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X-57 Maxwell

Mod II Go/No-Go Parameter List

OPS-CEPT-001

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OPS-CEPT-001 Mod II
Go/No-Go Parameter List

Revision History

REV	DATE	DESCRIPTION	AUTHOR
-	9/27/2022	Baseline	Ethan Baumann

1 Purpose

The purpose of this document is to formally document the Go/No-Go Parameter List for the X-57 Mod II Flights. This document will be updated as necessary to properly reflect and capture project needs.

2 Scope

This document applies only to the X-57 Mod II flights. Only Safety of Flight, Safety of Test, and Mission Critical parameters are tracked as part of the Go/No-Go Parameter List.

3 Managing Go/No-Go Parameters

If a Go/No-Go Parameter needs to be added to or deleted from the project, a new revision of this document with approval signatures is required. When Parameters are deleted, they are removed from Section 6 "X-57 MOD II Go/No-Go & Mission Critical Parameters" or Section 7 "X-57 Mod II Derived Go/No-Go Parameters". The deleted Parameter is then moved to Section 8 "X-57 MOD II Go/No-Go Parameters: Deleted List" along with a justification for removing the Parameter. The Revision Sheet will describe the actions taken prior to updating this document in the "List of Changes" column.

4 X-57 MOD II Go/No-Go Parameter Categories

The only derived parameters tracked as Go/No-Go Parameters are those identified as Safety of Flight or Safety of Test Parameters. Derived parameters are listed in Section **Error! Reference source not found.**. The parameters used in the calculation of these derived parameters are classified at the same level as the derived parameter.

The Mod II Go/No-Go Parameters are classified as either Safety of Flight (SF), Safety of Test (ST), Mission Critical (MC), or Technically desired (TD). Definitions for each of these classifications is below. This document only tracks telemetered SF, ST, and MC parameters and derived SF and ST parameters.

<u>Safety of Flight (SF) Go/No-Go Parameters:</u>

Parameter monitored by the control room as a mitigation for a flight safety hazard throughout the entire flight. An RTB is called if any of the following occur: loss of parameter, discrepancies with the parameter, or exceedance of a Safety Critical Go/No-Go Criteria.

The X-57 project SF Parameter definition is consistent with the Safety Critical Go/No-Go Criteria as defined in "Hazard Management Procedure" AFOP 8715.3-005 (formerly DCP-S-002).

Safety of Test (ST) Go/No-Go Parameters:

Parameter monitored by the control room as a mitigation for a flight safety hazard during a flight test maneuver. Flight test maneuvers requiring this parameter are discontinued and an RTB may be called if any of the following occur: loss of parameter, discrepancies with the parameter, or exceedance of a Safety Critical Go/No-Go Criteria.

The X-57 project ST Parameter definition is consistent with the Mission Critical Go/No-Go Criteria as defined in "Hazard Management Procedure" AFOP 8715.3-005 (formerly DCP-S-002).

Mission Critical (MC) Parameters:

Mission Critical Parameters are required to meet research objectives and requirements. Failure of a mission critical parameter may result in discontinuation of test points requiring the parameter.

The X-57 project MC Parameter definition is consistent with the Mission Go/No-Go Criteria as defined in "Hazard Management Procedure" AFOP 8715.3-005 (formerly DCP-S-002).

Technically Desired (TD) Parameters:

Technically Desired Parameters are not tracked as part of the Project's Go/No-Go Parameter list. Technically Desired Parameters are those that are not Safety of Flight, Safety of Test, or Mission Critical. Technically Desired Parameters are those that the project will make an effort to capture but are not considered necessary for mission success. Failure of these parameters will not result in discontinuation of any test points and will not impact the planned flow of a mission.

5 Summary of the X-57 MOD II Go/No-Go Parameters

A summary of the Mod II Go/No-Go Parameters is shown below in Table *1*. The Go/No-Go parameters are color-coded by the discipline of principle interest for each flight phase.

For the Go/No-Go Parameters, which are not telemetered, these parameters are checked as a part of the Day of Flight Procedure. Non-telemetered Go/No-Go parameters are identified in the summary list below as "Not Telemetered."

Lead Monitor
Aerodynamics
Flight Controls
Dynamics
Flight Systems
Static Structures
Operations

	Classification			
Parameter Type	**Safety of Flight (SF)**	**Safety of Test (ST)**	**Mission Critical (MC)**	**Not Telemetered**
Accelerometers - Gear			Dynamics (Taxi Test)	
Accelerometers - Motor Mount Y & Z Axis	Dynamics			
Accelerometers - Rudder, Vertical Tail, Fuselage, Wing			Dynamics	
Accelerometers - Stabilator, Wing fore/aft & Right Wing X axis		Dynamics (>135 KCAS)	Dynamics	
Advanced Nav - X Accel, Y Accel, rates, angles, altitude, velocities			Aero	
Advanced Nav - Z - Accel	Static Structures			
Angle of Attack and Angle of Sideslip		Aero (211s, Raps)	Aero	
Avionics Bus Voltage and Current	Flight Systems			
BCM - Cell Average & Maximum Temperatures	Flight Systems			
BCM - Cell Maximum & Minimum Voltages	Flight Systems			
BCM - Cell Minimum & Standard Deviation Temperatures			Flight Systems	
BCM - Failure Indications (Isolation and Master Fault)	Flight Systems			
BCM - Internal Temperatures			Flight Systems	
BCM - Pack Voltage	Flight Systems			
BCM - SOC and Pack Current			Flight Systems	
Control Surface Deflections			Flight Controls	
Cruise Motor - Bearing Temperatures	Flight Systems			
Cruise Motor - Winding Temperatures	Flight Systems			
Cruise Motor Controller - Failure Indications	Flight Systems			
Cruise Motor Controller - Internal Temperatures	Flight Systems			
GoPro Video & Audio			Operations	X
KCAS - Calculated		Aero (211s, Raps)		
Novatel GPS Data			Operations	X
Prop RPM			Operations	
QBAR - Calculated		Aero (211s, Raps)		
Rudder Deflection		Static Structures (211s, Raps)	Flight Controls	
Strain Gages - Vertical Tail			Static Structures	
Total Air Temperature			Aero	
Total Pressure & Static Pressure		Aero (211s, Raps)	Aero	
Traction Bus Voltage & Current	Flight Systems			
Verical Tail Calculated Load		Static Structures (211s, Raps)		

Table 1: Summary of Mod II Go/No-Go Parameters

6 X-57 MOD II Telemetered, Derived, and Deleted Go/No-Go Parameters

See following pages

X-57 MOD II Telemetered Go/No-Go Parameters

Yellow & Red Limit Definitions	Yellow Limit – Adjust test point to reduce value and ensure Red Limit is not Exceeded Red Limit – Do Not Exceed

