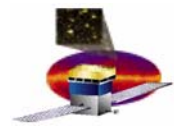


# GLAST Large Area Telescope

LAT Systems Engineering  
LAT Test Plan Update

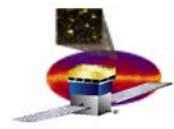
Tom Leisgang  
LAT Systems Engineering



# Test Plan Update Topics

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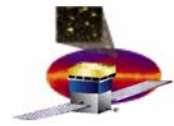
- **Additions**
- **Deletions**
- **New Requirements**
- **Subsystem Plan changes**



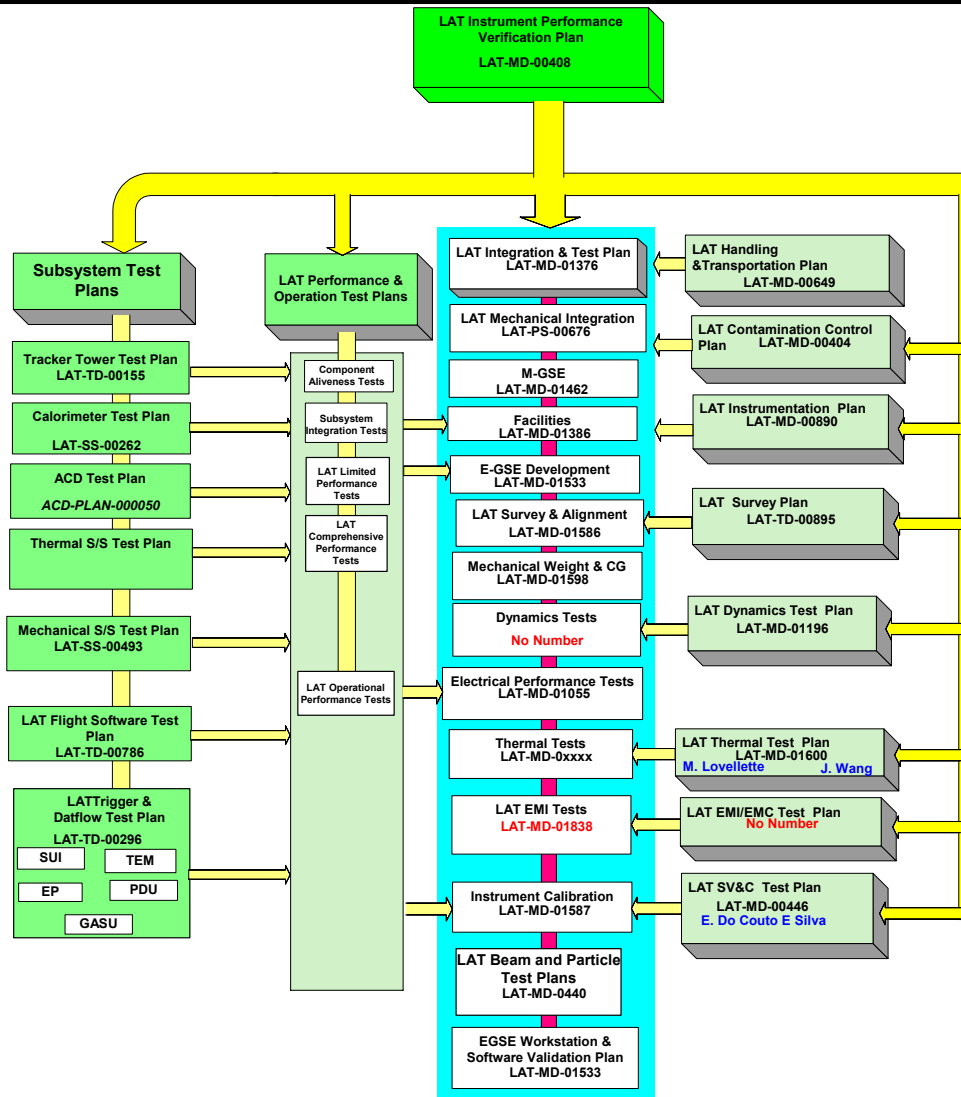
# Changes/Corrections/Amplifications

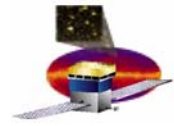
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- **General Updates**
  - Reference documents (section 4)
  - document release matrix
- **Added**
  - LAT Test Plan directive reference information
  - Figure 5 : LAT Test Plan Directive document matrix section on plan for the plans
- **Deleted**
  - Reference to an ESD test
    - *where did this come from? Removed it*



# LAT Test Plan Matrix



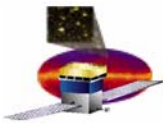


# Changes/Corrections/Amplifications

## continued

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- Section 6
  - Updated Table 6-1 to current signature plan
  - Updated section on End Item Data Packages
    - Topic of 8/11/03 Engineering Meeting
  - Expanded test support requirement definitions



# Updated Document Release Signature Requirements

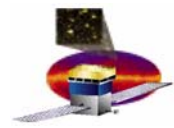
Technical Document Release- Signature Requirements																									
