***\*Notice:***

***This file is an example based on generic satellite design and does not guarantee to be approved on the review process for launch or deployment. In accordance with design of each satellite, this document may have to be changed. Details of this template are subject to change without notice. Please change YELLOW sentence according to each satellite.***

***(本文書は標準的な設計の衛星を想定した一例であり、打上げ・放出のための審査プロセスでの承認を保証しているものではありません。各衛星の設計によって内容を変更する必要があります。また、本テンプレートの内容は予告なく変更される場合があります。黄色の箇所を各衛星に応じて変更してください。)***

[Satellite Name]

FM Assembly Procedure

Initial Release: DD/MM/YYYY

[Project Team Name]

Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| Version | Date | Writer | Annotations |
| 1 | DD/MM/YYYY | XXX | Initial Release |
| 1.1 |  |  |  |
| 1.2 |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

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# **Purpose**

This document is an assembly procedure of [Satellite Name] which describes an assembly sequence and a physical inspection to verify the requirement.

# **Applicable Document**

1. JX-ESPC-101132-C JEM Payload Accommodation Handbook-Vol.8-

Small Satellite Deployment Interface Control Document

1. [Document Number] Structure Fracture Control Evaluation Form for

Small Satellite deployed from J-SSOD

1. [Document Number] [Satellite Name] Flight Safety Assessment Report

for phase XXX

1. [Document Number] J-SSOD & [Satellite Name] Interface Verification Record

# **Test Objective**

1. The flight satellite shall be assembled in accordance with this procedure. And the result during assembly shall be recorded.
2. According to the Interface Verification Record, all verification value for the interface requirement shall be obtained.
3. The all screws which uses for the satellite shall be same as ones selected at design phase.
4. All screws shall be tightened with appropriate torque. And apply torque mark to the screws to be able to find looseness after assembly.
5. A compound used as secondary locking feature, such as Loctite, shall be applied in accordance with proper procedure provided by manufacturer. Also, if the compound must be removed, the work shall be conducted in accordance with proper procedure.
6. If satellite has deployable mechanism, strings used for holding the deployable mechanism shall be tightened with proper knotting method.
7. If any deployable components contact the inside wall of the J-SSOD Satellite Install Case in their unintentional deployment, the contact surface of the deployable components shall have more than 1mm thickness.

# **Satellite Information**

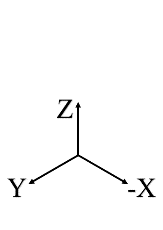
 

Figure 3-1. [Satellite Name]

# **General Requirement**

1. The handling of the satellite must wear a clean glove.
2. Don't let oil and fats etc. adhere to Flight Hardware. Moreover, when you adhere, wipe off well in IPA or ethanol.
3. After removing the connector, protect it with a dust cap, a plastic bag and the like.
4. Confirm that there is no anomaly, such as a bend of a pin, rust, places coming-off, adhesion of a foreign object, and deformation of the socket and pin, by visual check before attaching the connector.
5. Before attachment of the connector, confirm that there is no anomaly in the connecting surface, the phase of a plug-receptacle, and joint and separation of the connector. After a dust removal spray removes dust, combine combination of a connector.
6. If a bend of the pin is found before attaching the connector, stop the joint work and inform the appropriate personnel promptly.
7. When providing power to the flight module, confirm that it is in good working order by monitoring the voltage and current.
8. Before using measuring and test equipment, confirm that it is within term of validity, and warm it up enough to be stabilized.
9. In measuring resistance, use the equipment that serves its purpose.
10. When connecting a test cable to the connector of the flight hardware for a conduction/insulation-check, don't pull or twist the connector the flight hardware.
11. Naked terminals must be insulated in order to prevent short-circuit.
12. When handling the items subject to ESD, use a wrist stat in order to prevent damage caused by static electricity.
13. Before connecting the flight hardware (including functional parts), check each joint surface and confirm that there is no anomaly, such as a dent, crack etc.
14. When carrying the flight hardware, check in advance that there is no level difference of a passage etc.
15. Handle all equipment carefully. Be careful not to do damage on them.
16. Before moving equipment, confirm that surrounding obstacles have been taken away and that there is no obstacle.
17. When performing the following important tasks in assembling or adjusting work, the name or initial of the workers must be recorded in the procedure document.
18. Making torque
19. Installing flight parts
20. Doing other works that influence the flight hardware.
21. The tapes used for the flight hardware must be those with which the glue does not remain when removing the tapes (a plastic tape, a kapton tape, etc.).
22. When tightening bolts, nuts B-nuts, fittings etc. with torque, the torque setup value and torque wrench No. must be recorded in the procedure document.
23. In a clean room, wear the working clothes, a cap, shoes, gloves and a mask for clean room only when you get in clean work area.
24. Record every change in the hook-up, condition of flight hardware and testing conditions in the form of photographs and video.
25. Leave on record the type and tool number of the measuring equipment which were actually used.
26. Report the details of the anomaly to the task conductor immediately.