					Flight Limit (If Applicable)									
Class.	Parameter Name	Parameter Description	Haz. Mit (SF / ST Only)	Input to Derived Parm	Lower Flight Limit	Source	Upper Flight Limit	Source	Units	Type of Maneuver	Control Room Display Location	Control Room Lead Monitor	Alternative Parameter	Comment
SF	AALC_MMGY	Accelerometer AC, LH Cruise Motor Forward Mount, Global Y-Axis	X-57 HR-35		Post-flight fatigue life calculation.		Post-flight fatigue life calculation.		g	All	Statics Dynamics	Dynamics	None	SF because data is used for motor mount fatigue life calculation by Static Structures. Dynamics to verify data quality in control room
SF	AALC_MMGZ	Accelerometer AC, LH Cruise Motor Forward Mount, Global Z-Axis	X-57 HR-35		Post-flight fatigue life calculation.		Post-flight fatigue life calculation.		g	All	Statics Dynamics	Dynamics	None	SF because data is used for motor mount fatigue life calculation by Static Structures. Dynamics to verify data quality in control room
SF	AARC_MMGY	Accelerometer AC, RH Cruise Motor Forward Mount, Global Y-Axis	X-57 HR-35		Post-flight fatigue life calculation.		Post-flight fatigue life calculation.		g	All	Statics Dynamics	Dynamics	None	SF because data is used for motor mount fatigue life calculation by Static Structures. Dynamics to verify data quality in control room
SF	AARC_MMGZ	Accelerometer AC, RH Cruise Motor Forward Mount, Global Z-Axis	X-57 HR-35		Post-flight fatigue life calculation.		Post-flight fatigue life calculation.		g	All	Statics Dynamics	Dynamics	None	SF because data is used for motor mount fatigue life calculation by Static Structures. Dynamics to verify data quality in control room
ST/MC	ADEH_LAGZ	Accelerometer DC, LH Side of Stabilator Aft Tip, Global Z-axis	X-57 HR-28						g	ST: >135 KCAS MC: RAPs, HS Taxi	Dynamics	Dynamics	ADEH_RAGZ	Need left or right stab accels working. ST for test points >135 KCAS until aeroelastic predictions validated with flight test data (100% margin from predicted 270 KCAS @12,000 ft flutter boundary)
ST/MC	ADEH_LFGZ	Accelerometer DC, LH Side of Stabilator Forward Tip, Global Z-axis	X-57 HR-28						g	ST: >135 KCAS MC: RAPs, HS Taxi	Dynamics	Dynamics	ADEH_RFGZ	Need left or right stab accels working. ST for test points >135 KCAS until aeroelastic predictions validated with flight test data (100% margin from predicted 270 KCAS @12,000 ft flutter boundary)
ST/MC	ADEH_RAGZ	Accelerometer DC, RH Side of Stabilator Aft Tip, Global Z-axis	X-57 HR-28						g	ST: >135 KCAS MC: RAPs, HS Taxi	Dynamics	Dynamics	ADEH_LAGZ	Need left or right stab accels working. ST for test points >135 KCAS until aeroelastic predictions validated with flight test data (100% margin from predicted 270 KCAS @12,000 ft flutter boundary)
ST/MC	ADEH_RFGZ	Accelerometer DC, RH Side of Stabilator Forward Tip, Global Z-axis	X-57 HR-28						g	ST: >135 KCAS MC: RAPs, HS Taxi	Dynamics	Dynamics	ADEH_LFGZ	Need left or right stab accels working. ST for test points >135 KCAS until aeroelastic predictions validated with flight test data (100% margin from predicted 270 KCAS @12,000 ft flutter boundary)
MC	ADER_ABGY	Accelerometer DC, Rudder Base Aft Tip, Global Y-axis							g	RAPs, HS Taxi	Dynamics	Dynamics	None	
MC	ADEV_ATGY	Accelerometer DC, Top of Vertical Tail Aft Tip (Not Rudder), Global Y-axis							g	RAPs, HS Taxi	Dynamics	Dynamics	ADEV_FTGY	
MC	ADEV_FTGY	Accelerometer DC, Top of Vertical Tail Forward Tip (Not Rudder), Global Y-axis							g	RAPs, HS Taxi	Dynamics	Dynamics	ADEV_ATGY	
MC	ADFN_G0Y	Accelerometer DC, Fuselage Nose, Global Y-axis							g	RAPs, HS Taxi	Dynamics	Dynamics	None	
MC	ADFN_G0Z	Accelerometer DC, Fuselage Nose, Global Z-axis							g	RAPs, HS Taxi	Dynamics	Dynamics	None	
MC/TD	ADGL_G0Z	Accelerometer DC, LH Main Gear, Global Z-axis							g	MC: High-Speed Taxi TD: All Else	Dynamics	Dynamics	None	MC during high speed taxi test (high freq excitation)
MC/TD	ADGN_G0Y	Accelerometer DC, Nose Gear, Global Y-axis							g	MC: High-Speed Taxi TD: All Else	Dynamics	Dynamics	None	MC during high speed taxi test (high freq excitation)
MC/TD	ADGN_G0Z	Accelerometer DC, Nose Gear, Global Z-axis							g	MC: High-Speed Taxi TD: All Else	Dynamics	Dynamics	None	MC during high speed taxi test (high freq excitation)
MC/TD	ADGR_G0Z	Accelerometer DC, RH Main Gear, Global Z-axis							g	MC: High-Speed Taxi TD: All Else	Dynamics	Dynamics	None	MC during high speed taxi test (high freq excitation)
MC	ADLW_LEGZ	Accelerometer DC, LH Wing Forward Motion in Z							g	RAPs, HS Taxi	Dynamics	Dynamics	ADLT_TEGZ	
MC	ADLW_TEGZ	Accelerometer DC, LH Wing Aft Motion in Z							g	RAPs, HS Taxi	Dynamics	Dynamics	ADLT_LEGZ	
ST/MC	ADRW_LEGX	Accelerometer DC, RH Wing Forward Motion in X	X-57 HR-28						g	ST: >135 KCAS MC: RAPs, HS Taxi	Dynamics	Dynamics	None	ST for test points >135 KCAS until aeroelastic predictions validated with flight test data (100% margin from predicted 270 KCAS @12,000 ft flutter boundary)
MC	ADRW_TEGZ	Accelerometer DC, RH Wing Aft Motion in Z							g	RAPs, HS Taxi	Dynamics	Dynamics		
MC	BA_BCMTEMP1	BCM A BCC701 Left Side of Board Temp					Yellow: 65 C Red: 71 C	thermal-go-no-go Spreadsheet	deg C		Flight Systems	Flight Systems		
MC	BA_BCMTEMP2	BCM A BCC701 Right Side of Board Temp					Yellow: 65 C Red: 71 C	thermal-go-no-go Spreadsheet	deg C		Flight Systems	Flight Systems		
MC	BA_BCMTEMP3	BCM A BCC701 Middle of Board Temp					Yellow: 65 C Red: 71 C	thermal-go-no-go Spreadsheet	deg C		Flight Systems	Flight Systems		
SF	BA_CELLTEMPAVG	PA Avg Battery Temp	X-57 HR-01				Yellow: 60 C Red: 65 C	See Note	deg C	Entire Flight	Flight Systems	Flight Systems		Yellow is the cell maximum temperature for discharge per the Battery System User's Manual and Safety Instructions. Red is the limit at which the BMS Master Fault is set per the BMS Software Design Description SDD-CEPT-043
SF	BA_CELLTEMPMAX	PA Max Battery Temp	X-57 HR-01				Yellow: 60 C Red: 65 C	See Note	deg C	Entire Flight	Flight Systems	Flight Systems		Yellow is the cell maximum temperature for discharge per the Battery System User's Manual and Safety Instructions. Red is the limit at which the BMS Master Fault is set per the BMS Software Design Description SDD-CEPT-043
MC	BA_CELLTEMPMIN	PA Min Battery Temp			5 C	Battery System User's Manual and Safety Instructions			degC	Entire Flight	Flight Systems	Flight Systems		
MC	BA_CELLTEMPSTD	PA Battery Temp Std Dev							degC	Entire Flight	Flight Systems	Flight Systems		
MC	BA_Cellvoltavg	Pk A Cell voltage avg val			Yellow - 2.8 Red - 2.5	Battery System User's Manual and Safety Instructions	4.2	Battery System User's Manual and Safety Instructions	volts	Entire Flight	Flight Systems	Flight Systems		Yellow limit provide margin. The battery system user's manual states that 2.5V and 4.2V are the minimum and maximum allowable voltages.
SF	BA_Cellvoltmax	Pk A Cell voltage max val	X-57 HR-01		Yellow - 2.8 Red - 2.5	Battery System User's Manual and Safety Instructions	4.2	Battery System User's Manual and Safety Instructions	volts	Entire Flight	Flight Systems	Flight Systems		Yellow limit provide margin. The battery system user's manual states that 2.5V and 4.2V are the minimum and maximum allowable voltages.

