



**HDT ENGINEERING
SERVICES
AN OBJECTIVE
APPROACH... FROM
PROOF-OF-CONCEPT
TO FINAL ASSEMBLY
AND TEST**



The prevailing force in the field.

About HDT

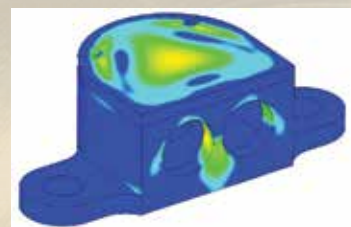
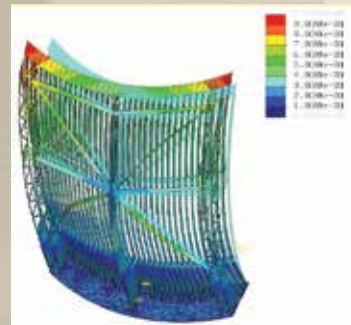
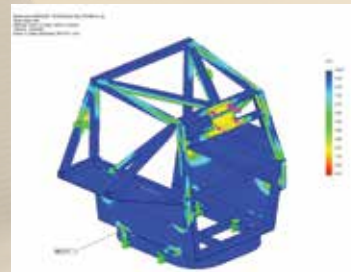
HDT designs, specifies and manufactures integrated solutions serving the military, government, industrial, commercial, robotic, and healthcare markets. With core capabilities in environmental control and protection, intelligent and conditioned power, advanced materials, and mechatronics, our products include shelter systems, command and control (C2) systems, environmental control units (ECUs) such as air conditioners and heaters, air handling/air filtration equipment protecting personnel from toxic particulate and toxic gaseous chemical, biological, radiological, and nuclear contaminants; power generation units, specialty products including military vehicles and containerized protection systems; robotic actuator arms, load-carrying robots, patient gait recovery systems, and undersea robotic and sensor solutions.

HDT Engineering Services offers distinct skills and talents compared to other engineering services businesses.

- HDT understands what it takes to turn new technology into products rugged enough to withstand the abuse of harsh conditions. Extreme temperatures, vibration, corrosion, shock, snow, rain, sand, EMI and ESD are all conditions that can destroy equipment if it isn't engineered to take it.
- HDT has been designing and building commercial and military equipment to survive in harsh environments since 1937. Capabilities uniquely differentiating HDT Engineering Services, and benefiting customers developing products used in applications ranging from "every day" use to the other extreme of severe or harsh duty applications, include:
 - HDT's *knowledge* of government procurement processes.
 - HDT's *understanding* of the requirements for building "ruggedized" equipment.
 - HDT's *ability* to take extremely sophisticated technological processes and create products with non-complex user interfaces that are easy to operate.

HDT Engineering Services Team Quick Facts

- 125 Engineers in 7 offices throughout the United States
- Expertise with a wide array of software tools in analysis, design, modeling, simulation, testing
- Proficiencies in analog/digital control, programmable controllers, system controls, thermal management, communication circuits, power generation, electromechanical systems, structural analysis, hydraulic actuation man/machine interface, sensor design, and many other technologies and interfaces
- HDT engineers are instrumental in the company's attainment of **47 patents granted, pending, or in process**



An Array of Engineering Capabilities

HDT Engineers are proficient in many software tools in the development of our product solutions:

CAD Software

AutoCad
CadSoft
Inventor
M-Panel
Pro Engineer
SolidWorks
UniGraphics
Visio

Modeling Software

Altium
COMSOL
HOMER
LabView
LT Spice
MatLab
Membrane by NDN
SolidWorks Modeling

Software Languages and Communications Platforms

C, C++, C#
Comm. Bus Protocols – USB, MODBUS, I2C
Embedded Linux
ROS and ROS Industrial
RTOS (MQX, FreeRTOS)
TCP/IP Networking Protocols



