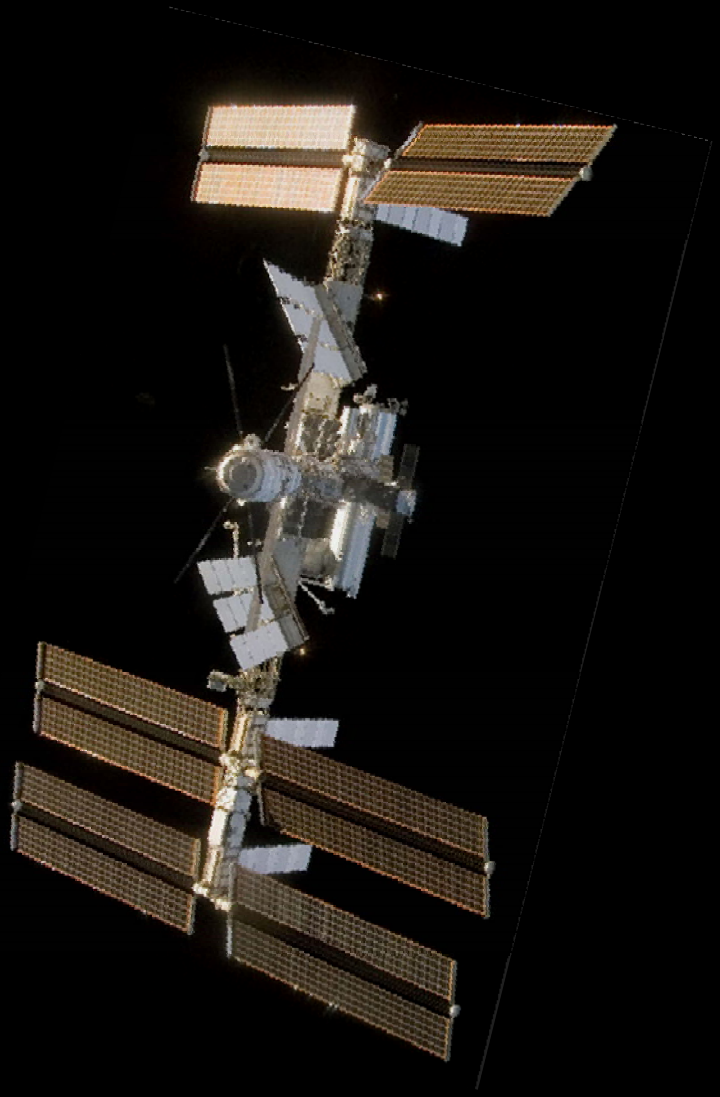
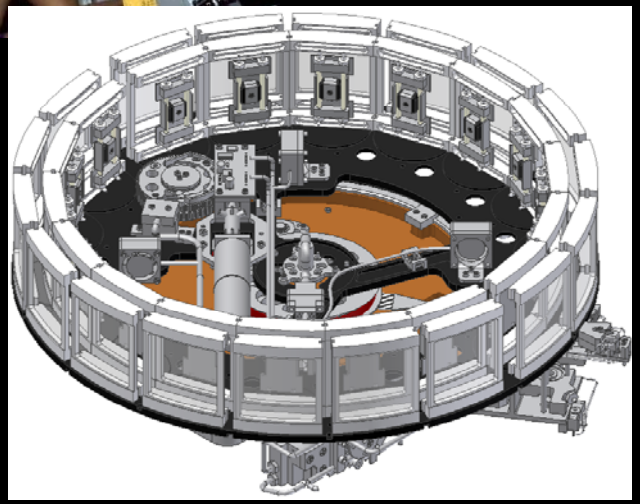
An experienced company



- Founded in 1988
- Expert designers, builders and integrators of life science research equipment for space flight
- Seven shuttle missions, three sub-orbital launches and several sorties of parabolic-flight aircraft
- Mechanical, electrical, software, chemical engineers and technicians on staff
- Scientific staff led by Paul W. Todd, Ph.D., biophysicist and past president of the American Society for Gravitational and Space Biology

