** — workflows built with DFARS, ITAR, and DoD marking realities in mind from the start.
- **Integration over disruption** — solutions that connect to the systems you already run, rather than replacing them.
- **Local accountability** — a single, accessible partner responsible for the outcome, not just the box.

THE BOTTOM LINE

When mission success depends on precision, the safe choice is the proven one — backed by a partner who is there long after the install.

NEXT STEPS

PUT PRECISION TO WORK

Every defense floor is different. The fastest way to see where the gains are is to start with your floor, your programs, and your compliance obligations — then map the fit.

STEP 01

REQUEST A DEMO

See the portfolio in a workflow that mirrors your own operation, end to end.

STEP 02

BOOK AN ASSESSMENT

Have Ahearn & Soper walk your floor and map traceability and compliance gaps.

STEP 03

TALK TO A SPECIALIST

Connect with a defense supply-chain specialist to scope a phased rollout.



TRACK IT · TRACE IT · TRUST IT

GET STARTED

AHEARN & SOPER INC.

Ahearn.com / ZebraDefense

CAMPAIGN

MISSION-CRITICAL PRECISION

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