# **Parts List**

Table 6-1. Flight Parts List

| No. | Part Name | Part Number | Qty | Check |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Table 6-2. Consumable List

| No. | Part Name | Part Number | Qty | Check |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

# **Measurement Instrument**

Table 7-1. Instrument List

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Part Name | Part Number | Calibration Due Date | Check |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

# **Assembly Procedure**

Assembly Date : YYYY/MM/DD - YYYY/MM/DD

Assembly Personnel : XXXXXX

Inspector : XXXXXX

**Assembly Procedure**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Step No. | Procedure | Requirement | Record | Check |
| 1 | * ***Please describe assembly procedure step by step*** * ***Please add picture or CG if provided*** * ***Clarify which value or photo to be recorded*** * ***English is recommended*** * ***Check mark is inputted by a person other than the person who assemble*** | ***Please add requirement in accordance your design.*** | ***Please fill record. If some steps do not require record, please input “-”.*** |  |
| 2 | <Example>  Attach +Z panel to the main structure with the following screws.   * BOX-SFB3-10 x 4 pieces | BOX-SFB3-10  Torque: 0.63 [Nm] | BOX-SFB3-10  Torque: 0.63 [Nm] | ✓  ✓ |
| 3 | <Example>  Apply torque marks to the tighten screws (4) on the +Z panel | Check all torque marks | Checked | ✓ |