X-57 MOD II Telemetered Go/No-Go Parameters

Yellow & Red Limit Definitions	Yellow Limit – Adjust test point to reduce value and ensure Red Limit is not Exceeded Red Limit – Do Not Exceed

					Flight Limit (If Applicable)										
Class.	Parameter Name	Parameter Description	Haz. Mit (SF / ST Only)	Input to Derived Parm	Lower Flight Limit	Source	Upper Flight Limit	Source	Units	Type of Maneuver	Control Room Display Location	Control Room Lead Monitor	Alternative Parameter	Comment
SF	BA_Cellvoltmin	Pk A Cell voltage min val	X-57 HR-01		Yellow - 2.8 Red - 2.5	Battery System User's Manual and Safety Instructions	4.2	Battery System User's Manual and Safety Instructions	volts	Entire Flight	Flight Systems	Flight Systems		Yellow limit provide margin. The battery system user's manual states that 2.5V and 4.2V are the minimum and maximum allowable voltages.
MC	BA_Cellvoltstd	Pk A Cell voltage std dev							volts	Entire Flight	Flight Systems	Flight Systems		
MC	BA_PACKCURR	Pack A Pack Current							Amps	Entire Flight	Flight Systems	Flight Systems		
MC	BA_PACKSOC	Pack A State of Charge							%	Entire Flight	Flight Systems, Flight Ops	Flight Systems		SOC is an estimate of the energy in the system. Traction bus voltage provides a better estimate of the energy in the system.
SF	BA_PACKVOLT	Pack A Pack Voltage	X-57 HR-01		Yellow: 350 VDC Red: 320 VDC	See Note	537.6	See Note	VDC	Entire Flight	Flight Systems, Flight Ops	Flight Systems		Yellow source is Traction Battery Low Voltage Annunciator Alarm Setting. Red Source is battery system User's Manual and Safety Instructions for the System charge and discharge cut-off voltages.
SF	BAFL_ISOLATION	PA Fail –Isol Compromised	X-57 HR-01		Loss or any intermittent signal that isolation is compromised		Loss or any intermittent signal that isolation is compromised		discrete	Entire Flight	Flight Systems	Flight Systems		
SF	BAPL_MASTERFALT	PA CPLD – Master Fault	X-57 HR-01		Sustained master fault for any reason		Sustained master fault for any reason		discrete	Entire Flight	Flight Systems	Flight Systems		
MC	BB_BCMTEMP1	BCM B BCC701 Left Side of Board Temp					Yellow: 65 C Red: 71 C	thermal-go-no-go Spreadsheet	deg C		Flight Systems	Flight Systems		
MC	BB_BCMTEMP2	BCM B BCC701 Right Side of Board Temp					Yellow: 65 C Red: 71 C	thermal-go-no-go Spreadsheet	deg C		Flight Systems	Flight Systems		
MC	BB_BCMTEMP3	BCM B BCC701 Middle of Board Temp					Yellow: 65 C Red: 71 C	thermal-go-no-go Spreadsheet	deg C		Flight Systems	Flight Systems		
SF	BB_CELLTEMPAVG	PB Avg Battery Temp	X-57 HR-01				Yellow: 60 C Red: 65 C	See Note	deg C	Entire Flight	Flight Systems	Flight Systems		Yellow is the cell maximum temperature for discharge per the Battery System User's Manual and Safety Instructions. Red is the limit at which the BMS Master Fault is set per the BMS Software Design Description SDD-CEPT-043
SF	BB_CELLTEMPMAX	PB Max Battery Temp	X-57 HR-01				Yellow: 60 C Red: 65 C	See Note	deg C	Entire Flight	Flight Systems	Flight Systems		Yellow is the cell maximum temperature for discharge per the Battery System User's Manual and Safety Instructions. Red is the limit at which the BMS Master Fault is set per the BMS Software Design Description SDD-CEPT-043
MC	BB_CELLTEMPMIN	PB Min Battery Temp			5 C	Battery System User's Manual and Safety Instructions			degC	Entire Flight	Flight Systems	Flight Systems		
MC	BB_CELLTEMPSTD	PB Battery Temp Std Dev							degC	Entire Flight	Flight Systems	Flight Systems		
MC	BB_Cellvoltavg	Pk B Cell voltage avg val			Yellow - 2.8 Red - 2.5	Battery System User's Manual and Safety Instructions	4.2	Battery System User's Manual and Safety Instructions	volts	Entire Flight	Flight Systems	Flight Systems		Yellow limit provide margin. The battery system user's manual states that 2.5V and 4.2V are the minimum and maximum allowable voltages.
SF	BB_Cellvoltmax	Pk B Cell voltage max val	X-57 HR-01		Yellow - 2.8 Red - 2.5	Battery System User's Manual and Safety Instructions	4.2	Battery System User's Manual and Safety Instructions	volts	Entire Flight	Flight Systems	Flight Systems		Yellow limit provide margin. The battery system user's manual states that 2.5V and 4.2V are the minimum and maximum allowable voltages.
SF	BB_Cellvoltmin	Pk B Cell voltage min val	X-57 HR-01		Yellow - 2.8 Red - 2.5	Battery System User's Manual and Safety Instructions	4.2	Battery System User's Manual and Safety Instructions	volts	Entire Flight	Flight Systems	Flight Systems		Yellow limit provide margin. The battery system user's manual states that 2.5V and 4.2V are the minimum and maximum allowable voltages.
MC	BB_Cellvoltstd	Pk B Cell voltage std dev							volts	Entire Flight	Flight Systems	Flight Systems		
MC	BB_PACKCURR	Pack B Pack Current							Amps	Entire Flight	Flight Systems	Flight Systems		
MC	BB_PACKSOC	Pack B State of Charge							%	Entire Flight	Flight Systems, Flight Ops	Flight Systems		SOC is an estimate of the energy in the system. Traction bus voltage provides a better estimate of the energy in the system.
SF	BB_PACKVOLT	Pack B Pack Voltage	X-57 HR-01		Yellow: 350 VDC Red: 320 VDC	See Note	537.6	See Note	VDC	Entire Flight	Flight Systems, Flight Ops	Flight Systems		Yellow source is Traction Battery Low Voltage Annunciator Alarm Setting. Red Source is battery system User's Manual and Safety Instructions for the System charge and discharge cut-off voltages.
SF	BBFL_ISOLATION	PB Fail –Isol Compromised	X-57 HR-01		Loss or any intermittent signal that isolation is compromised		Loss or any intermittent signal that isolation is compromised		discrete	Entire Flight	Flight Systems	Flight Systems		
SF	BBPL_MASTERFALT	PB CPLD – Master Fault	X-57 HR-01		Sustained master fault for any reason		Sustained master fault for any reason		discrete	Entire Flight	Flight Systems	Flight Systems		
SF	CDCL_BEARTAFT1	Lt Aft Bearing Temp 1	X-57 HR-21				Yellow: 89 C Red: 99 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems	Need 1 of 2 Aft Bearing Temps	Bearing temperatures will be monitored to ensure remain within limits and that trends are not rising quickly.
SF	CDCL_BEARTAFT2	Lt Aft Bearing Temp 2	X-57 HR-21				Yellow: 89 C Red: 99 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems	Need 1 of 2 Aft Bearing Temps	Bearing temperatures will be monitored to ensure remain within limits and that trends are not rising quickly.
SF	CDCL_BEARTFWD1	Lt Fwd Bearing Temp 1	X-57 HR-21				Yellow: 89 C Red: 99 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems	Need 1 of 2 Fwd Bearing Temps	Bearing temperatures will be monitored to ensure remain within limits and that trends are not rising quickly.

