

DOC. No. FAST TEV-002
DATE: MARCH 17, 1992

VERIFICATION MATRIX
FOR THE
FAST AURORAL SNAPSHOT (FAST) MISSION

GODDARD SPACE FLIGHT CENTER
GREENBELT, MARYLAND

DOC No.

FAST TEV-002

VERIFICATION MATRIX
FOR THE
FAST AURORAL SNAPSHOT (FAST) MISSION

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Tim Gehringer
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13-Feb-92				FAST VERIFICATION MATRIX																						
HARDWARE DESCRIPTION				TESTS AND ANALYSIS																						
				ANAL.		ENVIRONMENTAL														OTHER						
LEVEL OF ASSEMBLY	ITEM	UNIT TYPE	SUPPLIER	STRUCTURAL ANALYSIS	THERMAL ANALYSIS	MODAL SURVEY	RANDOM VIBRATION	LOADS (SINE BURST)	SINE SWEEP	SHOCK	MECHANICAL FUNCTION	ACOUSTICS	LIFE TEST	MASS PROPERTIES (1)	PRESSURE PROFILE	EMC (3)	MAGNETICS	THERMAL VACUUM	THERMAL BALANCE	BAKEOUT	LEAK			RADIATION	PULL TEST	
P	PAYLOAD	PF	GSFC	X	X		X	X	X	X	X	X		X		X	X	X	X	X						
S	STRUCTURES																									
C	S/C Structure	PF	741	X			X	X	X	X				X												
C	ETU S/A	PF	741	X			X	X	X	X		X														
S	ATTITUDE CONTROL																									
C	HCI	PF	745		X		O	O						O		O		O								
C	Sun Sensor	PF	745		X		O	O						O		O		O								
C	Magnetic Torquers	PF	745	X			8	8	8	8				X			X	9								
C	Magnetometer	PF	745		X		X	X	X	X				X			X	X								
C	Nutation Damper	PF	745	X			8	8	8	8				X						4						
S	ELECTRICAL																									
C	Wire Harnesses/Cabling	PF	743																	X					X	
C	Umbilical Interface																								X	
S	POWER																									
C	Flight Solar Array	PF	711	X	X		5	5	5	5		O		O			2	O		O						
C	Solar Array Qual Panel	PF	711				O							7						O					X	
C	Batteries	PF	711				O	O	O	O				6	O			2	O		O					
S	COMMUNICATIONS																									
C	Transponder	PF	Motorola				O		O					O		O	X	O								
C	Antennas	PF	727	X	X		X	X	X	X				X											X	
	INSTRUMENTS																									
I	Flight IDPU	PF	UCB	O	O		O	O	O	O				O		O	X	O								
I	ETU IDPU	PT	UCB													O										
I	Search Coil Magnetometer	PF	UCLA	O	X		O	O	O	O				O		O	X	O								
I	Flux Gate Magnetometer	PF	UCLA	O	X		O	O	O	O				O		O	X	O								
I	TEAMS	PF	UNH/Loch	O	O		O	O	O	O	O	O		O	O	O	X	O								
I	ESA Stacks	PF	Berkley	O	O		O	O	O	O	O			O		O	X	O								
I	ETU ESA Stacks	PF	Berkley													O										
	DEPLOYABLES																									
I	Wire Booms & Assy	PF	UCB		O		O	O	O	O	O			O				O								
I	ETU Wire Booms & Assy	PT	UCB																							
I	Axial Booms & Assy	PF	UCB	O	O		O	O	O	O	O			O				O								
I	ETU Axial Booms & Assy	PT	UCB																							
I	Mag Booms & Assy	PF	UCB	O	O		O	O	O	O	O			O				O								
I	ETU Mag Booms & Assy	PT	UCB																							
S	ELECTRONICS																									
C	MJE	PF	745	X	X		X	X	X	X				X		X	X	X								
C	ETU MJE	PT	745													X										
C	Shunt Drivers	PF	745	X	X		X	X	X	X				X		X	X	X								
C	ETU Shunt Drivers	PT	745													X										
C	EEE Parts	PF	GSFC																						X	

