Advanced Rotorcraft Technology Inc. (ART) offers expert consulting support for the design and analysis of rotorcraft, eVTOL and other air vehicles. ART supported the aerospace industry since 1982, and ART performed design, analysis, and test and evaluation services for manufacturers and the U.S. government that include performance, stability and control, loads, vibrations, aeroelastic stability, etc.

Model Development and Simulator Integration
ART has developed an extensive library of rotorcraft models using FLIGHTLAB® that include variable fidelity modeling options to support applications ranging from comprehensive analysis to real-time simulation. ART also offers integration support for interfacing our rotorcraft simulation models with our customers’ training or engineering simulators. We customize our model interface and interface protocol based on the customer’s needs.

Avionics and Flight Control Testing
ART provides customized simulation models for interfacing with and testing avionics and flight control hardware. The integrated solution allows testing and refinement of hardware prior to installation on rotorcraft and other air vehicles.

Flight Test Support
ART supports rotorcraft flight test programs and the post processing of flight test data. Both U.S. Army and U.S. Navy customers have used ART’s FLIGHTLAB® modeling and analysis tool to support rotorcraft flight testing. ART has developed unique software to simulate the standard flight test scenarios performed in evaluating rotorcraft. ART can use these scenarios with FLIGHTLAB® flight dynamics models to simulate a complete rotorcraft flight test program, allowing for the optimization of sensor types and locations, maneuvers, and flight conditions.

Accident Investigation
ART provides expert support for flight reconstruction, often as part of a rotorcraft accident investigation. ART applies FLIGHTLAB® models and known information about a particular flight in order to reconstruct the flight. Using the reconstructed flight, we can predict flight data that may be missing or not recorded.

FLIGHTLAB®
FLIGHTLAB® is a finite element, multi-body, selective fidelity modeling and analysis software package. It supports modeling and simulation of rotorcraft, fixed-wing aircraft, compound aircraft, including eVTOL drones and air mobility aircraft, and experimental aircraft configurations. FLIGHTLAB® comprehensive modeling capabilities include interfacing with Computational Fluid Dynamics (CFD) codes and the Viscous Vortex Particle Method to model interactional aerodynamics between multiple vortex producing sources. Coupling these interactional aerodynamics with FLIGHTLAB’s internal Computational Structural Dynamics (CSD) modeling capability provides fully coupled CFD/CSD/VVPM modeling and analysis. 1

FLIGHTLAB® consists of two products:
- Development System
- Run-time System

As well as a selection of add-ons:
- Viscous Vortex Particle Method (VVPM)
- Simulation Qualification Tool (SIMQT)
- PilotStation

Flight Dynamics Models
ART supplies off-the-shelf and customized models for rotorcraft (helicopters, multi-copters, etc.) and fixed wing aircraft. Models are available in three categories:
- Generic Flight Dynamics Models
- Aircraft Specific Flight Dynamics Models
- Custom Flight Dynamics Models

GRCAS - Graphical Rotorcraft Comprehensive Analysis System (U.S. only)
The Rotorcraft Comprehensive Analysis System (RCAS) is a leading tool for comprehensive aeroelastic analysis of rotorcraft and other air vehicles. The analysis includes structural dynamics, aeroelastic stability, vibration, and loads prediction. RCAS is supported and utilized by the U.S. government, as well as rotorcraft designers and manufacturers. RCAS uses a finite element approach and is capable of modeling existing and novel configurations at varying levels of fidelity through an extensive library of structure, airloads, airwake, interference, and control elements. GRCAS is an enhanced version of RCAS, with a Graphical User Interface that facilitates model development and analysis. 2
Located in the heart of Silicon Valley in Sunnyvale, CA, Advanced Rotorcraft Technology, Inc. specializes in air vehicle simulation. Our emphasis is on rotorcraft and helicopter simulation, software, models, and consulting services. Our simulation software features selective fidelity for a range of applications including commercial and military pilot training, research, and aircraft design. Our software and models are thoroughly validated and are utilized by the U.S. government, Boeing, Sikorsky, and others. Our team of engineers, including internationally recognized experts in rotorcraft simulation, provide consulting support to manufacturers for design and analysis of new and novel air vehicle configurations.

Since 1982, our staff of experts have supported all aspects of engineering analysis in regards to rotorcraft simulation and helicopter simulation. This list includes aerodynamics, controls, structures, propulsion, handling qualities, and more. We are an industry leader in the field of modeling, analysis, and real-time simulation for rotorcraft and helicopters. ART has developed two major comprehensive analysis and simulation tools for rotorcraft, helicopters, and other air vehicles; FLIGHTLAB® and, under the guidance of the U.S. Army’s Aviation Development Directorate (ADD), the Rotorcraft Comprehensive Analysis System (RCAS). These tools are used throughout the rotorcraft industry and we continue to enhance their capabilities through research and development of advanced rotorcraft simulation technologies.

Services
Aircraft Design and Analysis
Avionics and Flight Control
Testing Simulator Integration
Flight Test Support

Products
FLIGHTLAB®
Flight Dynamic Models
Including multiple rotor eVTOL and FVL configurations
GRCAS