REGIONAL CAPABILITIES: CANADA

CURTISS-WRIGHT

CURTISSWRIGHTDS.COM

TRUSTED
PROVEN
LEADER

AIR   LAND   SEA

CURTISS-WRIGHT'S CANADIAN CAPABILITIES

For Curtiss-Wright, innovation is deeply rooted in our history. Born from the merger of companies founded by the world-renowned aviation pioneers Glenn Curtiss and the Wright brothers, Curtiss-Wright has a long and proud history as a trusted, proven technology leader.

With design and manufacturing facilities located in Canada, the United States, and Europe, and sales and support teams located around the globe, Curtiss-Wright Defense Solutions is uniquely positioned to satisfy regional requirements.

Our field-proven embedded computing modules and systems can be produced at our facilities in Canada or the United States, giving you the ultimate flexibility to meet requirements for Canadian or non-ITAR content. As well, our equipment for naval aircraft handling and underwater sensor handling, trusted for years by navies worldwide, is engineered and manufactured in Canada.

For Canadian programs, Curtiss-Wright's ability to design, develop, and manufacture technology on Canadian soil supports the Government of Canada's Industrial Technological Benefits and Value Proposition (ITB/VP) Program.

RUGGED SOLUTIONS FROM LEADERS IN INNOVATION

Curtiss-Wright's Canadian facilities have years of experience producing the powerful, reliable technology for the mission-critical systems that drive today's aerospace and defence platforms, including a wide range of field-proven solutions for C4ISR applications, naval aircraft handling, and underwater sensor handling.

C4ISR Embedded Computing Modules and Systems

Our selection of rugged, commercial off-the-shelf (COTS) modules give you the flexibility to design a system that meets your requirements at a fraction of the cost of a custom solution. Reduce your program risk and development time with boards that have been deployed and field proven in programs worldwide, some even available with an artifacts package for DO-254 certification.

If you're looking for support getting your system off the ground, we offer a variety of integration services. And, our Modified COTS program enables board modifications, such as custom pinouts, extra I/O interfaces, and special configurations, to tailor your solution to your exact needs.

Processing Solutions

+ Arm®, Intel®, and Power Architecture® single board computers

+ Signal acquisition, radar, and digital signal processing (DSP) modules

+ FPGA & GPU processing modules
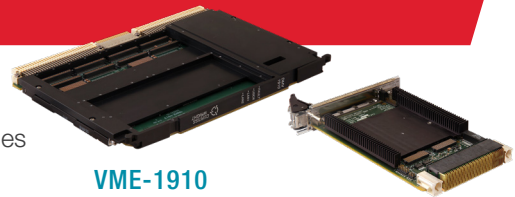
VME-1910