Signatory	Specifications	L-II	L-III	L-IV	Design Documents	LAT	Subsystem	Component	Test Plans	LAT	Subsystem	Component	Interface Documents	LAT	Subsystem	Component	Test Procedures	LAT	Subsystem	Component	Drawings	Interface	Subsystem	Component	Technical Documents / memos
Originator / Design Engineer		●	●	●		●	●	●		●	●	●		●	●	●		●	●	●		●	●	●	●
Originating Subsystem Lead		○	○	○		○	○	○		○	○	○		○	○	○		○	○	○		○	○	○	○
Originating Subsystem Manager(s)		●	●	●		●	●	●		●	●	●		●	●	●		●	●	●		●	●	●	●
Affected Subsystem Manager (s)		○	○	○		○	○	○		○	○	○		○	○	○		○	○	○		○	○	○	○
Performance & Safety Assurance		●	●	○		●	●			●	●	□		●				●	●	●		□	□		
Systems Engineering		●	●	○						●	●	□		●	●	□		●	●	□		●	□		
Chief Design Engineer		●	●	□		●	●			●	●	□		●	●	□		●	●	□		●	□		
Chief Electronics Engineer		□	□	□		●	●			□	●	□		●	○	□		□	□	□		□	□		
Chief Mechanical Engineer		□	□	□		●	●			□	●	□		●	○	□		□	□	□		□	□		
Integration & Test Manager		●	○	□		○	○			●	○			●				●	□			○	○		
Instrument Operations		○	○	□		○	○			○				○				○				□	□		
Science Analysis		□	○	□		□	□			○				○				□				□	□		
Instrument Scientist		●	●			□	□			●	□							□							
Principal Investigator		●				□																			
LAT Project Manager		●				□				●															
GSFC Project Office		●																							
● Required		○ As required (If Impacted)				□ Review Copy - FYI																			



# Updated Acceptance Test Data Package

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- **ID and Configuration Information**
- **Mechanical Summary Data**
- **Electrical Interface Data**
- **Software Configuration**
- **Unit Calibration Data**
- **Unit Performance Data**
- **Unit Support Data**
- **Operational Support Data**
- **Quality Data**



