

ANNEX
BETWEEN
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GEORGE C. MARSHALL SPACE FLIGHT CENTER
AND UNITED LAUNCH ALLIANCE
UNDER SPACE ACT UMBRELLA AGREEMENT
NO. SAA8-1726580, DATED 10/31/2017 SAA8-1726580.18.

ARTICLE 1. PURPOSE

This Annex shall be for the purpose of performing Shock, Frequency Identification, and Structural Strength qualification tests on the 2624 Payload Adapter (PLA) Structural Test Article (STA) for United Launch Alliance (ULA) in support of the Vulcan rocket program.

The legal authority for this Annex, consistent with the Umbrella Agreement, is in accordance with the Space Act, Other Transactions Authority (OTA), 51 U.S.C. § 20113(e).

ARTICLE 2. RESPONSIBILITIES

NASA will use reasonable efforts to:

1. Provide a single engineering point of contact for all communication between NASA and ULA.
2. Support 30% Test Readiness Review.
3. Support 70% Test Readiness Review.
4. Support 90% Test Readiness Review.
5. Install strain gages on 2624 PLA STA.
6. Install and configure 2624 PLA STA for Shocks Tests at MSFC building 4619.
7. Conduct 100% Test Readiness Review for Shock Testing.
8. Conduct Shock tests on 2624 PLA STA.
9. Conduct Shock Test Post-Test Review.
10. Reconfigure 2624 PLA STA for Frequency Identification (FID) tests.
11. Conduct 100% Test Readiness Review for FID Testing.
12. Conduct FID tests on 2624 PLA STA.
13. Conduct FID Test Post-Test Review.
14. Install 2624 PLA STA into 4619 Load Test Annex Extension (LTAE) Test Stand and complete all integration and setup.
15. Conduct 100% Test Readiness Review for Structural Strength Testing.
16. Conduct structural strength qualification test on 2624 PLA STA.
17. Conduct structural strength test Post-Test Review.
18. Deliver test report package to Partner.
19. Conduct post-test teardown, STA removal, and Test Stand restoration.

B. Partner will use reasonable efforts to:

1. Provide a single engineering point of contact for all communication between NASA and ULA.
2. Support 30% Test Readiness Review.
3. Support 70% Test Readiness Review.
4. Provide 2624 Payload Adapter Structural Test Article for strain gage installation.
5. Support 90% Test Readiness Review.
6. Deliver instrumented 2624 PLA STA to Marshall Space Flight Center (MSFC).
7. Install and configure 2624 PLA STA for Shocks Tests at MSFC building 4619.
8. Conduct 100% Test Readiness Review for Shock Testing.
9. Conduct Shock tests on 2624 PLA STA.
10. Conduct Shock Test Post-Test Review. Approve Shock Test Break of Configuration.
11. Reconfigure 2624 PLA STA for Frequency Identification (FID) tests.
12. Conduct 100% Test Readiness Review for FID Testing.
13. Conduct FID tests on 2624 PLA STA.
14. Conduct FID Test Post-Test Review. Approve FID Test Break of Configuration.
15. Conduct 100% Test Readiness Review for Structural Strength Testing.
16. Conduct structural strength qualification test on 2624 PLA STA.
17. Conduct structural strength test Post-Test Review. Approve final Break of Configuration.
18. Provide transportation to remove 2624 PLA STA.

ARTICLE 3. SCHEDULE AND MILESTONES

The planned major milestones for the activities for this Annex defined in the "Responsibilities" Article are as follows:

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|---|------------------------|
| 1. NASA and Partner provide a single engineering point of contact for all communication between NASA and ULA. | Effective Date |
| 2. NASA and Partner support 30% Test Readiness Review | Milestone 1 + 1 day |
| 3. NASA and Partner support 70% Test Readiness Review | Milestone 2 + 31 days |
| 4. Partner provide 2624 Payload Adapter Structural Test Article for strain gage installation. | Milestone 3 + 20 days |
| 5. NASA and Partner support 90% Test Readiness Review | Milestone 4 + 55 days |
| 6. NASA install strain gages on 2624 PLA STA. | Milestone 5 + 125 days |
| 7. Partner deliver instrumented 2624 PLA STA to Marshall Space Flight Center (MSFC). | Milestone 6 + 5 days |
| 8. NASA and Partner install and configure 2624 PLA STA for Shocks Tests at MSFC building 4619. | Milestone 7 + 5 days |
| 9. NASA and Partner conduct 100% Test Readiness | Milestone 8 + 1 day |

Review for Shock Testing.