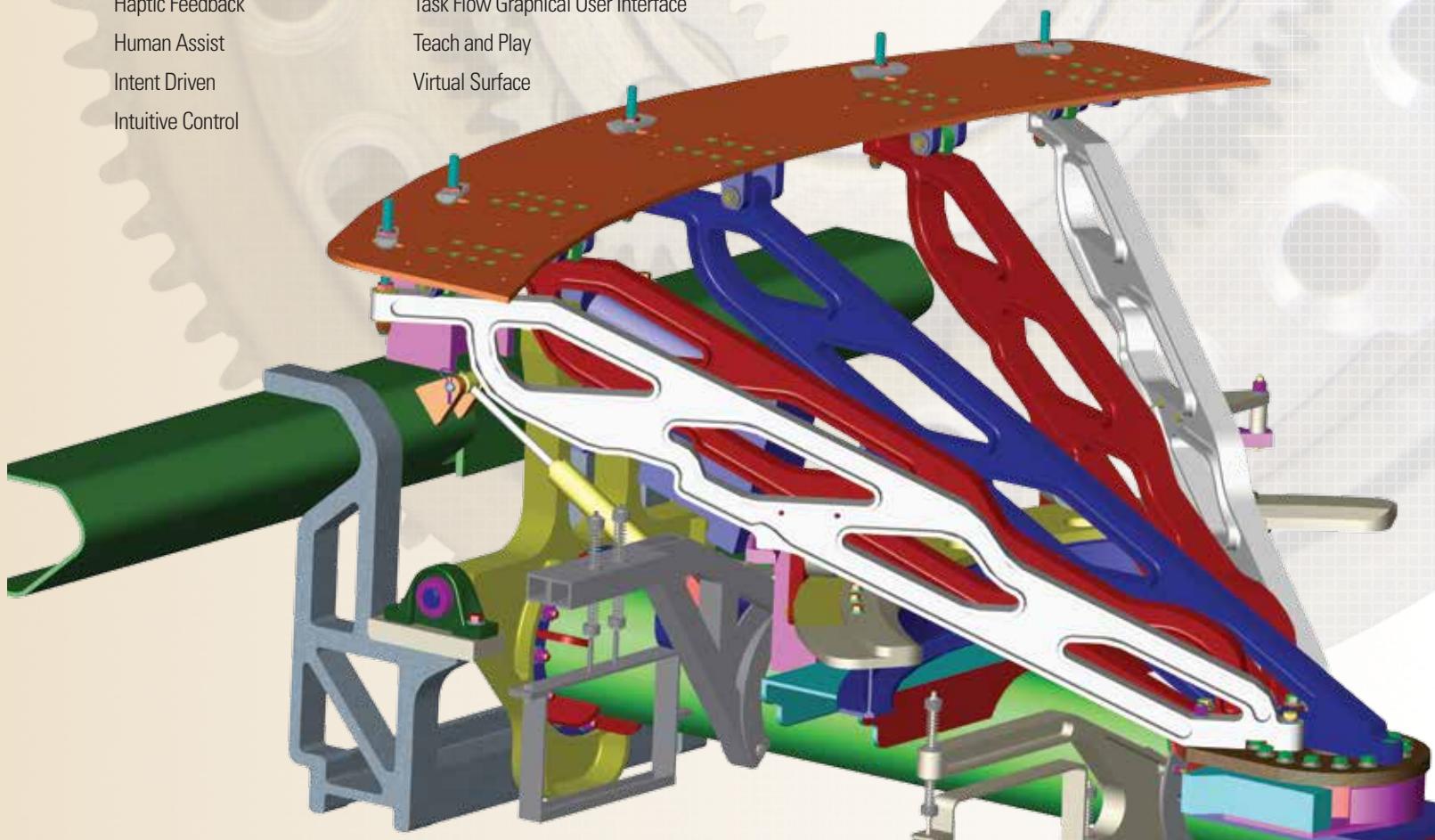
HDT Engineers are responsible for mechanical, electrical, and software development and are involved in projects requiring skills in many disciplines, including but not limited to:

Air and Thermal Management	Power Generation/Electromechanical Controls
Electromechanical Actuation	Power Management
Energy Efficiency	Robotic Manipulation
Man/Machine Interface and Haptics	Shock and Vibration Hardened Electronics
Mechatronic Systems Design	Structural Analysis

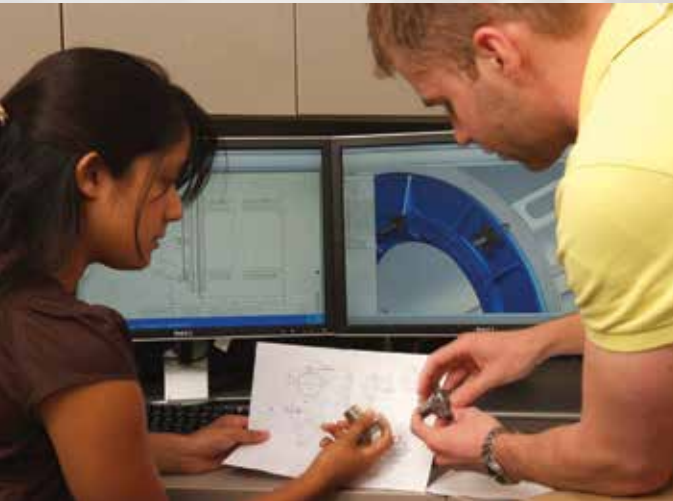


Interfaces

Autonomous Semi-Autonomous	Sensor Visualization
Haptic Feedback	Task Flow Graphical User Interface
Human Assist	Teach and Play
Intent Driven	Virtual Surface
Intuitive Control	



Utilizing HDT Engineering As Your Consultant



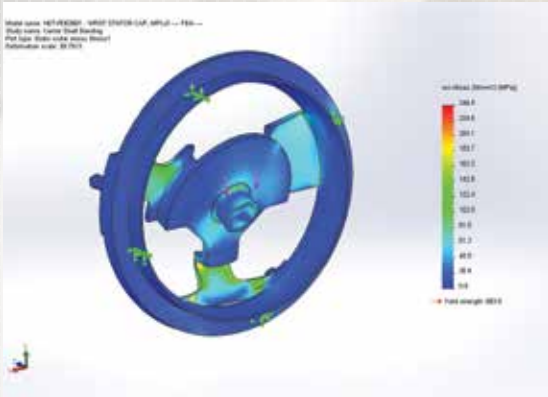
HDT Engineering Services maintains and supports common competencies and processes including:

- System Requirements Analysis
- Design and Engineering
- Product Development
- Fabrication
- Assembly, Integration and Test
- Support