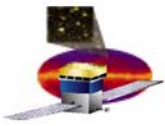
# LAT Assembly & Test Flow

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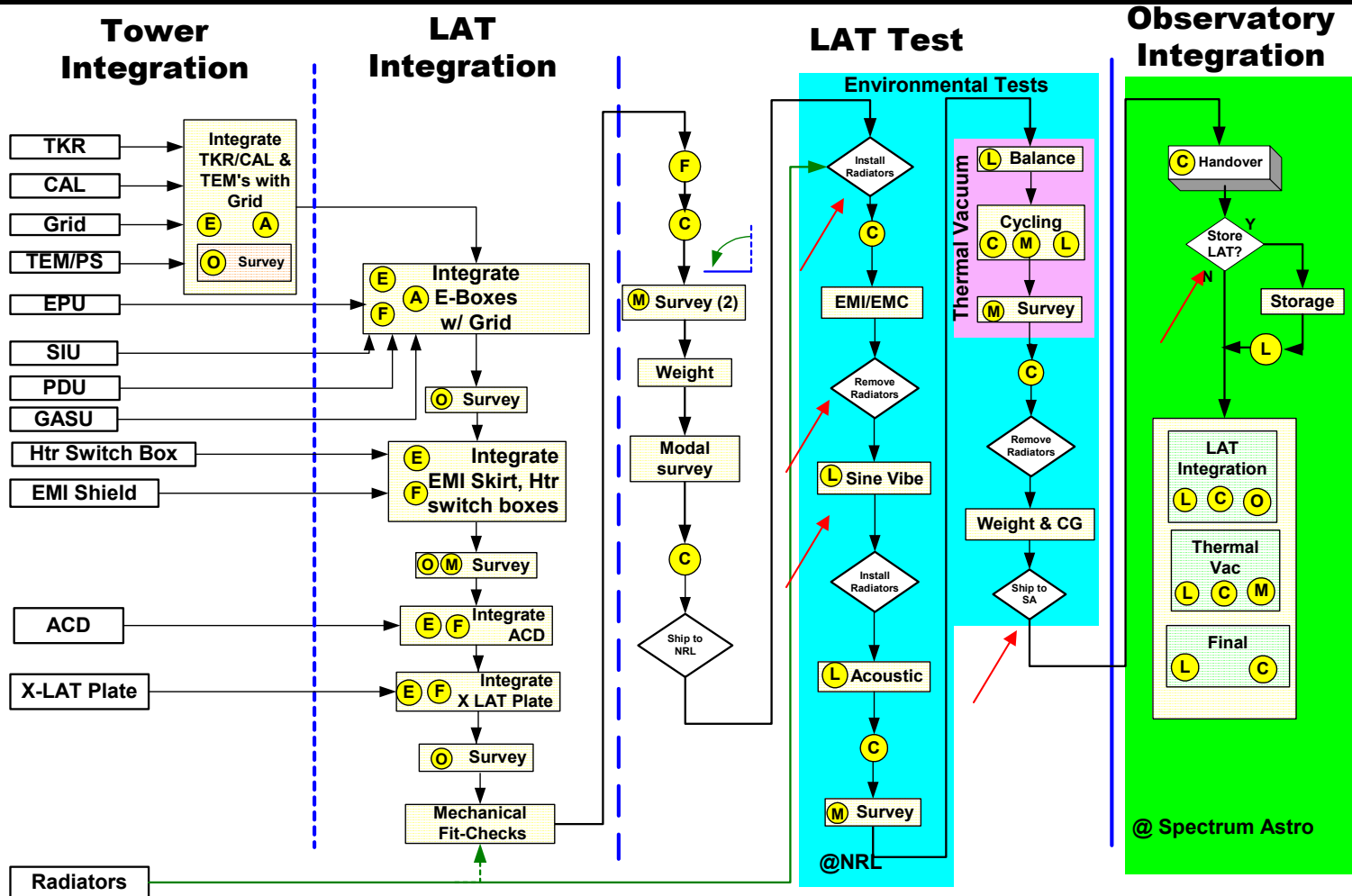
## Updated figure 5-2

- **Removed Sine Burst**
- **Relocated arrival of Radiators to support EMI/EMC testing**
  - **Arrival, installation & removal to support current plans**
- **Changed delivery sequence**

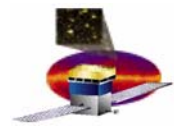




# Updated LAT Assembly Flow



v4 post CDR 10/30/03



# Test Performance Updates

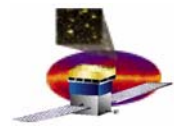
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- **Section 7**
  - Updated information on Dynamics Testing
  - Updated and improved test requirements for EMI testing
  - Added Tracker as a Proto-flight program

