

CARGO SUMMARY		MISSION SEQUENCE: 1	STS-1	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
10,823	-0-	10,823	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
None			None	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
1. Passive Sample Array 2. DFI (Development Flight Instrumentation) Pallet , 9,290 lb 3. ACIP (Aerodynamic Coefficient Identification Package)			None Note: RMS NOT FLOWN	

CARGO SUMMARY		MISSION SEQUENCE: 2	STS-2	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
18,778	-0-	18,778	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
None			None	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
1. OFT (Orbital Flight Test) Pallet <ul style="list-style-type: none"> a. MAPS (Measurement of Air Pollution from Satellite) b. SMIRR (Shuttle Multispectral Infrared Radiometer) c. SIR (Shuttle Imaging Radar) d. FILE (Features Identification and Location Experiment) e. OCE (Ocean Color Experiment) 2. DFI (Development Flight Instrumentation) Pallet 11,048 lb 3. ACIP (Aerodynamic Coefficient Identification Package) 4. IECM (Induced Environment Contamination Monitor) 5. OSTA-1 (Office of Space and Terrestrial Application) 5,395 lb			1. RMS (Remote Manipulator System) S/N 201	

CARGO SUMMARY		MISSION SEQUENCE: 3	STS-3	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u> Verification Canister	
22,710	344*	22,170		
<u>DEPLOYABLE PAYLOADS:</u> * Plasma Diagnostic Package (PDP) Deployed Retrieved and Berthed Wt.= 344 lb (See RMS section)			<u>CREW COMPARTMENT PAYLOAD:</u> 1. MLR (Monodisperse Latex Reactor) 2. HBT (Heflex Bioengineering Test)	
<u>ATTACHED PLB PAYLOADS:</u> 1. OSS (Office of Space Science)-1 Pallet (8,740 lb) a. Plant Lignification Experiment b. Plasma Diagnostic Package* c. Vehicle Charging and Potential d. Space Shuttle Induced Atmosphere e. Thermal Canister f. Solar Flare X-ray Polarimeter g. Solar Ultraviolet and Spectral Irradiance Monitor h. Contamination Monitor Package i. Foil Microabrasion Package 2. DFI Pallet, 11,048 3. ACIP 448 lb *RMS deployed/berthed			<u>SPECIAL PAYLOAD MISSION KITS:</u> 1. RMS - S/N 201	

CARGO SUMMARY		MISSION SEQUENCE: 4	STS-4	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
11,644	816	11,644	1. Utah State University a. Drosophila Melanogaster (fruit fly) Growth Experiment b. Artemia (Brine Shrimp) Growth Experiment c. Surface Tension Experiments d. Composite Curing Experiment e. Thermal Conductivity Experiment f. Microgravity Soldering Experiment g. Root Growth of Lemna Minor L. (Duckweed) in Microgravity h. Homogeneous Alloy Experiment i. Algal Microgravity Bioassay Experiment	
<u>DEPLOYABLE PAYLOADS:</u> IECM (Induced Environment Contamination Monitor) deployed/reberthed by RMS Deployed and Berthed Wt. = 816 lb (See RMS section)				
<u>ATTACHED PLB PAYLOADS:</u> DFI Pallet, 9,900 lb			<u>CREW COMPARTMENT PAYLOAD:</u> 1. MLR (Monodisperse Latex Reactor) 2. CFES (Continuous Flow Electrophoresis System) 3. SSIP (Shuttle Student Involvement Program) S404: Effect of Prolonged Space Travel on Levels of Trivalent Chromium in the Body S405: Effect of Diet, Exercise and Zero Gravity on Lipoprotein Profiles 4. VPCF (Vapor Phase Compression Freezer)	
<u>DEPARTMENT OF DEFENSE</u> DOD 82-1			<u>SPECIAL PAYLOAD MISSION KITS:</u> 1. RMS (Remote Manipulator System) S/N 201	

CARGO SUMMARY		MISSION SEQUENCE: 5	STS-5	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
20,830	14,585	6,245	G-026: ERNO/Stability Of Metallic Dispersions. (JSC PIP 14021)	
<u>DEPLOYABLE PAYLOADS:</u> 1. SBS-C/PAM-D (Satellite Business Systems/Payload Assist Module) Deployed Wt = 7,211 lb 2. ANIK-C/PAM-D - TELESAT Canada, Ltd/Payload Assist Module Deployed Wt = 7,374 lb			<u>CREW COMPARTMENT PAYLOAD:</u> SSIP (Shuttle Student Involvement Program) a. SE81-5 - Crystal Formation In Zero Gravity b. SE81-9 - Convection In Zero Gravity c. SE81-2 - Growth Of Porifera	
<u>ATTACHED PLB PAYLOADS:</u> DFI (Development Flight Instrumentation) a. EIOM (Effects of Interaction of Oxygen with Materials) b. ISAL (Investigation of STS Atmospheric Luminosities)			<u>SPECIAL PAYLOAD MISSION KITS:</u> Mission Specialist Seats (2) Note: RMS NOT FLOWN	

CARGO SUMMARY		MISSION SEQUENCE: 6	STS-6	ORBITER OV-099
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
46,662	37,546	9,116	1. G-005: Asahi Shimban, Japan 2. G-049: U. S. Air Force Academy 3. G-381: Park Seed Company	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
TDRS-A/IUS (Tracking and Data Relay Satellite/Inertial Upper Stage) Deployed Wt = 37,546 lb			1. CFES 2. MLR 3. RME (Radiation Monitoring Experiment) 4. NOSL (Night/Day Optical Survey Of Lightning)	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
CBSA (Cargo Bay Stowage Assembly)			1. Mini-MADS 2. EMU (Extravehicular Mobility Unit)	
Note: RMS NOT FLOWN				

CARGO SUMMARY		MISSION SEQUENCE: 7	STS-7	ORBITER OV-099
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
31,893	14,949	16,944	1. G-033: California Institute of Tech.-Plant Gravireception and Liquid Dispersion 2. G-088: Edsyn, Inc. - Soldering of Material 3. G-002: Kayser Threde, W. Germany - Youth Fair Experiment 4. G-009: Purdue University - Geotropism Fluid Dynamics and Nuclear Particle Velocity 5. G-305: U. S. Air Force and National Research Labs- Ultraviolet Spectrometer 6. G-012: RCA, Camden, NJ, Schools - Ant Colony 7. G-345: Goddard Space Flight Center and National Research Labs - Payload Bay Environment	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
1. ANIK-C/PAM-D: TELESAT Canada Satellite Deployed Wt = 7,374 lb 2. PALAPA-B1/PAM-D: Indonesian Satellite Deployed Wt = 7,575 lb 3. SPAS (Shuttle Pallet Satellite)-01 Unberthing/Berthing Tests Deployed and Retrieved Wt. = 3,192 lb (See RMS Section)			1. CFES 2. MLR 3. SSIP	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
1. OSTA (Office of Space and Terrestrial Applications)-2 2. CBSA			1. RMS - S/N 201 2. TAGS (Text and Graphics System) 3. Mini-MADS	

CARGO SUMMARY		MISSION SEQUENCE: 8		STS-8	ORBITER OV-099
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>		
25,790	7,445	22,631	1. U. S. Postal Service - 8 cans of philatelic covers		
<u>DEPLOYABLE PAYLOADS:</u>			2. G-475: Asahi Shimbun - Artificial Snow Crystal Experiment		
1. INSAT/PAM-D: Indian National Satellite Deployed Wt = 7,445 lb			3. G-348: Office of Space Science - Atomic Oxygen Erosion		
2. PFTA (Payload Flight Test Article) Test Unberthing/Berthing Tests Deployed and Retrieved Wt = 7,350 lb			4. G-347: Navy Research Lab - Ultraviolet Photo Film		
			5. G-346: Goddard Space Flight Center - Cosmic Ray Upset Experiment		
<u>ATTACHED PLB PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>		
1. DFI (Development Flight Instrumentation) Pallet a. Oxygen Interaction and Heat Pipe Experiment b. Postal Covers (2 boxes)			1. CFES		
2. CBSA			2. ICAT (Incubator-Cell Attachment Test)		
3. SPAS - 01 Umbilical Disconnect			3. ISAL (Investigation of STS Atmospheric Luminosities)		
			4. AEM (Animal Enclosure Module) - Evaluation of AEM using rats		
			5. RME		
			6. SSIP Biofeedback		
			<u>SPECIAL PAYLOAD MISSION KITS:</u>		
			1. RMS - S/N 201		
			2. MADS		
			3. COMSEC (Communication Security)		
			4. TAGS		

CARGO SUMMARY		MISSION SEQUENCE: 9		STS-9	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>		
33,131	-0-	33,131	None		
<u>DEPLOYABLE PAYLOADS:</u>					
None					
<u>ATTACHED PLB PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>		
1. Spacelab-1: a. Spacelab Long Module b. Spacelab Pallet c. Tunnel d. Tunnel Extension e. Tunnel Adapter			None		
2. Experiments (73) a. Astronomy and Physics (6) b. Atmospheric Physics (4) c. Earth Observations (2) d. Life Sciences (16) e. Materials Sciences (39) f. Space Plasma Physics (5) g. Technology (1)			<u>SPECIAL PAYLOAD MISSION KITS:</u>		
			1. Cryogenic sets 4 and 5.		
			2. Spacelab utility kit		
			3. TAGS		
			4. Galley		
			Note: RMS NOT FLOWN		

CARGO SUMMARY		MISSION SEQUENCE: 10	STS-41-B	ORBITER OV-099
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
28,252	15,073	13,179	1. G-004: Utah State University/Aberdeen University 2. G-008: Utah State University/University of Utah/ Brighton High School 3. G-051: General Telephone Labs 4. G-309: U. S. Air Force 5. G-349: Goddard Space Flight Center (re: flight STS-8)	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
1. WESTAR VI/PAM-D - Western Union Communications Satellite/Payload Assist Module Deployed Wt = 7,307 lb 2. PALAPA-B/PAM-D - Indonesian Communications Satellite/Payload Assist Module Deployed Wt = 7,556 lb 3. SPAS - 01 - Not deployed due to RMS anomaly 4. IRT (Integrated Rendezvous Target) - Failed to inflate due to internal failure Deployed Wt =210			1. ACES (Acoustic Containerless Experiment System) 2. IEF (Isoelectric Focusing) 3. Cinema 360 Camera 4. Student Experiment SE81-10 - Effects of Zero g on Arthritis 5. MLR 6. RME	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
1. MFR (Manipulator Foot Restraint) 2. SESA (Special Equipment Stowage Assembly) 3. Cinema 360 - High Quality Motion Picture Camera			1. RMS - S/N 201 2. MMU (Manned Maneuvering Unit) - 3. Mini-MADS 4. Galley	

CARGO SUMMARY		MISSION SEQUENCE: 11	STS-41-C	ORBITER OV-099
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
33,831	21,396	12,435	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
1. LDEF (Long Duration Exposure Facility) - Office of Aeronautics and Space Technology Deployed Wt = 21,396 lb 2. SMM (Solar Maximum Mission) Spacecraft Rendezvous/Retrieve/Repair/Deploy Retrieve/Repair/Deploy Wt - 4740 lb (See Other Payloads Section)			1. RME 2. IMAX Camera - Canadian Commercial Company color film camera using 70mm x 280mm film 3. SSIP Comparison of honeycomb structure of bees in low g and bees in 1 g	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
1. SMRM (Solar Maximum Repair Mission) - Flight Support System 2. Cinema 360 - High quality motion picture camera 3. CBSA (Cargo Bay Storage Assembly bay 2 starboard side)			1. MMU - 2 2. EMU (Extravehicular Mobility Units) - 3 3. RMS - S/N 302 4. MFR 5. Galley	

CARGO SUMMARY		MISSION SEQUENCE: 12	STS-41-D	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
41,382	30,086	11,296	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
1. SBS/PAM-D (Satellite Business System/Payload Assist Module) Deployed Wt = 7,383 2. SYNCOM IV-2 (Leased to DOD for UHF and SHF communications, also called LEASAT) Deployed Wt = 15,196 lb 3. TELSTAR/PAM-D (American Telephone & Telegraph/ Payload Assist Module) Deployed Wt = 7,507			1. CFES III (Continuous Flow Electrophoresis System) 2. IMAX Camera - IMAX System Corporation (Canadian Company) 70mm x 280mm film 3. RME - USAF Space Div. 4. Clouds - USAF Nikon F 3/T with 105mm lens 5. SSIP - (Shuttle Student Involvement Package) grow single crystal of Indium, Shawn Murphy, Hiram, Ohio; Rockwell International, Sponsor.	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
OAST-1 (Office of Application and Space Technology) a. SAE (Solar Array Experiment) b. DAE (Dynamic Augmentation Experiment) c. SCCF (Solar Cell Calibration Facility)			1. RMS - S/N 301 2. MADS	

