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Technical
Summary
Document

DR-MA-03

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Appendices

Atmospheric, Magnetospheric, and Plasmas in Space (AMPS) Spacelab Payload Definition Study

MARTIN MARIETTA

Bendix

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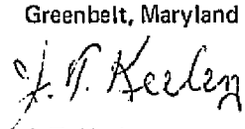
Appendixes

ATMOSPHERIC, MAGNETOSPHERIC AND PLASMAS IN SPACE (AMPS) SPACELAB PAYLOAD DEFINITION STUDY

Prepared for

Goddard Space Flight Center
Greenbelt, Maryland 20771



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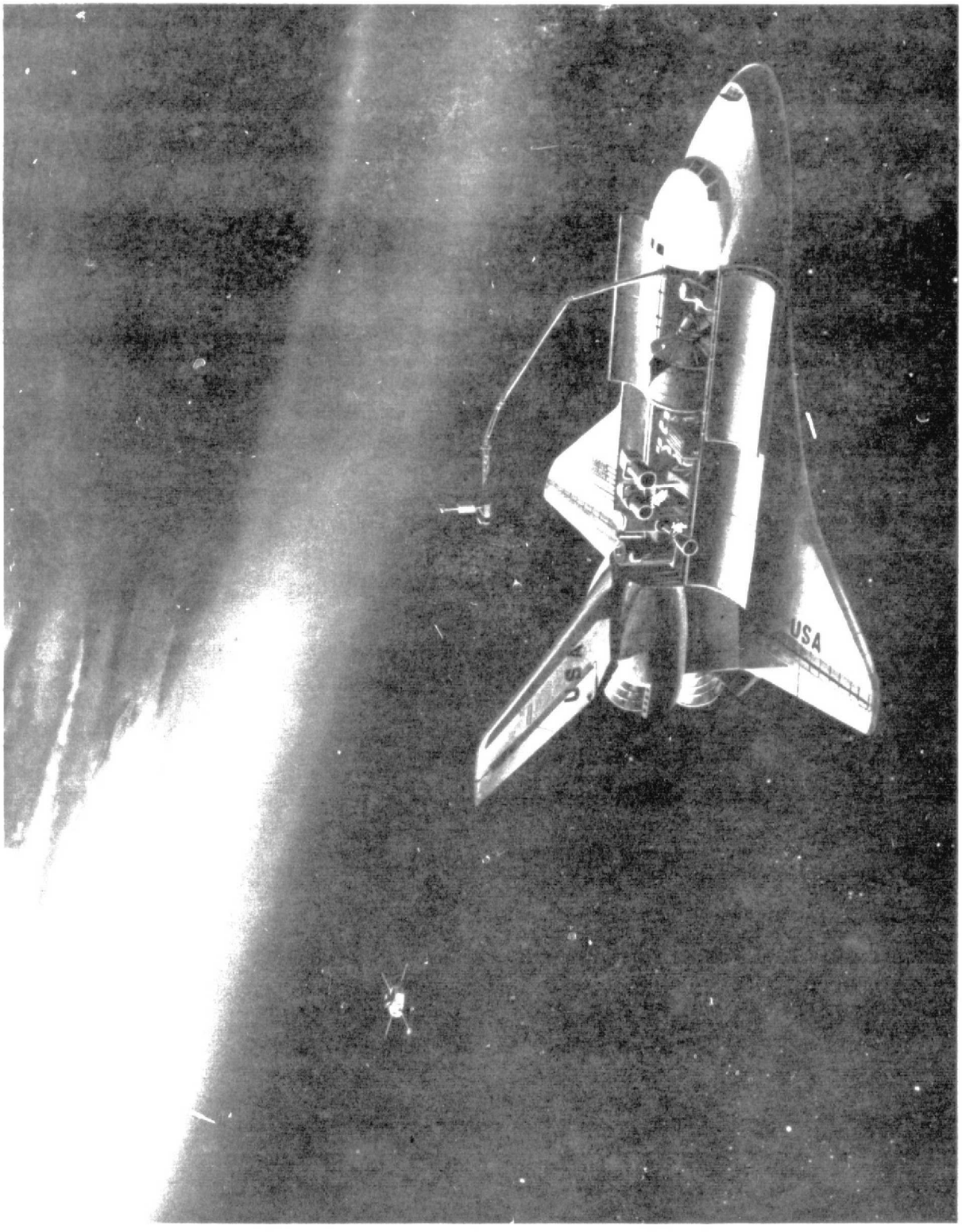

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FOREWORD

The AMPS Technical Summary Document is submitted by Martin Marietta in accordance with Data Procurement Document Number 486, Revision A, of Goddard Space Flight Center NAS8-31689.

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APPENDIX A

EQUIPMENT LIST

AMPS -----FLIGHT 1-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
SPACELAB MODULE	A5	1	3363.00	GFE	GFP	—		
6 METER PALLET TRAIN	A1	1	1236.00	GFE	GFP	—		
3 METER PALLET	A4	1	618.00	GFE	GFP	—		
SL/ORBITER UTILITY BRIDGE	A6	1	218.20	GFE	GFP	—		
TUNNEL	A8	1	352.00	GFE	GFP	—		
TUNNEL ADAPTER	A8	1	408.20	GFE	GFP	—		
P/L ARS FAN AND DUCTING	A8	1	9.50	GFE	GFP	—		
AIRLOCK	A9	1	364.00	GFE	GFP	—		
LESS SHUTTLE AIRLOCK	A9	1	-363.00	GFE	GFP	—		

***** BASIC SPACELAB

PANEL (PNL) CODES (XY)

AMPS/APP/SPP (X)		AMPS (Y)	
Basic Spacelab	A	Orbiter	0
Mission Dependent	B	Pallet Train	1
AMPS Instruments	D	Pallet-Fwd	2
AMPS Labcraft	C	Pallet-Mid	3
		Pallet-Aft	4
		Module	5
		Util Bridge-Fwd	6
		Util Bridge-Aft	7
		Tunnel	8
		Airlock	9

Reuse Code

A = Reuse Flight 1 Equipment with no modification

B = Reuse Flight 1 Equipment with modification

AMPS ------FLIGHT 1--------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
* EXTRA WATER FOR COOLING	BO	1	68.20	GFE	GFP	—		
EPS KIT 2-DRY PLUS RESIDUALS	BO	1	357.02	GFE	GFP	—		
* EPS KIT 2-EXPENDABLES	BO	1	383.30	GFE	GFP	—		
ORBITER HEAT REJECTION KIT	BO	1	87.50	GFE	GFP	—		
LONGERON FITTING-PALLET	BO	1	40.40	GFE	GFP	—		
LONGERON FITTING-PALLET	BO	1	40.40	GFE	GFP	—		
LONGERON FITTING-PALLET	BO	1	40.40	GFE	GFP	—		
LONGERON FITTING-PALLET	BO	1	40.40	GFE	GFP	—		
LONGERON FITTING-PALLET	BO	1	40.40	GFE	GFP	—		
LONGERON FITTING-PALLET	BO	1	40.40	GFE	GFP	—		
LONGERON FITTING-PALLET	BO	1	40.40	GFE	GFP	—		
LONGERON FITTING-PALLET	BO	1	40.40	GFE	GFP	—		
KEEL FITTING-PALLET	BO	1	35.40	GFE	GFP	—		
KEEL FITTING-PALLET	BO	1	35.40	GFE	GFP	—		
LONGERON FITTING-MODULE	BO	1	40.40	GFE	GFP	—		
LONGERON FITTING-MODULE	BO	1	40.40	GFE	GFP	—		
LONGERON FITTING-MODULE	BO	1	40.40	GFE	GFP	—		
LONGERON FITTING-MODULE	BO	1	40.40	GFE	GFP	—		
KEEL FITTING-MODULE	BO	1	35.40	GFE	GFP	—		
LESS ORBITER ALLOWANCE	BO	1	-204.00	GFE	GFP	—		
CREWMAN 5	BO	1	77.10	—	—	—		
CREWMAN 6	BO	1	77.10	—	—	—		
SEAT 5	BO	1	24.50	GFE	GFP	—		
SEAT 6	BO	1	24.50	GFE	GFP	—		
O2 TANKAGE PLUS RESIDUAL	BO	1	37.60	GFE	GFP	—		
* USABLE O2	BO	1	22.70	GFE	GFP	—		
EMERGENCY EQUIPMENT	BO	1	49.50	GFE	GFP	—		
WASTE WATER TANKAGE	BO	1	22.00	GFE	GFP	—		
FOOD	BO	1	28.60	GFE	GFP	—		
HYGIENE EQUIPMENT	BO	1	26.20	GFE	GFP	—		
CREW PROVISIONS	BO	1	25.20	GFE	GFP	—		
LIOH	BO	1	31.90	GFE	GFP	—		
RESTRAINTS	BO	1	1.70	GFE	GFP	—		
STOWAGE VOLUME PENTALY	BO	1	43.90	GFE	GFP	—		
MONITOR AND CONTROL PANEL	BO	1	5.00	GFE	GFP	—		
KEYBOARD	BO	1	3.50	GFE	GFP	—		
CRT DISPLAY/SIGNAL GENERATOR	BO	1	28.90	GFE	GFP	—		
REMOTE STATION, COMMUNICATIO	BO	1	1.50	GFE	GFP	—		
DOUBLE RACK	B5	1	58.10	GFE	GFP	—		
SINGLE RACK	B5	1	37.[illegible]	GFE	GFP	—		
PALLET HARDPOINTS	B1	45	.83	GFE	GFP	—		
INSERTS FOR PANELS	B1	6	6.50	GFE	GFP	—		
EXP SWITCH PANEL	B5	1	12.70	GFE	GFP	—		
EXP SWITCH PANEL	B5	1	12.70	GFE	GFP	—		
EXP SWITCH PANEL	B5	1	12.70	GFE	GFP	—		

AMPS ——FLIGHT I——LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
INVERTER (400 HZ)	B5	1	32.20	GFE	GFP	—		
COLD PLATE-IECM	B4	1	5.50	GFE	GFP	—		
COLD PLATE-ELECT ACCEL	B4	1	5.50	GFE	GFP	—		
COLD PLATE-ELECT ACCEL	B4	1	5.50	GFE	GFP	—		
COLD PLATE-ELECT ACCEL	B4	1	5.50	GFE	GFP	—		
COLD PLATE-ELECT ACCEL	B4	1	5.50	GFE	GFP	—		
COLD PLATE-PEAKING BATTERY	B4	1	5.50	GFE	GFP	—		
COLD PLATE-PS	B4	1	5.50	GFE	GFP	—		
COLD PLATE-RF TERMINAL	B3	1	5.50	GFE	GFP	—		
EXP RAU	B2	1	2.30	GFE	GFP	—		
EXP RAU	B3	1	2.30	GFE	GFP	—		
EXP RAU	B3	1	2.30	GFE	GFP	—		
EXP RAU	B4	1	2.30	GFE	GFP	—		
EXP RAU	B4	1	2.30	GFE	GFP	—		
EXP RAU	B5	1	2.30	GFE	GFP	—		
EXP COMPUTER	B5	1	30.20	GFE	GFP	—		
DIGITAL TAPE RECORDER	B5	1	43.00	GFE	GFP	—		
EXPERIMENT I/O	B5	1	27.50	GFE	GFP	—		
HIGH RATE DIGITAL MUX	B5	1	10.00	GFE	GFP	—		
TAPE AND CANISTERS	B5	15	5.90	GFE	GFP	—		
CONSOL VERTICAL RAILS	B5	4	.50	GFE	GFP	—		
CONSOL HORIZONTAL RAILS	B5	4	.75	GFE	GFP	—		
PSA FOOT RESTRAINTS	B5	6	3.00	GFE	GFP	—		
RACK CLOSEOUT FT RESTRAINTS	B5	4	7.93	GFE	GFP	—		
KEYBOARD	B5	1	3.50	GFE	GFP	—		
CRT AND SYMBOL GENERATOR	B5	1	28.90	GFE	GFP	—		

***** MISSION DEPENDENT EQUIPMENT

AMPS -----FLIGHT 1-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
C AND D PANELS	C5	1	18.00	BUY	BENDIX	NEW		
C AND D PANELS	C5	1	8.40	BUY	BENDIX	NEW		
C AND D PANELS	C5	1	3.00	BUY	BENDIX	NEW		
TV MONITOR	C5	1	10.00	BUY	---	O/S		
OSCILLOSCOPE	C5	1	20.00	BUY	XXX	O/S		10 PERCENT MOD OF AVAILABLE UNIT
C AND W SENSORS-PRESSURE	C2	12	.16	BUY	XXX	NEW		PURCHASE ORBITER OR SPACELAB DES
C AND W SENSORS-TEMPERATURE	C2	8	.16	BUY	XXX	NEW		PURCHASE ORBITER OR SPACELAB DES
SIPS PLATFORM	C3	1	527.00	GFE	GFP	---		INCLUDES ELECTRONICS
TWO AXES GYRO PACKAGE	C3	1	8.00	GFE	GFP	---		FOR CYRO LIMB SCANNER
TWO AXES GYRO PACKAGE	C3	1	8.00	GFE	GFP	---		FOR CYRO IR SPEC
3 AXES GYRO PACKAGE-OBIPS	C4	1	10.00	GFE	GFP	---		
3 AXES GYRO PACKAGE-NIR SPEC	C2	1	10.00	GFE	GFP	---		
MPM PLATFORM-OBIPS	C4	1	56.00	GFE	GFP	---		INCLUDES ELECTRONICS
FIXED HD STAR TRKER-II-7-10	C4	1	4.00	GFE	GFP	---		WITH SUN SHADE
MPM PLATFORM-NIR SPEC	C2	1	56.00	GFE	GFP	---		INCLUDES ELECTRONICS
FIXED HEAD STAR TRACKER-NIR	C2	1	4.00	GFE	GFP	---		WITH SUN SHADE
I/F PLUMBING KITS-PALLET 3	C4	1	12.00	MAKE	MMC	NEW		
THERMAL CURTAIN-PALLET 1	C2	1	10.00	MAKE	MMC	NEW		
THERMAL CURTAIN-PALLET 2	C3	1	10.00	MAKE	MMC	NEW		
THERMAL CURTAIN-PALLET 3	C4	1	10.00	MAKE	MMC	NEW		
EXP HEAT EXCHANGER-LIDAR	C4	1	25.00	BUY	---	NEW		
TCS PUMP-LIDAR	C4	1	10.00	BUY	---	O/S		
COOLANT FILTERS	C4	6	.45	BUY	---	O/S		
MPM CANISTER-NIR SPEC	C2	1	215.00	GFE	GFP	---		
CABLE SET-PALLET 1	C2	1	102.00	MAKE	MMC	NEW		POWER AND SIGNAL SEPARATE
CABLE SET-PALLET 2	C3	1	91.00	MAKE	MMC	NEW		POWER AND SIGNAL SEPARATE
CABLE SET-PALLET 3	C4	1	68.00	MAKE	MMC	NEW		POWER AND SIGNAL SEPARATE
CABLE SET-MODULE TO PALLET	C7	1	57.00	MAKE	MMC	NEW		POWER AND SIGNAL SEPARATE
CABLE SET-MODULE	C5	1	34.00	MAKE	MMC	NEW		POWER AND SIGNAL SEPARATE
CABLE SET-SIPS TO INSTRUMENT	C3	1	40.00	MAKE	MMC	NEW		POWER AND SIGNAL SEPARATE
PULSE POWER SUPPLY-LIDAR	C4	1	95.00	BUY	---	NEW		
PULSE POWER SUPPLY-ACCELER	C4	1	600.00	BUY	---	---		
PEAKING BATTERY	C4	1	40.30	BUY	---	O/S		
ELECTRICAL DIST UNIT	C2	1	10.00	MAKE	MMC	NEW		
ELECTRICAL DIST UNIT	C3	1	10.00	MAKE	MMC	NEW		
ELECTRICAL DIST UNIT	C4	1	10.00	MAKE	MMC	NEW		
FM MODULE	C5	1	21.80	BUY	---	O/S		
SENSOR INTERFACE BOX	C3	1	2.27	MAKE	MMC	NEW		SIPS YOKE 1
SENSOR INTERFACE BOX	C3	1	2.27	MAKE	MMC	NEW		SIPS YOKE 2
SENSOR INTERFACE BOX	C2	1	2.27	MAKE	MMC	NEW		MPM
SENSOR INTERFACE BOX	C4	1	2.27	MAKE	MMC	NEW		MPM
ANALOG RECORDER	C5	1	22.70	BUY	---	O/S		
TRANSIENT RECORDER	C5	5	6.16	BUY	---	O/S		
SWITCHING PANEL	C5	1	3.63	MAKE	MMC	NEW		
VIDEO RECORDER	C5	1	36.30	BUY	---	O/S		

AMPS -----FLIGHT 1-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
COMMAND TRANMITTER	C3	1	.50	BUY	---	O/S		
RF MULTIPLEXER	C3	1	1.36	MAKE	BENDIX	NEW		
WIDE BAND RECEIVER	C3	2	1.13	BUY	---	NEW		
CONICAL ANTENNA	C3	1	.91	MAKE	BENDIX	NEW		
FOR HV POWER SUPPLY	C4	1	12.00	MAKE	MMC	NEW		BASE MOUNT BRACKETRY
FOR INSTRUMENT IV-1	C4	1	1.40	MAKE	MMC	NEW		BASE MOUNT BRACKETRY
FOR INSTRUMENT I-21	C2	1	20.80	MAKE	MMC	NEW		INDIVIDUAL TRUSS MOUNT
FOR INSTRUMENT I-21	C2	1	20.80	MAKE	MMC	NEW		INDIVIDUAL TRUSS MOUNT
FOR INSTRUMENT I-21	C2	1	20.80	MAKE	MMC	NEW		INDIVIDUAL TRUSS MOUNT
FOR INSTRUMENT I-21	C2	1	20.80	MAKE	MMC	NEW		INDIVIDUAL TRUSS MOUNT
FOR INSTRUMENT I-21	C2	1	20.80	MAKE	MMC	NEW		INDIVIDUAL TRUSS MOUNT
FOR INSTRUMENT I-21	C2	1	20.80	MAKE	MMC	NEW		INDIVIDUAL TRUSS MOUNT
INSTRUMENT I-21 PLATFORM	C2	1	65.30	MAKE	MMC	NEW		PLATFORM FOR SIX
FOR INSTRUMENT I-1	C4	1	39.00	MAKE	MMC	NEW		TRUSS SUPPORT
FOR INSTRUMENT II-3	C4	1	20.40	MAKE	MMC	NEW		PTG PLATFORM TO PALLET (TRUSS)
FOR INSTRUMENT II-7	C3	1	6.40	MAKE	MMC	NEW		INSTR TO YOKE
FOR INSTRUMENT II-9	C2	1	20.40	MAKE	MMC	NEW		PTG PLATFORM TO PALLET
FOR INSTRUMENT II-10	C3	1	6.40	MAKE	MMC	NEW		INSTR TO YOKE
FOR IECH	C4	1	22.70	MAKE	MMC	NEW		TRUSS/PLATFORM
FOR ESP	C2	1	13.60	MAKE	MMC	NEW		TRUSS/PLATFORM
FOR BEAM DIAGNOSTIC PACKAGE	C3	1	9.10	MAKE	MMC	NEW		TRUSS/PLATFORM
FOR RF TERMINAL	C3	1	5.00	MAKE	MMC	NEW		BASE MOUNTING BRACKETRY
INSTR TO INSTR I/F STRUCTURE	C4	14	1.14	MAKE	MMC	NEW		SETS OF BRACKETS
THERMAL CURTAIN SPT-PALLET 1	C2	1	11.30	MAKE	MMC	NEW		TRUSS MEMBERS
THERMAL CURTAIN SPT-PALLET 2	C3	1	11.30	MAKE	MMC	NEW		TRUSS MEMBERS
THERMAL CURTAIN SPT-PALLET 3	C4	1	11.30	MAKE	MMC	NEW		TRUSS MEMBERS
L/L LOCKS -OBIPS	C4	1	6.80	MAKE	MMC	NEW		
EMERGENCY JETT-MPM PLATFORM	C4	1	8.20	GFE	GFP	NEW		
CAPTURE RELEASE DEVICE	C3	1	1.80	MAKE	MMC	NEW		BEAM DIAG PKG, FWD
CAPTURE RELEASE DEVICE	C3	1	10.00	MAKE	MMC	NEW		BEAM DIAG PKG, AFT
L/L LOCKS-NIR SPEC	C2	1	1.80	MAKE	MMC	NEW		
L/L LOCKS-NIR SPEC	C2	1	9.10	MAKE	MMC	NEW		
EMERGENCY JETT-MPM PLATFORM	C2	1	8.20	GFE	GFP	NEW		
CAPTURE RELEASE DEVICE	C2	1	10.40	GFE	GFP	NEW		ENVIR SENSOR PKG
PIC(FOR HOLDDOWN NUTS)	C2	6	1.00	MAKE	MMC	O/S		
HOLDDOWN ORDNANCE	C2	18	.10	BUY	---	O/S		FOR GAS RELEASE MODULES

***** AMPS LABCRAFT

AMPS -----FLIGHT 1-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
EMERGENCY JETTISON FOR I-1	D4	1	.90	GFE	GFP	---		COVERS ONLY
LIDAR EMITTER	D4	1	75.00	GFE	GFP	---		FRENCH VERSION
LIDAR EMITTER	D4	1	75.00	GFE	GFP	---		FRENCH VERSION
LIDAR RECEIVER	D4	1	300.00	GFE	GFP	---		FRENCH VERSION

***** LASER SOUNDER (I-1)

AMPS -----FLIGHT 1-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
EMERGENCY JETTISON FOR I-9	D4	1	.90	GFE	GFP	---		COVERS ONLY
ELECTRON ACCEL (I-9)	D4	1	40.50	GFE	GFP	---		
GAS PLUME RELEASE (III-3)	D4	1	9.00	GFE	GFP	---		

***** ELECT ACCELERATOR

AMPS -----FLIGHT 1-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
IECM	D4	1	340.00	GFE	GFP	---		CONTAMINATION PKG FRM

***** IECM

AMPS -----FLIGHT 1-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
SOLAR FLUX MONITOR (IV-1)	D4	1	3.00	GFE	GFP	---		

***** SOLAR FLUX MONITOR

AMPS -----FLIGHT 1-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
OBIPS (II-3)	D4	1	43.00	GFE	GFP	---		S/S 1 ONLY W/SUNSHIELD

***** OBIPS

AMPS -----FLIGHT 1-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
CRYO LIMB SCANNER-DRY (II-7)	D3	1	207.00	GFE	GFP	---		
* CRYO	D3	1	293.00	BUY	---	O/S		

***** CRYO LIMB SCANNER

AMPS ——FLIGHT 1——LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
CRYO IR INTERFEROMETER-DRY	D3	1	215.00	GFE	GFP	---		INSTRUMENT II-10
* CRYO	D3	1	285.00	BUY	---	O/S		INSTRUMENT II-10

***** CRYO IR INTERFEROMETER

AMPS ——FLIGHT 1——LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
WIDE BAND TRANSMITTER	C3	2	.50	BUY	---	O/S		
COMMAND RECEIVER	C3	1	1.00	BUY	---	O/S		
RF MULTIPLEXER	C3	1	1.00	MAKE	BENDIX	NEW		
ANTENNA ,STUB	C3	1	1.00	BUY	---	O/S		
CABLE SET-BEAM DIAG PACKAGE	C3	1	1.50	MAKE	MMC	NEW		POWER AND SIGNAL SEPARATE
POWER SUPPLY	C3	1	29.00	M/B	---	O/S		BATTERY/SWITCHING
STRIP HEATERS	C3	1	1.00	BUY	---	O/S		
MULTILAYER INSULATION	C3	1	4.00	MAKE	MMC	NEW		
SUBCARRIER OSCILLATOR ASSY	C3	1	5.00	BUY	---	O/S		
PCM PROGRAMMER	C3	1	2.00	BUY	---	O/S		
COMMAND DECODER	C3	1	1.50	BUY	---	O/S		
DEPLOY DEVICE (III-2)	C3	1	2.70	MAKE	MMC	NEW		EXTEND AND RETRACT
CAPTURE/RELEASE INTERFACE	C3	1	.50	MAKE	MMC	NEW		
LAUNCH LOCK-VECTOR MAG	C3	1	1.00	MAKE	MMC	NEW		
BASIC STRUCTURE PACKAGE	C2	1	26.00	MAKE	MMC	NEW		
OBIPS (II-3)	D3	1	38.00	GFE	GFP	---		S/S 1 ONLY W/O SUNSHIELD
VECTOR MAGNETOMETER (III-2)	D3	1	4.10	GFE	GFP	---		S/S 2 AND 4 ONLY
LEVEL II DIAGNOSTIC (III-4)	D3	1	23.00	GFE	GFP	---		

***** BEAM DIAGNOSTIC PKG

AMPS -----FLIGHT 1-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
* COMMAND RECEIVER	C2	1	1.00	BUY	---	O/S		
* COMMAND RECEIVER	C2	1	1.00	BUY	---	O/S		
* COMMAND RECEIVER	C2	1	1.00	BUY	---	O/S		
* COMMAND RECEIVER	C2	1	1.00	BUY	---	O/S		
* COMMAND RECEIVER	C2	1	1.00	BUY	---	O/S		
* COMMAND RECEIVER	C2	1	1.00	BUY	---	O/S		
* ANTENNA,STUB	C2	1	1.00	BUY	---	O/S		
* ANTENNA,STUB	C2	1	1.00	BUY	---	O/S		
* ANTENNA,STUB	C2	1	1.00	BUY	---	O/S		
* ANTENNA,STUB	C2	1	1.00	BUY	---	O/S		
* ANTENNA,STUB	C2	1	1.00	BUY	---	O/S		
* ANTENNA,STUB	C2	1	1.00	BUY	---	O/S		
* COMMAND DECODER	C2	1	1.50	BUY	---	O/S		
* COMMAND DECODER	C2	1	1.50	BUY	---	O/S		
* COMMAND DECODER	C2	1	1.50	BUY	---	O/S		
* COMMAND DECODER	C2	1	1.50	BUY	---	O/S		
* COMMAND DECODER	C2	1	1.50	BUY	---	O/S		
* COMMAND DECODER	C2	1	1.50	BUY	---	O/S		
* CABLE SET-GAS RELEASE	C2	1	1.36	MAKE	MMC	NEW		POWER AND SIGNAL SEPARATE
* CABLE SET-GAS RELEASE	C2	1	1.36	MAKE	MMC	NEW		POWER AND SIGNAL SEPARATE
* CABLE SET-GAS RELEASE	C2	1	1.36	MAKE	MMC	NEW		POWER AND SIGNAL SEPARATE
* CABLE SET-GAS RELEASE	C2	1	1.36	MAKE	MMC	NEW		POWER AND SIGNAL SEPARATE
* CABLE SET-GAS RELEASE	C2	1	1.36	MAKE	MMC	NEW		POWER AND SIGNAL SEPARATE
* CABLE SET-GAS RELEASE	C2	1	1.36	MAKE	MMC	NEW		POWER AND SIGNAL SEPARATE
* POWER SUPPLY-GAS RELEASE	C2	1	3.00	B/M	MMC	O/S		BATTERY,SWITCHING
* POWER SUPPLY-GAS RELEASE	C2	1	3.00	B/M	MMC	O/S		BATTERY,SWITCHING
* POWER SUPPLY-GAS RELEASE	C2	1	3.00	B/M	MMC	O/S		BATTERY,SWITCHING
* POWER SUPPLY-GAS RELEASE	C2	1	3.00	B/M	MMC	O/S		BATTERY,SWITCHING
* POWER SUPPLY-GAS RELEASE	C2	1	3.00	B/M	MMC	O/S		BATTERY,SWITCHING
* POWER SUPPLY-GAS RELEASE	C2	1	3.00	B/M	MMC	O/S		BATTERY,SWITCHING
FOR INSTRUMENT I-21	C2	1	6.16	MAKE	MMC	NEW		5 M/S DELTA V
* FOR INSTRUMENT I-21	C2	1	6.40	MAKE	MMC	NEW		5 M/S DELTA V
FOR INSTRUMENT I-21	C2	1	6.16	MAKE	MMC	NEW		5 M/S DELTA V
* FOR INSTRUMENT I-21	C2	1	6.40	MAKE	MMC	NEW		5 M/S DELTA V
FOR INSTRUMENT I-21	C2	1	6.16	MAKE	MMC	NEW		5 M/S DELTA V
* FOR INSTRUMENT I-21	C2	1	6.40	MAKE	MMC	NEW		5 M/S DELTA V
FOR INSTRUMENT I-21	C2	1	6.16	MAKE	MMC	NEW		5 M/S DELTA V
* FOR INSTRUMENT I-21	C2	1	6.40	MAKE	MMC	NEW		5 M/S DELTA V
FOR INSTRUMENT I-21	C2	1	6.16	MAKE	MMC	NEW		5 M/S DELTA V
* FOR INSTRUMENT I-21	C2	1	6.40	MAKE	MMC	NEW		5 M/S DELTA V
FOR INSTRUMENT I-21	C2	1	6.16	MAKE	MMC	NEW		5 M/S DELTA V
* FOR INSTRUMENT I-21	C2	1	6.40	MAKE	MMC	NEW		5 M/S DELTA V
FOR GAS RELEASE INSTR (I-21)	C2	2	.04	BUY	---	O/S		ORDNANCE
FOR GAS RELEASE INSTR (I-21)	C2	2	.04	BUY	---	O/S		ORDNANCE
FOR GAS RELEASE INSTR (I-21)	C2	2	.04	BUY	---	O/S		ORDNANCE

AMPS ------FLIGHT 1--------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
FOR GAS RELEASE INSTR (I-21)	C2	2	.04	BUY	---	O/S		ORDNANCE
FOR GAS RELEASE INSTR (I-21)	C2	2	.04	BUY	---	O/S		ORDNANCE
FOR GAS RELEASE INSTR (I-21)	C2	2	.04	BUY	---	O/S		ORDNANCE
*PIC(FOR GAS RELEASE)	C2	1	.20	MAKE	MMC	O/S		
*PIC(FOR GAS RELEASE)	C2	1	.20	MAKE	MMC	O/S		
*PIC(FOR GAS RELEASE)	C2	1	.20	MAKE	MMC	O/S		
*PIC(FOR GAS RELEASE)	C2	1	.20	MAKE	MMC	O/S		
*PIC(FOR GAS RELEASE)	C2	1	.20	MAKE	MMC	O/S		
*PIC(FOR GAS RELEASE)	C2	1	.20	MAKE	MMC	O/S		
*MULTILAYER INSULATION	C2	1	1.60	MAKE	MMC	NEW		
*MULTILAYER INSULATION	C2	1	1.60	MAKE	MMC	NEW		
*MULTILAYER INSULATION	C2	1	1.60	MAKE	MMC	NEW		
*MULTILAYER INSULATION	C2	1	1.60	MAKE	MMC	NEW		
*MULTILAYER INSULATION	C2	1	1.60	MAKE	MMC	NEW		
*MULTILAYER INSULATION	C2	1	1.60	MAKE	MMC	NEW		
*STRIP HEATERS	C2	1	1.00	MAKE	MMC	NEW		
*STRIP HEATERS	C2	1	1.00	MAKE	MMC	NEW		
*STRIP HEATERS	C2	1	1.00	MAKE	MMC	NEW		
*STRIP HEATERS	C2	1	1.00	MAKE	MMC	NEW		
*STRIP HEATERS	C2	1	1.00	MAKE	MMC	NEW		
*STRIP HEATERS	C2	1	1.00	MAKE	MMC	NEW		
* GAS RELEASE	D2	1	160.00	GFE	GFP	---		PRESSURE SPHERES
* GAS RELEASE	D2	1	160.00	GFE	GFP	---		PRESSURE SPHERES
* GAS RELEASE	D2	1	160.00	GFE	GFP	---		PRESSURE SPHERES
* GAS RELEASE	D2	1	160.00	GFE	GFP	---		PRESSURE SPHERES
* GAS RELEASE	D2	1	160.00	GFE	GFP	---		PRESSURE SPHERES
* GAS RELEASE	D2	1	160.00	GFE	GFP	---		PRESSURE SPHERES

*****   GAS RELEASE TOTAL

AMPS -----FLIGHT 1-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
NEAR IR SPECTROMETER (II-9)	D2	1	60.00	GFE	GFP	---		

***** NEAR IR SPECTROMETER TOTAL

AMPS -----FLIGHT 1-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
* TM XMITTER (S-BAND)	C2	1	.50	BUY	---	O/S		
* ANTENNA,CONICAL	C2	1	1.00	MAKE	BENDIX	NEW		
* ANTENNA,CONICAL	C2	1	1.00	MAKE	BENDIX	NEW		
* COMMAND RECEIVER	C2	1	.60	BUY	---	O/S		
* DIPLEXER/SPLITTER	C2	1	1.00	BUY	---	O/S		
* PCM PROGRAMMER	C2	1	2.00	MAKE	MMC	NEW		
* COMMAND DECODER	C2	1	1.00	BUY	---	O/S		
* CABLE SET-ESP	C2	1	2.00	MAKE	MMC	NEW		POWER AND SIGNAL SEPARATE
* POWER SUPPLY-ESP	C2	1	23.00	B/M	MMC	O/S		BATTERY,SWITCHING
* STRIP HEATERS	C2	1	1.00	BUY	---	O/S		
* MULTILAYER INSULATION	C2	1	3.90	MAKE	MMC	NEW		
* CAPTURE/RELEASE INTERFACE	C2	1	3.30	MAKE	MMC	NEW		
* FOR ESP -ANTENNA	C2	1	.75	BUY	---	O/S		EXT AND RETR (.1-1 M)
* FOR ESP -ANTENNA	C2	1	.75	BUY	---	O/S		
* LAUNCH LOCK-VECTOR MAG	C2	1	1.00	BUY	---	O/S		
* FOR ESP -PROBE	C2	1	2.00	BUY	---	O/S		EXT AND RETR
* III-2 SENSOR DRIVE	C2	1	1.00	BUY	---	O/S		EXT AND RETR
* SPIN TABLE- ESP	C2	1	6.50	BUY	---	NEW		
* ESP STRUCTURE	C2	1	47.60	MAKE	MMC	NEW		
* RELEASE ORDNANCE + CONT	C2	1	4.00	BUY	---	O/S		PIC/NSI/SPRINGS/LOCK
* EMI DIAGNOSTIC (III-25)	D2	1	22.60	GFE	GFP	---		
* PLANAR RPA (III-18)	D2	1	3.00	GFE	GFP	---		
* NEUTRAL MASS SPEC (III-23)	D2	1	10.00	GFE	GFP	---		

***** ESP

AMPS -----FLIGHT 2-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
SPACELAB MODULE	A5	1	3363.00	GFE	GFP	---	A	
6 METER PALLET TRAIN	A1	1	1236.00	GFE	GFP	---	A	
3 METER PALLET	A4	1	618.00	GFE	GFP	---	A	
SL/ORBITER UTILITY BRIDGE	A6	1	218.20	GFE	GFP	---	A	
TUNNEL	A8	1	352.00	GFE	GFP	---	A	
TUNNEL ADAPTER	A8	1	408.20	GFE	GFP	---	A	
P/L ARS FAN AND DUCTING	A8	1	9.50	GFE	GFP	---	A	
AIRLOCK	A9	1	364.00	GFE	GFP	---	A	
LESS SHUTTLE AIRLOCK	A9	1	-363.00	GFE	GFP	---	A	

***** BASIC SPACELAB

AMPS ------FLIGHT 2--------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
RMS (SECOND UNIT)	B0	1	393.50	GFE	GFP	---	A	
* EXTRA WATER FOR COOLING	B0	1	68.20	GFE	GFP	---		
EPS KIT 2-DRY PLUS RESIDUALS	B0	1	357.02	GFE	GFP	---	A	
* EPS KIT 2-EXPENDABLES	B0	1	303.30	GFE	GFP	---		
ORBITER HEAT REJECTION KIT	B0	1	87.50	GFE	GFP	---	A	
LONGERON FITTING-PALLET	B0	1	40.40	GFE	GFP	---	A	
LONGERON FITTING-PALLET	B0	1	40.40	GFE	GFP	---	A	
LONGERON FITTING-PALLET	B0	1	40.40	GFE	GFP	---	A	
LONGERON FITTING-PALLET	B0	1	40.40	GFE	GFP	---	A	
LONGERON FITTING-PALLET	B0	1	40.40	GFE	GFP	---	A	
LONGERON FITTING-PALLET	B0	1	40.40	GFE	GFP	---	A	
LONGERON FITTING-PALLET	B0	1	40.40	GFE	GFP	---	A	
LONGERON FITTING-PALLET	B0	1	40.40	GFE	GFP	---	A	
KEEL FITTING-PALLET	B0	1	35.40	GFE	GFP	---	A	
KEEL FITTING-PALLET	B0	1	35.40	GFE	GFP	---	A	
LONGERON FITTING-MODULE	B0	1	40.40	GFE	GFP	---	A	
LONGERON FITTING-MODULE	B0	1	40.40	GFE	GFP	---	A	
LONGERON FITTING-MODULE	B0	1	40.40	GFE	GFP	---	A	
LONGERON FITTING-MODULE	B0	1	40.40	GFE	GFP	---	A	
KEEL FITTING-MODULE	B0	1	35.40	GFE	GFP	---	A	
LESS ORBITER ALLOWANCE	B0	1	-204.00	GFE	GFP	---		
CREWMAN 5	B0	1	77.10	---	---	---		
CREWMAN 6	B0	1	77.10	---	---	---		
SEAT 5	B0	1	24.50	GFE	GFP	---	A	
SEAT 6	B0	1	24.50	GFE	GFP	---	A	
O2 TANKAGE PLUS RESIDUAL	B0	1	37.60	GFE	GFP	---	A	
* USABLE O2	B0	1	22.70	GFE	GFP	---		
EMERGENCY EQUIPMENT	B0	1	49.50	GFE	GFP	---	A	
WASTE WATER TANKAGE	B0	1	22.00	GFE	GFP	---	A	
FOOD	B0	1	28.60	GFE	GFP	---		
HYGIENE EQUIPMENT	B0	1	26.20	GFE	GFP	---	A	
CREW PROVISIONS	B0	1	25.20	GFE	GFP	---	A	
LIOH	B0	1	31.90	GFE	GFP	---	A	
RESTRAINTS	B0	1	1.70	GFE	GFP	---	A	
STOWAGE VOLUME PENALTY	B0	1	43.90	GFE	GFP	---	A	
MONITOR AND CONTROL PANEL	B0	1	5.00	GFE	GFP	---	A	
KEYBOARD	B0	1	3.50	GFE	GFP	---	A	
CRT DISPLAY/SIGNAL GENERATOR	B0	1	20.90	GFE	GFP	---	A	
REMOTE STATION, COMMUNICATIO	B0	1	1.50	GFE	GFP	---	A	
DOUBLE RACK	B5	1	58.10	GFE	GFP	---	A	
SINGLE RACK	B5	1	37.60	GFE	GFP	---	A	
PALLET HARDPOINTS	B1	45	.03	GFE	GFP	---	A	
INSERTS FOR PANELS	B1	6	6.50	GFE	GFP	---	A	
EXP SWITCH PANEL	B5	1	12.70	GFE	GFP	---	A	
EXP SWITCH PANEL	B5	1	12.70	GFE	GFP	---	A	

AMPS ------FLIGHT 2--------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
EXP SWITCH PANEL	B5	1	12.70	GFE	GFP	----	A	
INVERTER (400 HZ)	B5	1	32.20	GFE	GFP	----	A	
COLD PLATE-RF INSTR	B4	1	5.50	GFE	GFP	----	A	
COLD PLATE-PEAKING BATTERY	B4	1	5.50	GFE	GFP	----	A	
COLD PLATE-PS	B4	1	5.50	GFE	GFP	----	A	
COLD PLATE-RF TERMINAL	B3	1	5.50	GFE	GFP	----	A	
EXP RAU	B2	1	2.30	GFE	GFP	----	A	
EXP RAU	B3	1	2.30	GFE	GFP	----	A	
EXP RAU	B3	1	2.30	GFE	GFP	----	A	
EXP RAU	B4	1	2.30	GFE	GFP	----	A	
EXP RAU	B4	1	2.30	GFE	GFP	----	A	
EXP RAU	B5	1	2.30	GFE	GFP	----	A	
EXP COMPUTER	B5	1	30.20	GFE	GFP	----	A	
DIGITAL TAPE RECORDER	B5	1	43.00	GFE	GFP	----	A	
EXPERIMENT I/O	B5	1	27.50	GFE	GFP	----	A	
HIGH RATE DIGITAL MUX	B5	1	10.00	GFE	GFP	----	A	
TAPE AND CANISTERS	B5	15	5.90	GFE	GFP	----		
CONSOL VERTICAL RAILS	B5	4	.50	GFE	GFP	----	A	
CONSOL HORIZONTAL RAILS	B5	4	.75	GFE	GFP	----	A	
PSA FOOT RESTRAINTS	B5	6	3.00	GFE	GFP	----	A	
RACK CLOSEOUT FT RESTRAINTS	B5	4	7.93	GFE	GFP	----	A	
KEYBOARD	B5	1	3.50	GFE	GFP	----	A	
CRT AND SYMBOL GENERATOR	B5	1	28.90	GFE	GFP	----	A	

***** MISSION DEPENDENT EQUIPMENT

AMPS ———FLIGHT 2———LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
C AND D PANELS	C5	1	18.00	BUY	BENDIX	NEW	B	
C AND D PANELS	C5	1	8.40	BUY	BENDIX	NEW	B	
C AND D PANELS	C5	1	3.00	BUY	BENDIX	NEW	B	
TV MONITOR	C5	1	10.00	BUY	---	O/S	A	
C AND W SENSORS-PRESSURE	C2	4	.16	BUY	XXX	NEW	A	PURCHASE ORBITER OR SPACELAB DES
C AND W SENSORS-TEMPERATURE	C2	4	.16	BUY	XXX	NEW	A	PURCHASE ORBITER OR SPACELAB DES
SENSOR INTERFACE BOX	C3	1	2.27	MAKE	MMC	NEW	A	SIPS YOKE 1
SENSOR INTERFACE BOX	C3	1	2.27	MAKE	MMC	NEW	A	SIPS YOKE 2
SENSOR INTERFACE BOX	C2	1	2.27	MAKE	MMC	NEW	A	MPM
SENSOR INTERFACE BOX	C4	1	2.27	MAKE	MMC	NEW	A	MPM
VIDEO RECORDER	C5	1	36.30	BUY	---	O/S	A	
ANALOG RECORDER	C5	1	22.70	BUY	---	O/S	A	
TRANSIENT RECORDER	C5	5	6.16	BUY	---	O/S	A	
SWITCHING PANEL	C5	1	3.63	MAKE	MMC	NEW	A	
FM MODULE	C5	1	21.80	BUY	---	O/S	B	
SIPS PLATFORM	C3	1	527.00	GFE	GFP	---	A	INCLUDES ELECTRONICS
MPM PLATFORM-OBIPS	C4	1	56.00	GFE	GFP	---	A	INCLUDES ELECTRONICS
MPM PLATFORM-NIR SPEC	C2	1	56.00	GFE	GFP	---	A	INCLUDES ELECTRONICS
FIXED HD STAR TRKER-II-7-10	C4	1	4.00	GFE	GFP	---	A	WITH SUN SHADE
FIXED HEAD STAR TRACKER-NIR	C2	1	4.00	GFE	GFP	---	A	WITH SUN SHADE
TWO AXES GYRO PACKAGE	C3	1	8.00	GFE	GFP	---	A	FOR CYRO LIMB SCANNER
TWO AXES GYRO PACKAGE	C3	1	8.00	GFE	GFP	---	A	FOR CYRO IR SPEC
3 AXES GYRO PACKAGE-OBIPS	C4	1	10.00	GFE	GFP	---	A	
3 AXES GYRO PACKAGE-NIR SPEC	C2	1	10.00	GFE	GFP	---	A	
SIPS CANISTER-NIR SPEC	C2	1	90.00	GFE/M	GFP/MMC	---		GFP + EXTENSION MOD
I/F PLUMBING KITS-PALLET 3	C4	1	12.00	MAKE	MMC	NEW	B	
EXP HEAT EXCHANGER-LIDAR	C4	1	25.00	BUY	---	NEW	A	
THERMAL CURTAIN-PALLET 1	C2	1	10.00	MAKE	MMC	NEW	B	10% MOD FROM FLIGHT 1
THERMAL CURTAIN-PALLET 2	C3	1	10.00	MAKE	MMC	NEW	B	10% MOD FROM FLIGHT 1
THERMAL CURTAIN-PALLET 3	C4	1	10.00	MAKE	MMC	NEW	B	10% MOD FROM FLIGHT 1
TCS PUMP-LIDAR	C4	1	10.00	BUY	---	O/S	A	
COOLANT FILTERS	C4	6	.45	BUY	---	O/S	A	
PULSE POWER SUPPLY-LIDAR	C4	1	95.00	BUY	---	NEW	B	5 % MOD FROM FLT 1
PULSE POWER SUPLY	C4	1	600.00	BUY	---	---	A	
PEAKING BATTERY	C4	1	40.30	BUY	---	O/S	A	
ELECT DIST PANEL	C2	1	10.00	MAKE	MMC	NEW	A	
ELECT DIST PANEL	C4	1	10.00	MAKE	MMC	NEW	A	
ELECT DIST PANEL	C3	1	10.00	MAKE	MMC	NEW	A	
CABLE SET-PALLET 1	C2	1	102.00	MAKE	MMC	NEW	B	POWER AND SIGNAL SEPARATE
CABLE SET-PALLET 2	C3	1	91.00	MAKE	MMC	NEW	B	POWER AND SIGNAL SEPARATE
CABLE SET-PALLET 3	C4	1	68.00	MAKE	MMC	NEW	B	POWER AND SIGNAL SEPARATE
CABLE SET-MODULE TO PALLET	C7	1	57.00	MAKE	MMC	NEW	B	POWER AND SIGNAL SEPARATE
CABLE SET-MODULE	C5	1	34.00	MAKE	MMC	NEW	B	POWER AND SIGNAL SEPARATE
CABLE SET-SIPS TO INSTRUMENT	C3	1	40.00	MAKE	MMC	NEW	A	POWER AND SIGNAL SEPARATE
WIDE BAND RECEIVER	C3	1	2.27	BUY	---	NEW	A	