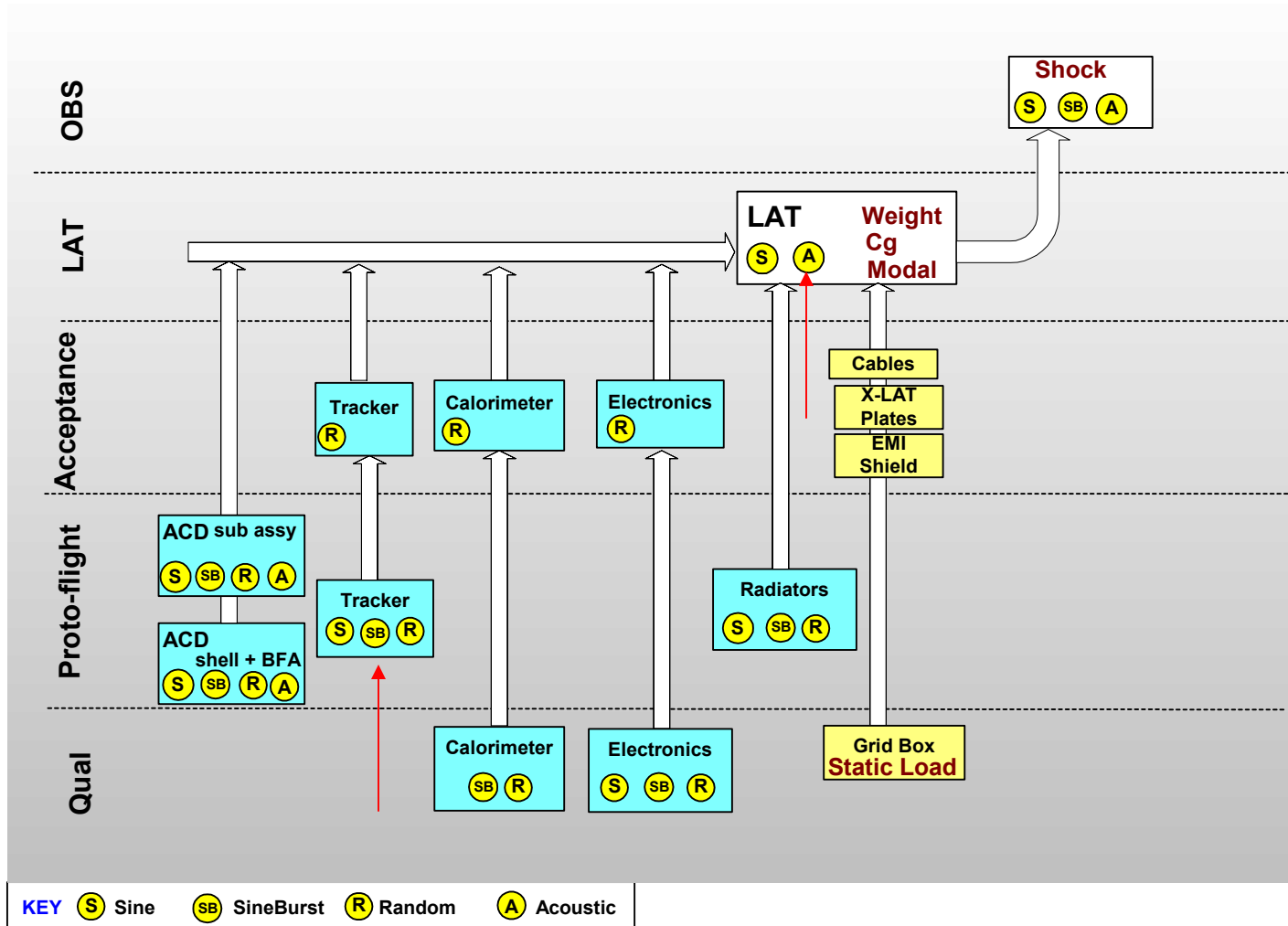


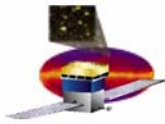
# EMI Test Requirements Matrix

	Emissions				Susceptability						Other		
	Radiated		Conducted		Radiated		Conducted						
	Electric Field (RE102)	Magnetic Field (RE101)	Conducted Emissions(CE 101/102)	Conducted Emissions Common Mode (CECM)	Radiated Susceptability -Electric Field (RS 103)	Radiated Susceptability Magnetic Field (RS101-Static)	Conducted Susceptability Electric Field (CS101/102)	Conducted Susceptability Common Mode (CSCM)	Instrument Conducted Fuse Blow Transient (CS06)	Static Dipole Moment	EMI Safety Margin	EMI Superposition (EMISM)	
<b>Subsystem Components</b>													
EM/Prototype	●	●	●	●	●	●	●	●	●				
Proto-flight/Qualification	●	●	●	●	●	●	●	●					
Acceptance/Flight				●				●					
<b>LAT Instrument</b>	●	●	●	●	●	●	●	●		●	●	●	
			●	Recommended	●	Required							

