

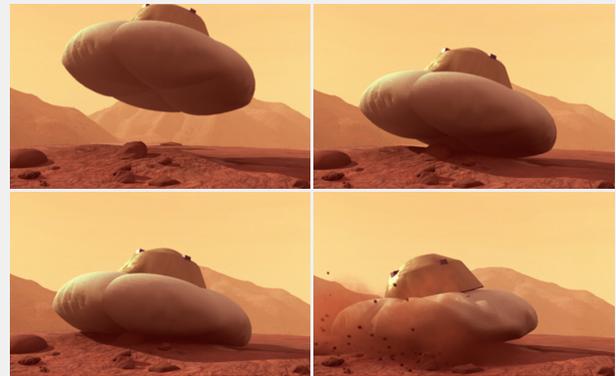
## First for **Aerospace Weight Reduction**

Too often, weight is improved undesireably as a post-design initiative which often degrades performance to meet weight targets. The Altair design process considers weight as a primary attribute from program inception and tracked through the design phases. The Altair approach includes an aggressive application of technology utilizing **Altair HyperWorks** and consulting through **Altair ProductDesign** with a focus on weight efficiency. The award-winning **OptiStruct** technology helps teams predict the optimal structure early in the program and to improve existing design concepts for both metallic and composite structures. **OptiStruct** can solve the most complex optimization problems with thousands of design variables in a short period of time, inspiring weight efficient designs.

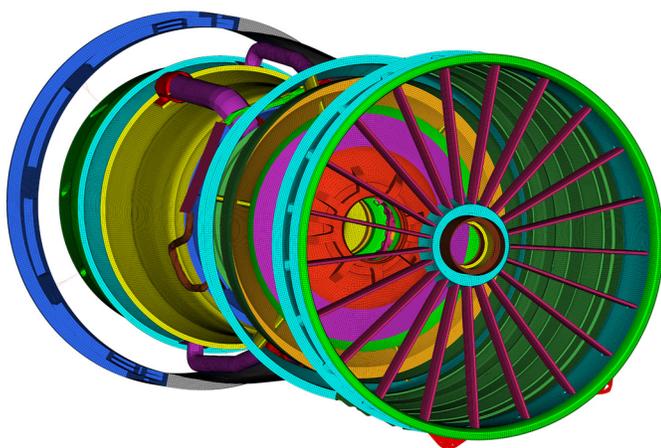


## **Bird Strike, Ditching** and **Event Simulation**

Designers have to analyze and certify aerospace systems operating in adverse conditions. **Altair RADIOSS** is a leading simulation code for assessing the performance of metallic and composite structures under high velocity impact events. From bird strike to ditching to ballistic and hail impact to acoustic and thermal response, Altair's technology and consulting expertise can help you design better structures in all types of loading and environmental conditions. Our significant experience designing safe transportation vehicles under impact loading can help your company design safe and survivable aerospace structures.



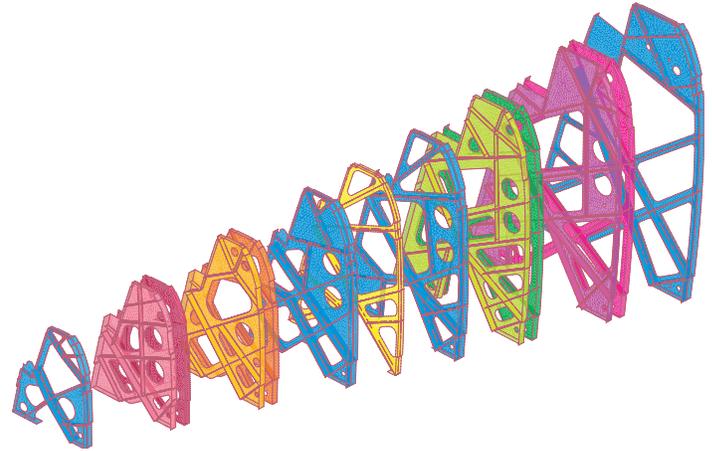
## Efficient Use of **CAE Technology**



**Altair Engineering** has over 25 years experience in applying advanced simulation technologies to the design of structures. We pioneered the application of finite element methods in the automotive industry and are now bringing that experience to aerospace. We are helping companies get more from their investments in CAE software by helping to define robust methods, identify best practices, automate repetitive tasks, and correlate simulation results with existing test data. This is providing our customers with greater confidence in relying on CAE results which leads to more efficient design processes and higher performance structures.

## HyperWorks Leads to Efficient Designs

**Altair HyperWorks** has many tools that lessen the time required to design and analyze aerospace structures. **OptiStruct**, when used early in the design phase, can provide insight on load paths and structure topology which helps you get to the right design quickly. **HyperMesh** is the most efficient CAE pre- and post-processing environment on the market making your stress analysis tasks efficient and robust. **HyperStudy** can help you quickly meet margin requirements by automating many of the routine checks that are required for certification and getting to a minimum weight design. Our process management tools provide an efficient framework for automating your common analysis tasks to lessen training costs while maintaining tight control over methods employed in your organization.



For over ten years, Altair has made its software products available to customers using Altair's patented license management system. Altair customers purchase a lease pool of **HyperWorks Units (HWU's)** which allows metered usage of the entire suite of Altair products.

- Early structural optimization studies during initial design with **OptiStruct**
- Efficient pre-processing of finite element models with **HyperMesh**
- Impact Analysis for bird strike, ballistics, and ditching of metallic and composite structures with **RADIOSS**
- **HyperStudy** for DoE, optimization, margin checks, and stochastic studies
- Results analysis and report automation using **HyperView**
- Multi-body dynamics modeling using **MotionSolve**

Altair is an engineering partner to many aerospace companies by providing people experienced with applying advanced design and simulation technology to the design of Aerospace structures. Some examples of our partnership activities include:

**Optimization Centers** – Altair provides optimization experts on-site and off-site to help companies reduce the weight of their aerospace structures. The center concept has proven to be a very efficient model to apply optimization technologies within a large organization.

**Impact Analysis** – Altair has worked with a number of companies to help meet stringent certification requirements for bird strike and ditching. Altair employs some of the world's leading experts in the analysis of impact damage on metallic and composite structures.

**Advanced FEA** – Altair draws from its significant experience in many industries to help those in the aerospace industry get more from their FEA technology.

Under the **HyperWorks Partner Alliance**, Altair has opened the **HyperWorks Platform** to third-party products. This program allows on-demand access to tools including:



Digmat offers advanced analysis of composite materials and structures by evaluating the performance of individual constituents in the model to predict failure modes and damage accumulation.



CFD++ is one of the leading computational fluid dynamics solvers for aerodynamics, aero-acoustics, and thermal management.



FEKO is a comprehensive electromagnetic (EM) analysis software suite for antenna placement, cable coupling analysis.

[www.altairhyperworks.com](http://www.altairhyperworks.com)

[www.altairproductdesign.com](http://www.altairproductdesign.com)

[www.hyperworksalliance.com](http://www.hyperworksalliance.com)