**Final Inspection Record**

| **No.** | **Item** | | | |  | | **Results** | |  | | | **Requirement** | **Check** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **<< Mechanical Interface >>** | | | | |  | |  | |  | | |  |  |
| **2.** | **Width in -Z Plane** | | | |  | |  | |  | | |  |  |
|  | a. | +X Plane | | |  | | mm | |  | | | 100.0+/-0.1mm |  |
|  | b. | +Y Plane | | |  | | mm | |  | | |  |
|  | c. | -X Plane | | |  | | mm | |  | | |  |
|  | d. | -Y Plane | | |  | | mm | |  | | |  |
|  |  |  | | |  | |  | |  | | |  |  |
| **3.** | **Width in +Z Plane** | | | |  | |  | |  | | |  |  |
|  | a. | +X Plane | | |  | | mm | |  | | | 100.0+/-0.1mm |  |
|  | b. | +Y Plane | | |  | | mm | |  | | |  |
|  | c. | -X Plane | | |  | | mm | |  | | |  |
|  | d. | -Y Plane | | |  | | mm | |  | | |  |
|  |  |  | | |  | |  | |  | | |  |  |
| **4.** | **Rails Length** | | | |  | |  | |  | | |  |  |
|  | a. | Rail 1 | | |  | | mm (S/W or Spring) | |  | | | [For Deployment S/W ] [For Separation Spring ]  113.5+/-0.1mm (1U) 111.5+/-0.1mm (1U)  227.0+/-0.1mm (2U) 225.0+/-0.1mm (2U)  340.5+/-0.3mm (3U) 340.5+/-0.3mm (3U)  340.5+/-0.3mm (6U) 340.5+/-0.3mm (6U)  or or  366.0+/-0.3mm (6U) 366.0+/-0.3mm (6U) |  |
|  | b. | Rail 2 | | |  | | mm (S/W or Spring) | |  | | |  |
|  | c. | Rail 3 | | |  | | mm (S/W or Spring) | |  | | |  |
|  | d. | Rail 4 | | |  | | mm (S/W or Spring) | |  | | |  |
|  |  |  | | |  | |  | |  | | |  |  |
| **5.** | **Rails Width** | | | |  | |  | |  | | |  |  |
|  | a. | Rail 1 | | |  | | x mm | |  | | | Min 8.5 x 8.5 mm |  |
|  | b. | Rail 2 | | |  | | x mm | |  | | |  |
|  | c. | Rail 3 | | |  | | x mm | |  | | |  |
|  | d. | Rail 4 | | |  | | x mm | |  | | |  |
|  |  |  | | |  | |  | |  | | |  |  |
| **7.** | **Rails Edges Rounding** | | | |  | |  | |  | | |  |  |
|  | a. | Rail 1 | | |  | | OK / NG | |  | | | Min R1 mm  or  Min C1 mm |  |
|  | b. | Rail 2 | | |  | | OK / NG | |  | | |  |
|  | c. | Rail 3 | | |  | | OK / NG | |  | | |  |
|  | d. | Rail 4 | | |  | | OK / NG | |  | | |  |
|  |  |  | | |  | |  | |  | | |  |  |
| **8.** | **Rails Surface Area (+Z Plane)** | | | | | |  | |  | | |  |  |
|  | a. | Rail 1 | | |  | | mm | |  | | | Min 6.5 x 6.5 mm |  |
|  | b. | Rail 2 | | |  | | mm | |  | | |  |
|  | c. | Rail 3 | | |  | | mm | |  | | |  |
|  | d. | Rail 4 | | |  | | mm | |  | | |  |
|  |  |  | | |  | |  | |  | | |  |  |
| **9.** | **Rails Contact Length with J-SSOD Rail Guides** | | | | | |  | |  | | |  |  |
|  | a. | Rail 1, +X | | |  | | mm | |  | | | ≧ 85.1mm (1U) ≧ 170.3mm (2U) ≧ 255.4mm (3U, 6U(+Z:340.5mm))  ≧ 274.5mm (6U(+Z:366.0mm)) |  |
|  | b. | Rail 1, -Y | | |  | | mm | |  | | |  |
|  | c. | Rail 2, -Y | | |  | | mm | |  | | |  |
|  | d. | Rail 2, -X | | |  | | mm | |  | | |  |
|  | e. | Rail 3, -X | | |  | | mm | |  | | |  |
|  | f. | Rail 3, +Y | | |  | | mm | |  | | |  |
|  | g. | Rail 4, +Y | | |  | | mm | |  | | |  |
|  | h. | Rail 4, +X | | |  | | mm | |  | | |  |
|  |  |  | | |  | |  | |  | | |  |  |
| **11.** | **Clearance between Rail Edges & Main Structure (Z direction)** | | | | | | |  |  | |  | |  |
|  | a. | | Rail 1, +Z | |  | | | mm |  | | ≧ 7mm | |  |
|  | b. | | Rail 2, +Z | |  | | | mm |  | |  |
|  | c. | | Rail 3, +Z | |  | | | mm |  | |  |
|  | d. | | Rail 4, +Z | |  | | | mm |  | |  |
|  | e. | | Rail 1, -Z | |  | | | mm |  | | ≧ 6.5mm | |  |
|  | f. | | Rail 2, -Z | |  | | | mm |  | |  |
|  | g. | | Rail 3, -Z | |  | | | mm |  | |  |
|  | h. | | Rail 4, -Z | |  | | | mm |  | |  |
|  |  | |  | |  | | |  |  | |  | |  |
| **12.** | **Rails Perpendicularity against +Z Plane** | | | | | | |  |  | |  | |  |
|  | a. | | Rail 1, +X | |  | | | OK / NG |  | | ≦ 0.2mm | |  |
|  | b. | | Rail 1, -Y | |  | | | OK / NG |  | |  |
|  | c. | | Rail 2, -Y | |  | | | OK / NG |  | |  |
|  | d. | | Rail 2, -X | |  | | | OK / NG |  | |  |
|  | e. | | Rail 3, -X | |  | | | OK / NG |  | |  |
|  | f. | | Rail 3, +Y | |  | | | OK / NG |  | |  |
|  | g. | | Rail 4, +Y | |  | | | OK / NG |  | |  |
|  | h. | | Rail 4, +X | |  | | | OK / NG |  | |  |