X-57 MOD II Telemetered Go/No-Go Parameters

Yellow & Red Limit Definitions	Yellow Limit – Adjust test point to reduce value and ensure Red Limit is not Exceeded Red Limit – Do Not Exceed

					Flight Limit (If Applicable)									
Class.	Parameter Name	Parameter Description	Haz. Mit (SF / ST Only)	Input to Derived Parm	Lower Flight Limit	Source	Upper Flight Limit	Source	Units	Type of Maneuver	Control Room Display Location	Control Room Lead Monitor	Alternative Parameter	Comment
SF	CDCL_BEARTFWD2	Lt Fwd Bearing Temp 2	X-57 HR-21				Yellow: 89 C Red: 99 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems	Need 1 of 2 Fwd Bearing Temps	Bearing temperatures will be monitored to ensure remain within limits and that trends are not rising quickly.
SF	CDCL_BEARTMID1	Lt Mid Bearing Temp 1	X-57 HR-21				Yellow: 89 C Red: 99 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems	Need 1 of 2 Mid Bearing Temps	Bearing temperatures will be monitored to ensure remain within limits and that trends are not rising quickly.
SF	CDCL_BEARTMID2	Lt Mid Bearing Temp 2	X-57 HR-21				Yellow: 89 C Red: 99 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems	Need 1 of 2 Mid Bearing Temps	Bearing temperatures will be monitored to ensure remain within limits and that trends are not rising quickly.
SF	CDCR_BEARTAFT1	Rt Aft Bearing Temp 1	X-57 HR-21				Yellow: 89 C Red: 99 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems	Need 1 of 2 Aft Bearing Temps	Bearing temperatures will be monitored to ensure remain within limits and that trends are not rising quickly.
SF	CDCR_BEARTAFT2	Rt Aft Bearing Temp 2	X-57 HR-21				Yellow: 89 C Red: 99 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems	Need 1 of 2 Fwd Bearing Temps	Bearing temperatures will be monitored to ensure remain within limits and that trends are not rising quickly.
SF	CDCR_BEARTFWD1	Rt Fwd Bearing Temp 1	X-57 HR-21				Yellow: 89 C Red: 99 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems	Need 1 of 2 Fwd Bearing Temps	Bearing temperatures will be monitored to ensure remain within limits and that trends are not rising quickly.
SF	CDCR_BEARTFWD2	Rt Fwd Bearing Temp 2	X-57 HR-21				Yellow: 89 C Red: 99 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems	Need 1 of 2 Mid Bearing Temps	Bearing temperatures will be monitored to ensure remain within limits and that trends are not rising quickly.
SF	CDCR_BEARTMID1	Rt Mid Bearing Temp 1	X-57 HR-21				Yellow: 89 C Red: 99 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems	Need 1 of 2 Mid Bearing Temps	Bearing temperatures will be monitored to ensure remain within limits and that trends are not rising quickly.
SF	CDCR_BEARTMID2	Rt Mid Bearing Temp 2	X-57 HR-21				Yellow: 89 C Red: 99 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems	Need 1 of 2 Mid Bearing Temps	Bearing temperatures will be monitored to ensure remain within limits and that trends are not rising quickly.
MC	DCF1_AIL	Aileron Deflection			Up 20 +/-2	POH	Down 17 +/-2	POH	deg	Flying Qualities, PID, RAPs	Flight Controls, Aero, Dynamics, Ops	Flight Controls	None	
MC	DCFC_ELE	Stabilator Deflection			Up 4 +/-2	POH	Down 15 +/-2	POH	deg	Flying Qualities, PID, RAPs	Flight Controls, Aero, Dynamics, Ops	Flight Controls	None	
MC	DCFC_ELT	Stabilator Trim Deflection			Up 2 +/-2	POH	Down 19 +/-2	POH	deg	All	Flight Controls, Aero	Flight Controls	None	
MC	DCFC_FLA	Flap Deflection			0	POH	40	POH	deg	All	Flight Controls, Aero	Flight Controls	None	
ST/MC	DCFC_RUD	Rudder Deflection	X-57 HR-36	VT_FORCE	Ground: -26 +/- 2 Flight: See Tail Loads Memo	MEM-CEPT-009	Ground: 26 +/- 2 Flight: See Tail Loads Memo	MEM-CEPT-009	deg	ST: 211s, Raps, Doublets, MC: All other maneuvers	Static Structures, Dynamics, Flight Controls, Aero	ST - Static Structures MC - Flight Controls	None	
MC	DCFT_RUT	Rudder Trim Deflection			20 +/- 2	POH	20 +/- 2	POH	deg	All	Flight Controls, Aero	Flight Controls	None	
ST/MC	DVFN_AOA	Angle of attack	X-57 HR-36	ALPHA	N/A	N/A	N/A	N/A	deg	ST: 211s, Raps, Doublets MC: Air data calibration, Flying Qualities, RAPs	Aero, Flight Controls, Dynamics	Aero	None	
ST/MC	DVFN_AOS	Angle of Sideslip	X-57 HR-36	BETA	N/A	N/A	N/A	N/A	deg	ST: 211s, Raps, Doublets MC: Air data calibration, Flying Qualities, RAPs	Aero, Flight Controls, Dynamics	Aero	None	
MC	HAFN_TA1	Total Air Temperature TAT Sensor							deg F	Air data calibration	Aero	Aero	None	
MC	NAFC_GLX1	INS/IMU Global X-axis Acceleration (1st Word)		AX_IMU_CORR					discrete	PID	Aero, Flight Controls, structures	Aero	None	
MC	NAFC_GLX2	INS/IMU Global X-axis Acceleration (2nd Word)		AX_IMU_CORR					discrete	PID	Aero, Flight Controls, structures	Aero	None	
MC	NAFC_GLY1	INS/IMU Global Y-axis Acceleration (1st Word)		AY_IMU_CORR					discrete	PID	Aero, Flight Controls, structures	Aero	None	
MC	NAFC_GLY2	INS/IMU Global Y-axis Acceleration (2nd Word)		AY_IMU_CORR					discrete	PID	Aero, Flight Controls, structures	Aero	None	
SF	NAFC_GLZ1	INS/IMU Global Z-axis Acceleration (1st Word)	X-57 HR-35	AZ_IMU_CORR, NZ_IMU_CORR	See NZ_IMU_CORR	See NZ_IMU_CORR	See NZ_IMU_CORR	See NZ_IMU_CORR	discrete	PID	Aero, Flight Controls, Static Structures, Ops	Static Structures	None	

Yellow & Red Limit Definitions	Yellow Limit – Adjust test point to reduce value and ensure Red Limit is not Exceeded Red Limit – Do Not Exceed