AMPS ------FLIGHT 2--------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
NARROW BAND RECEIVER	C3	1	.57	BUY	---	O/S		
COMMAND TRANSMITTER	C3	1	.50	BUY	---	O/S	A	
MULTIPLEXER	C3	1	1.36	MAKE	BENDIX	NEW	A	
CONICAL ANTENNA	C3	1	.91	MAKE	BENDIX	NEW	A	
L/L LOCKS-NIR SPEC	C2	1	1.80	MAKE	MMC	NEW		
L/L LOCKS-NIR SPEC	C2	1	9.10	MAKE	MMC	NEW		
L/L LOCKS-OBIPS	C4	1	6.80	MAKE	MMC	NEW	A	
EMER JETTISON (MPM PLATFORM)	C2	1	8.20	GFE	GFP	NEW	A	FOR NIR SPEC
EMER JETTISON (MPM PLATFORM)	C4	1	8.20	GFE	GFP	NEW	A	FOR OBIPS
FOR PLASMA WAKE DIAGNOSTIC	C3	1	10.00	MAKE	MMC	NEW	A	CAPTURE/RELEASE DEVICE
FOR PLASMA WAKE GENERATOR	C2	1	10.40	MAKE	MMC	NEW	A	CAPTURE/RELEASE DEVICE
PIC(FOR HOLDDOWN NUTS)	C2	1	.20	MAKE	MMC	O/S		FOR CHEM RELEASE MODULE
PIC(FOR HOLDDOWN NUTS)	C4	1	.20	MAKE	MMC	O/S		FOR RF RECEIVER PACKAGE
HOLDDOWN ORDNANCE	C2	6	1.00	BUY	---	O/S		FOR CHEM RELEASE MODULE
FOR HV POWER SUPPLY	C4	1	12.00	MAKE	MMC	NEW	A	DIRECT MTG BRACKETRY
FOR INSTRUMENT IV-1	C4	1	1.40	MAKE	MMC	NEW	A	DIRECT MTG BRACKETRY
FOR CHEMICAL RELEASE	C2	1	5.40	MAKE	MMC	NEW		DIRECT MTG BRACKETRY
INSTRUMENT I-21 PLATFORM	C2	1	65.30	MAKE	MMC	NEW	A	INTER SPT STRUCTURE
FOR INSTRUMENT I-1	C4	1	39.00	MAKE	MMC	NEW	A	TRUSS SUPPORT
FOR INSTRUMENT II-3	C4	1	20.40	MAKE	MMC	NEW	A	PTG PLATFORM TO PALLET(TRUSS)
FOR INSTRUMENT II-7	C3	1	6.35	MAKE	MMC	NEW	A	INSTR TO YOKE
FOR INSTRUMENT II-9 AND II-4	C2	1	20.40	MAKE	MMC	NEW	B	PTG PLATFORM TO PALLET
FOR INSTRUMENT II-10	C3	1	6.35	MAKE	MMC	NEW	A	INSTR TO YOKE
FOR RF RECEIVER PACKAGE	C3	1	13.60	MAKE	MMC	NEW		INTER SPT STRUCTURE
FOR PLASMA WAKE GENERATOR	C2	1	13.60	MAKE	MMC	NEW	A	INTER SPT STRUCTURE
FOR PLASMA WAKE DIAGNOSTIC	C3	1	13.60	MAKE	MMC	NEW	A	INTER SPT STRUCTURE
FOR RF TERMINAL	C3	1	5.00	MAKE	MMC	NEW	A	BASE MOUNTING BRACKETRY
INSTR TO INSTR I/F STRUCTURE	C4	14	1.14	MAKE	MMC	NEW	B	SETS OF BRACKETS
THERMAL CURTAIN SPT-PALLET 1	C2	1	11.34	MAKE	MMC	NEW	B	TRUSS(10% MOD FROM FLT 1)
THERMAL CURTAIN SPT-PALLET 2	C3	1	11.34	MAKE	MMC	NEW	B	TRUSS(10% MOD FROM FLT 1)
THERMAL CURTAIN SPT-PALLET 3	C4	1	11.34	MAKE	MMC	NEW	B	TRUSS(10% MOD FROM FLT 1)

***** AMPS LABCRAFT

AMPS -----FLIGHT 2-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
EMERGENCY JETTISON FOR I-1	D4	1	.90	GFE	GFP	---	A	COVER ONLY
LIDAR EMITTER	D4	1	75.00	GFE	GFP	---	A	FRENCH VERSION
LIDAR EMITTER	D4	1	75.00	GFE	GFP	---	A	FRENCH VERSION
LIDAR RECEIVER	D4	1	300.00	GFE	GFP	---	A	FRENCH VERSION

***** LASER SOUNDER (I-1)

AMPS -----FLIGHT 2-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
SOLAR FLUX MONITOR (IV-1)	D4	1	3.00	GFE	GFP	---	A	

***** SOLAR FLUX MONITOR

AMPS -----FLIGHT 2-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
OBIPS (II-3)	D4	1	43.00	GFE	GFP	---	A	S/S 1 ONLY W/SUNSHIELD

***** OBIPS

AMPS -----FLIGHT 2-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
CRYO LIMB SCANNER-DRY	D3	1	207.00	GFE	GFP	---	A	INSTRUMENT II-7
* CRYO	D3	1	293.00	BUY	---	O/S		FOR INSTRUMENT II-7

***** CRYO LIMB SCANNER-WET

AMPS -----FLIGHT 2-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
CRYO IR INTERFEROMETER-DRY	D2	1	215.00	GFE	GFP	---	A	INSTRUMENT II-10
* CRYO	D2	1	285.00	BUY	---	O/S		FOR INSTRUMENT II-10

***** CRYO IR INTERFEROMETER

AMPS -----FLIGHT 2-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
* COMMAND RECEIVER	C2	1	.60	BUY	---	O/S		
* ANTENNA,STUB	C2	1	1.00	BUY	---	O/S		
* COMMAND DECODER	C2	1	1.50	BUY	---	---		
* SEQUENCER	C2	1	10.00	BUY	---	---		
* CHEMICAL RELEASE (I-21)	D2	1	1472.00	GFE	GFP	---		THERMITE CANISTERS
* POWER SUPPLY	C2	1	3.00	MAKE	MMC	NEW		BATTERY,SWITCHING
* CABLE SET-CHEMICAL RELEASE	C2	1	2.00	MAKE	MMC	NEW		POWER AND SIGNAL SEPARATE
FOR CHEMICAL RELEASE (I-21)	C2	1	.50	BUY	---	O/S		TIE DOWN ORDNANCE
* CHEMICAL RELEASE STRUCTURE	C2	1	174.60	MAKE	MMC	NEW		INTEGRATED EQUIP MODULE
*PIC	C2	2	1.00	MAKE	MMC	O/S		FOR BURN INITIATION

***** CHEMICAL RELEASE

AMPS -----FLIGHT 2-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
RF PLASMA WAVE PACKAGE(I-12)	D4	1	205.00	GFE	GFP	---		SUBSYSTEMS 1 AND 2 ONLY
DIPOLE ANTENNA (100 METERS)	C4	1	19.96	BUY	XXX	NEW		I-12,S/S 3-USE I-17C

***** RF PLASMA WAVE PACKAGE

AMPS -----FLIGHT 2-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
UV/VIS/NIR SPEC (II-4)	D2	2	22.00	GFE	GFP	---		2 EBERT FASTIE UNITS ONLY

***** UV/VIS/NIR SPEC

AMPS ------FLIGHT 2--------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
DEPLOYABLE TEST BODY(III-17)	D2	1	16.00	GFE	GFP	---		
* DEPLOYABLE TEST BODY	D2	1	4.00	GFE	GFP	---		III-17,SPHERICAL SHAPE
PROG EJEC (PWG,III-17)	C2	1	.90	MAKE	MMC	NEW		REL BALLOON PR RETRAC OF RMS
CAPTURE/RELEASE INTERFACE	C2	1	.50	MAKE	MMC	NEW		
PLASMA WAKE GENERATOR STRUCT	C2	1	20.40	MAKE	MMC	NEW		INTEGRATED EQUIP MODULE
DATA TRANSMITTER	C2	1	.50	BUY	---	O/S		
COMMAND RECEIVER	C2	1	1.00	BUY	---	O/S		A
DIPLEXER	C2	1	1.00	MAKE	BENDIX	NEW		
ANTENNA, STUB	C2	1	1.00	BUY	---	O/S		
PCM PROGRAMMER/MULTIPLEXER	C2	1	1.00	BUY	---	O/S		
COMMAND DECODER	C2	1	1.50	BUY	---	O/S		
POWER SUPPLY	C2	1	18.00	MAKE/B	MMC	NEW		BATTERY,SWITCHING
CABLE SET	C2	1	1.00	MAKE	MMC	NEW		POWER AND SIGNAL SEPARATE
STRIP HEATERS	C2	1	1.00	BUY	---	O/S		
MULTILAYER INSULATION	C2	1	1.70	BUY	---	O/S		
ENTENSION MECHANISM	C2	1	10.00	BUY	---	O/S		

***** PLASMA WAKE GENERATOR

AMPS -----FLIGHT 2-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
* TM XMITTER (S-BAND)	C4	1	.50	BUY	---	O/S		
* 10 METER DIPOLE ANTENNA	C4	1	2.00	BUY	---	O/S		
* CONICAL ANTENNA	C4	1	1.00	MAKE	BENDIX	NEW		
* CONICAL ANTENNA	C4	1	1.00	MAKE	BENDIX	NEW		
* COMMAND RECEIVER	C4	1	.60	BUY	---	O/S		
* DIPLEXER/SPLITTER	C4	1	1.00	MAKE	BENDIX	NEW		
* SUBCARRIER OSCILLATOR ASSY	C4	1	.90	MAKE	MMC	NEW		
* PCM PROGRAMMER/MULTIPLEXER	C4	1	2.00	BUY	---	O/S		
* COMMAND DECODER	C4	1	1.00	BUY	---	O/S		
* RF PLASMA WAVE (I-12)	D4	1	5.00	GFE	GFP	---		SUBSYSTEM 2 ONLY
* VECTOR MAGNETOMETER(III-2)	D4	1	4.10	GFE	GFP	---		SUBSYSTEM 2 AND 4 ONLY
* POWER SUPPLY-RF RCVR PKG	C4	1	10.00	BUY	---	NEW		
* CABLE SET-RF RECEIVER PKG	C4	1	1.00	MAKE	MMC	NEW		
PROG EJEC-RF RECEIVER PKG	C4	1	3.00	MAKE	MMC	NEW		5 M/S DELTA V
* PROG EJEC-RF RECEIVER PKG	C4	1	4.00	MAKE	MMC	NEW		5 M/S DELTA V
* SPIN TABLE-RF RCVR PKG	C4	1	4.50	MAKE	MMC	NEW		
RF RECEIVER PACKAGE STRUCT	C4	1	14.20	MAKE	MMC	NEW		INTEGRATED EQUIP MODULE
*STRIP HEATERS	C4	1	1.00	BUY	---	O/S		
*MULYILAYER INSULATION	C4	1	1.70	BUY	---	O/S		

***** RF RECEIVER PACKAGE

AMPS ——FLIGHT 2——LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
VECTOR MAGNETOMETER	D3	1	4.10	GFE	GFP	——		INSTRUMENT III-2
ION MASS + DIST ANALYSIS	D3	1	2.00	GFE	GFP	——		INSTRU III-10,ONE AXIS ONLY
PLANAR RPA	D3	1	3.00	GFE	GFP	——		INSTRUMENT III-19
LANGMUIR PROBE	D3	1	3.50	GFE	GFP	——		INSTRUMENT III-22
NEUTRAL MASS SPEC	D3	1	10.00	GFE	GFP	——		INSTRUMENT III-23
PLASMA WAKE DIA-STRUCTURE	C3	1	11.34	MAKE	MMC	NEW		INTEGRATED EQUIP MODULE
CAPTURE/RELEASE INTERFACE	C3	1	.60	MAKE	MMC	NEW		
DATA TRANSMITTER	C3	1	.50	BUY	——	O/S		
COMMAND RECEIVER	C3	1	.60	BUY	——	O/S	A	
DIPLEXER	C3	1	1.00	MAKE	BENDIX	NEW	A	
ANTENNA, STUB	C3	1	1.00	BUY	——	O/S	A	
COMMAND DECODER	C3	1	1.40	BUY	——	O/S	A	
PCM PROGRAMMER/MULTIPLEXER	C3	1	2.00	BUY	——	O/S	A	
SUBCARRIER OSCILLATOR ASSY	C3	1	2.14	BUY	——	——	B	
POWER SUPPLY	C3	1	17.00	M/B	MMC	O/S		BATTERY/SWITCHING
CABLE SET	C3	1	1.40	MAKE	MMC	NEW		POWER AND SIGNAL SEPARATE
STRIP HEATERS	C3	1	1.00	BUY	——	O/S		
MULTILAYER INSULATION	C3	1	3.50	BUY	——	O/S		

***** PLASMA WAKE DIAGNOSTIC PKG

AMPS ——FLIGHT 2——LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

NOMENCLATURE	PNL	QTY	UNIT WT (KG)	MAKE BUY GFE	POTENTIAL SOURCE	DEV STATUS	REUSE CODE	REMARKS
NEAR IR SPECTROMETER (II-9)	D4	1	60.00	GFE	GFP	——		

***** NEAR IR SPECTROMETER

APPENDIX B

INSTRUMENT BASELINE DATA

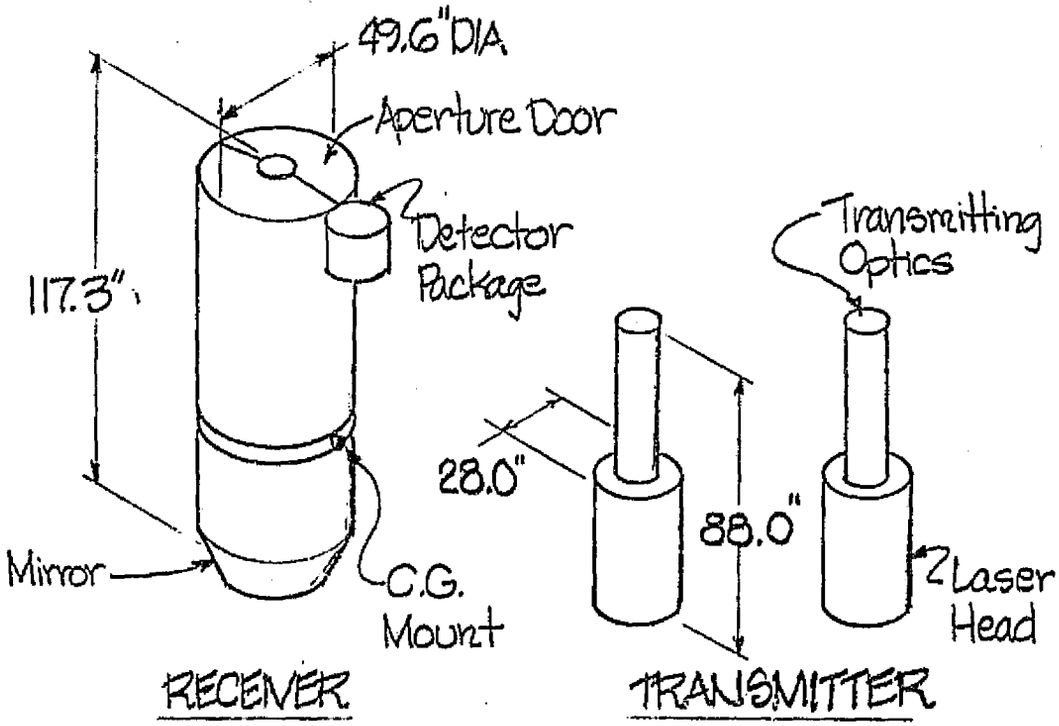
INSTRUMENT BASELINE DATA

IFRD NO.: I-1

INSTRUMENT: LIDAR

FLIGHT	1	2
	X	X

PHYSICAL DESCRIPTION



WEIGHT: Receiver: 300kg Transmitters: 75kg each = 450kg

MOUNTING: Pallet hard mount

OPERATIONAL REQUIREMENTS: Co-alignment between transmitter & receiver, requires pulse power supply (capacitor bank), viewing: +Z axis, receiver & transmitters may be separated

SOURCE: French version 1.0 meter Newton telescope

INSTRUMENT BASELINE DATA

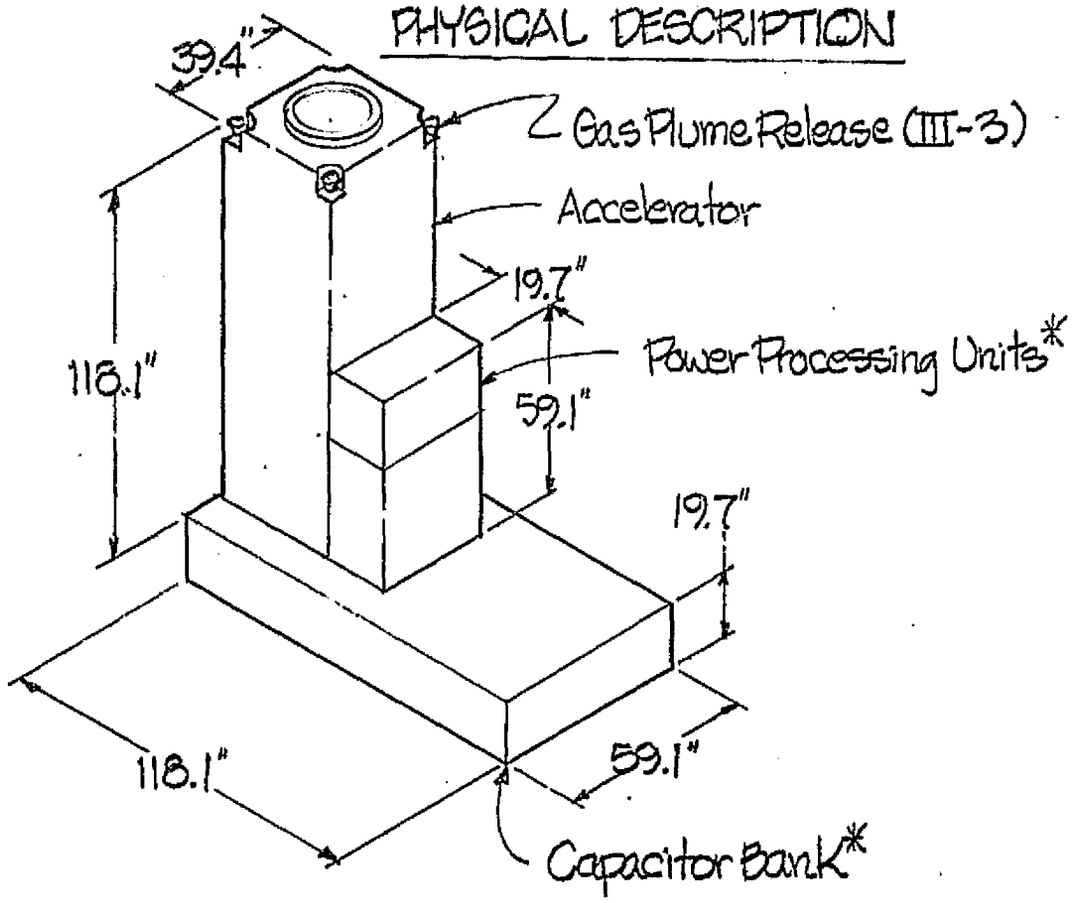
IFRD NO.: I-9

FLIGHT	1	2
	X	*

INSTRUMENT: ELECTRON ACCELERATOR

*Partial

PHYSICAL DESCRIPTION



WEIGHT: Accelerator 40.5kg, Gas Release 9.0kg, Power Processing Unit 95kg, Capacitor Bank 600kg = 744.5kg

MOUNTING: Pallet hard mount

OPERATIONAL REQUIREMENTS: Share power supply with LIDAR (I-1), Capacitor Bank & Power Processing Units used on flight 2

SOURCE: IFRD

INSTRUMENT BASELINE DATA

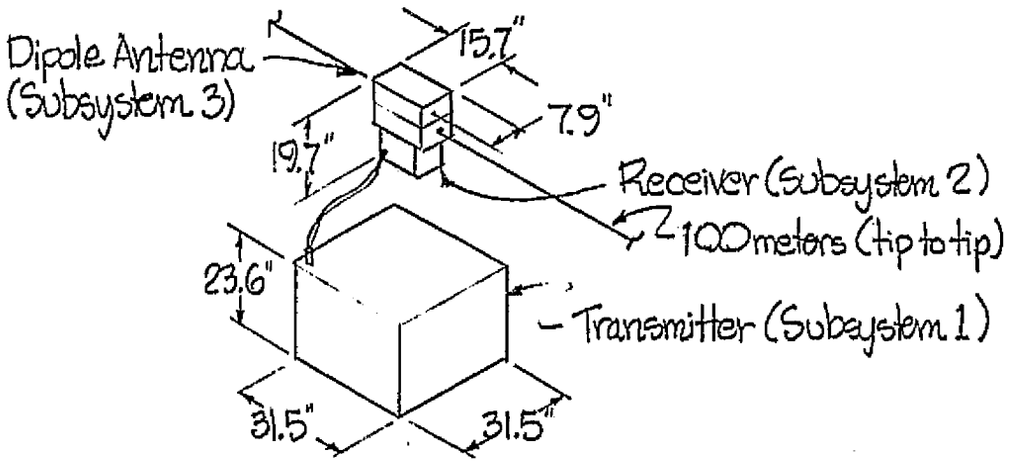
IFRD: I-12 (Subsystems 1, 2 & 3)

INSTRUMENT: RF PLASMA WAVE

- FLIGHT

1	2
	X

PHYSICAL DESCRIPTION



WEIGHT: Transmitter 180 kg, Receiver 5kg, Dipole Antenna 20kg = 205kg

MOUNTING: Pallet hard mount

OPERATIONAL REQUIREMENTS: Mount antenna as high in bay as possible

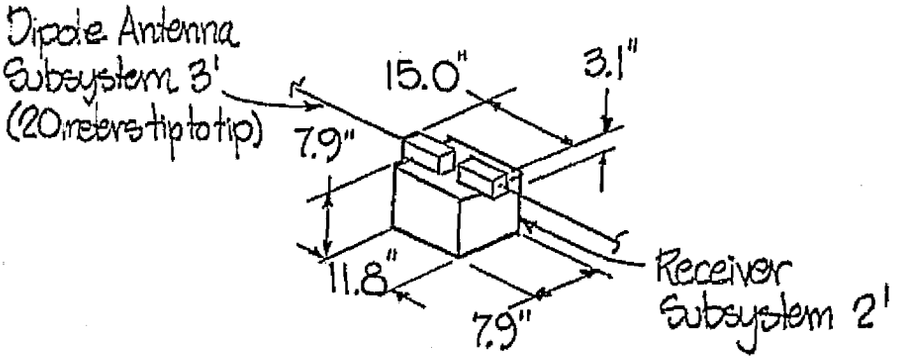
INSTRUMENT BASELINE DATA

IFRD NO.: I-12 Subsystem 2' & 3'

FLIGHT	1	2
	X

INSTRUMENT: RF PLASMA WAVE PACKAGE

PHYSICAL DESCRIPTION



WEIGHT: Receiver 5kg, Antenna 1.0 kg each = 7.0kg

MOUNTING: Mount on ejected module

OPERATIONAL REQUIREMENTS: Ejected from orbiter

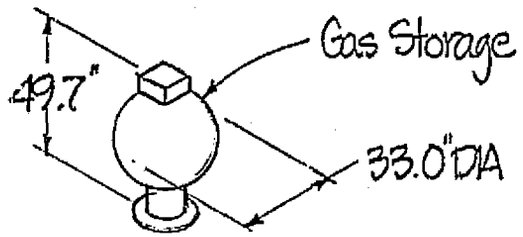
SOURCE: IFRD

INSTRUMENT BASELINE DATA

IFRD NO.: I-21 Subsystem 1
INSTRUMENT: GAS RELEASE

FLIGHT	1	2
	X	

PHYSICAL DESCRIPTION



6 REQUIRED

WEIGHT: 160Kg
MOUNTING: Pallet hard mount/Ejected
OPERATIONAL REQUIREMENTS: Ejected from orbiter (ΔV = 5m/sec), Remote tank rupture to release gas

SOURCE: IFRD & MMC (See MMC Sketch SK05-006)

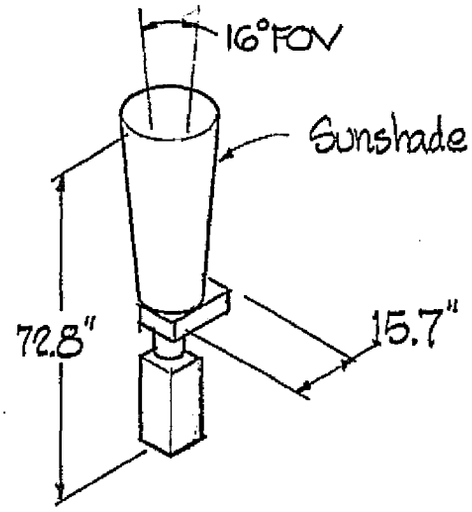
INSTRUMENT BASELINE DATA

IFRD NO. : II-3 Subsystem 1

INSTRUMENT: OPTICAL BAND IMAGER & PHOTOMETER

FLIGHT SYSTEM	1	2
	X	X

PHYSICAL DESCRIPTION



WEIGHT: OBIPS 38kg, Sunshade 5kg 43.0kg

MOUNTING: Pointing platform mount required

OPERATIONAL REQUIREMENTS: Viewing "over the sill"

SOURCE: IFRD & MMC (sunshade)

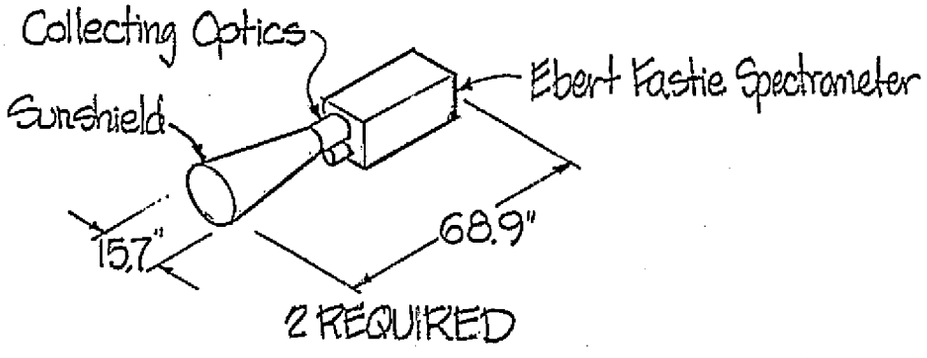
INSTRUMENT BASELINE DATA

IFRD NO.: II-4

FLIGHT	1	2
		X

INSTRUMENT: UV-VIS-NIR SPECTROMETER

PHYSICAL DESCRIPTION



WEIGHT: 11Kg each 11.0Kg
MOUNT: Pointing platform
OPERATIONAL REQUIREMENTS: Co-alignment between spectrometers & OBIPS, requires environmental enclosure

SOURCE: IFRD

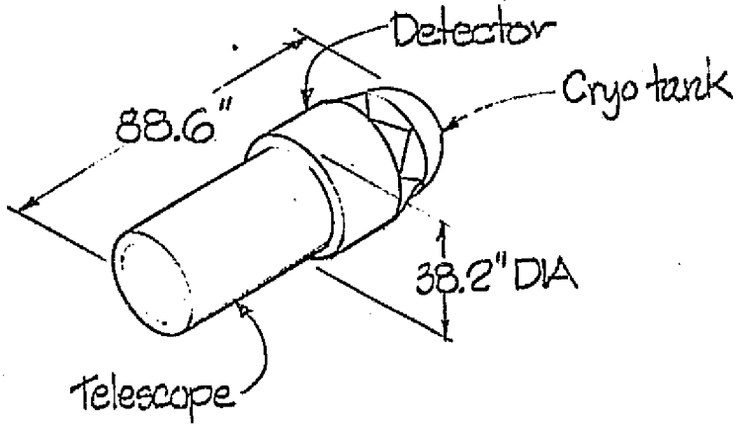
INSTRUMENT BASELINE DATA

IFRD NO.: II-7

INSTRUMENT: CRYO LIMB SCANNER

FLIGHTS	1	2
	X	X

PHYSICAL DESCRIPTION



WEIGHT: Limb scanner 207kg Cryo 135kg = 342kg

MOUNTING: Pointing platform

OPERATIONAL REQUIREMENTS: "Over the sill" viewing (4), Co-alignment with II-10

SOURCE: IFRD & MMC

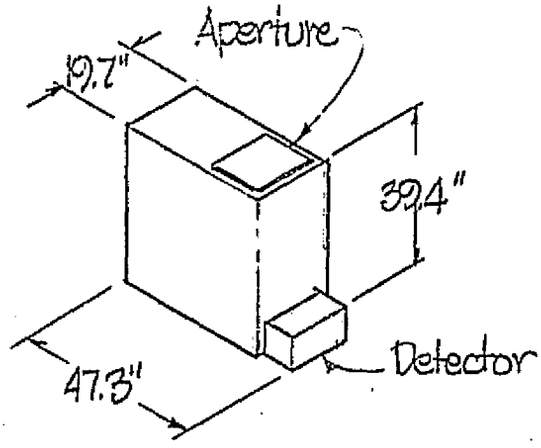
INSTRUMENT BASELINE DATA

IFRD NO.: II-9

INSTRUMENT: NEAR IR SPECTROMETER

FLIGHT	1	2
	X	X

PHYSICAL DESCRIPTION



WEIGHT: Spectrometer 50kg Detector 10kg = 60Kg
MOUNTING: Pointing platform
OPERATIONAL REQUIREMENTS: Environmental enclosure required, ±Y viewing

SOURCE: IFRD

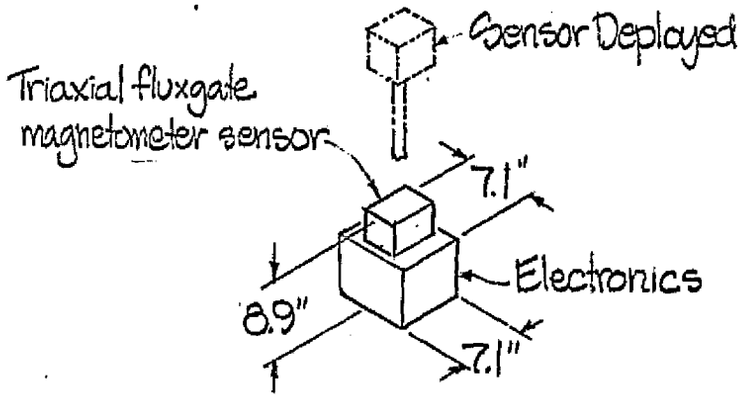
INSTRUMENT BASELINE DATA

IFRD NO.: III-2

FLIGHT	1	2
	X	X

INSTRUMENT: VECTOR MAGNETOMETER

PHYSICAL DESCRIPTION



WEIGHT: Electronics 3.6kg Sensor .5kg = 4.1 kg
MOUNTING: Mount on deployed & ejected modules
OPERATIONAL REQUIREMENTS: Sensor deployed away from electronics during operation

SOURCE: IFRD

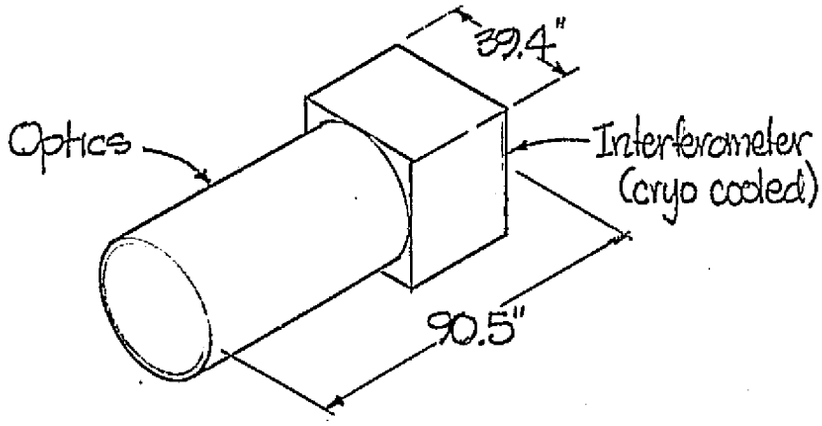
INSTRUMENT BASELINE DATA

IFRD NO.: II-10

FLIGHT	1	2
	X	X

INSTRUMENT: CRYO IR INTERFEROMETER SPECTROMETER

PHYSICAL DESCRIPTION



WEIGHT: Interferometer 215kg Cryo 135kg = 350kg
MOUNTING: Pointing platform
OPERATIONAL REQUIREMENTS: "Over the sill viewing" (+Y), Co-alignment with II-7

SOURCE: IFRD

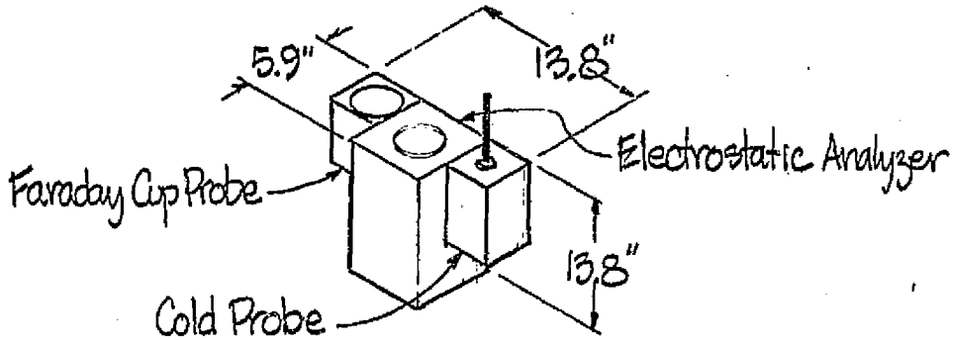
INSTRUMENT BASELINE DATA

IFRD NO.: III-4

FLIGHT	1	2
	X	

INSTRUMENT: LEVEL II BEAM DIAGNOSTICS

PHYSICAL DESCRIPTION



WEIGHT: Faraday probe 7kg, Electrostatic analyzer 9kg, Cold probe 5k — 23kg

MOUNTING: Mount on deployed package

OPERATIONAL REQUIREMENTS: Deploy over and scan electron accelerator beam

SOURCE: IFRD

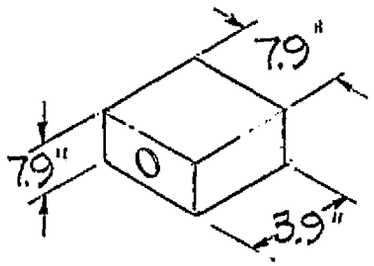
INSTRUMENT BASELINE DATA

IFRD NO.: III-10

FLIGHT	1	2
	X

INSTRUMENT: ION MASS & DISTRIBUTION ANALYSIS

PHYSICAL DESCRIPTION



WEIGHT: 2kg

MOUNTING: Mount on deployed module

OPERATIONAL REQUIREMENTS: Orient facing velocity vector

SOURCE: IFRD

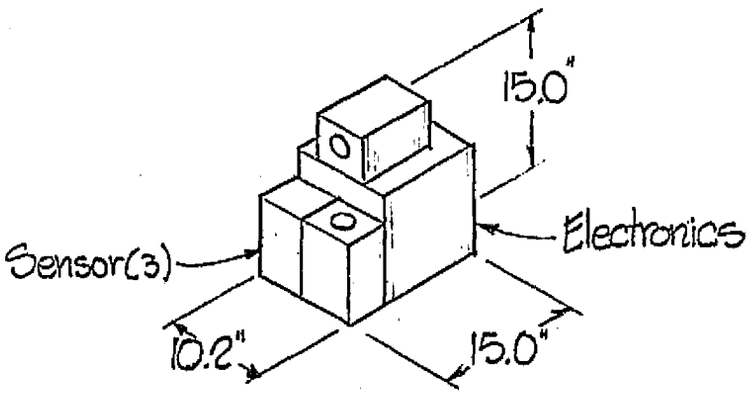
INSTRUMENT BASELINE DATA

IFRD NO.: III-16

FLIGHT	1	2
	X	

INSTRUMENT: ION MASS & DISTRIBUTION ANALYZER

PHYSICAL DESCRIPTION



WEIGHT: Electronics 2kg Sensors 3kg = 5kg

MOUNTING: Mount on deployed module

OPERATIONAL REQUIREMENTS: Orient sensors parallel & perpendicular to module spin axis

SOURCE: IFRD

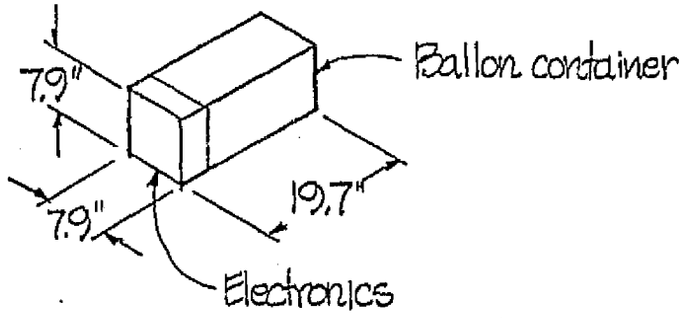
INSTRUMENT BASELINE DATA

IFRD NO.: III-17

FLIGHT	1	2
		X

INSTRUMENT: PLASMA WAKE GENERATOR

PHYSICAL DESCRIPTION



WEIGHT: 20kg

MOUNTING: Mount on deployed module

OPERATIONAL REQUIREMENTS: Package to be deployed approx 70' beyond payload bay, ballon is jettisoned & package is restowed

SOURCE: IFRD & MMC

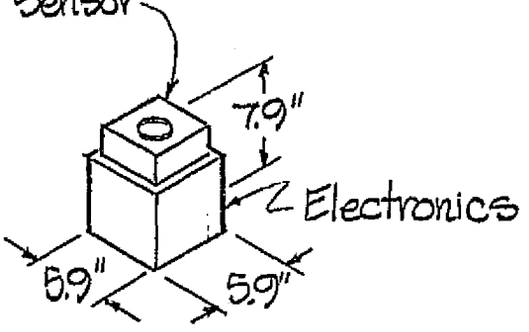
INSTRUMENT BASELINE DATA

IFRD NO.: III-18

FLIGHT	1	2
	X	X

INSTRUMENT: RETARDING POTENTIAL ANALYZER

PHYSICAL DESCRIPTION



WEIGHT: 3Kg

MOUNTING: Mount on deployed/ejected modules

OPERATIONAL REQUIREMENTS: Approx 180° FOV, exposed conducting surface required

SOURCE: IFRD

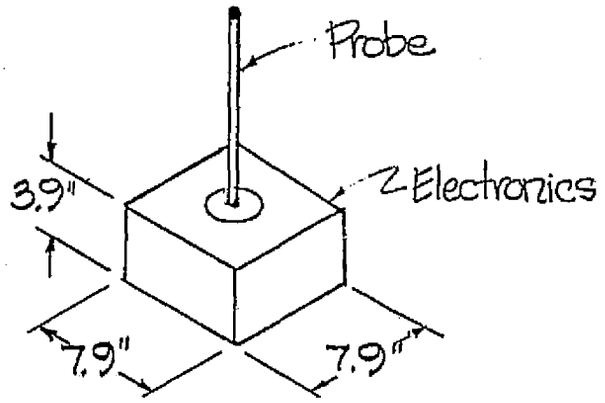
INSTRUMENT BASELINE DATA

IFRD NO. III-22

FLIGHT	1	2
	X	X

INSTRUMENT: LANGMUIR PROBE

PHYSICAL DESCRIPTION



WEIGHT: 3.5 kg
MOUNTING: Mount on deployed/ejected modules
OPERATIONAL REQUIREMENTS: Conducting surface required

SOURCE: IFRD

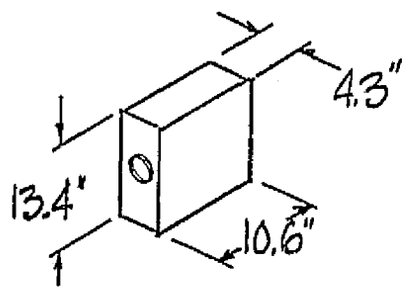
INSTRUMENT BASELINE DATA

IFRD NO.: III-23

FLIGHT | 1 | 2 |
|---|---|
| | X | X |

INSTRUMENT: NEUTRAL MASS SPECTROMETER

PHYSICAL DESCRIPTION



WEIGHT: 10Kg

MOUNTING: Mount on deployed modules

OPERATIONAL REQUIREMENTS: Orient facing velocity vector

SOURCE: IFRD

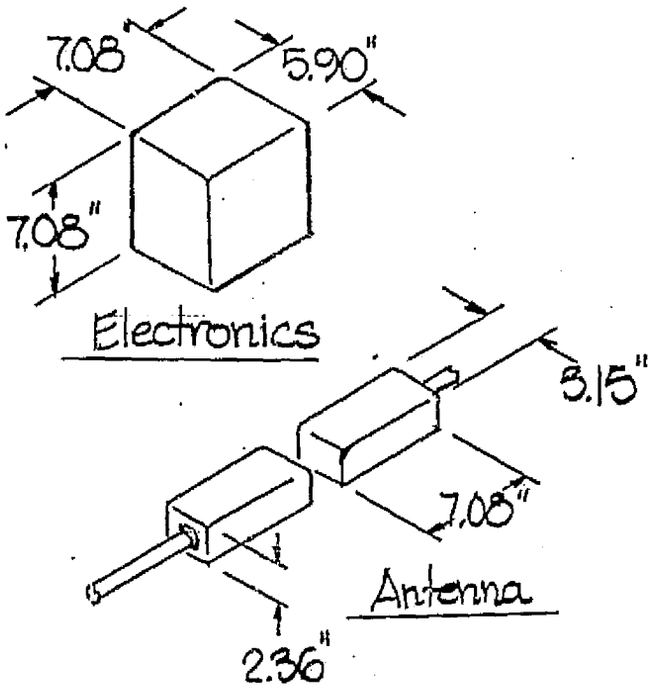
INSTRUMENT BASELINE DATA

IFRD NO. : III-25 Subsystem A

INSTRUMENT: EMI DIAGNOSTICS PACKAGE

FLIGHT 1 [X] 2 [ ]

PHYSICAL DESCRIPTION



WEIGHT: Electronics: 3kg Antenna: 1 kg each = 5kg

MOUNTING: Mount on deployed/ejected module

OPERATIONAL REQUIREMENTS:

SOURCE: MMC

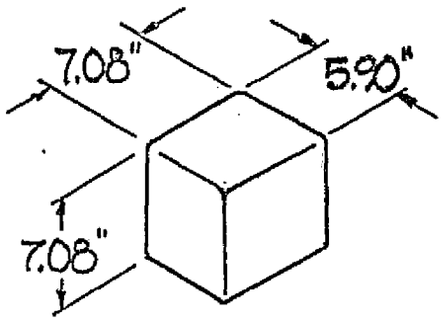
INSTRUMENT BASELINE DATA

IFRD NO. : III-25 Subsystem B

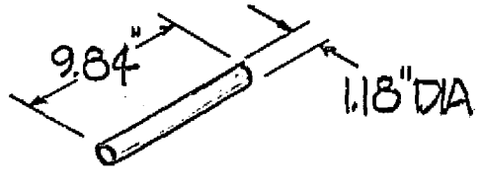
INSTRUMENT: EMI DIAGNOSTICS PACKAGE

FLIGHT	1	2
	X	

PHYSICAL DESCRIPTION



Electronics



Antenna

WEIGHT: Electronics : 3kg Antenna 1kg = 4kg

MOUNTING: Mount on deployed/ejected module

OPERATIONAL REQUIREMENTS:

SOURCE: MMC

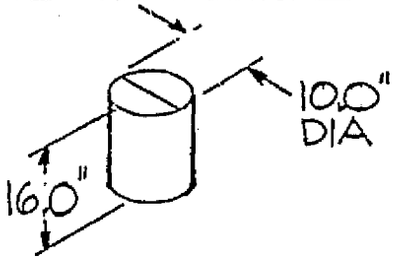
- INSTRUMENT BASELINE DATA

IFRD NO.: IV-1
INSTRUMENT: SOLAR FLUX MONITOR

- FLIGHT

1	2
X	X

- PHYSICAL DESCRIPTION



-WEIGHT: 3kg
MOUNTING: Pallet hard mount
OPERATIONAL REQUIREMENTS: Orient towards sun (+Z)