VPX3-1707

GPU and Graphics Modules

+ Video display, capture and processing modules

+ GPGPU accelerators

VPX6-4953

XMC-715

HPEC Software Tools

+ High-performance computing accelerator suites

+ PCIe Fabric Libraries

CURTISS-WRIGHT
OpenHPEC Accelerator Suite™

Dolphin
INTERCONNECT SOLUTIONS

Connectivity Solutions

+ Basic Ethernet switching

+ Multi-layer Ethernet switching and routing

+ Secure WAN services

+ Fabric switching

VME-690

VPX3-663

Safety-Certifiable Modules

+ Single board computers

+ Graphics modules

+ I/O modules

V3-611
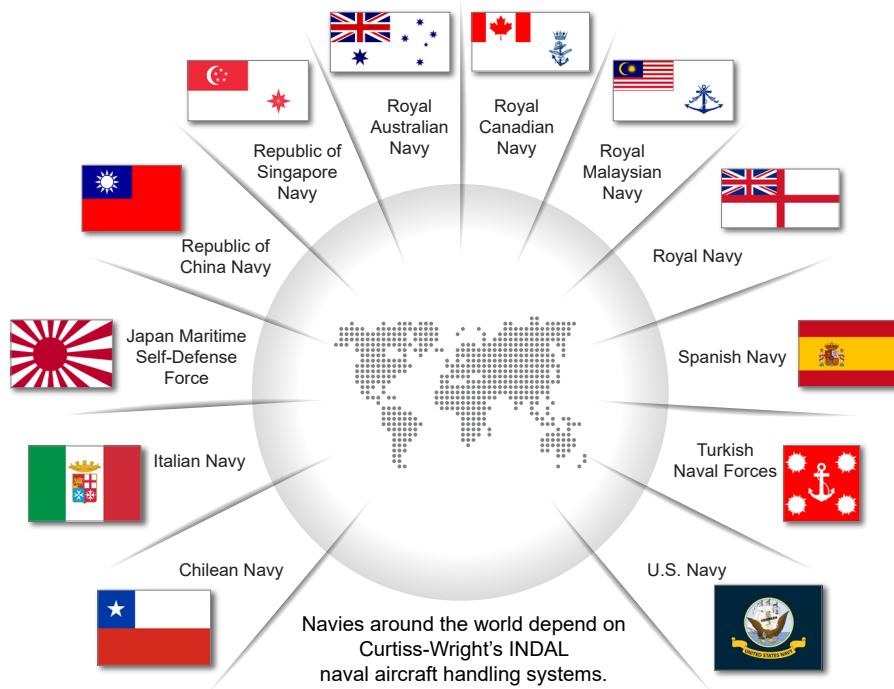
V3-152

Naval Aircraft Handling Systems

Curtiss-Wright's INDAL business unit offers a range of naval aircraft handling systems that can meet the requirements of any aircraft and any ship in a variety of sea states. To help navies select the optimal naval aircraft handling systems for their requirements, we offer a unique modeling and simulation process to analyze ship motion and the associated aircraft reactions.

We design our state-of-the-art naval aircraft handling systems using computer-aided design (CAD) software, computer simulation and solid modeling to ensure efficient and economical delivery of high-quality, custom systems. All of our naval aircraft handling systems are manufactured and tested following stringent practices that meet the most demanding requirements. In every project, we maintain a strong focus on

+ safety of personnel and equipment,

+ delivering high-performance systems at competitive prices, and

+ providing industry-leading life cycle support and services.

Republic of Singapore Navy

Royal Australian Navy

Royal Canadian Navy

Royal Malaysian Navy

Republic of China Navy

Royal Navy

Japan Maritime Self-Defense Force

Spanish Navy

Italian Navy

Turkish Naval Forces

Chilean Navy

U.S. Navy

Navies around the world depend on Curtiss-Wright's INDAL naval aircraft handling systems.

Underwater Sensor Handling

Curtiss-Wright designs and manufactures underwater sensor handling technologies that are developed to support a range of depth requirements and vessel sizes in all sea state conditions:

+ Variable Depth Sonar (VDS) handling systems for low, medium and high frequency sonars

+ Surface and submarine towed line array handling and stowage systems

+ Sonar domes, sonar tow cable and fairings and mine counter measures

MANUFACTURING AND INVENTORY MANAGEMENT

Curtiss-Wright's Ottawa manufacturing facility, which specializes in the production of COTS modules and systems for C4ISR, has 100,000 square feet of floor space, of which 34,000 is dedicated to production. Our 110 highly-skilled production staff members currently build over 2,500 cards on a monthly basis (the equivalent of over three million component placements each month) in our temperature-, humidity-, and ESD-controlled production area. Our Ottawa facility allows for a very high volume of product manufacturing on an ongoing basis, which is ideal for addressing anticipated future program production needs. Our Ottawa facility also possesses a Joint Certification Program (DD2345) which provides access to military sensitive Technical Data Packages and the ability to provide design and manufacturing for U.S. programs.

Our Ottawa manufacturing facility offers the following features:

+ State-of-the-art automated assembly machinery is in place to enable Surface Mount Technology (SMT)

+ Manual assembly lines for plated through hole technology

+ Mechanical assembly for the application of thermally conductive adhesive gap pads, structural adhesive applications, and thermal frame/heat sink assembly

+ Automated, networked functional testing equipment

+ Environmental screening for ESS and vibration

+ Conformal coating including acrylic, urethane, and parylene

+ Assembly documentation online resulting in a paperless shop floor

+ Quality control and automated inspection

+ Process control that includes traceability, statistical process control, and reporting

Curtiss-Wright's Ottawa Facility

Dedicated to delivering critical naval onboard equipment handling systems and specialized structures, Curtiss-Wright's 200,000-square-foot Mississauga facility devotes 130,000 square feet to manufacturing. Our Mississauga facility offers a thorough approach to system engineering that encompasses requirements management, system integration and system-level problem solutions, and designs products for a wide range of environmental requirements, such as airborne, exposed flight deck, hangars and submarines. All Curtiss-Wright naval systems are tested following stringent practices that meet the most demanding requirements.

