



Standard Operating Procedure
Purchasing Specification
Attachment "W" Quality Assurance
Requirements

No: 0631Q1
Rev: AD
Date: 07/31/23
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INTRODUCTION

This document is an attachment to L3Harris Aviation Products Division (L3Harris APD) purchase orders listing Quality Assurance requirements. When referred to on the face of an L3Harris APD purchase order, the requirements listed herein form a part of it and are in addition to other provisions thereof.

DELIVER THIS ATTACHMENT TO YOUR QUALITY CONTROL MANAGER.

10. THIS ITEM REMOVED

All Clause 10 items now revert to Clause 11.

11. Certification of Conformance and General Supplier Commitment

The seller shall supply a Certification of Conformance (C of C), identified to the L3Harris APD Purchase Order, signed by a responsible official, preferably from Quality Assurance, attesting that the materials or parts supplied fulfill all requirements of the Purchase Order.

At a minimum, the C of C will contain the information listed below:

- Manufacturer of part/assembly or Authorized Distributor
- L3Harris APD Part Number (P/N) (and Revision Level for L3Harris APD Design Controlled Parts)
- L3Harris APD Purchase Order Number
- Date of manufacture or Lot Number or shipping date
- Serial numbers of product supplied (serialized products only)
- Signature of responsible individual and date signed

Note: For Catalogue items, it is an acceptable option for the supplier C of C to list only the supplier P/N and/or manufacturer's P/N.

12. Process Certification

The seller shall supply a certification signed by a responsible official, attesting that all processes performed were in accordance with the specifications referenced on the Purchase Order and any applicable L3Harris APD supplied drawings. The certification shall be identified to the L3Harris APD Purchase Order. Certification shall be enclosed in an envelope and clearly marked.

13. L3 Inspection at Seller's Facility

L3Harris APD inspection of materials under this Purchase Order is required prior to shipment from your facility. Evidence of such inspection shall be by stamp or signature of the L3Harris APD representative on your shipper or other document accompanying the shipment. The seller shall notify the L3Harris APD buyer 10 days in advance of the start of final test or inspection, so source inspection may be planned and accomplished.

14. Government Inspection at Source

- A. Government inspection is required prior to shipment from your plant. Upon receipt of this order, promptly notify the Government Representative who normally services your plant so that appropriate planning for Government inspection can be accomplished.
- B. On Receipt of this order, promptly furnish a copy to the Government Representative who normally services your plant, or, if none, to the nearest Army, Navy, Air Force, FAA, or Defense Supply

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Agency inspection office. In the event the representative or office cannot be located, our purchasing agent should be notified immediately.

15. Physical and/or Chemical Test Report

Seller shall supply a test report containing physical properties and/or chemical composition of all raw materials supplied on this P.O. The report must specifically identify the material by reference to the number of the melt, cast, heat, drop, lot, or other similar designation and must indicate the applicable specification and revision. Test reports shall be enclosed in an envelope marked "Attention Receiving Inspection".

16. Seller's Acceptance Test Data

Seller will furnish a copy of test data electrical and/or mechanical that verifies compliance of the materials to Purchase Order requirements. The test data and materials must be marked to ensure they are identifiable one to the other and to the L3Harris APD Purchase Order number.

For Calibration Purchase Orders, the seller will provide a copy of the appropriate calibration records.

17. Reservation of Inspection Rights/Entry

Items being purchased hereunder may be inspected or tested by representatives of L3Harris APD, the U.S. Government, and the L3Harris APD customer at all times and places including the place and period of manufacture. If any inspection or test is made by the aforementioned representatives on the premises of the seller, the seller without additional charge shall provide all reasonable facilities and assistance for the safety and convenience of the inspectors in the performance of their duty. All inspection and tests shall be performed in such manner as not to unduly delay the work. These rights shall be flowed down to any subcontractor utilized by the seller. No inspection made prior to final inspection and acceptance shall relieve the seller from responsibility for defects or other failure to meet the requirement of this contract.

L3Harris APD reserves the right of access to all facilities utilized by the supplier to fulfill applicable purchase order requirements. Access shall be granted by the supplier in conjunction with a prior written request from L3Harris APD. Access activities may include but are not limited to inspections, investigations, physical supplier audits/surveys, and quality record reviews.

