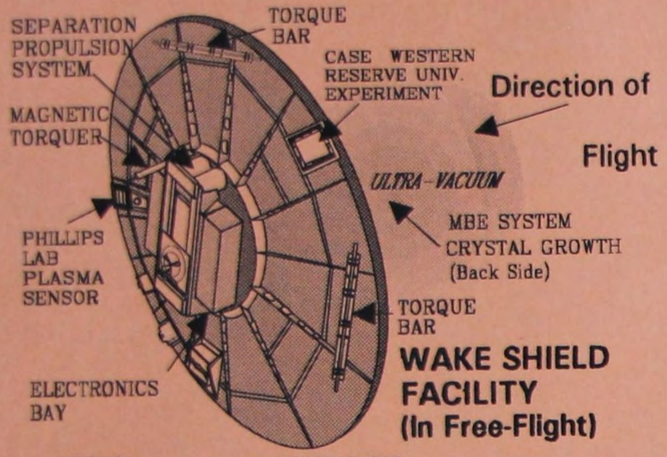
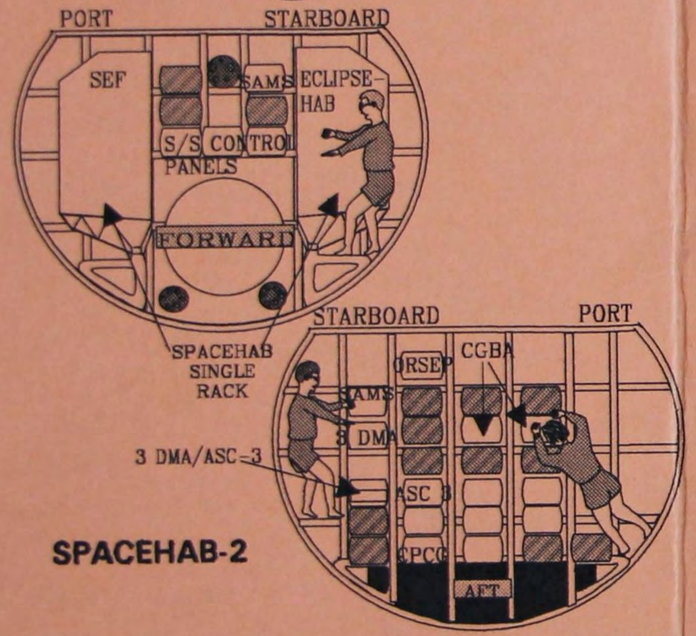


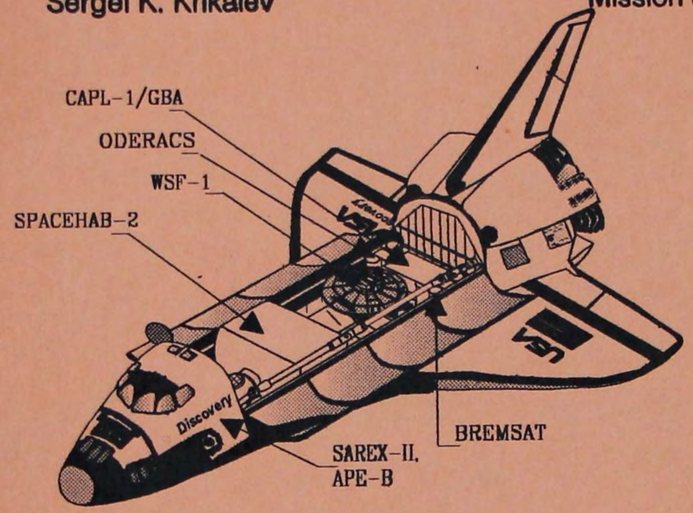
WAKE SHIELD FACILITY (In Free-Flight)



SPACEHAB-2

Crew:

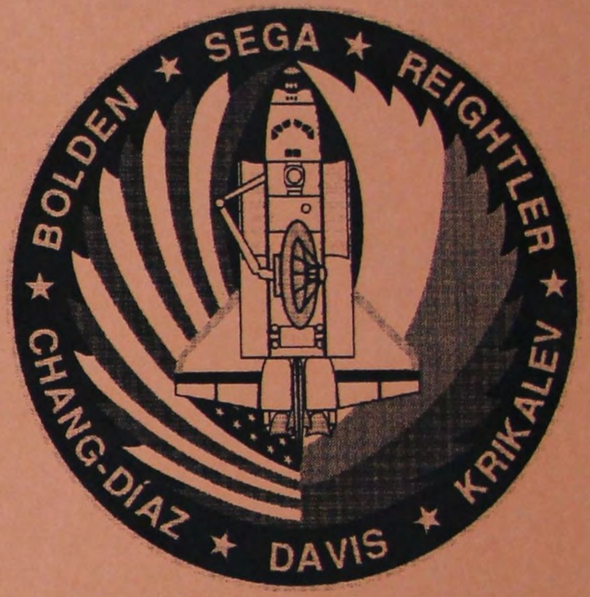
Charles F. Bolden	Commander
Kenneth S. Reightler, Jr.	Pilot
Franklin R. Chang-Diaz	Mission Specialist
N. Jan Davis	Mission Specialist
Ronald M. Sega	Mission Specialist
Sergei K. Krikalev	Mission Specialist



Profile Summary

Nominal Launch Time:	6:10 AM CST
Orbit Inclination:	57 Degrees
Initial Orbital Altitude:	190 nm
Mission Duration:	197 Hr 32 Min
Landing Time at KSC:	11:42 AM CST

STS-60
DISCOVERY OV -103



NASA - JSC

FLIGHT INTEGRATION OFFICE
February 1994
STS-60 Flight Integration Manager
Dianne Murphy/TM2