CARGO SUMMARY		MISSION SEQUENCE: 13	STS-41-G	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
17,592	4,949	12,643	1. G007: Alabama Space and Rocket Center Solidification of lead-antimony; and aluminum copper student experiment 2. G032: ASAHI National Broadcasting Corp., Japan Surface tension and viscosity; and materials experiment 3. G306: Air Force and U. S. Naval Research Laboratory Low Energy Heavy Ions Search in the Inner Magnetosphere 4. G469: Goddard Space Flight Center - Cosmic Ray Upset Experiment (CRUX) 5. G038: Marshall-McShane Vapor Deposition of Metals and Non-Metals 6. G074: McDonnell Douglas Company Study Proposed Propellant Acquisition System 7. G013: Kayser Threde, West Germany Verify Transport Mechanism in Halogen Lamps Performance in Extended Micro-g 8. G518: Utah State University Study Solar Flux Separation, Capillary Waves on Water Surface, and Thermo-Capillary Flow in Liquid Columns	
<u>DEPLOYABLE PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
1. ERBS (Earth Radiation Budget Satellite) Deployed Wt = 4,949 lb.			1. RMS - S/N 302 2. Galley 3. EMU - (3) 4. PSA (Provisions Stowage Assembly)	
<u>ATTACHED PLB PAYLOADS:</u>				
1. OSTA-3 (Office of Space and Terrestrial Applications) a. SIR-B (Shuttle Imaging Radar) b. FILE (Feature Ident. and Location Exp.) c. MAPS (Measurement of Air Pollution from Satellite) 2. LFC (Large Format Camera) ORS (Orbital Refueling System)				
<u>CREW COMPARTMENT PAYLOAD:</u>				
1. APE (Auroral Photography Experiment) 2. CANEX (Canadian Experiments) a. VISET b. ACOMEX c. OGLOW (Orbital Glow & Atmospheric Emissions) d. SPEAM (Sun Photometer Earth Atmosphere Measurement) 3. SASSE (Space Adaptation Syndrome Studies Experiment) 4. RME 5. TLD (Thermoluminescent Dosimeter)				

CARGO SUMMARY		MISSION SEQUENCE: 14	STS-51-A	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
38,003	22,764	17,620	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
1. TELESAT-H (ANIK)-D2/PAM-D - Canadian 24 channel communications satellite. PAM D is a payload assist module built by McDonnell Douglas Deployed weight: 7,574 lb 2. SYNCOM IV-1 - Synchronous Communication Satellite, also called LEASAT, leased to U. S. Navy. 2) Deployed weight: 15,190 lb			1. RMS - S/N 301 2. MMU (2) 3. EMU (3) 4. PSA Restraint (2) 5. Satellite Retrieval Hardware: a. Modified Spacelab pallet (2) b. MFR (Manipulator Foot Restraint) c. Stinger Adapter (2) d. Satellite Adapter Trunnion (2) e. Berthing A Frame (2)	
<u>RETRIEVED PAYLOADS</u>				
1. PALAPA-B2 - Deployed during mission STS 41-B, failed to achieve proper transfer orbit due to PAM-D failure Retrieved weight: 1,262 lb 2. WESTAR-VI - Deployed during mission STS 41-B, failed to achieve proper transfer orbit due to PAM-D failure. Retrieved weight: 1,119 lb				
<u>CREW COMPARTMENT PAYLOAD:</u>				
1. DMOS (Diffusive Mixing of Organic Solutions) 3M Corp. 2.. RME				

CARGO SUMMARY		MISSION SEQUENCE: 15	STS-51C	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
10,823	-0-	10,823	Data not available DOD Classified Mission	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
Data not available, DOD Classified Mission			Data not available, DOD Classified Mission	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
Data not available, DOD Classified Mission			RMS - S/N 301 Other data not available, DOD Classified Mission	

CARGO SUMMARY		MISSION SEQUENCE: 16	STS-51D	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u> 1. G-035 - Asahi National Broadcasting Corporation, Japan a. Surface tension and viscosity b. Alloy, lead oxide and carbon fiber 2. G-471 - Goddard Space Flight Center, Thermal Engineering Branch Capillary Pump Loop (CPL) Priming Experiment	
28,747	22,576	6,171		
<u>DEPLOYABLE PAYLOADS:</u> SYNCOM IV-3 Synchronous Communication Satellite, built by Hughes, third in a series of 4, leased to the Navy Failed to activate after nominal deploy from Orbiter Deploy wt: 15,190 TELESAT-I (ANIK C-1)/PAM D - Canadian communication Placed in three year storage orbit Deployed wt: 7,386 lb			<u>SPECIAL PAYLOAD MISSION KITS:</u> 1. RMS - S/N 301 2. PSA 3. MADS III	
<u>ATTACHED PLB PAYLOADS:</u> None				
<u>CREW COMPARTMENT PAYLOAD:</u> 1. CFES-III 2. AFE (American Flight Echocardiograph) satellite. 3. PPE (Phase Partitioning Experiment) 4. SSIP (2) a. Corn Statolith b. Brain Cell				

CARGO SUMMARY		MISSION SEQUENCE: 17	STS-51-B	ORBITER OV-099
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u> G-010 NUSAT, Northern Utah Satellite Weber State College, Utah Utah State University, and New Mexico State University. First successful payload ejection from a GAS canister Deployment Wt = 105 lb	
30,748	105	30,643		
<u>DEPLOYABLE PAYLOADS:</u> Refer to GAS section			G-308 GLOMR, Global Low Orbiting Message Relay Satellite Defense Systems Inc., McLean, VA Failed to eject from GAS canister	
<u>ATTACHED PLB PAYLOADS - Spacelab 3:</u> Materials Processing in Space: 1. Solution Growth of Crystals in Zero Gravity 2. Mercuric Iodide Crystal Growth, Vapor Crystal Growth System (VCGS) 3. Mercury Iodide Crystal Growth (MICG) Technology 1. Dynamics of Rotating and Oscillating Free Drops (DROP) Environmental Observations 1. Geophysical Fluid Flow Cell Experiment (GFFC) 2. Atmospheric Trace Molecule Spectroscopy (ATMOS) 3. Very Wide Field Galactic Camera (VWFGC) 4. Aurora Observation Astro Physics 1. Studies of the Ionization States of Solar and Galactic Cosmic Ray Heavy Nuclei (ION) Life Sciences 1. Research Animal Holding Facility (RAHF) 2. Urine Monitoring Investigation (UMI) 3. Autogenic Feedback Training (AFT)				
			<u>SPECIAL PAYLOAD MISSION KITS:</u> 1. Airlock 2. Long Transfer Tunnel 3. Galley 4. MPES - Mission Peculiar Equipment Support Structure, carried ATMOS & ION Note: RMS NOT FLOWN	

CARGO SUMMARY		MISSION SEQUENCE: 18	STS-51-G	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
38,258	22,832	15,426	G-007: Alabama Space & Rocket Center/Marshall Amateur Radio Club 1. Solidification of Metals 2. Crystal Growth 3. Radish Seed Root Study 4. Radio Transmission Experiment G-025: ERNO - Dynamic Behavior of Liquid Propellants in low-g. G-027: DFVLR of West Germany - Slipcasting in micro-g. G-028: DFVLR of West Germany - Manganese Bismuth production in micro-g G-034: Dickshire Coors, Texas High Students 11 Biological/physical science experiments 1 Microprocessor controller G-314: USAF and USNRL - SURE (Space Ultra- violet Radiation Environment)	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
1. TELSTAR-3D/PAM-D: Hughes 376 Comm Satellite with McDac Payload Assist Module Booster. Owned by AT&T Co Wt. = 7,546.0 2. ARABSAT-A/PAM-D: Aerospatiale Comm Satellite with McDac Payload Assist Module Booster. Owned by Saudi Arabian Communications Organization.. Wt. = 7,695.0 lb 3. MORELOS-A/PAM-D: Hughes 376 Comm Satellite with McDac Payload Assist Module Booster. Owned by Mexican Communications and Transportation Wt. = 7,591.0 lb 4. SPARTAN-101: Shuttle Pointed Autonomous Tool for Astronomy SFSS: Spartan Flight Support Structure REM: Release/Engage Mechanism SEC: Scientific Experiment Carrier The SEC was released and retrieved using REM and RMS Deployed and retrieved Wt = 2,217.0 lb			ADSF (Automated Directional Solidification FEE (French Echocardiograph Experiment) FPE (French Postural Experiment) HPTE (High Precision Tracking Experiment)	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
None			RMS - S/N 301 Galley	

CARGO SUMMARY		MISSION SEQUENCE: 19	STS-51-F	ORBITER OV-099
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED RETRIEVED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
33,012	628	33,012	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
Ejectable Plasma Diagnostic Package, Exp No. 3 second flight of PDP (STS-3 first flight First flight as a free flyer to sample plasma from the Shuttle Deployed/Retrieved Wt = 628.0 lb			0 Life Sciences ° Vitamin D Metabolites and Bone Demineralization (Exp 1) ° The Interaction of Oxygen and Gravity Induced Lignification (Exp 2) ° Shuttle Amateur Radio Experiment (SAREX) ° Dispenser Technology Experiment - Dispensing carbonated Beverages In Micro-g ° Protein Crystal Growth	
<u>ATTACHED PLB PAYLOADS:</u> Spacelab 2			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
0 Plasma Physics ° Deployable/Retrievable Plasma Diagnostic Package (PDP) (Exp 3) ° Plasma Depletion Experiments for Ionospheric and Radio Astronomical Studies (Exp 4) ° Vehicle Charging and Potential (VCAP) (Exp 14)			RMS - S/N 302 Galley	
0 Astrophysical Research ° Small Helium Cooled Infrared Telescope (IRT) (Exp 5) ° Hard X-ray Imaging of Clusters of Galaxies and Other Extended X-ray Sources (XRT) (Exp 7) ° Elemental Composition and Energy Spectra of Cosmic Ray Nuclei (CRNE) (Exp 6)				
0 Solar Astronomy ° Solar Magnetic and Velocity Field Measurement System (SOUP) (Exp 8) ° Coronal Helium Abundance Spacelab Experiment (CHASE) (Exp 9) ° High Resolution Telescope and Spectrograph (HRTS) (Exp 10) ° Solar Ultraviolet Spectral Irradiance Monitor (SUSIM) (Exp 11)				
0 Technology Properties of Superfluid Helium Zero-g (SFHe) (Exp 13)				

CARGO SUMMARY		MISSION SEQUENCE: 20	STS-51-I	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
38,884	30,289	8,595	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
ASC-1/PAM-D - American Satellite Company, first of two satellites built by RCA and owned by a partnership between Fairchild Industries and Continental Telecon Inc. PAM-D Payload Assist Module built by McDonnell Douglas. "D" indicates used for lightweight satellites, less than 2,250 lb Deployed Wt. = 7,591 lb			PVTOS - Physical Vapor Transport Organic Solid Experiment, 3M Corporation	
AUSSAT-1/PAM-D - Australian Communications Satellite, owned by AUSSAT Proprietary Ltd., built by Hughes Communications International, Model HS376 Deployed Wt. = 7,508 lb			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
SYNCOM IV-4 - Synchronous Communication Satellite - Last in a series of 4 satellites built by Hughes Communication Services and leased to the U. S. Navy. Referred to as LEASAT when deployed. Failed to function after reaching correct geosynchronous orbit. Deployed Wt. = 15,190 lb			1. RMS - S/N 301 2. Galley 3. LEASAT-3 Salvage Equipment LEASAT-3 was successfully retrieved repaired and redeployed Retrieved and redeployed weight = 15,190 lb	
<u>ATTACHED PLB PAYLOADS:</u>				
None				

CARGO SUMMARY		MISSION SEQUENCE: 21	STS-51-J	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u> Data not available, DOD Classified Mission	
<u>DEPLOYABLE PAYLOADS:</u> Data not available, DOD Classified Mission			<u>CREW COMPARTMENT PAYLOAD:</u> Data not available, DOD Classified Mission	
<u>ATTACHED PLB PAYLOADS:</u> Data not available, DOD Classified Mission			<u>SPECIAL PAYLOAD MISSION KITS:</u> Data not available, DOD Classified Mission	

CARGO SUMMARY		MISSION SEQUENCE: 22	STS-61-A	ORBITER OV-099
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	Mono-ellipsoid Mirror Heating Facility High Precision Thermostat Facility 4. BW-Biowissenschaften: Experiments relating to Life Sciences. Experiments include: Biological (1) Medical (2) Botanical (3) 5. VS-Vestibular Sled: Experiments in Life Science regarding visio-vestibular coordination system and sensory perception process. Experiment facilities include: Mechanically accelerated sled Instrumented helmet 6. BR-Biorack: Multi-purpose facility for biological research in cell development physiology, cell fertilization and radiobiology. Facilities include: 2 Incubators Cooler freeze Glove box 7. NX-NAVEX: Navigation Experiment; located in payload bay attached to USS (unique support structure). 8. ME-MEA Materials Experiment Assembly; mounted on USS containing three materials processing experiments.	
30, 519	150	30, 369		
<u>DEPLOYABLE PAYLOADS:</u> GLOMR - Global Low Orbiting Message Relay Satellite. Built by Defense System, Inc., for DARPA. First launch attempt was on STS 51-B which failed. Deployed from GAS canister. Deployed Wt = 150 lb			<u>GAS (Getaway Special):</u> None	
<u>ATTACHED PLB PAYLOADS:</u> Spacelab D-1 - First completed Spacelab mission under German Mission Management. Joint control by BMFT (Federal Ministry of Research and Technology) and DFVLR Deutsche Forschungs-und Versuchsanstalt FurLuft-und Raumfahrt). Experiment Facilities: 1. WL-Werkstoff Labor; experiments relating to metallurgy, crystal growth, glasses/ceramics, and fluid physics. Experiment facilities include: Mirror Heating Facility Isothermal Heating Facility Gradient Heating Facility High Temperature Thermostat Fluid Physics Module Cryostat 2. PK-Progresskammer; experiment relating to Bubble Transport Boundary Layer, and Transparent Media. Experiment facilities include: Holographic Interferometric Apparatus Marangoni Convection Boat Interdiffusion in Salt Melt 3. MD-MEDEA: A material science double rack. Experiment facilities include: Gradient Heating Facility			<u>SPECIAL PAYLOAD MISSION KITS:</u> 1. Airlock 2. Long Transfer 3. Galley 4. USS - Unique Support Structure 5. RMS - S/N 302.	