18. Single Lot/Date Code

This item must be supplied as a single lot or date code to fulfill the demands of an individual purchase order. Multiple lots, batches, manufacturer's batches, or date codes will not be accepted.

19. Lot Identification

Each item of material shall have lot identification. "Lot" is defined as product of a single facility, produced at essentially the same time by essentially the same process from essentially the same material.

20. Lot Test Coupon

A test coupon identifiable to the lot of material supplied shall be furnished.

21. Calibration Requirements

The seller shall maintain a system for the calibration of all measuring and testing equipment used in fulfillment of the Purchase Order that is in accordance with ANSI/NCCL Z540-1-1994, and/or ISO 17025 for accredited laboratories.

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22. Limited-Life and Special Storage Items

Materials shipped against this Purchase Order shall have not less than three quarters of the shelf life remaining at time of shipment. Materials or containers shall be marked with the date of manufacture. Where storage at other than room conditions would extend life in storage, recommended storage conditions shall be marked on the material or container.

23. Static Sensitive Devices

This order is for Static sensitive device(s) that should be handled per ANSI/ESD S20.20-1999. These items must be packaged in conductive material or must be packaged in material which is inherently anti-static or which has been coated or treated with an anti-static material to prevent buildup of static charge. If anti-static material is used, the vendor shall furnish certification with the delivery that the packing material is or has been treated to prevent buildup of static charge. Shipping containers shall have a warning label affixed to the outside stating that the package contains static sensitive devices.

24. Serialization

This part requires L3Harris APD issued serial numbers. If no serial numbers were supplied with this order, contact L3Harris APD procurement.

25. Manufacturer’s Identification Marking

Manufacturer must mark parts produced with unique symbol or logo in an unobservable area of each piece. Marking will allow L3Harris APD to distinguish manufacturer from other producers of part. Contact L3Harris APD if unsure of location available for symbol or logo. Small parts may be bagged and tagged for marking purposes.

26. Two Year Limited-Life and Special Storage Items

Materials shipped against this Purchase Order shall have not less than two years shelf life remaining at time of shipment. Materials or containers shall be marked with the expiration date. Where storage at other than room conditions would extend life in storage, recommended storage conditions shall be marked on the material or container.

27. Non-Static Packaging

Items shipped against this P.O. shall be wrapped /packaged with materials that do not generate a static charge. Contact the Purchasing Agent for clarification if required.

28. Repairable Items

Subassemblies/assemblies costing more than \$150 shall be designed as repairable.

29. Microelectronic Devices

Microelectronic devices shall conform to MIL-M-38510, JAN parts, class B. When MIL-M-38510 parts are not available, microelectronics shall be screened in accordance with MIL-STD-883 methods 5004 and 5005, class B.

30. Semiconductor Devices

Semiconductors shall be JANTXV devices. Semiconductors shall be hermetically sealed. Plastic encapsulated devices shall not be used. Where JANTXV devices are not available, the following order shall take precedence:

- (1) JANTX

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- (2) JAN screened to TX level
- (3) Nonstandard screened to TXV level

31. Supplier’s Records

The supplier shall maintain all pertinent records for a minimum of ten years from the date of manufacture. The records shall be available for review by L3Harris APD Communications and/or applicable regulatory authorities as required. The supplier shall ensure records remain legible, readily identifiable, and retrievable. Records should be disposed of via shredding after they exceed ten years from date of manufacture. A supplier with retention policies of less than 10 years can request a waiver.

32. Product Screening Data

A certificate of compliance providing lot identity, customer order identity, test, methods and conditions of processing performed shall be provided with all dash 883X material shipped. In addition, group A subgroup -- test summary attributes data shall be furnished.

33. Notification by Supplier

The supplier is required to notify L3Harris APD immediately in writing of any product modifications, process modifications, and/or anomalies which may adversely affect the quality or reliability of items supplied for use by L3Harris APD. Notification shall occur within three working days of discovery of the deviation. Examples of process modifications include but are not limited to: changes in Plant Location or Layout, Transportation Method, MRP/ERP System, Top Level Organization and Personnel at Key Positions, Quality System, Process (manufacturing, assembly, tests, inspection, main tools), Major Suppliers (including subcontractors).