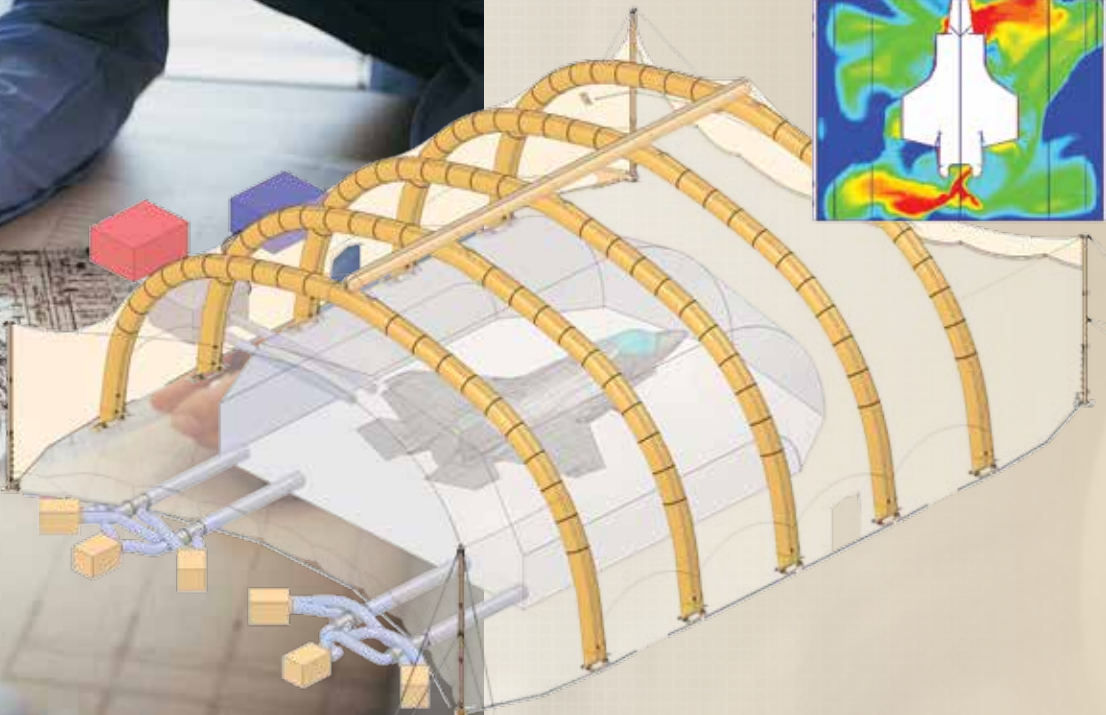
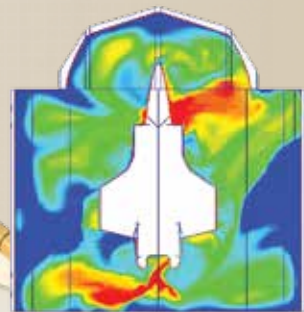
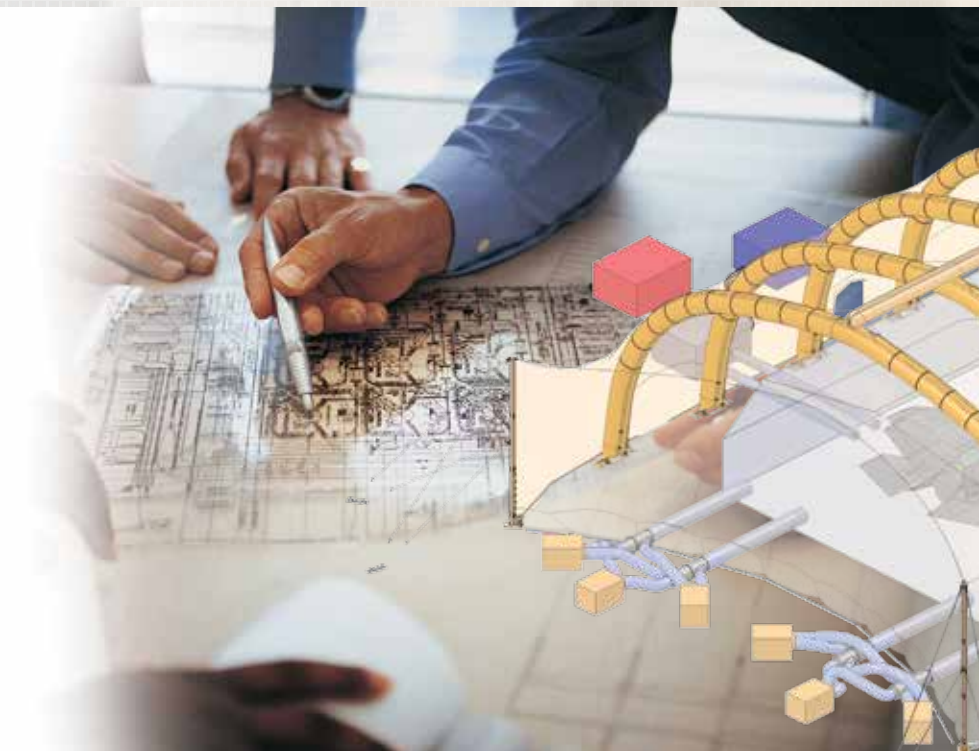
HDT utilizes an approach starting with the funded project, moving through:

- Planning
- Concept Development
- System Level Design
- Detailed Design, Build, and Test
- Product Validation
- Production Ramp-up

and ending up with the product launch.



HDT Engineering Services can be your contracted, objective consultant for the entire process, or brought in for the portions of a project as you prescribe. While it is beneficial to utilize Engineering Services as early in the process as possible, HDT's previously discussed skills, capabilities, analytic and development software tools, and testing procedures gives you the flexibility of engaging HDT when it's right for you, at whichever threshold of the project you desire HDT's involvement.



System Requirements Analysis

- Systems Requirements Review and Management
- Multi-Dimensional Tradespace
- Risk Assessment
- Integrated Turnkey Programmatic Review

Design and Engineering

- Concept Development
- 3D CAD Modeling
- Electrical System Design
- Linear and Nonlinear Finite Element Analysis for Stress and Heat Transfer
- Requirements Analysis
- CFD Airflow Characterization
- Software Design

Product Development

- Design for Production
- System Performance Testing
- In-House Machining
- Design Verification and Validation
- Model Shop Assembly
- Rapid Prototyping
- Carbon Fiber Layup

Fabrication

- CNC Machining
- Laser and Punch Machining
- Fabric Bonding
- CARC Painting
- Automated and Manual Welding
- Automated Wire Cutting/Labeling
- Electro/Chemical Pretreatment
- Powder Coating

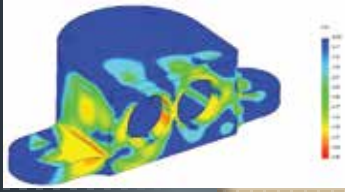
Assembly, Integration and Test

- Full Systems Integration
- Final Assembly
- LabView Testing
- Final System Certification
- Sub System Assembly
- Environmental Test