Level of Assembly
C = Component
I = Instrument
S = Subsystem
P = Payload/Spacecraft

Unit Type
PT = Prototype
PF = Protoflight

Test Matrix
X = Internal Testing
O = Outside Facility

- (1) WEIGHT, CG, AND MOI
- (2) REQUIRED IF DEEMED NECESSARY BY ANALYSIS.
- (3) EMC ON INSTRUMENTS NOT PRACTICAL WITHOUT VACUUM.
- (4) BAKEOUT TO INCLUDE 2 THERMAL CYCLES
- (5) ACOUSTICS TO SATISFY VIBRATION REQUIREMENTS?
- (6) BATTERIES LIFE TESTED FOR USE ON SAMPEX
- (7) THERMAL CYCLING
- (8) DONE WITH SPACECRAFT STRUCTURE
- (9) THERMAL CYCLING AT AMBIENT PRESSURE

6-Aug-92				FAST VERIFICATION MATRIX																					
HARDWARE DESCRIPTION				TESTS AND ANALYSIS																					
				ANAL.	ENVIRONMENTAL																OTHER				
LEVEL OF ASSEMBLY	ITEM	UNIT TYPE	SUPPLIER OR RESPONSIBLE GSFC CODE	STRUCTURAL ANALYSIS	THERMAL ANALYSIS	MODAL SURVEY	RANDOM VIBRATION	LOADS (SINE BURST)	SINE SWEEP (11)	SHOCK	MECHANICAL FUNCTION	ACOUSTICS	LIFE TEST	MASS PROPERTIES (1)	PRESSURE PROFILE	EMC/EMI/RFI (3)	MAGNETICS	THERMAL VACUUM	THERMAL BALANCE	BAKEOUT	LEAK		RADIATION	PULL TEST	
P	PAYLOAD	FF	GSFC	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
S	STRUCTURES																								
C	ETU S/C Structure (10)	PT	741	X		X	X	X	X	X	12	X		X											
S	ATTITUDE CONTROL																								
C	HCI	FF	745				O	O						O		O		O							
C	Sun Sensor	FF	745				O	O						O		O		O							
C	Magnetic Torquers	FF	745	X			8	8	8					X			X	9							
C	Magnetometer	FF	745		X		X	X	X					X			X	X							
C	Nutation Damper	FF	745	X			8	8	8					X							4				
S	ELECTRICAL																								
C	Wire Harnesses/Cabling	FF	743																		X				X
C	Umbilical Interface	FF	743																						X
S	POWER																								
C	Flight Solar Array	FF	734	X			5	5	5				O		O		2	O			O				
C	Solar Array Qual Panel	FF	734										O	7							O				13
C	Flight Battery	FF	734	X			O	O	O					6	O		2	O				O			
C	Qual Battery	FF	734				O	O	O					6	O		2	O				O			
S	COMMUNICATIONS																								
C	Transponder	FF	Motorola		O		O	O							O		O	X	O						
C	Antennas	FF	737	X	X		X	X	X					X											X
	INSTRUMENTS																								
I	Flight IDPU	FF	UCB	O	O		O	O	O						O		O	X	O						
I	ETU IDPU	PT	UCB														O								
I	Search Coil Magnetometer	FF	UCLA	O	X		O	O	O						O		O	X	O						
I	Flux Gate Magnetometer	FF	UCLA	O	X		O	O	O						O		O	X	O						
I	TEAMS	FF	UNH/Loch	O	O		O	O	O		O	O			O	O	O	X	O						
I	ESA Stacks	FF	Berkley	O	O		O	O	O		O				O		O	X	O						
I	ETU ESA Stacks	FF	Berkley														O								
	DEPLOYABLES																								
I	Wire Booms & Assy	FF	UCB		O		O	O	O		O				O				O						
I	ETU Wire Booms & Assy	PT	UCB																						
I	Axial Booms & Assy	FF	UCB	O	O	O	O	O	O		O				O				O						
I	ETU Axial Booms & Assy	PT	UCB																						
I	Mag Booms & Assy	FF	UCB	O	X	O	O	O	O		O				O				O						
I	ETU Mag Booms & Assy	PT	UCB																						
S	ELECTRONICS																								
C	MUE	FF	745	X	X		X	X	X					X		X	X	X							
C	ETU MUE	PT	745													X									
C	Shunt Drivers	FF	745	X			X	X	X					X		X	X	X							
C	ETU Shunt Drivers	PT	745													X									
C	EEE Parts	FF	GSFC																						X
S	THERMAL																								
C	Blankets	FF	724																		X				
C	Heaters	FF	724																		X				

