



National Aeronautics and
Space Administration

Armstrong Flight Research Center
Edwards, CA 93523-0273

X-57

Maxwell

Mod II Go/No-Go Parameter List

OPS-CEPT-001

Release: - Date: September 27, 2022

Prepared By:

Ethan Baumann / AFRC 510 Date
X-57 Project Chief Engineer

Approved By:

Heather Maliska / AFRC 310 Date
X-57 Project Manager

Brennan Wehr / AFRC 430 Date
X-57 Project Operations Lead

Tim Williams / AFRC 410 Date
X-57 Project Pilot



Approved By:

Mike Frederick / AFRC 520 Date
AFRC X-57 Aerodynamics Lead

James Reynolds / AFRC 530 Date
X-57 Controls IPT Lead

Joe Hernandez / AFRC 550 Date
AFRC X-57 Instrumentation Lead

Otto Schnarr / AFRC 550 Date
AFRC X-57 Flight Systems Lead

Wesley Li / AFRC 560 Date
AFRC X-57 Static Structures Lead

Keerti Bhamidipati / AFRC 560 Date
AFRC X-57 Dynamic Structures Lead

Sean Clarke / AFRC 540 Date
X-57 Power and Command IPT Lead

Jeff Viken / LaRC E403 Date
X-57 Wing IPT Lead

Nick Borer / LaRC E403 Date
X-57 Performance & Sizing IPT Lead

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

Revision History

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

- 1 Purpose 5
- 2 Scope 5
- 3 Managing Go/No-Go Parameters 5
- 4 X-57 MOD II Go/No-Go Parameter Categories 5
- 5 Summary of the X-57 MOD II Go/No-Go Parameters 7
- 6 X-57 MOD II Telemetered, Derived, and Deleted Go/No-Go Parameters 8

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.

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

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.”

| Parameter Type | Classification | | | |
|--|-----------------------|--------------------------------|-----------------------|-----------------|
| | Safety of Flight (SF) | Safety of Test (ST) | Mission Critical (MC) | Not Telemetered |
| Lead Monitor | | | | |
| Aerodynamics | | | | |
| Flight Controls | | | | |
| Dynamics | | | | |
| Flight Systems | | | | |
| Static Structures | | | | |
| Operations | | | | |
| 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 | | | |
| Vertical 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 |
|---|--|

| Class | Parameter Name | Parameter Description | Haz. Mit (SF / ST Only) | Flight Limit (If Applicable) | | | | | Units | Type of Maneuver | Control Room Display Location | Control Room Lead Monitor | Alternative Parameter | Comment |
|-------|----------------|--|-------------------------|------------------------------|---------------------------------------|--|---------------------------------------|--|-------|-------------------------------------|-------------------------------|---------------------------|-----------------------|---|
| | | | | Input to Derived Parm | Lower Flight Limit | Source | Upper Flight Limit | Source | | | | | | |
| 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 accel 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 accel 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 accel 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 accel 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_FTYG | |
| MC | ADEV_FTYG | 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_Cellvoltage | 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_Cellvoltage | 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 |
|--------------------------------|--|

| Class | Parameter Name | Parameter Description | Haz. Mit (SF / ST Only) | Flight Limit (If Applicable) | | | | | Units | Type of Maneuver | Control Room Display Location | Control Room Lead Monitor | Alternative Parameter | Comment |
|-------|-----------------|---------------------------------------|-------------------------|------------------------------|---|--|---------------------------|---|----------|------------------|-------------------------------|---------------------------|-------------------------------|---|
| | | | | Input to Derived Parm | Lower Flight Limit | Source | Upper Flight Limit | Source | | | | | | |
| 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 |
|---|--|

| Class | Parameter Name | Parameter Description | Haz. Mit (SF / ST Only) | Flight Limit (If Applicable) | | | | | Units | Type of Maneuver | Control Room Display Location | Control Room Lead Monitor | Alternative Parameter | Comment |
|-------|----------------|---|-------------------------|------------------------------|--|-----------------|---|------------------------------|----------|---|--|--|-------------------------------|---|
| | | | | Input to Derived Parm | Lower Flight Limit | Source | Upper Flight Limit | Source | | | | | | |
| 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, RAs | Flight Controls, Aero, Dynamics, Ops | Flight Controls | None | |
| MC | DFC_ELE | Stabilator Deflection | | | Up 4 +/-2 | POH | Down 15 +/-2 | POH | deg | Flying Qualities, PID, RAs | Flight Controls, Aero, Dynamics, Ops | Flight Controls | None | |
| MC | DFC_ELT | Stabilator Trim Deflection | | | Up 2 +/-2 | POH | Down 19 +/-2 | POH | deg | All | Flight Controls, Aero | Flight Controls | None | |
| MC | DFC_FLA | Flap Deflection | | | 0 | POH | 40 | POH | deg | All | Flight Controls, Aero | Flight Controls | None | |
| ST/MC | DFC_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 | DCF_T_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, RAs | 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, RAs | 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 | |