Our Mississauga manufacturing facility leverages the following state-of-the-art systems:

+ Computer-Aided Design (CAD), Computer-Aided Engineering (CAE), Computer-Aided Manufacturing (CAM) using Pro Engineer

+ C/SCSC Program Management

+ ILS Systems including SLIC

+ Technical Publishing including Interleaf, Adobe

+ Software Development Systems including ADA compilers

+ Engineering Data Management System including Pro Intralin

+ Engineering Modeling and Simulation Systems for towed body characteristics and ship/helo interface

## Automated Assembly for Surface Mount Technology at the Ottawa Facility

COMPONENTS AND INVENTORY CONTROL

Based in our Ottawa facility, our Supply Chain Management group strives to obtain components for products using suppliers who can reliably meet quality, cost, and schedule targets. To maximize Canadian content, Curtiss-Wright looks to source components from Canadian-based distributors to the maximum extent possible. An extensive network of suppliers and distributors that form our supply chain network can be leveraged to obtain as many components from Canadian suppliers or distributors, as possible.

In order to eliminate the threat of counterfeit parts entering the supply chain of electronics used in aerospace and defence programs, Curtiss-Wright has established a robust set of authentication procedures. In the event of obsolescence, Curtiss-Wright COTS customers are able to review and approve authenticity reports for non-franchise parts prior to manufacture. Regularly audited processes and systematic controls ensure no broker material is used without explicit customer knowledge and approval.

Our strict inventory control ensures all materials are labelled and bar-coded upon receipt. In addition, we apply batch code traceability on all materials, and have a cycle-count process and restricted access areas in place for customer owned materials. Shelf Life Controls are also in place, which means that materials are always accounted for.

To read more about our best practices for a trusted supply chain, read our recent white paper.
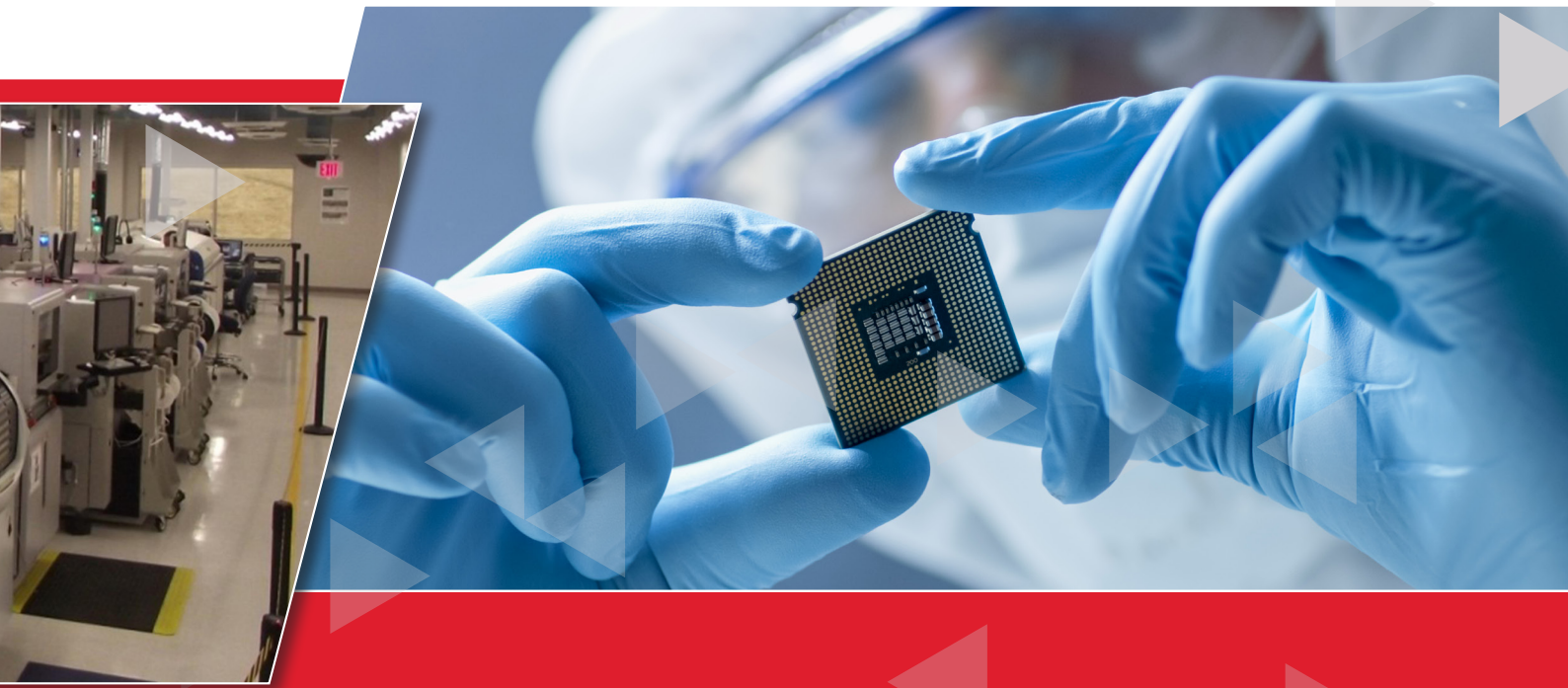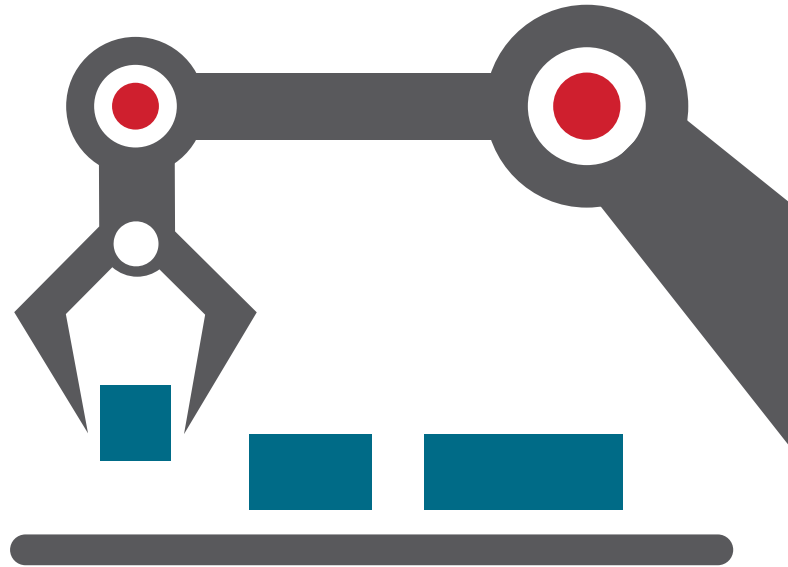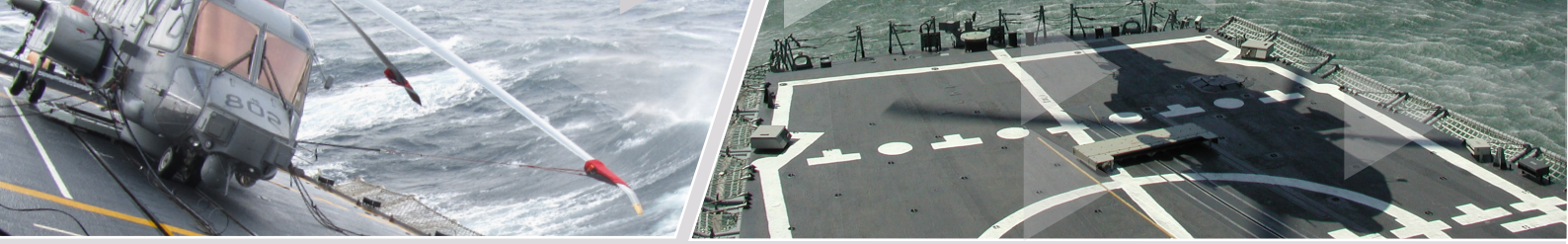
Certifications and Standards