CARGO SUMMARY		MISSION SEQUENCE: 24	STS-61-C	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special) (continued)</u>	
28,625	12,351	16,274	8. G-481: Unprimed, prepared linen and painted canvas reactions to space travel. Vertical Horizons.	
<u>DEPLOYABLE PAYLOADS:</u>			9. G-062: 4 part experiment from Pennsylvania State University/General Electric.	
SATCOM KU-1/PAM D-2: RCA built/owned 16 channel Ku-Band communications satellite. Second of four satellites. MDAC Payload Assist Module Deployment Wt. = 12,351.0 lb			10. G-449: JULIE (Joint Utilization of Laser Integrated Experiments). Four part experiment from St. Mary's Hospital, Milwaukee WI	
<u>ATTACHED PLB PAYLOADS:</u>			11. G-332: 2 part experiment from Booker T. Washington Senior High School and High School for Engineering, Houston, TX.	
1. MSL-2 (Materials Science Laboratory) consisting of MSL Carrier; MPE (Mission Peculiar Equipment), and 3 experiments			12. G-310: USAF Academy experiment Note: Above 12 GAS canisters mounted on Gas Bridge carrier.	
a. 3AAL (3-Axis Acoustic Levitator)			13. G-470: Experiment from GSFC and U.S. Dept of Agriculture.	
b. ADSF (Automated Directional Solidification Furnace)			<u>CREW COMPARTMENT PAYLOAD:</u>	
c. SEECM (Shuttle Environmental Effects of Coated Mirrors).			1. IBSE (Initial Blood Storage Experiment) package in 4 mid-deck lockers	
2. HITCHHIKER G-1: A Goddard Space Flight Center (GSFC) managed program consisting of 3 experiments			2. CHAMP (Comet Halley Active Monitoring Program) uses cameras spectroscopic grating and filters to observe comet through aft flight-deck overhead window.	
a. PACS (Particle Analysis Camera for Shuttle)			3. HPCG (Hand-held Protein Crystal Growth) experiment.	
b. CPL (Capillary Pump Loop)			4. SSIP (Shuttle Student Involvement Program)	
c. SEECM (Shuttle Environment Effects of coated Mirrors)			a. SE83-4, Production of Paper Fiber in Space.	
3. IR-IE (Infrared - Imaging Experiment consisting of a RCA IR TV camera mounted in Orbiter CCTV pan/tilt unit.			b. SE83-6, Argon Injection as an Alternative to Honey combing.-	
<u>GAS (Getaway Special):</u>			c. SE82-19, Measurement of Auxin Levels and Starch Grains in Plant Roots	
1. G-464: UVX (Ultraviolet Experiment) referred to as UCB (Univ. of Calif. at Berkley) contains a Bowyer UV spectrometer. GSFC experiment.			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
2. G-463: UVX, referred to as JHU (John Hopkins University) contains a Feldman Spectrophotometer. GSFC experiment.			1. GAS Bridge Carrier	
3. G-462: UVX, referred to as GAP (GSFC Avionics Package) contains Telemetry System, Tape Recorder, and Battery. GSFC experiment			2. Galley	
4. G-007: Alabama Space and Rocket Center/Marshall Amateur Club. Contains 3 student experiments and 1 radio transmission experiment.			Note: RMS NOT FLOWN	
5. G-446: HPLC (High Performance Liquid Chromatography) analytical columns. All Tech Assoc. Inc				
6. G-494: PHOTONS (Photometric Thermospheric Oxygen Night-glow Study). Canada Centre for Space Science, NRC of Can				
7. Not numbered: EMP (Environmental Monitoring Package) measures the environment for GSFC.				

CARGO SUMMARY		MISSION SEQUENCE: 25	STS-51-L	ORBITER OV-099
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>CREW COMPARTMENT PAYLOAD:</u>	
48,633	N/A	N/A	1. Fluid Dynamics Experiment (FDE) Hughes Aircraft Company Experiment composed of six experiments: a. Fluid position and ullage b. Fluid motion due to spin c. Fluid self-inertia d. Fluid motion due to payload deployment. e. Energy dissipation due to fluid motion f. Fluid transfer 2. Comet Halley Active Monitoring Program (CHAMP), second flight. Phase Partitioning Experiment (PPE) dissolves two polymer solutions in water to observe their separation. Teacher in Space: Six experiments including hydroponics magnetism, Newton's laws, effervescence chromatography and simple machines. Shuttle Student Involvement Packages:	
<u>DEPLOYABLE PAYLOADS:</u>				
1. TDRS-B/IUS: Tracking and Data Relay Satellite/Inertial Upper Stage. Deployment Weight = 37,636 lb (IUS = 32,636, TDRS-B = 5000 lb) Non-deployable Weight = 5,603 lb 2. SPARTAN-203/Halley: Shuttle pointed Autonomous Research Tool for Astronomy/Halley's Comet Experiment Deployable/retrieval packages using RMS a. SPARTAN experiment package: 1) 2 UV Spectrometers from University of Colorado 2) 2 Nikon F-3 Cameras. 3) Optic Bench b. Halley's Comet Experiment; measure Halley's Comet composition/activity				
GAS (Getaway Special):			SE82-4 "The effects of weightlessness on grain formation and strength in metals From: L. Bruce - St. Louis, MO Sponsor: McDonnell Douglas	
None			SE82-5 "Utilizing a semi-permeable membrane to direct crystal growth in zero gravity" From: S.Cavou Marlboro, NY Sponsor: Union College	
			SE83-9 "Chicken embryo development in space From: J. Vellinger - Lafayette, In Sponsor: Kentucky Fried Chicken Corporation	
			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
			1. RMS - S/N 302 2. Galley 3. MADS	

CARGO SUMMARY		MISSION SEQUENCE: 26	STS-26	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
44,601	37,514	7,087	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOADS</u>	
<p>1. TDRS-C/IUS: Tracking and Data Relay Satellite/Inertial Upper Stage Deployable Wt = 37,514 lb (IUS = 32,877 lb TDRS-C = 4,637 lb Non-deployable Weight = 5,592 lb)</p>			<ol style="list-style-type: none"> 1. PVTOS - Physical Vapor Transport of Organic Solids, 3M Corporation; Second flight. 2. ADSF - Automated Directional Solidification Furnace, MSFC, Third flight, test material solidification in zero g 3. IRCFE - Infrared Communication Flight Experiment, JSC, first flight; Test infrared transmitting crew headsets 4. PCG - Protein Crystal Growth, MSFC, flown four previous flights in less complicated configurations to examine growth of protein crystals in zero g. 5. IEF - Isoelectric Focusing, MSFC, second flight, test isoelectric transport through a permeable membrane in zero g. 6. PPE - Phase Partitioning Experiment, MSFC, second flight. Photograph fluid phase partitioning phenomena in zero g. 7. ARC - Aggregation of Red Blood Cells, MSFC & Australia, investigate aggregation characteristics of human red blood cells in zero g. 8. MLE - Mesoscale Lightning Experiment, MSFC, first flight, photograph atmospheric lightning activity from orbit. 9. ELRAD - Earth Limb Radiance Experiment, JSC, first flight, photograph earth limb radiance pre-sunrise/post-sunset. 10. Student Experiment SE82-4 - "Effects of weightlessness on Ti grain formation and strength". From L. Bruce St. Louis, Mo., sponsor: McDonnell-Douglas 11. Student Experiment SE82-5 - "Utilizing a semi-permeable membrane to direct crystal growth in zero gravity". From S. Cavou, Marlboro, N. Y., sponsor: Union College. 	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
OASIS-1: Orbiter Experiment Autonomous Supporting Instrumentation System measures and records payload bay environmental data.			<ol style="list-style-type: none"> 1. Galley 2. MADS Note: RMS NOT FLOWN	

CARGO SUMMARY		MISSION SEQUENCE: 27	STS-27	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u> Data not available - DOD Classified Mission	
<u>DEPLOYABLE PAYLOADS:</u> Data not available - DOD Classified Mission			<u>CREW COMPARTMENT PAYLOAD:</u> Data not available - DOD Classified Mission	
<u>ATTACHED PLB PAYLOADS:</u> Data not available - DOD Classified Mission			<u>SPECIAL PAYLOAD MISSION KIT:</u> Data not available - DOD Classified Mission	

CARGO SUMMARY		MISSION SEQUENCE: 28	STS-29	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
45,316	37,640	7,676		
<u>DEPLOYABLE PAYLOADS:</u> Tracking and Data Relay Satellite/Inertial Upper Stage (TDRS/IUS) one of four identical communication satellites providing support for STS and other customers. TDRS weight = 4,950 lb. Total TDRS/IUS deployed weight = 37,546 lb			<u>CREW COMPARTMENT PAYLOAD:</u> 1. Protein Crystal Growth (PCG-111-1) Total weight = 90.7 lb 2. Chromosome and Plant Cell Division in Space (CHROMEX) Total weight = 89.0 lb 3. IMAX Camera Total weight = 313 lb 4. Air Force Maui Optical Site Calibration Test (AMOS) Total weight = 0 lb 5. Chicken Embryo Development (CHIX) in Space 6. Effects of Weightlessness on Bones (SSIP - 82-08) Total weight = 58 lb	
<u>ATTACHED PLB PAYLOADS:</u> 1. Space Station Heat Pipe Advanced Radiator Element (SHARE) 2. Orbiter Experiments Autonomous Supporting Instrumentation System (OASIS-1)			<u>SPECIAL PAYLOAD MISSION KITS:</u> Note: RMS NOT FLOWN	

CARGO SUMMARY		MISSION SEQUENCE: 29		STS-30	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>		
45,823	40,118	5,705	None		
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>		
Unmanned, three-axis attitude-controlled exploration spacecraft containing systems required to achieve orbit of Venus and map its surface Deployable weight = 40,118 lb Non-deployable weight = 5,540 lb IUS = 32,525 lb Magellan = 7,593 lb Deployed: 125:01:01:01 G.m.t. SRM 1: 125:02:01:23 G.m.t. SRM 2: 125:02:06:28 G.m.t.			1. Fluids Experience Apparatus (FEA) FEA weight = 69 lb Total weight = 128 lb 2. Mesoscale Lightning Experiment (MLE) Total weight = 31 lb 3. Air Force Maui Optical Sight Calibration Test (AMOS) Total weight = 0 lb		
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>		
None			Note: RMS NOT FLOWN		

CARGO SUMMARY		MISSION SEQUENCE: 30		STS-28	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>		
			Data not available - DOD Classified Mission		
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>		
Data not available - DOD Classified Mission			Data not available - DOD Classified Mission		
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>		
Data not available - DOD Classified Mission			Data not available - DOD Classified Mission		

CARGO SUMMARY		MISSION SEQUENCE: 31		STS-34	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>		
45,905	38,323	7,582	1. Zero Gravity Growth of Ice Crystals		
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>		
1. GALILEO/IUS, an unmanned spin-stabilized exploration spacecraft comprising a Jupiter orbiter and a Jupiter atmospheric entry probe mated to the IUS. Deployable weight = 38,323 lb.			1. Polymer Morphology 2. Growth Horome Concentration and Distribution in Plants 3. Sensor Technology Experiment 4. IMAX Camera 5. Mesoscale Lightning Experiment 6. Air Force Maui Optical Site Calibration Test		
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>		
1. Shuttle Solar Backscatter Ultraviolet (SSBUV)			None		

CARGO SUMMARY		MISSION SEQUENCE: 32	STS-33	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u> Data not available - DOD Classified Mission	
<u>DEPLOYABLE PAYLOADS:</u> Data not available - DOD Classified Mission			<u>CREW COMPARTMENT PAYLOAD:</u> Data not available - DOD Classified Mission	
<u>ATTACHED PLB PAYLOADS:</u> Data not available - DOD Classified Mission			<u>SPECIAL PAYLOAD MISSION KITS:</u> Data not available - DOD Classified Mission	