Flight-proven hardware

Flight-proven hardware

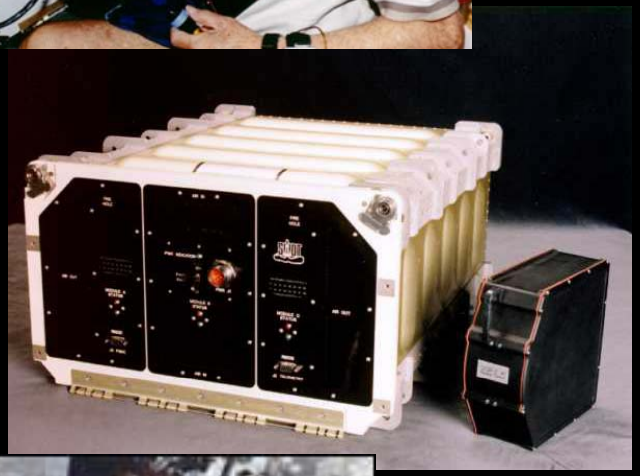


ADF

Includes 2 internal centrifuges!

- Accommodates a broad range of specimens of interest to diverse fields of study.
- Fully programmable, closed environment system, including monitored and controlled temperature, relative humidity, acceleration, O_2 level and CO_2 level.
- Full telemetry capability to downlink data and uplink commands for real time telescience and telerobotic experiment manipulation (flight crew interaction not essential for operations).
- Two identical carousels rotate independently and are served by a chemical robot that injects solutions into one sample at a time on a predetermined program or by remote control. Each sample holder rotates.
- Various levels of artificial gravity by programming either/both carousel(s) to rotate.

Flight-proven hardware



ADSEP

Mini-laboratory Cassettes

- Fully automated, multi-use single locker processing facility for interface with middeck, SPACEHAB, or International Space Station EXPRESS racks.
- ADSEP contains three independent thermal zones, each accommodating one cassette, and an internal computer that controls the internal functions of all three cassettes.
- Modular, on-board microprocessors and motor driver cards accommodate a variety of biotechnology and life science experiments.
- Several applications:

Cell Dynamics
1. Cell Culturing (CellCult)
2. Dynamic Culturing (DynaCult)

Pharmaceutical Development
3. Microencapsulation
4. Protein Crystal Growth

Separations
5. Biphasic Separation (BISEP)
6. Electrophoretic Separation (ELECSEP)

Fluid Processing
7. C-elegans studies
8. Bacteria studies

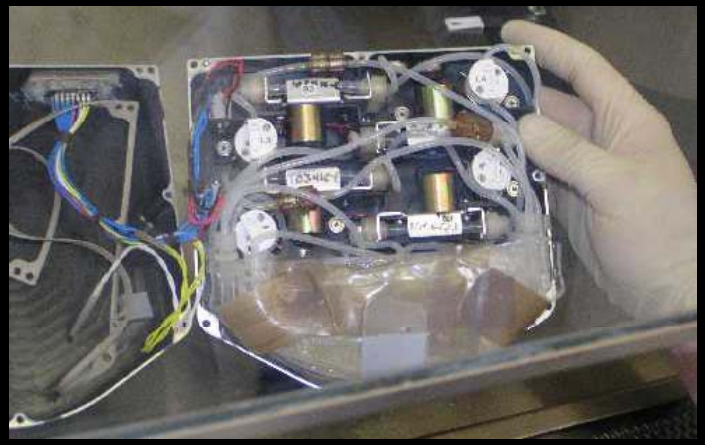
Flight-proven hardware

CELLCULT

Rotating Bioreactor

- Flight proven: flown on STS-95
- Rotating bioreactor
- Feed bag & pump
- Collects up to 6 samples: cells or medium
- Adds fixative at any time point
- Perfusion, batch feed, aeration modes
- Double containment
- Operated in ADSEP Processing Facility