34. Foreign Object Debris/Damage Prevention

Supplier shall manufacture, distribute, or maintain products in such a way to eliminate or reduce foreign object debris/damage (FOD) in items delivered to L3Harris APD. That tooling, test equipment, and fixtures as required in the supplier’s processes are maintained in a manner to prevent FOD. L3Harris APD will consider received items to be verified by the supplier to be free of foreign materials.

35. Printed Circuit Board (PCB) Requirements

NOTE: The following clauses apply unless otherwise specified on the drawing.

35.1. Single/Double Sided Boards

- 35.1.1. All boards will meet/exceed IPC- 6011/6012/6013 Class 3.
- 35.1.2. All boards will have Matte finish green solder mask on both sides unless otherwise specified. All circuits must be completely covered with mask. There shall be no mask on pads or in component holes. Solder mask must be compatible with conformal coatings utilized by L3Harris APD.
- 35.1.3. All boards will be started with 1 oz. copper laminate unless otherwise specified.
- 35.1.4. All boards will be legended on both sides per IPC-6011/6012/6013 with yellow ink, color no. 13655 per FED-STD-595 unless otherwise specified. Legend ink is not permitted on pads or in component holes.
- 35.1.5. 35.1.5 All shipments of PWBs to L3Harris APD will include a certification of compliance with the following statements:
 - Quantity of Boards shipped

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- Purchase order boards are shipped against
 - Boards comply with IPC-6011/6012/6013 Class 3
- 35.1.6. The L3Harris APD test coupon that is located on each artwork board layer which depicts a group of representative plated through-holes and lines, shall be submitted with each production lot of boards produced. Each coupon shall be serialized to each production panel and each board made to the production lot produced for tracking purposes. If the artwork package does not have an L3Harris APD coupon on it, the latest revision IPC coupon may be substituted. One coupon per lot shall be submitted for evaluation. Include samples of smallest pad/drilled hole size.
- 35.1.7. A certification of electrical test, including parameters of the test performed shall be included with each applicable order.
- 35.1.8. Unless otherwise stated, all finished all Tooling hole tolerances will be ± 0.003 ". When holes are specified as tooling holes, pads may be removed from artwork.
- 35.1.9. The PWB drawing revision level must be permanently marked (etched or legended) on the side of each printed circuit board near the PWB part number.
- 35.1.10. Surface Mount PWBs - via holes must be open. Preferred mask method utilizes 24 mil. aperture centered on via. Supplier may plug vias if previously authorized by L3Harris APD. Via plugging must be stated on the certificate of compliance. All vias must be completely plugged and not create protrusions which interfere with solder pasting.
- 35.1.11. If boards are nickel and gold plated or HASL plated, measurements of plating thickness must be submitted along with the lot's certificate of compliance.

35.2. Multilayer/Surface Mount Boards/Microvia

- 35.2.1. All boards will meet/exceed IPC-6011/6012/6013 Class 3.
- 35.2.2. All boards will receive Matte finish green solder mask on both sides unless otherwise specified. All circuits must be covered completely with mask. There shall be no mask on pads or in component holes. Solder mask must be compatible with conformal coatings utilized by L3Harris APD.
- 35.2.3. All boards will be started with 1 oz. copper laminate unless otherwise specified.
- 35.2.4. All boards will be legended on both sides per IPC-6011/6012/6013 with yellow ink, color no. 13655 per FED-STD-595 unless otherwise specified. Legend ink is not permitted on pads or in component holes.
- 35.2.5. A certification of electrical test, including parameters of the test performed, shall be included with each order.
- 35.2.6. Kovar welding will not be allowed.
- 35.2.7. All shipments of PWBs to L3Harris APD will include a certification of compliance with the following statements:
 - Quantity of boards shipped
 - Purchased order boards are shipped against
 - Boards comply with applicable IPC Standard and Class.
- 35.2.8. All shipments of PWBs to L3Harris APD will include coupons. The L3Harris APD test coupon that is located on each artwork board layer which depicts a group of representative plated through holes and lines (connecting with all layers). Each coupon shall be serialized to each production panel produced and each board shall be serialized to each panel. One coupon for each panel of boards produced shall be submitted for evaluation. (If the artwork has no coupon,

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the latest revision IPC coupon may be substituted.) Include samples of smallest pad/drilled hole size.