CARGO SUMMARY		MISSION SEQUENCE: 33	STS-32	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u> None	
18,317	15,316	24,394	<u>CREW COMPARTMENT PAYLOAD:</u> 1. American Flight Echocardiograph (AFE) 2. Air Force Maui Optical Site Calibration Test (AMOS) 3. Characterization of Neurospora Circadian Rhythms (CNCR) 4. Fluids Experiment Apparatus 5. IMAX Camera 6. Latitude/Longitude Locator (L3) 7. Mesoscale Lightning Experiment (MLE) 8. Protein Crystal Growth (PCG)	
<u>DEPLOYABLE PAYLOADS:</u> SYNCOM IV-5, a geostationary communications satellite also known as LEASAT; leased to U.S. Navy Deployed weight: 15,316 lb			<u>SPECIAL PAYLOAD MISSION KITS:</u> 1. RMS - S/N 201 2. Galley 3. MADS	
<u>ATTACHED PLB PAYLOAD:</u> None				
<u>RETRIEVED CARGO</u> LDEF, a non-powered space vehicle containing experiments. LDEF deployed on STS-41C Retrieved weight: 21,393 lb				

CARGO SUMMARY		MISSION SEQUENCE: 34	STS-36	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u> Data not available DOD Classified Mission	
<u>DEPLOYABLE PAYLOADS:</u> Data not available, DOD Classified Mission			<u>CREW COMPARTMENT PAYLOAD:</u> Data not available, DOD Classified Mission	
<u>ATTACHED PLB PAYLOADS:</u> Data not available, DOD Classified Mission			<u>SPECIAL PAYLOAD MISSION KITS:</u> Data not available, DOD Classified Mission	

CARGO SUMMARY		MISSION SEQUENCE: 35	STS-31	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
25,517	23,905	1,612	None	
<u>DEPLOYABLE PAYLOADS:</u> Hubble Space Telescope (HST), a large aperture optical telescope. Total deployed wt = 23,905 lb			<u>CREW COMPARTMENT PAYLOAD</u> 1. Air Force Maui Optical Site Calibration Test (AMOS) 2. IMAX Camera 3. Investigation into Polymer Membrane Processing (IPMP) 4. Protein Crystal Growth (PCG) 5. Radiation Monitoring Experiment (RME) 6. Investigation of Arc and Ion Behavior in Microgravity (Student Experiment 82-16)	
<u>ATTACHED PLB PAYLOADS:</u> 1. IMAX Cargo Bay Camera (ICBC) 2. Ascent Particle Monitor (APM)			<u>SPECIAL PAYLOAD MISSION KITS</u> 1. RMS 301 2. Galley 3. HST EVA Tools	

CARGO SUMMARY		MISSION SEQUENCE: 36	STS-41	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
46,173	38,604	7,569	None	
<u>DEPLOYABLE PAYLOADS:</u> Ulysses/IUS/PAM-S - Deployable weight = 38,604 lb			<u>CREW COMPARTMENT PAYLOAD:</u> CHROMEX - Chromosome and Plant Cell Division in Space Environment SSCE - Solid Surface Combustion Experiment VCS - Voice Command System Experiment PSE - Physiological Systems Experiment RME - Radiation Monitoring Experiment IPMP - Investigation into Polymer Membrane Processing AMOS - Air Force Maui Optical Site Calibration Test	
<u>ATTACHED PLB PAYLOADS</u> SSBUV - Shuttle Solar Backscatter Ultraviolet Spectrometer ISAC - Intelsat Solar Array Coupon (Attached to RMS arm)			<u>SPECIAL PAYLOAD MISSION KITS:</u> 1. RMS 301 2. Galley 3. Radioisotope Generator (RTG) Cooling System	

CARGO SUMMARY		MISSION SEQUENCE: 37	STS-38	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
			Data not available - DOD Classified Mission	
<u>DEPLOYABLE PAYLOADS:</u> Data not available - DOD Classified Mission			<u>CREW COMPARTMENT PAYLOAD</u> Data not available - DOD Classified Mission	
<u>ATTACHED PLB PAYLOADS:</u> Spacelab 2			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
Data not available - DOD Classified Mission			Data not available - DOD Classified Mission	

CARGO SUMMARY		MISSION SEQUENCE: 38	STS-35	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
27,760	0	27,760	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
None			SAREX - Shuttle Amateur Radio Experiment AMOS - Air Force Maui Optical Site Calibration Test	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
ASTRO-1 - Three ultraviolet telescopes attached to an Instrument Pointing System (IPS): <ol style="list-style-type: none"> 1. Wisconsin UV Photopolarimeter Experiment (WUPPE) 2. UV Imaging Telescope (UIT) 3. Hopkins UV Telescope (HUT) BBXRT - Broad Band X-Ray Telescope Attached to its own two-axis pointing system (TAPS)			<ol style="list-style-type: none"> 1. Galley 2. Aerodynamic Coefficient Identification Package (ACIP) 	

CARGO SUMMARY		MISSION SEQUENCE: 39	STS-37	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
36,800	34,442	2,358	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
Gamma Ray Observatory (GRO), an unmanned observatory designed to image objects at high (gamma ray) wavelengths. Deployment weight: 34,442 lb			Protein Crystal Growth (PCG) - II Air Force Maui Optical Site (AMOS) Radiation Monitoring Equipment (RME) - III Shuttle Amateur Radio Experiment (SAREX-II) Bioserve/Instrumentation Technology Associates Materials Dispersion Apparatus (BIMDA)	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
Crew and Equipment Translation Aids (CETA) - designed to evaluate candidate techniques/equipment for EVA crewmember translation. Ascent Particle Monitor (APM) - designed to assess the particulate contamination in the Orbiter PLB during ascent			RMS - S/N 303	

CARGO SUMMARY		MISSION SEQUENCE: 40	STS-39	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special)</u>	
21,413	4,873	20,495	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
Shuttle Payload Autonomous Satellite (SPAS) - II/ Infrared Background Signature Survey (IBSS) - SPAS-II/ IBSS was designed to observe rocket plume firings at infrared wavelengths Deployment weight: 4,046 lb Retrieval weight: 3,955 lb <u>Multi-Purpose Experiment Container (MPEC)</u> - An additional USAF experiment mounted on STP-1 Deployed weight: 270 lb <u>CRO A, B, and C canister</u> - Three canisters of chemicals were released. Deployed weight: 548 lb			Cloud Logic to Optimize Use of Defense Systems (CLOUDS) - 1A Radiation Monitoring Equipment (RME) - III	
<u>ATTACHED PLB PAYLOAD:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
<u>Air Force Program (AFP) - 675</u> - The objective of AFP-675 was to observe near-Earth space and celestial objects at infrared and ultraviolet wavelengths. <u>Space Test Payload (STP) - 1</u> - Five USAF experiments mounted on a Hitchhiker M carrier.			RMS - S/N 301	

CARGO SUMMARY		MISSION SEQUENCE: 41	STS-40	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
28,114	0	28,114	12 Experiments on GBA Solid State Microaccelerometer Experiment Experiment in Crystal Growth Orbital Ball Bearing Experiment In-Space Commercial Processing Foamed Ultralight Metals Chemical Precipitate Formation Microgravity Experiments Flower and vegetable seeds exposure to Space Semiconductor Crystal Growth Experiment Active Soldering Experiments Orbiter Stability Experiment Effects of Cosmic Ray Radiation on Floppy Disks and Plant Seeds Exposure to Microgravity	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
None			Physiological Monitoring System (PMS) Urine Monitoring System (UMS) Animal Enclosure Modules (AEM) Middeck Zero-Gravity Experiment (MODE)	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
<u>Spacelab Life Sciences (SLS) - 1</u> a.. Spacelab Long Module b. Tunnel c. Tunnel Extension d. Tunnel Adapter <u>Experiments</u> 6 Body Systems 6 Cardiovascular/Cardiopulmonary 3 Blood System 6 Musculoskeletal 3 Neurovestibular 1 Immune System 1 Renal/Endocrine System <u>Gas Bridge Assembly (GBA) - 12</u> GAS experiments mounted on a truss structure PLB			Airlock Transfer Tunnel Note RMS NOT FLOWN	

CARGO SUMMARY		MISSION SEQUENCE: 42	STS-43	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special) (continued)</u> 1. Tank Pressure Control Experiment (TPCE)	
46,712	37,575	9,137	<u>CREW COMPARTMENT PAYLOAD:</u> 1. Air Force Maui Optical Site Calibration Test (AMOS) 2. Auroral Photography Experiment (APE) 3. Bioserve/Instrumentation Technology Associates Materials Dispersion Apparatus (BIMDA) 4. Investigations into Polymer Membrane Processing (IPMP) 5. Protein Crystal Growth (PCG-III) 6. Space Acceleration Measurement System (SAMS) 7. Solid Surface Combustion System (SSCS) 8. Ultraviolet Plume Instrument	
<u>DEPLOYABLE PAYLOADS:</u> Tracking and Data Relay Satellite/Inertial Upper Stage (TDRS/IUS), one of four identical communication satellites providing support for STS and other customers. TDRS/IUS Weight = 37,575 lb			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
<u>ATTACHED PLB PAYLOADS:</u> 1. Space Station Heatpipe Advanced Radiator Element (SHARE-II) 2. Shuttle Solar Backscatter Ultraviolet Instrument 03 (SSBUV) 3. Optical Communications Through the Window (OCTW)			None	
<u>Gas Bridge Assembly (GBA)</u>				

CARGO SUMMARY		MISSION SEQUENCE: 43	STS-48	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u> None	
17,144	14,388	2,756	<u>CREW COMPARTMENT PAYLOAD:</u> 1. Ascent Particle Monitor (APM) 2. Cosmic Radiation Effects and Activation Monitor (CREAM) 3. Radiation Monitoring Experiment (RME) 4. Investigations into Polymer Membrane Processing (IPMP) 5. Protein Crystal Growth (PCG) 6. Middeck 0-Gravity Dynamics Experiment (MODE) 7. Shuttle Activation Monitor (SAM) 8. Physiological and Anatomical Rodent Experiment (PARE)	
<u>DEPLOYABLE PAYLOADS:</u> Upper Atmosphere Research Satellite (UARS) UARS Weight = 17,144 lb Deployable weight: 14,388 lb Non-deployable weight: 2,050 lb			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
<u>ATTACHED PLB PAYLOAD:</u> <u>Gas Bridge Assembly (GBA)</u>			RMS 301	

CARGO SUMMARY		MISSION SEQUENCE: 44	STS-44	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
44,637	37,588	7,049	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOADS</u>	
Defense Support Program/Inertial Upper Stage satellite DSP/IUS Weight Deployed weight: 37,588 lb Non-deployed weight: 5,612 lb			1. Terra Scout 2. Military Man in Space (M88-1) 3. Air Force Maui Optical Site Calibration Test (AMOS) 4. Cosmic Radiation Effects and Activation Monitor (CREAM) 5. Shuttle Activation Monitor (SAM) 6. Radiation Monitoring Equipment (RME-III) 7. Visual Function Monitor (VFT-1) 8. Ultraviolet Plume Instrument (UVPI)	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
Interim Operational Contamination Monitor (IOCM)			None	
Gas Bridge Assembly (GBA)				

CARGO SUMMARY		MISSION SEQUENCE: 45	STS-42	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special): (GAS) BRIDGE CONSISTING OF 12 CANNISTERS</u>	
28,663	0	28,663	G-086: Effects of microgravity on cysts hatched in space; thermal conductivity and bubble velocity of air in water	
<u>DEPLOYABLE PAYLOADS:</u>			G-140: Marangoni convection in a floating zone	
None			G-143: Glass bubbles in glass melts	
<u>ATTACHED PLB PAYLOADS:</u>			G-329: Solidification of phenomena in metal alloys	
International Microgravity Laboratory-1 (Spacelab Long Module)			G-336: Measurement of diffuse zodiacal and galactic emissions at B, R, & V standard astronomical wavelengths	
Objective: Conduct 9 Materials Science and 7 Life Science Experiments in Microgravity			G-337: Performance of thermoacoustic refrigerator under microgravity	
1. Fluid Experiment System - Crystal growth and fluid behavior			G457: Gas-liquid separation under microgravity	
2. Vapor Crystal Growth System -Reflight from Spacelab 3			G609, G610: Ultraviolet observations of deep space	
3. Mercury Iodide Crystal Growth -Reflight from Spacelab 3			G-614: Motion of debris under microgravity conditions: low melting point materials processing	
4. Protein Crystal Growth Reflight from STS-26, 29, 32, 37 (Middeck)			GAS ballast payload no. 1 (GBP 1)	
5. Organic Crystal Growth Facility - Crystal growth			GAS ballast payload no. 2 (GBP 2)	
6. Cryostat - Crystal Growth			<u>CREW COMPARTMENT PAYLOAD</u>	
7. Space Acceleration Monitoring System - Measure on-orbit shuttle acceleration to support other microgravity experiments			Gelation of Sols: Applied Microgravity Research (GOSAMR)	
8. Critical Point Facility - Measure material properties at the critical point			Student Experiment SE 83-2	
9. Gravitational Plant Physiology Facility- Biological Investigation of plants during spaceflight			Investigation into Polymer Membrane Processing (IPMP)	
10. Biorack - Biological investigation of various life forms during spaceflight - Reflight of Spacelab D-1 experiment			Radiation Monitoring Equipment (RME-III)	
11. Space Physiology experiments - Investigate human space adaptation and motion sickness			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
12. Microgravity Vestibular Investigations - Study space motion sickness			None	
13. Biostack - Investigate space radiation effects on biological materials				
14. Mental Workload and Performance Evaluation - Test human performance of computer tasks in Zero-G				
15. Radiation Monitoring Container/Dosimeter Measure effect of space radiation on biological materials				