Flight-qualified hardware

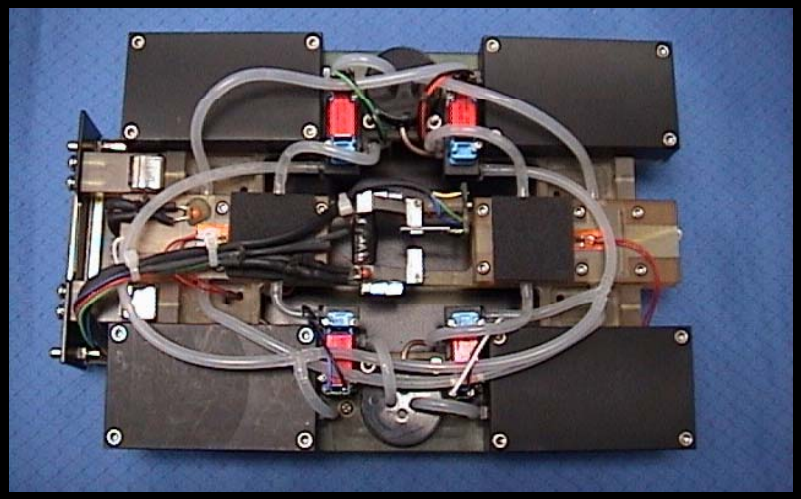


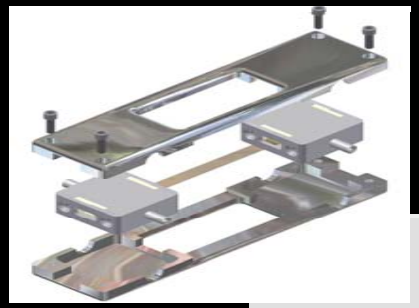
Fluid Processing Cassette

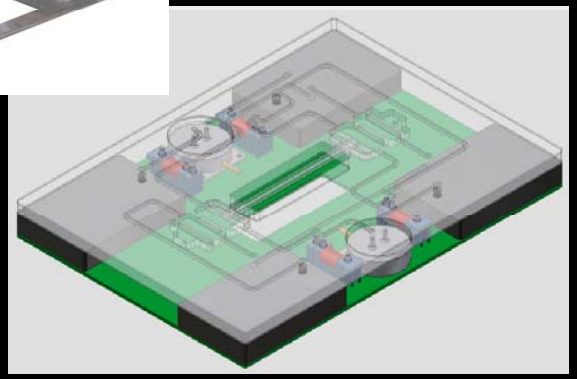
Processed in ADSEP or Generic Thermal Carriers

- Reconfigurable bags, pumps, valves
- Feed, treat and fix organisms in liquid suspensions
- Triple containment
- Processed in ADSEP or generic thermal carrier
- Bacteria for gene expression experiments
- C. elegans
- Other uses

Microscopy hardware





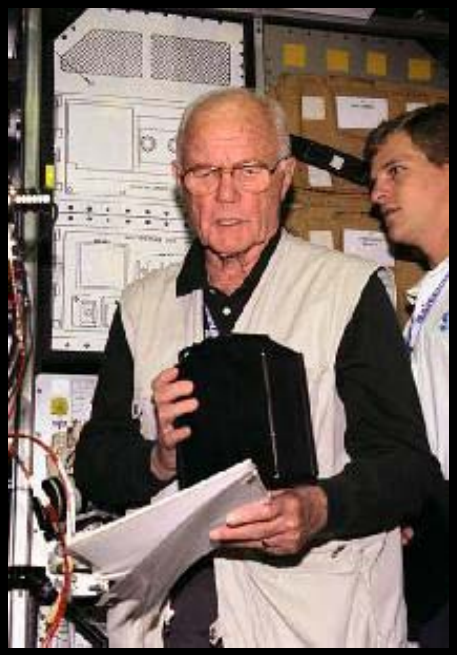


Dynascope Fluidics Microscope Slide

Processed in Light Microscope Module LMM (Glen Research Center)

- Replaceable platens with hollow slides, resevoirs, pumps, valves
- Feed, treat, observe and fix cells attached or in liquid suspensions
- Triple containment
- Processed in LMM using all microscopic techniques
- Quantitative microscopy (image cytometry)
- Tissue cells, immune cells, blood cells, yeast, bacteria
- *C. elegans*
- Magnetic, electrokinetic, interfacial, cell culture models

Flight Integration Services



Complete Mission Support

Payload Development through Payload Recovery

- Ground-trainer mockup development
- Crew hardware training and scientific familiarization
- Payload integration and mission support
- Launch site assistance in payload processing.
- Experiment loading and handover for integration into the shuttle
- Payload monitoring while on orbit using Techshot's hardware data downlink and command uplink capabilities
- Payload collection and return during post-landing recovery operations
- Bonded storage of flight hardware, parts and materials
- Traceability of parts and materials (esp. safety critical)