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 |
|---|--|

| Class | Parameter Name | Parameter Description | Haz. Mit (SF / ST Only) | Flight Limit (if Applicable) | | | | | Units | Type of Maneuver | Control Room Display Location | Control Room Lead Monitor | Alternative Parameter | Comment |
|-------|----------------|--|-------------------------|------------------------------|--------------------|-----------------|--------------------|-----------------|----------|--|---|---------------------------|-----------------------|---|
| | | | | Input to Derived Parm | Lower Flight Limit | Source | Upper Flight Limit | Source | | | | | | |
| 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_OPD | 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_OPS | 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 |
|--------------------------------|--|

| Class | Parameter Name | Parameter Description | Haz. Mit (SF / ST Only) | Input to Derived Parm | Flight Limit (If Applicable) | | | | Units | Type of Maneuver | Control Room Display Location | Control Room Lead Monitor | Alternative Parameter | Comment |
|-------|----------------|--|-------------------------|-----------------------|---------------------------------------|--------|---------------------------------------|------------------------------|----------|--|-------------------------------|---------------------------|-----------------------|---|
| | | | | | Lower Flight Limit | Source | Upper Flight Limit | Source | | | | | | |
| 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_MSFTMP1 | 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_MSFTMP2 | 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_MSFTMP3 | 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_MSFTMP1 | 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_MSFTMP2 | 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_MSFTMP3 | 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_MSFTMP1 | 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_MSFTMP2 | 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_MSFTMP3 | 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 |
|--------------------------------|--|

| Class | Parameter Name | Parameter Description | Haz. Mit (SF / ST Only) | Flight Limit (If Applicable) | | | | | Units | Type of Maneuver | Control Room Display Location | Control Room Lead Monitor | Alternative Parameter | Comment |
|-------|----------------|---|-------------------------|------------------------------|--------------------|--------|-----------------------------|--|-------------|-----------------------------------|---|---------------------------|-----------------------|--|
| | | | | Input to Derived Parm | Lower Flight Limit | Source | Upper Flight Limit | Source | | | | | | |
| 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 |
|---|--|

| Class | Parameter Name | Parameter Description | Haz. Mit (SF / ST Only) | Input to Derived Parm | Flight Limit (if Applicable) | | | Source | Units | Type of Maneuver | Control Room Display Location | Control Room Lead Monitor | Alternative Parameter | Comment |
|-------|----------------|----------------------------------|-------------------------|-----------------------|------------------------------|--------------------|--|--------|--|------------------|-------------------------------|----------------------------|-----------------------|--|
| | | | | | Lower Flight Limit | Upper Flight Limit | Source | | | | | | | |
| SF | WAF4_PBRW | Power Bus B\ Right Current | X-57 HR-21 | | | | 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 |
|---|--|

| Class | Derived Parameter | Parameter Description | Haz. Mit (SF / ST Only) | Uses input Parms | Input to Derived Parm | Flight Limit (If Applicable) | | | | Units | Type of Maneuver | Control Room Display Location | Control Room Lead Monitor | Alternative Parameter | Comment |
|-------|-------------------|--------------------------------|-------------------------|----------------------|-----------------------|---|--|--|--|-------|--|---|---------------------------|-----------------------|--|
| | | | | | | Lower Flight Limit | Source | Upper Flight Limit | Source | | | | | | |
| 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 | 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_WingLoads_ANLYS-CEPT-007 Rev A.pdf | N/A | X-57_Mod2_LandingGear_WingLoads_ANLYS-CEPT-007 Rev A.pdf | 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 Fit: -1.29 - KIO at -1.1 Asym Fit: -1.29 - KIO at -1.1 Flaps Ext: 0.0 | X-57_Mod2_LandingGear_WingLoads_ANLYS-CEPT-007 Rev A.pdf | Landing: 2 Sym Fit: 2.4 - KIO at 2 Asym Fit: 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, Static 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_OPD, 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_OPS, 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 |
|---|--|

| Class | Derived Parameter | Parameter Description | Haz. Mit (SF / ST Only) | Uses input Parm | Input to Derived Parm | Flight Limit (If Applicable) | | | | | Type of Maneuver | Control Room Display Location | Control Room Lead Monitor | Alternative Parameter | Comment |
|-------|-------------------|-----------------------------------|-------------------------|------------------------------------|-----------------------|------------------------------|-------------|-------------------------|-------------|-------|----------------------------|-------------------------------|---------------------------|-----------------------|--|
| | | | | | | Lower Flight Limit | Source | Upper Flight Limit | Source | Units | | | | | |
| 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. MEM CEPT-009, 7/21/21 RTB limit set to be Design Limit. Aircraft P2006T Report No. 2006/011 Flight Loads, 17th Jan 2009. |