- 35.2.9. Unless otherwise stated, all finished all Tooling hole tolerances will be ± 0.003 ". When holes are specified as tooling holes, pads may be removed from artwork.
- 35.2.10. The PWB drawing revision level must be permanently marked (etched or legended) on the side of each printed circuit board near the PWB part number.
- 35.2.11. All multilayers require evidence of POSITIVE etchback at final X-section. Evidence of POSITIVE etchback is not required for ceramic CCA's Reference IPC-A-600.
- 35.2.12. Surface Mount PWBs - via holes must be open. Preferred mask method utilizes 24 mil. aperture centered on via. Supplier may plug vias if previously authorized by L3Harris APD. Via plugging must be stated on the certificate of compliance. All vias must be completely plugged and not create protrusions which interfere with solder pasting.
- 35.2.13. If boards are nickel and gold plated or HASL plated, measurements of plating thickness must be submitted along with the lot's certificate of compliance.

36. ISO 9001

Seller's Quality System shall comply with and be certified to ISO 9001.

37. AS 9100

Seller's Quality System shall comply with and be certified to AS 9100.

38. Thru 40. These Items Reserved for Future Use

41. Special Packaging

The subcontractor shall package all items with 3-M oxidation arrest paper in a sealed, air tight, clear plastic bag. If the size of the part is less than 3.3" X 3.3" or 10.0 square inches, the package may contain one strip and no more than 10 pieces per sealed bag. All other parts shall be individually packaged with one strip in each sealed bag. A desiccant packet is an acceptable alternate for the 3-M oxidation arrest paper inside of a sealed, air tight, clear plastic bag..

42. Workmanship

All materials supplied by the subcontractor shall meet the requirements of the latest revision of the L3Harris APD Workmanship Standards Manual. All flow down requirements shall apply.

43. IPC-J-STD-001

The subcontractor shall comply with IPC-J-STD-001. All flow down requirements shall apply.

44. This Item Reserved for Future Use

45. Government - Furnished Property to Sub-Contractor

The following clause of the Federal Acquisition Regulation (FAR), and the Department of Defense FAR Supplement as in effect in the Prime Contract on the date of this Purchase Order is incorporated herein by reference and made a part hereof with the same force and effect as if it were given full text:

FAR 52.245-2 Government Property (Fixed-Price Contracts)

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NOTE: Describe assets quantity, P/N, and description on Purchase Order.

46. Documentation

Documentation for any engineering change, modification, and/or discrepant material (MRB) shall be supplied with shipment in order to allow inspection of items at Buyer's facility.

47. Accounting Notification

Notification to L3Harris APD Accounting is required upon receipt of material.
(Material may require the application of an asset tag.)

48. Calibration Lab Notification

Notification to the L3Harris APD Calibration Lab is required upon receipt of material.
(Material may require entry into the calibration system.)

49. Fabricated Parts

All L3Harris APD drawings for fabricated parts comply with ANSI 14.5 unless otherwise specified on the individual drawing.

50. Test Report Requirements for Subcontractors and Vendors.

The seller shall comply with L3Harris APD document number 905-E1695-44 (latest revision).

51. Age of Electrical Components

All electronic components, with the exception of aluminum electrolytic capacitors, shall be from lots manufactured no more than five (5) years from the date ordered. Exceptions to this must be approved by Components Engineering.

52. Age of Aluminum Electrolytic Capacitors

All aluminum electrolytic capacitors shall be from lots manufactured no more than five (5) years from the date ordered. Exceptions to this must be approved by Components Engineering.

53. This Item Reserved for Future Use

54. L3Harris APD Paint Specification 21412

Supplier shall conform with the requirements of L3Harris APD specification 21412 (latest revision). All manufactured parts or assemblies that receive organic coatings must have the coatings applied and meet the inspection requirements of this specification.

55. L3Harris APD Design Specifications 905-E1721-07 and 905-E1741-07

Supplier shall conform with the requirements of L3Harris APD Design Specifications 905-E1721-07 (latest revision), or 905-E1741-07 (latest revision), whichever is applicable.