					Flight Limit (If Applicable)									
Class.	Parameter Name	Parameter Description	Haz. Mit (SF / ST Only)	Input to Derived Parm	Lower Flight Limit	Source	Upper Flight Limit	Source	Units	Type of Maneuver	Control Room Display Location	Control Room Lead Monitor	Alternative Parameter	Comment
SF	NAFC_GLZ2	INS/IMU Global Z-axis Acceleration (2nd Word)	X-57 HR-35	AZ_IMU_CORR, NZ_IMU_CORR	See NZ_IMU_CORR	See NZ_IMU_CORR	See NZ_IMU_CORR	See NZ_IMU_CORR	discrete	PID	Aero, Flight Controls, Static Structures, Ops	Static Structures	None	
MC	NEFC_GLX1	INS/IMU Global X-axis Euler Angle (Roll) (1st Word)		NAV_ROL					discrete	Air data calibration/ PID, Flying Qualities	Aero, Flight Controls	Aero	None	
MC	NEFC_GLX2	INS/IMU Global X-axis Euler Angle (Roll) (2nd Word)		NAV_ROL					discrete	Air data calibration/ PID, Flying Qualities	Aero, Flight Controls	Aero	None	
MC	NEFC_GLY1	INS/IMU Global Y-axis Euler Angle (Pitch) (1st Word)		NAV_PIT					discrete	Air data calibration/ PID, Flying Qualities	Aero, Flight Controls	Aero	None	
MC	NEFC_GLY2	INS/IMU Global Y-axis Euler Angle (Pitch) (2nd Word)		NAV_PIT					discrete	Air data calibration/ PID, Flying Qualities	Aero, Flight Controls	Aero	None	
MC	NEFC_GLZ1	INS/IMU Global Z-axis Euler Angle (Yaw) (1st Word)		NAV_HDN					discrete	Air data calibration/ PID, Flying Qualities	Aero, Flight Controls	Aero	None	
MC	NEFC_GLZ2	INS/IMU Global Z-axis Euler Angle (Yaw) (2nd Word)		NAV_HDN					discrete	Air data calibration/ PID, Flying Qualities	Aero, Flight Controls	Aero	None	
MC	NPFC_ALT1	INS/IMU Altitude (1st Word)		NAV_ALT					discrete	Air data calibration	Aero, Flight Controls	Aero	Novatel Altitude	Backup to Novatel data
MC	NPFC_ALT2	INS/IMU Altitude (2nd Word)		NAV_ALT					discrete	Air data calibration	Aero, Flight Controls	Aero	Novatel Altitude	Backup to Novatel data
MC	NPFC_ALT3	INS/IMU Altitude (3rd Word)		NAV_ALT					discrete	Air data calibration	Aero, Flight Controls	Aero	Novatel Altitude	Backup to Novatel data
MC	NPFC_ALT4	INS/IMU Altitude (4th Word)		NAV_ALT					discrete	Air data calibration	Aero, Flight Controls	Aero	Novatel Altitude	Backup to Novatel data
MC	NRFC_GLX1	INS/IMU Global Roll Rate (Rotation about X-axis) (1st Word)		P_IMU_CORR					discrete	Air data calibration/ PID	Aero, Flight Controls	Aero	None	
MC	NRFC_GLX2	INS/IMU Global Roll Rate (Rotation about X-axis) (2nd Word)		P_IMU_CORR					discrete	Air data calibration/ PID	Aero, Flight Controls	Aero	None	
MC	NRFC_GLY1	INS/IMU Global Pitch Rate (Rotation about Y-axis) (1st Word)		Q_IMU_CORR					discrete	Air data calibration/ PID	Aero, Flight Controls	Aero	None	
MC	NRFC_GLY2	INS/IMU Global Pitch Rate (Rotation about Y-axis) (2nd Word)		Q_IMU_CORR					discrete	Air data calibration/ PID	Aero, Flight Controls	Aero	None	
MC	NRFC_GLZ1	INS/IMU Global Yaw Rate (Rotation about Z-axis) (1st Word)		R_IMU_CORR					discrete	Air data calibration/ PID	Aero, Flight Controls	Aero	None	
MC	NRFC_GLZ2	INS/IMU Global Yaw Rate (Rotation about Z-axis) (2nd Word)		R_IMU_CORR					discrete	Air data calibration/ PID	Aero, Flight Controls	Aero	None	
MC	NVFC_DWN1	INS/IMU Velocity Down (1st Word)		NAV_DWN					discrete	Air data calibration/ PID	Aero, Flight Controls	Aero	Novatel Vdown	Novatel needs to be confirmed working to be used as a backup.
MC	NVFC_DWN2	INS/IMU Velocity Down (2nd Word)		NAV_DWN					discrete	Air data calibration/ PID	Aero, Flight Controls	Aero	Novatel Vdown	Novatel needs to be confirmed working to be used as a backup.
MC	NVFC_EAS1	INS/IMU Velocity East (1st Word)		NAV_EAS					discrete	Air data calibration/ PID	Aero, Flight Controls	Aero	Novatel Veast	Novatel needs to be confirmed working to be used as a backup.
MC	NVFC_EAS2	INS/IMU Velocity East (2nd Word)		NAV_EAS					discrete	Air data calibration/ PID	Aero, Flight Controls	Aero	Novatel Veast	Novatel needs to be confirmed working to be used as a backup.
MC	NVFC_NOR1	INS/IMU Velocity North (1st Word)		NAV_NOR					discrete	Air data calibration/ PID	Aero, Flight Controls	Aero	Novatel Vnorth	Novatel needs to be confirmed working to be used as a backup.
MC	NVFC_NOR2	INS/IMU Velocity North (2nd Word)		NAV_NOR					discrete	Air data calibration/ PID	Aero, Flight Controls	Aero	Novatel Vnorth	Novatel needs to be confirmed working to be used as a backup.
ST/MC	PTFN_0PD	Total Pressure (Pitot Stagnation Pressure)	X-57 HR-36	PTFN_PD	N/A	N/A	N/A	N/A	PSI	ST: 211s, Raps, Doublets MC: Air data calibration	Aero	Aero	None	ST since input to KCAS, and KCAS is input to VT_FORCE
ST/MC	PTFN_0PS	Static Pressure (Pitot Static Pressure)	X-57 HR-36	PTFN_PS	N/A	N/A	N/A	N/A	PSI	ST: 211s, Raps, Doublets MC: Air data calibration	Aero	Aero	None	ST since input to KCAS, and KCAS is input to VT_FORCE

X-57 MOD II Telemetered Go/No-Go Parameters

Yellow & Red Limit Definitions	Yellow Limit – Adjust test point to reduce value and ensure Red Limit is not Exceeded Red Limit – Do Not Exceed