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|---|------------------------|
| 10. NASA and Partner conduct Shock tests on 2624 PLA STA. | Milestone 9 + 19 days |
| 11. NASA and Partner conduct Shock Test Post-Test Review. Partner approve Shock Test Break of Configuration. | Milestone 10 + 1 day |
| 12. NASA and Partner reconfigure 2624 PLA STA for Frequency Identification (FID) tests. | Milestone 11 + 5 days |
| 13. NASA and Partner conduct 100% Test Readiness Review for FID Testing. | Milestone 12 + 1 day |
| 14. NASA and Partner conduct FID tests on 2624 PLA STA. | Milestone 13 + 2 days |
| 15. NASA and Partner conduct FID Test Post-Test Review. Partner approve FID Test Break of Configuration. | Milestone 14 + 1 day |
| 16. NASA install 2624 PLA STA into 4619 Load Test Annex Extension (LTAE) Test Stand and complete all integration and setup. | Milestone 15 + 50 days |
| 17. NASA and Partner conduct 100% Test Readiness Review for Structural Strength Testing. | Milestone 16 + 1 day |
| 18. NASA and Partner conduct structural strength qualification test on 2624 PLA STA. | Milestone 17 + 16 days |
| 19. NASA and Partner conduct structural strength test Post-Test Review. Partner approve Break of Configuration. | Milestone 18 + 1 day |
| 20. NASA deliver test report package to Partner | Milestone 18 + 15 days |
| 21. Partner provide transportation to remove 2624 PLA STA. | Milestone 19 + 16 days |
| 22. NASA conduct post-test teardown, STA removal, and Test Stand restoration. | Milestone 19 + 22 days |

ARTICLE 4. FINANCIAL OBLIGATIONS

A. Partner agrees to reimburse NASA an estimated cost of \$5,649,109.00 for NASA to carry out its responsibilities under this Annex.

Payment #1 \$500,000.00 prior to initiation of work under this Agreement

Payment #2 \$5,149,109.00 prior to milestone 6

Each payment shall be marked with SAA8-1726580.18.

B. NASA will not provide services or incur costs beyond the current funding. Although NASA has made a good faith effort to accurately estimate its costs, it is understood that NASA provides no assurance that the proposed effort under this Annex will be accomplished for the estimated amount. Should the effort cost more than the estimate, Partner will be advised by NASA as soon as possible. Partner shall pay all costs incurred and have the option of canceling the remaining effort, or providing additional funding in order to continue the proposed effort under the revised estimate. Should this Annex be terminated, or the effort completed at a cost less than the agreed-to estimated cost, NASA shall account for any unspent funds within one year after completion of all effort under this Annex, and promptly thereafter, at Partner's option return any unspent funds to Partner or apply any such unspent funds to other activities under the Umbrella Agreement. Return of unspent funds will be processed via Electronic Funds Transfer (EFT) in accordance with 31 C.F.R. Part 208 and, upon request by NASA, Partner agrees to complete the Automated Clearing House (ACH) Vendor/Miscellaneous Payment Enrollment Form (SF 3881).

ARTICLE 5. INTELLECTUAL PROPERTY RIGHTS - DATA RIGHTS

A. Data produced under this Annex which is subject to paragraph C. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement will be protected for the period of one year.

B. Under paragraph H. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement, Disclosing Party provides the following Data to Receiving Party. The lists below may not be comprehensive, are subject to change, and do not supersede any restrictive notice on the Data provided.

1. Background Data:

None.

2. Third Party Proprietary Data:

None.

3. Controlled Government Data:

None.

4. The following software and related Data will be provided to Partner under a separate Software Usage Agreement:

None

ARTICLE 6. TERM OF ANNEX

This Annex becomes effective upon the date of the last signature below ("Effective Date") and shall remain in effect until the completion of all obligations of both Parties hereto, or one year from the Effective Date, whichever comes first, unless such term exceeds the duration of the Umbrella Agreement. The term of this Annex shall not exceed the term of the Umbrella Agreement. The Annex automatically expires upon the expiration of the Umbrella Agreement.

ARTICLE 7. RIGHT TO TERMINATE

Either Party may unilaterally terminate this Annex by providing thirty (30) calendar days written notice to the other Party.

ARTICLE 8. POINTS OF CONTACT

The following personnel are designated as the Points of Contact between the Parties in the performance of this Annex.

Technical Points of Contact

NASA George C. Marshall Space Flight Center

Mike Lau

Structural Strength Test Branch Chief

Mail Suite: 4619:144B

Marshall Space Flight Center, AL 35812

Phone: 256-544-5609

mike.p.lau@nasa.gov

United Launch Alliance

Patrick Jones

Test and Verification Project Manager

7670 South Chester Street

Centennial, CO 801123439

Phone: 720-425-6311

Patrick.Jones@ulalaunch.com

ARTICLE 9. MODIFICATIONS

Any modification to this Annex shall be executed, in writing, and signed by an authorized representative of NASA and the Partner. Modification of an Annex does not modify the terms of the Umbrella Agreement.

ARTICLE 10. SIGNATORY AUTHORITY

The signatories to this Annex covenant and warrant that they have authority to execute this Annex. By signing below, the undersigned agrees to the above terms and conditions.

NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION
GEORGE C. MARSHALL SPACE
FLIGHT CENTER

UNITED LAUNCH ALLIANCE

BY: _____
Mary Beth Koelbl
Director Engineering Directorate

BY: _____
Don Tidwell
Contract Management Specialist

DATE: _____

DATE: _____