CARGO SUMMARY		MISSION SEQUENCE: 46	STS-45	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	Space Plasma Physics Atmospheric Emissions Photometric Imaging (AEPI) Previously flown on Spacelab 1 Space Experiments with Particle Accelerators (SEPAC) Previously flown on Spacelab 1 Energetic Neutral; Atom Precipitation Ultraviolet Astronomy - Far Ultraviolet Space Telescope (FAUST), previously flown on Spacelab 1 Shuttle Solar Backscatter Ultraviolet/A (SSBUV/A) Objective: To provide more accurate and reliable readings of global ozone to aid in the calibration of backscatter ultraviolet instruments being flown on free- flying satellites	
17,683	0	17,683		
<u>DEPLOYABLE PAYLOADS:</u>				
None			<u>CREW COMPARTMENT PAYLOAD:</u> Investigation into Polymer Membranes Processing (IPMP) Objective: to flash evaporate mixed solvent systems in the absence of convection to control the porosity of the polymer membrane in microgravity Space tissue LOSS-01 (STL-01) Objective: To monitor the activities of tissue samples at the cellular level under the influence of microgravity Radiation Monitoring Equipment-III (RME-III) Objective: To measure ionizing radiation over repeated time intervals and digitally store the resulting data Visual Function Tester-2 (VFT-2) Objective: To measure basic vision performance parameters in an orbital space flight environment Cloud Logic to Optimize Use of Defense System Objective: To obtain photographic sequences of cloud fields of interest as targets of opportunity. Shuttle Amateur Radio Experiment II (SAREX II) Objective: To demonstrate voice, slow-scan television (SSTV), and pocket radio. All transmitted on 2 meter capabilities and fast scan television (FSTV) transmitted on 70 cm capability.	
<u>GAS (Getaway Special):</u>				
Getaway Special 229 (GAS-229) Objective: To melt and regrow gallium arsenide crystals with convective effects absent.			<u>SPECIAL PAYLOAD MISSION KITS:</u> None	
<u>ATTACHED PLB PAYLOADS:</u>				
ATLAS-1 (2 Spacelab Pallet and Igloo) Objective: Study the composition of the middle atmosphere and its variations over an 11 year solar cycle. This is the first of 10 planned ATLAS missions over the next 11 years. Atmosphere Physics Atmosphere Trace Molecule Spectroscopy (ATMOS) previously flew on Spacelab 1, Reflight from Spacelab 3 Millimeter Wave Atmospheric Sounder (MAS), first flight Atmospheric Lyman Alpha Emissions (ALAE), previously flew on Spacelab 1 Grille Spectrometer (GRILLE), previously flew on Spacelab 1 Imaging Spectrometric Observatory (ISO), previously flew on Spacelab 1 Solar Science Active Cavity Radiometer Irradiance Monitor (ACRIM) ACRIM 1 flown on the solar maximum satellite Measurement of the Solar Constant (SOLCON) Previously flown on Spacelab 1 Solar Spectrum Measurement from 180 to 3200 Nanometers (SOLSPEC) Previously flown on Spacelab 1 Solar Ultraviolet Spectral Irradiance Monitor (SUSIM) Previously flown on Spacelab 2 and on the Upper Atmosphere Research Satellite (UARS)				

CARGO SUMMARY		MISSION SEQUENCE: 47	STS-49	ORBITER OV-105
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
32,809	23,346	9,463	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
International telecommunications satellite VI F3 (ntelsat) perigee kick motor (PKM)			Commercial protein crystal growth (CPCG) Air Force Maui Optical Site Calibration (AMOS) Ultraviolet Plume Instrument (UVPI)	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
Assembly of station by EVA methods			RMS 303	

CARGO SUMMARY		MISSION SEQUENCE: 48	STS-50	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
24,305	0	24,305	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD</u>	
None			Zeolite Crystal Growth *Generic Bioprocessing Apparatus with 1 Refrigerator/ Incubator Module (R/IM) *Astroculture (ASC) Protein Crystal Growth (PCG) Block 1 with 3 RIMs *Investigation into Polymer Membrane Processing (IPMP) Shuttle Amateur Radio Experiment - II (SAREX-II) Ultraviolet Plume Instrument (UVPI)	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
United States Microgravity Laboratory (USML-1) Investigation into Polymer Membrane Processing (IPMP) Shuttle Amateur Radio Experiment - II (SAREX-II) Ultraviolet Plume Instrument (UVPI) Orbital Acceleration Research Experiment (OARE) Zeolite Crystal Growth (ZCG) Astroculture Generic Bioprocessing Apparatus (GBA) Protein Crystal Growth (PCG) Block 1			None	

CARGO SUMMARY		MISSION SEQUENCE: 49	STS-46	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
28,585	11,387	18,594	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
EURECA Deployable weight: 9,901 lb			Gas Autonomous Payload Controller (GAPC) for Use in ICBC Operations Pituitary Growth Hormone Cell Function (PHCF) Air Force Maui Optical Site Calibration (AMOS) (Passive Requirements Only) Ultraviolet Plume Instrument (UVPI)	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
Tethered Satellite System (TSS-1) Evaluation of Oxygen Interaction with Materials-III/Thermal Energy Management Processes 2A-3 (EOIM-III/Temp 2A) IMAX Cargo Bay Camera (ICBC) Consortium for Material Development in Space - Autonomous Payload-II (CONCAP-II) CONCAP-III - Limited Duration Space Environment Candidate Materials Exposure (LDCE)			RMS S/N 201	

CARGO SUMMARY		MISSION SEQUENCE: 50	STS-47	ORBITER OV-105
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
27,607	0	27,607	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
None			Israeli Space Agency Investigation about Hornets (ISAI AH) Shuttle Amateur Radio Experiment (SAREX) Solid Surface Combustion Experiment (SSCE) Ultraviolet Plume Instrument (UVPI) - Payload of Opportunity	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
Japanese Spacelab (Spacelab-J) Long Module Gas Bridge Assembly (GBA) with 12 gas canisters			RMS 303	

CARGO SUMMARY		MISSION SEQUENCE: 51	STS-52	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
20,132	5,577	14,555	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
Laser Geodynamics Satellite (LAGEOS) Canadian Target Assembly (CTA)			Queens University Experiment in Liquid Metal Diffusion (QUELD) Phase Partition in Liquid (PARLIQ) Sun Photo Spectrometer Earth Atmosphere Measurement-2 (SPEAM) Orbiter Glow-2 Space Adaptation Tests and Observation(SATO) Commercial Materials Dispersion Apparatus Instrumentation Technology Associates Experiments (CMIX) Crystal by Vapor Transport Experiment(CVTE) Heat Pipe Performance (HPP) Commercial Protein Crystal Growth (CPCG) Shuttle Plume Impingement Experiment (SPIE) Physiological System Experiment (PSE)	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
United States Microgravity Payload-2 (USMP-1)			RMS 301	

CARGO SUMMARY		MISSION SEQUENCE: 52	STS-53	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
26,118	20,953	7,557	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD</u>	
DOD-1 Payload Deployment Weight: 20,953 lb			CLOUDS - Cloud Logic to Optimize the use of Defense Systems FARE - Fluid Acquisition and Resupply Experiment MIS - Microcapsule In Space RME III - Radiation Monitoring Equipment - III STL - Space Tissue Loss BLAST - Battlefield Laser Acquisition Sensor Test HERCULES - Hand-Held, Earth-Oriented, Real-Time, Cooperative, User Friendly, Location Targeting, and Environmental System CREAM - Cosmic Radiation Effects and Activation Monitor	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS</u>	
ODERACS - Orbital Debris Radar Calibration Spheres GLO - Glow Experiment/Cryogenic Heat Pipe Experiment			Note: RMS NOT FLOWN	

CARGO SUMMARY		MISSION SEQUENCE: 53	STS-54	ORBITER OV-105
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
46,540	37,497	11,572	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
TDRS/IUS - Tracking and Data Relay Satellite/Inertial Upper Stage Deployment Weight = 37,497 lb.			CHROMEX - Chromosome and Plant Cell Division in Space CGBA - Commercial Generic Bioprocessing Apparatus PARE - Physiological and Anatomical Rodent Experiment SSCE - Solid Surface Combustion Experiment	
<u>ATTACHED PLB PAYLOADS - Spacelab 3:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
DXS - Diffuse X-Ray Spectrometer			None	

CARGO SUMMARY		MISSION SEQUENCE: 54	STS-56	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
16,439	2,840	20,988	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
SPARTAN-201 - Shuttle Pointed Autonomous Research Tool for Astronomy-201 Deployed Weight: 2,840 lb Retrieved Weight: 2,798 lb			SUVE - Solar Ultraviolet Spectrometer HERCULES - Hand-Held, Earth-Oriented, Real-Time, Cooperative, User-Friendly, Location Targeting, and Environmental System RME III - Radiation Monitoring Equipment III CREAM - Cosmic Radiation Effects and Activation Monitor SAREX II - Shuttle Amateur Radio Experiment II CMIX - Commercial Materials Dispersion Apparatus ITA Experiments STL - Space Tissue Loss Experiment PARE - Physiological and Anatomical Rodent Experiment	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
ATLAS-2 - Atmospheric Laboratory for Applications and Science			RMS - S/N 201	

CARGO SUMMARY		MISSION SEQUENCE: 55	STS-55	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u> RKGM - Reaction Kinetics in Glass Melts	
26,881	0	33,721		
<u>DEPLOYABLE PAYLOADS:</u> None			<u>CREW COMPARTMENT PAYLOAD</u> Crew Telesupport Experiment SAREX - Shuttle Amateur Radio Experiment	
<u>ATTACHED PLB PAYLOADS:</u> SPACELAB - D2 (German) payload User Support Structure MAUS - Material Science Autonomous Payload AOET - Atomic Oxygen Exposure Tray GAUSS - Galactic Ultrawide Angle Schmidt System Camera MOMS - Modular Opto-Electronic Multispectral Stereo Scanner			<u>SPECIAL PAYLOAD MISSION KITS:</u> Note: RMS NOT FLOWN	

CARGO SUMMARY		MISSION SEQUENCE: 56	STS-57	ORBITER OV-105
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u> G-022 - Liquid Gauging Technology Experiment G-324 - Can Do G-399 - Insulin Tagging & Artemia Growth Experiment G-450 - Multiple Experiments G-452 - Crystal Growth Gallium Arsenide G-453 - Semi-Conductor/Super Conductor Experiment G-454 - Crystal Growth G-535 - The Pool Boiling Experiment G-601 - High Frequency Variations of the Sun G-647 - Configurable Hardware for Multi- Disciplinary Projects in Space	
19,630	132	29,149		
<u>DEPLOYABLE PAYLOADS:</u> EURECA - European Retrieval Carrier Retrieval Weight = 9424 lb			<u>CREW COMPARTMENT PAYLOAD:</u> Fluid Acquisition & Resupply Experiment Shuttle Amateur Radio Experiment Air Force Maui Optical Calibration Site Calibration Test	
<u>ATTACHED PLB PAYLOADS:</u> SPACEHAB-1 Bioserve Pilot Laboratory Liquid Encapsulated Melt Zone ECLSS Flight Experiment Human Factors Assessment Physiological Systems Experiment Space Acceleration Measurement System Superfluid Helium On Orbit Transfer Consortium for Materials Development in Space Complex Autonomous Payload-IV			<u>SPECIAL PAYLOAD MISSION KITS:</u> RMS	

CARGO SUMMARY		MISSION SEQUENCE: 57	STS-51	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
42,637	34,210	19,826	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
ACTS/TOS - Advanced Communications Technology Satellite/ Transfer Orbit Stage Deployment Wt. = 26,889 lb ORFEUS/SPAS - Orbiting Retrievable Far and Extreme Ultraviolet Spectrometer-Shuttle Satellite Deployment Wt. = 7321 lb Retrieval Wt. = 7321 lb			IMAX - In-Cabin Operations	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
LDCE - Limited Duration Space Environment Candidate Materials Exposure CHROMEX - Chromosome & Plant Cell Division in Space CPCG - Commercial Protein Crystal Growth HRSGS - High Resolution Shuttle Glow Spectroscopy APE-B - Auroral Photography Experiment-B PMP - Investigation into Polymer Membrane Processing RME-III - Radiation Monitoring Experiment AMOS - Air Force Maui Optical Site Calibration Test RIMC - Remote IMAX Camera			RMS Special EVA Tools	