STS-60 EVENTS TIMELINE

MAJOR EVENTS	MET*	CST**
FLIGHT DAY 1	**MIN:SEC**	**HR:MIN**
ASCENT		
SRB IGNITION	0:00	6:10 AM
MAX DYNAMIC PRESSURE	01:03	6:12 AM
SRB SEPARATION	08:40	6:18 AM
MECO (186/40 NM)	08:50	6:19 AM
OMS 2 CUTOFF	45:00	6:55 AM
ON-ORBIT	**DAYS/HRS/MIN**	
PAYLOAD BAY DOOR OPS	0/01:27	7:37 AM
18-0 INGEST - (DSO 202)	0/02:30	8:40 AM
WSF PANEL CHECKS	0/02:30	8:40 AM
KU-BAND ACTIVATION	0/02:45	8:55 AM
CAPL ACTIVATION	0/02:55	9:05 AM
SPACEHAB ACTIVATION	0/03:00	9:10 AM
PSB ACTIVATION	0/03:15	9:25 AM
JOINT SCIENCE OPS (DSO 201,202)	0/05:00	11:10 AM
CPCG SET-UP	0/06:00	12:10 PM
GRP A GAS	0/07:25	1:35 PM
3-DMA	0/07:40	1:50 PM
DTO 623 SET-UP	0/07:55	2:05 PM
FLIGHT DAY 2		
CREW AWAKE	0/19:00	1:10 AM
DTO 670 SET-UP	0/23:00	5:10 AM
RMS CHECKOUT	0/23:10	5:20 AM
DSO 326	1/00:20	6:30 AM
NEURO SET-UP	1/00:50	7:00 AM
BPL ACTIVATION	1/01:35	7:45 AM
SAREX BOISE, IDAHO (HIGH SCHOOL)	1/03:35	9:45 AM
ORSEP ACTIVATION	1/03:50	10:00 AM
SEF TRANSPARENT	1/03:55	10:05 AM
CGBA INITIALIZATION	1/04:10	10:20 AM
GBA INITIALIZATION	1/04:35	10:45 AM
BLACK ENTERTAINMENT TV	1/05:15	11:25 AM
DTO 664	1/07:30	1:40 PM
FLIGHT DAY 3		
CREW AWAKE		
WSF GRAPPLE	1/22:00	4:10 AM
DSO 326, DTO 664	1/22:10	4:20 AM
SPACEHAB OPERATIONS	1/22:25	4:35 AM
DTO 700-7 SET-UP	1/22:25	4:35 AM
CGBA INITIALIZATION	1/22:50	5:00 AM
BPL DEACTIVATION	1/23:00	5:10 AM
WSF UNBERTH	1/23:30	5:40 AM
WSF DEPLOY	2/02:15	8:25 AM
WSF DEPLOY EARLY WINDOW	2/02:19	8:29 AM
WSF DEPLOY WINDOW 1	2/03:50	10:00 AM
WSF DEPLOY WINDOW 2	2/05:22	11:32 AM
ASC-3 ACTIVATION	2/05:40	11:50 AM
WSF DEPLOY WINDOW 3	2/06:54	1:04 PM
FLIGHT DAY 4		
CREW AWAKE	2/19:30	1:40 AM
VESTIBULAR OPERATION (DSO 201)	2/22:20	4:30 AM
SAREX MOSCOW, HS&T FOR YOUTH	2/22:30	4:40 AM
"GOOD MORNING AMERICA"	3/00:00	6:10 AM
CERL ACTIVATION	3/00:10	6:20 AM
ASC-3 CHAMBER TEST	3/01:10	7:20 AM
PCS ACTIVATION/RECONFIGURATION	3/02:50	9:00 AM
SAREX, MARS, PA	3/05:30	11:40 AM
GRP C GAS	3/08:25	14:35 PM
FLIGHT DAY 5		
CREW AWAKE	3/19:30	1:40 AM
RENDEZVOUS-NC4 BURN	3/23:06	5:16 AM
TI BURN	4/02:09	8:19 AM
WSF PLUME IMPINGEMENT-400 FT	4/03:50	10:00 AM
WSF PLUME IMPINGEMENT-200 FT	4/05:05	11:15 AM
WSF GRAPPLE	4/08:00	2:10 PM
FLIGHT DAY 6		
CREW AWAKE	4/20:00	2:10 AM
MATLAB COVER CLOSED	4/22:20	4:30 AM
APE SET-UP	4/23:00	5:10 AM
DSO 201	4/23:20	5:30 AM
CHAWS INITIALIZATION	5/01:35	7:45 AM
WSF BERTH	5/06:25	12:35 PM
RMS POWERDOWN	5/06:45	12:55 PM
CERL DEACTIVATION	5/07:10	1:20 PM
ECLIPSE-HAB ACTIVATION	5/08:15	2:25 PM
PGSC UPSET SET-UP (DTO 656)	5/08:45	2:55 PM
FLIGHT DAY 7		
CREW AWAKE	5/20:00	2:10 AM
DSO 202	5/20:30	2:40 AM
SAREX CHARITON, IA (HIGH SCHOOL)	5/23:30	5:40 AM
DSO 201	6/00:05	6:15 AM
ECLIPSE-HAB DEACTIVATION	6/01:35	7:45 AM
ODERACS DEPLOY	6/02:00	8:10 AM
CREW CONFERENCE	6/04:30	10:40 AM
BPL DEACTIVATION	6/05:00	11:10 AM
SEF OPAQUE ACTIVATION	6/05:15	11:25 AM
BREMSAT DEPLOY	6/07:39	1:49 PM
FLIGHT DAY 8		
CREW AWAKE	6/20:00	2:10 AM
DSO 202	6/20:45	2:55 AM
DSO 201	6/23:00	5:10 AM
RCS HOT FIRE	6/23:25	5:35 AM
FCS C/O	6/23:40	5:50 AM
CNN	7/02:30	8:40 AM
ASC-3 DEACTIVATION	7/03:05	9:15 AM
SAREX-SIDNEY, ME (JAMES DEAN SCHOOL)	7/04:45	10:55 AM
GRP F GAS	7/05:00	11:10 AM
SEF OPAQUE DEACTIVATION	7/05:30	11:40 AM
SAREX STOW	7/05:35	11:45 AM
ERGOMETER STOW	7/05:45	11:55 AM
ORSEP DEACTIVATION	7/06:15	12:25 PM
CABIN STOW	7/06:30	12:40 PM
KU-BAND STOW	7/09:25	3:35 PM
FLIGHT DAY 9		
CREW AWAKE	7/20:30	2:40 AM
SAMS DEACTIVATION	7/23:35	5:45 AM
CAPL DEACTIVATION	7/23:45	5:55 AM
S-HAB DEACTIVATION	7/23:55	6:05 AM
DEORBIT PREPARATION	8/00:25	6:35 AM
DEORBIT BURN	8/04:28	10:42 AM
KSC LANDING	8/05:32	11:42 AM

* MISSION ELAPSED TIME REFERENCED TO SRB IGNITION
** CENTRAL STANDARD TIME ASSUMES LIFTOFF AT 6:10 AM

CARGO BAY PAYLOADS:

WSF (Wake Shield Facility): The WSF experiment will test the creation of an ultra-vacuum to produce extremely pure thin film crystals for industrial uses ranging from microelectronics to lasers and superconductivity. The USAF Charge Analysis and Wake Studies (CHAWS) flight experiment on WSF free flyer will determine whether secondary ion effects are important to high voltage current collection in a plasma wake. The U.S. Army Construction Engineering Research Laboratory (CERL) uses two canisters for its Containerless Coating Process (CONCOP) hot filament thin film deposition experiment. The orbiter plume experiment will determine the PRCS plume impingement effects on the WSF free-flyer.

SPACEHAB-2: The Spacehab is a habitable volume carrying thirteen separated experiments:

ASC-3	Astroculture-3
BPL	Bioserve Pilot laboratory
CGBA	Commercial Generic Bioprocessing Apparatus
CPCG	Commercial Protein Crystal Growth
ECLiPSE-Hab	Equipment for Controlled Liquid Phase Sintering Experiment- Spacehab
IMMUNE-01	Immunology Experiment 01
ORSEP	Organic Separation
PSB	Penn State Biomodule
SAMS	Space Acceleration Measurement System
SEF	Space Experiment Facility
SORF	Sterling Orbiter Refrigerator Freezer
SRE	Sample Return Experiment
3-DMA	3-Dimensional Microgravity Accelerometer

COB/GBA (CAPL/ODERACS/BREMSAT/GAS BRIDGE ASSEMBLY): The GAS Bridge Assembly is an across the bay structure to provide avionics and support for the following payloads and Get-Away-Special (GAS) experiments:

CAPL (Capillary Pumped Loop): The CAPL experiment investigates heat rejection in microgravity as a prototype of the two-phase thermal control system planned for use in the Earth Observing System (EOS) platform.

ODERACS (Orbital Debris Radar Calibration Spheres): The ODERACS experiment will eject six spheres of three different sizes (2 to 6 in.) The spheres will be observed, tracked, and recorded by ground-based radar's and optical telescopes.

BREMSAT (Breman Satellite Experiment): BREMSAT is an ejectable satellite consisting of 6 scientific experiments to operate in various phases through the mission. They are: measurements of heat conductivity , residual acceleration forces, density distribution and dynamics of micrometeorites and dust particles in low orbit, atomic oxygen, exchange of momentum and energy between the molecular flow and the rotating satellite, and pressure and temperature during reentry.

G-071 - Forming perfect spheres from melted alloy pellets
G-514 - Evaluate fogging of photographic emissions due to energetic particles
G-536 - Heat flux and liquid subcooling
G-557 - Demonstration of a two-phase Capillary Pumped Loop

DEVELOPMENT TEST OBJECTIVES (DTO'S):

DTO 301D	Ascent Structural Capability Evaluation
DTO 305D	Ascent Compartment Venting Evaluation
DTO 306D	Descent Compartment Venting Evaluation
DTO 307D	Entry Structural Capability
DTO 312	ET TPS Performance (Method 3)
DTO 319D	Shuttle/Payload Low Frequency Environment
DTO 414	APU Shutdown Test, Sequence B
DTO 623	Cabin Air Monitoring
DTO 656	PGSC Single Event Upset Monitoring
DTO 684	Cabin Temperature Survey
DTO 670	Evaluation of Passive Cycle Isolation System
DTO 700-2	Laser Range and Range Rate Device
DTO 700-7	Orbiter Data for Real-Time Navigation Evaluation
DTO 805	Crosswind Landing Performance

DETAILED SUPPLEMENTARY OBJECTIVES (DSO'S):

DSO 200	Joint U.S./Russian Investigations: Radiobiological Effects
DSO 201	Joint U.S./Russian Sensory-Motor Investigations (SMI)
DSO 202	Joint U.S./Russian Investigations: Metabolic
DSO 204	Joint U.S./Russian Investigations: Visual Observations From Space
DSO 325	Dried Blood Method For In-Flight Storage (Protocol 1)
DSO 326	Window Impact Observations
DSO 487	Immunological Assessment of Crewmembers
DSO 901	Documentary Television
DSO 902	Documentary Motion Picture Photography
DSO 903	Documentary Still Photography