				Flight Limit (If Applicable)										
Class.	Parameter Name	Parameter Description	Haz. Mit (SF / ST Only)	Input to Derived Parm	Lower Flight Limit	Source	Upper Flight Limit	Source	Units	Type of Maneuver	Control Room Display Location	Control Room Lead Monitor	Alternative Parameter	Comment
ST/MC	PTFN_PDE1	Total Pressure (Extended Read) (Pitot Stagnation Pressure)	X-57 HR-36	PTFN_PD	N/A	N/A	N/A	N/A	Counts	ST: 211s, Raps, Doublets MC: Air data calibration	Aero	Aero	None	ST since input to KCAS, and KCAS is input to VT_FORCE
ST/MC	PTFN_PSE1	Static Pressure (Extended Read) (Pitot Static Pressure)	X-57 HR-36	PTFN_PS	N/A	N/A	N/A	N/A	Counts	ST: 211s, Raps, Doublets MC: Air data calibration	Aero	Aero	None	ST since input to KCAS, and KCAS is input to VT_FORCE
SF	QLA_DIGOUT	LA CMC Fault Light - digout	X-57 HR-21		Sustained master fault for any reason		Sustained master fault for any reason		discrete	Entire Flight	Flight Systems, Flight Ops	Flight Systems		
SF	QLA_FPGATEMP	LA FPGA Temp	X-57 HR-21				Yellow: 89 C Red 100 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QLA_LVTEMP1	LA Driver Board Temp	X-57 HR-21				Yellow: 89 C Red 100 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QLA_LVTEMP2	LA Vicor Power Supply Temp	X-57 HR-21				Yellow: 74 C Red: 85 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QLA_LVTEMP3	LA CPU Board Temp	X-57 HR-21				Yellow: 74 C Red: 85 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QLA_MSFTEMP1	LA MOSFET 1 Temp	X-57 HR-21				Yellow: 123 C Red: 134 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QLA_MSFTEMP2	LA MOSFET 2 Temp	X-57 HR-21				Yellow: 123 C Red: 134 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QLA_MSFTEMP3	LA MOSFET 3 Temp	X-57 HR-21				Yellow: 123 C Red: 134 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QLA_MWTEMP1	Lt Mtr Winding Temp A1	X-57 HR-21				Yellow: 124 C Red: 135 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		Need 5 of 6 working per motor
SF	QLA_MWTEMP2	Lt Mtr Winding Temp B1	X-57 HR-21				Yellow: 124 C Red: 135 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		Need 5 of 6 working per motor
SF	QLA_MWTEMP3	Lt Mtr Winding Temp C1	X-57 HR-21				Yellow: 124 C Red: 135 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		Need 5 of 6 working per motor
SF	QLB_DIGOUT	LB CMC Fault Light - digout	X-57 HR-21		Sustained master fault for any reason		Sustained master fault for any reason		discrete	Entire Flight	Flight Systems, Flight Ops	Flight Systems		
SF	QLB_FPGATEMP	LB FPGA Temp	X-57 HR-21				Yellow: 89 C Red 100 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QLB_LVTEMP1	LB Driver Board Temp	X-57 HR-21				Yellow: 89 C Red 100 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QLB_LVTEMP2	LB Vicor Power Supply Temp	X-57 HR-21				Yellow: 74 C Red: 85 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QLB_LVTEMP3	LB CPU Board Temp	X-57 HR-21				Yellow: 74 C Red: 85 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QLB_MSFTEMP1	LB MOSFET 1 Temp	X-57 HR-21				Yellow: 123 C Red: 134 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QLB_MSFTEMP2	LB MOSFET 2 Temp	X-57 HR-21				Yellow: 123 C Red: 134 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QLB_MSFTEMP3	LB MOSFET 3 Temp	X-57 HR-21				Yellow: 123 C Red: 134 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QLB_MWTEMP1	Lt Mtr Winding Temp A2	X-57 HR-21				Yellow: 124 C Red: 135 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		Need 5 of 6 working per motor
SF	QLB_MWTEMP2	Lt Mtr Winding Temp B2	X-57 HR-21				Yellow: 124 C Red: 135 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		Need 5 of 6 working per motor
SF	QLB_MWTEMP3	Lt Mtr Winding Temp C2	X-57 HR-21				Yellow: 124 C Red: 135 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		Need 5 of 6 working per motor
SF	QRA_DIGOUT	RA CMC Fault Light - digout	X-57 HR-21		Sustained master fault for any reason		Sustained master fault for any reason		discrete	Entire Flight	Flight Systems, Flight Ops	Flight Systems		
SF	QRA_FPGATEMP	RA FPGA Temp	X-57 HR-21				Yellow: 89 C Red 100 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QRA_LVTEMP1	RA Driver Board Temp	X-57 HR-21				Yellow: 89 C Red 100 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QRA_LVTEMP2	RA Vicor Power Supply Temp	X-57 HR-21				Yellow: 74 C Red: 85 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QRA_LVTEMP3	RA CPU Board Temp	X-57 HR-21				Yellow: 74 C Red: 85 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QRA_MSFTEMP1	RA MOSFET 1 Temp	X-57 HR-21				Yellow: 123 C Red: 134 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QRA_MSFTEMP2	RA MOSFET 2 Temp	X-57 HR-21				Yellow: 123 C Red: 134 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QRA_MSFTEMP3	RA MOSFET 3 Temp	X-57 HR-21				Yellow: 123 C Red: 134 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QRA_MWTEMP1	Rt Mtr Winding Temp A1	X-57 HR-21				Yellow: 124 C Red: 135 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		Need 5 of 6 working per motor
SF	QRA_MWTEMP2	Rt Mtr Winding Temp B1	X-57 HR-21				Yellow: 124 C Red: 135 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		Need 5 of 6 working per motor
SF	QRA_MWTEMP3	Rt Mtr Winding Temp C1	X-57 HR-21				Yellow: 124 C Red: 135 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		Need 5 of 6 working per motor
SF	QRB_DIGOUT	RB CMC Fault Light - digout	X-57 HR-21		Sustained master fault for any reason		Sustained master fault for any reason		discrete	Entire Flight	Flight Systems, Flight Ops	Flight Systems		
SF	QRB_FPGATEMP	RB FPGA Temp	X-57 HR-21				Yellow: 89 C Red 100 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		

X-57 MOD II Telemetered Go/No-Go Parameters

Yellow & Red Limit Definitions	Yellow Limit – Adjust test point to reduce value and ensure Red Limit is not Exceeded Red Limit – Do Not Exceed