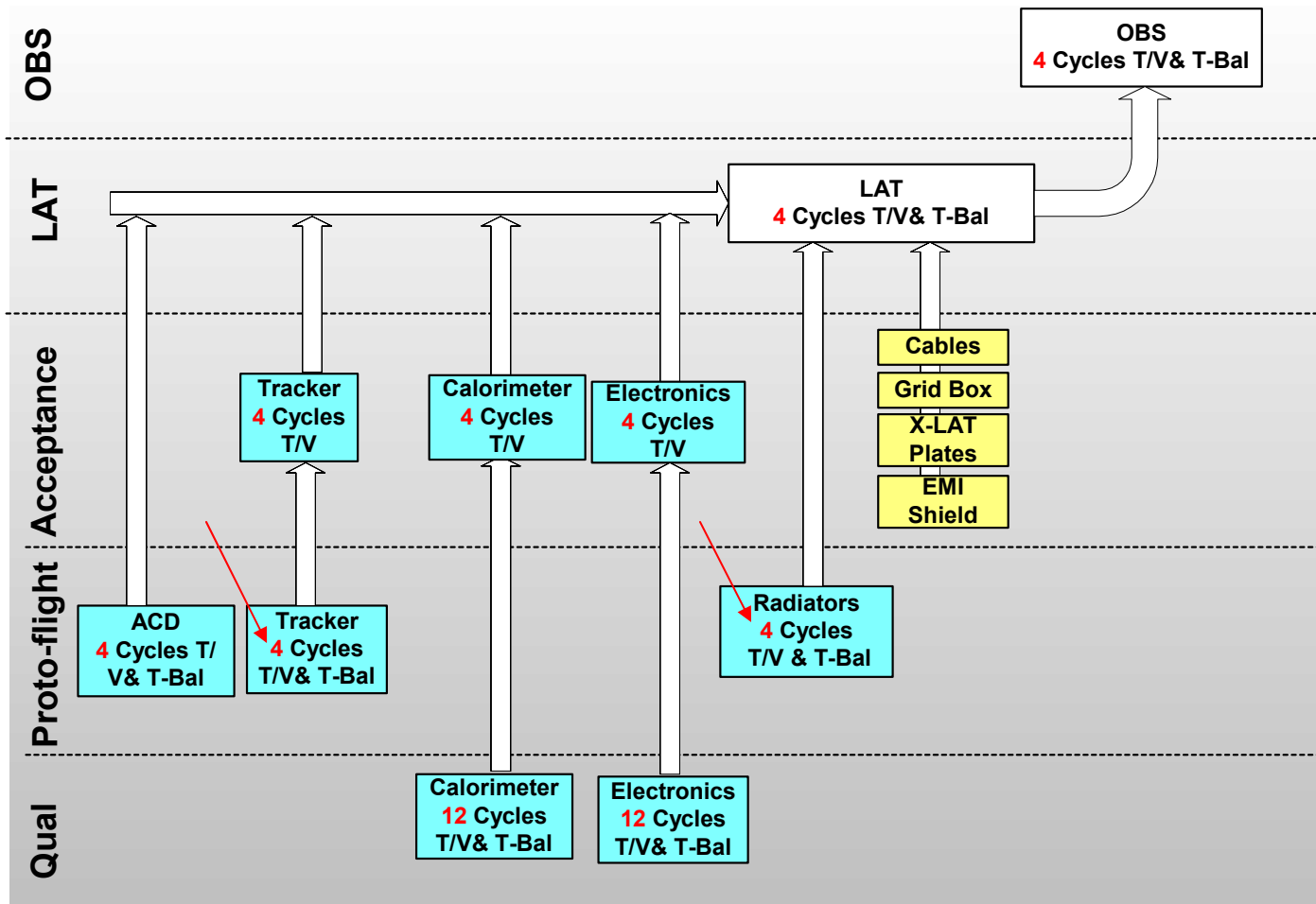


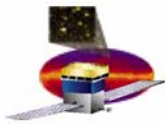
# Updated Dynamics





# Updated Thermal Vacuum Plans





# Tracker Conversion to Proto-Flight Program

Hardware			Mechanical						Electrical					Thermal		Other					
Assembly Level	Unit Type	Component (ITEM)	Quantity	Static Load	Sine Burst (static equivalent acc.)	Sinusoidal vibration+modal survey	Random Vibe + modal survey	Acoustic	Pressure Profile	Mass Properties	Interface Verification	EMI/EMC	EDS Compatibility (Grounding)	Stacked Cosmic Ray Test	Functional and Power	Burn-In	Thermal Vacuum	Thermal Balance	Thermal Cycle	Radiation	Comments
C	E	EM Tracker MCMs	8							T	T				T	T				TQ	
C	E	Tray panels	24				TQ														Vibe z-axis only
C	E	Live trays	5				TQ			M					T		TQ				Vibe & TV only 1
C	E	EM Mini-Tower	1								T	T	T		T						
C	E	EM Bottom Tray	2	TQ						M										TQ	Test 1 to destruction
C	E	EM Tracker Std. Trays	18	A			TQ													TQ	Vibe 5; z-axis only