Level of Assembly
C = Component
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P = Payload/Spacecraft

Unit Type
PT = Prototype
PF = Protoflight

Test Matrix
X = Internal Testing
O = Outside Facility

- (1) WEIGHT, CG, AND MOI
- (2) REQUIRED IF DEEMED NECESSARY BY ANALYSIS.
- (3) EMC ON INSTRUMENTS NOT PRACTICAL WITHOUT VACUUM.
- (4) BAKEOUT TO INCLUDE 2 THERMAL CYCLES
- (5) ACOUSTICS TO SATISFY VIBRATION REQUIREMENTS?
- (6) BATTERIES LIFE TESTED FOR USE ON SAMPEX
- (7) THERMAL CYCLING
- (8) DONE WITH SPACECRAFT STRUCTURE
- (9) THERMAL CYCLING AT AMBIENT PRESSURE
- (10) STRUCTURE INCLUDES ETU SOLAR ARRAY STRUCTURE
- (11) NOT REQUIRED. USED TO IDENTIFY STRUCTURAL DEGRADATION.
- (12) BOOM DEPLOYMENTS
- (13) PERFORMED ON SAMPLE CELLS

25-Aug-92				FAST VERIFICATION MATRIX																			
HARDWARE DESCRIPTION				TESTS AND ANALYSIS																			
LEVEL OF ASSEMBLY	ITEM	UNIT TYPE	SUPPLIER OR RESPONSIBLE GSFC CODE	ANAL.		ENVIRONMENTAL														OTHER			
				STRUCTURAL ANALYSIS	THERMAL ANALYSIS	TOTAL SURVEY	RANDOM VIBRATION	LOADS (SINE BURST)	SINE SWEEP (5)	SHOCK	MECHANICAL FUNCTION	ACOUSTICS	LIFE TEST	MASS PROPERTIES (10)	PRESSURE PROFILE	EMI/ENF/RFI (11)	MAGNETICS	THERMAL VACUUM	THERMAL BALANCE	BAKEOUT	LEAK	RADIATION	PULL TEST
P	PAYLOAD	PF	GSFC	X	X		X	X	X	X	X	X		X		X	X	X	X	X			
S	STRUCTURES																						
C	ETU S/C Structure (1)	PF	741	X		X	X	X	X	X	6			X									
S	ATTITUDE CONTROL																						
C	HCI	PF	745				O	O						O		O		O					
C	Sun Sensor	PF	745				O	O						O		O		O					
C	Magnetic Torquers	PF	745	X			2	2	2	2				X			X	13					
C	Magnetometer	PF	745		X		3	3	3	3				X			X	3					
C	Nutation Damper	PF	745	X			2	2	2	2				X						14			
S	ELECTRICAL																						
C	Wire Harnesses/Cabling	PF	743																	X			X
C	Umbilical Interface	PF	743																				X
S	POWER																						
C	Flight Solar Array	PF	734	X			4	4	4			O		O			12	O		O			
C	Solar Array Qual Panel	PF	734									O	8							O			15
C	Flight Battery	PF	734	X			O	O	O				9	O			12	O		O			
C	Qual Battery	PF	734				O	O	O				9	O			12	O		O			
S	COMMUNICATIONS																						
C	Transponder	PF	Motorola		O		O	O		O				O		O	X	O					
C	Antennas	PF	737	X	X		X	X	X	X				X									16
	INSTRUMENTS																						
I	Flight IDPU	PF	UCB	O	O		O	O	O					O		O	X	O					
I	ETU IDPU	PT	UCB													O							
I	Search Coil Magnetometer	PF	UCLA	O	X		O	O	O					O		O	X	O					
I	Flux Gate Magnetometer	PF	UCLA	O	X		O	O	O					O		O	X	O					
I	TEAMS	PF	UNH/Loch	O	O		O	O	O		O	O		O	O	O	X	O					
I	ESA Stacks	PF	Berkley	O	O		O	O	O		O			O		O	X	O					
I	ETU ESA Stacks	PF	Berkley													O							
	DEPLOYABLES																						
I	Wire Booms & Assy	PF	UCB		O		O	O	O		7			O				O					
I	Axial Booms & Assy	PF	UCB	O	O	O	O	O	O		O			O				O					
I	Mag Booms & Assy	PF	UCB	O	X	O	O	O	O		O			O				O					
S	ELECTRONICS																						
C	MUE	PF	745	X	X		X	X	X	X				X		X	X	X					
C	ETU MUE	PT	745													X							
C	Shunt Drivers	PF	745	X			X	X	X	X				X		X	X	X					
C	ETU Shunt Drivers	PT	745													X							
C	EEE Parts	PF	GSFC																				X
S	THERMAL																						
C	Blankets	PF	724																	X			
C	Heaters	PF	724																	X			