				Flight Limit (If Applicable)										
Class.	Parameter Name	Parameter Description	Haz. Mit (SF / ST Only)	Input to Derived Parm	Lower Flight Limit	Source	Upper Flight Limit	Source	Units	Type of Maneuver	Control Room Display Location	Control Room Lead Monitor	Alternative Parameter	Comment
SF	QRB_LVTEMP1	RB Driver Board Temp	X-57 HR-21				Yellow: 89 C Red 100 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QRB_LVTEMP2	RB Vicor Power Supply Temp	X-57 HR-21				Yellow: 74 C Red: 85 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QRB_LVTEMP3	RB CPU Board Temp	X-57 HR-21				Yellow: 74 C Red: 85 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QRB_MSFTEMP1	RB MOSFET 1 Temp	X-57 HR-21				Yellow: 123 C Red: 134 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QRB_MSFTEMP2	RB MOSFET 2 Temp	X-57 HR-21				Yellow: 123 C Red: 134 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QRB_MSFTEMP3	RB MOSFET 3 Temp	X-57 HR-21				Yellow: 123 C Red: 134 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		
SF	QRB_MWTEMP1	Rt Mtr Winding Temp A2	X-57 HR-21				Yellow: 124 C Red: 135 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		Need 5 of 6 working per motor
SF	QRB_MWTEMP2	Rt Mtr Winding Temp B2	X-57 HR-21				Yellow: 124 C Red: 135 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		Need 5 of 6 working per motor
SF	QRB_MWTEMP3	Rt Mtr Winding Temp C2	X-57 HR-21				Yellow: 124 C Red: 135 C	thermal-go-no-go Spreadsheet	deg C	Entire Flight	Flight Systems	Flight Systems		Need 5 of 6 working per motor
MC	RDLC_RPM_D	LH Prop RPM		LT_MTR_RPM_DER					Volts	All	Aero, Flight Controls, Dynamics, Flight Systems	Operations		
MC	RDRC_RPM_D	RH Prop RPM		RT_MTR_RPM_DER					Volts	All	Aero, Flight Controls, Dynamics, Flight Systems	Operations		
MC	SBEV_ASLS	Strain Gauge, Vertical Tail, Aft Spar, Left Surface, (Bending)							microstrain	Beta Sweeps/Wings Level Sideslips	Static Structures	Static Structures	None	
MC	SBEV_ASRS	Strain Gauge, Vertical Tail, Aft Spar, Right Surface, (Bending)							microstrain	Beta Sweeps/Wings Level Sideslips	Static Structures	Static Structures	None	
MC	SBEV_FSLS	Strain Gauge, Vertical Tail, Forward Spar, Left Surface, (Bending)							microstrain	Beta Sweeps/Wings Level Sideslips	Static Structures	Static Structures	None	
MC	SBEV_FSRS	Strain Gauge, Vertical Tail, Forward Spar Right Surface (Bending)							microstrain	Beta Sweeps/Wings Level Sideslips	Static Structures	Static Structures	None	
MC	STEV_APLS	Strain Gauge, Vertical Tail, Aft Panel Section, Left Surface (Torsion)							microstrain	Beta Sweeps/Wings Level Sideslips	Static Structures	Static Structures	None	
MC	STEV_APRS	Strain Gauge, Vertical Tail, Aft Panel Section, Right Surface (Torsion)							microstrain	Beta Sweeps/Wings Level Sideslips	Static Structures	Static Structures	None	
SF	WAF2_APBA	Avionics Power Bus Current Bus A	X-57 HR-21				Yellow: 65 A Red: 70 A	ANLYS-CEPT-020 Mod II Avionics Power Analysis Rev B 20210624	amps	All	Flight Systems, Flight Ops	Flight Systems		Max expected current is 61 A. Hardware limit is 72.4 A when battery voltage is ≤400 V and 87.0 A when battery voltage is >400 V.
SF	WAF2_APBB	Avionics Power Bus Current Bus B	X-57 HR-21				Yellow: 65 A Red: 70 A	ANLYS-CEPT-020 Mod II Avionics Power Analysis Rev B 20210624	amps	All	Flight Systems, Flight Ops	Flight Systems		Max expected current is 61 A. Hardware limit is 72.4 A when battery voltage is ≤400 V and 87.0 A when battery voltage is >400 V.
SF	WAF3_PBLW	Power Bus A\Left Current	X-57 HR-21				Yellow: 100 A Red: 150 A	ANLYS-CEPT-018 X-57 Cruise Motor and High-Lift Motor Mission Profile Power Analysis Rev D 20210412	amps		Flight Systems, Flight Ops	Flight Systems		Max expected current for dual-CMC (nominal) operation is 92 A. Single-CMC Overdrive could draw 143 A while the pilot is stabilizing the aircraft. SAE 50881 analysis and GRC Mod 3 duct COMSOL thermal model estimate hardware limit is 180 A.
SF	WAF3_PBRW	Power Bus A\ Right Current	X-57 HR-21				Yellow: 100 A Red: 150 A	ANLYS-CEPT-018 X-57 Cruise Motor and High-Lift Motor Mission Profile Power Analysis Rev D 20210412	amps		Flight Systems, Flight Ops	Flight Systems		Max expected current for dual-CMC (nominal) operation is 92 A. Single-CMC Overdrive could draw 143 A while the pilot is stabilizing the aircraft. SAE 50881 analysis and GRC Mod 3 duct COMSOL thermal model estimate hardware limit is 180 A.
SF	WAF4_PBLW	Power Bus B\Left Current	X-57 HR-21				Yellow: 100 A Red: 150 A	ANLYS-CEPT-018 X-57 Cruise Motor and High-Lift Motor Mission Profile Power Analysis Rev D 20210412	amps		Flight Systems, Flight Ops	Flight Systems		Max expected current for dual-CMC (nominal) operation is 92 A. Single-CMC Overdrive could draw 143 A while the pilot is stabilizing the aircraft. SAE 50881 analysis and GRC Mod 3 duct COMSOL thermal model estimate hardware limit is 180 A.

X-57 MOD II Telemetered Go/No-Go Parameters

Yellow & Red Limit Definitions	Yellow Limit – Adjust test point to reduce value and ensure Red Limit is not Exceeded Red Limit – Do Not Exceed

					Flight Limit (If Applicable)										
Class.	Parameter Name	Parameter Description	Haz. Mit (SF / ST Only)	Input to Derived Parm	Lower Flight Limit	Source	Upper Flight Limit	Source	Units	Type of Maneuver	Control Room Display Location	Control Room Lead Monitor	Alternative Parameter	Comment
SF	WAF4_PBRW	Power Bus B\ Right Current	X-57 HR-21				Yellow: 100 A Red: 150 A	ANLYS-CEPT-018 X-57 Cruise Motor and High-Lift Motor Mission Profile Power Analysis Rev D 20210412	amps		Flight Systems, Flight Ops	Flight Systems		Max expected current for dual-CMC (nominal) operation is 92 A. Single-CMC Overdrive could draw 143 A while the pilot is stabilizing the aircraft. SAE 50881 analysis and GRC Mod 3 duct COMSOL thermal model estimate hardware limit is 180 A.
SF	WVF2_APBA	Avionics Power Bus Voltage Bus A	X-57 HR-21		11.5 V	ICD-CEPT-006	14.6 V	ICD-CEPT-006	volts	All	Flight Systems, Flight Ops	Flight Systems		Cockpit indication will be Red above 15.5V, yellow between 11.5V and 15.5V, and Green below
SF	WVF2_APBB	Avionics Power Bus Voltage Bus B	X-57 HR-21		11.5 V	ICD-CEPT-006	14.6 V	ICD-CEPT-006	volts	All	Flight Systems, Flight Ops	Flight Systems		Cockpit indication will be Red above 15.5V, yellow between 11.5V and 15.5V, and Green below
SF	WVF3_PBLW	Power Bus A\Left Voltage	X-57 HR-21		Yellow: 350 Red: 320	See Note	537.6	Battery System User's Manual and Safety Instructions	volts		Flight Systems, Flight Ops	Flight Systems		Yellow is the Traction Battery Low Voltage Warning in the cockpit per ICD-CEPT-006. Red Limit is the Battery System Discharge cut-off voltage per the battery system User's Manual and Safety Instructions.
SF	WVF3_PBRW	Power Bus A\ Right Voltage	X-57 HR-21		Yellow: 350 Red: 320	See Note	537.6	Battery System User's Manual and Safety Instructions	volts		Flight Systems, Flight Ops	Flight Systems		Yellow is the Traction Battery Low Voltage Warning in the cockpit per ICD-CEPT-006. Red Limit is the Battery System Discharge cut-off voltage per the battery system User's Manual and Safety Instructions.
SF	WVF4_PBLW	Power Bus B\ Left Voltage	X-57 HR-21		Yellow: 350 Red: 320	See Note	537.6	Battery System User's Manual and Safety Instructions	volts		Flight Systems, Flight Ops	Flight Systems		Yellow is the Traction Battery Low Voltage Warning in the cockpit per ICD-CEPT-006. Red Limit is the Battery System Discharge cut-off voltage per the battery system User's Manual and Safety Instructions.
SF	WVF4_PBRW	Power Bus B\ Right Voltage	X-57 HR-21		Yellow: 350 Red: 320	See Note	537.6	Battery System User's Manual and Safety Instructions	volts		Flight Systems, Flight Ops	Flight Systems		Yellow is the Traction Battery Low Voltage Warning in the cockpit per ICD-CEPT-006. Red Limit is the Battery System Discharge cut-off voltage per the battery system User's Manual and Safety Instructions.