CARGO SUMMARY		MISSION SEQUENCE: 58	STS-58	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special)</u>	
23,127	0	32,041	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
None			Orbital Acceleration Research Experiment Shuttle Amateur Radio Experiment Urine Monitoring System	
<u>ATTACHED PLB PAYLOAD:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
SPACELAB LIFE SCIENCES-2 <u>Cardiovascular/Cardiopulmonary System Experiments</u> 066 - In-Flight Study of Cardiovascular Deconditioning 294 - Cardiovascular Adaptation to Zero Gravity 198 - Pulmonary Function During Weightlessness <u>Neurovascular System</u> 238 - Effects of Space Travel on Mammalian Gravity Receptors 072 - Vestibular Experiments in Spacelab <u>Regulatory Physiology</u> 192 - Fluid-Electrolyte Regulation During Space Flight 141 - Regulation of Blood Volume During Space Flight 012 - Regulation of Erythropoiesis in Rats During Space Flight 261 - Influence of Space Flight on Erythrokinetics in Man Musculoskeletal System 120 - Protein Metabolism During Space Flight 127 - Effect of Zero Gravity on the Functional & Biochemical Properties of Anti-Gravity Skeletal Muscles 303 - Effects of Microgravity on the Electron Microscopy-Histochemistry & Protease Activity of Rat Hindlimb Muscles 305 - Pathophysiology of Mineral Loss During Space Flight 194 - Bone, Calcium & Space Flight			None	

CARGO SUMMARY		MISSION SEQUENCE: 59	STS-61	ORBITER OV-105
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special):</u>	
17,401	2,308	24,543	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
Hubble Space Telescope Replacement Equipment Retrieved Wt. = 1,814.0 lb (deployed solar array not included)			IMAX Camera	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
HST Solar Arrays HST Wide Field/Planetary Camera II HST Corrective Optics Space Telescope Axial Replacement(COSTAR) HST Rate Sensing Units HST Electronic Control Units HST Magnetic Sensing Systems IMAX Cargo Bay Camera			RMS HST EVA Tools & Crew Aids	

CARGO SUMMARY		MISSION SEQUENCE: 60	STS-60	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (Getaway Special)</u>	
22,311	3,956	28,831	G-071 - Ball Bearing Experiment G-514 - Orbiter Stability Experiment & Medicines in Microgravity G-536 - Heat Flux G-577 - Capillary Pumped Loop Experiment	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
Wake Shield Facility Deployment Wt. = 3,785 lb (Not deployed) Retrieval Wt. = 3,785 lb Bremen Satellite Deployment Wt. = 139 lb ODERACS Deployment Wt. = 32 lb			SAREX - Shuttle Amateur Radio Experiment APE-B - Auroral Photography Experiment	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
SPACEHAB-2 PAYLOAD Astroculture-3 Bioserve Pilot Laboratory Commercial Generic Bioprocessing Apparatus Equipment for Controlled Liquid Phase Sintering Experiment Immunology Experiment-01 Organic Separation Pennsylvania StateBiomodule Space Acceleration Measurement System Space Experiment Furnace Stirling Orbiter Refrigerator/Freezer Sample Return Experiment Three-dimensional Microgravity Accelerator ODERACS - Orbital Debris Radar Calibration Spheres BREMSAT - Bremen Satellite Experiment			None	

CARGO SUMMARY		MISSION SEQUENCE: 61	STS-62	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	GAS (Getaway Special):	
19,792	0	30,046	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOAD:</u>	
None			Advanced Protein Crystal Growth Experiments Commercial Protein Crystal Growth Payload Middeck 0-Gravity Dynamics Experiment Air Force Maui Optical Calibration Test Auroral Photography Experiment-B Bioreactor Demonstration System Physiological Systems Experiment	
<u>ATTACHED PLB PAYLOAD:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
United States Microgravity Payload-2 - Advanced Automated Directional Solidification Furnace - Material pour L'Etude des Phenomenes Interessant la Solidificationsur Terre et en Orbite - Isothermal Dendritic Growth Experiment - Critical Fluid Light Scattering Experiment - Space Acceleration Measurement System Office of Aeronautics & Space Technology - Experimental Investigation of Spacecraft Glow - Spacecraft Kinetic Infrared Test Experiment - Cryogenic Two-Phase Experiment - Solar Array Module Plasma Interaction Experiment - Thermal Energy Stowage Experiment - Emulsion Chamber Technology Experiment Shuttle Solar Backscatter Ultraviolet A Experiment Dexterous End Effector Limited Duration Space Environment Candidate Materials Exposure Experiment			None	

CARGO SUMMARY		MISSION SEQUENCE: 62	STS-59	ORBITER OV-105
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	GAS (Getaway Special):	
27,447	0	33,788	G-203 - Study of Freezing & Crystallization G-300 - Thermal Conductivity Measurements on Liquids in Microgravity G-458 - Growth of Small Fruiting Bodies in Microgravity	
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOADS</u>	
None			Space Tissue Loss Shuttle Amateur Radio Experiment II Toughened Uni-Piece Fibrous Insulation Visual Function Tester-4	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
Space Radar Laboratory - 1 Consortium for Materials Development in Space Complex Autonomous Payload-IV Measurement of Air Pollution from Satellite			None	

CARGO SUMMARY		MISSION SEQUENCE: 63	STS-65	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	2. Materials Science: a. Advance Protein Crystallization Facility b. Bubble, Drop, and Particle Unit c. Critical Point Facility d. Free Flow Electrophoresis Unit e. Large Isothermal Furnace f. Quasi - Steady Acceleration Measurement g. Space Acceleration Measurement System h. Electromagnetic Containerless Processing Facility i. Vibration Isolation Box Experiment Station Orbital Acceleration Research Experiment Inter-Mars Tissue Equivalent Proportional Counter (ITEPC)	
24,159	0	24,159		
<u>DEPLOYABLE PAYLOADS:</u>				
None				
<u>ATTACHED PLB PAYLOADS:</u>			<u>GAS (Getaway Special):</u>	
International Microgravity Laboratory-2 (Spacelab) 1. Life Sciences a. Aquatic Animal Experiment Unit b. Biorack c. Biostack d. Extended Duration Orbiter (EDO) Medical Project e. Linear Compressor Enhanced Orbiter Refrigerator/Freezer f. Slow Rotating Centrifuge Microscope g. Microgravity Effects on Standardized Cognitive Performance Measures h. Applied Research of Separation Methods Using Spæ Electrophoresis l. Real-Time Radiation Monitoring Device j. Spinal Injuries in Microgravity k. Thermoelectric Incubator and Cell Culture Kits			None	
			<u>CREW COMPARTMENT PAYLOADS</u>	
			Commercial Protein Crystal Growth Shuttle Amateur Radio Experiment Military Applications of Ship Tracks Air Force Maui Optical System	
			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
			None	

CARGO SUMMARY		MISSION SEQUENCE: 64	STS-64	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GETAWAY SPECIALS CONT'D:</u>	
19,260	2,840	19,218	G-254 - Four Experiments a. Distillation Experiment b. Float Zone Instability Experiment c. Pachamama d. Bubble Interferometer Experiment	
<u>DEPLOYABLE PAYLOADS:</u>			G-325 - Sound Effects on Dust Particles in Near Zero Gravity	
Shuttle Pointed Autonomous Research Tool For Astronomy - 201 (SPARTAN) Deployable Weight: 2840 lb Retrieval Weight: 2798 lb			G-417 - Three Experiments a. Reproduction of Parameciums b. Surface Interaction of Different Fluids c. Survey of Surface Interaction of Solids and Liquids	
<u>ATTACHED PLB PAYLOADS:</u>			G-453 - Two Experiments: a. Formation of Silicon-Lead Alloy b. Boiling of Organic Solvent under Microgravity and in the Absence of Convection	
Robot Operated Materials Processing System (ROMPS) LIDAR In-Space Technology Experiment (LITE) Shuttle Plume Impingement Flight Experiment Simplified Aid for EVA Rescue Trajectory Control Sensor			G-454 - Two Experiments: a. Crystal Growth of 3-Selenic Niobium from the Vapor Phase b. Crystal Growth of the Optoelectronic Crystal by the Diffusion Method.	
<u>CREW COMPARTMENT PAYLOADS:</u>			G-456 - Electrophoresis Experiment.	
Air Force Maui Optical Site Military Applications of Ship Tracks Solid Surface Combustion Experiment Radiation Monitoring Experiment III Shuttle Amateur Radio Experiment Biological Research in Canisters			G-485 - Feasibility of Depositing Different Materials in a Vacuum Environment in Microgravity	
<u>GETAWAY SPECIALS:</u>			G-506 - Orbiter Stability Experiment	
G-178 - Ozone Measurements of Earth's Upper Atmosphere in the Ultraviolet 200 to 400 Nanometer Spectral Range			G-562 - Quest-2 Material Sciences Experiment a. Droplet Growth in Liquid-Liquid Systems b. Metal-Matrix Composites c. Distribution of Reinforcing Material Produced in Microgravity and One-Gravity	
			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
			RMS 201 - Not used	

CARGO SUMMARY		MISSION SEQUENCE: 65	STS-68	ORBITER OV-105
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GAS (GETAWAY SPECIALS):</u>	
27,582	0	27,582	G-316 - Two Experiments: 1. Effects of Microgravity on Survival, Mating and Development of Milkweed Bug. 2. Microgravity Effects on Growth Quality and Size of Crystal of Rochelle Salt.	
<u>DEPLOYABLE PAYLOADS:</u>			G-503 - Four Experiments: 1. Microgravity and Cosmic Radiation Effects on	
None			Diatoms	
<u>ATTACHED PLB PAYLOADS:</u>			2. Concrete Curing in Microgravity 3. Root Growth in Space 4. Microgravity Corrosion	
Space Radar Laboratory-2			G-541 - Study of Breakdown of Planar Solid/Liquid Interface during Crystal Growth	
<u>CREW COMPARTMENT PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
Chromosome and Plant Cell Division in Space Commercial Protein Crystal Growth Biological Research in Canisters Cosmic Radiation Effects and Activation Monitor Military Applications of Ship Tracks			RMS - 303	

CARGO SUMMARY		MISSION SEQUENCE: 66		STS-66	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>ATTACHED PLB PAYLOADS (CONT'D)</u>		
18,001	7194	18,001	Inter Mars Tissue Equivalent Proportional Counter Experiment of the Sun complementing the Atlas Payload and Education - II		
<u>DEPLOYABLE PAYLOADS:</u>			<u>GAS (GETAWAY SPECIALS):</u>		
CRISTA - SPAS Deployed Wt. 7194 lb Retrieval Wt. 7194 lb			None		
<u>ATTACHED PLB PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOADS:</u>		
ATLAS - 3 (SPACELAB) a. Chemical Constituents of the Middle Atmosphere 1. Atmospheric Trace Molecule Spectroscopy 2. Millimeter Wave Atmospheric Sounder 3. Shuttle Solar Backscatter Ultraviolet/A b. Solar Radiation and the Middle Atmosphere 1. Solar Spectrum Experiment 2. Solar Ultraviolet Spectral Radiation Monitor TOTAL SOLAR IRRADIANCE MEASUREMENTS 1. Active Cavity Radiometer Irradiance Monitor 2. Solar Constant PAYLOAD MISSION-PECULIAR/MISSION DEPENDENT EQUIPMENT - Global Pointing System			Physiological and Anatomical Rodent Experiment/National Institutes of Health - Rodents (PARE - NIH-R) Protein Crystal Growth Experiments Space Tissue Loss/National Institutes of Health - Cells (STL-NIH-C) Space Acceleration Measurement System Heat Pipe Performance Experiment		
			<u>SPECIAL PAYLOAD MISSION KITS:</u>		
			RMS 202		

CARGO SUMMARY		MISSION SEQUENCE: 67		STS-63	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>ATTACHED PLB PAYLOADS (CONT'D)</u>		
19,108	2674	19,051	Gas Permeable Polymer Membrane Fluids Generic Bioprocessing Apparatus Protein Crystal Growth - Small Thermal Enclosure Sys Immunology Experiment National Institute of Health - Cells Radiation Monitoring Experiment - III Space Acceleration Measurement System Window Experiment Trajectory Control Sensor Cryogenic System Experiment Shuttle Glow - 2 Experiment IMAX Cargo Bay Camera		
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOADS:</u>		
SPARTAN - 204 Deployed Wt. 2651 lb Retrieval Wt. 2617 lb ODERACS Deployed Wt. 23.0 lb			Solid Surface Combustion Experiment Air Force Maui Optical Site		
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>		
SPACEHAB - 3 Astroculture IV Bio Serve Pilot Laboratory Protein Crystallization Facility 3 Dimensional Microgravity Accelerometer Biological Research in Canisters Commercial Generic Processing Apparatus Charlotte Chromosome and Plant Cell Division in Space Commercial Protein Crystal Growth - Vapor Diffusion Apparatus Charged Particle Directional Spectrometer Cosmic Radiation Effects and Activation Monitoring Equipment for Controlled Liquid Phase & Sintering Experiment			RMS 201 Payload Recorder		

CARGO SUMMARY		MISSION SEQUENCE: 68	STS-67	ORBITER OV-105
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>CREW COMPARTMENT PAYLOADS:</u>	
20,250	0	20,250	Middeck Active Control Experiment Protein Crystal Growth Experiments Commercial Materials Dispersion Apparatus Instrumentation Technology Associates Experiment Shuttle Amateur Radio Experiment - II	
<u>DEPLOYABLE PAYLOADS:</u>			<u>GAS (Getaway Special):</u>	
None			G-387 - Ultraviolet Telescope G-388 - Ultraviolet Telescope	
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
Astro-2 Obervatory Instrument Pointing System (IPS) Hopkins Ultraviolet Telescope (HUT) Ultraviolet Imaging Telescope (UIT) Wisconsin Ultraviolet PhotoPolarimeter Experiment (WUPPE)			RMS 303	