Our Canadian facilities manufacture adhering to the following certifications and standards.

Certifications, Standards, and Tools	Description
Certifications	
AS9100D	Quality management for aviation, space, and defence industries
ISO 9001:2015	Quality management
IPC-A-610 Class 3 Inspection Std.	Handling, mechanical, and workmanship
IPC-7711/7721	Rework and repair
J-STD-001	Workmanship standard
ANSI/J-STD-001B	High reliability soldering
CSA STD-C2221	Electrical wiring
Canadian Welding Bureau Qualification, W47.1/2	Steel welding and aluminum welding
Compliance	
ISO 10012	Measurement management for calibration
ISO 10007	Configuration management
Standards	
MIL-STD-2077 and Def-Stan-00-52 Issue 3	Acceptance Test Procedure Guideline
MIL-STD-130 & DOC# 810409	Marking and Labeling
MIL-I-46058	Insulating compound
MIL-STD-1520	Corrective action and disposition system for nonconforming material
MIL-STD-1695, ANSI/ESD-S-20.20	Electrical standards
IPC-A-610 & IEEE Specification STD-45	Electrical assembly and wiring

PROGRAM MANAGEMENT

Our Canadian Program Management teams provide responsive, close management of all project activities and agile decision-making.

A Program Manager (PM) is assigned to each program. The PM leads all program-related activities and acts as the program's key point of contact, aligning groups such as engineering, manufacturing/OPS, finance, quality, and contracts. With the full support of the Product Team, the PM creates and updates an integrated master program schedule and regularly reports on schedule, risks, and technical issues. We ensure daily communication to keep all stakeholders aware of project progress at all times, enabling quick resolution of any issues, as well as proactive risk management.