X-57 MOD II Derived Go/No-Go & Mission Critical Parameters

Yellow & Red Limit Definitions	Yellow Limit – Adjust test point to reduce value and ensure Red Limit is not Exceeded Red Limit – Do Not Exceed

						Flight Limit (If Applicable)									
Class.	**Derived Parameter**	**Parameter Description**	**Haz. Mit (SF / ST Only)**	**Uses input Parms**	**Input to Derived Parm**	**Lower Flight Limit**	**Source**	**Upper Flight Limit**	**Source**	**Units**	**Type of Maneuver**	**Control Room Display Location**	**Control Room Lead Monitor**	**Alternative Parameter**	**Comment**
ST/MC	ALPHA	Calibrated angle of attack	X-57 HR-36	DVFN_AOA	VT_FORCE					deg	ST: 211s, Raps, Doublets MC: Air data calibration, Flying Qualities	Aero, Controls, Dynamics	Aero		No limit for this derived parameter since it feeds VT_FORCE, which is where a limit is set.
MC	AX_IMU_CORR	X-axis acceleration				Ground: -0.23 Landing: N/A Flight: TBD	X-57_Mod2_LandingGear_WingLoads_ANLYS-CEPT-007 Rev A.pdf	Ground: 0.23 Landing: N/A Flight: TBD	X-57_Mod2_LandingGear_WingLoads_ANLYS-CEPT-007 Rev A.pdf	g	PID	Aero, Controls	Aero		If limit exceeded, gear inspection required before next flight.
MC	AY_IMU_CORR	Y-axis acceleration				Ground: -0.44 Landing: -0.63 Flight: -1.33	X-57_Mod2_LandingGear_WingLoads_ANLYS-CEPT-007 Rev A.pdf	Ground: 0.44 Landing: N/A Flight: 1.33	X-57_Mod2_LandingGear_WingLoads_ANLYS-CEPT-007 Rev A.pdf	g	PID	Aero, Controls	Aero		If limit exceeded, gear inspection required before next flight.
SF	AZ_IMU_CORR	Z-axis acceleration	X-57 HR-35		NZ_IMU_CORR					g	PID	Aero, Controls	Aero		
ST/MC	BETA	Calibrated angle of sideslip	X-57 HR-36	DVFN_AOS	VT_FORCE					deg	ST: 211s, Raps, Doublets MC: Air data calibration, Flying Qualities, RAPs	Aero, Controls, Dynamics	Aero		No limit for this derived parameter since it feeds VT_FORCE, which is where a limit is set.
MC	HP	Pressure Altitude								ft	Entire flight	All	Aero		
ST/MC	KCAS	Calibrated Air Speed	X-57 HR-36	PTFN_PD, PTFN_PS	VT_FORCE					knots	ST: 211s, Raps, Doublets	Aero, Structures, Dynamics	Aero		No limit for this derived parameter since it feeds VT_FORCE, which is where a limit is set.
MC	KTAS	True Air speed		PTFN_PD, PTFN_PS, MI						knots	All	Aero	Aero		
MC	LT_MTR_RPM_DER	Derived Revolutions Per Minute						Red: 3081 RPM	ICD-CEPT-006 - Cockpit ICD	RPM	All	Aero, Flight Controls, Dynamics, Flight Systems	Operations		Above 3080 RPM, consult MT Prop tables for post-flight inspection requirements.
MC	MI	Mach Number								n/a			Aero		
MC	NAV_ALT	NAV altitude								m	Air data calibration	Aero, Controls	Aero		
MC	NAV_DWN	Down velocity				-2.13 m/s	X-57_Mod2_LandingGear_WingLoad	N/A	X-57_Mod2_LandingGear_Wing	m/s	Landing, Air data calibration/ PID	Aero, Controls, Structures	Controls		
MC	NAV_EAS	East velocity								m/s	Air data calibration/ PID	Aero	Aero		
MC	NAV_HDN	Heading angle								deg	Air data calibration/ PID	Aero, Controls	Aero		
MC	NAV_NOR	North velocity								m/s	Air data calibration/ PID	Aero	Aero		
MC	NAV_PIT	Pitch angle								deg	Air data calibration/ PID	Aero, Controls	Aero		
MC	NAV_PTR	Pitch rate								deg/s	Air data calibration/ PID	Aero, Controls	Aero		
MC	NAV_RLR	Roll rate								deg/s	Air data calibration/ PID	Aero, Controls	Aero		
MC	NAV_ROL	Roll angle								deg	Air data calibration/ PID	Aero, Controls	Aero		
MC	NAV_YWR	Yaw rate								deg/s	Air data calibration/ PID	Aero, Controls	Aero		
SF	NZ_IMU_CORR	Nz	X-57 HR-35			Sym Flt: -1.29 - KIO at -1.1 Asym Flt: -1.29 - KIO at -1.1 Flaps Ext: 0.0	X-57_Mod2_LandingGear_WingLoads_ANLYS-CEPT-007 Rev A.pdf	Landing: 2 Sym Flt: 2.4 - KIO at 2 Asym Flt: 2.1 - KIO at 1.8 Flaps Ext: 1.7 - KIO at 1.4	X-57_Mod2_LandingGear_WingLoads_ANLYS-CEPT-007 Rev A.pdf	g	Entire Flight	Aero, Controls, Statics Structures, Ops	Static Structures		If limit exceeded, inspection required before next flight. KIO limit for test point is 85% of limit. i.e. WUT Nz limit = 1.8g
ST/MC	PTFN_PD	Pitot Stagnation Pressure	X-57 HR-36	PTFN_0PD, PTFN_PDE1	KCAS, KTAS, VT_FORCE					psi	ST: 211s, Raps, Doublets MC: Air data calibration	Aero, Controls	Aero		No limit for this derived parameter since it feeds VT_FORCE, which is where a limit is set.
ST/MC	PTFN_PS	Pitot Static Pressure	X-57 HR-36	PTFN_0PS, PTFN_PSE1	KCAS, KTAS, VT_FORCE					psi	ST: 211s, Raps, Doublets MC: Air data calibration	Aero, Controls	Aero		No limit for this derived parameter since it feeds VT_FORCE, which is where a limit is set.
ST/MC	QBAR	Dynamic Pressure	X-57 HR-36	PTFN_PD, PTFN_PS	VT_FORCE					psf	ST: 211s, Raps, Doublets MC: All Else		Aero		
MC	RT_MTR_RPM_DER	Derived Revolutions Per Minute						Red: 3081 RPM	ICD-CEPT-006 - Cockpit ICD	RPM	All	Aero, Flight Controls, Dynamics, Flight Systems	Operations		Above 3080 RPM, consult MT Prop tables for post-flight inspection requirements.

X-57 MOD II Derived Go/No-Go & Mission Critical Parameters

Yellow & Red Limit Definitions	Yellow Limit – Adjust test point to reduce value and ensure Red Limit is not Exceeded Red Limit – Do Not Exceed

						Flight Limit (If Applicable)									
Class.	**Derived Parameter**	**Parameter Description**	**Haz. Mit (SF / ST Only)**	**Uses input Parms**	**Input to Derived Parm**	**Lower Flight Limit**	**Source**	**Upper Flight Limit**	**Source**	**Units**	**Type of Maneuver**	**Control Room Display Location**	**Control Room Lead Monitor**	**Alternative Parameter**	**Comment**
ST	VT_FORCE	Vertical Tail Side Force (+Right)	X-57 HR-36	DVFN_AOA, DVFN_AOS, QBAR, DCFC_RUD		KO at -498 RTB at -623	See Comment	KO at 498 RTB at 623	See Comment	lbf	2-1-1s, Yaw Doublets, Raps	Static Structures	Static Structures		Knock it off limit set at 80% of Design Limit. MEMCEPT-009, 7/21/21 RTB limit set to be Design Limit. Aircraft P2006T Report No. 2006/011 Flight Loads, 17th Jan 2009.

X-57 MOD II Go/No-Go Parameters: Deleted List

						Flight Limit (If Applicable)									
Class.	Derived Parameter	Parameter Description	Hazard Mitigation (Safety of Flight or Safety of Test Only)	Uses input Parms	Input to Derived Parm	Lower Flight Limit	Source	Upper Flight Limit	Source	Units	Type of Maneuver	Control Room Parm Display Location	Control Room Lead Monitor	Alternative Parameter	Comment