SOURCE: MMC

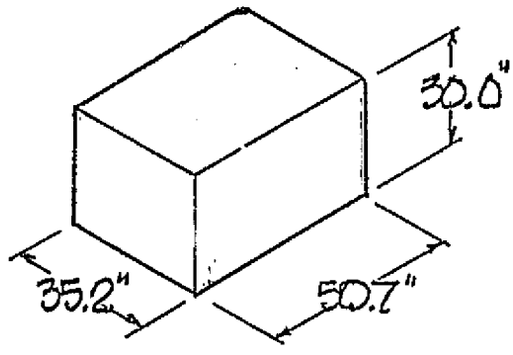
INSTRUMENT BASELINE DATA

IFRD NO.: NONE

FLIGHT 2: [X]

INSTRUMENT: INDUCED ENVIR. CONTAMINATION MONITOR

PHYSICAL DESCRIPTION



WEIGHT: 160 kg

MOUNTING: Pallet hard mount

OPERATIONAL REQUIREMENTS:

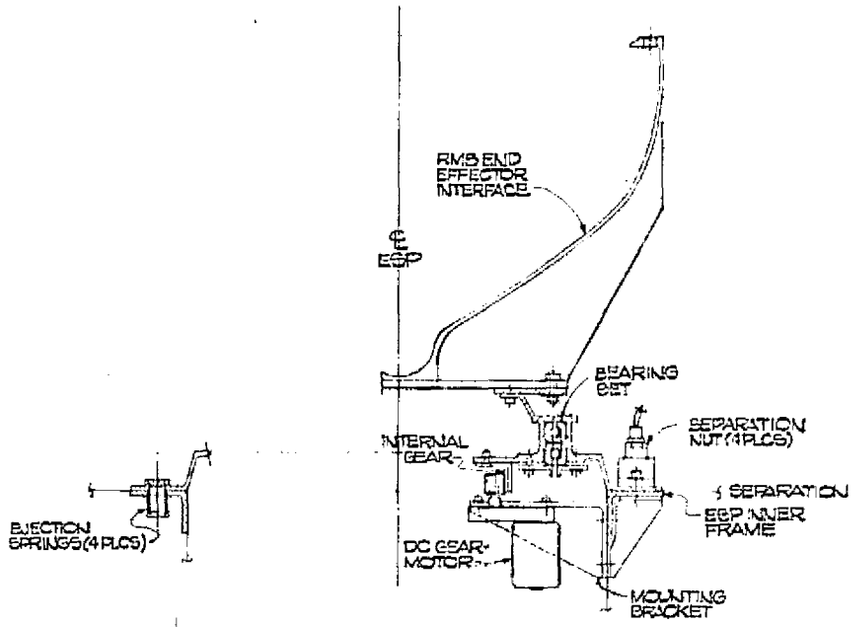
SOURCE: MSFC

APPENDIX C

ENGINEERING DRAWINGS

ENGINEERING DRAWINGS

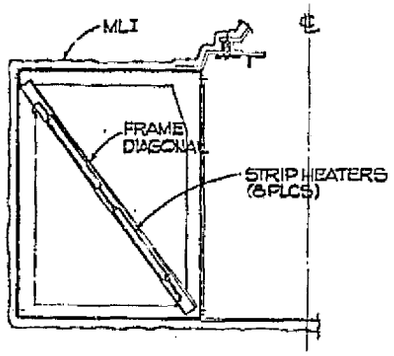
INDEX



SECTION A-A
SCALE 1/2
(MLI OMITTED)
ROTATED 22 1/2° CCW

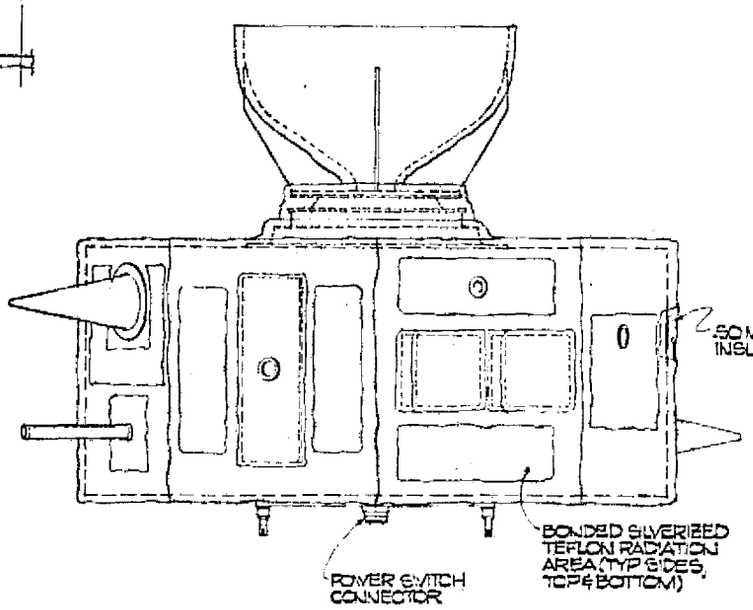
SEE SHEET 2 FOR EQUIPMENT LAYOUT & FRAME DETAILS

E
-Y

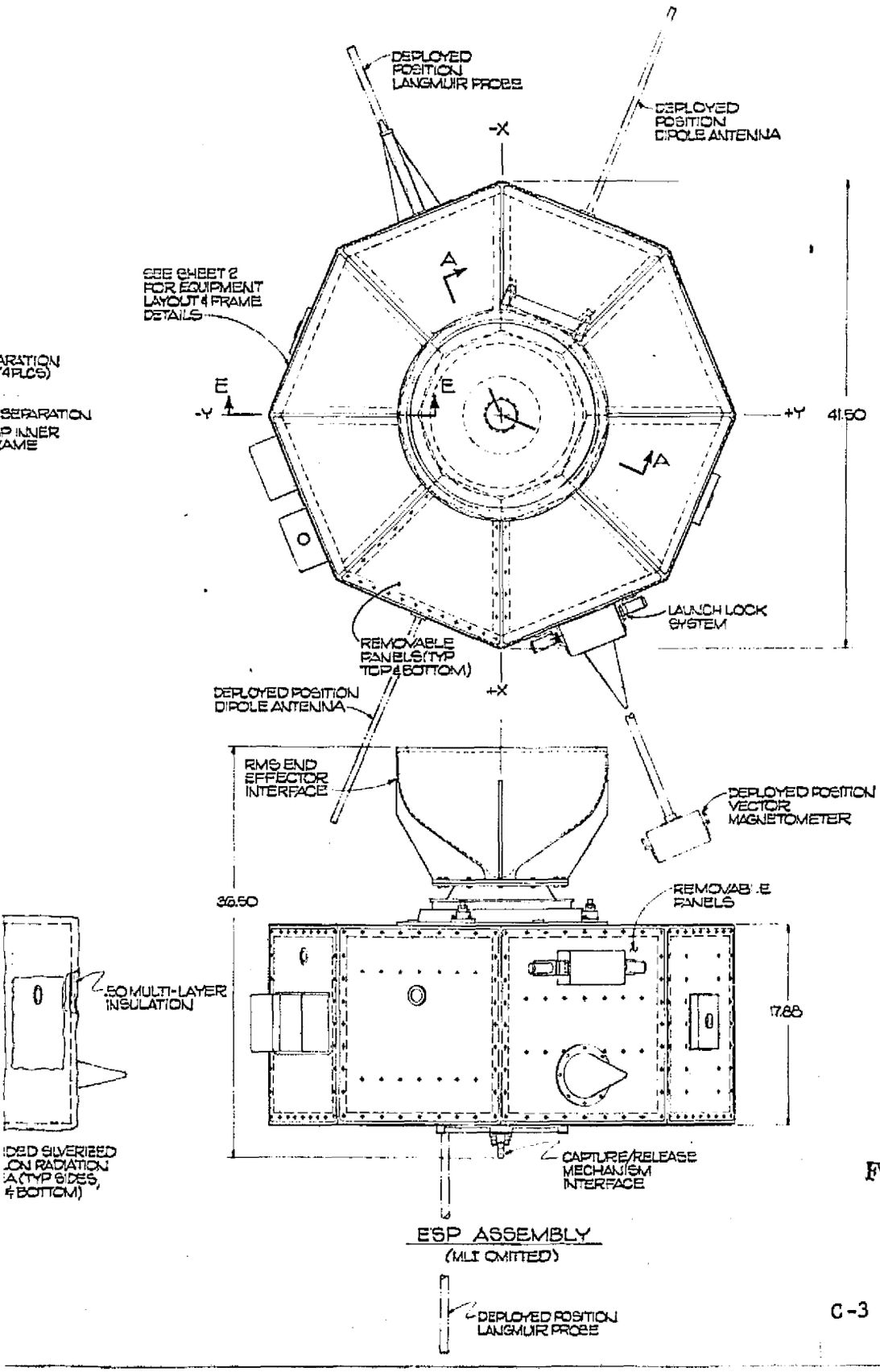


SECTION E-E

DEPLOYED P
DIPOLE ANT



FOLDOUT FRAME 1

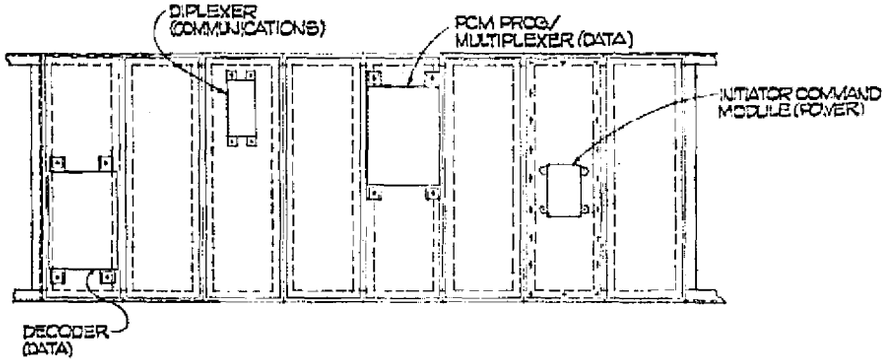


ESP ASSEMBLY
(MLI OMITTED)

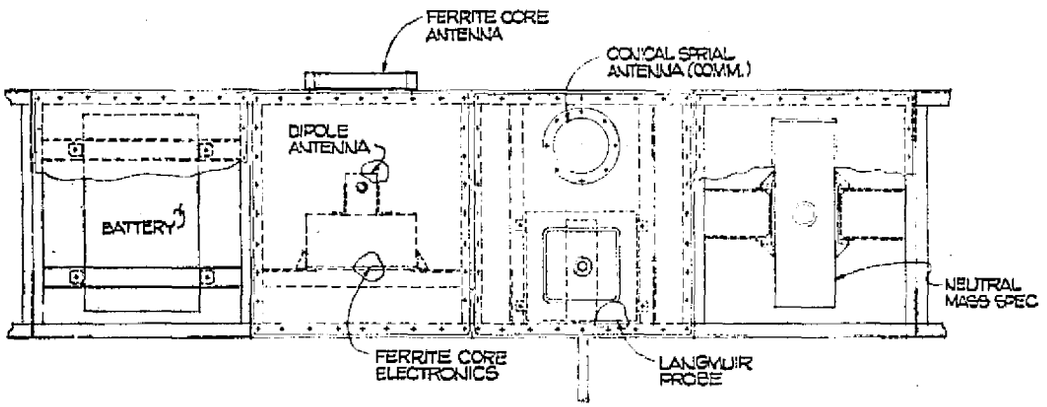
FOLDOUT FRAME 2

C-3

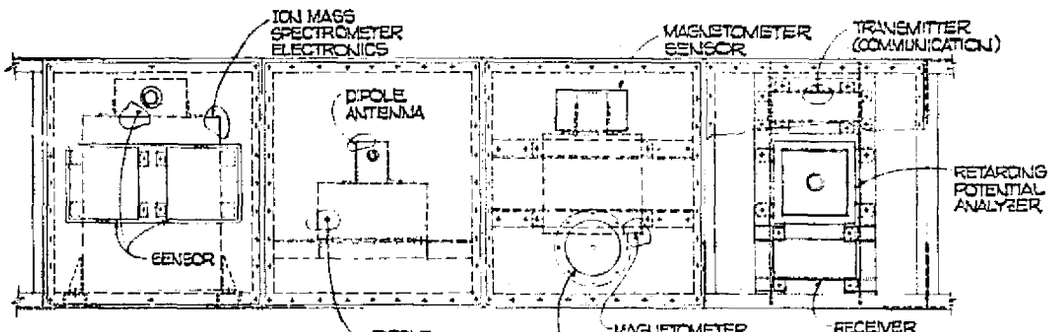
SK05-004
ENVIRONMENTAL SENSING PACKAGE - ASSEMBLY
SCALE: 1/4 19JULY96 SHEET 1 OF 2



EQUIPMENT COMPARTMENT
(FLAT PATTERN)

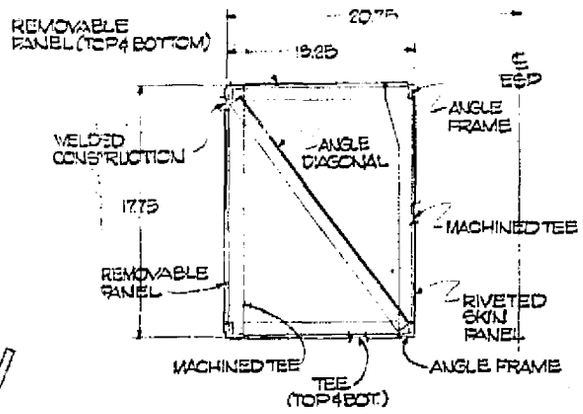


VIEW C-C
(FLAT PATTERN)
ROTATED 180°

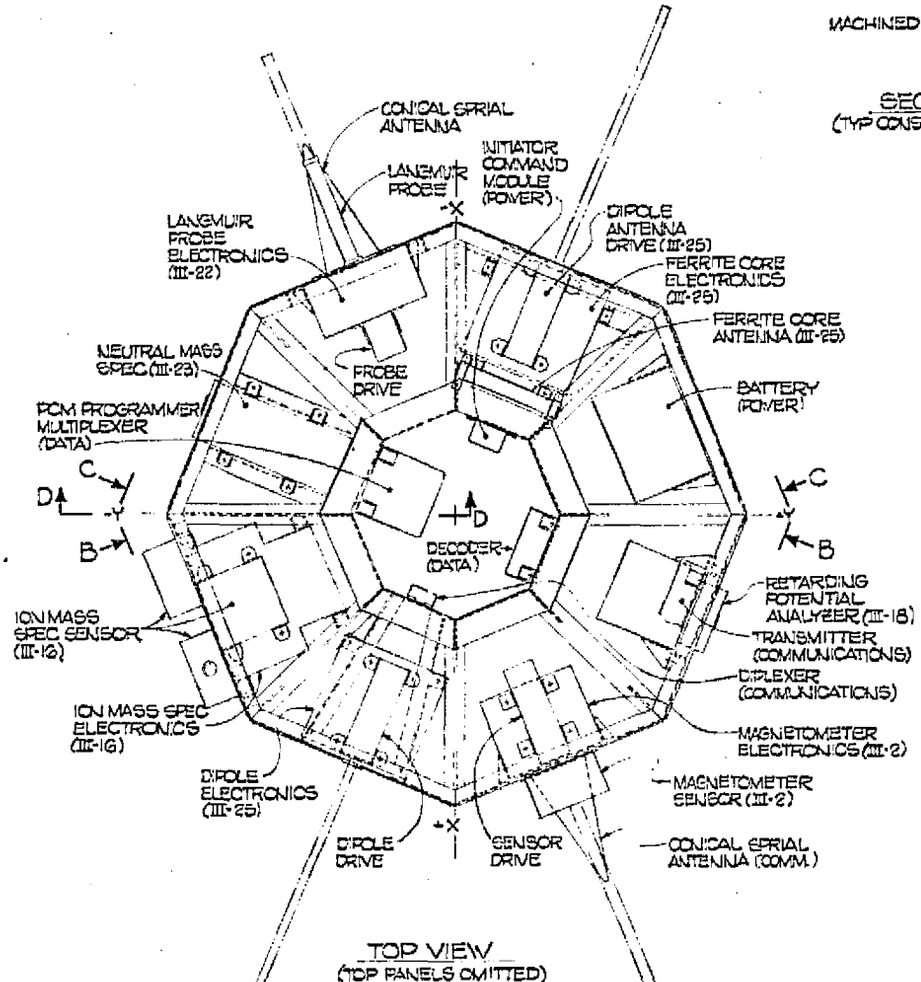


VIEW B-B
(FLAT PATTERN)

FOLDOUT FRAME



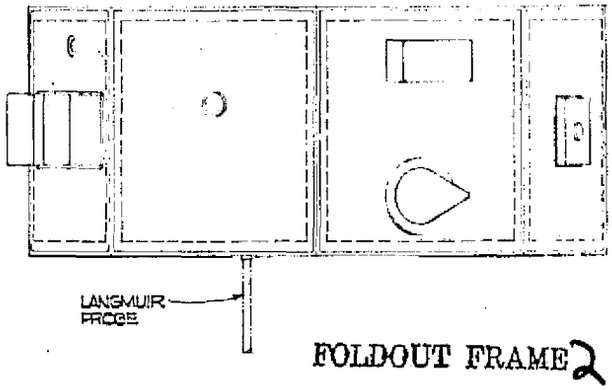
SECTION D-D
(TYP CONSTRUCTION DETAILS)



TOP VIEW
(TOP PANELS OMITTED)

MATERIALS:
SKIN & FORMED SHAPES - 6061-T6 ALUM. SHEET
MACHINED FITTINGS & BRKTS - 6061-T651 ALUM PLATE
ACTUATORS & LOCKS - STEEL & ALUMINUM

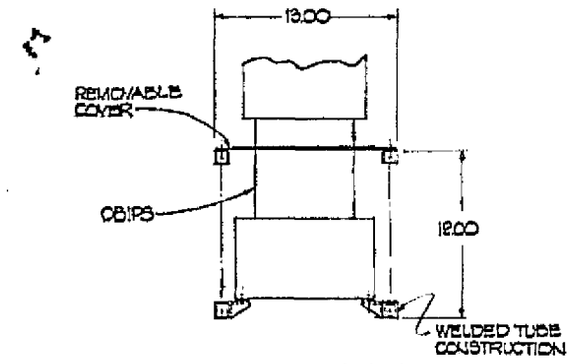
FINISHES:
IRIDITE ALL ALUMINUM
DIFFUSE BLACK PAINT ON INSIDE SURFACES



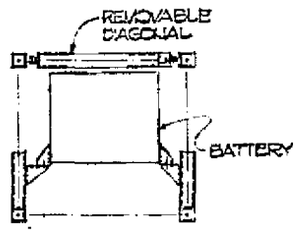
C-4

FOLDOUT FRAME 2

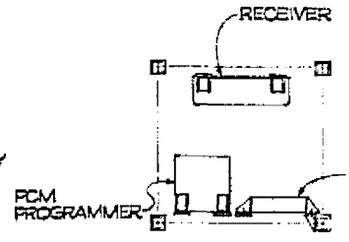
SK05-004
ESP-EQUIPMENT LAYOUT & STRUCTURAL CONCEPT
SCALE: 1/4 15JULY76 SHEET 2 OF 2



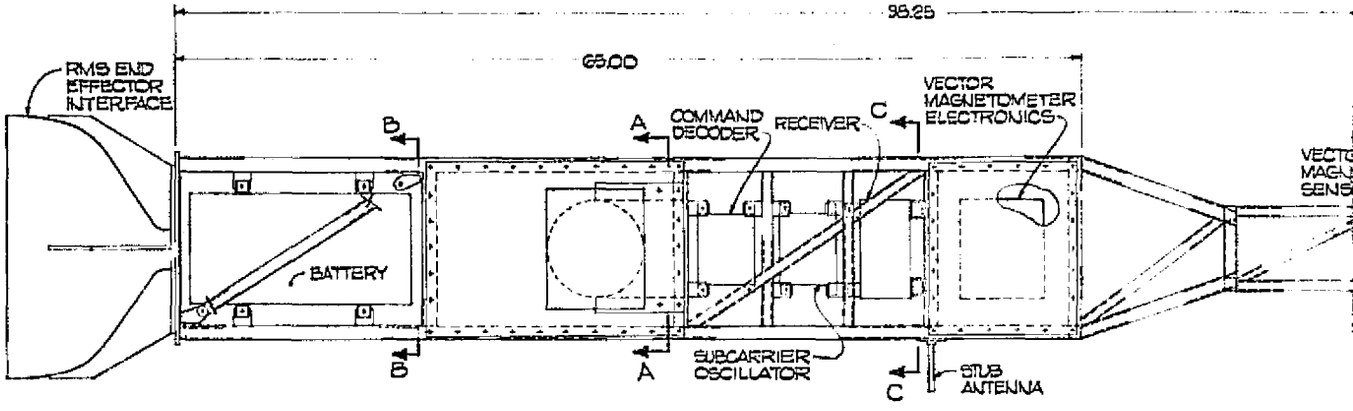
SECTION A-A
ROTATED 90°CW



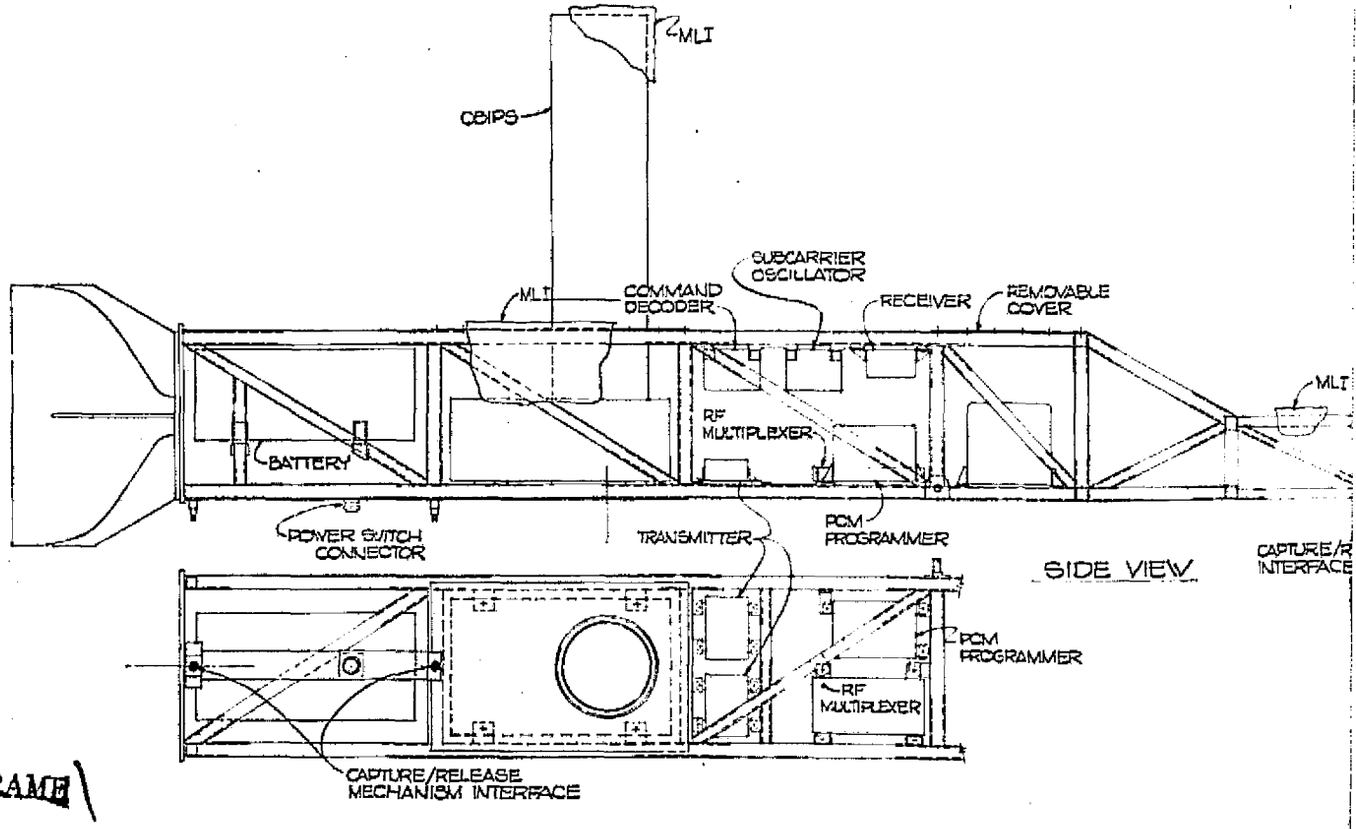
SECTION B-B
ROTATED 90°CW



SECTION C-C
ROTATED 90°CW

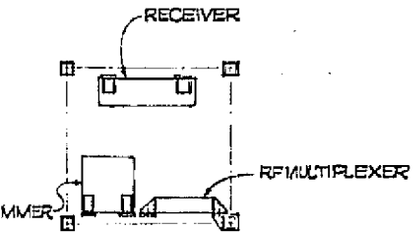


TOP VIEW

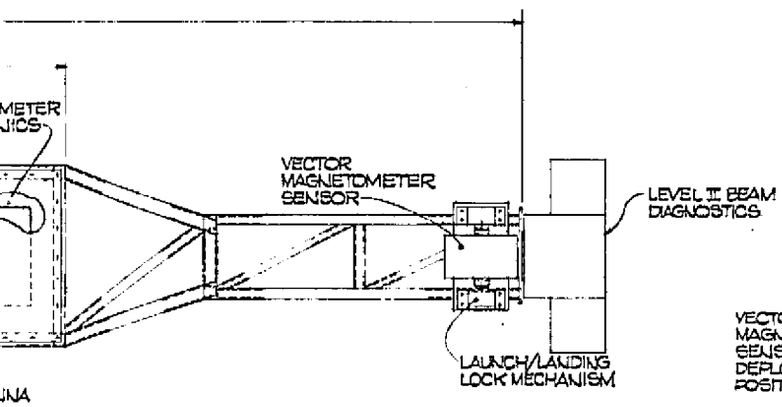


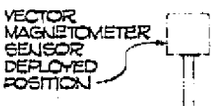
SIDE VIEW

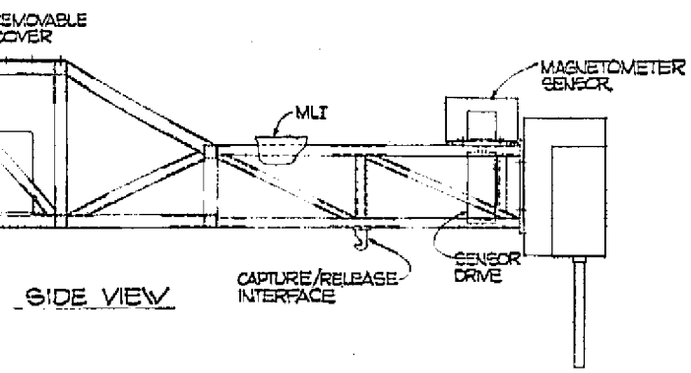
FOLDOUT FRAME



SECTION C-C
ROTATED 90°CW

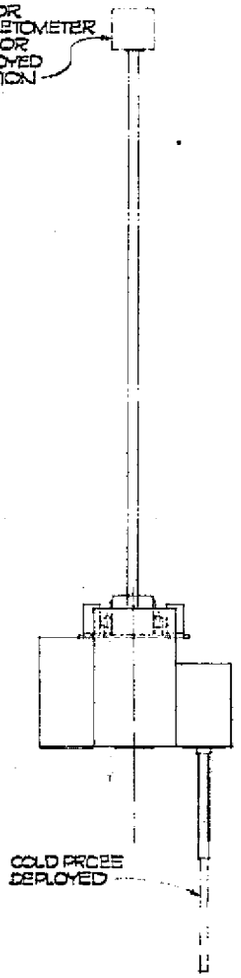






SIDE VIEW

AMMER

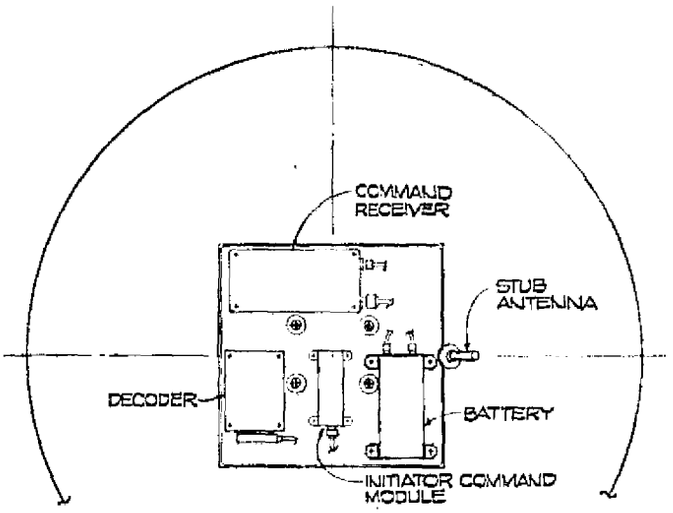


MATERIALS
FRAME : 6061-T6 ALUM. TUBES
SKIN & COVERS : 6061-T6 ALUM. SHEET
ACTUATORS & LOCKS : STEEL & ALUM.
MACHINED FITTINGS : 6061-T651 PLATE
INSULATION : ALUMINIZED MYLAR (MULTILAYER)

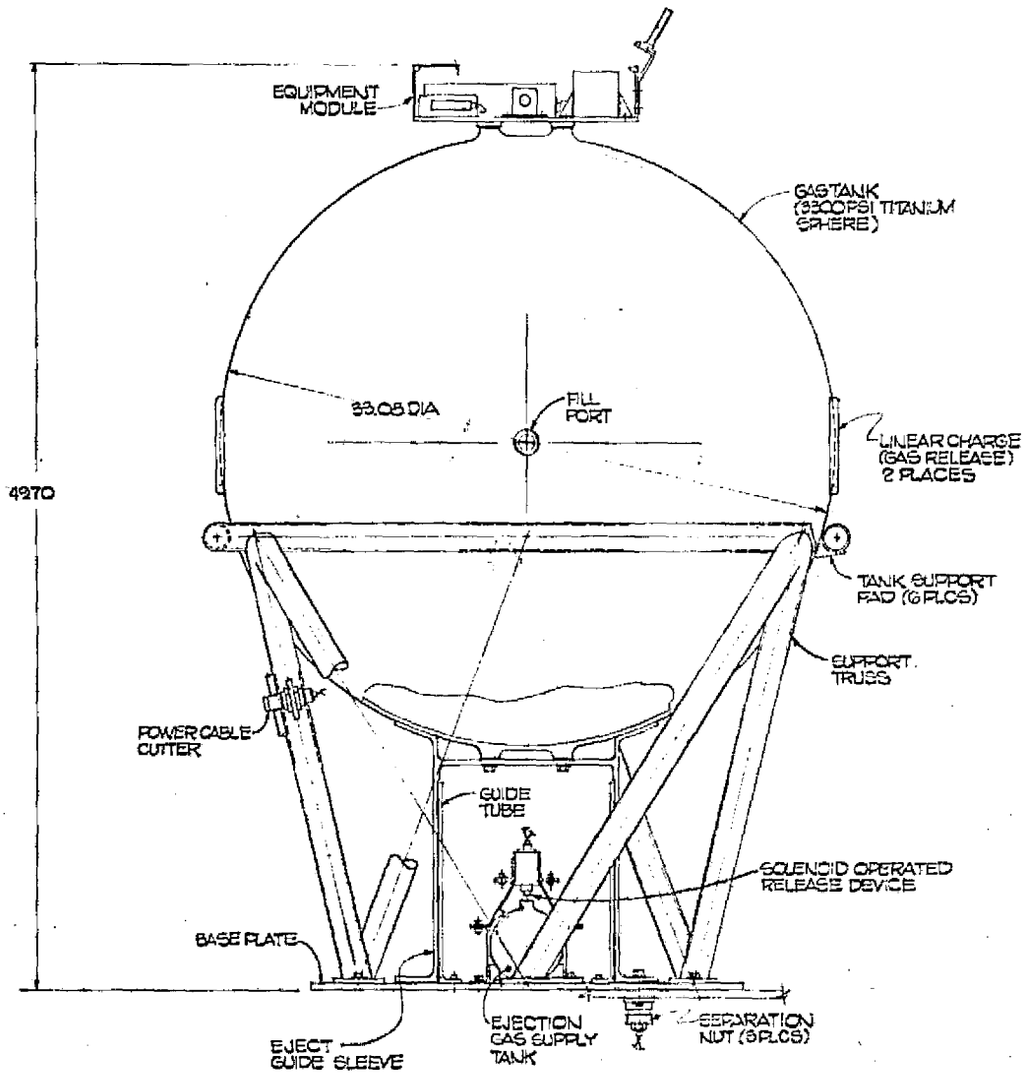
FINISHES
IRIDITE ALL ALUMINUM
SILVER COATED TEFLON RADIATION AREAS
DIFFUSE BLACK PAINT ON INSIDE SURFACES

SK05-005
BEAM DIAGNOSTICS PKG.
EQUIPMENT LAYOUT
SCALE 1/4 26 JULY 76 SHEET 1 OF 1

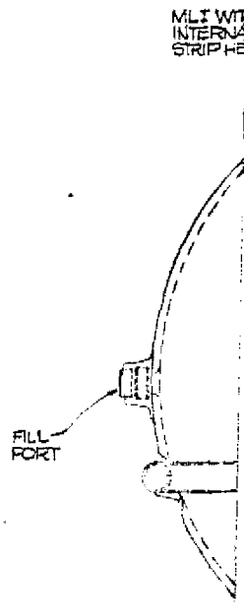
FOLDOUT FRAME 2



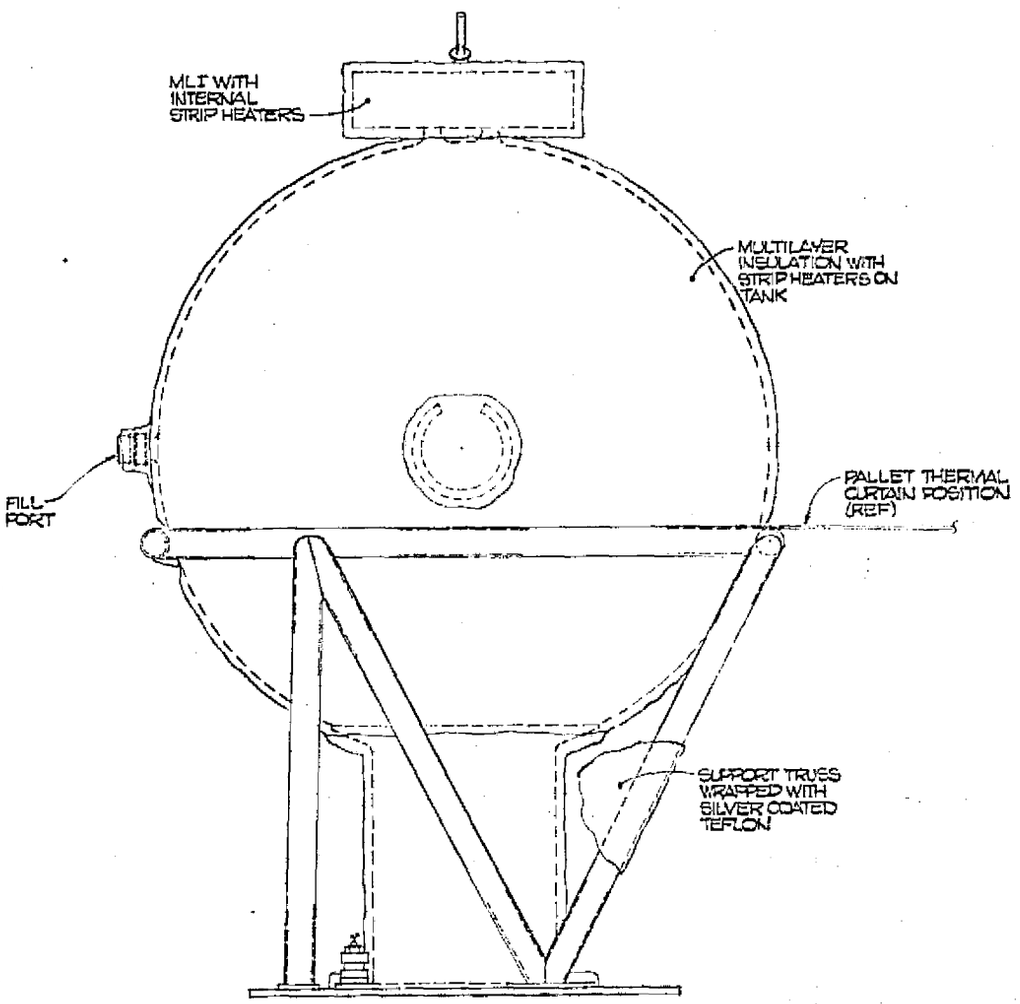
TOP VIEW



STRUCTURAL & MECHANICAL DETAILS



FOLDOUT FRAME 1



ASSEMBLY

MATERIALS

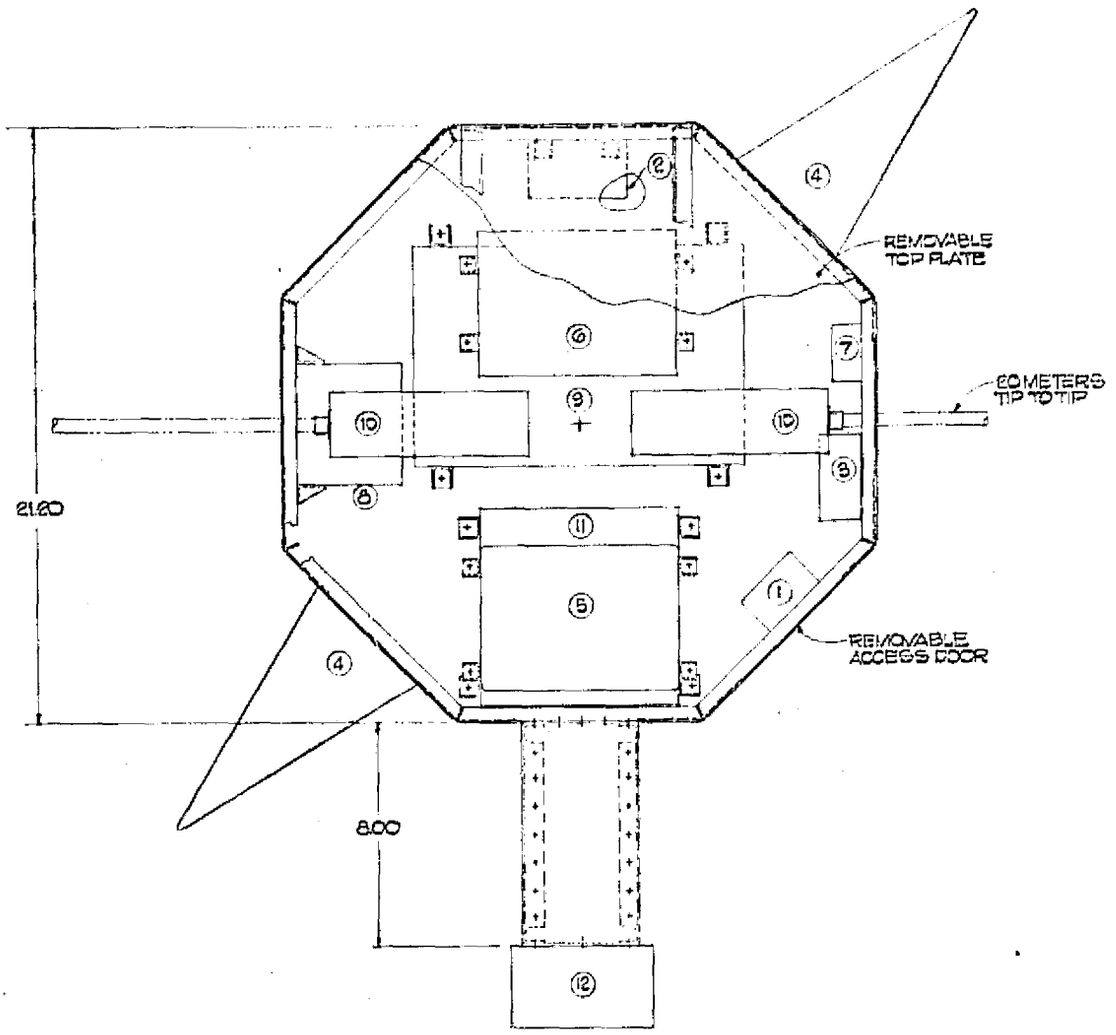
TANK: FORGED & WELDED TITANIUM
TRUSS: 6061-T6 ALUM. TUBE
MACHINED FITTINGS & BRKTS: 6061-T651 PLATE
INSULATION: ALUMINIZED MYLAR (MULTILAYER)

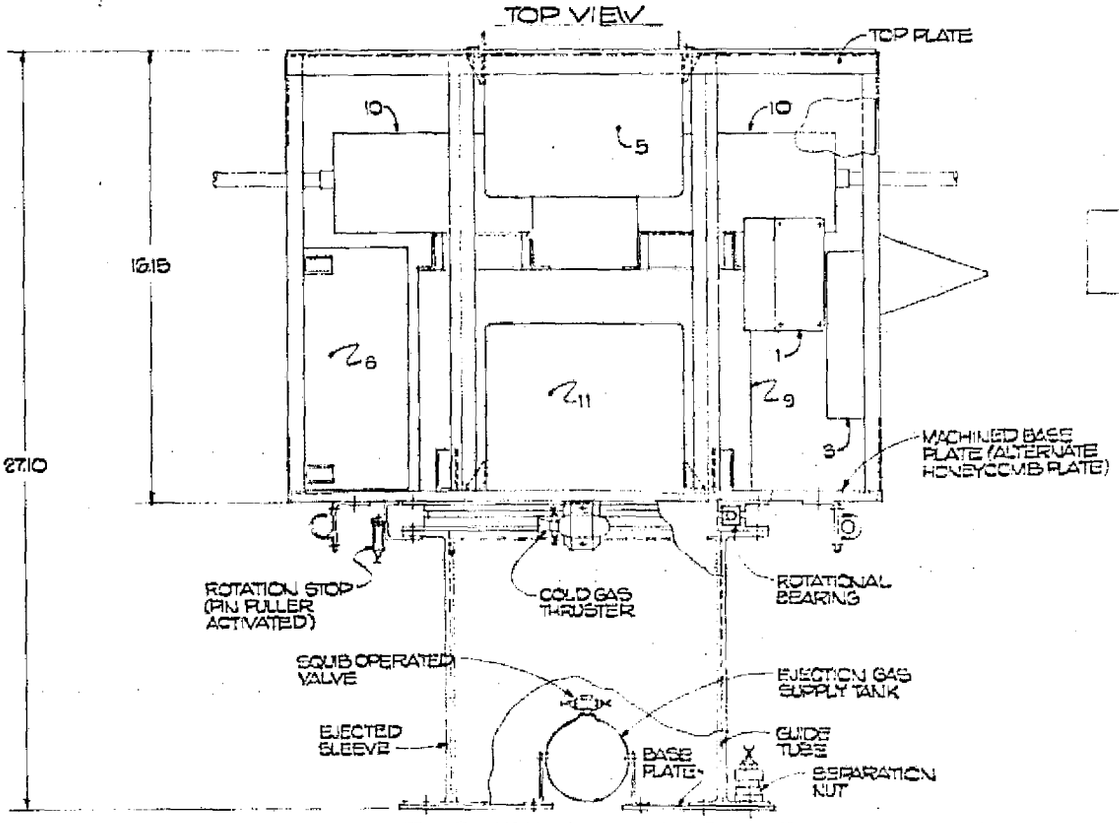
FINISHES

IRIDITE ALL ALUMINUM
SILVER COATED TEFLON RADIATION AREAS

SK05-006
GAS RELEASE MODULE
EQUIPMENT LAYOUT
SCALE: 1/3 27 JULY 1976 SHEET 1 OF 1

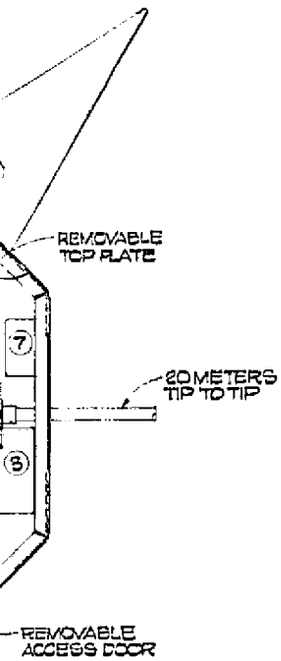
FOLDOUT FRAME 2





STRUCTURAL & MECHANICAL DETAILS
(MAGNETOMETER SENSOR NOT SHOWN)