S	E	EM Tracker Tower	1	A	TQ	TQ	TQ			M	T						TQ	T			
C	Q	Mini-MCMs (ASICs)	4												T					TQ	
C	Q	Qualification MCMs	38						T	M	T				T	T				TQ	2 for DPA
C	Q	QM Tracker MCMs	36								T				T	T				TQ	
C	Q	Tray panels	19				TQ														Vibe z-axis only
C	Q	QM Bottom Tray	1	TQ						M	T				T	T				TQ	
C	Q	QM Tracker Std. Trays	18	A						M	T				T	T				TQ	
S	Q	QM Tracker Tower	1	A	TQ	TQ	TQ	A		M	T	T	T		T		TQ	T			
C	F	Flight Tracker MCMs	612								T				T	T				T	
C	F	Tray panels	323			TA	TA														Vibe z-axis only
C	F	Flight Bottom Trays	17	TA							T			T	T					TA	
C	F	Flight Tracker Std. Trays	306								T			T	T					TA	
S	F	Flight Tracker Towers	17		TA	TA	TA			M	T	QS	QS		T		TA	T			

		<b>Assembly Level</b>	<b>Unit Type</b>	<b>Verification Method:</b>
		S= Subsystem	F= Flight	T= Test
		C= Component	Q= Qual	A= Analysis
			E= Engineering Model	M= Measurement
				QS= Qual by Similarity
				TQ= Test, Qual Level
				TA= Test, Acceptance Level