



# **Bihlrle Applied Research Inc.**

## **Company Capabilities**



# Comprehensive aerodynamic data collection and flight model development services



**Bihrl Applied Research Inc.** is a world-class aerospace technology company specializing in wind tunnel testing and simulation of aircraft. Since 1973, BAR has provided the military and civil aerospace industry with expertise in the area of flight dynamics modeling and analysis, compiling a resume of over 150 aircraft configurations. Leveraging a unique range of capabilities and resources, BAR has played a key role in all aspects of flight model development efforts, from the collection and analysis of source data, through the development of complex math models, to the validation and final acceptance of advanced trainers.

## Flight Simulation Services

BAR specializes in the development of software math models for military and civil fixed-wing and rotary-wing aircraft, including full-envelope modeling, aircraft upset recovery modeling, and failure/malfunction modeling. BAR successfully incorporates such flight models into a wide range of customer applications, including engineering workstations, full mission military training simulators, civil Level-D Full Flight Simulators (FFS), hardware-in-the-loop simulators and multi-vehicle networked simulations. Using a variety of data sources, including wind-tunnel data and flight data, BAR develops cost-effective flight models from the ground up to meets the fidelity requirements of the simulator program. BAR also provides on-site engineering support services for flight model integration and simulator validation & acceptance, and provides the software tools for efficiently conducting verification, validation and re-certification tasks.

## Wind Tunnel Testing

BAR's wind tunnel testing services provide for the acquisition of static, dynamic, pressure and powered-effects data. Whether working with a sub-scale model or a full-scale flight article, BAR accommodates a wide range of configurations using company-owned and partner facilities. Leveraging BAR-developed test rigs and data acquisition software and hardware, BAR provides the ability to independently or simultaneously acquire static and dynamic test data using a single model and a single test facility. BAR's extensive testing experience, specialized software tools, and innovative solutions to complex testing problems combine to provide customers with the most effective test program and engineering support during the evolution of the vehicle configuration.

## Model and Parts Fabrication

BAR offers an array of scale aircraft model fabrication services including construction of wind tunnel models, remotely piloted vehicles, advanced prototypes and component parts. BAR specializes in constructing lightweight models using materials ranging from balsa and plywood to the latest composites such as Kevlar and carbon fibers. Models options include removable wings and tail surfaces in order to accommodate component testing and a complete array of pylons and stores can also be designed and built to allow testing of multiple configurations. BAR also specializes in the construction of powered models for customers requiring to evaluate power effects and the integration of global pressure taps for customers requiring to collect and visualize surface pressures.

## Software Tools

Several of the software tools developed and used by BAR engineers in the execution of BAR's services have been transformed into commercial products for use in the aerospace industry. These flight simulation development and deployment tools include: (1) DSix – flight model development and deployment software, (2) SimGen – aerodynamics prediction software, (3) CompARE – Quality Test Guide (QTG) software for flight model validation and certification, and (4) CGFlight – computer code for generating physics-based aircraft models for Computer Generated Forces (CGF) applications.