56. L3Harris APD requirements for Industry Specifications.

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Supplier shall conform with the latest revision of all Industry Specifications noted on L3Harris APD drawings, contracts, or purchase orders (i.e., IPC, ANSI, MIL-STD, etc.). Latest revision is defined as the revision level at the time of purchase order acceptance.

57. L3Harris APD Contract Manufacturing Specification 0631Q

Supplier shall conform to the Contract Manufacturing Specification for L3Harris APD assemblies, 0631Q (latest revision).

58. Counterfeit Parts

If suspect/counterfeit parts are furnished under this purchase order and are found in any of the goods delivered hereunder, such items will be impounded by Buyer. The Seller shall promptly replace such suspect/counterfeit parts with parts acceptable to the Buyer and the Seller shall be liable for all costs relating to the removal and replacement of said parts. Buyer reserves all contractual rights and remedies to address grievances and detrimental impacts caused by suspect/counterfeit parts.

59. 8130-3 Form Required

Supplier shall provide a signed 8130-3 form for EACH unit sent in the shipment. For New and Zero Hour equipment processed by a Production Facility, the 8130-3 form must be signed by an FAA approved DMIR. For Return to Service equipment processed by an FAA approved Repair Station, the 8130-3 form must be signed by the appropriate authorized individual. An 8130-3 form will be required for all parts that list a TSO, PMA, or spares/replacement components of a TSO'd or PMA'd item.

If the part is pending FAA approval, then the supplier must submit an 8130-9 form for each unit in the shipment.

60. FAI

AS9102 AEROSPACE FIRST ARTICLE INSPECTION REQUIREMENT - DELIVERABLE REPORT

First Article Inspection (FAI) shall be performed by Seller in accordance with the requirements of AS9102. The exclusion for unique single run production orders not intended for ongoing production (Section 1.3 Applicability) shall not apply. When documenting the FAI, Seller may use the forms contained within AS9102 or their equivalent, so long as the forms contain all the information required by AS9102.

Seller shall furnish a copy of the FAI report in the first shipment or as directed by Buyer's Authorized Procurement Representative. Additionally, when a partial or re-accomplished FAI is performed as required by AS9102, Seller shall furnish a copy of such FAI report. All FAIs shall be sent to FAI.Submittal@l3harris.com for review and approval.

For printed circuitry, the supplier shall supply a copy of each layer of the master pattern to remain the property of L3Harris APD.

In the event that the seller creates an internal Bill of Material (BOM) based on the L3Harris APD BOM, a BOM comparison is a required FAI artifact.

61. PFMEA and Risk Mitigation

The supplier will provide a PFMEA (Process Failure Mode and Effects Analysis) for every assembly submitted to L3Harris APD, as well as a PFMEA for special processes and those processes where risk needs to be managed and mitigated. The supplier will provide a revised PFMEA whenever there is a major change in the process or every two years thereafter at the current revision of the product at that point in time. This should include a gap analysis from when the original PFMEA was submitted by the supplier. The PFMEA is a living document which will provide the

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recommended and implemented actions to minimize risk to the customer if any of the key process inputs to the process fails, and for the ten failure modes with the highest RPN values. The PFMEA methodology and approach must be in accordance with the IAQG standard or its equivalent. L3Harris APD quality engineering personnel, at their discretion, shall perform review and approval of new and updated PFMEAs.

62. Reasonableness and Quality Check Required

No Certification of Conformance is required. The Deliverable Report must state that the Reasonableness and Quality Check was performed in accordance with Federal Aviation Administration Advisory Circular AC 20-141B, Airworthiness and Operations Approval of Digital Flight Data Recorder Systems, or an alternative method to demonstrate compliance with the applicable Regulations for the continued airworthiness and operational approval for the digital flight data recorder system. Alternate methods may include those defined in the International Civil Aviation Organization (ICAO) Regulations or the European Safety Aviation Agency (EASA) Regulations.

63. Acceptance Authority Media

The seller shall ensure that Acceptance Authority Media, (e.g., stamps, electronic passwords), are controlled and are considered as a personal warranty of compliance and conformity.

64. Root Cause and Corrective Action

The seller’s quality management system shall have written procedures for ready detection of discrepancies and for prompt and effective root cause and correct action. Corrective action must prevent reoccurrence, including firm effectivity points by serial number, part number, date, or other agreed methods. Root cause and corrective action records and information, such as pertinent data on defects and failures shall be available.