Support

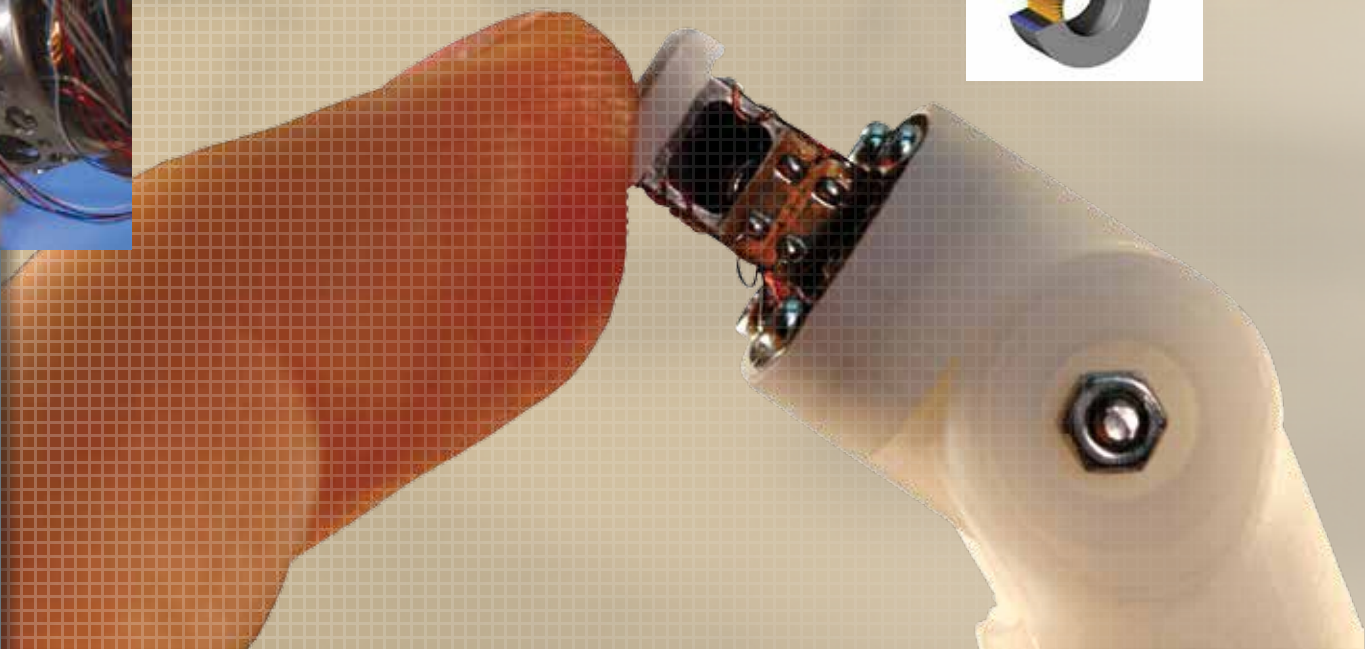
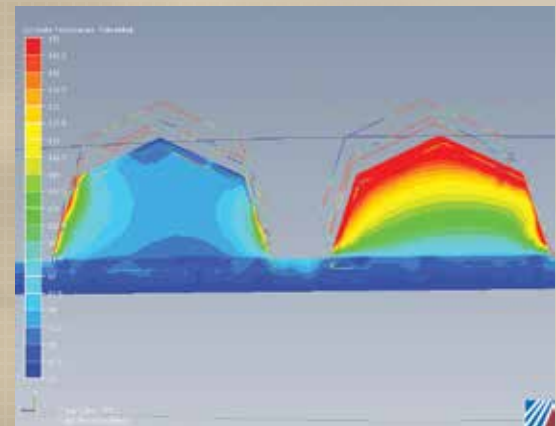
- Training
- Technical Manuals
- Obsolescence Mitigation
- Integrated Logistics Support
- Troubleshooting
- Spares Provisioning
- Overhaul/Repair
- Field Services

HDT Lab Testing and Design Validation Capabilities



HDT's breadth of products and engineering expertise in environmental control and protection, advanced materials and mechatronics benefits companies seeking an objective organization to test products or product designs. HDT engineers are experts in:

- High performance air filtration systems testing
- CBRN rugged filtration system engineering design
- Pleated HEPA filter and deep carbon bed design
- Refrigeration design concept testing
- Fabric tensile strength testing
- Air conditioner temperature and humidity psychrometric chamber testing
- Shock and vibration testing
- High-performance electromechanical system testing
- EMI/environmental hazard testing



Working With HDT

Why work with HDT? In addition to our engineering capabilities HDT has:

- Experience with government contracting, including CPFF, T&M, and Fixed Price contracts
- Longstanding, successful experience with project management and financial management in the R&D environment
- Certified Program Managers
- Processes in product development to capture customer input and requirements
- Annual Defense Contract Audit Agency (DCAA) reviews
- ISO 9001:2000 certification
- ISO 13485:2012 Medical Devices-Quality Management Systems certification

Engaging with HDT is easy. Call or meet with your HDT sales representative to let them know you are interested in meeting with our Engineering Services team. Once your HDT sales representative is informed regarding your project, we will set up a time for you to meet with an engineering representative whose background and expertise match the project criteria where you would like our assistance. With the personnel, capabilities, tools, facilities, processes and patents we maintain, we're eager to work with you and share our expertise to enable a successful product launch for your next project.

Contact us at 800-969-8527, or contact your HDT sales representative directly.



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