|  |  | |  | |  | | |  |  | |  | |  |
| **11.** | **Clearance between Rail Edges & Main Structure (Z direction)** | | | | | | |  |  | |  | |  |
|  | a. | | Rail 1, +Z | |  | | | mm |  | | ≧ 7mm | |  |
|  | b. | | Rail 2, +Z | |  | | | mm |  | |  |
|  | c. | | Rail 3, +Z | |  | | | mm |  | |  |
|  | d. | | Rail 4, +Z | |  | | | mm |  | |  |
|  | e. | | Rail 1, -Z | |  | | | mm |  | | ≧ 6.5mm | |  |
|  | f. | | Rail 2, -Z | |  | | | mm |  | |  |
|  | g. | | Rail 3, -Z | |  | | | mm |  | |  |
|  | h. | | Rail 4, -Z | |  | | | mm |  | |  |
|  |  | |  | |  | | |  |  | |  | |  |
| **12.** | **Rails Perpendicularity against +Z Plane** | | | | | | |  |  | |  | |  |
|  | a. | | Rail 1, +X | |  | | | OK / NG |  | | ≦ 0.2mm | |  |
|  | b. | | Rail 1, -Y | |  | | | OK / NG |  | |  |
|  | c. | | Rail 2, -Y | |  | | | OK / NG |  | |  |
|  | d. | | Rail 2, -X | |  | | | OK / NG |  | |  |
|  | e. | | Rail 3, -X | |  | | | OK / NG |  | |  |
|  | f. | | Rail 3, +Y | |  | | | OK / NG |  | |  |
|  | g. | | Rail 4, +Y | |  | | | OK / NG |  | |  |
|  | h. | | Rail 4, +X | |  | | | OK / NG |  | |  |
|  |  | |  | |  | | |  |  | |  | |  |
| **13.** | **Rails Perpendicularity against +Y Plane** | | | | | | |  |  | |  | |  |
|  | a. | | Rail 1, +X | |  | | | OK / NG |  | | ≦ 0.2mm | |  |
|  | b. | | Rail 2, -X | |  | | | OK / NG |  | |  |
|  | c. | | Rail 3, -X | |  | | | OK / NG |  | |  |
|  | d. | | Rail 4, +X | |  | | | OK / NG |  | |  |
|  |  | |  | |  | | |  |  | |  | |  |
| **14.** | **Rails Parallelism to +Y Plane** | | | | | | |  |  | |  | |  |
|  | a. | | Rail 1, -Y | |  | | | OK / NG |  | | ≦ 0.2mm | |  |
|  | b. | | Rail 2, -Y | |  | | | OK / NG |  | |  |
|  |  | |  | |  | | |  |  | |  | |  |
| **15.** | **Rail Edges Flatness on +Z Plane** | | | |  | | |  |  | |  | |  |
|  | a. | | Rail 1 | |  | | | OK / NG |  | | ≦ 0.2mm | |  |
|  | b. | | Rail 2 | |  | | | OK / NG |  | |  |
|  | c. | | Rail 3 | |  | | | OK / NG |  | |  |
|  | d. | | Rail 4 | |  | | | OK / NG |  | |  |
|  |  | |  | |  | | |  |  | |  | |  |
| **16.** | **Envelope (\*2)** | | | | *(\*2) Dynamic deformation shall be considered.* | | | | | | | |  |
|  | a. | | +X Plane | |  | | | mm |  | | ≦ 6.5mm | |  |
|  | b. | | +Y Plane | |  | | | mm |  | |  |
|  | c. | | -X Plane | |  | | | mm |  | |  |
|  | d. | | -Y Plane | |  | | | mm |  | |  |
|  | e. | | +Z Plane | |  | | | mm |  | | ≧ 0.5mm from rail surfaces (+Z). | |  |
|  |  |
|  | f. | | -Z Plane | |  | | | OK / NG |  | | No protrusion from rail surfaces (-Z). | |  |
|  |  |
|  | g. | | Constraints on deployable components | |  | | | OK / NG |  | | Any deployable components shall be constrained by the satellite itself. The J-SSOD rails and walls shall not be used to constrain these deployables. | |  |
|  |  | |  | |  | | |  |  | |  | |  |
|  |  | |  | |  | | |  |  | |  | |  |
| **17.** | **Mass Properties** | | | |  | |  | |  | |  | |  |
|  | a. | | Mass | |  | | Kg | |  | | 0.13～1.33kg/1U (1U,2U,3U)  ≦ 14kg (6U) | |  |
|  |  | |  | |  | |  | |  | |  | |  |
| **18.** | **Separation Spring  (1U & 2U Only)** | | | |  | |  | |  | |  | |  |
|  | a. | | Location | |  | | Option # | |  | | Option 1 or Option 2 | |  |
|  | b. | | Parts Number | |  | | OK / NG | |  | | IA P/N: 251D939002-1 | |  |
|  | c. | | Positional Tolerance | |  | | mm | |  | | ≦ 0.3mm (Basis: 4.25mm from rail surfaces) | |  |
|  |  | |  | |  | |  | |  | |  | |  |
| **<< Electrical Interface >>** | | | |  | |  | | |  |  | | |  |
| **22.** | **Deployment Switches** | | |  | |  | | |  |  | | |  |
|  | a. | | Location |  | | Option # | | |  | Option 1 or Option 2 | | |  |
|  |  | |  |  | |  | | |  |  | | |  |
| **37.** | **Envelope** | | |  | |  | | |  |  | | |  |
|  |  | | Contact surface of the deployable components |  | | mm | | |  | If any deployable components make contact with the inside wall of the J-SSOD Satellite Install Case in their unintentional deployment, the contact surface of the deployable components shall have more than 1mm thickness. | | |  |
|  |  | |  |  | |  | | |  |  | | |  |
|  |  | |  |  | |  | | |  |  | | |  |