The Seller is responsible for initiation of prompt replies to nonconforming material reports and/or corrective action reports, and implementation of required corrective action.

When corrective action is required by the buyer for Government source-inspected items, the seller shall coordinate such action with the Government source inspector at his or her plant.

If the seller determines the buyer’s PO requirements were not met after the product or article has already shipped to the buyer, the seller shall notify the buyer immediately in writing. PO requirements include part number revision level, form, fit, function, quality, reliability and safety of the product or article. The seller shall initiate an internal CAR that includes a definition of the root cause, corrective actions and preventative actions for this problem.

65. Statistical Process Control and Key Characteristics

The seller shall define a methodology to determine product key characteristics and process key characteristics. Management of KCs and KPs shall be in accordance with AS9103A. Statistical Process Control (SPC) shall be used to monitor KCs and KPs, and evidence shall be presented when requested. If necessary, seller shall define actions plans and corrective actions to improve product and process variation.

66. Value Stream Mapping

The seller shall establish and maintain a Value Stream Map (VSM) for all products identified on the PO. At a minimum, the VSM should contain: physical flow of parts/assemblies, information flow, customer demand, production rate, resources required at each process step, available time, efficiency, lot size, lead time, and any other information deemed relevant for the VSM.

67. CCA Serialization Requirements

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The seller shall identify all Circuit Card Assemblies with a globally unique serial number IAW WI 0801M3.

68. Independent Distributor Parts Notification

The seller must have traceability and notify buyer of hardware (LRUs, CCAs, subassemblies, components) delivered with components purchased from an Independent Distributor (non-Original Component Manufacturers and/or Franchised Distributors) IAW section 4.39 of WI0631P1 Purchase Order Quality Terms and Condition Flow Down. Seller must include as part of the C of C with each shipment the following information for each individual hardware containing component(s) from an Independent Distributor: Part number, serial number and/or lot number.

69. APQP (Advanced Product Quality Planning)

In accordance with AS9145, Seller shall begin implementation of APQP at the time of order or prior to start of production. Seller shall submit an APQP PPAP package IAW AS9145, as defined by elements listed below, a minimum of five (5) days prior to shipping for review and approval. The APQP Package shall be submitted to the buyers' Supplier Quality Engineer or Purchasing Point of Contact and approved prior to the shipment of hardware. If an approved package is on file for this part number with no changes in location, process, design, or lapse in production of more than two (2) years, a resubmittal is not required. As defined by AS9102 guidelines, if changes or lapse in production has occurred, Seller shall submit a delta APQP package validating only those conditions, such as changes in location, process, or design, that have changed since the last package approval. Seller shall not ship parts from a production run for L3Harris APD inspection prior to L3Harris APD acceptance of the associated APQP Package.

- Design Failure Mode and Effect Analysis (DFMEA) (only applicable if seller has design authority)
- Key Characteristics (KC)
- Process Flowchart(s)
- Process Failure Mode and Effects Analysis (PFMEA)
- Control Plan(s)
- Measurement Systems Analysis (Gage R&R)
- First Article Inspection Report IAW AS9102, Form 3 (if not already required by contract)

70. APD Paint Inspection

All surfaces need to meet the cosmetic inspection criteria defined in WI 0543Q4, unless inspection criteria is clearly defined on the drawing.

71. Thru 98. These Items Reserved for Future Use

99. Drawings for Purchase Orders

The drawings required for this purchase order have been reviewed for associated L3Harris APD specifications and/or drawings.

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REVISION HISTORY

Rev AA	Original Issue. This document is based off 905-L0140-07, Rev AJ, which this document has superseded. Updated Clause 57 to include Contract Manufacturing. Added Clause 69.	08/26/21
Rev AB	Updated Clause 60 to add email address for FAI submittal. Added Clause 70.	04/04/22
Rev AC	Updated Clause 70.	04/05/22
Rev AD	Updated email address in clause 60 to FAI.Submittal@l3harris.com .	07/31/23

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APPROVALS

Signature on file in SignIt

Adam Reuscher
Director of Procurement

Signature on file in SignIt

Wolfgang Niesing
Director of Quality

Signature on file in SignIt

Ray Jogensen
Manager, CAS Engineering Excellence

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