CARGO SUMMARY		MISSION SEQUENCE: 69	STS-71	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>CREW COMPARTMENT PAYLOADS:</u>	
18,299	0	18,299	Protein Crystal Growth Experiment Space Acceleration Measurement Experiment IMAX Camera System Shuttle Amateur Radio Experiment II	
<u>DEPLOYABLE PAYLOADS:</u>			<u>RISK MITIGATION EXPERIMENT:</u>	
None			1301 - Mated Model and MIR Structural Dynamic Test	
<u>ATTACHED PAYLOAD BAY PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
SPACELAB Metabolic Research Cardiovascular and Pulmonary Research Neurosensory Research Hygiene, Sanitation and Radiation Research Behavior and Performance Research Fundamental Biology Research Microgravity Research			Orbiter Docking System	

CARGO SUMMARY		MISSION SEQUENCE: 70	STS-70	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>GETAWAY SPECIALS (GAS)</u>	
44,232	37,575	6,657	None	
<u>DEPLOYABLE PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
Tracking and Data Relay Satellite - G/Inertial Upper Stage Deployable Weight: 37,575 lb				
<u>ATTACHED PAYLOAD BAY PAYLOADS:</u>				
None			None	
<u>CREW COMPARTMENT PAYLOADS:</u>				
Physiological and Anatomical Rodent Experiments/National Institute of Health Rodents Bioreactor Demonstration System Commercial Protein Crystal Growth Experiment Space Tissue Loss Experiment Bioresearch in Canister Experiment Shuttle Amateur Radio Experiment II Vision Function Tester Hand-Held, Earth-Oriented, Cooperative, Real-Time, User Friendly, Location Targeting and Environmental System Microencapsulation in Space-B Experiment Window Experiment Radiation Monitoring Experiment Military Application of Ship Tracks				

CARGO SUMMARY		MISSION SEQUENCE: 71	STS-69	ORBITER OV-105
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>CREW COMPARTMENT PAYLOADS:</u>	
25,352	7,206	25,304	Space Tissue Loss/National Institute of Health - Cells Commercial Generic Bioprocessing Apparatus Biological Research in Canister Electrolysis Performance Improvement Concept & Study Commercial Materials Dispersion Apparatus Instrumentation Technology Associates Experiment	
<u>DEPLOYABLE PAYLOADS:</u>			<u>GAS (Getaway Special):</u>	
1. Shuttle Pointed Autonomous Research Tool for Astronomy - (SPARTAN) 201-03 Deployable Weight: 2800 lb Retrievable Weight: 2758 lb			G-515: Control Flexibility Interaction Experiment G-645: Structural Damping Evaluation of Electrorheological Fluid-filled Beans in Space	
2. Wake Shield Facility (WSF): Deployable Weight: 4358 lb Retrievable Weight: 4352 lb			G-702: Microgravity Smoldering Combustion Experiment G-726: Joint Damping Experiment	
<u>ATTACHED PAYLOAD BAY PAYLOADS:</u>			<u>RISK MITIGATION EXPERIMENT:</u>	
1. International Extreme Ultraviolet Hitchhiker a. Solar Extreme Ultraviolet Hitchhiker b. UV Spectrograph Telescope for Astronomical Research			1311: Relative Global Position System	
2. Shuttle Glow Experiment			<u>SPECIAL PAYLOAD MISSION KITS</u>	
3. Capillary Pumped Loop/Getaway Special Bridge Assembly a. Capillary Pumped Loop Demonstration b. Thermal Energy Storage			RMS 303 EVA Task Board	

CARGO SUMMARY		MISSION SEQUENCE: 72	STS-73	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	11. Zeolite Crystal Growth Furnace 12. Glovebox Facility 13. Interface Configuration Experiment 14. Oscillatory Thermocapillary Flow Experiment 15. Fiber Supported Droplet Combustion 16. Protein Crystal Growth - Glovebox 17. Zeolite Crystal Growth-Glovebox 18. Colloidal Disorder/Order Transitions 19. Particle Dispersion Experiment 20. Protein Crystal Growth Experiments 21. Crystal Growth by Liquid-Liquid Diffusion 22. Advanced Protein Crystallization Facility 23. Commercial Generic Bioprocessing Apparatus 24. Astroculture Facility and Experiment 25. Space Acceleration Measurement System 26. Three Dimensional Microgravity Accelerometer 27. Suppression of Transient Accelerations by Levitation Evaluation 28. High Packed Digital Television Technical Demonstration	
25,167	0	25,167		
<u>DEPLOYABLE PAYLOADS:</u>				
None			<u>CREW COMPARTMENT PAYLOADS:</u> Single Locker Protein Crystal Growth Commercial Protein Crystal Growth Orbital Acceleration Research Experiment	
<u>ATTACHED PAYLOAD BAY PAYLOADS:</u>				
United States Microgravity Laboratory (USML)-2 1. Surface Tension Driven Convection Experiment 2. Drop Physics Module 3. Drop Dynamics Experiment 4. Science and Technology of Surface-Controlled Phenomena 5. Geophysical Fluid Flow Cell Experiment 6. Crystal Growth Furnace 7. Orbiter Processing of High Quality Cadmium Zinc Telluride Compound Semiconductors 8. Study of Dopant Segregation Behavior During Crystal Growth of Gallium Arsenide 9. Crystal Growth of Selected 1/-V1 Semiconducting Alloys by Directional Solidification 10. Vapor Transport Crystal Growth of Mercury Cadmium Telluride in Microgravity				

CARGO SUMMARY		MISSION SEQUENCE: 73	STS-74	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>CREW COMPARTMENT PAYLOADS:</u> Shuttle Amateur Radio Experiment - II	
13,525	9,066	13,860		
<u>DEPLOYABLE PAYLOADS:</u>				
Docking Module Deployment Weight: 9,066 lb			<u>SPECIAL PAYLOAD MISSION KITS:</u> RMS: 301 Orbiter Docking Module Russian Logistics - 949 lb	
<u>ATTACHED PLB PAYLOADS:</u>				
IMAX Cargo Bay Camera Shuttle Glo Experiment Photogrammetric Appendage Structural Dynamics Experiment				

CARGO SUMMARY		MISSION SEQUENCE: 74	STS-72	ORBITER OV-105
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>CREW COMPARTMENT PAYLOADS:</u>	
14,353	2579		Physiological and Anatomical Rodent Experiment/NIH - Rodents Experiment Space Tissue Loss/NIH - Cells Experiment Protein Crystal Growth - Single Locker TES Commercial Protein Crystal Growth - 8	
<u>DEPLOYABLE PAYLOADS:</u>			<u>GET-AWAY SPECIALS (GAS):</u>	
OAST-FLYER (SPARTAN) Deployable Weight: 2579 lb Retrieval Weight:			G-342 Flexible Beam Experiment 2 G-459 Protein Crystal Growth	
SPACE FLYER UNIT Retrieval Weight: 7670 lb				
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
Shuttle Solar Backscatter Ultraviolet Experiment Shuttle Laser Altimeter Payload Thermal Energy Storage - 2 Experiment			RMS:	

CARGO SUMMARY		MISSION SEQUENCE: 75	STS-75	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>CREW COMPARTMENT PAYLOADS:</u>	
23,346	1396	21,950	Orbital Acceleration Research Experiment Middeck Glovebox Commercial Protein Crystal Growth	
<u>DEPLOYABLE PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
Tethered Satellite System Deployed Weight: 1396 lb* * Tether broke and TSS was lost:			RMS:	
<u>ATTACHED PLB PAYLOADS:</u>				
United States Microgravity Payload - Advanced Automated Directional Solidification Furnace Isothermal Dendritic Growth Experiment Material pour L'Etudedes Phenomenes Interessant la Solidification Sur Terre eten Orbite Experiment Critical Fluid Light Scattering Experiment				

CARGO SUMMARY		MISSION SEQUENCE: 76	STS-76	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>CREW COMPARTMENT PAYLOADS:</u>	
14,888	--	14,488	KIDSAT PROJECT Shuttle Amateur Radio Experiment Middeck Glovebox Passive Thermal Control Unit	
<u>DEPLOYABLE PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
Mir Environmental Effects Payload - 213 lb			Orbiter Docking System	
<u>ATTACHED PLB PAYLOADS:</u>				
Spacehab Module Russian Logistics EVA tools Risk Mitigation Experiments (6) Biorack (II Experiments) Mir transfer items				

CARGO SUMMARY		MISSION SEQUENCE: 77	STS-77	ORBITER OV-105
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>CREW COMPARTMENT PAYLOADS:</u> Brilliant Eyes Ten Kelvin SorptionCryocooler Experiment Aquatic Research Facility Biological Research in Canisters Tank Pressure Control Experiment Commercial Vapor Diffusion Apparatus - National Institutes of Health - Cells -07	
27322	1993	27310		
<u>DEPLOYABLE PAYLOADS:</u>			<u>GET-AWAY SPECIALS (GAS)</u> G-056 - Gamma Ray Astrophysics Mission G-142/144 - Autonomous Material Science Experiments G-163 - Diffusion Coefficient Measurement Facility G-200 - Utah State University Experiments (3) G-490 - British Sugar p/c. (2) G-564 - Nanocrystal GAS G-565 - Atlantic Canada Thin Organic Semiconductors G-703 - Microgravity Smoldering Combustion G-741 - Nucleate Pool Boiling Heat Transfer	
SPARTAN 207/IAE Deployed Weight: 1878 lb Retrieved Weight: 1866 lb PAMS/STU Deployed Weight: 115 lb				
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
SPACEHAB 4 Advanced Separation Process for Organic Materials Commercial Generic Bioprocessing Apparatus Plant Generic Bioprocessing Apparatus Fluids Generic Bioprocessing Apparatus Gas Permeable Polymer Membrane Hand-Held Diffusion Test Cell Commercial Float Zone Furnace Space Experiment Facility TECHNOLOGY EXPERIMENTS FOR ADVANCING MISSIONS IN SPACE (TEAMS) Global Positioning System Attitude and Navigation Experiment Vented Tank Resupply Experiment Passive Aerodynamically Stabilized Magnetically Damped Satellite/Satellite Test Unit Liquid Metal Thermal Experiment				

CARGO SUMMARY		MISSION SEQUENCE: 78	STS-78	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>ATTACHED PLB PAYLOADS (Continued):</u> Space Biology experiments - 3 investigations Microgravity Science Bubble, Drop and Particle Unit - 6 investigations Advanced Gradient Heating Facility - 6 investigations Advanced Protein Crystallization Facility - 12 Investigations Accelerometers Space Acceleration Measurement System Orbital Acceleration Research Experiment Microgravity Measurement Assembly	
23,537	--	23,537		
<u>DEPLOYABLE PAYLOADS:</u>			<u>CREW COMPARTMENT PAYLOADS:</u> Shuttle Amateur Radio Experiment	
None				
<u>ATTACHED PLB PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u> Orbiter Docking System	
SPACELAB - LIFE AND MICROGRAVITY SCIENCES Human Physiology Investigations Musculoskeletal - 6 investigations Metabolic - 2 investigations Pulmonary - 1 investigation Human Behavior and Performance - 2 investigations Neuroscience - 2 investigations				

CARGO SUMMARY		MISSION SEQUENCE: 79	STS-79	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB		<u>CREW COMPARTMENT PAYLOADS:</u>	
19,039	3170		Commercial Protein Crystal Growth SAREX-II Extreme Temperature Translation Furnace IMAX Biotechnology System Materials in Devices as Super Conductor IMAX Camera Midcourse Space Experiment	
<u>DEPLOYABLE PAYLOADS:</u>			<u>GET-AWAY SPECIALS (GAS)</u>	
MIR Support Equipment and Experiments: 3170 lb Retrievable MIR Support Equipment and Experiments: 2126 lb			None	
<u>ATTACHED PAYLOADS</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
Spacehab Double Module Science Experiments 1. Mechanics of Granular Materials 2. Shuttle Acceleration Measurement System 3. Commercial Generic Bioprocessing Apparatus Risk Mitigation Experiments 1. RME 1302 - MIR Electric Field Characteristics 2. RME 1303 - Shuttle MIR Experiment Kit Transport 3. RME 1310 - Shuttle MIR Alignment Stability 4. RME 1312 - Intravehicular Radiation Environment Measurement 5. RME 1313 - Active Rack Isolation System 6. RME 1319 - Inventory Management System			Orbiter Docking System Double Spacehab Module	

CARGO SUMMARY		MISSION SEQUENCE: 80	STS-80	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>CREW COMPARTMENT PAYLOADS:</u>	
21422	12428	21324	Midcourse Space Experiment Physiological and Anatomical Rodent Experiment Rodents Cell Culture Module Osteoblast Adhesion and Phenotype in Microgravity Biological Research in Canister-09 Commercial Materials Dispersion Apparatus ITA Experiment Visualization in an Experimental Water Capillary Pumped Loop Risk Mitigation Experiments	
<u>DEPLOYABLE PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
Orbiting Retrievable Far and Extreme Ultraviolet Spectrometer -Shuttle Pallet Satellite Deployed Weight: 7784 lb Retrieved Weight: 7692 lb Wake Shield Facility Deployed Weight: 4644 lb Retrieved Weight: 4638 lb			RMS	
<u>ATTACHED PAYLOADS</u>				
Space Experiment Module a. Charleston, S.C. experiments b. Purdue University experiments				