FOLDOUT FRAME



EQUIPMENT LIST

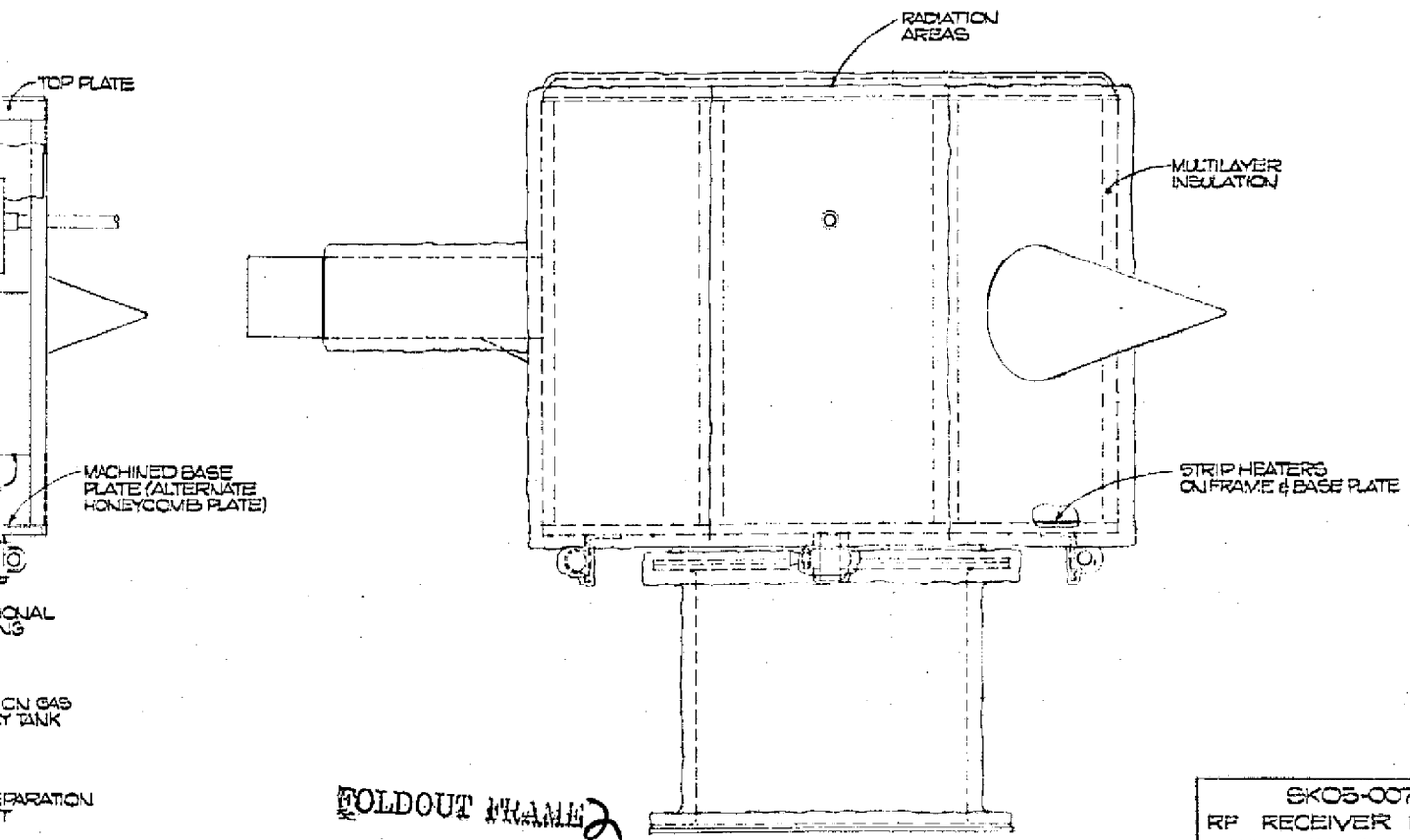
1 TRANSMITTER
2 COMMAND RECEIVER
3 DIPLEXER/SPLITER
4 CONICAL ANTENNA
5 PROGRAMMER
6 DECODER
7 PREMODULATION PROCESSER
8 BATTERY
9 RF PLASMA WAVE ELECTRONICS (I-12)
10 RF PLASMA WAVE DIPOLE ANTENNA
11 VECTOR MAGNETOMETER ELECTRONICS (III-2)
12 VECTOR MAGNETOMETER SENSOR

MATERIALS

FRAME (MACHINED SHAPES): 6061-T651 PLATE
SKIN & FORMED SHAPES: 6061-T6 ALUM. SHEET
FITTINGS & BRACKETS: 6061-T651 ALUM. PLATE
INSULATION: ALUMINIZED MYLAR (MULTILAYER)

FINISHES

IRIDITE ALL ALUMINUM
DIFFUSE BLACK PAINT ON INSIDE SURFACES
SILVER COATED TEFLON RADIATION AREAS

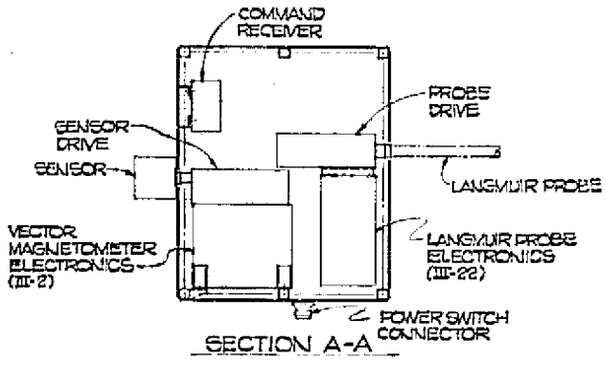


FOLDOUT FRAME 2

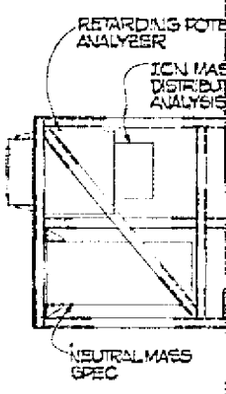
ASSEMBLY

C-7

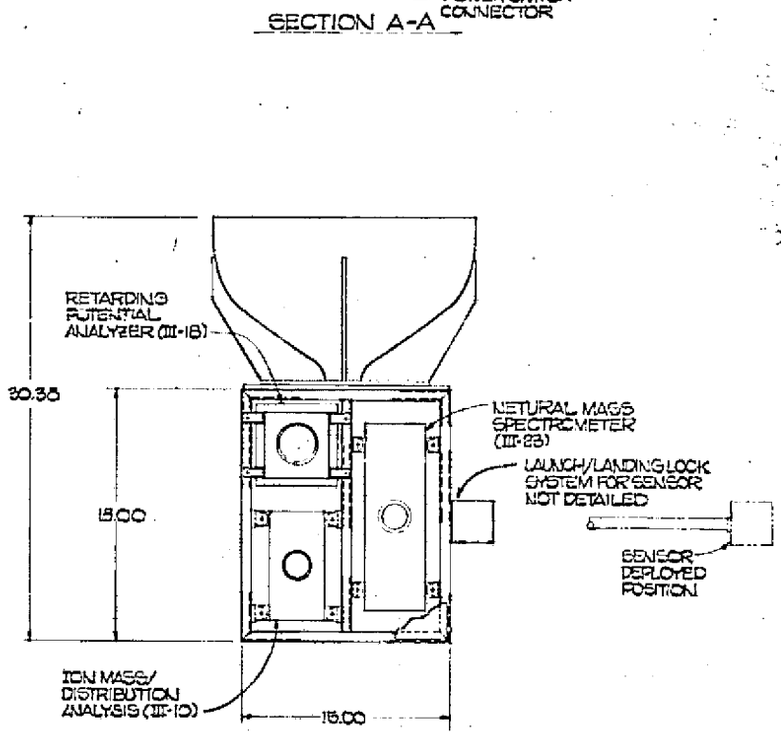
SK05-007
RF RECEIVER PACKAGE
EQUIPMENT LAYOUT
SCALE: 1/2 30 JULY 76 SHEET 1 OF 1

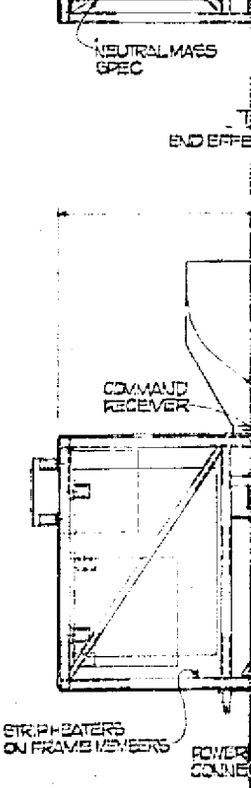


SECTION A-A

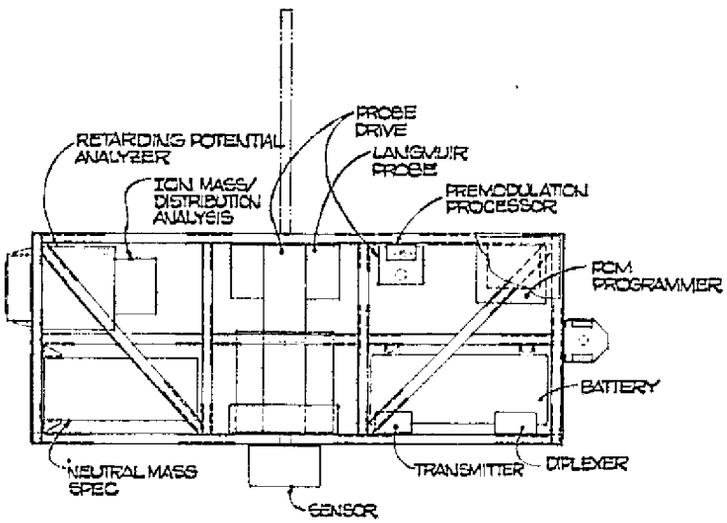


END EFFE





FOLDOUT FRAME



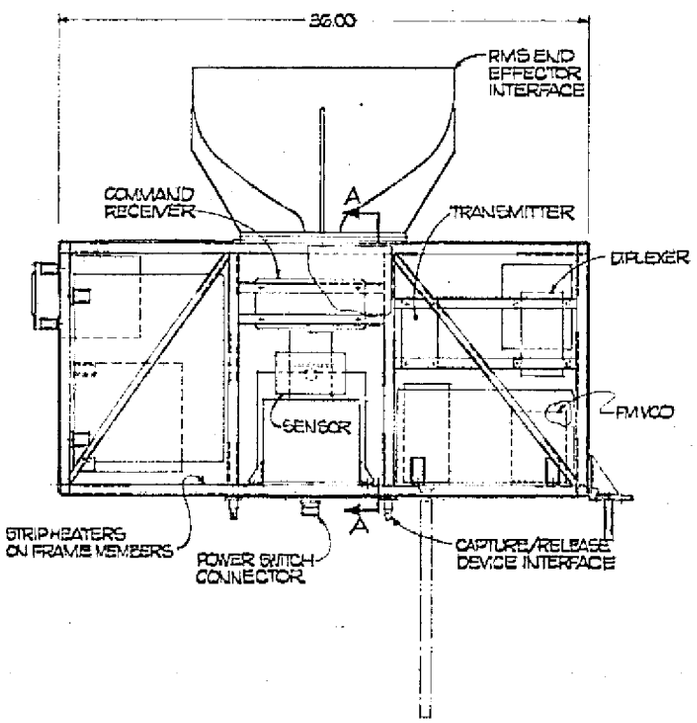
TOP VIEW
END EFFECTOR INTERFACE NOT SHOWN

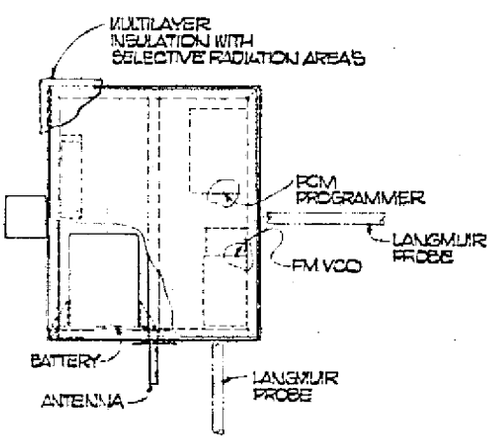
MATERIALS

FRAME: GOGI-T6 ALUMINUM TUBES
SKIN & FORMED SHAPES: GOGI-T6 ALUM. SHEET
MACHINED FITTINGS: GOGI-T6 DI ALUM. PLATE
ACTUATORS & LOCKS: STEEL & ALUM.
INSULATION: ALUMINIZED MYLAR (MULTILAYER)

FINISHES

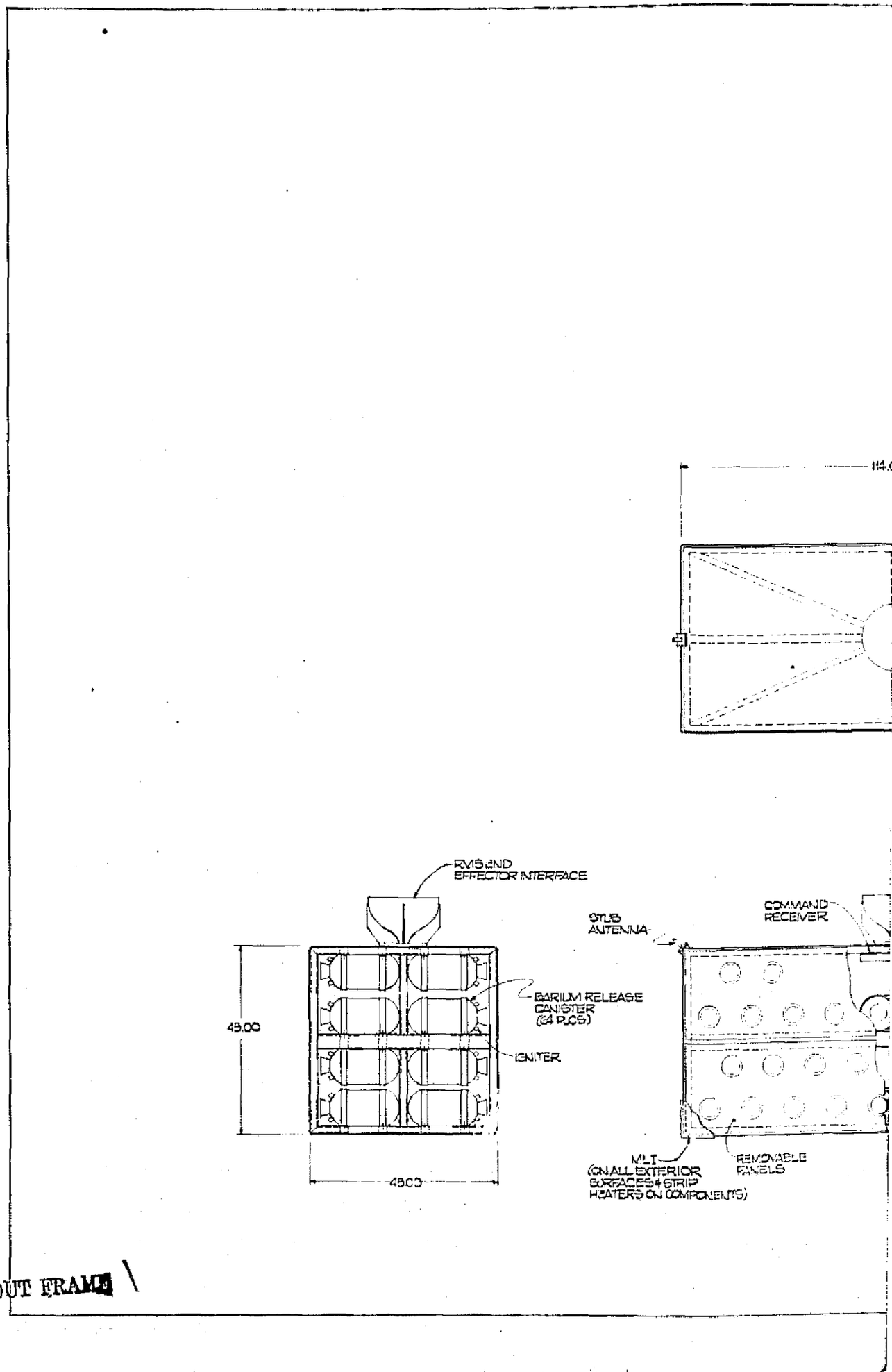
IRIDITE ALL ALUMINUM
DIFFUSE BLACK PAINT ON INTERIOR SURFACES
SILVER COATED TEFLON RADIATION AREAS



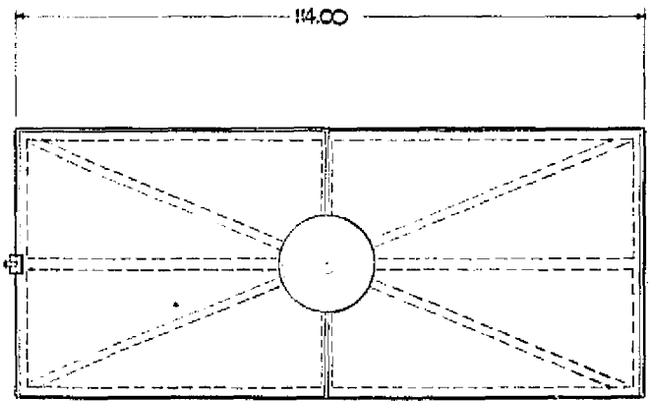


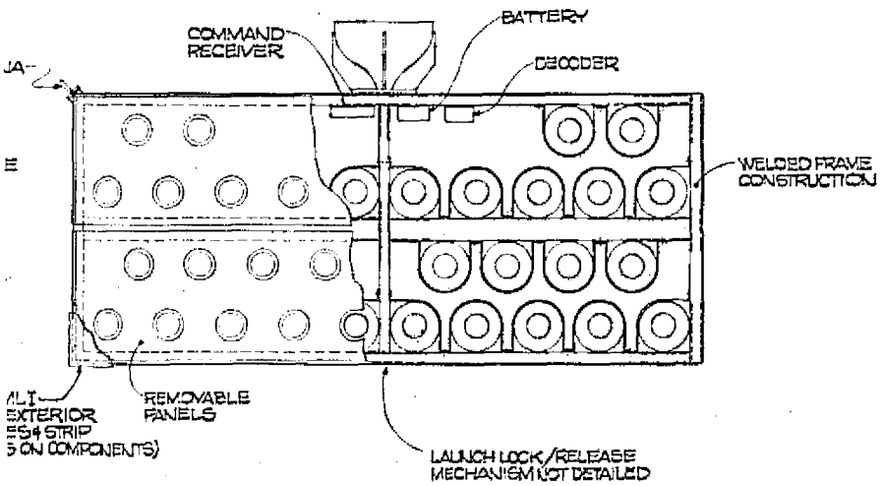
SK05-008
PLASMA WAKE DIAGNOSTICS PKG.
EQUIPMENT LAYOUT
SCALE: 1/4 SIZE B/3 SHEET 1 OF 1

FOLDOUT FRAME 2



FOLDOUT FRAME





MATERIALS

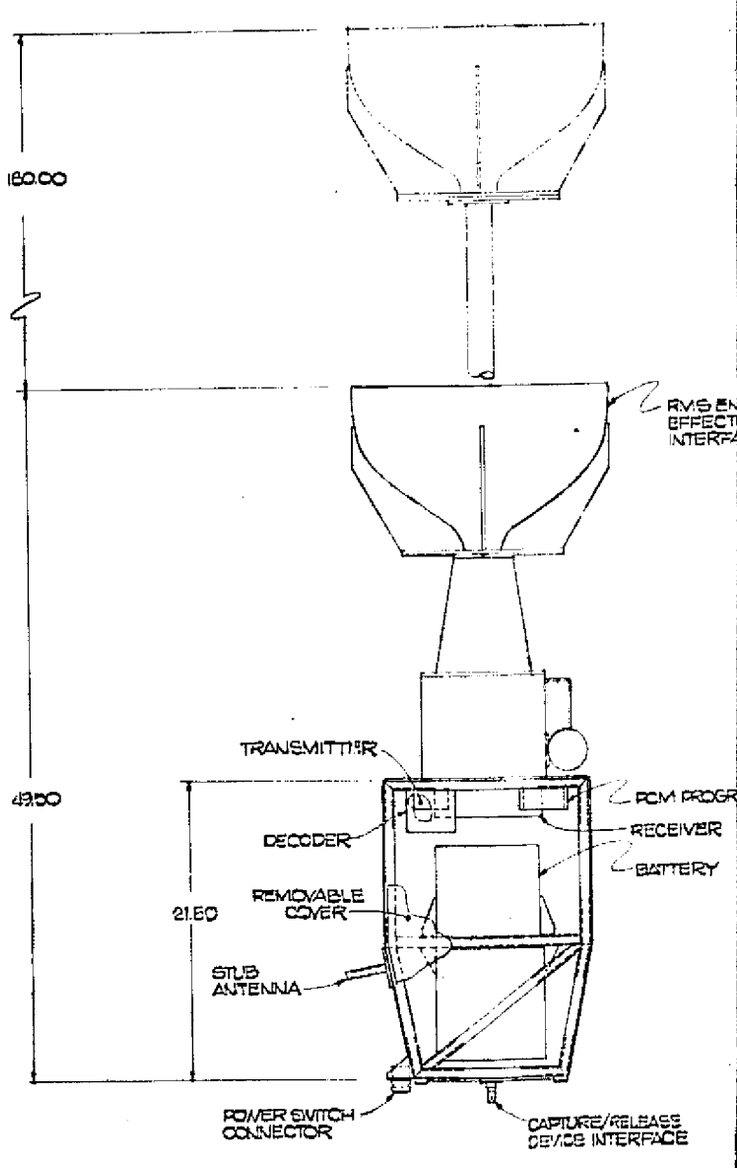
FRAME: 6061-T6 ALUMINUM TUBES
SKIN: 6061-T6 ALUMINUM SHEET
ACTUATORS & LOCKS: STEEL & ALUM.
INSULATION: ALUMINIZED MYLAR (MULTILAYER)

FINISHES

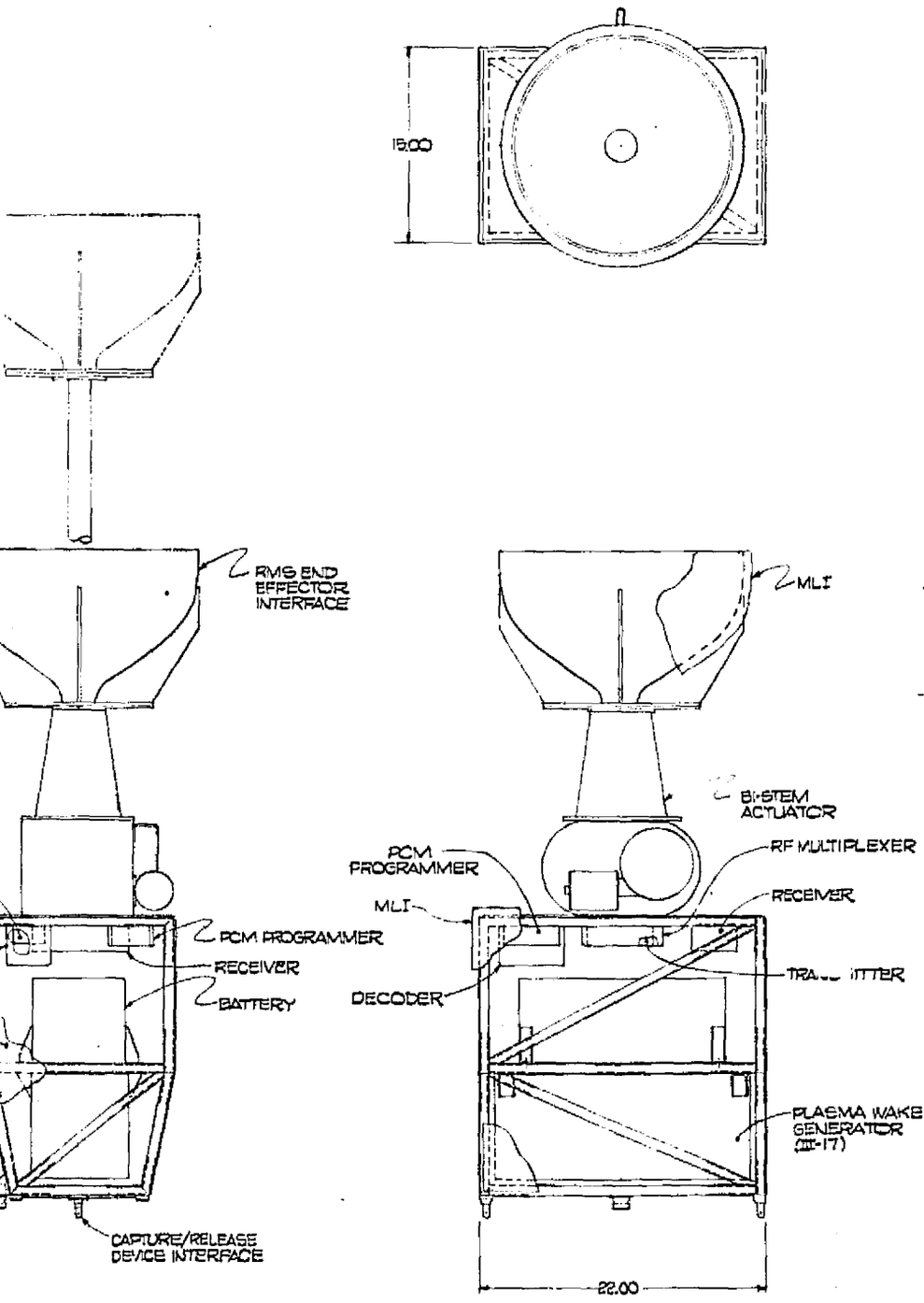
IRIDITE ALL ALUMINUM

SK05-009
CHEMICAL RELEASE MODULE
EQUIPMENT LAYOUT
SCALE: NO DATE: AUG 1973 SHEET 1 OF 1

FOLDOUT FRAME 2



FOLDOUT FRAME 1



MATERIALS

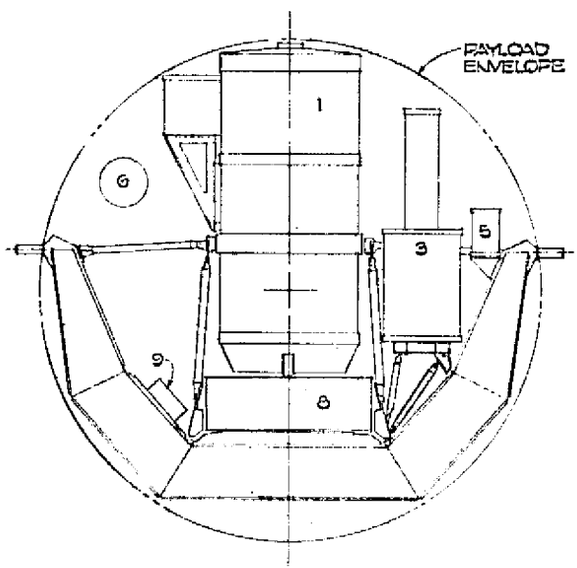
FRAME : 6061-T6 ALUMINUM TUBES
SKIN & COVERS : 6061-T6 ALUMINUM SHEET
MACHINED FITTINGS : 6061-T651 ALUM. PLATE
LOCK INTERFACE : STEEL & ALUMINUM
INSULATION : ALUMINIZED MYLAR (MULTILAYER)

FINISHES

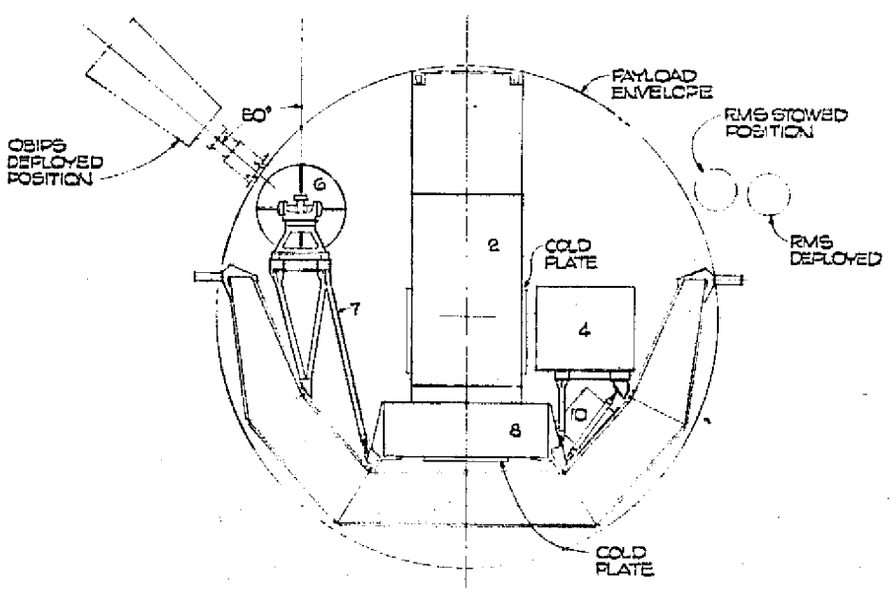
IRIDITE ALL ALUMINUM
DIFFUSE BLACK PAINT O[illegible] INTERIOR SURFACES
SILVER COATED TEFLON [illegible]DIATION AREAS

SK05-010
PLASMA WAKE GENERATOR
EQUIPMENT LAYOUT
SCALE: 1/4 6AUG1976 SHEET 1 OF 1

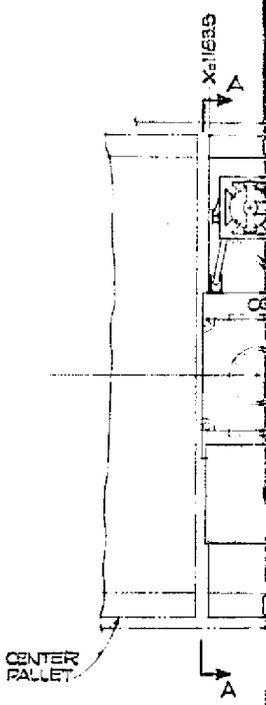
FOLDOUT FRAME 2



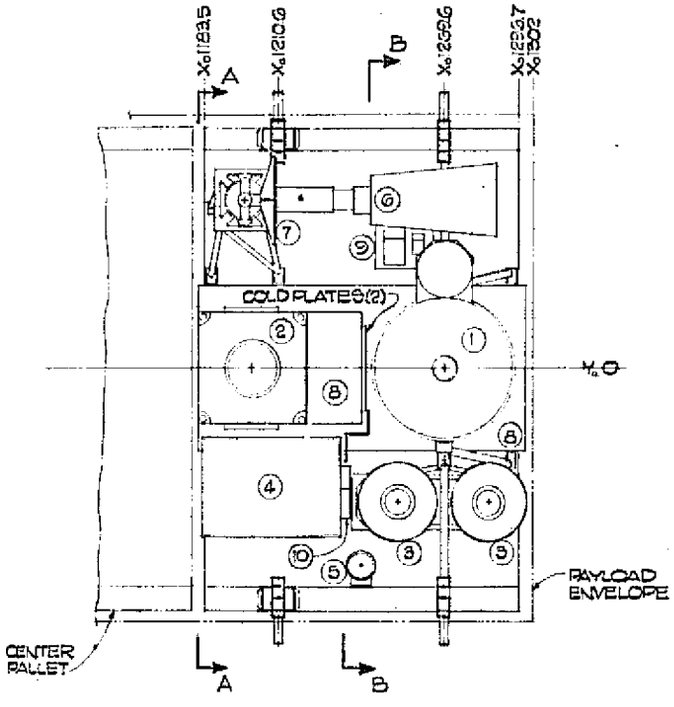
SECTION B-B



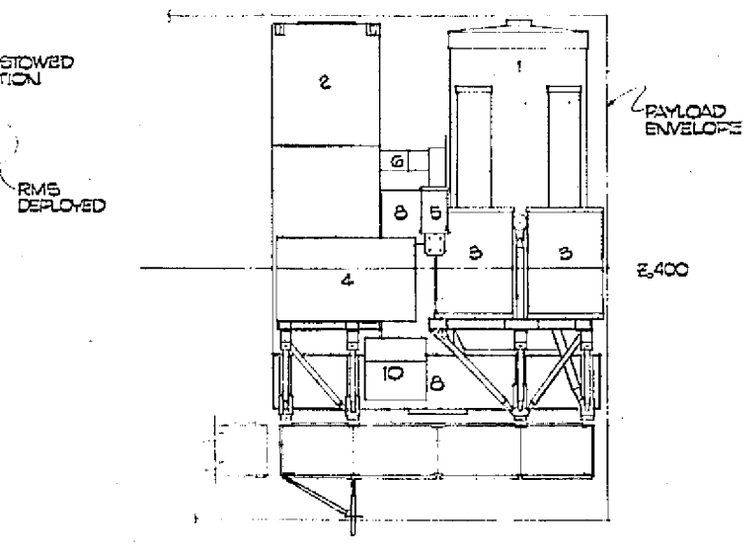
SECTION A-A



FOLDOUT FRAME



PLAN VIEW



SIDE VIEW

LEGEND

1 LIDAR RECEIVER (I-1)
2 ELECTRON ACCELERATOR (I-9)
3 LIDAR TRANSMITTER (I-1)
4 INDUCED ENVIRONMENTAL CONTAM. MONITOR
5 SOLAR FLUX MONITOR (IV-1)
6 OSIPS (II-3)
7 MINI-POINTING MOUNT
8 HIGH-VOLTAGE POWER SUPPLY
9 PEAKING BATTERY & CHARGER ON COLD PLATE
10 EXPERIMENT HEAT EXCHANGER

SK05-011
AMPS FLIGHT ONE
AFT PALLET LAYOUT
SCALE: NO 23AUG1976 SH 1 OF 1

FOLDOUT FRAME 2

APPENDIX D

MASS PROPERTIES COMPUTER PRINTOUTS

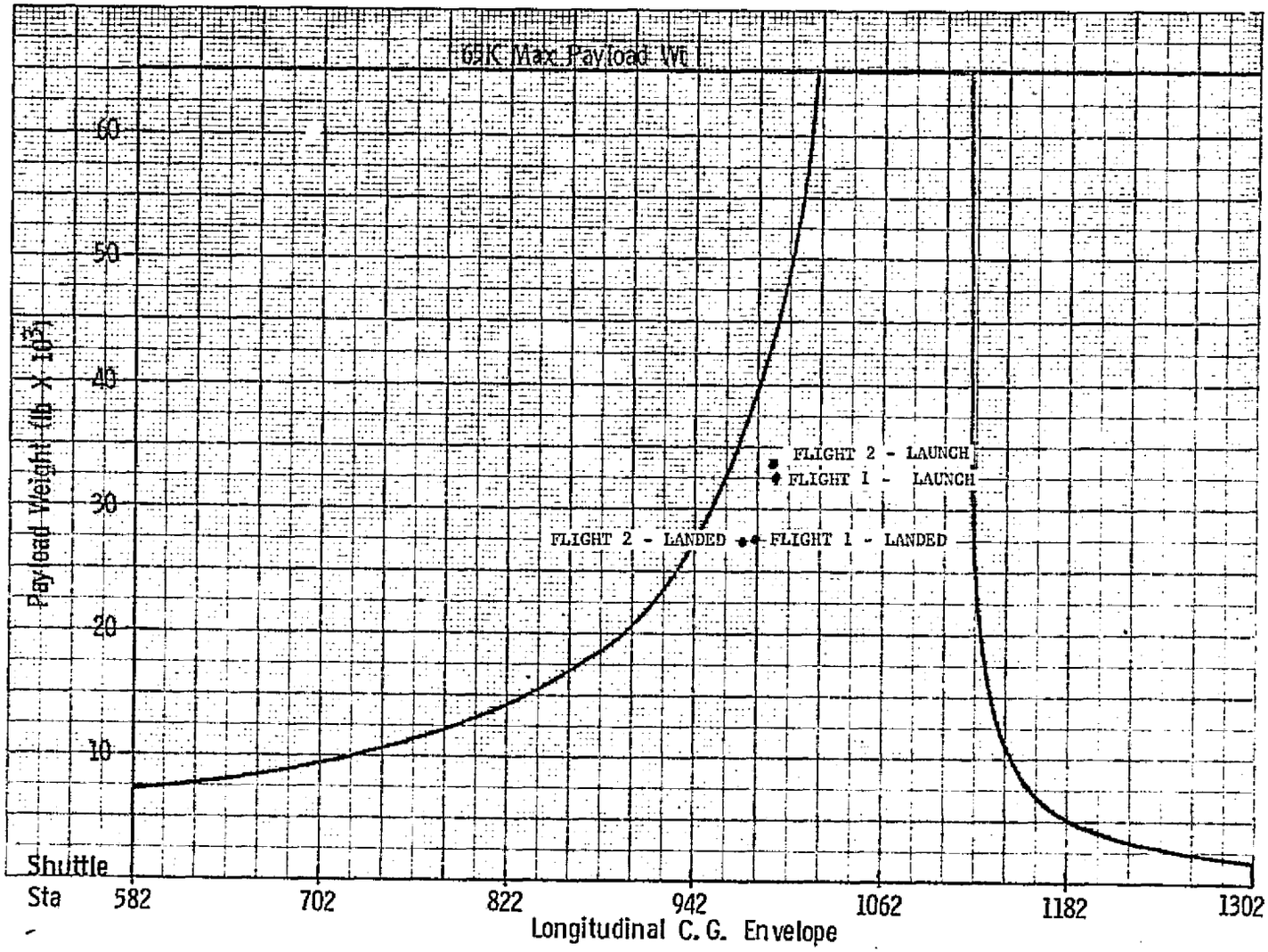
MASS PROPERTIES COMPUTER PRINTOUTS

INDEX

LOCATION CODES (XY)

(X)		(Y)	
Basic Spacelab	A	Orbiter	0
Mission Dependent	B	Pallet Train	1
AMPS Instruments	D	Pallet-Fwd	2
AMPS Labcraft	C	Pallet-Mid	3
		Pallet-Aft	4
		Module	5
		Util Bridge-Fwd	6
		Util Bridge-Aft	7
		Tunnel	8
		Airlock	9

* Indicates expendable--not included in landed weight.


65K Max. Payload Wt
Payload Weight lb X 10³
60
50
40
30
20
10
FLIGHT 2 - LAUNCH
FLIGHT 1 - LAUNCH
FLIGHT 2 - LANDED
FLIGHT 1 - LANDED
Shuttle
Sta
582
702
822
942
1062
1182
1302
Longitudinal C. G. Envelope

AMPS -----FLIGHT 1--------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

DATE OF RUN 09/20/76
PAGE 1

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
SPACELAB MODULE	A5	1	3383.00	2156.5	-8.5	1004.3	160.5	165.9	154.9
6 METER PALLET TRAIN	A1	1	1236.00	2700.0	11.9	911.5	212.5	179.4	223.0
3 METER PALLET	A4	1	618.00	3183.6	11.9	911.5	212.6	1[illegible].6	189.0
SL/ORBITER UTILITY BRIDGE	A6	1	218.20	1836.0	0.	914.0	0.	.	0.
TUNNEL	A8	1	352.00	1877.1	0.	9[illegible]	142.0	1[illegible].1	141.0
TUNNEL ADAPTER	A8	1	408.20	1500.0	0.	[illegible]	87.1	105.4	95.0
P/L ARS FAN AND DUCTING	A8	1	9.50	1577.3	0.	[illegible].7	0.	0.	0.
AIRLOCK	A9	1	364.00	1805.3	0.	1089.3	0.	0.	0.
LESS SHUTTLE AIRLOCK	A9	1	-363.00	1402.0	0.	914.0	0.	0.	0.
****** BASIC SPACELAB			6205.90	2305.7	-1.1	973.7	177.9	430.4	432.8
* EXTRA WATER FOR COOLING	B0	1	68.20	1117.6	0.	1016.0	0.	0.	0.
EPS KIT 2-DRY PLUS RESIDUALS	B0	1	357.02	2834.0	-16.[illegible]	994.9	206.0	294.4	357.1
* EPS KIT 2-EXPENDABLES	B0	1	383.30	2783.8	-109.	80.0	58.7	110.5	125.7
EPS KIT 2			740.32	2701.2	-65.6	82.4	156.0	228.8	275.6
ORBITER HEAT REJECTION KIT	B0	1	87.50	3083.6	0.	[illegible] 4.0	98.0	171.7	108.5
LONGERON FITTING-PALLET	B0	1	40.40	2475.5	238.8	1[illegible] 1.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	2475.5	-238.7	1[illegible] 1.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	2925.1	238.8	10[illegible] 1.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	2925.1	-238.7	10[illegible] 1.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	3074.9	238.8	105[illegible].6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	3074.9	-238.7	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	3224.8	238.8	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	3224.8	-238.7	1051.6	0.	0.	0.
KEEL FITTING-PALLET	B0	1	35.40	2993.4	0.	777.2	0.	0.	0.
KEEL FITTING-PALLET	B0	1	35.40	3000.6	0.	777.2	0.	0.	0.
LONGERON FITTING-MODULE	B0	1	40.40	2035.9	238.8	1051.6	[illegible]	0.	0.
LONGERON FITTING-MODULE	B0	1	40.40	2035.9	-238.7	1051.6	0.	0.	0.
LONGERON FITTING-MODULE	B0	1	40.40	2275.7	238.8	1051.6	0.	0.	0.
LONGERON FITTING-MODULE	B0	1	40.40	2275.7	-238.7	1051.6	0.	0.	0.

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
KEEL FITTING-MODULE	B0	1	35.40	2275.7	0.	777.2	0.	0.	0.
LESS ORBITER ALLOWANCE	B0	1	-204.00	2728.0	0.	1003.3	0.	0.	0.
ORBITER RETENTION FITTINGS			387.00	2661.5	.1	1001.8	297.2	534.1	582.9
CREWMAN 5	B0	1	77.10	1244.6	121.9	886.5	0.	0.	0.
CREWMAN 6	B0	1	77.10	1244.6	71.1	886.5	0.	0.	0.
SEAT 5	B0	1	24.50	1254.8	121.9	863.6	0.	0.	0.
SEAT 6	B0	1	24.50	1254.8	71.1	863.6	0.	0.	0.
O2 TANKAGE PLUS RESIDUAL	B0	1	37.60	1905.0	0.	782.3	0.	0.	0.
* USABLE O2	B0	1	22.70	1905.0	0.	782.3	0.	0.	0.
EMERGENCY EQUIPMENT	B0	1	49.50	1366.5	0.	1016.0	0.	0.	0.
WASTE WATER TANKAGE	B0	1	22.00	1216.7	12.7	800.1	0.	0.	0.
FOOD	B0	1	28.60	1181.1	-177.7	934.7	0.	0.	0.
HYGIENE EQUIPMENT	B0	1	26.20	1414.8	-109.1	904.2	0.	0.	0.
CREW PROVISIONS	B0	1	25.20	1244.6	96.5	886.5	0.	0.	0.
LIOH	B0	1	31.90	1244.6	0.	800.1	0.	0.	0.
RESTRAINTS	B0	1	1.70	1206.5	0.	1016.0	0.	0.	0.
STOWAGE VOLUME PENTALY	B0	1	43.90	1104.9	-25.3	939.8	0.	0.	0.
CREW SYSTEMS			492.50	1330.3	26.9	884.0	103.6	235.5	239.8
MONITOR AND CONTROL PANEL	B0	1	5.00	1358.9	0.	1016.0	0.	0.	0.
KEYBOARD	B0	1	3.50	1358.9	0.	1016.0	0.	0.	0.
CRT DISPLAY/SIGNAL GENERATOR	B0	1	28.90	1358.9	0.	1016.0	0.	0.	0.
REMOTE STATION, COMMUNICATIO	B0	1	1.50	1358.9	0.	1016.0	0.	0.	0.
PSS EQUIPMENT			38.90	1358.9	0.	1016.0	.0	.0	.0
DOUBLE RACK	B5	1	58.10	2080.0	127.0	1034.3	0.	0.	0.
SINGLE RACK	B5	1	37.60	2207.0	127.0	1034.3	0.	0.	0.
PALLET HARDPOINTS	B1	45	37.35	2853.8	0.	934.7	0.	0.	0.
INSERTS FOR PANELS	B1	6	39.00	2846.3	0.	904.2	0.	0.	0.

AMPS -----FLIGHT 1-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

DATE OF RUN 09/20/76
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DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
STRUCTURE			172.05	2450.5	70.6	983.2	85.8	366.6	367.4
EXP SWITCH PANEL	B5	1	12.70	2156.0	0.	1016.0	0.	0.	0.
EXP SWITCH PANEL	B5	1	12.70	2156.0	0.	1016.0	0.	0.	0.
EXP SWITCH PANEL	B5	1	12.70	2156.0	0.	1016.0	0.	0.	0.
INVERTER (400 HZ)	B5	1	32.20	2197.9	-123.9	934.0	0.	0.	0.
EPDS			70.30	2175.2	-56.8	978.4	74.0	45.9	65.2
COLD PLATE-IECM	B4	1	5.50	3051.7	-109.2	965.2	0.	0.	0.
COLD PLATE-ELECT ACCEL	B4	1	5.50	3051.0	50.0	1013.5	0.	0.	0.
COLD PLATE-ELECT ACCEL	B4	1	5.50	3051.0	-50.0	1013.5	0.	0.	0.
COLD PLATE-ELECT ACCEL	B4	1	5.50	3152.6	0.	1092.2	0.	0.	0.
COLD PLATE-ELECT ACCEL	B4	1	5.50	3152.6	0.	990.0	0.	0.	0.
COLD PLATE-PEAKING BATTERY	B4	1	5.50	3192.4	114.0	914.0	0.	0.	0.
COLD PLATE-PS	B4	1	5.50	3154.3	0.	889.0	0.	0.	0.
COLD PLATE-RF TERMINAL	B3	1	5.50	2836.0	114.0	914.0	0.	0.	0.
ECS			44.00	3080.2	14.9	973.9	95.5	123.8	128.4
EXP RAU	B2	1	2.30	2524.8	0.	889.0	3.5	5.8	5.2
EXP RAU	B3	1	2.30	2824.5	0.	889.0	3.5	5.8	5.2
EXP RAU	B3	1	2.30	2824.5	0.	889.0	3.5	5.8	5.2
EXP RAU	B4	1	2.30	3124.2	0.	889.0	3.5	5.8	5.2
EXP RAU	B4	1	2.30	3124.2	0.	889.0	3.5	5.8	5.2
EXP RAU	B5	1	2.30	2156.5	-139.6	990.5	3.5	5.8	5.2
EXP COMPUTER	B5	1	30.20	2156.0	-0.	1016.0	0.	0.	0.
DIGITAL TAPE RECORDER	B5	1	43.00	2156.0	-0.	1016.0	0.	0.	0.
EXPERIMENT I/O	B5	1	27.50	2156.0	-0.	1016.0	0.	0.	0.
HIGH RATE DIGITAL MUX	B5	1	10.00	2156.0	-0.	1016.0	0.	0.	0.
TAPE AND CANISTERS	B5	15	88.50	2165.5	0.	1016.0	0.	0.	0.