Our Program Management team supports coordination meetings and reviews, with action items and minutes provided. As development activities evolve over the product development lifecycle, team membership will similarly evolve. Each team member is directly responsible to the Program Manager for the cost, schedule, and technical performance of his or her assigned tasks.

A complete set of management tools is available to support visibility into all areas of technical scope, schedule, and budget. This includes:

+ Work Breakdown Structure (WBS)

+ Integrated Master Schedule (IMS)

+ Budget Allocation

+ Program Financial Management System

+ Work Authorization

+ Requirements Management

+ Technical Performance Measurement

+ Change Management

TOTAL LIFECYCLE MANAGEMENT

Today's programs demand longer lifecycles for defence equipment, despite the rapid rate at which technology is evolving. Declining defence spending over the last decade has caused the average age of military systems to increase. What's more, forecasting future needs is becoming increasingly difficult, making diminishing manufacturing sources and out-of-production parts a greater challenge for defence departments.

Curtiss-Wright reduces the risk of obsolescence and uncertainty with its industry-leading Total LifeCycle Management™ (TLCM) program, which offers unprecedented visibility into program technology. With a user-friendly portal that places key information at your fingertips, Total LifeCycle Management optimizes program costs with a blended approach to COTS longevity that balances technology insertion and inventory investment to provide a proactive method tailored to your specific needs.

Total LifeCycle Management

(AL) *Dedicated Curtiss-Wright care team, including a team of lifecycle experts*

Custom industry-leading TLCM platform

Free on-site component storage

Component Health Analysis

(AL) *Obsolescence reporting on semiconductor devices*

Forward-looking availability predictions

Risk mitigation strategies for DMS parts

Test Infrastructure Investments

(L) *Test hardware maintenance*

Procurement of test item (cables, jigs, test cards, etc.)

Operator training

Active equipment maintenance
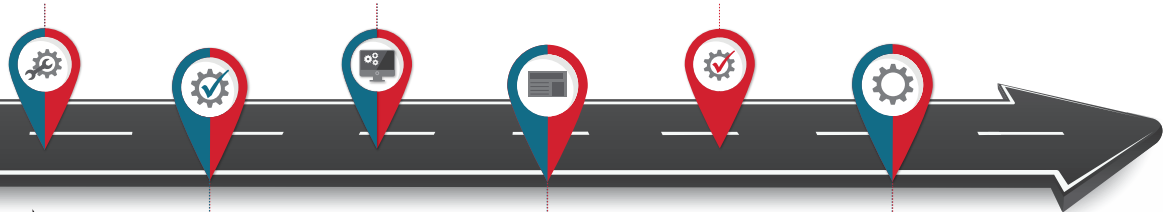
Product Configuration Controls

(AL) *Fit, form, function DMS replacements*

Operational enhancements

Non fit, form, function DMS solutions

Service Notifications

(AL) *Early Alert LTB notification*

LTB component quotations

Service renewals

Push email system for services portal

TLCM Partnerships

(A) *Have an active voice in change approval*

Make calculated risk assessments in order to secure forecasts

Reduce cost and risk of supply with early identification

Increase operational readiness

(L) *Common goal to support a fixed forecast or fielded units*

Extension of your program with the preferred COTS vendor

LTB parts buys sustain a fixed configuration

Active
Longevity

360° ACCESS TO YOUR TLCM PORTAL

Curtiss-Wright's online TLCM web portal provides around the clock access to valuable support documentation such as:

+ Proposed engineering change orders

+ Component health reporting

+ Early alert notifications

+ Product longevity information

+ Manuals

+ Software downloads

+ Firmware updates

+ Pinout configurator utilities

+ FPGA loads

The portal contains all the program information you need, right at your fingertips. You can keep your business informed and prepare for upcoming changes with full visibility.

CURTISS-WRIGHT'S MADE IN CANADA ADVANTAGE

From program design to program management and lifecycle services, our Canadian facilities have all the necessary technical and managerial resources required to design, build, test, deliver, and support defence programs with Canadian-only or non-ITAR content requirements.

We provide the program resources and facilities required for the design, qualification, support, and sustainment of the product, including the production of fully qualified hardware.

With experience in tackling challenging integration schedules and meeting customer budgetary commitments, Curtiss-Wright is ready and uniquely positioned to support your needs throughout your entire program, no matter what tomorrow brings.

CURTISS-WRIGHT

TRUSTED PROVEN LEADER

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