CARGO SUMMARY		MISSION SEQUENCE: 81	STS-81	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>CREW COMPARTMENT PAYLOADS:</u>	
19156		19156	Surface Sampler Kit/Microbial Air Sampler Cosmic radiation Effects and Activation Monitor Risk Mitigation Experiments RME 1302 RME 1303-1 RME 1303-2 RME 1303-3 RME 1307 RME 1317 RME 1318 RME 1324 RME 1324 Crew medical Restraint System Space Station Crew Middeck Interface Functionality Kid Sat Project Midcourse Correction Experiment Space Acceleration Measurements System	
<u>DEPLOYABLE PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
None			Double Spacehab Module	
<u>ATTACHED PAYLOADS</u>				
Biorack Return Payloads Commerical Generic Bioprocessing Apparatus Biotechnology System				

CARGO SUMMARY		MISSION SEQUENCE: 82	STS-82	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	HST Solar Array Drive Electronics HST Optical Control Electronics Enhancement Kit HST Data Interface Unit EVA Tools and Crew Aids	
16497		16497	Returned Hardware: Goddard High Resolution Spectrograph Faint Object Spectrograph Fine Guidance Sensor Engineering/Science Tape Recorder (2) Data Interface Unit Reaction Wheel Assembly Solar Array Drive Electronics	
<u>DEPLOYABLE PAYLOADS:</u> Hubble Space Telescope Replacement Equipment Deployed Wt Retrieved Wt			<u>CREW COMPARTMENT PAYLOADS:</u> Midcourse Space Experiment	
<u>ATTACHED PAYLOADS</u> Deployed Hardware: HST Near-Infrared Camera and Multi-Object Spectrometer HST Space Telescope Imaging Spectrograph HST Fine Guidance Sensor HST Solid State Recorder HST Engineering Science Tape Recorder HST Reaction Wheel Assembly			<u>SPECIAL PAYLOAD MISSION KITS:</u> RMS: 301	

CARGO SUMMARY		MISSION SEQUENCE: 83	STS-83	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	Microgravity Measurement Assembly Space Acceleration Measurement System Quasi Steady Acceleration Measurement Orbital Acceleration Research Experiment Cryogenic Flexible Diode Experiment	
25082		25082	<u>CREW COMPARTMENT PAYLOADS:</u> Shuttle Amateur Radio Experiment - II Middeck Glove Box Midcourse Space Experiment Wireless Data Acquisition System	
<u>DEPLOYABLE PAYLOADS:</u> None			<u>SPECIAL PAYLOAD MISSION KITS:</u> Microgravity Science Laboratory (MSL-1)	
<u>ATTACHED PAYLOADS</u> Droplet Combustion Experiment Physics of Hard Spheres Experiment Large Isothermal Furnace Electromagnetic Containerless Processing Facility Biotechnology				

CARGO SUMMARY		MISSION SEQUENCE: 84	STS-84	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>CREW COMPARTMENT PAYLOADS</u> Protein Crystal Growth - Single Locker Thermal Enclosure System Fundamental Biology Beetle Kit Gaseous Nitrogen Freezer Dewar Experiment Cosmic Radiation Effects and Activation Monitor Risk Mitigation Experiments (6)	
19582	3682	18030	<u>SPECIAL PAYLOAD MISSION KITS:</u> RMS: Double Spacehab Module Shuttle/Mir Experiment Transport Kit (RME-1303)	
<u>DEPLOYABLE PAYLOADS:</u> None				
<u>ATTACHED PAYLOADS</u> Russian Logistics Biorack 11 Experiments Self-Standing Drawer/Morphological Transition and Model Substances Commercial Vapor Diffusion Apparatus Liquid Motion Experiment				

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CARGO SUMMARY		MISSION SEQUENCE: 85		STS-94	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	Microgravity Measurement Assembly Space Acceleration Measurement System Quasi Steady Acceleration Measurement Orbital Acceleration Research Experiment Cryogenic Flexible Diode Experiment		
25556	0	25556			
<u>DEPLOYABLE PAYLOADS:</u> None			<u>CREW COMPARTMENT PAYLOADS</u> Shuttle Amateur Radio Experiment-II Middeck Glove Box Midcourse Space Experiment Wireless Data Acquisition System		
<u>ATTACHED PAYLOADS</u> Droplet combustion Experiment Physics of Hard Spheres Experiment Large Isothermal Furnace Electromagnetic Containerless Process Facility Biotechnology			<u>SPECIAL PAYLOAD MISSION KITS:</u> Microgravity Science Laboratory (MSL-1)		

CARGO SUMMARY		MISSION SEQUENCE: 86		STS-85	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	Two-Phase Fluid Loop Experiment Evaluation of Space Environment and Effects on Materials International Extreme Ultraviolet Hitchhiker a..Solar Extreme Ultraviolet Hitchhiker Research b Ultraviolet Spectrograph Telescope for Astronomical Advancement c Distribution and Automation Technology d Arizona Air Glow Experiments Southwest Ultraviolet Imaging System Get Away Special Payloads (2)		
24933	7154	24801			
<u>DEPLOYABLE PAYLOADS:</u> Cryogenic Infrared Spectrometers and Telescopes for the Atmosphere-Shuttle Pallet Satellite (CRISTA-SPAS Deployment Weight Retrieval Weight					
<u>ATTACHED PAYLOADS</u> Middle Atmosphere High Resolution Spectrograph Investigation Technology Application and Science a. Solar Constant Experiment b. Infrared Spectral Imaging Radiometer c. Shuttle Laser Altimeter d. Critical Viscosity of Xenon e. Two-Phase Flow Experiment f. Cryogenic On-Orbit Long Life Active Refrigerator Flight Experiment Space Experiment Module Seven Student Experiments Stand Alone Acceleration Measurement Device and Wide Band Stand Alone Acceleration Measurement Device Manipulator Flight Demonstration Payload			<u>CREW COMPARTMENT PAYLOADS</u> Protein Crystal Growth/Single Locker Thermal Enclosure System Midcourse Space Experiment Shuttle Ionospheric Modification with Pulsed Local Exhaust Biological Research in Canisters Solid Surface Combustion Experiment Bioreactor Demonstration System Risk Mitigation Experiments (1)		
			<u>SPECIAL PAYLOAD MISSION KITS:</u> RMS		

CARGO SUMMARY		MISSION SEQUENCE: 87	STS-86	ORBITER OV-104
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>CREW COMPARTMENT PAYLOADS</u>	
21293	5645	20516	Midcourse Space Experiment Physiological and Anatomical rodent Experiment NIH-Rodents Cell Culture Experiment Osteoblast Adhesion and Phenotype in Microgravity Biological Research in Canisters Commercial Materials Dispersion Apparatus ITA Experiment Visualization in an Experimental Water Capillary Pumped Loop Risk Mitigation Experiments 1309 1311	
<u>DEPLOYABLE PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
None			RMS: 202 arm	
<u>ATTACHED PAYLOADS</u>				
Space Experiment Module (Eight School Experiments) Mir Resupply Mission				

CARGO SUMMARY		MISSION SEQUENCE: 88	STS-87	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>CREW COMPARTMENT PAYLOADS</u>	
22130	0	22130	Cable Caddy Shuttle Ozone Limb Sounding Equipment Loop Heat Pipe Get Away Special (JG-036) Space Acceleration Measurement System Orbital Acceleration Research Experiment	
<u>DEPLOYABLE PAYLOADS:</u>			<u>SPECIAL PAYLOAD MISSION KITS:</u>	
SPARTAN-201-04 Deployable Weight: 2980 Retrievable Weight:			Microgravity Glovebox Facility Automated Rendezvous and Capture Video Guidance Sensor Light Experiment Collaborative Ukrainian Experiment Autonomous EVA Robotic Camera Sprint	
<u>ATTACHED PAYLOADS</u>			RMS: Body Restraint Tether Crane	
United States Microgravity Payload-04 Advanced Automated Directional Solidification Furnace (AASDF) Confined Helium Experiment Isothermal Dendritic Growth Experiment Materials for the Study of Interesting Phenomena of Solidification on Earth and in Orbit (MEPHISTO) Wetting Characteristics of Immiscibles Particle Engulfment and Pushing by a Solid/Liquid Interface Space Acceleration Measurement System Orbital Acceleration Research Experiment Battery Orbital Replacement Unit				

CARGO SUMMARY		MISSION SEQUENCE: 89	STS-89	ORBITER OV-105
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>CREW COMPARTMENT PAYLOADS</u> Advanced Astroculture Biochemistry of Three Dimensional Tissue Biotechnology Refrigeration Thermal Electric Holding Module Thermal Electric Holding Facility Biological Closed Aquatic System CoCulture Cosmic Radiation Effects and Activation Monitor Earth Cam Human Performance Microgravity Plan Nutrient Experiment Simplex	
21849	10340	25548		
<u>DEPLOYABLE PAYLOADS:</u> Russian Logistics Water 1615 lb				
<u>ATTACHED PAYLOADS</u> Advanced X-Ray Detector Advanced Commercial Generic Bioprocessing Apparatus Mechanics of Granular Material Getaway Specials G-093 Vortex Ring Transit Experiment G-141 Structure of G-145 Glass Fining G-432 Five Chinese Experiments			<u>SPECIAL PAYLOAD MISSION KITS:</u> RMS:	

CARGO SUMMARY		MISSION SEQUENCE: 90	STS-90	ORBITER OV-102
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	Neurobiology - 2 Experiments Getaway Special Payloads G-197 Pulse Tube Cooling Technology G-744 Ozone Measurement G-772 Collisions in Dust Experiment	
26530	0	26530		
<u>DEPLOYABLE PAYLOADS:</u> None			<u>CREW COMPARTMENT PAYLOADS</u> Bioreactor Demonstration System -04	
<u>ATTACHED PAYLOADS</u> Neurolab Autonomic Nervous System - 4 Experiments Sensory Motor Performance - 3 Experiments Vestibular - 2 Experiments Sleep - 2 Experiments Mammalian Development - 4 Experiments Neuronal Plasticity - 3 Experiments Aquatic - 2 Experiments			<u>SPECIAL PAYLOAD MISSION KITS:</u>	

CARGO SUMMARY		MISSION SEQUENCE: 91	STS-91	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	<u>CREW COMPARTMENT PAYLOADS</u> Shuttle Amateur Radio Experiment -II Cosmic Radiation Effects and Active Monitor Commercial Protein Crystal Growth Solid Surface Combustion Experiment Shuttle Ionospheric Modification with Pulsed Local Exhaust	
26237	4950	26042		
<u>DEPLOYABLE PAYLOADS:</u> Russian Logistics Deployed Weight: Returned Weight				
<u>ATTACHED PAYLOADS</u> Alpha Magnetic Spectrometer Getaway Specials G-090, G-648, G-743 and G765			<u>SPECIAL PAYLOAD MISSION KITS:</u> RMS: 201 Spacehab Module	

CARGO SUMMARY		MISSION SEQUENCE: 92	STS-95	ORBITER OV-103
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	Vapor Diffusion Apparatus/Single Locker Thermal Enclosure system Getaway Special - 2 Experiments Space Experiment Module - 8 Experiments SPARTAN 021-5 (2 Studies and 3 Experiments)	
28804	3105	28649		
<u>DEPLOYABLE PAYLOADS:</u> PAN SAT Satellite Deployed Weight: 127 lb SPARTAN 201 Deployed Weight 2978 Retrieved Weight 2950			<u>CREW COMPARTMENT PAYLOADS</u> Biological Research in Canisters Electronic Nose	
<u>ATTACHED PAYLOADS</u> Spacehab Payloads(24 Experiments) Hubble Space Telescope Orbital Systems Test Platform Cryogenic Thermal Storage Unit International Extreme Ultraviolet Hitchhiker - 5 Experiments			<u>SPECIAL PAYLOAD MISSION KITS:</u> RMS: ARM 201 Spacehab Module	

CARGO SUMMARY		MISSION SEQUENCE: 93	STS-88	ORBITER OV-105
PAYLOAD-CHARGEABLE CARGO WEIGHT AT LIFT-OFF, LB	DEPLOYED P/L WEIGHT, LB	RETURNED CARGO WEIGHT, LB	EVA Required Tools and Support Equipment Getaway Special G-093 Vortex Ring Transit Experiment	
31363	27843	11382	<u>CREW COMPARTMENT PAYLOADS</u>	
<u>DEPLOYABLE PAYLOADS:</u> Launch Package 2 of ISS (Unity and Zoyra) Deployable Weight Mighty Sat 1 Deployable Weight 146 Sac A Deployable Weight 150			SIMPLEX Space Experiment Module (14 Experiments)	
<u>ATTACHED PAYLOADS</u> IMAX Cargo Bay Camera Alkali Metal Thermal-to Electric Converter/Automated Water Cartridge System (AMTEC/AWCS)			<u>SPECIAL PAYLOAD MISSION KITS:</u> RMS: 202 Third EMU	