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
CMDS			213.00	2199.3	-1.5	1008.9	32.2	174.2	172.4
CONSOL VERTICAL RAILS	B5	4	2.00	2156.5	0.	1016.0	0.	0.	0.
CONSOL HORIZONTAL RAILS	B5	4	3.00	2156.5	0.	1016.0	0.	0.	0.
PSA FOOT RESTRAINTS	B5	6	18.00	2156.5	0.	1016.0	0.	0.	0.
RACK CLOSEOUT FT RESTRAINTS	B5	4	31.70	2156.5	0.	1016.0	0.	0.	0.
HABITABILITY			54.70	2156.5	0.	1016.0	0.	.0	.0
KEYBOARD	B5	1	3.50	2156.0	-141.9	984.5	0.	0.	0.
CRT AND SYMBOL GENERATOR	B5	1	28.90	2156.0	-141.9	1009.9	0.	0.	0.
CONTROL AND DISPLAY			32.40	2156.0	-141.9	1007.2	7.9	7.9	0.
****** MISSION DEPENDENT EQUIPMENT			2400.87	2270.2	-13.1	916.5	198.1	673.5	677.9
C AND D PANELS	C5	1	18.00	2156.0	0.	1016.0	0.	0.	0.
C AND D PANELS	C5	1	8.40	2156.0	0.	1016.0	0.	0.	0.
C AND D PANELS	C5	1	3.00	2156.0	0.	1016.0	0.	0.	0.
TV MONITOR	C5	1	10.00	2156.0	0.	1016.0	0.	0.	0.
OSCILLOSCOPE	C5	1	20.00	2156.0	0.	1016.0	0.	0.	0.
C AND W SENSORS-PRESSURE	C2	12	1.90	2156.0	0.	1016.0	0.	0.	0.
C AND W SENSORS-TEMPERATURE	C2	8	1.30	2156.0	0.	1016.0	0.	0.	0.
CONTROL AND DISPLAY			62.60	2156.0	0.	1016.0	.0	.0	.0
SIPS PLATFORM	C3	1	527.00	2856.0	0.	990.6	0.	0.	0.
TWO AXES GYRO PACKAGE	C3	1	8.00	2856.0	50.8	977.9	0.	0.	0.
TWO AXES GYRO PACKAGE	C3	1	8.00	2856.0	-50.7	977.9	0.	0.	0.
3 AXES GYRO PACKAGE-OSIPS	C4	1	10.00	3092.0	152.0	1066.8	0.	0.	0.
3 AXES GYRO PACKAGE-NIR SPEC	C2	1	10.00	2452.0	139.7	1054.1	0.	0.	0.

AMPS -----FLIGHT 1-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

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DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
RATE GYROS			36.00	2809.3	81.1	1023.8	90.1	245.6	255.0
MPM PLATFORM-OBIPS	C4	1	50.00	3067.0	152.0	1104.9	0.	0.	0.
FIXED HD STAR TRKER-II-7-10	C4	1	4.00	3079.0	406.0	1104.9	0.	0.	0.
MPM PLATFORM-NIR SPEC	C2	1	25.00	2452.0	139.7	1117.6	0.	0.	0.
FIXED HEAD STAR TRACKER-NIR	C2	1	4.00	2452.0	0.	1054.1	0.	0.	0.
MPM			120.00	2759.9	149.7	1109.1	55.9	308.1	312.7
ATTITUDE POINTING			683.00	2836.7	30.6	1013.2	79.6	152.5	159.1
I/F PLUMBING KITS-PALLET 3	C4	1	12.00	3156.0	0.	876.3	0.	0.	0.
THERMAL CURTAIN-PALLET 1	C2	1	10.00	2561.0	0.	1016.0	0.	0.	0.
THERMAL CURTAIN-PALLET 2	C3	1	10.00	2864.0	0.	1016.0	0.	0.	0.
THERMAL CURTAIN-PALLET 3	C4	1	10.00	3156.0	0.	1016.0	0.	0.	0.
EXP HEAT EXCHANGER-LIDAR	C4	1	25.00	3219.0	-127.0	952.0	0.	0.	0.
TCS PUMP-LIDAR	C4	1	10.00	3219.0	-127.0	952.0	0.	0.	0.
COOLANT FILTERS	C4	6	2.70	3219.0	-127.0	952.0	0.	0.	0.
THERMAL CONTROL-LIDAR			37.70	3219.0	-127.0	952.0	.0	.0	.0
MPM CANISTER-NIR SPEC	C2	1	215.00	2452.0	10.0	1140.0	0.	0.	0.
THERMAL			294.70	2620.4	-9.0	1092.6	93.4	311.0	303.5
CABLE SET-PALLET 1	C2	1	102.00	2561.0	-119.3	914.4	0.	0.	0.
CABLE SET-PALLET 2	C3	1	91.00	2864.0	-119.3	914.4	0.	0.	0.
CABLE SET-PALLET 3	C4	1	68.00	3156.0	-119.3	914.4	0.	0.	0.

AMPS -----FLIGHT 1-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

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DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
CABLE SET-MODULE TO PALLET	C7	1	57.00	2362.0	-152.3	863.6	0.	0.	0.
CABLE SET-MODULE	C5	1	34.00	2156.0	-152.3	863.6	0.	0.	0.
CABLE SET-SIFS TO INSTRUMENT	C3	1	40.00	2856.0	-152.3	863.6	0.	0.	0.
COMMON CABLE SET			392.00	2700.6	-130.3	897.4	28.6	304.4	303.9
PULSE POWER SUPPLY-LIDAR	C4	1	95.00	3156.0	0.	1010.9	0.	0.	0.
PULSE POWER SUPPLY-ACCELER	C4	1	600.00	3156.0	0.	909.3	0.	0.	0.
PEAKING BATTERY	C4	1	40.30	3166.0	101.6	902.0	0.	0.	0.
ELECTRICAL DIST UNIT	C2	1	10.00	2561.0	-0.	902.0	0.	0.	0.
ELECTRICAL DIST UNIT	C3	1	10.00	2864.0	-0.	902.0	0.	0.	0.
ELECTRICAL DIST UNIT	C4	1	10.00	3166.0	-0.	902.0	0.	0.	0.
POWER SUPPLIES			765.30	3145.1	5.4	921.2	40.7	82.3	78.4
ELECTRICAL			1157.30	2994.5	-40.6	913.2	75.0	283.3	289.3
FM MODULE	C5	1	21.80	2156.0	-0.	1016.0	0.	0.	0.
SENSOR INTERFACE BOX	C3	1	2.27	2864.0	-0.	890.0	0.	0.	0.
SENSOR INTERFACE BOX	C3	1	2.27	2864.0	-0.	890.0	0.	0.	0.
SENSOR INTERFACE BOX	C2	1	2.27	3168.0	-0.	890.0	0.	0.	0.
SENSOR INTERFACE BOX	C4	1	2.27	3168.0	-0.	890.0	0.	0.	0.
ANALOG RECORDER	C5	1	22.70	2156.0	-0.	1016.0	0.	0.	0.
TRANSIENT RECORDER	C5	5	30.80	2156.0	-0.	1016.0	0.	0.	0.
SWITCHING PANEL	C5	1	3.63	2156.0	-0.	1016.0	0.	0.	0.
VIDEO RECORDER	C5	1	36.30	2156.0	-0.	1016.0	0.	0.	0.
DATA MANAGEMENT SYSTEM			124.31	2218.8	0.	1006.8	32.8	229.9	227.5
COMMAND TRANMITTER	C3	1	.50	2926.1	-172.6	1059.2	0.	0.	0.
RF MULTIPLEXER	C3	1	1.36	2926.1	-172.6	1059.2	0.	0.	0.

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX	KY (CM)	KZ
WIDE BAND RECEIVER	C3	2	2.27	2926.1	-172.6	1059.2	0.	0.	0.
CONICAL ANTENNA	C3	1	.91	2926.1	-172.6	1059.2	0.	0.	0.
COMMUNICATIONS			5.04	2926.1	-172.6	1059.2	.0	.0	.0
FOR HV POWER SUPPLY	C4	1	12.00	3153.0	0.	889.0	0.	0.	0.
FOR INSTRUMENT IV-1	C4	1	1.40	3160.0	-208.2	1049.0	0.	0.	0.
DIRECT MOUNTING BRACKETRY			13.40	3153.7	-21.8	905.7	80.3	49.0	63.7
FOR INSTRUMENT I-21	C2	1	20.80	2569.2	101.0	987.0	0.	0.	0.
FOR INSTRUMENT I-21	C2	1	20.80	2569.2	0.	987.0	0.	0.	0.
FOR INSTRUMENT I-21	C2	1	20.80	2569.2	-101.0	987.0	0.	0.	0.
FOR INSTRUMENT I-21	C2	1	20.80	2662.0	101.0	987.0	0.	0.	0.
FOR INSTRUMENT I-21	C2	1	20.80	2662.0	0.	987.0	0.	0.	0.
FOR INSTRUMENT I-21	C2	1	20.80	2662.0	-101.0	987.0	0.	0.	0.
INSTRUMENT I-21 PLATFORM	C2	1	65.30	2634.0	0.	911.0	0.	0.	0.
FOR INSTRUMENT I-1	C4	1	39.00	3229.0	-0.	927.0	0.	0.	0.
FOR INSTRUMENT II-3	C4	1	20.40	3051.0	127.0	927.0	0.	0.	0.
FOR INSTRUMENT II-7	C3	1	6.40	2853.0	94.0	1090.0	0.	0.	0.
FOR INSTRUMENT II-9	C2	1	20.40	2440.0	142.0	978.0	0.	0.	0.
FOR INSTRUMENT II-10	C3	1	6.40	2853.0	-93.9	1090.0	0.	0.	0.
FOR IECM	C4	1	22.70	3054.9	-101.5	927.1	0.	0.	0.
FOR ESP	C2	1	13.60	2444.8	-94.0	914.0	0.	0.	0.
FOR BEAM DIAGNOSTIC PACKAGE	C3	1	9.10	2749.6	-165.0	995.7	0.	0.	0.
FOR RF TERMINAL	C3	1	5.00	2838.4	114.0	914.0	0.	0.	0.
INTERMEDIATE SPT STRUCTURE			333.10	2746.0	2.9	956.9	9.5	246.3	257.3
INSTR TO INSTR I/F STRUCTURE	C4	14	15.90	3073.4	0.	914.4	0.	0.	0.

AMPS -----FLIGHT 1-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

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DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
THERMAL CURTAIN SPT-PALLET 1	C2	1	11.30	2561.0	0.	1016.0	0.	0.	0.
THERMAL CURTAIN SPT-PALLET 2	C3	1	11.30	2864.0	0.	1016.0	0.	0.	0.
THERMAL CURTAIN SPT-PALLET 3	C4	1	11.30	3146.0	0.	1016.0	0.	0.	0.
MISC STRUCTURE			33.90	2857.0	0.	1016.0	.0	238.9	238.9
PALLET I/F STRUCTURE			396.30	2782.4	1.7	958.5	90.5	257.5	265.2
L/L LOCKS -OBIPS	C4	1	6.80	3100.0	152.4	1084.6	0.	0.	0.
EMERGENCY JETT-MPM PLATFORM	C4	1	8.20	3067.0	152.4	1059.2	0.	0.	0.
CAPTURE RELEASE DEVICE	C3	1	1.80	2804.0	-170.0	1043.9	0.	0.	0.
CAPTURE RELEASE DEVICE	C3	1	10.00	2951.0	-170.0	1033.8	0.	0.	0.
L/L LOCKS-NIR SPEC	C2	1	1.80	2457.0	-30.4	1077.0	0.	0.	0.
L/L LOCKS-NIR SPEC	C2	1	9.10	2457.5	114.3	1107.4	0.	0.	0.
EMERGENCY JETT-MPM PLATFORM	C2	1	8.20	2452.0	152.4	1059.2	0.	0.	0.
CAPTURE RELEASE DEVICE	C2	1	10.40	2444.8	-101.5	1028.0	0.	0.	0.
PIC(FOR HOLDDOWN NUTS)	C2	6	6.00	2514.6	-0.	889.0	0.	0.	0.
HOLDDOWN ORDNANCE	C2	18	1.80	2514.6	-0.	889.0	0.	0.	0.
MECHANISMS			64.10	2694.5	22.8	1039.1	143.4	284.1	306.1
****** AMPS LABCRAFT			2787.35	2825.7	-9.9	972.7	105.0	331.7	331.0
EMERGENCY JETTISON FOR I-1	D4	1	.90	3232.0	0.	1231.9	0.	0.	0.
LIDAR EMITTER	D4	1	75.00	3188.0	-121.0	1041.4	0.	0.	0.
LIDAR EMITTER	D4	1	75.00	3270.0	-121.0	1041.4	0.	0.	0.
LIDAR RECEIVER	D4	1	300.00	3232.0	0.	1082.0	0.	0.	0.
****** LASER SOUNDER (I-1)			450.90	3231.0	-40.3	1068.8	60.6	31.3	61.7
EMERGENCY JETTISON FOR I-9	D4	1	.90	3055.9	0.	1231.9	0.	0.	0.

	DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
	ELECTRON ACCEL (I-3)	D4	1	40.50	3056.9	0.	1082.0	0.	0.	0.
	GAS PLUME RELEASE (III-3)	D4	1	9.00	3056.9	0.	1219.2	0.	0.	0.
******	ELECT ACCELERATOR			50.40	3056.9	0.	1109.2	55.0	55.0	.0
	IECM	D4	1	340.00	3072.1	-109.1	988.1	0.	0.	0.
******	IECM			340.00	3072.1	-109.1	998.1	.0	.0	0.
	SOLAR FLUX MONITOR (IV-1)	D4	1	3.00	3232.0	-200.6	1079.0	0.	0.	0.
******	SOLAR FLUX MONITOR			3.00	3232.0	-200.6	1079.0	0.	0.	0.
	OBIPS (II-3)	D4	1	43.00	3194.0	150.0	1117.6	0.	0.	0.
******	OBIPS			43.00	3194.0	150.0	1117.6	0.	0.	0.
	CRYO LIMB SCANNER-DRY (II-7)	D3	1	207.00	2838.0	94.0	1077.0	0.	0.	0.
	* CRYO	D3	1	293.00	2838.0	94.0	1077.0	0.	0.	0.
******	CRYO LIMB SCANNER			500.00	2838.0	94.0	1077.0	0.	0.	0.
	CRYO IR INTERFEROMETER-DRY	D3	1	215.00	2838.0	-93.9	1077.0	0.	0.	0.
	* CRYO	D3	1	285.00	2915.0	-93.9	1077.0	0.	0.	0.
******	CRYO IR INTERFEROMETER			500.00	2881.9	-93.9	1077.0	0.	38.1	38.1
	WIDE BAND TRANSMITTER	C3	2	1.00	2831.0	-170.0	1047.5	0.	0.	0.
	COMMAND RECEIVER	C3	1	1.00	2862.0	-170.0	1047.5	0.	0.	0.
	RF MULTIPLEXER	C3	1	1.00	2857.5	-162.4	1049.0	0.	0.	0.
	ANTENNA .STUB	C3	1	1.00	2870.0	-190.0	1046.0	0.	0.	0.
	COMMUNICATIONS			4.00	2855.1	-173.1	1047.5	10.3	14.7	17.9

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
CABLE SET-BEAM DIAG PACKAGE	C3	1	1.50	2865.0	-170.0	1053.0	0.	0.	0.
POWER SUPPLY	C3	1	29.00	2461.3	-170.0	1064.8	0.	0.	0.
POWER SUBSYSTEM			30.50	2481.2	-170.0	1064.2	2.6	87.3	87.3
STRIP HEATERS	C3	1	1.00	2865.0	-170.0	1053.0	0.	0.	0.
MULTILAYER INSULATION	C3	1	4.00	2844.0	-170.0	1072.0	0.	0.	0.
THERMAL SUBSYSTEM			5.00	2848.2	-170.0	1068.2	7.6	11.3	6.4
SUBCARRIER OSCILLATOR ASSY	C3	1	5.00	2847.3	-170.0	1067.9	0.	0.	0.
PCM PROGRAMMER	C3	1	2.00	2859.3	-178.9	1049.0	0.	0.	0.
COMMAND DECODER	C3	1	1.50	2794.0	-170.0	1049.0	0.	0.	0.
DATA MANAGEMENT SUBSYSTEM			8.50	2840.7	-172.1	1060.1	10.0	24.1	22.5
DEPLOY DEVICE (III-2)	C3	1	2.70	2974.3	-170.0	1052.1	0.	0.	0.
CAPTURE/RELEASE INTERFACE	C3	1	.50	2830.0	-170.0	1042.0	0.	0.	0.
LAUNCH LOCK-VECTOR MAG	C3	1	1.00	2974.3	-170.0	1062.3	0.	0.	0.
BASIC STRUCTURE PACKAGE	C2	1	26.00	2860.0	-170.0	1057.2	0.	0.	0.
STRUCTURE SUBSYSTEM			30.20	2874.3	-170.0	1056.7	2.6	37.5	37.4
CBIPS (II-3)	D3	1	38.00	2763.5	-170.0	1072.4	0.	0.	0.
VECTOR MAGNETOMETER (III-2)	D3	1	4.10	2974.3	-170.0	1063.6	0.	0.	0.
LEVEL II DIAGNOSTIC (III-4)	D3	1	23.00	2989.6	-170.0	1052.1	0.	0.	0.
INSTRUMENTS			65.10	2856.7	-170.0	1064.7	9.5	110.8	110.4
****** BEA DIAGNOSTIC PKG			143.30	2779.2	-170.2	1062.3	8.6	177.9	177.7

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
* COMMAND RECEIVER	C2	1	1.00	2552.7	110.5	1067.0	0.	0.	0.
* COMMAND RECEIVER	C2	1	1.00	2552.7	-5.1	1062.0	0.	0.	0.
* COMMAND RECEIVER	C2	1	1.00	2552.7	-100.3	1067.0	0.	0.	0.
* COMMAND RECEIVER	C2	1	1.00	2650.2	110.5	1067.0	0.	0.	0.
* COMMAND RECEIVER	C2	1	1.00	2650.2	-5.1	1067.0	0.	0.	0.
* COMMAND RECEIVER	C2	1	1.00	2650.2	-100.3	1067.0	0.	0.	0.
* ANTENNA,STUB	C2	1	1.00	2581.2	105.4	1078.0	0.	0.	0.
* ANTENNA,STUB	C2	1	1.00	2581.2	0.	1078.0	0.	0.	0.
* ANTENNA,STUB	C2	1	1.00	2581.2	-105.4	1078.0	0.	0.	0.
* ANTENNA,STUB	C2	1	1.00	2678.7	105.4	1078.0	0.	0.	0.
* ANTENNA,STUB	C2	1	1.00	2678.7	-0.	1078.0	0.	0.	0.
* ANTENNA,STUB	C2	1	1.00	2678.7	-105.4	1078.0	0.	0.	0.
* COMMAND DECODER	C2	1	1.50	2552.7	110.5	1067.0	0.	0.	0.
* COMMAND DECODER	C2	1	1.50	2552.7	-5.1	1067.0	0.	0.	0.
* COMMAND DECODER	C2	1	1.50	2552.7	-110.5	1067.0	0.	0.	0.
* COMMAND DECODER	C2	1	1.50	2650.2	110.5	1067.0	0.	0.	0.
* COMMAND DECODER	C2	1	1.50	2650.2	-5.1	1067.0	0.	0.	0.
* COMMAND DECODER	C2	1	1.50	2650.2	-110.5	1067.0	0.	0.	0.
COMMUNICATIONS			21.00	2609.6	-.2	1069.9	88.1	50.7	101.4
* CABLE SET-GAS RELEASE	C2	1	1.36	2563.4	105.4	1068.1	0.	0.	0.
* CABLE SET-GAS RELEASE	C2	1	1.36	2563.4	-0.	1068.1	0.	0.	0.
* CABLE SET-GAS RELEASE	C2	1	1.36	2563.4	-105.4	1068.1	0.	0.	0.
* CABLE SET-GAS RELEASE	C2	1	1.36	2660.9	105.4	1068.1	0.	0.	0.
* CABLE SET-GAS RELEASE	C2	1	1.36	2660.9	-0.	1068.1	0.	0.	0.
* CABLE SET-GAS RELEASE	C2	1	1.36	2660.9	-105.4	1068.1	0.	0.	0.
* POWER SUPPLY-GAS RELEASE	C2	1	3.00	2572.8	114.8	1069.1	0.	0.	0.
* POWER SUPPLY-GAS RELEASE	C2	1	3.00	2572.8	9.4	1069.1	0.	0.	0.
* POWER SUPPLY-GAS RELEASE	C2	1	3.00	2572.8	-96.0	1069.1	0.	0.	0.
* POWER SUPPLY-GAS RELEASE	C2	1	3.00	2670.3	114.8	1069.1	0.	0.	0.
* POWER SUPPLY-GAS RELEASE	C2	1	3.00	2670.3	9.4	1069.1	0.	0.	0.
* POWER SUPPLY-GAS RELEASE	C2	1	3.00	2670.3	-96.0	1069.1	0.	0.	0.

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DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
ELECTRICAL			26.16	2618.6	6.5	1068.8	86.2	48.9	99.1
FOR INSTRUMENT I-21	C2	1	6.16	2563.4	105.4	957.0	0.	0.	0.
* FOR INSTRUMENT I-21	C2	1	6.40	2563.4	105.4	960.0	0.	0.	0.
FOR INSTRUMENT I-21	C2	1	6.16	2563.4	-0.	957.0	0.	0.	0.
* FOR INSTRUMENT I-21	C2	1	6.40	2563.4	-0.	960.0	0.	0.	0.
FOR INSTRUMENT I-21	C2	1	6.16	2563.4	-105.4	957.0	0.	0.	0.
FOR INSTRUMENT I-21	C2	1	6.40	2563.4	-105.4	960.0	0.	0.	0.
FOR INSTRUMENT I-21	C2	1	6.16	2660.9	105.4	957.0	0.	0.	0.
* FOR INSTRUMENT I-21	C2	1	6.40	2660.9	105.4	960.0	0.	0.	0.
FOR INSTRUMENT I-21	C2	1	6.16	2660.9	-0.	957.0	0.	0.	0.
* FOR INSTRUMENT I-21	C2	1	6.40	2660.9	-0.	960.0	0.	0.	0.
FOR INSTRUMENT I-21	C2	1	6.16	2660.9	-105.4	957.0	0.	0.	0.
* FOR INSTRUMENT I-21	C2	1	6.40	2660.9	-105.4	960.0	0.	0.	0.
DEPLOY DEVICE			75.36	2612.1	-.0	958.5	86.1	48.8	98.9
FOR GAS RELEASE INSTR (I-21)	C2	2	.09	2563.4	105.4	1066.0	0.	0.	0.
FOR GAS RELEASE INSTR (I-21)	C2	2	.09	2563.4	0.	1066.0	0.	0.	0.
FOR GAS RELEASE INSTR (I-21)	C2	2	.09	2563.4	-105.4	1066.0	0.	0.	0.
FOR GAS RELEASE INSTR (I-21)	C2	2	.09	2660.9	105.4	1066.0	0.	0.	0.
FOR GAS RELEASE INSTR (I-21)	C2	2	.09	2660.9	-0.	1066.0	0.	0.	0.
FOR GAS RELEASE INSTR (I-21)	C2	2	.09	2660.9	-105.4	1066.0	0.	0.	0.
*PIC(FOR GAS RELEASE)	C2	1	.20	2563.4	105.4	1066.2	0.	0.	0.
*PIC(FOR GAS RELEASE)	C2	1	.20	2563.4	-0.	1066.2	0.	0.	0.
*PIC(FOR GAS RELEASE)	C2	1	.20	2563.4	-105.4	1066.2	0.	0.	0.
*PIC(FOR GAS RELEASE)	C2	1	.20	2660.9	105.4	1066.2	0.	0.	0.
*PIC(FOR GAS RELEASE)	C2	1	.20	2660.9	-0.	1066.2	0.	0.	0.
*PIC(FOR GAS RELEASE)	C2	1	.20	2660.9	-105.4	1066.2	0.	0.	0.
ORDNANCE			1.74	2612.1	0.	1066.1	86.1	48.8	98.9

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
*MULTILAYER INSULATION	C2	1	1.60	2563.4	105.4	1023.0	0.	0.	0.
*MULTILAYER INSULATION	C2	1	1.60	2563.4	-0.	1023.0	0.	0.	0.
*MULTILAYER INSULATION	C2	1	1.60	2563.4	-105.4	1023.0	0.	0.	0.
*MULTILAYER INSULATION	C2	1	1.60	2660.9	105.4	1023.0	0.	0.	0.
*MULTILAYER INSULATION	C2	1	1.60	2660.9	-0.	1023.0	0.	0.	0.
*MULTILAYER INSULATION	C2	1	1.60	2660.9	-105.4	1023.0	0.	0.	0.
*STRIP HEATERS	C2	1	1.00	2563.4	105.4	1021.4	0.	0.	0.
*STRIP HEATERS	C2	1	1.00	2563.4	-0.	1021.4	0.	0.	0.
*STRIP HEATERS	C2	1	1.00	2563.4	-105.4	1021.4	0.	0.	0.
*STRIP HEATERS	C2	1	1.00	2660.9	105.4	1021.4	0.	0.	0.
*STRIP HEATERS	C2	1	1.00	2660.9	-0.	1021.4	0.	0.	0.
*STRIP HEATERS	C2	1	1.00	2660.9	-105.4	1021.4	0.	0.	0.
THERMAL CONTROL			15.60	2612.1	0.	1022.4	86.1	48.8	98.9
* GAS RELEASE	D2	1	160.00	2563.4	105.4	1023.0	0.	0.	0.
* GAS RELEASE	D2	1	160.00	2563.4	0.	1023.0	0.	0.	0.
* GAS RELEASE	D2	1	160.00	2563.4	-105.4	1023.0	0.	0.	0.
* GAS RELEASE	D2	1	160.00	2660.9	105.4	1023.0	0.	0.	0.
* GAS RELEASE	D2	1	160.00	2660.9	-0.	1023.0	0.	0.	0.
* GAS RELEASE	D2	1	160.00	2660.9	-105.4	1023.0	0.	0.	0.
GAS RELEASE INSTRUMENTS			960.00	2612.1	0.	1023.0	86.1	48.7	98.9
****** GAS RELEASE TOTAL			1099.86	2612.3	.1	1020.6	88.3	52.5	99.0
NEAR IR SPECTROMETER (II-9)	D2	1	60.00	2452.0	30.5	1140.5	0.	0.	0.
****** NEAR IR SPECTROMETER TOTAL			60.00	2452.0	30.5	1140.5	.0	.0	.0
* TM XMITTER (S-BAND)	C2	1	.50	2474.8	-59.0	1003.8	0.	0.	0.
* ANTENNA,CONICAL	C2	1	1.00	2507.0	-78.8	977.8	0.	0.	0.

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DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
* ANTENNA,CONICAL	C2	1	1.00	2408.0	-119.0	1002.2	0.	0.	0.
* COMMAND RECEIVER	C2	1	.60	2474.8	-59.0	976.6	0.	0.	0.
* DIPLEXER/SPLITTER	C2	1	1.00	2472.7	-105.5	990.6	0.	0.	0.
COMMUNICATIONS			4.10	2465.8	-89.8	989.9	26.0	37.2	42.6
* PCM PROGRAMMER	C2	1	2.00	2447.3	-102.9	998.2	0.	0.	0.
* COMMAND DECODER	C2	1	1.00	2462.6	-83.3	996.6	0.	0.	0.
DATA MANAGEMENT			3.00	2452.4	-96.4	997.7	9.3	7.3	11.7
* CABLE SET-ESP	C2	1	2.00	2457.5	-99.1	990.6	0.	0.	0.
* POWER SUPPLY-ESP	C2	1	23.00	2443.3	-62.6	990.6	0.	0.	0.
ELECTRICAL			25.00	2444.4	-65.5	990.6	9.9	3.9	10.6
* STRIP HEATERS	C2	1	1.00	2457.5	-99.1	990.6	0.	0.	0.
* MULTILAYER INSULATION	C2	1	3.90	2457.5	-99.1	990.6	0.	0.	0.
* THERMAL			4.90	2457.5	-99.1	990.6	.0	0.	.0
* CAPTURE/RELEASE INTERFACE	C2	1	3.30	2457.5	-99.1	990.6	0.	0.	0.
PROGRAMMED EJECTION			3.30	2457.5	-99.1	990.6	0.	0.	0.
* FOR ESP -ANTENNA	C2	1	.75	2493.1	-114.3	993.1	0.	0.	0.
* FOR ESP -ANTENNA	C2	1	.75	2421.9	83.9	993.1	0.	0.	0.
* LAUNCH LOCK-VECTOR MAG	C2	1	1.00	2505.8	-78.8	1003.3	0.	0.	0.
* FOR ESP -PROBE	C2	1	2.00	2420.5	-113.0	980.4	0.	0.	0.
* III-2 SENSOR DRIVE	C2	1	1.00	2493.1	-83.9	1003.0	0.	0.	0.
DEVICE DEPLOYMENT			5.50	2459.3	-74.8	992.1	65.5	39.9	75.4

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
* SPIN TABLE- ESP	C2	1	6.50	2457.5	-99.1	1017.0	0.	0.	0.
* ESP STRUCTURE	C2	1	47.60	2457.5	-99.1	997.0	0.	0.	0.
* RELEASE ORDNANCE + CONT	C2	1	4.00	2457.5	-99.1	1014.7	0.	0.	0.
* EMI DIAGNOSTIC (III-25)	D2	1	22.60	2457.5	-99.1	990.6	0.	0.	0.
* PLANAR RPA (III-18)	D2	1	3.00	2459.0	-62.5	990.6	0.	0.	0.
* NEUTRAL MASS SPEC (III-23)	D2	1	10.00	2443.5	-132.0	990.6	0.	0.	0.
****** ESP			139.50	2454.4	-93.4	994.9	23.6	13.8	25.3

GRAND TOTAL

MASS 14724.08 KGS

CENTER OF GRAVITY		RADIUS OF GYRATION	
X =	2516.87 CM	KX =	160.71 CM
Y =	-10.20 CM	KY =	506.77 CM
Z =	980.60 CM	KZ =	508.43 CM

MOMENT OF INERTIA			PRODUCT OF INERTIA	
IX=	38027	KG-M2	PXY=	-5252 KG-M2
IY=	378133	KG-M2	PXZ=	-1752 KG-M2
IZ=	380619	KG-M2	PYZ=	1129 KG-M2

MOMENT OF INERTIA			PRODUCT OF INERTIA	
IX=	380267128	KG-CM2	PXY=	-52517875 KG-CM2
IY=	3781326053	KG-CM2	PXZ=	-17516574 KG-CM2
IZ=	3806187520	KG-CM2	PYZ=	11283530 KG-CM2

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DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
SPACELAB MODULE	A5	1	3363.00	2156.5	-8.5	1004.6	160.5	165.9	154.9
6 METER PALLET TRAIN	A1	1	1236.00	2700.0	11.9	911.6	212.6	179.4	223.0
3 METER PALLET	A4	1	618.00	3163.6	11.9	911.6	212.6	105.6	189.0
SL/ORBITER UTILITY BRIDGE	A6	1	218.20	1836.0	0.	914.4	0.	0.	0.
TUNNEL	A8	1	352.00	1877.1	0.	967.5	142.0	101.1	141.0
TUNNEL ADAPTER	A8	1	408.20	1500.0	0.	901.7	87.1	105.4	95.0
P/L ARS FAN AND DUCTING	A8	1	9.50	1577.3	0.	901.7	0.	0.	0.
AIRLOCK	A9	1	364.00	1605.3	0.	1069.3	0.	0.	0.
LESS SHUTTLE AIRLOCK	A9	1	-363.00	1402.0	0.	914.0	0.	0.	0.
****** BASIC SPACELAB			6205.90	2305.7	-1.1	973.7	177.9	430.4	432.8
EPS KIT 2-DRY PLUS RESIDUALS	B0	1	357.02	2634.0	-18.4	784.9	206.0	294.4	357.1
EPS KIT 2			357.02	2634.0	-18.4	784.9	206.0	294.4	357.1
ORBITER HEAT REJECTION KIT	B0	1	87.50	3088.6	0.	1204.0	98.0	171.7	108.5
LONGERON FITTING-PALLET	B0	1	40.40	2475.5	238.8	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	2475.5	-238.7	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	2925.1	238.8	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	2925.1	-238.7	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	3074.9	238.8	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	3074.9	-238.7	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	3224.8	238.8	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	3224.8	-238.7	1051.6	0.	0.	0.
KEEL FITTING-PALLET	B0	1	35.40	2993.4	0.	777.2	0.	0.	0.
KEEL FITTING-PALLET	B0	1	35.40	3000.6	0.	777.2	0.	0.	0.
LONGERON FITTING-MODULE	B0	1	40.40	2035.9	238.8	1051.6	0.	0.	0.
LONGERON FITTING-MODULE	B0	1	40.40	2035.9	-238.7	1051.6	0.	0.	0.
LONGERON FITTING-MODULE	B0	1	40.40	2275.7	238.8	1051.6	0.	0.	0.
LONGERON FITTING-MODULE	B0	1	40.40	2275.7	-238.7	1051.6	0.	0.	0.
KEEL FITTING-MODULE	B0	1	35.40	2275.7	0.	777.2	0.	0.	0.
LESS ORBITER ALLOWANCE	B0	1	-204.00	2728.0	0.	1003.3	0.	0.	0.

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
ORBITER RETENTION FITTINGS			387.00	2661.5	.1	1001.8	297.2	534.1	582.9
CREWMAN 5	B0	1	77.10	1244.6	121.9	886.5	0.	0.	0.
CREWMAN 6	B0	1	77.10	1244.6	71.1	886.5	0.	0.	0.
SEAT 5	B0	1	24.50	1254.8	121.9	863.6	0.	0.	0.
SEAT 6	B0	1	24.50	1254.8	71.1	863.6	0.	0.	0.
O2 TANKAGE PLUS RESIDUAL	B0	1	37.60	1905.0	0.	782.3	0.	0.	0.
EMERGENCY EQUIPMENT	B0	1	49.50	1366.5	0.	1016.0	0.	0.	0.
WASTE WATER TANKAGE	B0	1	22.00	1216.7	12.7	800.1	0.	0.	0.
FOOD	B0	1	28.60	1181.1	-177.7	934.7	0.	0.	0.
HYGIENE EQUIPMENT	B0	1	26.20	1414.8	-109.1	904.2	0.	0.	0.
CREW PROVISIONS	B0	1	25.20	1244.6	96.5	886.5	0.	0.	0.
LIOH	B0	1	31.90	1244.6	0.	800.1	0.	0.	0.
RESTRAINTS	B0	1	1.70	1206.5	0.	1016.0	0.	0.	0.
STOWAGE VOLUME PENTALY	B0	1	43.90	1104.9	-25.3	939.8	0.	0.	0.
CREW SYSTEMS			469.80	1302.5	28.2	888.9	103.4	202.2	208.6
MONITOR AND CONTROL PANEL	B0	1	5.00	1358.9	0.	1016.0	0.	0.	0.
KEYBOARD	B0	1	3.50	1358.9	0.	1016.0	0.	0.	0.
CRT DISPLAY/SIGNAL GENERATOR	B0	1	28.90	1358.9	0.	1016.0	0.	0.	0.
REMOTE STATION, COMMUNICATIO	B0	1	1.50	1358.9	0.	1016.0	0.	0.	0.
PSS EQUIPMENT			38.90	1358.9	0.	1016.0	.0	.0	.0
DOUBLE RACK	B5	1	58.10	2080.0	127.0	1034.3	0.	0.	0.
SINGLE RACK	B5	1	37.60	2207.0	127.0	1034.3	0.	0.	0.
PALLET HARDPOINTS	B1	45	37.35	2858.8	0.	934.7	0.	0.	0.
INSERTS FOR PANELS	B1	6	39.00	2846.3	0.	904.2	0.	0.	0.
STRUCTURE			172.05	2450.5	70.6	983.2	85.8	366.6	367.4

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DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
EXP SWITCH PANEL	B5	1	12.70	2156.0	0.	1016.0	0.	0.	0.
EXP SWITCH PANEL	B5	1	12.70	2156.0	0.	1016.0	0.	0.	0.
EXP SWITCH PANEL	B5	1	12.70	2156.0	0.	1016.0	0.	0.	0.
INVERTER (400 HZ)	B5	1	32.20	2197.9	-123.9	934.0	0.	0.	0.
EPDS			70.30	2175.2	-56.8	978.4	74.0	45.9	65.2
COLD PLATE-IECM	B4	1	5.50	3051.7	-109.2	965.2	0.	0.	0.
COLD PLATE-ELECT ACCEL	B4	1	5.50	3051.0	50.0	1013.5	0.	0.	0.
COLD PLATE-ELECT ACCEL	B4	1	5.50	3051.0	-50.0	1013.5	0.	0.	0.
COLD PLATE-ELECT ACCEL	B4	1	5.50	3152.6	0.	1092.2	0.	0.	0.
COLD PLATE-ELECT ACCEL	B4	1	5.50	3152.6	0.	990.0	0.	0.	0.
COLD PLATE-PEAKING BATTERY	B4	1	5.50	3192.4	114.0	914.0	0.	0.	0.
COLD PLATE-PS	B4	1	5.50	3154.3	0.	889.0	0.	0.	0.
COLD PLATE-RF TERMINAL	B3	1	5.50	2836.0	114.0	914.0	0.	0.	0.
ECS			44.00	3080.2	14.9	973.9	95.5	123.8	128.4
EXP RAU	B2	1	2.30	2524.8	0.	889.0	3.5	5.8	5.2
EXP RAU	B3	1	2.30	2824.5	0.	889.0	3.5	5.8	5.2
EXP RAU	B3	1	2.30	2824.5	0.	889.0	3.5	5.8	5.2
EXP RAU	B4	1	2.30	3124.2	0.	889.0	3.5	5.8	5.2
EXP RAU	B4	1	2.30	3124.2	0.	889.0	3.5	5.8	5.2
EXP RAU	B5	1	2.30	2156.5	-139.6	990.6	3.5	5.8	5.2
EXP COMPUTER	B5	1	30.20	2156.0	-0.	1016.0	0.	0.	0.
DIGITAL TAPE RECORDER	B5	1	43.00	2156.0	-0.	1016.0	0.	0.	0.
EXPERIMENT I/O	B5	1	27.50	2156.0	-0.	1016.0	0.	0.	0.
HIGH RATE DIGITAL MUX	B5	1	10.00	2156.0	-0.	1016.0	0.	0.	0.
TAPE AND CANISTERS	B5	15	88.50	2165.5	0.	1016.0	0.	0.	0.
CMDS			213.00	2199.3	-1.5	1008.9	32.2	174.2	172.4
CONSOL VERTICAL RAILS	B5	4	2.00	2156.5	0.	1016.0	0.	0.	0.

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y	Z	RADIUS OF GYRATION KX (CM)	KY	KZ
CONSOL HORIZONTAL RAILS	B5	4	3.00	2156.5	0.	1016.0	0.	0.	0.
PSA FOOT RESTRAINTS	B5	6	18.00	2156.5	0.	1016.0	0.	0.	0.
RACK CLOSEOUT FT RESTRAINTS	B5	4	31.70	2156.5	0.	1016.0	0.	0.	0.
HABITABILITY			54.70	2156.5	0.	1016.0	0.	.0	.0
KEYBOARD	B5	1	3.50	2156.0	-141.9	984.5	0.	0.	0.
CRT AND SYMBOL GENERATOR	B5	1	28.90	2156.0	-141.9	1009.9	0.	0.	0.
CONTROL AND DISPLAY			32.40	2156.0	-141.9	1007.2	7.9	7.9	0.
****** MISSION DEPENDENT EQUIPMENT			1926.67	2217.2	5.5	941.7	202.8	676.7	683.7
C AND D PANELS	C5	1	18.00	2156.0	0.	1016.0	0.	0.	0.
C AND D PANELS	C5	1	8.40	2156.0	0.	1016.0	0.	0.	0.
C AND D PANELS	C5	1	3.00	2156.0	0.	1016.0	0.	0.	0.
TV MONITOR	C5	1	10.00	2156.0	0.	1016.0	0.	0.	0.
OSCILLOSCOPE	C5	1	20.00	2156.0	0.	1016.0	0.	0.	0.
C AND W SENSORS-PRESSURE	C2	12	1.90	2156.0	0.	1016.0	0.	0.	0.
C AND W SENSORS-TEMPERATURE	C2	8	1.30	2156.0	0.	1016.0	0.	0.	0.
CONTROL AND DISPLAY			62.60	2156.0	0.	1016.0	.0	.0	.0
SIPS PLATFORM	C3	1	527.00	2856.0	0.	990.6	0.	0.	0.
TWO AXES GYRO PACKAGE	C3	1	8.00	2856.0	50.8	977.9	0.	0.	0.
TWO AXES GYRO PACKAGE	C3	1	8.00	2856.0	-50.7	977.9	0.	0.	0.
3 AXES GYRO PACKAGE-OBIPS	C4	1	10.00	3092.0	152.0	1066.8	0.	0.	0.
3 AXES GYRO PACKAGE-NIR SPEC	C2	1	10.00	2452.0	139.7	1054.1	0.	0.	0.
RATE GYROS			36.00	2809.3	81.1	1023.8	90.1	245.6	255.0

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
MPM PLATFORM-OBIPS	C4	1	56.00	3067.0	152.0	1104.9	0.	0.	0.
FIXED HD STAR TRKER-II-7-10	C4	1	4.00	3079.0	406.0	1104.9	0.	0.	0.
MPM PLATFORM-NIR SPEC	C2	1	56.00	2452.0	139.7	1117.6	0.	0.	0.
FIXED HEAD STAR TRACKER-NIR	C2	1	4.00	2452.0	0.	1054.1	0.	0.	0.
MPM			120.00	2759.9	149.7	1109.1	55.9	308.1	312.7
ATTITUDE POINTING			683.00	2836.7	30.6	1013.2	79.6	152.5	159.1
I/F PLUMBING KITS-PALLET 3	C4	1	12.00	3156.0	0.	876.3	0.	0.	0.
THERMAL CURTAIN-PALLET 1	C2	1	10.00	2561.0	0.	1016.0	0.	0.	0.
THERMAL CURTAIN-PALLET 2	C3	1	10.00	2864.0	0.	1016.0	0.	0.	0.
THERMAL CURTAIN-PALLET 3	C4	1	10.00	3156.0	0.	1016.0	0.	0.	0.
EXP HEAT EXCHANGER-LIDAR	C4	1	25.00	3219.0	-127.0	952.0	0.	0.	0.
TCS PUMP-LIDAR	C4	1	10.00	3219.0	-127.0	952.0	0.	0.	0.
COOLANT FILTERS	C4	6	2.70	3219.0	-127.0	952.0	0.	0.	0.
THERMAL CONTROL-LIDAR			37.70	3219.0	-127.0	952.0	.0	.0	.0
MPM CANISTER-NIR SPEC	C2	1	215.00	2452.0	10.0	1140.0	0.	0.	0.
THERMAL			294.70	2620.4	-9.0	1092.6	93.4	311.0	303.5
CABLE SET-PALLET 1	C2	1	102.00	2561.0	-119.3	914.4	0.	0.	0.
CABLE SET-PALLET 2	C3	1	91.00	2864.0	-119.3	914.4	0.	0.	0.
CABLE SET-PALLET 3	C4	1	68.00	3156.0	-119.3	914.4	0.	0.	0.
CABLE SET-MODULE TO PALLET	C7	1	57.00	2362.0	-152.3	863.6	0.	0.	0.
CABLE SET-MODULE	C5	1	34.00	2156.0	-152.3	863.6	0.	0.	0.
CABLE SET-SIPS TO INSTRUMENT	C3	1	40.00	2856.0	-152.3	863.6	0.	0.	0.