Level of Assembly
C = Component
I = Instrument
S = Subsystem
P = Payload/Spacecraft

Unit Type
PT = Prototype
PF = Protoflight

Test Matrix
X = Internal Testing
O = Outside Facility

- (1) INCLUDES FLIGHT MAGNETIC TORQUERS AND NUTATION DAMPER AND ETU SOLAR ARRAYS, ANTENNA, ANTENNA MAST, AND MAGNETIC BOOM.
- (2) FLIGHT UNITS TESTED WITH THE STRUCTURAL ETU TO PROTOFLIGHT LEVELS.
- (3) PERFORMED WITH MUE.
- (4) ACOUSTICS TO SATISFY VIBRATION REQUIREMENTS?
- (5) NOT REQUIRED. USED TO IDENTIFY STRUCTURAL DEGRADATION.
- (6) ETU BOOM DEPLOYMENTS IN VACUUM.
- (7) COVER PYRO ACTUATION, REEL CHECK, AND AMBIENT THERMAL RELEASE.
- (8) THERMAL CYCLING AT AMBIANT PRESSURE FOR LIFE TESTING.
- (9) BATTERIES LIFE TESTED FOR USE ON SAMPEX.
- (10) WEIGHT, CG, AND MOI.
- (11) EMC ON INSTRUMENTS NOT PRACTICAL WITHOUT VACUUM.
- (12) REQUIRED IF DEEMED NECESSARY BY ANALYSIS.
- (13) THERMAL CYCLING AT AMBIENT PRESSURE.
- (14) BAKEOUT TO INCLUDE 2 THERMAL CYCLES.
- (15) PERFORMED ON SAMPLE CELLS.
- (16) PERFORMED ON ETU ANTENNA.