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DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
COMMON CABLE SET			392.00	2700.6	-130.3	897.4	28.6	304.4	303.9
PULSE POWER SUPPLY-LIDAR	C4	1	95.00	3156.0	0.	1010.9	0.	0.	0.
PULSE POWER SUPPLY-ACCELER	C4	1	600.00	3156.0	0.	909.3	0.	0.	0.
PEAKING BATTERY	C4	1	40.30	3166.0	101.6	902.0	0.	0.	0.
ELECTRICAL DIST UNIT	C2	1	10.00	2561.0	-0.	902.0	0.	0.	0.
ELECTRICAL DIST UNIT	C3	1	10.00	2864.0	-0.	902.0	0.	0.	0.
ELECTRICAL DIST UNIT	C4	1	10.00	3166.0	-0.	902.0	0.	0.	0.
POWER SUPPLIES			765.30	3145.1	5.4	921.2	40.7	82.3	78.4
ELECTRICAL			1157.30	2994.5	-40.6	913.2	75.0	283.3	289.3
FM MODULE	C5	1	21.80	2156.0	-0.	1016.0	0.	0.	0.
SENSOR INTERFACE BOX	C3	1	2.27	2864.0	-0.	890.0	0.	0.	0.
SENSOR INTERFACE BOX	C3	1	2.27	2864.0	-0.	890.0	0.	0.	0.
SENSOR INTERFACE BOX	C2	1	2.27	3168.0	-0.	890.0	0.	0.	0.
SENSOR INTERFACE BOX	C4	1	2.27	3168.0	-0.	890.0	0.	0.	0.
ANALOG RECORDER	C5	1	22.70	2156.0	-0.	1016.0	0.	0.	0.
TRANSIENT RECORDER	C5	5	30.80	2156.0	-0.	1016.0	0.	0.	0.
SWITCHING PANEL	C5	1	3.63	2156.0	-0.	1016.0	0.	0.	0.
VIDEO RECORDER	C5	1	36.30	2156.0	-0.	1016.0	0.	0.	0.
DATA MANAGEMENT SYSTEM			124.31	2218.8	0.	1006.8	32.8	229.9	227.5
COMMAND TRANMITTER	C3	1	.50	2926.1	-172.6	1059.2	0.	0.	0.
RF MULTIPLEXER	C3	1	1.36	2926.1	-172.6	1059.2	0.	0.	0.
WIDE BAND RECEIVER	C3	2	2.27	2926.1	-172.6	1059.2	0.	0.	0.
CONICAL ANTENNA	C3	1	.91	2926.1	-172.6	1059.2	0.	0.	0.

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
COMMUNICATIONS			5.04	2926.1	-172.6	1059.2	.0	.0	.0
FOR HV POWER SUPPLY	C4	1	12.00	3153.0	0.	889.0	0.	0.	0.
FOR INSTRUMENT IV-1	C4	1	1.40	3160.0	-208.2	1049.0	0.	0.	0.
DIRECT MOUNTING BRACKETRY			13.40	3153.7	-21.8	905.7	80.3	49.0	63.7
FOR INSTRUMENT I-21	C2	1	20.80	2569.2	101.0	987.0	0.	0.	0.
FOR INSTRUMENT I-21	C2	1	20.80	2569.2	0.	987.0	0.	0.	0.
FOR INSTRUMENT I-21	C2	1	20.80	2569.2	-101.0	987.0	0.	0.	0.
FOR INSTRUMENT I-21	C2	1	20.80	2662.0	101.0	987.0	0.	0.	0.
FOR INSTRUMENT I-21	C2	1	20.80	2662.0	0.	987.0	0.	0.	0.
FOR INSTRUMENT I-21	C2	1	20.80	2662.0	-101.0	987.0	0.	0.	0.
INSTRUMENT I-21 PLATFORM	C2	1	65.30	2634.0	0.	911.0	0.	0.	0.
FOR INSTRUMENT I-1	C4	1	39.00	3229.0	-0.	927.0	0.	0.	0.
FOR INSTRUMENT II-3	C4	1	20.40	3051.0	127.0	927.0	0.	0.	0.
FOR INSTRUMENT II-7	C3	1	6.40	2853.0	94.0	1090.0	0.	0.	0.
FOR INSTRUMENT II-9	C2	1	20.40	2440.0	142.0	978.0	0.	0.	0.
FOR INSTRUMENT II-10	C3	1	6.40	2853.0	-93.9	1090.0	0.	0.	0.
FOR IECM	C4	1	22.70	3054.0	-101.5	927.1	0.	0.	0.
FOR ESP	C2	1	13.60	2444.8	-94.0	914.0	.0.	0.	0.
FOR BEAM DIAGNOSTIC PACKAGE	C3	1	9.10	2749.6	-165.0	995.7	0.	0.	0.
FOR RF TERMINAL	C3	1	5.00	2838.4	114.0	914.0	0.	0.	0.
INTERMEDIATE SPT STRUCTURE			333.10	2746.0	2.9	956.9	94.5	246.9	257.3
INSTR TO INSTR I/F STRUCTURE	C4	14	15.90	3073.4	0.	914.4	0.	0.	0.
THERMAL CURTAIN SPT-PALLET 1	C2	1	11.30	2561.0	0.	1016.0	0.	0.	0.
THERMAL CURTAIN SPT-PALLET 2	C3	1	11.30	2864.0	0.	1016.0	0.	0.	0.
THERMAL CURTAIN SPT-PALLET 3	C4	1	11.30	3146.0	0.	1016.0	0.	0.	0.

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	DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
	MISC STRUCTURE			33.90	2857.0	0.	1016.0	.0	238.9	238.9
	PALLET I/F STRUCTURE			396.30	2782.4	1.7	958.5	90.5	257.5	265.2
	L/L LOCKS -OBIPS	C4	1	6.80	3100.0	152.4	1084.6	0.	0.	0.
	EMERGENCY JETT-MPM PLATFORM	C4	1	8.20	3067.0	152.4	1059.2	0.	0.	0.
	CAPTURE RELEASE DEVICE	C3	1	1.80	2804.0	-170.0	1043.9	0.	0.	0.
	CAPTURE RELEASE DEVICE	C3	1	10.00	2951.0	-170.0	1033.8	0.	0.	0.
	L/L LOCKS-NIR SPEC	C2	1	1.80	2457.0	-30.4	1077.0	0.	0.	0.
	L/L LOCKS-NIR SPEC	C2	1	9.10	2457.5	114.3	1107.4	0.	0.	0.
	EMERGENCY JETT-MPM PLATFORM	C2	1	8.20	2452.0	152.4	1059.2	0.	0.	0.
	CAPTURE RELEASE DEVICE	C2	1	10.40	2444.8	-101.5	1028.0	0.	0.	0.
	PIC(FOR HOLDDOWN NUTS)	C2	6	6.00	2514.6	-0.	889.0	0.	0.	0.
	HOLDDOWN ORDNANCE	C2	18	1.80	2514.6	-0.	889.0	0.	0.	0.
	MECHANISMS			64.10	2694.5	22.8	1039.1	143.4	284.1	306.1
******	AMPS LABCRAFT			2787.35	2825.7	-9.9	972.7	105.0	331.7	331.0
	EMERGENCY JETTISON FOR I-1	D4	1	.90	3232.0	0.	1231.9	0.	0.	0.
	LIDAR EMITTER	D4	1	75.00	3188.0	-121.0	1041.4	0.	0.	0.
	LIDAR EMITTER	D4	1	75.00	3270.0	-121.0	1041.4	0.	0.	0.
	LIDAR RECEIVER	D4	1	300.00	3232.0	0.	1082.0	0.	0.	0.
******	LASER SOUNDER (I-1)			450.90	3231.0	-40.3	1068.8	60.6	31.3	61.7
	EMERGENCY JETTISON FOR I-9	D4	1	.90	3056.9	0.	1231.9	0.	0.	0.
	ELECTRON ACCEL (I-9)	D4	1	40.50	3056.9	0.	1082.0	0.	0.	0.
	GAS PLUME RELEASE (III-3)	D4	1	9.00	3056.9	0.	1219.2	0.	0.	0.

AMPS -----FLIGHT 1-------LANDED CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

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DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
****** ELECT ACCELERATOR			50.40	3056.9	0.	1109.2	55.0	55.0	.0
IECM	D4	1	340.00	3072.1	-109.1	988.1	0.	0.	0.
****** IECM			340.00	3072.1	-109.1	988.1	.0	.0	0.
SOLAR FLUX MONITOR (IV-1)	D4	1	3.00	3232.0	-200.6	1079.0	0.	0.	0.
****** SOLAR FLUX MONITOR			3.00	3232.0	-200.6	1079.0	0.	0.	0.
OBIPS (II-3)	D4	1	43.00	3194.0	150.0	1117.6	0.	0.	0.
****** OBIPS			43.00	3194.0	150.0	1117.6	0.	0.	0.
CRYO LIMB SCANNER-DRY (II-7)	D3	1	207.00	2838.0	94.0	1077.0	0.	0.	0.
****** CRYO LIMB SCANNER			207.00	2838.0	94.0	1077.0	0.	0.	0.
CRYO IR INTERFEROMETER-DRY	D3	1	215.00	2838.0	-93.9	1077.0	0.	0.	0.
****** CRYO IR INTERFEROMETER			215.00	2838.0	-93.9	1077.0	.0	.0	.0
WIDE BAND TRANSMITTER	C3	2	1.00	2831.0	-170.0	1047.5	0.	0.	0.
COMMAND RECEIVER	C3	1	1.00	2862.0	-170.0	1047.5	0.	0.	0.
RF MULTIPLEXER	C3	1	1.00	2857.5	-162.4	1049.0	0.	0.	0.
ANTENNA ,STUB	C3	1	1.00	2870.0	-190.0	1046.0	0.	0.	0.
COMMUNICATIONS			4.00	2855.1	-173.1	1047.5	10.3	14.7	17.9
CABLE SET-BEAM DIAG PACKAGE	C3	1	1.50	2865.0	-170.0	1053.0	0.	0.	0.
POWER SUPPLY	C3	1	29.00	2461.3	-170.0	1064.8	0.	0.	0.
POWER SUBSYSTEM			30.50	2481.2	-170.0	1064.2	2.6	87.3	87.3

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX	KY (CM)	KZ (CM)
STRIP HEATERS	C3	1	1.00	2865.0	-170.0	1053.0	0.	0.	0.
MULTILAYER INSULATION	C3	1	4.00	2844.0	-170.0	1072.0	0.	0.	0.
THERMAL SUBSYSTEM			5.00	2848.2	-170.0	1068.2	7.6	11.3	8.4
SUBCARRIER OSCILLATOR ASSY	C3	1	5.00	2847.3	-170.0	1067.9	0.	0.	0.
PCM PROGRAMMER	C3	1	2.00	2859.3	-178.9	1049.0	0.	0.	0.
COMMAND DECODER	C3	1	1.50	2794.0	-170.0	1049.0	0.	0.	0.
DATA MANAGEMENT SUBSYSTEM			8.50	2840.7	-172.1	1060.1	10.0	24.1	22.5
DEPLOY DEVICE (III-2)	C3	1	2.70	2974.3	-170.0	1052.1	0.	0.	0.
CAPTURE/RELEASE INTERFACE	C3	1	.50	2880.0	-170.0	1042.0	0.	0.	0.
LAUNCH LOCK-VECTOR MAG	C3	1	1.00	2974.3	-170.0	1062.3	0.	0.	0.
BASIC STRUCTURE PACKAGE	C2	1	26.00	2860.0	-170.0	1057.2	0.	0.	0.
STRUCTURE SUBSYSTEM			30.20	2874.3	-170.0	1056.7	2.6	37.5	37.4
OBIPS (II-3)	D3	1	38.00	2763.5	-170.0	1072.4	0.	0.	0.
VECTOR MAGNETOMETER (III-2)	D3	1	4.10	2974.3	-170.0	1063.6	0.	0.	0.
LEVEL II DIAGNOSTIC (III-4)	D3	1	23.00	2989.6	-170.0	1052.1	0.	0.	0.
INSTRUMENTS			65.10	2856.7	-170.0	1064.7	9.5	110.8	110.4
****** BEAM DIAGNOSTIC PKG			143.30	2779.2	-170.2	1062.3	8.6	177.9	177.7
COMMUNICATIONS			-0.	-0.	-0.	-0.	-0.	-0.	-0.
ELECTRICAL			-0.	-0.	-0.	-0.	-0.	-0.	-0.
FOR INSTRUMENT I-21	C2	1	6.16	2563.4	105.4	957.0	0.	0.	0.
FOR INSTRUMENT I-21	C2	1	6.16	2563.4	-0.	957.0	0.	0.	0.
FOR INSTRUMENT I-21	C2	1	6.16	2563.4	-105.4	957.0	0.	0.	0.

	DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
	FOR INSTRUMENT I-21	C2	1	6.16	2660.9	105.4	957.0	0.	0.	0.
	FOR INSTRUMENT I-21	C2	1	6.16	2660.9	-0.	957.0	0.	0.	0.
	FOR INSTRUMENT I-21	C2	1	6.16	2660.9	-105.4	957.0	0.	0.	0.
	DEPLOY DEVICE			36.96	2612.2	0.	957.0	86.1	48.7	98.9
	FOR GAS RELEASE INSTR (I-21)	C2	2	.09	2563.4	105.4	1066.0	0.	0.	0.
	FOR GAS RELEASE INSTR (I-21)	C2	2	.09	2563.4	0.	1066.0	0.	0.	0.
	FOR GAS RELEASE INSTR (I-21)	C2	2	.09	2563.4	-105.4	1066.0	0.	0.	0.
	FOR GAS RELEASE INSTR (I-21)	C2	2	.09	2660.9	105.4	1066.0	0.	0.	0.
	FOR GAS RELEASE INSTR (I-21)	C2	2	.09	2660.9	-0.	1066.0	0.	0.	0.
	FOR GAS RELEASE INSTR (I-21)	C2	2	.09	2660.9	-105.4	1066.0	0.	0.	0.
	ORDNANCE			.54	2612.1	0.	1066.0	86.1	48.7	98.9
	THERMAL CONTROL			-0.	-0.	-0.	-0.	-0.	-0.	-0.
	GAS RELEASE INSTRUMENTS			-0.	-0.	-0.	-0.	-0.	-0.	-0.
******	GAS RELEASE TOTAL			37.50	2612.2	0.	958.6	87.0	50.4	98.9
	NEAR IR SPECTROMETER (II-9)	D2	1	60.00	2452.0	30.5	1140.5	0.	0.	0.
******	NEAR IR SPECTROMETER TOTAL			60.00	2452.0	30.5	1140.5	.0	.0	.0
	COMMUNICATIONS			-0.	-0.	-0.	-0.	-0.	-0.	-0.
	DATA MANAGEMENT			-0.	-0.	-0.	-0.	-0.	-0.	-0.
	ELECTRICAL			-0.	-0.	-0.	-0.	-0.	-0.	-0.
	PROGRAMMED EJECTION			-0.	-0.	-0.	-0.	-0.	-0.	-0.
	DEVICE DEPLOYMENT			-0.	-0.	-0.	-0.	-0.	-0.	-0.
******	ESP			0.	0.	0.	0.	0.	0.	0.

GRAND TOTAL

MASS 12470.02 KGS

CENTER OF GRAVITY		RADIUS OF GYRATION	
X =	2493.98 CM	KX =	164.36 CM
Y =	-7.70 CM	KY =	529.22 CM
Z =	978.71 CM	KZ =	531.45 CM

MOMENT OF INERTIA			PRODUCT OF INERTIA		
IX=	33687	KG-M2	PXY=	-4336	KG-M2
IY=	349255	KG-M2	PXZ=	-2262	KG-M2
IZ=	352197	KG-M2	PYZ=	278	KG-M2

MOMENT OF INERTIA			PRODUCT OF INERTIA		
IX=	336865250	KG-CM2	PXY=	-43360513	KG-CM2
IY=	3492554296	KG-CM2	PXZ=	-22617397	KG-CM2
IZ=	3521966009	KG-CM2	PYZ=	2776976	KG-CM2

BCD INPUT *ENDFILE*A
ERROR NUMBER 0065 DETECTED BY INPUTC AT ADDRESS 010135
CALLED FROM AMPS AT 000114

ERROR SUMMARY

ERROR	TIMES
:0065	:0001

AMPS -----FLIGHT 2-------LAUNCH CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

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DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
SPACELAB MODULE	A5	1	3363.00	2156.5	-8.5	1004.6	160.5	165.9	154.9
6 METER PALLET TRAIN	A1	1	1236.00	2709.0	11.9	911.6	212.6	179.4	223.0
3 METER PALLET	A4	1	618.00	3163.6	11.9	911.6	212.6	105.6	189.0
SL/ORBITER UTILITY BRIDGE	A6	1	218.20	1836.0	0.	914.4	0.	0.	0.
TUNNEL	A8	1	352.00	1877.1	0.	967.5	142.0	101.1	141.0
TUNNEL ADAPTER	A8	1	408.20	1500.0	0.	901.7	87.1	105.4	95.0
P/L ARS FAN AND DUCTING	A8	1	9.50	1577.3	0.	901.7	0.	0.	0.
AIRLOCK	A9	1	364.00	1605.3	0.	1069.3	0.	0.	0.
LESS SHUTTLE AIRLOCK	A9	1	-363.00	1402.0	0.	914.0	0.	0.	0.
****** BASIC SPACELAB			6205.90	2305.7	-1.1	973.7	171.9	430.4	432.8
ARS (SECOND UNIT)	B0	1	393.50	2376.4	213.4	1107.6	0.	0.	0.
* EXTRA WATER FOR COOLING	B0	1	68.20	1117.6	0.	1016.0	0.	0.	0.
EPS KIT 2-DRY PLUS RESIDUALS	B0	1	357.02	2634.0	-18.4	784.9	206.0	294.4	357.1
* EPS KIT 2-EXPENDABLES	B0	1	383.30	2763.8	-109.6	780.0	58.7	110.5	125.7
EPS KIT 2			740.32	2701.2	-65.6	782.4	156.0	228.8	275.6
ORBITER HEAT REJECTION KIT	B0	1	87.50	3098.6	0.	1204.0	98.0	171.7	108.5
LONGERON FITTING-PALLET	B0	1	40.40	2475.5	238.8	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	2475.5	-238.7	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	2925.1	238.8	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	2925.1	-238.7	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	3074.9	238.8	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	3074.9	-238.7	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	3224.8	238.8	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	3224.8	-238.7	1051.6	0.	0.	0.
KEEL FITTING-PALLET	B0	1	35.40	2993.4	0.	777.2	0.	0.	0.
KEEL FITTING-PALLET	B0	1	35.40	3000.6	0.	777.2	0.	0.	0.
LONGERON FITTING-MODULE	B0	1	40.40	2035.9	238.8	1051.6	0.	0.	0.
LONGERON FITTING-MODULE	B0	1	40.40	2035.9	-238.7	1051.6	0.	0.	0.
LONGERON FITTING-MODULE	B0	1	40.40	2275.7	238.8	1051.6	0.	0.	0.

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
LONGERON FITTING-MODULE	B0	1	40.40	2275.7	-238.7	1051.6	0.	0.	0.
KEEL FITTING-MODULE	B0	1	35.40	2275.7	0.	777.2	0.	0.	0.
LESS ORBITER ALLOWANCE	B0	1	-204.00	2728.0	0.	1003.3	0.	0.	0.
ORBITER RETENTION FITTINGS			387.00	2661.5	.1	1001.8	297.2	534.1	582.9
CREWMAN 5	B0	1	77.10	1244.6	121.9	886.5	0.	0.	0.
CREWMAN 6	B0	1	77.10	1244.6	71.1	886.5	0.	0.	0.
SEAT 5	B0	1	24.50	1254.8	121.9	863.6	0.	0.	0.
SEAT 6	B0	1	24.50	1254.8	71.1	863.6	0.	0.	0.
O2 TANKAGE PLUS RESIDUAL	B0	1	37.60	1905.0	0.	782.3	0.	0.	0.
* USABLE O2	B0	1	22.70	1905.0	0.	782.3	0.	0.	0.
EMERGENCY EQUIPMENT	B0	1	49.50	1366.5	0.	1016.0	0.	0.	0.
WASTE WATER TANKAGE	B0	1	22.00	1216.7	12.7	800.1	0.	0.	0.
FOOD	B0	1	28.60	1181.1	-177.7	934.7	0.	0.	0.
HYGIENE EQUIPMENT	B0	1	26.20	1414.8	-109.1	904.2	0.	0.	0.
CREW PROVISIONS	B0	1	25.20	1244.6	96.5	886.5	0.	0.	0.
LIOH	B0	1	31.90	1244.6	0.	800.1	0.	0.	0.
RESTRAINTS	B0	1	1.70	1206.5	0.	1016.0	0.	0.	0.
STOWAGE VOLUME PENALTY	B0	1	43.90	1104.9	-25.3	939.8	0.	0.	0.
CREW SYSTEMS			492.50	1330.3	26.9	884.0	103.6	235.5	239.8
MONITOR AND CONTROL PANEL	B0	1	5.00	1358.9	0.	1016.0	0.	0.	0.
KEYBOARD	B0	1	3.50	1358.9	0.	1016.0	0.	0.	0.
CRT DISPLAY/SIGNAL GENERATOR	B0	1	28.90	1358.9	0.	1016.0	0.	0.	0.
REMOTE STATION, COMMUNICATIO	B0	1	1.50	1358.9	0.	1016.0	0.	0.	0.
PSS EQUIPMENT			38.90	1358.9	0.	1016.0	.0	.0	.0
DOUBLE RACK	B5	1	58.10	2080.0	127.0	1034.3	0.	0.	0.
SINGLE RACK	B5	1	37.60	2207.0	127.0	1034.3	0.	0.	0.
PALLET HARDPOINTS	B1	45	37.35	2858.8	0.	934.7	0.	0.	0.

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
INSERTS FOR PANELS	B1	6	39.00	2846.3	0.	904.2	0.	0.	0.
STRUCTURE			172.05	2450.5	70.6	983.2	85.8	366.6	367.4
EXP SWITCH PANEL	B5	1	12.70	2156.0	0.	1016.0	0.	0.	0.
EXP SWITCH PANEL	B5	1	12.70	2156.0	0.	1016.0	0.	0.	0.
EXP SWITCH PANEL	B5	1	12.70	2156.0	0.	1016.0	0.	0.	0.
INVERTER (400 HZ)	B5	1	32.20	2197.9	-123.9	934.0	0.	0.	0.
EPDS			70.30	2175.2	-56.8	978.4	74.0	45.9	65.2
COLD PLATE-RF INSTR	B4	1	5.50	3051.7	-109.2	965.2	0.	0.	0.
COLD PLATE-PEAKING BATTERY	B4	1	5.50	3192.4	114.0	914.0	0.	0.	0.
COLD PLATE-PS	B4	1	5.50	3154.3	0.	889.0	0.	0.	0.
COLD PLATE-RF TERMINAL	B3	1	5.50	2836.0	114.0	914.0	0.	0.	0.
ECS			22.00	3058.6	29.7	920.5	96.8	141.2	166.6
EXP RAU	B2	1	2.30	2524.8	0.	889.0	3.5	5.8	5.2
EXP RAU	B3	1	2.30	2824.5	0.	889.0	3.5	5.8	5.2
EXP RAU	B3	1	2.30	2824.5	0.	889.0	3.5	5.8	5.2
EXP RAU	B4	1	2.30	3124.2	0.	889.0	3.5	5.8	5.2
EXP RAU	B4	1	2.30	3124.2	0.	889.0	3.5	5.8	5.2
EXP RAU	B5	1	2.30	2156.5	-139.6	990.6	3.5	5.8	5.2
EXP COMPUTER	B5	1	30.20	2156.0	-0.	1016.0	0.	0.	0.
DIGITAL TAPE RECORDER	B5	1	43.00	2156.0	-0.	1016.0	0.	0.	0.
EXPERIMENT I/O	B5	1	27.50	2156.0	-0.	1016.0	0.	0.	0.
HIGH RATE DIGITAL MUX	B5	1	10.00	2156.0	-0.	1016.0	0.	0.	0.
TAPE AND CANISTERS	B5	15	88.50	2156.5	0.	1143.0	0.	0.	0.
CMDS			213.00	2195.5	-1.5	1061.6	75.5	187.9	173.2
CONSOL VERTICAL RAILS	B5	4	2.00	2156.5	0.	1016.0	0.	0.	0.

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX	KY (CM)	KZ
CONSOL HORIZONTAL RAILS	B5	4	3.00	2156.5	0.	1016.0	0.	0.	0.
PSA FOOT RESTRAINTS	B5	6	18.00	2156.5	0.	1016.0	0.	0.	0.
RACK CLOSEOUT FT RESTRAINTS	B5	4	31.70	2156.5	0.	1016.0	0.	0.	0.
HABITABILITY			54.70	2156.5	0.	1016.0	0.	.0	.0
KEYBOARD	B5	1	3.50	2156.0	-141.9	984.5	0.	0.	0.
CRT AND SYMBOL GENERATOR	B5	1	28.90	2156.0	-141.9	1009.9	0.	0.	0.
CONTROL AND DISPLAY			32.40	2156.0	-141.9	1007.2	7.9	7.9	0.
****** MISSION DEPENDENT EQUIPMENT			2772.37	2278.4	19.0	946.8	213.8	628.0	632.7
C AND D PANELS	C5	1	18.00	2156.0	0.	1016.0	0.	0.	0.
C AND D PANELS	C5	1	8.40	2156.0	0.	1016.0	0.	0.	0.
C AND D PANELS	C5	1	3.00	2156.0	0.	1016.0	0.	0.	0.
TV MONITOR	C5	1	10.00	2156.0	0.	1016.0	0.	0.	0.
C AND W SENSORS-PRESSURE	C2	4	.64	2212.8	0.	1016.0	0.	0.	0.
C AND W SENSORS-TEMPERATURE	C2	4	.64	2212.8	0.	1016.0	0.	0.	0.
SENSOR INTERFACE BOX	C3	1	2.27	2864.0	-0.	890.0	0.	0.	0.
SENSOR INTERFACE BOX	C3	1	2.27	2864.0	-0.	890.0	0.	0.	0.
SENSOR INTERFACE BOX	C2	1	2.27	2257.0	-0.	890.0	0.	0.	0.
SENSOR INTERFACE BOX	C4	1	2.27	3168.0	-0.	890.0	0.	0.	0.
VIDEO RECORDER	C5	1	36.30	2156.0	-0.	1016.0	0.	0.	0.
ANALOG RECORDER	C5	1	22.70	2156.0	-0.	1016.0	0.	0.	0.
TRANSIENT RECORDER	C5	5	30.80	2156.0	-0.	1016.0	0.	0.	0.
SWITCHING PANEL	C5	1	3.63	2156.0	-0.	1016.0	0.	0.	0.
CONTROL AND DISPLAY			143.19	2196.6	0.	1008.0	30.7	177.8	175.1
FM MODULE	C5	1	21.80	2155.0	-0.	1016.0	0.	0.	0.

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
DATA MANAGEMENT			21.80	2156.0	0.	1016.0	0.	0.	0.
SIPS PLATFORM	C3	1	527.00	2856.0	-0.	996.0	0.	0.	0.
MPM PLATFORM-OBIPS	C4	1	56.00	3067.0	152.0	1104.9	0.	0.	0.
MPM PLATFORM-NIR SPEC	C2	1	56.00	2452.0	139.7	1117.6	0.	0.	0.
FIXED HD STAR TRKER-II-7-10	C4	1	4.00	3079.0	406.0	1104.9	0.	0.	0.
FIXED HEAD STAR TRACKER-NIR	C2	1	4.00	2452.0	0.	1054.1	0.	0.	0.
TWO AXES GYRO PACKAGE	C3	1	8.00	2856.0	50.8	977.5	0.	0.	0.
TWO AXES GYRO PACKAGE	C3	1	8.00	2856.0	-50.8	977.5	0.	0.	0.
3 AXES GYRO PACKAGE-OBIPS	C4	1	10.00	3092.0	152.0	1066.8	0.	0.	0.
3 AXES GYRO PACKAGE-NIR SPEC	C2	1	10.00	2452.0	139.7	1054.1	0.	0.	0.
RATE GYRO			36.00	2809.3	81.0	1023.6	90.2	245.7	255.1
ATTITUDE POINTING			683.00	2836.7	30.6	1017.3	78.5	151.9	159.1
SIPS CANISTER-NIR SPEC	C2	1	90.00	2452.0	10.0	1140.0	0.	0.	0.
I/F PLUMBING KITS-PALLET 3	C4	1	12.00	3156.0	-0.	876.3	0.	0.	0.
EXP HEAT EXCHANGER-LIDAR	C4	1	25.00	3219.0	-127.0	952.0	0.	0.	0.
THERMAL CURTAIN-PALLET 1	C2	1	10.00	2561.0	-0.	1016.0	0.	0.	0.
THERMAL CURTAIN-PALLET 2	C3	1	10.00	2864.0	-0.	1016.0	0.	0.	0.
THERMAL CURTAIN-PALLET 3	C4	1	10.00	3156.0	-0.	1016.0	0.	0.	0.
TCS PUMP-LIDAR	C4	1	10.00	3219.0	-127.0	952.0	0.	0.	0.
COOLANT FILTERS	C4	6	2.70	3219.0	-127.0	952.0	0.	0.	0.
THERMAL			169.70	2744.4	-22.9	1057.7	108.7	359.0	351.1
PULSE POWER SUPPLY-LIDAR	C4	1	95.00	3156.0	-0.	957.6	0.	0.	0.
PULSE POWER SUPLY	C4	1	600.00	3156.0	-0.	909.3	0.	0.	0.
PEAKING BATTERY	C4	1	40.30	3166.0	101.6	902.0	0.	0.	0.

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
ELECT DIST PANEL	C2	1	10.00	2561.0	-0.	902.0	0.	0.	0.
ELECT DIST PANEL	C4	1	10.00	3166.0	-0.	902.0	0.	0.	0.
ELECT DIST PANEL	C3	1	10.00	2866.0	-0.	902.0	0.	0.	0.
POWER SUPPLY TOTAL			765.30	3145.1	5.4	914.6	27.9	76.7	78.3
CABLE SET-PALLET 1	C2	1	102.00	2561.0	-119.4	914.4	0.	0.	0.
CABLE SET-PALLET 2	C3	1	91.00	2864.0	-119.4	914.4	0.	0.	0.
CABLE SET-PALLET 3	C4	1	68.00	3156.0	-119.4	914.4	0.	0.	0.
CABLE SET-MODULE TO PALLET	C7	1	57.00	2362.0	-152.4	863.6	0.	0.	0.
CABLE SET-MODULE	C5	1	34.00	2156.0	-152.4	863.6	0.	0.	0.
CABLE SET-SIPS TO INSTRUMENT	C3	1	40.00	2856.0	-152.4	863.6	0.	0.	0.
CABLE SET TOTAL			392.00	2700.6	-130.4	897.4	28.6	304.4	303.9
ELECTRICAL			1157.30	2994.5	-40.6	908.8	70.6	282.1	289.3
WIDE BAND RECEIVER	C3	1	2.27	2926.1	-172.6	1059.2	0.	0.	0.
NARROW BAND RECEIVER	C3	1	.57	2926.1	-172.6	1059.2	0.	0.	0.
COMMAND TRANSMITTER	C3	1	.50	2926.1	-172.6	1059.2	0.	0.	0.
MULTIPLEXER	C3	1	1.36	2926.1	-172.6	1059.2	0.	0.	0.
CONICAL ANTENNA	C3	1	.91	2926.1	-172.6	1059.2	0.	0.	0.
L/L LOCKS-NIR SPEC	C2	1	1.80	2457.5	-30.5	1077.0	0.	0.	0.
L/L LOCKS-NIR SPEC	C2	1	9.10	2457.5	114.3	1107.4	0.	0.	0.
L/L LOCKS-OSIPS	C4	1	6.80	3100.0	152.4	1084.6	0.	0.	0.
LAUNCH/LANDING LOCKS			17.70	2704.3	114.2	1095.5	52.3	312.8	316.8
EMER JETTISON (MPM PLATFORM)	C2	1	8.20	2452.0	152.4	1059.2	0.	0.	0.

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
EMER JETTISON (MPM PLATFORM)	C4	1	8.20	3067.0	152.4	1059.2	0.	0.	0.
EMERGENCY JETTISON			16.40	2759.5	152.4	1059.2	.0	307.5	307.5
FOR PLASMA WAKE DIAGNOSTIC	C3	1	10.00	2749.6	-165.0	1059.0	0.	0.	0.
FOR PLASMA WAKE GENERATOR	C2	1	10.40	2444.8	-101.5	1026.0	0.	0.	0.
PIC(FOR HOLDDOWN NUTS)	C2	1	.20	2561.0	-0.	914.0	0.	0.	0.
PIC(FOR HOLDDOWN NUTS)	C4	1	.20	3156.0	-0.	914.0	0.	0.	0.
HOLDDOWN ORDNANCE	C2	6	6.00	2610.0	-0.	939.0	0.	0.	0.
CAPTURE/RELEASE DEVICE			26.80	2601.7	-101.0	1017.9	78.7	149.2	154.9
MECHANISMS			66.51	2695.3	12.7	1052.2	141.1	261.5	290.5
FOR HV POWER SUPPLY	C4	1	12.00	3153.0	-0.	889.0	0.	0.	0.
FOR INSTRUMENT IV-1	C4	1	1.40	3116.0	-208.0	1049.0	0.	0.	0.
FOR CHEMICAL RELEASE	C2	1	5.40	2673.0	-0.	914.0	0.	0.	0.
DIRECT MOUNTING BRACKETRY			18.80	3012.4	-15.5	908.1	68.6	219.6	222.5
INSTRUMENT I-21 PLATFORM	C2	1	60.30	2634.0	-91.1	927.1	0.	0.	0.
FOR INSTRUMENT I-1	C4	1	39.00	3229.0	-92.7	16.0	0.	0.	0.
FOR INSTRUMENT II-3	C4	1	20.40	3051.0	127.0	927.0	0.	0.	0.
FOR INSTRUMENT II-7	C3	1	6.35	2853.0	-0.	1090.0	0.	0.	0.
FOR INSTRUMENT II-9 AND II-4	C2	1	20.40	2440.0	142.0	976.0	0.	0.	0.
FOR INSTRUMENT II-10	C3	1	6.35	2853.0	-94.0	1090.0	0.	0.	0.
FOR RF RECEIVER PACKAGE	C3	1	13.60	2838.4	114.0	914.0	0.	0.	0.
FOR PLASMA WAKE GENERATOR	C2	1	13.60	2444.8	-94.0	914.0	0.	0.	0.
FOR PLASMA WAKE DIAGNOSTIC	C3	1	13.60	2749.6	-165.1	995.7	0.	0.	0.

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
FOR RF TERMINAL	C3	1	5.00	2838.4	114.0	914.0	0.	0.	0.
INTERMEDIATE SPT STRUCTURE			203.60	2797.7	-29.8	770.3	384.2	457.1	288.5
INSTR TO INSTR I/F STRUCTURE	C4	14	15.90	3037.4	-0.	990.6	0.	0.	0.
THERMAL CURTAIN SPT-PALLET 1	C2	1	11.34	2561.0	-0.	1016.0	0.	0.	0.
THERMAL CURTAIN SPT-PALLET 2	C3	1	11.34	2864.0	-0.	1016.0	0.	0.	0.
THERMAL CURTAIN SPT-PALLET 3	C4	1	11.34	3156.0	-0.	1016.0	0.	0.	0.
MISC STRUCTURE			34.02	2860.3	0.	1016.0	.0	242.9	242.9
PALLET I/F STRUCTURE			272.32	2834.4	-23.4	823.4	346.0	426.0	280.8
****** AMPS LABCRAFT			2513.82	2856.6	-14.1	949.5	155.8	345.6	326.7
EMERGENCY JETTISON FOR I-1	D4	1	.90	3232.0	-0.	1231.9	0.	0.	0.
LIDAR EMITTER	D4	1	75.00	3188.0	-121.0	1041.4	0.	0.	0.
LIDAR EMITTER	D4	1	75.00	3270.0	-121.0	1041.4	.0.	0.	0.
LIDAR RECEIVER	D4	1	300.00	3232.0	-0.	1082.0	0.	0.	0.
****** LASER SOUNDER (I-1)			450.90	3231.0	-40.3	1068.8	60.6	31.3	61.7
SOLAR FLUX MONITOR (IV-1)	D4	1	3.00	3232.0	-200.7	1079.0	0.	0.	0.
****** SOLAR FLUX MONITOR			3.00	3232.0	-200.7	1079.0	.0	0.	0.
OBIPS (II-3)	D4	1	43.00	3194.0	150.0	1117.6	0.	0.	0.
****** OBIPS			43.00	3194.0	150.0	1117.6	0.	0.	0.

	DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
	CRYO LIMB SCANNER-DRY	D3	1	207.00	2823.0	94.0	1077.0	0.	0.	0.
	* CRYO	D3	1	293.00	2915.0	94.0	1077.0	0.	0.	0.
******	CRYO LIMB SCANNER-WET			500.00	2376.9	94.0	1077.0	0.	45.3	45.3
	CRYO IR INTERFEROMETER-DRY	D2	1	215.00	2823.0	-94.0	1077.0	0.	0.	0.
	* CRYO	D2	1	285.00	2915.0	-94.0	1077.0	0.	0.	0.
******	CRYO IR INTERFEROMETER			500.00	2875.4	-94.0	1077.0	0.	45.5	45.5
	* COMMAND RECEIVER	C2	1	.60	2635.2	-0.	1028.0	0.	0.	0.
	* ANTENNA,STUB	C2	1	1.00	2635.3	-0.	1028.0	0.	0.	0.
	COMMUNICATIONS			1.60	2635.3	0.	1028.0	.0	.0	.0
	* COMMAND DECODER	C2	1	1.50	2635.2	-0.	1028.0	0.	0.	0.
	* SEQUENCER	C2	1	10.00	2635.2	-0.	1028.0	0.	0.	0.
	DATA MANAGEMENT			11.50	2635.2	0.	1028.0	0.	0.	0.
	* CHEMICAL RELEASE (1-21)	D2	1	1472.00	2635.2	-0.	1003.0	0.	0.	0.
	* POWER SUPPLY	C2	1	3.00	2635.2	-0.	1028.0	0.	0.	0.
	* CABLE SET-CHEMICAL RELEASE	C2	1	2.00	2635.2	-0.	1013.5	0.	0.	0.
	FOR CHEMICAL RELEASE (I-21)	C2	1	.50	2635.2	-0.	940.0	0.	0.	0.
	* CHEMICAL RELEASE STRUCTURE	C2	1	174.60	2635.2	-0.	1013.5	0.	0.	0.
	*PIC	C2	2	2.00	2635.2	-0.	1028.0	0.	0.	0.
******	CHEMICAL RELEASE			1667.20	2635.2	0.	1004.4	4.2	4.2	.0
	RF PLASMA WAVE PACKAGE(I-12)	D4	1	205.00	3036.8	-0.	1051.6	0.	0.	0.
	DIPOLE ANTENNA (100 METERS)	C4	1	19.96	3065.8	-0.	1051.6	0.	0.	0.
	COMMUNICATIONS			19.96	3065.8	0.	1051.6	0.	0.	0.

	DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
******	RF PLASMA WAVE PACKAGE			224.96	3039.4	0.	1051.6	.0	8.2	8.2
	UV/VIS/NIR SPEC (II-4)	D2	2	44.00	2457.5	30.5	1140.5	0.	0.	0.
******	UV/VIS/NIR SPEC			44.00	2457.5	30.5	1140.5	0.	0.	0.
	DEPLOYABLE TEST BODY(III-17)	D2	1	16.00	2454.9	-104.1	1061.7	0.	0.	0.
	* DEPLOYABLE TEST BODY	D2	1	4.00	2454.9	-104.1	1061.7	0.	0.	0.
	PROG EJEC (PNG,III-17)	C2	1	.90	2454.9	-104.1	1061.7	0.	0.	0.
	CAPTURE/RELEASE INTERFACE	C2	1	.50	2454.9	-104.1	965.2	0.	0.	0.
	PLASMA WAKE GENERATOR STRUCT	C2	1	20.40	2454.9	-104.1	1000.8	0.	0.	0.
	DATA TRANSMITTER	C2	1	.50	2454.9	-104.1	1000.8	0.	0.	0.
	COMMAND RECEIVER	C2	1	1.00	2454.9	-104.1	1000.8	0.	0.	0.
	DIPLEXER	C2	1	1.00	2454.9	-104.1	1000.8	0.	0.	0.
	ANTENNA, STUB	C2	1	1.00	2454.9	-104.1	1000.8	0.	0.	0.
	COMMUNIATIONS			3.50	2454.9	-104.1	1000.8	.0	.0	.0
	PCM PROGRAMMER/MULTIPLEXER	C2	1	1.00	2454.9	-104.1	1000.8	0.	0.	0.
	COMMAND DECODER	C2	1	1.50	2454.9	-104.1	1000.8	0.	0.	0.
	DATA MANAGEMENT			2.50	2454.9	-104.1	1000.8	.0	0.	0.
	POWER SUPPLY	C2	1	18.00	2454.9	-104.1	1000.8	0.	0.	0.
	CABLE SET	C2	1	1.00	2454.9	-104.1	1000.8	0.	0.	0.
	ELECTRICAL			19.00	2454.9	-104.1	1000.8	.0	.0	.0
	STRIP HEATERS	C2	1	1.00	2454.9	-104.1	1000.8	0.	0.	0.
	MULTILAYER INSULATION	C2	1	1.70	2454.9	-104.1	1000.8	0.	0.	0.

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DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
THERMAL CONTROL			2.70	2454.9	-104.1	1000.8	0.	0.	0.
ENTENSION MECHANISM	C2		10.00	2454.9	-104.1	1000.8	0.	0.	0.
PLASMA WAKE GENERATOR			79.50	2454.9	-104.1	1016.6	27.1	27.1	.0
* TM XMITTER (S-BAND)	C4	1	.50	3071.4	-102.1	1001.3	0.	0.	0.
* 10 METER DIPOLE ANTENNA	C4	1	2.00	3053.1	-118.1	1010.1	0.	0.	0.
* CONICAL ANTENNA	C4	1	1.00	3030.2	-95.2	1010.1	0.	0.	0.
* CONICAL ANTENNA	C4	1	1.00	3030.2	-95.2	1004.1	0.	0.	0.
* COMMAND RECEIVER	C4	1	.60	3053.1	-141.0	1001.3	0.	0.	0.
* DIPLEXER/SPLITTER	C4	1	1.00	3077.0	-113.0	996.0	0.	0.	0.
COMMUNICATIONS			6.10	3051.0	-110.7	1005.2	14.9	17.8	22.0
* SUBCARRIER OSCILLATOR ASSY	C4	1	.90	3042.2	-124.5	1003.7	0.	0.	0.
* PCM PROGRAMMER/MULTIPLEXER	C4	1	2.00	3035.3	-114.3	990.6	0.	0.	0.
* COMMAND DECODER	C4	1	1.00	3053.1	-129.0	1003.7	0.	0.	0.
DATA MANAGEMENT			3.90	3041.5	-120.4	997.0	9.2	9.9	9.8
* RF PLASMA WAVE (I-12)	D4	1	5.00	3053.1	-124.5	991.4	0.	0.	0.
* VECTOR MAGNETOMETER(III-2)	D4	1	4.10	3053.1	-101.0	991.3	0.	0.	0.
* POWER SUPPLY-RF RCVR PKG	C4	1	10.00	3030.7	-118.1	993.6	0.	0.	0.
* CABLE SET-RF RECEIVER PKG	C4	1	1.00	3053.1	-118.7	999.7	0.	0.	0.
ELECTRICAL			11.00	3032.7	-118.2	994.2	1.8	6.7	6.4
PROG EJEC-RF RECEIVER PKG	C4	1	3.80	3053.1	-118.1	960.0	0.	0.	0.
* PROG EJEC-RF RECEIVER PKG	C4	1	4.00	3053.1	-118.1	965.7	0.	0.	0.
* SPIN TABLE-RF RCVR PKG	C4	1	4.50	3053.1	-118.1	980.5	0.	0.	0.
RF RECEIVER PACKAGE STRUCT	C4	1	14.20	3053.1	-118.1	999.8	0.	0.	0.
*STRIP HEATERS	C4	1	1.00	3053.1	-118.1	999.8	0.	0.	0.

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
*MULTILAYER INSULATION	C4	1	1.70	3053.1	-118.1	999.8	0.	0.	0.
THERMAL CONTROL			2.70	3053.1	-118.1	999.8	.0	.0	.0
****** RF RECEIVER PACKAGE			59.30	3048.3	-116.9	991.5	14.7	16.5	12.5
VECTOR MAGNETOMETER	D3	1	4.10	2775.0	-170.0	1069.0	0.	0.	0.
ION MASS + DIST ANALYSIS	D3	1	2.00	2775.0	-117.0	106.9	0.	0.	0.
PLANAR RPA	D3	1	3.00	2775.0	-170.0	1069.6	0.	0.	0.
LANGMUIR PROBE	D3	1	3.50	2775.0	-170.0	1069.6	0.	0.	0.
NEUTRAL MASS SPEC	D3	1	10.00	2775.0	-170.0	1069.6	0.	0.	0.
PLASMA WAKE DIA-STRUCTURE	C3	1	11.34	2775.0	-170.0	1069.6	0.	0.	0.
CAPTURE/RELEASE INTERFACE	C3	1	.60	2926.1	-172.7	1059.2	0.	0.	0.
DATA TRANSMITTER	C3	1	.50	2775.0	-170.0	1069.6	0.	0.	0.
COMMAND RECEIVER	C3	1	.60	2775.0	-170.0	1069.6	0.	0.	0.
DIPLEXER	C3	1	1.00	2775.0	-170.0	1069.6	0.	0.	0.
ANTENNA, STUB	C3	1	1.00	2775.0	-170.0	1069.6	0.	0.	0.
COMMUNICATION			3.10	2775.0	-170.0	1069.6	0.	0.	0.
COMMAND DECODER	C3	1	1.40	2775.0	-170.0	1069.6	0.	0.	0.
PCM PROGRAMMER/MULTIPLEXER	C3	1	2.00	2775.0	-170.0	1069.6	0.	0.	0.
SUBCARRIER OSCILLATOR ASSY	C3	1	2.14	2775.0	-170.0	1069.6	0.	0.	0.
DATA MANAGEMENT			5.54	2775.0	-170.0	1069.6	.0	.0	.0
POWER SUPPLY	C3	1	17.00	2775.0	-170.0	1069.6	0.	0.	0.
CABLE SET	C3	1	1.40	2775.0	-170.0	1069.6	0.	0.	0.
ELECTRICAL			18.40	2775.0	-170.0	1069.6	.0	.0	0.
STRIP HEATERS	C3	1	1.00	2775.0	-170.0	1069.6	0.	0.	0.