18-Sep-92

FAST VERIFICATION MATRIX

HARDWARE DESCRIPTION				TESTS AND ANALYSIS																				
LEVEL OF ASSEMBLY	ITEM	UNIT TYPE	SUPPLIER OR RESPONSIBLE GSFC CODE	ANAL.		ENVIRONMENTAL																OTHER		
				STRUCTURAL ANALYSIS	THERMAL ANALYSIS	MODAL SURVEY	RANDOM VIBRATION	LOADS (SINE BURST)	LOW LEVEL SINE SWEEP (3)	SHOCK	MECHANICAL FUNCTION	ACOUSTICS	LIFE TEST	MASS PROPERTIES (4)	PRESSURE PROFILE	EMI/EMC/RFI	MAGNETICS	THERMAL VACUUM	THERMAL BALANCE	BAKEOUT	LEAK	RADIATION	PULL TEST	COMMENTS
P	PAYLOAD	PF	GSFC	X	X		X	X	X	X	X	X		X		X	X	X	X	X				
S	STRUCTURES																							
C	ETU S/C Structure	PT	741	X		X	1	1	1	1	X			X										
S	ATTITUDE CONTROL																							
C	HCI	PF	745		X		O	O						O		O		O						
C	Sun Sensor	PF	745		X		O	O						O		O		O						
C	Magnetic Torquers	PF	745	X			1	1	1	1				X			X	X		X				
C	Magnetometer	PF	745		X		2	2	2	2				X			X	2						
C	Nutation Damper	PF	745	X			1	1	1	1				X						5				
S	ELECTRICAL																							
C	Wire Harnesses/Cabling	PF	743																	X			X	
C	Umbilical Interface	PF	743																				X	
S	POWER																							
C	Flight Solar Array	PF	734	X	X								O	O			7	O		O				
C	Solar Array Qual Panel	PF	734										O	O						O		6		
C	Batteries	PF	734				O	O	O	O					O		7	O		O				
S	COMMUNICATIONS																							
C	Transponder	PF	Motorola				O	O		O				O		O	X	O						
C	Antennas	PF	737	X	X		X	X	X	X				X										
	INSTRUMENTS																							
I	Flight IDPU	PF	UCB	O	O		O	O	O	O				O		O	X	O						
I	ETU IDPU	PT	UCB													O								
I	Search Coil Magnetometer	PF	UCLA	O	X		O	O	O	O				O		O	X	O						
I	Flux Gate Magnetometer	PF	UCLA	O	X		O	O	O	O				O		O	X	O						
I	TEAMS	PF	UNH/Loch	O	O	O	O	O	O	O	O	O		O	O	O	X	O						
I	ESA Stacks	PF	Berkley	O	O		O	O	O	O	O			O		O	X	O						
I	ETU ESA Stacks	PF	Berkley													O								
	DEPLOYABLES																							
I	Wire Booms & Assy	PF	UCB		O		O	O	O	O	O			O				O						
I	Axial Booms & Assy	PF	UCB	O	O	O	O	O	O	O	O			O				O						
I	Mag Booms & Assy	PF	UCB	O	O	O	O	O	O	O	O			O				O						
S	ELECTRONICS																							
C	MJE	PF	745	X	X		X	X	X	X				X		X	X	X						
C	ETUMJE	PT	745													X	X							
C	Shunt Drivers	PF	745	X	X		X	X	X	X				X		X	X	X						
C	ETU Shunt Drivers	PT	745													X	X							
C	EEE Parts	PF	GSFC																			X		
S	THERMAL																							
C	Blankets	PF	724																	X				
C	Heaters	PF	724																	X				

Level of Assembly
 C = Component
 I = Instrument
 S = Subsystem
 P = Payload/Spacecraft

Unit Type
 PT = Prototype
 PF = Protolight

Test Matrix
 X = Internal (GSFC)
 O = External
 A = Analysis

- (1) STRUCTURAL ETU TESTSING INCLUDES FLIGHT MAG. TORQUERS AND NUTATION DAMPER AND ETU SOLAR ARRAYS, ANTENNA, ANTENNA MAST, AND MAG. BOOM
- (2) PERFORMED WITH MJE
- (3) NOT REQUIRED. USED TO IDENTIFY STRUCTURAL DEGRADATION.
- (4) WEIGHT, CG, AND MOI
- (5) BAKEOUT TO INCLUDE 2 THERMAL CYCLES
- (6) RADIATION PERFORMED ON SAMPLE SOLAR CELLS
- (7) TEST REQUIRED IF DETERMINED NECESSARY BY ANALYSIS