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
MULTILAYER INSULATION	C3	1	3.50	2775.0	-170.0	1069.6	0.	0.	0.
THERMAL CONTROL			4.50	2775.0	-170.0	1069.6	.0	.0	0.
PLASMA WAKE DIAGNOSTIC PKG			66.08	2776.4	-168.4	1040.3	165.2	165.5	17.0
NEAR IR SPECTROMETER (II-9)	D4	1	60.00	2449.8	30.5	1140.5	0.	0.	0.
****** NEAR IR SPECTROMETER			60.00	2449.8	30.5	1140.5	.0	.0	.0

GRAND TOTAL

MASS 15199.03 KGS

CENTER OF GRAVITY
X = 2513.39 CM
Y = -1.64 CM
Z = 981.07 CM

RADIUS OF GYRATION
KX = 167.89 CM
KY = 499.10 CM
KZ = 498.28 CM

MOMENT OF INERTIA
IX= 42815 KG-M2
IY= 378380 KG-M2
IZ= 377144 KG-M2

PRODUCT OF INERTIA
PXY= -4368 KG-M2
PXZ= -5070 KG-M2
PYZ= 2676 KG-M2

MOMENT OF INERTIA
IX= 428145052 KG-CM2
IY=3783798318 KG-CM2
IZ=3771444006 KG-CM2

PRODUCT OF INERTIA
PXY= -43681261 KG-CM2
PXZ= -50704516 KG-CM2
PYZ= 26759128 KG-CM2

AMPS -----FLIGHT 2-------LANDED CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

DATE OF RUN 09/16/76
PAGE 1

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
SPACELAB MODULE	A5	1	3363.00	2156.5	-8.5	1004.6	160.5	165.9	154.9
6 METER PALLET TRAIN	A1	1	1236.00	2700.0	11.9	911.6	212.6	179.4	223.0
3 METER PALLET	A4	1	518.00	3163.6	11.9	911.6	212.6	105.6	189.0
SL/ORBITER UTILITY BRIDGE	A6	1	218.20	1836.0	0.	914.4	0.	0.	0.
TUNNEL	A8	1	352.00	1877.1	0.	967.5	142.0	101.1	141.0
TUNNEL ADAPTER	A8	1	408.20	1500.0	0.	901.7	87.1	105.4	95.0
P/L ARS FAN AND DUCTING	A8	1	9.50	1577.3	0.	901.7	0.	0.	0.
AIRLOCK	A9	1	364.00	1605.3	0.	1069.3	0.	0.	0.
LESS SHUTTLE AIRLOCK	A9	1	-363.00	1402.0	0.	914.0	0.	0.	0.
****** BASIC SPACELAB			6205.90	2305.7	-1.1	973.7	177.9	430.4	432.8
RMS (SECOND UNIT)	B0	1	393.50	2376.4	213.4	1107.6	0.	0.	0.
EPS KIT 2-DRY PLUS RESIDUALS	B0	1	357.02	2634.0	-18.4	784.9	206.0	294.4	357.1
EPS KIT 2			357.02	2634.0	-18.4	784.9	206.0	294.4	357.1
ORBITER HEAT REJECTION KIT	B0	1	87.50	3088.6	0.	1204.0	98.0	171.7	108.5
LONGERON FITTING-PALLET	B0	1	40.40	2475.5	238.8	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	2475.5	-238.7	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	2925.1	238.8	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	2925.1	-238.7	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	3074.9	238.8	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	3074.9	-238.7	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	3224.8	238.8	1051.6	0.	0.	0.
LONGERON FITTING-PALLET	B0	1	40.40	3224.8	-238.7	1051.6	0.	0.	0.
KEEL FITTING-PALLET	B0	1	35.40	2993.4	0.	777.2	0.	0.	0.
KEEL FITTING-PALLET	B0	1	35.40	3000.6	0.	777.2	0.	0.	0.
LONGERON FITTING-MODULE	B0	1	40.40	2035.9	238.8	1051.6	0.	0.	0.
LONGERON FITTING-MODULE	B0	1	40.40	2035.9	-238.7	1051.6	0.	0.	0.
LONGERON FITTING-MODULE	B0	1	40.40	2275.7	238.8	1051.6	0.	0.	0.
LONGERON FITTING-MODULE	B0	1	40.40	2275.7	-238.7	1051.6	0.	0.	0.
KEEL FITTING-MODULE	B0	1	35.40	2275.7	0.	777.2	0.	0.	0.

AMPS -----FLIGHT 2-------LANDED CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

DATE OF RUN 09/16/76
PAGE 2

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
LESS ORBITER ALLOWANCE	B0	1	-204.00	2728.0	0.	1003.3	0.	0.	0.
ORBITER RETENTION FITTINGS			387.00	2661.5	.1	1001.8	297.2	534.1	582.9
CREWMAN 5	B0	1	77.10	1244.6	121.9	886.5	0.	0.	0.
CREWMAN 6	B0	1	77.10	1244.6	71.1	886.5	0.	0.	0.
SEAT 5	B0	1	24.50	1254.8	121.9	863.6	0.	0.	0.
SEAT 6	B0	1	24.50	1254.8	71.1	863.6	0.	0.	0.
O2 TANKAGE PLUS RESIDUAL	B0	1	37.60	1905.0	0.	782.3	0.	0.	0.
EMERGENCY EQUIPMENT	B0	1	49.50	1366.5	0.	1016.0	0.	0.	0.
WASTE WATER TANKAGE	B0	1	22.00	1216.7	12.7	800.1	0.	0.	0.
FOOD	B0	1	28.60	1181.1	-177.7	934.7	0.	0.	0.
HYGIENE EQUIPMENT	B0	1	26.20	1414.8	-109.1	904.2	0.	0.	0.
CREW PROVISIONS	B0	1	25.20	1244.6	96.5	886.5	0.	0.	0.
LIOH	B0	1	31.90	1244.6	0.	800.1	0.	0.	0.
RESTRAINTS	B0	1	1.70	1206.5	0.	1016.0	0.	0.	0.
STOWAGE VOLUME PENALTY	B0	1	43.90	1104.9	-25.3	939.8	0.	0.	0.
CREW SYSTEMS			469.80	1302.5	28.2	888.9	103.4	202.2	208.6
MONITOR AND CONTROL PANEL	B0	1	5.00	1358.9	0.	1016.0	0.	0.	0.
KEYBOARD	B0	1	3.50	1358.9	0.	1016.0	0.	0.	0.
CRT DISPLAY/SIGNAL GENERATOR	B0	1	28.90	1358.9	0.	1016.0	0.	0.	0.
REMOTE STATION, COMMUNICATIO	B0	1	1.50	1358.9	0.	1016.0	0.	0.	0.
PSS EQUIPMENT			38.90	1358.9	0.	1016.0	.0	.0	.0
DOUBLE RACK	B5	1	58.10	2080.0	127.0	1034.3	0.	0.	0.
SINGLE RACK	B5	1	37.60	2207.0	127.0	1034.3	0.	0.	0.
PALLET HARDPOINTS	B1	45	37.35	2858.8	0.	934.7	0.	0.	0.
INSERTS FOR PANELS	B1	6	39.00	2846.3	0.	904.2	0.	0.	0.
STRUCTURE			172.05	2450.5	70.6	983.2	85.8	366.6	367.4

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
EXP SWITCH PANEL	B5	1	12.70	2156.0	0.	1016.0	0.	0.	0.
EXP SWITCH PANEL	B5	1	12.70	2156.0	0.	1016.0	0.	0.	0.
EXP SWITCH PANEL	B5	1	12.70	2156.0	0.	1016.0	0.	0.	0.
INVERTER (400 HZ)	B5	1	32.20	2197.9	-123.9	934.0	0.	0.	0.
EPDS			70.30	2175.2	-56.8	978.4	74.0	45.9	65.2
COLD PLATE-RF INSTR	B4	1	5.50	3051.7	-109.2	965.2	0.	0.	0.
COLD PLATE-PEAKING BATTERY	B4	1	5.50	3192.4	114.0	914.0	0.	0.	0.
COLD PLATE-PS	B4	1	5.50	3154.3	0.	889.0	0.	0.	0.
COLD PLATE-RF TERMINAL	B3	1	5.50	2836.0	114.0	914.0	0.	0.	0.
ECS			22.00	3058.6	29.7	920.5	96.8	141.2	166.6
EXP RAU	B2	1	2.30	2524.8	0.	889.0	3.5	5.8	5.2
EXP RAU	B3	1	2.30	2824.5	0.	889.0	3.5	5.8	5.2
EXP RAU	B3	1	2.30	2824.5	0.	889.0	3.5	5.8	5.2
EXP RAU	B4	1	2.30	3124.2	0.	889.0	3.5	5.8	5.2
EXP RAU	B4	1	2.30	3124.2	0.	889.0	3.5	5.8	5.2
EXP RAU	B5	1	2.30	2156.5	-139.6	990.6	3.5	5.8	5.2
EXP COMPUTER	B5	1	30.20	2156.0	-0.	1016.0	0.	0.	0.
DIGITAL TAPE RECORDER	B5	1	43.00	2156.0	-0.	1016.0	0.	0.	0.
EXPERIMENT I/O	B5	1	27.50	2156.0	-0.	1016.0	0.	0.	0.
HIGH RATE DIGITAL MUX	B5	1	10.00	2153.0	-0.	1016.0	0.	0.	0.
TAPE AND CANISTERS	B5	15	88.50	2156.5	0.	1143.0	0.	0.	0.
CMDS			213.00	2195.5	-1.5	1061.6	75.5	187.9	173.2
CONSOL VERTICAL RAILS	B5	4	2.00	2156.5	0.	1016.0	0.	0.	0.
CONSOL HORIZONTAL RAILS	B5	4	3.00	2156.5	0.	1016.0	0.	0.	0.
PSA FOOT RESTRAINTS	B5	6	18.00	2156.5	0.	1016.0	0.	0.	0.
RACK CLOSEOUT FT RESTRAINTS	B5	4	31.70	2156.5	0.	1016.0	0.	0.	0.

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX	KY (CM)	KZ
HABITABILITY			54.70	2156.5	0.	1016.0	0.	.0	.0
KEYBOARD	B5	1	3.50	2156.0	-141.9	984.5	0.	0.	0.
CRT AND SYMBOL GENERATOR	B5	1	28.90	2156.0	-141.9	1009.9	0.	0.	0.
CONTROL AND DISPLAY			32.40	2156.0	-141.9	1007.2	7.9	7.9	0.
****** MISSION DEPENDENT EQUIPMENT			2298.17	2235.6	41.2	974.1	213.3	620.8	628.1
C AND D PANELS	C5	1	18.00	2156.0	0.	1016.0	0.	0.	0.
C AND D PANELS	C5	1	8.40	2156.0	0.	1016.0	0.	0.	0.
C AND D PANELS	C5	1	3.00	2156.0	0.	1016.0	0.	0.	0.
TV MONITOR	C5	1	10.00	2156.0	0.	1016.0	0.	0.	0.
C AND W SENSORS-PRESSURE	C2	4	.64	2212.8	0.	1016.0	0.	0.	0.
C AND W SENSORS-TEMPERATURE	C2	4	.64	2212.8	0.	1016.0	0.	0.	0.
SENSOR INTERFACE BOX	C3	1	2.27	2864.0	-0.	890.0	0.	0.	0.
SENSOR INTERFACE BOX	C3	1	2.27	2864.0	-0.	890.0	0.	0.	0.
SENSOR INTERFACE BOX	C2	1	2.27	2257.0	-0.	890.0	0.	0.	0.
SENSOR INTERFACE BOX	C4	1	2.27	3168.0	-0.	890.0	0.	0.	0.
VIDEO RECORDER	C5	1	36.30	2156.0	-0.	1016.0	0.	0.	0.
ANALOG RECORDER	C5	1	22.70	2156.0	-0.	1016.0	0.	0.	0.
TRANSIENT RECORDER	C5	5	30.80	2156.0	-0.	1016.0	0.	0.	0.
SWITCHING PANEL	C5	1	3.63	2156.0	-0.	1016.0	0.	0.	0.
CONTROL AND DISPLAY			143.19	2196.6	0.	1008.0	30.7	177.8	175.1
FM MODULE	C5	1	21.80	2156.0	-0.	1016.0	0.	0.	0.
DATA MANAGEMENT			21.80	2156.0	0.	1016.0	0.	0.	0.
SIPS PLATFORM	C3	1	527.00	2856.0	-0.	996.0	0.	0.	0.

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
MPM PLATFORM-OBIPS	C4	1	56.00	3067.0	152.0	1104.9	0.	0.	0.
MPM PLATFORM-NIR SPEC	C2	1	56.00	2452.0	139.7	1117.6	0.	0.	0.
FIXED HD STAR TRKER-II-7-10	C4	1	4.00	3079.0	406.0	1104.9	0.	0.	0.
FIXED HEAD STAR TRACKER-NIR	C2	1	4.00	2452.0	0.	1054.1	0.	0.	0.
TWO AXES GYRO PACKAGE	C3	1	8.00	2856.0	50.8	977.5	0.	0.	0.
TWO AXES GYRO PACKAGE	C3	1	8.00	2856.0	-50.8	977.5	0.	0.	0.
3 AXES GYRO PACKAGE-OBIPS	C4	1	10.00	3092.0	152.0	1066.8	0.	0.	0.
3 AXES GYRO PACKAGE-NIR SPEC	C2	1	10.00	2452.0	139.7	1054.1	0.	0.	0.
RATE GYRO			36.00	2809.3	81.0	1023.6	90.2	245.7	255.1
ATTITUDE POINTING			683.00	2836.7	30.6	1017.3	78.5	151.9	159.1
SIPS CANISTER-NIR SPEC	C2	1	90.00	2452.0	10.0	1140.0	0.	0.	0.
I/F PLUMBING KITS-PALLET 3	C4	1	12.00	3156.0	-0.	876.3	0.	0.	0.
EXP HEAT EXCHANGER-LIDAR	C4	1	25.00	3219.0	-127.0	952.0	0.	0.	0.
THERMAL CURTAIN-PALLET 1	C2	1	10.00	2561.0	-0.	1016.0	0.	0.	0.
THERMAL CURTAIN-PALLET 2	C3	1	10.00	2864.0	-0.	1016.0	0.	0.	0.
THERMAL CURTAIN-PALLET 3	C4	1	10.00	3156.0	-0.	1016.0	0.	0.	0.
TCS PUMP-LIDAR	C4	1	10.00	3219.0	-127.0	952.0	0.	0.	0.
COOLANT FILTERS	C4	6	2.70	3219.0	-127.0	952.0	0.	0.	0.
THERMAL			169.70	2744.4	-22.9	1057.7	108.7	359.0	351.1
PULSE POWER SUPPLY-LIDAR	C4	1	95.00	3156.0	-0.	957.6	0.	0.	0.
PULSE POWER SUPLY	C4	1	600.00	3156.0	-0.	909.3	0.	0.	0.
PEAKING BATTERY	C4	1	40.30	3166.0	101.6	902.0	0.	0.	0.
ELECT DIST PANEL	C2	1	10.00	2561.0	-0.	902.0	0.	0.	0.
ELECT DIST PANEL	C4	1	10.00	3166.0	-0.	902.0	0.	0.	0.
ELECT DIST PANEL	C3	1	10.00	2866.0	-0.	902.0	0.	0.	0.

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
POWER SUPPLY TOTAL			765.30	3145.1	5.4	914.6	27.9	76.7	78.3
CABLE SET-PALLET 1	C2	1	102.00	2561.0	-119.4	914.4	0.	0.	0.
CABLE SET-PALLET 2	C3	1	91.00	2864.0	-119.4	914.4	0.	0.	0.
CABLE SET-PALLET 3	C4	1	68.00	3156.0	-119.4	914.4	0.	0.	0.
CABLE SET-MODULE TO PALLET	C7	1	57.00	2362.0	-152.4	863.6	0.	0.	0.
CABLE SET-MODULE	C5	1	34.00	2156.0	-152.4	863.6	0.	0.	0.
CABLE SET-SIPS TO INSTRUMENT	C3	1	40.00	2856.0	-152.4	863.6	0.	0.	0.
CABLE SET TOTAL			392.00	2700.6	-130.4	897.4	28.6	304.4	303.9
ELECTRICAL			1157.30	2994.5	-40.6	908.8	70.6	282.1	289.3
WIDE BAND RECEIVER	C3	1	2.27	2926.1	-172.6	1059.2	0.	0.	0.
NARROW BAND RECEIVER	C3	1	.57	2926.1	-172.6	1059.2	0.	0.	0.
COMMAND TRANSMITTER	C3	1	.50	2926.1	-172.6	1059.2	0.	0.	0.
MULTIPLEXER	C3	1	1.36	2926.1	-172.6	1059.2	0.	0.	0.
CONICAL ANTENNA	C3	1	.91	2926.1	-172.6	1059.2	0.	0.	0.
L/L LOCKS-NIR SPEC	C2	1	1.80	2457.5	-30.5	1077.0	0.	0.	0.
L/L LOCKS-NIR SPEC	C2	1	9.10	2457.5	114.3	1107.4	0.	0.	0.
L/L LOCKS-OSIPS	C4	1	6.80	3100.0	152.4	1084.6	0.	0.	0.
LAUNCH/LANDING LOCKS			17.70	2704.3	114.2	1095.5	53.3	312.8	316.8
EMER JETTISON (MPM PLATFORM)	C2	1	8.20	2452.0	152.4	1059.2	0.	0.	0.
EMER JETTISON (MPM PLATFORM)	C4	1	8.20	3067.0	152.4	1059.2	0.	0.	0.
EMERGENCY JETTISON			16.40	2759.5	152.4	1059.2	.0	307.5	307.5

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
FOR PLASMA WAKE DIAGNOSTIC	C3	1	10.00	2749.6	-165.0	1059.0	0.	0.	0.
FOR PLASMA WAKE GENERATOR	C2	1	10.40	2444.8	-101.5	1028.0	0.	0.	0.
PIC(FOR HOLDDOWN NUTS)	C2	1	.20	2561.0	-0.	914.0	0.	0.	0.
PIC(FOR HOLDDOWN NUTS)	C4	1	.20	3156.0	-0.	914.0	0.	0.	0.
HOLDDOWN ORDNANCE	C2	6	6.00	2610.0	-0.	939.0	0.	0.	0.
CAPTURE/RELEASE DEVICE			26.80	2601.7	-101.0	1017.9	78.7	149.2	154.9
MECHANISMS			66.51	2695.3	12.7	1052.2	141.1	261.5	290.5
FOR HV POWER SUPPLY	C4	1	12.00	3153.0	-0.	889.0	0.	0.	0.
FOR INSTRUMENT IV-1	C4	1	1.40	3116.0	-208.0	1049.0	0.	0.	0.
FOR CHEMICAL RELEASE	C2	1	5.40	2673.0	-0.	914.0	0.	0.	0.
DIRECT MOUNTING BRACKETRY			18.80	3012.4	-15.5	908.1	68.6	219.6	222.5
INSTRUMENT I-21 PLATFORM	C2	1	65.30	2634.0	-91.1	927.1	0.	0.	0.
FOR INSTRUMENT I-1	C4	1	39.00	3229.0	-92.7	16.0	0.	0.	0.
FOR INSTRUMENT II-3	C4	1	20.40	3051.0	127.0	927.0	0.	0.	0.
FOR INSTRUMENT II-7	C3	1	6.35	2853.0	-0.	1090.0	0.	0.	0.
FOR INSTRUMENT II-9 AND II-4	C2	1	20.40	2440.0	142.0	978.0	0.	0.	0.
FOR INSTRUMENT II-10	C3	1	6.35	2853.0	-94.0	1090.0	0.	0.	0.
FOR RF RECEIVER PACKAGE	C3	1	13.60	2838.4	114.0	914.0	0.	0.	0.
FOR PLASMA WAKE GENERATOR	C2	1	13.60	2444.8	-94.0	914.0	0.	0.	0.
FOR PLASMA WAKE DIAGNOSTIC	C3	1	13.60	2749.6	-165.1	995.7	0.	0.	0.
FOR RF TERMINAL	C3	1	5.00	2838.4	114.0	914.0	0.	0.	0.
INTERMEDIATE SPT STRUCTURE			203.60	2797.7	-29.8	770.3	384.2	457.1	288.5

	DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
	INSTR TO INSTR I/F STRUCTURE	C4	14	15.90	3037.4	-0.	990.6	0.	0.	0.
	THERMAL CURTAIN SPT-PALLET 1	C2	1	11.34	2561.0	-0.	1016.0	0.	0.	0.
	THERMAL CURTAIN SPT-PALLET 2	C3	1	11.34	2864.0	-0.	1016.0	0.	0.	0.
	THERMAL CURTAIN SPT-PALLET 3	C4	1	11.34	3156.0	-0.	1016.0	0.	0.	0.
	MISC STRUCTURE			34.02	2860.3	0.	1016.0	.0	242.9	242.9
	PALLET I/F STRUCTURE			272.32	2834.4	-23.4	823.4	346.0	426.0	280.8
******	AMPS LABCRAFT			2513.82	2856.8	-14.1	949.5	155.8	345.6	326.7
	EMERGENCY JETTISON FOR I-1	D4	1	.90	3232.0	-0.	1231.9	0.	0.	0.
	LIDAR EMITTER	D4	1	75.00	3188.0	-121.0	1041.4	0.	0.	0.
	LIDAR EMITTER	D4	1	75.00	3270.0	-121.0	1041.4	0.	0.	0.
	LIDAR RECEIVER	D4	1	300.00	3232.0	-0.	1082.0	0.	0.	0.
******	LASER SOUNDER (I-1)			450.90	3231.0	-40.3	1068.8	60.6	31.3	61.7
	SOLAR FLUX MONITOR (IV-1)	D4	1	3.00	3232.0	-200.7	1079.0	0.	0.	0.
******	SOLAR FLUX MONITOR			3.00	3232.0	-200.7	1079.0	.0	0.	0.
	OBIPS (II-3)	D4	1	43.00	3194.0	150.0	1117.6	0.	0.	0.
******	OBIPS			43.00	3194.0	150.0	1117.6	0.	0.	0.
	CRYO LIMB SCANNER-DRY	D3	1	207.00	2823.0	94.0	1077.0	0.	0.	0.
******	CRYO LIMB SCANNER-WET			207.00	2823.0	94.0	1077.0	0.	0.	0.

	DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
	CRYO IR INTERFEROMETER-DRY	D2	1	215.00	2823.0	-94.0	1077.0	0.	0.	0.
******	CRYO IR INTERFEROMETER			215.00	2823.0	-94.0	1077.0	.0	.0	.0
	COMMUNICATIONS			-0.	-0.	-0.	-0.	-0.	-0.	-0.
	DATA MANAGEMENT			-0.	-0.	-0.	-0.	-0.	-0.	-0.
	FOR CHEMICAL RELEASE (I-21)	C2	1	.50	2635.2	-0.	940.0	0.	0.	0.
******	CHEMICAL RELEASE			.50	2635.2	0.	940.0	0.	0.	0.
	RF PLASMA WAVE PACKAGE(I-12)	D4	1	205.00	3036.8	-0.	1051.6	0.	0.	0.
	DIPOLE ANTENNA (100 METERS)	C4	1	19.96	3065.8	-0.	1051.6	0.	0.	0.
	COMMUNICATIONS			19.96	3065.8	0.	1051.6	0.	0.	0.
******	RF PLASMA WAVE PACKAGE			224.96	3039.4	0.	1051.6	.0	8.2	8.2
	UV/VIS/NIR SPEC (II-4)	D2	2	44.00	2457.5	30.5	1140.5	0.	0.	0.
******	UV/VIS/NIR SPEC			44.00	2457.5	30.5	1140.5	0.	0.	0.
	DEPLOYABLE TEST BODY(III-17)	D2	1	16.00	2454.9	-104.1	1061.7	0.	0.	0.
	PROG EJEC (PWG,III-17)	C2	1	.90	2454.9	-104.1	1061.7	0.	0.	0.
	CAPTURE/RELEASE INTERFACE	C2	1	.50	2454.9	-104.1	965.2	0.	0.	0.
	PLASMA WAKE GENERATOR STRUCT	C2	1	20.40	2454.9	-104.1	1000.8	0.	0.	0.
	DATA TRANSMITTER	C2	1	.50	2454.9	-104.1	1000.8	0.	0.	0.
	COMMAND RECEIVER	C2	1	1.00	2454.9	-104.1	1000.8	0.	0.	0.
	DIPLEXER	C2	1	1.00	2454.9	-104.1	1000.8	0.	0.	0.
	ANTENNA, STUB	C2	1	1.00	2454.9	-104.1	1000.8	0.	0.	0.
	COMMUNIATIONS			3.50	2454.9	-104.1	1000.8	.0	.0	.0

	DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
	PCM PROGRAMMER/MULTIPLEXER	C2	1	1.00	2454.9	-104.1	1000.8	0.	0.	0.
	COMMAND DECODER	C2	1	1.50	2454.9	-104.1	1000.8	0.	0.	0.
	DATA MANAGEMENT			2.50	2454.9	-104.1	1000.8	.0	0.	0.
	POWER SUPPLY	C2	1	18.00	2454.9	-104.1	1000.8	0.	0.	0.
	CABLE SET	C2	1	1.00	2454.9	-104.1	1000.8	0.	0.	0.
	ELECTRICAL			19.00	2454.9	-104.1	1000.8	.0	.0	.0
	STRIP HEATERS	C2	1	1.00	2454.9	-104.1	1000.8	0.	0.	0.
	MULTILAYER INSULATION	C2	1	1.70	2454.9	-104.1	1000.8	0.	0.	0.
	THERMAL CONTROL			2.70	2454.9	-104.1	1000.8	0.	0.	0.
	ENTENSION MECHANISM	C2	1	10.00	2454.9	-104.1	1000.8	0.	0.	0.
	PLASMA WAKE GENERATOR			75.50	2454.9	-104.1	1014.2	25.7	25.7	0.
	COMMUNICATIONS			-0.	-0.	-0.	-0.	-0.	-0.	-0.
	DATA MANAGEMENT			-0.	-0.	-0.	-0.	-0.	-0.	-0.
	ELECTRICAL			-0.	-0.	-0.	-0.	-0.	-0.	-0.
	PROG,EJEC-RF RECEIVER PKG	C4	1	3.80	3053.1	-118.1	960.0	0.	0.	0.
	RF RECEIVER PACKAGE STRUCT	C4	1	14.20	3053.1	-118.1	999.8	0.	0.	0.
	THERMAL CONTROL			-0.	-0.	-0.	-0.	-0.	-0.	-0.
******	RF RECEIVER PACKAGE			18.00	3053.1	-118.1	991.4	16.2	16.2	.0
	VECTOR MAGNETOMETER	D3	1	4.10	2775.0	-170.0	1069.0	0.	0.	0.
	ION MASS + DIST ANALYSIS	D3	1	2.00	2775.0	-117.0	106.9	0.	0.	0.
	PLANAR RPA	D3	1	3.00	2775.0	-170.0	1069.6	0.	0.	0.
	LANGMUIR PROBE	D3	1	3.50	2775.0	-170.0	1069.6	0.	0.	0.

AMPS -----FLIGHT 2-------LANDED CONDITION
MASS PROPERTIES AND EQUIPMENT LIST

DATE OF RUN 09/16/76
PAGE 11

DESCRIPTION		QTY	MASS (KG)	CENTER OF GRAVITY X (CM)	Y (CM)	Z (CM)	RADIUS OF GYRATION KX (CM)	KY (CM)	KZ (CM)
NEUTRAL MASS SPEC	D3	1	10.00	2775.0	-170.0	1069.6	0.	0.	0.
PLASMA WAKE DIA-STRUCTURE	C3	1	11.34	2775.0	-170.0	1069.6	0.	0.	0.
CAPTURE/RELEASE INTERFACE	C3	1	.60	2926.1	-172.7	1059.2	0.	0.	0.
DATA TRANSMITTER	C3	1	.50	2775.0	-170.0	1069.6	0.	0.	0.
COMMAND RECEIVER	C3	1	.60	2775.0	-170.0	1069.6	0.	0.	0.
DIPLEXER	C3	1	1.00	2775.0	-170.0	1069.6	0.	0.	0.
ANTENNA, STUB	C3	1	1.00	2775.0	-170.0	1069.6	0.	0.	0.
COMMUNICATION			3.10	2775.0	-170.0	1069.6	0.	0.	0.
COMMAND DECODER	C3	1	1.40	2775.0	-170.0	1069.6	0.	0.	0.
PCM PROGRAMMER/MULTIPLEXER	C3	1	2.00	2775.0	-170.0	1069.6	0.	0.	0.
SUBCARRIER OSCILLATOR ASSY	C3	1	2.14	2775.0	-170.0	1069.6	0.	0.	0.
DATA MANAGEMENT			5.54	2775.0	-170.0	1069.6	.0	.0	.0
POWER SUPPLY	C3	1	17.00	2775.0	-170.0	1069.6	0.	0.	0.
CABLE SET	C3	1	1.40	2775.0	-170.0	1069.6	0.	0.	0.
ELECTRICAL			18.40	2775.0	-170.0	1069.6	.0	.0	0.
STRIP HEATERS	C3	1	1.00	2775.0	-170.0	1069.6	0.	0.	0.
MULTILAYER INSULATION	C3	1	3.50	2775.0	-170.0	1069.6	0.	0.	0.
THERMAL CONTROL			4.50	2775.0	-170.0	1069.6	.0	.0	0.
PLASMA WAKE DIAGNOSTIC PKG			66.08	2776.4	-168.4	1040.3	165.2	165.5	17.0
NEAR IR SPECTROMETER (II-9)	D4	1	60.00	2449.8	30.5	1140.5	0.	0.	0.
****** NEAR IR SPECTROMETER			60.00	2449.8	30.5	1140.5	.0	.0	.0

GRAND TOTAL

MASS= 12425.83 KGS

CENTER OF GRAVITY
X = 2477.66 CM
Y = 1.73 CM
Z = 979.80 CM

RADIUS OF GYRATION
KX = 175.01 CM
KY = 526.58 CM
KZ = 526.48 CM

MOMENT OF INERTIA
IX= 39373 KG-M2
IY= 344546 KG-M2
IZ= 344420 KG-M2

PRODUCT OF INERTIA
PXY= -3016 KG-M2
PXZ= -5860 KG-M2
PYZ= 1835 KG-M2

MOMENT OF INERTIA
IX= 393726545 KG-CM2
IY=3445460671 KG-CM2
IZ=3444202457 KG-CM2

PRODUCT OF INERTIA
PXY= -30159046 KG-CM2
PXZ= -58603668 KG-CM2
PYZ= 18351001 KG-CM2

APPENDIX E

ELECTRICAL ENERGY MANAGEMENT

ELECTRICAL ENERGY MANAGEMENT

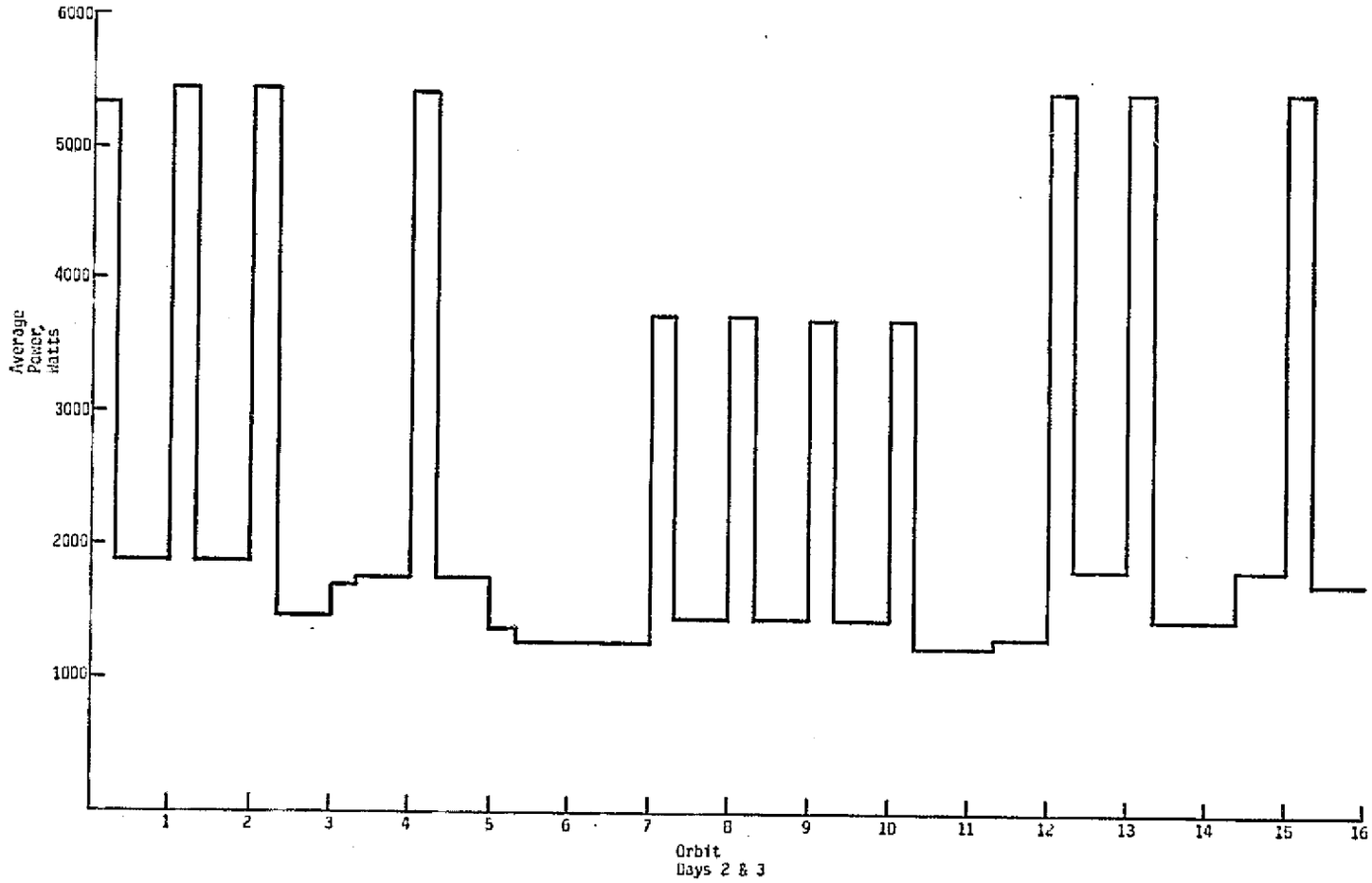
A power profile analysis of the Flight 1 mission was completed using the timelines developed during the study and the power requirements specified in the instrument IFRDs. The power requirements for subsystem support components are estimated based on the preliminary subsystem design. The analysis reflects a conservative approach to the load analysis and will be updated when operational sequences and power requirements are revised.

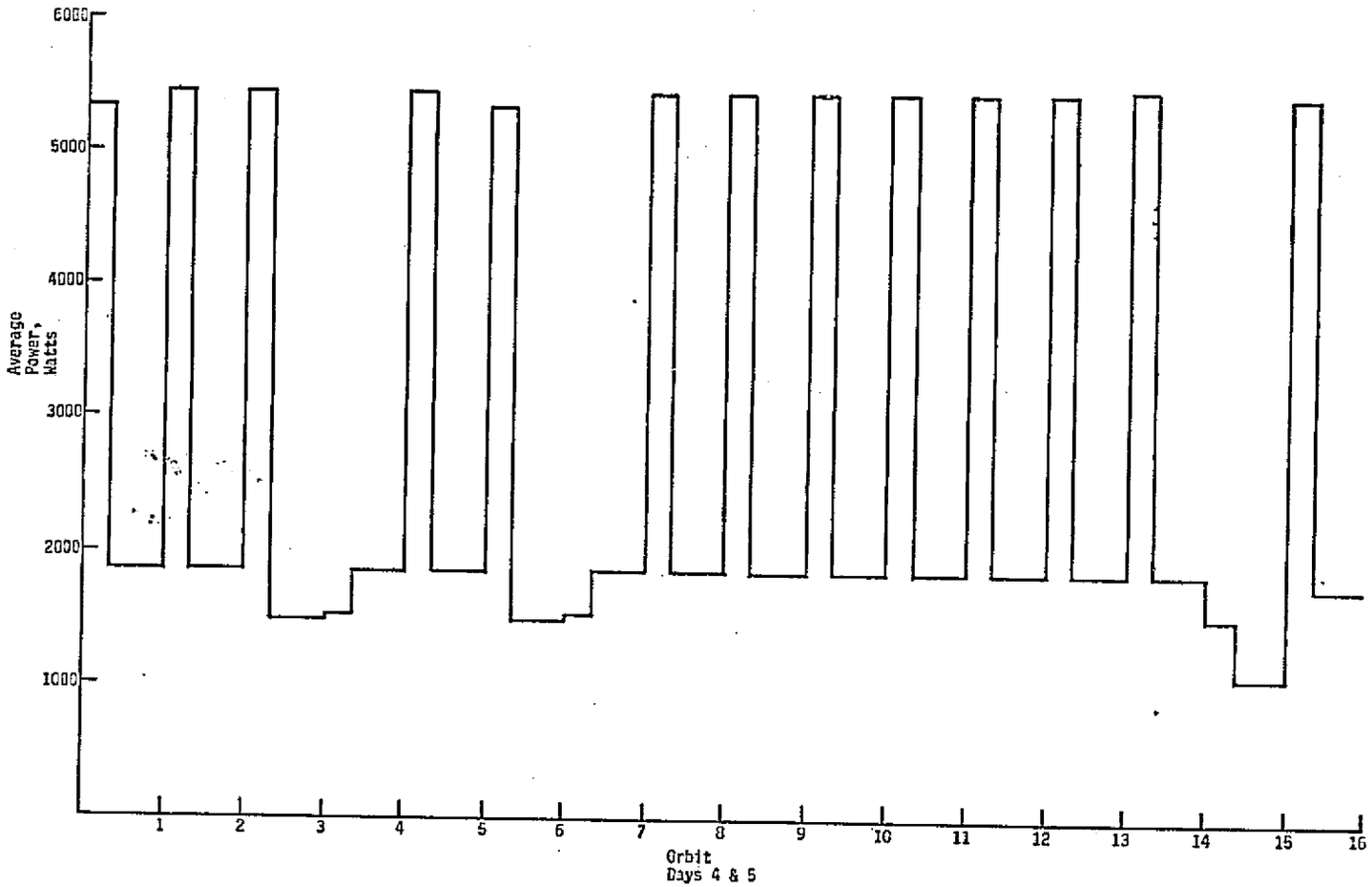
The timeline schedules the operation of the instruments but does not necessarily indicate the instrument status between operations. As a ground rule for this analysis the instrument was turned "off" if three or more orbits lapsed between operations. If the operation sequence required operation within 3 orbits, the instrument was placed in the "standby" mode between operations. Additional ground rules used in the analysis were as follows:

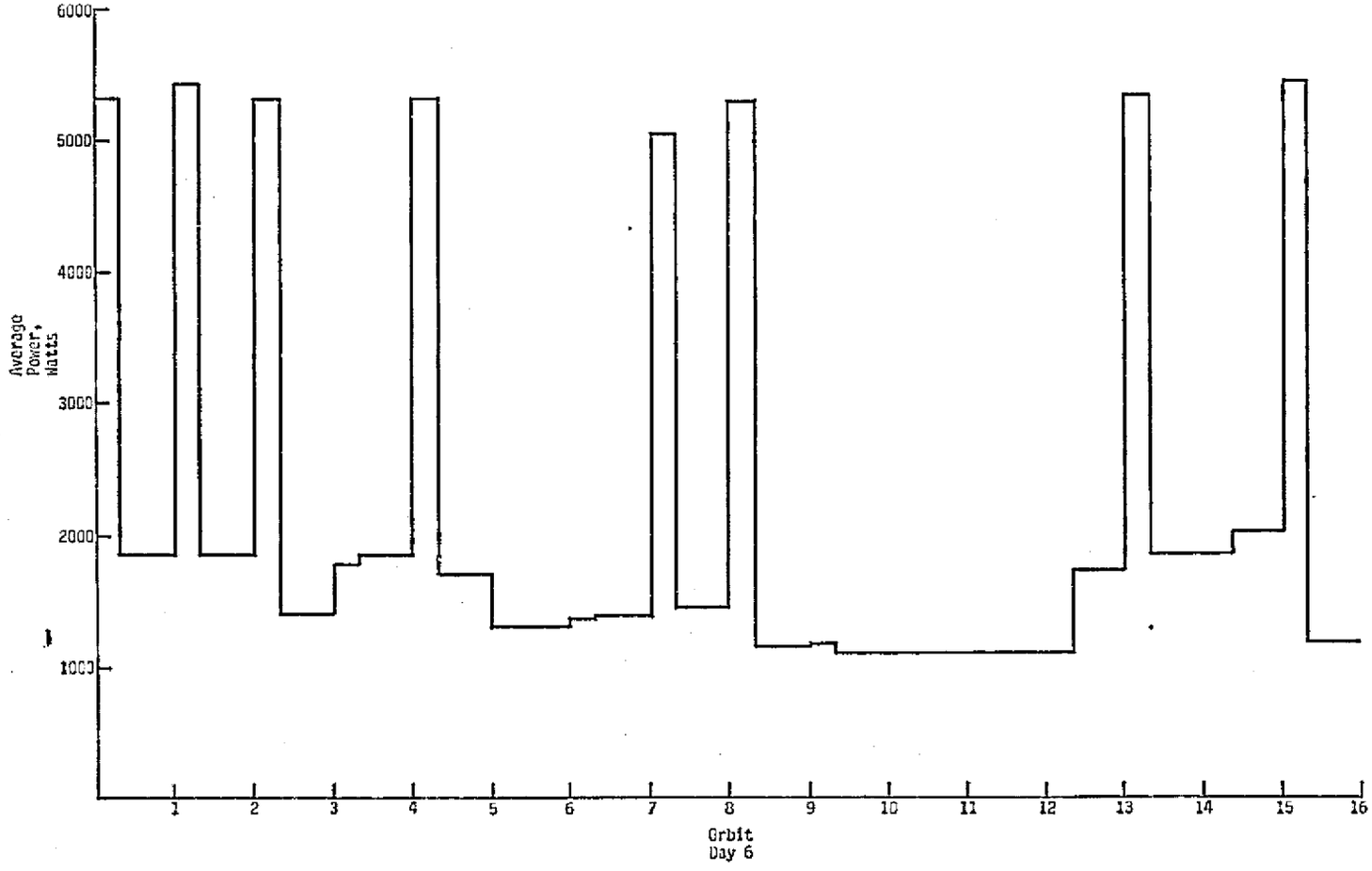
- Time period for day orbit = 53 minutes
  Time period for night orbit = 37 minutes
- Duty cycles when not indicated as a full day or night orbit are estimated and an average power calculated for use in profile
- Only Flight 1 calculated
- Power for computer and I/O unit part of Spacelab power allocation

Power profiles for Flight 1 are shown in the attached figures. The analysis results show an average power of 2622 watts and a total energy requirement of 378 kwh. The 2622 watts is well within the allowable 3400 watt continuous power available from the Orbiter fuel cells. The 378 kwh, however, is 9 kwh above the 369 kwh energy allocation from the Orbiter system. Since this preliminary analysis is very conservative in nature, this small disparity is not considered significant. Power management techniques could be suggested to eliminate the negative margin or an additional energy kit could be added to increase the energy available. The analysis of the power and energy for each day is shown in the attached tables. A daily summary of the totals is shown in Section 4.3.

The power analysis for Flight 2 was not performed since the majority of the instruments are the same as Flight 1. This indicates that the energy required for Flight 2 would approximate that of Flight 1 and would also be manageable within the power and energy available.


6000
5000
4000
3000
2000
1000
Average Power, Watts
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Orbit
Days 2 & 3


6000
5000
4000
3000
2000
1000
Average Power, Watts
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Orbit
Days 4 & 5


6000
5000
4000
3000
2000
1000
Average Power, Watts
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Orbit Day 6

LOAD	Stdby Pwr (W)	Oper Pwr (W)	ORBIT 1 N Avg Pwr	1 N W-H	1 D Avg Pwr	1 D W-H	2 N Avg Pwr	2 N W-H	2 D Avg Pwr	2 D W-H	3 N Avg Pwr	3 N W-H	3 D Avg Pwr	3 D W-H	4 N Avg Pwr	4 N W-H	4 D Avg Pwr	4 D W-H	5 N Avg Pwr	5 N W-H	5 D Avg Pwr	5 D W-H	6 N Avg Pwr	6 N W-H	6 D Avg Pwr	6 D W-H	7 N Avg Pwr	7 N W-H	7 D Avg Pwr	7 D W-H	8 N Avg Pwr	8 N W-H	8 D Avg Pwr	8 D W-H	Total W-H
I-1																																			
Laser Sounder	40	3600	3600	2220	40	35	3600	2220	40	35	3600	2220	40	35	40	25	40	35	3600	2220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9,045
II-7																																			
Cryo-Cool Limb Scnr.	15	75	75	46	75	66	75	46	75	66	75	46	15	13	15	9	75	66	75	46	75	66	-	-	-	-	-	-	-	-	-	-	-	-	470
SIPS	59	268	268	165	268	237	268	165	268	237	268	165	59	52	59	36	268	237	268	165	268	237	-	-	-	-	-	-	-	-	-	-	-	-	1,696
II-9																																			
Near IR Spectrometer	10	196	60	37	80	71	111	68	80	71	111	68	40	35	10	6	45	40	111	68	80	71	60	37	-	-	-	-	-	-	-	-	-	-	572
Mini Mount	115	200	138	85	147	130	161	99	147	130	161	99	131	116	115	71	131	116	161	99	147	120	138	85	115	102	115	70	115	102	115	70	115	102	1,606
Pump	-	115	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	1,376
II-10																																			
Cryo-Cool, Inf. Spec	0.5	56	56	35	56	49	56	35	56	49	56	35	0.5	-	0.5	-	56	49	56	35	56	49	-	-	-	-	-	-	-	-	-	-	-	-	336
I-21																																			
Chemical Release Sys.			All Power Self Contained Except Thermal Covered Below																																
II-3																																			
OBIPS on Point. Plat	7	116	-	-	-	-	-	-	-	-	-	-	-	-	116	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72
Mini Mount	115	200	-	-	-	-	-	-	-	-	-	-	-	-	200	123	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	123
I-9																																			
Electron Accel	200	2500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2500	1542	200	177	1,719
III-3																																			
Level I Beam Diag.	4	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	6	4	3.5	10
II-3																																			
OBIPS on RMS																																			
III-2			All Power Self Contained Except Thermal which is covered below																																
Vector Magnetometer																																			
III-4																																			
Level II Beam Diag.																																			
III-25, III-18, III-23																																			
ESP			All Power Self Contained Except Thermal which is covered below																																
IV-1																																			
Solar Flux Cal Array	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LIDM	-	400	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	4,800
Thermal	-	-	228	141	228	201	286	178	288	254	288	178	288	254	288	178	288	254	288	178	288	254	288	178	288	254	288	178	288	254	242	149	254	224	3,307
Lidar Pump	-	84	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	1,008
Freon Pump	-	274	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	3,288
			5298	3267	1767	1560	5432	3349	1827	1613	5432	3349	1522	1276	1717	1058	1776	1568	5432	3349	1787	1578	1644	838	1276	1127	1276	786	1276	1127	3740	2305	1446	1278	29,428

LOAD	ORBIT		9				10				11				12				13				14				15				16				Total W-H
	Stdby Pwr (W)	Oper Pwr (W)	N		D		N		D		N		D		N		D		N		D		N		D		N		D		N		D		
			Avg Pwr	W-H	Avg Pwr	W-H	Avg Pwr	W-H	Avg Pwr	W-H	Avg Pwr	W-H	Avg Pwr	W-H	Avg Pwr	W-H	Avg Pwr	W-H	Avg Pwr	W-H	Avg Pwr	W-H	Avg Pwr	W-H	Avg Pwr	W-H	Avg Pwr	W-H	Avg Pwr	W-H	Avg Pwr	W-H	Avg Pwr	W-H	
I-1																																			
Laser Sounder	40	3600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3600	2220	40	35	3600	2220	40	35	3600	2220	40	35	3600	2220	40	35	9,020
II-7																																			
Cryo-Cool Limb Scnr	15	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75	46	75	66	75	46	18	16	15	9	75	66	75	46	75	66	361
SIPS	59	268	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	268	165	268	237	268	165	66	58	59	36	268	237	268	165	268	237	1,300
II-9																																			
Near IR Spectrometer	10	196	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45	40	111	68	80	71	111	68	45	40	60	37	80	71	111	68	45	40	503
Mini Mount	115	200	115	70	115	102	115	70	115	102	115	70	115	102	115	70	131	116	161	99	147	130	161	99	131	116	138	85	147	130	161	99	131	116	1,576
Pump	-	115	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	1,376
II-10																																			
Cryo-Cool Intfr Spec	0.5	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56	35	56	49	56	35	14	12	0.5	-	56	49	56	35	56	49	264
I-21																																			
Chemical Release Sys	All Power Self Contained Except Thermal, Covered Below																																		
II-3																																			
OBIPS on Point, Plat	7	116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mini Mount	115	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I-9																																			
Electron Accel	200	2500	2500	1542	200	177	2500	1542	200	177	2500	1542	200	177	2500	1542	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6,699
III-3																																			
Level I Beam Diag.	4	10	10	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
II-3																																			
OBIPS on RHS																																			
III-2	All Power Self Contained Except Thermal which is covered below																																		
Vector Magnetometer																																			
III-4																																			
Level II Beam Diag.																																			
III-25, III-18, III-23																																			
ESP	All Power Self Contained Except Thermal which is covered below																																		
IV-1																																			
Solar Flux Cal Array	-	8	-	-	8	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
IECM	-	400	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	4,800
Thermal	-	-	182	112	256	224	256	157	256	224	256	157	184	161	288	178	288	254	288	178	288	254	288	178	288	254	288	178	288	254	288	178	288	254	3,197
Lidar Pump	-	84	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	1,008
Freon Pump	-	274	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	3,288
			3680	2268	1450	1281	3742	2307	1442	1274	3742	2307	1372	1213	3776	2328	1337	1181	5356	3349	1827	1613	5356	3349	1475	1302	5033	3103	1827	1613	5356	3349	1776	1568	33,405

Flight 1
Days 2 & 5
Page 1 of 2

LOAD	Stdby Pwr (W)	Oper Pwr (W)	ORBIT 1 N Avg Pwr	1 N W-H	1 D Avg Pwr	1 D W-H	2 N Avg Pwr	2 N W-H	2 D Avg Pwr	2 D W-H	3 N Avg Pwr	3 N W-H	3 D Avg Pwr	3 D W-H	4 N Avg Pwr	4 N W-H	4 D Avg Pwr	4 D W-H	5 N Avg Pwr	5 N W-H	5 D Avg Pwr	5 D W-H	6 N Avg Pwr	6 N W-H	6 D Avg Pwr	6 D W-H	7 N Avg Pwr	7 N W-H	7 D Avg Pwr	7 D W-H	8 N Avg Pwr	8 N W-H	8 D Avg Pwr	8 D W-H	Total W-H
I-1																																			
Laser Sounder	40	3600	3600	2220	40	35	3600	2220	40	35	3600	2220	40	35	40	25	40	35	3600	2220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9,045
II-7																																			
Cryo-Cool Limb Scnr	15	75	75	46	75	66	75	46	75	66	75	46	15	13	15	13	75	66	75	46	75	66	-	-	-	-	-	-	-	-	-	-	-	-	474
SIPS	59	268	268	165	268	237	268	165	268	237	268	165	59	52	59	52	268	237	268	165	268	237	-	-	-	-	-	-	-	-	-	-	-	-	1,712
II-9																																			
Near IR Spectrometer	10	196	60	37	80	71	111	68	80	71	111	68	40	35	10	6	5	40	111	68	80	71	60	37	-	-	-	-	-	-	-	-	-	-	572
Mini Mount	115	200	138	85	147	130	161	99	147	130	161	99	131	116	185	71	131	116	161	99	147	130	168	89	115	102	115	70	115	102	115	70	115	102	1,610
Pump	-	115	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	1,376
II-10																																			
Cryo-Cool Infr Spec	0.5	56	56	35	56	49	56	35	56	49	56	35	0.5	-	0.5	-	56	49	56	35	56	49	-	-	-	-	-	-	-	-	-	-	-	-	336
I-21																																			
Chemical Release Sys			All Power Self Contained Except Thermal, Covered Below																																
II-3																																			
OBIPS on Point. Plat	7	116	-	-	-	-	-	-	-	-	-	-	-	-	116	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72
Mini Mount	115	200	-	-	-	-	-	-	-	-	-	-	-	-	200	123	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	123
I-9																																			
Electron Accel	200	2500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2500	1542	200	177	1,719
III-3																																			
Level I Beam Diag.	4	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	6	4	3.5	10
II-3																																			
OBIPS on RMS																																			
III-2			All Power Self Contained Except Thermal Which is Covered Below																																
Vector Magnetometer																																			
III-4																																			
Level II Beam Diag.																																			
III-25, III-18, III-23																																			
ESP			All Power Self Contained Except Thermal Which is Covered Below																																
IV-1																																			
Solar Flux Cal Array	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IECM	-	400	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	4,800
Thermal	-	-	288	178	288	254	288	178	288	254	288	178	276	254	276	170	276	244	276	170	276	244	276	170	276	244	276	170	276	244	242	149	242	214	3,315
Lidar Pump	-	84	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	75	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	1,008
Freon Pump	-	274	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	3,288
			5358	3304	1827	1613	5432	3349	1827	1613	5432	3349	1435	1276	1704	1070	1764	1558	5420	3341	1775	1568	1377	834	1264	1117	1264	778	1264	1117	3740	2305	1434	1268	29,460

LOAD	ORBIT Stdby Pwr (W)	ORBIT Oper Pwr (W)	9 N Avg Pwr	9 N W-H	9 D Avg Pwr	9 D W-H	10 N Avg Pwr	10 N W-H	10 D Avg Pwr	10 D W-H	11 N Avg Pwr	11 N W-H	11 D Avg Pwr	11 D W-H	12 N Avg Pwr	12 N W-H	12 D Avg Pwr	12 D W-H	13 N Avg Pwr	13 N W-H	13 D Avg Pwr	13 D W-H	14 N Avg Pwr	14 N W-H	14 D Avg Pwr	14 D W-H	15 N Avg Pwr	15 N W-H	15 D Avg Pwr	15 D W-H	16 N Avg Pwr	16 N W-H	16 D Avg Pwr	16 D W-H	Total W-H
I-1																																			
Laser Sounder	40	3600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3600	2220	40	35	3600	2220	40	35	40	25	40	35	3600	2220	40	3	6,825
II-7																																			
Cryo-Cool Limb Scnr	15	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75	46	75	66	75	46	15	13	15	9	75	66	75	46	75	66	358
SIPS	59	268	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	268	165	268	237	268	165	59	52	59	36	268	237	268	165	268	237	1,294
II-9																																			
Near IR Spectrometer	10	196	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45	40	111	68	80	71	111	68	45	40	60	37	80	71	111	68	45	40	503
Mini Mount	115	200	115	70	115	102	115	70	115	102	115	70	115	102	115	70	131	116	161	99	147	130	161	99	131	116	138	85	147	130	161	99	131	116	1,576
Pump	-	115	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	1,376
II-10																																			
Cryo-Cool Infr Spec	0.5	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56	35	56	49	56	35	0.5	-	0.5	-	56	49	56	35	56	49	252
I-21																																			
Chemical Release Sys		All Power Self Contained Except Thermal, Covered Below																																	
II-3																																			
OBIPS on Point Plat	7	116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mini Mount	115	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I-9																																			
Electron Accel	200	2500	2500	1542	200	177	2500	1542	200	177	2500	1542	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,980
III-3																																			
Level I Beam Diag.	4	10	10	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
II-3																																			
OBIPS on RMS																																			
III-2		All Power Self Contained Except Thermal Which is Covered Below																																	
Vector Magnetometer																																			
III-4																																			
Level II Beam Diag.																																			
III-25, III-18, III-23																																			
ESP		All Power Self Contained Except Thermal Which is Covered Below																																	
IV-1																																			
Solar Flux Cal Array	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IRCM	-	400	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	4,800
Thermal	-	-	242	149	242	214	242	149	242	214	242	149	242	214	242	149	242	214	276	170	276	244	276	170	276	244	276	170	276	244	276	170	276	244	3,108
Lidar Pump	-	84	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	1,008
Freon Pump	-	274	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	3,288
			3740	2305	1430	1266	3730	2299	1430	1264	3730	2299	1230	1087	1230	757	1291	1141	5420	3341	1815	1603	5420	3341	1439	1271	1402	900	1815	1603	5420	3341	1764	1558	29,374

Flight 1
Days 4 & 5
Page 1 of 2

LOAD	Stdby Pwr (W)	Oper Pwr (W)	Orbit 1 N Avg Pwr	1 N W-H	1 D Avg Pwr	1 D W-H	2 N Avg Pwr	2 N W-H	2 D Avg Pwr	2 D W-H	3 N Avg Pwr	3 N W-H	3 D Avg Pwr	3 D W-H	4 N Avg Pwr	4 N W-H	4 D Avg Pwr	4 D W-H	5 N Avg Pwr	5 N W-H	5 D Avg Pwr	5 D W-H	6 N Avg Pwr	6 N W-H	6 D Avg Pwr	6 D W-H	7 N Avg Pwr	7 N W-H	7 D Avg Pwr	7 D W-H	8 N Avg Pwr	8 N W-H	8 D Avg Pwr	8 D W-H	Total W-H
I-1																																			
Laser Sounder	40	3600	3600	2220	40	35	3600	2220	40	35	3600	2220	40	35	40	25	40	35	3600	2220	40	35	3600	2220	40	35	40	35	40	35	3600	2220	40	35	13,650
II-7																																			
Cryo-Cool. Limb Scnr	13	75	75	46	75	66	75	46	75	66	75	46	15	13	15	9	75	66	75	46	75	66	75	46	15	13	15	9	75	66	75	46	75	66	716
SIPS	59	268	268	165	268	237	268	165	268	237	268	165	59	52	59	36	268	168	268	165	268	237	268	165	59	52	59	36	268	237	268	165	268	237	2,588
II-9																																			
Near IR Spectrometer	10	196	60	37	80	71	111	68	80	71	111	68	45	40	60	37	80	71	111	68	80	71	60	37	45	40	111	68	80	71	111	68	80	71	957
Mint Mount	115	200	138	85	147	130	161	99	147	130	161	99	131	116	138	85	147	130	161	99	147	130	138	85	131	116	161	99	147	130	161	99	147	130	1,762
Pump	-	115	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	1,376
II-10																																			
Cryo-Cool Infer Spec	0.5	56	56	35	56	49	56	35	56	49	56	35	0.5	-	0.5	-	56	49	56	35	56	49	56	-	0.5	-	0.5	-	56	49	56	35	56	49	504
I-21																																			
Chemical Release Sys		All Power Self Contained Except Thermal, Covered Below																																	
II-9																																			
OBIPS on Point. Plat	7	116	-	-	-	-	-	-	-	-	-	-	-	-	116	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72
Min. Mount	115	200	-	-	-	-	-	-	-	-	-	-	-	-	200	123	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	123
I-9																																			
Electron Accel	200	2500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
III-3																																			
Level I Beam Diag.	4	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
II-3																																			
OBIPS on RMS																																			
III-2																																			
Vector Magnetometer		All Power Self Contained Except Thermal Which is Covered Below																																	
III-4																																			
Level II Beam Diag.																																			
III-25, III-18, III-23																																			
ESP		All Power Self Contained Except Thermal Which is Covered Below																																	
IV-1																																			
Solar Flux Cal Array	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IECM	-	400	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	4,800
Thermal	-	-	288	178	288	254	288	178	288	254	288	178	286	254	288	78	284	254	288	178	288	254	288	178	288	254	288	178	288	254	288	178	288	254	3,456
Lidar Pump	-	84	84	52	84	74	84	52	84	74	84	52	84	74	84	2	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	1,008
Freon Pump	-	274	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	3,288
			5358	3304	1827	1613	5432	3349	1827	1613	5432	3349	1451	1281	1473	908	1827	1613	5432	3349	1827	1613	5358	3304	1451	1281	1542	953	1827	1613	5432	3349	1827	1613	34,300

LOAD	ORBIT Stdby Pwr (W)	ORBIT Oper Pwr (W)	9 N Avg Pwr	9 N W-H	9 D Avg Pwr	9 D W-H	10 N Avg Pwr	10 N W-H	10 D Avg Pwr	10 D W-H	11 N Avg Pwr	11 N W-H	11 D Avg Pwr	11 D W-H	12 N Avg Pwr	12 N W-H	12 D Avg Pwr	12 D W-H	13 N Avg Pwr	13 N W-H	13 D Avg Pwr	13 D W-H	14 N Avg Pwr	14 N W-H	14 D Avg Pwr	14 D W-H	15 N Avg Pwr	15 N W-H	15 D Avg Pwr	15 D W-H	16 N Avg Pwr	16 N W-H	16 D Avg Pwr	16 D W-H	Total W-H
I-1																																			
Laser Sounder	40	3600	3600	2220	40	35	3600	2220	40	35	3600	2220	40	35	3600	2220	40	35	3600	2220	40	35	3600	2220	40	35	40	25	40	35	3600	2220	40	35	15,845
II-7																																			
Cryo-Cool Limb Scanner	15	75	75	46	75	66	75	46	75	66	75	46	75	66	75	46	75	66	75	46	75	66	75	46	75	66	15	9	75	66	75	46	75	66	859
SIPS	59	268	268	165	268	237	268	165	268	237	268	165	268	237	268	165	268	237	268	165	268	237	268	165	268	237	59	36	268	237	268	156	268	237	3,087
II-9																																			
Near IR Spectrometer	10	196	111	68	80	71	111	68	80	71	111	68	80	71	111	68	80	71	111	68	80	71	111	68	80	71	111	68	80	71	111	68	45	40	1,081
Mini Mount	115	200	161	99	147	130	161	99	147	130	161	99	147	130	161	99	147	130	161	99	147	130	161	99	147	130	161	99	147	130	161	99	131	116	1,818
Pump	-	115	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	1,376
II-10																																			
Cryo-Cool Infer Spec	0.5	56	56	35	56	49	56	35	56	49	56	35	56	49	56	35	56	49	56	35	56	49	56	35	56	49	0.5	-	56	49	56	35	56	49	437
I-21																																			
Chemical Release Syst		All Power Self Contained Except Thermal Covered Below																																	
II-3																																			
OBIPS on Point. Plat	7	116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mini Mount	115	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I-9																																			
Electron Accel	200	2500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
III-3																																			
Level I Beam Diag.	4	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
II-3																																			
OBIPS on RMS																																			
III-2		All Power Self Contained Except Thermal Which is Covered Below																																	
Vector Magnetometer																																			
III-4																																			
Level II Beam Diag.																																			
III-25, III-18, III-23																																			
ESP		All Power Self Contained Except Thermal Which is Covered Below																																	
IV-1																																			
Solar Flux Cal Array	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	7	-	-	-	-	-	-	-	-	-	-	7
IECM	-	400	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	4,800
Thermal	-	-	288	178	288	254	288	178	288	254	288	178	288	254	288	178	288	254	288	178	288	254	288	178	288	254	288	178	288	254	288	178	288	254	3,456
Lidar Pump	-	84	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	1,008
Freon Pump	-	274	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	3,288
			5432	3349	1827	1613	5432	3349	1827	1613	5432	3349	1827	1613	5432	3349	1827	1613	5432	3349	1827	1613	5442	3356	1827	1613	1545	953	1079	1613	5432	3349	1776	1568	37,262

LOAD	Stdby Pwr (W)	Oper Pwr (W)	ORBIT 1 N Avg Pwr	1 N W-H	1 D Avg Pwr	1 D W-H	2 N Avg Pwr	2 N W-H	2 D Avg Pwr	2 D W-H	3 N Avg Pwr	3 N W-H	3 D Avg Pwr	3 D W-H	4 N Avg Pwr	4 N W-H	4 D Avg Pwr	4 D W-H	5 N Avg Pwr	5 N W-H	5 D Avg Pwr	5 D W-H	6 N Avg Pwr	6 N W-H	6 D Avg Pwr	6 D W-H	7 N Avg Pwr	7 N W-H	7 D Avg Pwr	7 D W-H	8 N Avg Pwr	8 N W-H	8 D Avg Pwr	8 D W-H	Total W-H
I-1																																			
Laser Sounder	40	3600	3600	2200	40	35	3600	2220	40	35	3600	2200	40	35	40	25	40	35	3600	2220	-	-	-	-	-	-	-	-	-	-	3600	2200	40	35	11,300
II-7																																			
Cryo-Cooled Limb Scnr	15	75	35	46	75	66	75	46	75	66	75	46	15	13	15	9	75	66	75	46	75	66	-	-	-	-	-	-	-	-	-	-	-	-	470
SLFS	59	248	268	165	268	237	268	165	268	237	268	165	59	52	59	36	268	237	268	165	268	237	-	-	-	-	-	-	-	-	-	-	-	-	1,696
II-9																																			
Near IR Spectrometer	10	196	60	37	80	71	111	68	80	71	60	37	10	9	60	37	80	71	60	37	10	9	10	6	10	9	60	37	80	71	111	78	80	71	709
Mini Mount	115	200	138	85	147	130	161	99	147	130	131	85	115	102	138	85	147	130	138	85	115	102	115	71	115	102	138	85	147	130	161	99	147	130	1,650
Pump	-	115	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	1,376
II-10																																			
Cryo-Cooled Spec.	0.5	56	56	35	56	49	56	35	56	49	56	35	0.5	-	0.5	-	56	49	56	35	56	49	-	-	-	-	-	-	-	-	-	-	-	-	336
I-21																																			
Chemical Release Sys			All Power Self Contained Except Thermal Which is Covered Below																																
II-3																																			
OBIPS on Pointing Plat	7	116	-	-	-	-	-	-	-	-	-	-	-	-	116	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72
Mini Mount	115	200	-	-	-	-	-	-	-	-	-	-	-	-	200	123	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	123
I-9																																			
Electron Accel	200	2500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
III-3																																			
Level I Beam Diag.	4	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
II-3																																			
OBIPS on RMS																																			
III-7																																			
Vector Magnetometer			All Power Self Contained Except Thermal Which is Covered Below																																
III-6																																			
Level II Beam Diag.																																			
III-25, III-18, III-23																																			
ESP			All Power Self Contained Except Thermal Which is Covered Below																																
IV-1																																			
Solar Flux Cal Array	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IECM	-	400	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	4,800
Thermal	-	-	288	178	288	254	288	178	288	254	288	178	288	254	288	178	288	254	288	178	288	254	288	178	288	254	288	178	288	254	288	178	288	254	3,456
Lidar Pump	-	84	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	1,008
Freon Pump	-	274	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	3,268
			5358	3304	1827	1613	5432	3349	1877	1613	5358	3304	1399	1236	1787	1103	1827	1613	5358	3304	1685	1488	1286	793	1296	1136	1359	838	1388	1226	5032	3103	1428	1261	30,284

LOAD	Stdby Pwr (W)	Oper Pwr (W)	ORBIT 9 N Avg Pwr	9 N W-H	9 D Avg Pwr	9 D W-H	10 N Avg Pwr	10 N W-H	10 D Avg Pwr	10 D W-H	11 N Avg Pwr	11 N W-H	11 D Avg Pwr	11 D W-H	12 N Avg Pwr	12 N W-H	12 D Avg Pwr	12 D W-H	13 N Avg Pwr	13 N W-H	13 D Avg Pwr	13 D W-H	14 N Avg Pwr	14 N W-H	14 D Avg Pwr	14 D W-H	15 N Avg Pwr	15 N W-H	15 D Avg Pwr	15 D W-H	16 N Avg Pwr	16 N W-H	16 D Avg Pwr	16 D W-H	Total W-H
I-1																																			
Laser Sounder	40	3600	3600	2220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3600	2200	40	35	40	25	40	35	3600	2220	-	-	6,755
II-7																																			
Cryo-Cooled Limb Scan	15	75	75	46		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75	66	75	46	75	66	15	46	75	66	75	46	-	-	382
SIPS	59	268	268	165	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	268	237	268	165	268	237	59	165	268	237	268	165	-	-	1,371
II-9																																			
Near IR Spectrometer	10	196	60	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45	40	111	68	80	71	111	68	80	71	111	68	45	40	463
Mini Mount	115	200	138	85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	131	116	161	99	147	130	161	99	130	116	161	99	131	116	860
Pump	-	115	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	115	70	115	102	1,376
II-10																																			
Cryo-Cooled Spec.	0.5	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56	49	56	35	50	49	0.5	-	56	49	56	35	-	-	217
I-21																																			
Chemical Release Sys			All Power Self Contained Except Thermal, Covered Below																																
II-3																																			
OBIPS on Pointing Plat	7	116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mini Mount	115	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I-9																																			
Electron Accel	700	2500	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
III-3																																			
Lev. I Beam Diag.	4	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
II-3																																			
OBIPS on RMS																																			
III-2			All Power Self Contained Except Thermal, Covered Below																																
Vector Magnetometer																																			
III-4																																			
Lev. II Beam Diag.																																			
III-25, III-16, III-23																																			
ESP			All Power Self Contained Except Thermal Which is Covered Below																																
IV-1																																			
Solar Flux Cal Array	-	8	-	-	-	-	8	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
IHEM	-	400	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	400	247	400	353	4,800
Thermal	-	-	288	178	288	254	288	179	228	201	228	141	228	201	228	141	228	201	228	141	288	254	288	178	288	254	288	178	288	254	288	178	288	254	3,186
Lidar Pump	-	84	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	84	52	84	74	1,008
Freon Pump	-	274	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	274	169	274	242	3,288
			5301	3269	1160	1025	1171	722	1101	972	1101	679	1101	972	1101	679	1101	972	1101	679	1735	1533	5352	3349	1827	1613	1814	1119	2107	1599	5432	3349	1337	1181	23,712

APPENDIX F

CONTROL AND DISPLAY FUNCTIONAL ANALYSIS

AMPS CONTROL AND DISPLAY (C&D) FUNCTIONAL REQUIREMENTS ANALYSIS

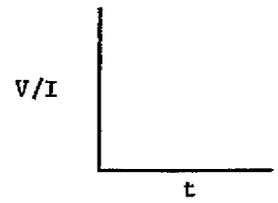
This section contains the detailed instrument and FSE C&D functional requirements for Flight 1 and Flight 2. The IFRD information was expanded in order to provide sufficient detail for subsequent C&D analyses, software analyses, and the data management and communication subsystem areas.

The tables define the functions required, the operational phase during which the functions are primarily used, the type of control or display function either a two function discrete (D), a multifunction discrete (Dm), an analog function (A), or a graphic display, and the function range and resolution when available. The analog function designation does not necessarily mean an analog signal, but only designates a high resolution command or display. The function could be implemented, for example, by an analog signal or by a PCM type signal.

Function	Power Up/ Checkout	Cal.	Experiment Operation	Control Type Discrete or Analog	Display Type Discrete or Analog	Function Range	Function Resolution	Remarks
I-1 LASER SOUNDER - TRANSMITTER; O_3, AEROSOLS, 2 REQUIRED								
Laser								
Main Power (On/Off)	X			D	D			
Aperture Door (Open/ Close)	X			D	D			
Cell Thermal (On/Off)	X			D	D			
Dye Thermal (On/Off)	X			D	D			
Flashlamp Thermal (On/Off)	X			D	D			
Input Current		X		A	A			
Input Voltage		X		A	A			
Pulse Width		X		D(m)	D(m)			
Laser Output Power		X		----	A			
Wavelength Tune		X		A	A			Grating Position Readout
Alignment		X		2A	----			Peak Output Power
High Voltage (On/Off)	X			D	D			
Dye Pumps (On/Off)	X			D	D			
Amplifier								
Cell Thermal (On/Off)	X			D	D			
Dye Thermal (On/Off)	X			D	D			
Flashlamp Thermal (On/Off)	X			D	D			
Input Current		X		A	A			
Input Voltage		X		A	A			
Laser Output Power		X		----	A			
Pulse Width		X		D(m)	D(m)			
Dye Pumps (On/Off)	X			D	D			

Function	Power Up/ Checkout	Cal.	Experiment Operation	Control Type (Discrete or Analog)	Display Type (Discrete or Analog)	Function Range	Function Resolution	Remarks
I-1 LASER SOUNDER - TRANSMITTER; O_3, AEROSOLS, 2 REQUIRED (CONTINUED)								
Harmonic Generator								
Thermal (On/Off)	X			D	D			
Output Power		X		----	A			
Mode (O_3/Aerosol)			X	D	D			
Start/Stop (Ready/OPR)			X	D	D			
I-1 LASER SOUNDER - RECEIVER-ALL TRANSMITTERS								
Alignment								
Pitch		X		A	----			1 Set Required For Each Transmitter
Yaw		X		A	----			
Alignment		X		----	Quadgraphic			
Telescope								
Prefilter Select		X		D(m)	D(m)			1/Transmitter
Univ Filter Select		X		D(m)	D(m)			
Univ Filter Mode (OPR/CAL)		X	X	D	D			
Wavelength Tune		X		A	----			Univ Filter Voltage Target = Ocean
Received Power		X		----	A			
Range Limits			X	2A	2A			
Range Resolution			X	A	A			
Attenuator (In/Out)		X		D	D			N.D. Filter For λ Cal,
Threshold			X	D(m)	D(m)			

Function	Power Up/ Checkout	Cal.	Experiment Operation	Control Type Discrete or Analog	Display Type Discrete or Analog	Function Range	Function Resolution	Remarks
I-1 LASER SOUNDER - RECEIVER ALL TRANSMITTERS (CONTINUED)								
Telescope (Continued)								
Integrated Count Vs Range			X	---	Plot			
Integration Interval			X	A	A			
Display Mode (Sig, Back, Sig-Back)			X	D(m)				
Calibrate		X		D	A			Preset Illum Source Provides Cal Level For Tuning
Saturation Ind		X		----	D			
Start/Stop (Ready/OPR)			X	D	D			
Main Power (On/Off)	X			D	D			
Aperture Door (Open/ Close)	X			D	D			
High Voltage (On/Off)	X			D	D			
I-9 ELECTRON ACCELERATOR								
Main Power (On/Off)	X			D	D			
Aperture Door (Open/ Close)	X			D	D			
Bank Voltage		X		A	A			
Voltage Mode (V(t))			X	D(m)	D(m)			
Pulse Width			X	D(m)	D(m)			
Current Mode			X	D(m)	D(m)			
Pitch Angle			X	2A	2A			
Pitch Angle Mode			X	D(m)	D(m)			
Beam Diameter			X	A	Oscilloscope			V t
Start/Stop			X	D	D			

Function	Power Up/ Checkout	Cal.	Experiment Operation	Control Type (Discrete or Analog)	Display Type (Discrete or Analog)	Function Range	Function Resolution	Remarks
I-9 ELECTRON ACCELERATOR (CONTINUED)								
V_{Accel} Vs Time			X	----	Oscillo-scope			
I_{Accel} Vs Time			X	----	Oscillo-scope			
I-12 RF PLASMA WAVE PACKAGE								
Transmitter								
Main Power (On/Off)	X	X	X	D	D			
Power Level	X	X	X	A	A			
Freq Mode (Fixed/Swept)			X	D(m)	D(m)			
Frequency			X	A	A			
Pulse Width			X	D(m)	D(m)			
Pulse Shape			X	D(m)	D(m)			
Repetition Rate			X	D(m)	D(m)			
Start/Stop (Ready/Opr)	X	X	X	D	D			
Mode Switch			X	D	D			
Receiver								
Main Power (On/Off)	X	X	X	D	D			
Attenuation			X	D(m)	D(m)			
Freq Mode (Fixed/Swept)			X	D	D			
Frequency			X	A	A			
Bandwidth			X	D(m)	D(m)			
Freq Vs Delay Time			X	----	Plot			
IF Vs Time			X	----	A			
Video Amplitudes Vs Time			X	----	Plot			
Fourier Transform					Plot			

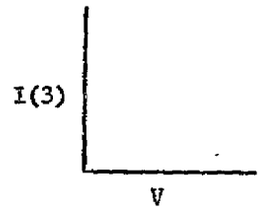
Function	Power Up/ Checkout	Cal.	Experiment Operation	Control Type Discrete or Analog	Display Type Discrete or Analog	Function Range	Function Resolution	Remarks
I-21 CHEMICAL RELEASE (SS #1 GAS RELEASE) (6 RELEASE MODULES)								
Main Power (On/Off)	X			D	D			
Module Select			X	D(6)	D(6)			All Commands
Timer (On/Off)			X	D	D			All Commands
Time Delay			X	A	A			All Commands
Arm/Safe			X	D	D			RF
Detonate/Safe			X	D	D			RF
II-3 OBIPS (B) (PLATFORM 1; ACOUSTIC GRAVITY WAVE EXPERIMENT)								
Main Power (On/Off)	X			D	D			
Aperture Door (Open/ Close)	X			D	D			
Sunshield (Extend/ Retract)	X			D	D			
H.V. (On/Off)	X			D	D			
Calibration (On/Off)		X		D	D			
Gain			X	A	----			
Focus			X	A	----			
Frame Rate			X	D(m)	D(m)			
Start/Stop			X	D	D			
Magnification (Zoom)			X	A	----			
Video Display			X	----	Video			TV Monitor

Function	Power Up/ Checkout	Cal.	Experiment Operation	Control Type Discrete or Analog	Display Type Discrete or Analog	Function Range	Function Resolution	Remarks
II-3 OBIPS(A) (BEAM STUDIES; REMOTE MANIPULATOR)								
Same Functions As OBIPS (B) Except No Sunshield								
II-4 UV-VIS-IR SPECTRO-METER (2 UNITS FOR MISSION #2)								
Main Power (On/Off)	X			D	D			
Aperture Door (Open/ Close)	X			D	D			
λ Scan Range			X	2A	2A			
λ Scan Rate			X	D(m)	D(m)			
Mode			X	D(m)	D(m)			
Calibrate		X		D	D			
0-Order Detector		X		----	----			
Gain			X	A	----			
Spatial Resolution			X	D(m)	D(m)			
Spectral Resolution			X	D(m)	D(m)			
Start/Stop			X	D	D			
Intensity Vs λ			X	----	Plot			 Multiple Superimposed Plots of I vs λ Displaced Vertically By A Function of Spatial Resolution

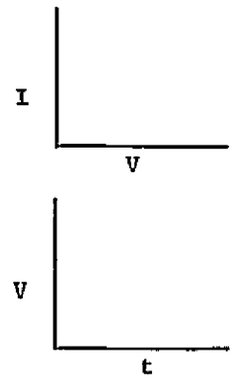
Function	Power Up/ Checkout	Cal.	Experiment Operation	Control Type Discrete or Analog	Display Type Discrete or Analog	Function Range	Function Resolution	Remarks
II-7 CRYO COOLED LIMB SCANNER								
Main Power (On/Off)	X			D	D			
Aperture Door (Open/ Close)	X			D	D			
Cryo Temps			X	----	6A			
Cryo Flow Rates			X	4A	4A			
Cryo Supply Level			X	----	A			
Scan Rate			X	A	A			Internal Scanning of Secondary Mirror
Start/Stop			X	D	D			No Onboard Data Monitoring Ground Will Reduce and Analyze
II-9 NEAR IR SPECTROMETER								
Main Power (On/Off)	X			D	D			
Aperture Door (Open/ Close)	X			D	D			
Cryo Temps			X	----	6A			
Cryo Flow Rates			X	4A	4A			
Cryo Supply Levels			X	----	A			
Start/Stop			X	D	D			No Onboard Data Monitoring

Function	Power Up/ Checkout	Cal.	Experiment Operation	Control Type Discrete or Analog	Display Type Discrete or Analog	Function Range	Function Resolution	Remarks
II-10 CRYO COOLED IR SPECTROMETER								
Main Power (On/Off)	X			D	D			
Aperture Door (Open/ Close)	X			D	D			
Cryo Temps			X	----	6A			
Cryo Flow Rates			X	4A	4A			
Cryo Supply Level			X	----	A			
Scan Rate			X	A	A			
Start/Stop			X	D	D			No Onboard Data Monitoring
III-2 VECTOR MAGNETOMETER (SS #2 FLUXGATE MAG ONLY; 1 SYST ON RMS, 1 SYST IN III-25 ESP)								
Main Power (On/Off)	X			D	D			Modified Via Computer Computational Rqts Or Via Ground Voice Uplink
Sample Rate			X	D(m)	D(m)			
Bias			X	D(m)	D(m)			
Start/Stop			X	D	D			No Onboard Data Display; Output To Computer For Orbiter Orientation Computation
III-3 LEVEL I DIAGNOSTICS (GAS RELEASE)								
Main Power (On/Off)	X			D	D			
Plenum Pressure			X	A	A			
Storage Pressure			X	----	A			
Burst Delay			X	A	A			Gated to Accel Pulse

Function	Power Up/ Checkout	Cal.	Experiment Operation	Control Type Discrete or Analog	Display Type Discrete or Analog	Function Range	Function Resolution	Remarks
III-3 LEVEL I DIAGNOSTICS (CONTINUED)								
Start/Stop			X	D	D			Assumes Direction of Release Slaved to Accel Pitch Angle
III-4 LEVEL II BEAM DIAGNOSTICS (RMS)								
Faraday Cup								
Main Power (On/Off)	X			D	D			
Grid 1 Potential			X	A	Oscillo-scope			
Grid 2 Potential			X	A	Oscillo-scope			
Current (3)			X	----	Oscillo-scope			
				D	D			
Electrostatic Analyzer								
Main Power (On/Off)	X			D	D			
Sweep Voltage			X	A	Oscillo-scope			
Current			X		Oscillo-scope			
Count Rate			X	----	A			

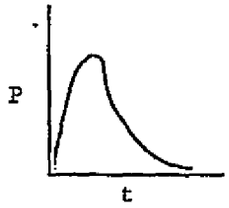


Function	Power Up/ Checkout	Cal.	Experiment Operation	Control Type (Discrete or Analog)	Display Type (Discrete or Analog)	Function Range	Function Resolution	Remarks
III-4 LEVEL II BEAM DIAGNOSTICS (RMS)								
Cold Probe (Langmuir Probe)								
Main Power (On/Off)	X			D	D			
Mode (V Vs I or V Vs t)			X	D	D			
Voltage			X	A	Oscillo-scope			
Current			X	----	Oscillo-scope			
III-10 ION MASS AND DISTRIBUTION ANALYZER								
Main Power (On/Off)	X			D	D			
Mode Select			X	D(m)	D(m)			
H.V. (On/Off)	X			D	D			
H.V. Adjust			X	A	A			
Magnet Current			X	A	A			
Calibration		X		D	D			
Count Rates (3)			X	----	3D			
Energy Vs. Mass			X	----	Plot			

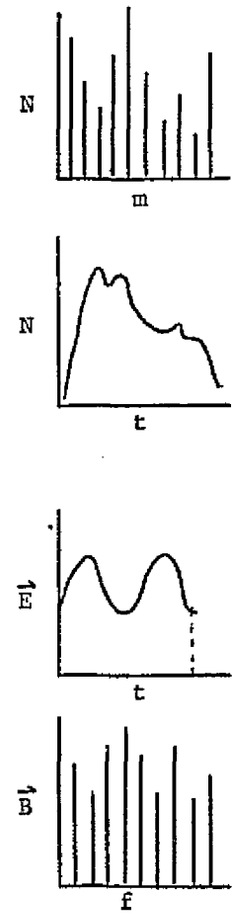


Note: Wideband Inst. Data, No Inst Processing

Function	Power Up/ Checkout	Cal.	Experiment Operation	Control Type (Discrete or Analog)	Display Type (Discrete or Analog)	Function Range	Function Resolution	Remarks
III-16 ION MASS SPECTROMETER (III-25 SS)								
Main Power (On/Off)	X			D	D			
Mode			X	D(m)	D(m)			
Potential			X	A	A			
Calibration		X		D	D			
Start/Stop			X	D	D			No Data Display Required; Parameters Modified Via Ground Voice Uplink
III-17 DEPLOYABLE TEST BODY								
Main Power (On/Off)	X			D	D			
Inflate/Deflate			X	D	D			
Pressure			X	----	A			
Body Potential			X	----	A			
Magnet Current			X	----	A			
Bias Potential			X	A	A			
Bias Current			X	A	A			
Start/Stop			X	D	D			Instrument Provided Ejection Mechanism
Lock/Unlock	X			D	D			
Eject/Safe	X			D	D			
III-18 PLANAR RETARDING POTENTIAL ANALYZER								
Main Power (On/Off)	X			D	D			
Grid 1 Potential			X	A	A			
Grid 2 Potential			X	A	A			
Grid 3 Potential			X	A	A			

Function	Power Up/ Checkout	Cal.	Experiment Operation	Control Type Discrete or Analog	Display Type Discrete or Analog	Function Range	Function Resolution	Remarks
III-18 PLANAR RETARDING POTENTIAL ANALYZER (CONTINUED)								
Current Range			X	D(m)	D(m)			
Sweep Rate			X	D(m)	D(m)			
Start/Stop			X	D	D			
Sweep Voltage			X		Plot			
Current			X		Plot			 Wideband Analog Data Digitized
III-22 LANGMUIR PROBE (III-25 SS)								
Main Power (On/Off)	X			D	D			
Sensitivity Range			X	D(m)	D(m)			
Voltage			X	A	A			
Electron Temp			X	----	A			
Electron Density			X	----	A			
Space Potential			X	----	A			
Start/Stop			X	D	D			
Space Potential Vs t			X	----	Plot			
Rise Time			X	----	A			
Peak Potential			X	----	A			 Note: Instrument Processes Data

Function	Power Up/ Checkout	Cal.	Experiment Operation	Control Type Discrete or Analog	Display Type Discrete or Analog	Function Range	Function Resolution	Remarks
III-23 NEUTRAL MASS SPECTROMETER	X			D	D			
Main Power (On/Off)	X		D	D				
Mode			X	D(m)	D(m)			
Detector Sensitivity (3)			X	3D(m)	3D(m)			
Calibration (Auto)		X		D	D			
Scan Voltage			X	A	A			
Start/Stop			X	D	D			
Count Rate			X	----	3A			
Count Vs Mass No.			X	----	Plot			
Count Vs t			X	----	3 Plots			
III-25 EMI DIAGNOSTIC PACKAGE (ESP)								
DC E-Field								
Main Power (On/Off)	X			D	D			
Field Magnitude			X	----	A			
Magnitude Vs t			X	----	Plot			
AC B-Field								
Main Power (On/Off)	X			D	D			
Orientation (1 Axis Only)			X	----	A			
Power Spectrum			X		Histogram			
Flux Gate Magnetometer	See III-2 Instrument							



Function	Power Up/ Checkout	Cal.	Experiment Operation	Control Type Discrete or Analog	Display Type Discrete or Analog	Function Range	Function Resolution	Remarks
III-25 EMI DIAGNOSTIC PACKAGE (ESP)								
Langmuir Probe	See III-22 Instrument							
Ion Mass Spectrometer	See III-16 Instrument							
Electrostatic Analyzer	Replaced by Ion Mass Spectrometer							
IV-1 SOLAR FLUX CAL ARRAY								
Main Power (On/Off)	X			D	D			
Start/Stop			X	D	D			
No Onboard Data Monitoring - Data Will Be Reduced And Analyzed Post Mission								
INTEGRATED ENVIRONMENTAL CONTAMINATION MONITOR								
Main Power (On/Off)	X			D	D			
All Data Recorded Internally To Package No Other C&D								
FSG-GIMBALLED PLATFORM--TYPICAL								
Main Power (On/Off)	X			D	D			
Launch Locks	X			D	D			
Rate Gyro Package (On/Off)	X			D	D			
Mode			X	D(m)	D(m)			
Gimbal Position			X	3A	3A			
Slew Rate (High/Low)			X	D	D			

Function	Power Up/ Checkout	Cal.	Experiment Operation	Control Type Discrete or Analog	Display Type Discrete or Analog	Function Range	Function Resolution	Remarks
FSG-GIMBALLED PLATFORM--TYPICAL								
Start/Stop			X	D	D			Auto Acquisition Mode
Safe/Arm	X			D	D			Ejection Mechanism
Safe/Jettison	X			D	D			Ejection Mechanism
FSE-HIGH ENERGY POWER SUPPLY								
Main Power (On/Off)	X			D	D			
Charging Voltage			X	A	A			
Charging Current			X	A	A			
Bank Energy			X	----	A			
Time To Full Charge			X	----	A			
PPU Input Currents			X	----	A			
PPU Output Current			X	----	A			
PPU Output Voltage			X	----	A			
Instrument Select			X	D(m)	D(m)			
FSE RELEASE MECHANISM								
Main Power (On/Off)	X			D	D			
Module Select			X	D(6)	D(6)			
Launch Locks (Latch/ Unlatch)	X			D	D			
Eject/Safe			X	D	D			
Arm/Safe	X			D	D			Release Mechanism
Jettison/Safe	X			D	D			Jettison
								Ejection Velocity Fixed Pre-Flight
								Direction Set by Orbiter Attitude

Function	Power Up/ Checkout	Cal.	Experiment Operation	Control Type Discrete or Analog	Display Type Discrete or Analog	Function Range	Function Resolution	Remarks
FSE STOWAGE MECHANISMS								
Main Power (On/Off)	X			D	D			
Launch Locks	X			D	D			
FSE-REMOTE MANIPULATOR SYSTEM (RSP) - ORBITER SUBSYSTEM								
Assume Position Control, Display (Angles), and Programmable Position/ Scan Modes Available								