



New Cumberland Manufacturing Inspection District Office
Bldg. 201, Room 102, 400 Airport Drive
New Cumberland, PA 17070-3419

Operating Limitations
Experimental: Research and Development, Market Survey,
and/or Crew Training

Registered Owner Name: L-3 BAI Aerosystems Registered Owner Address: 9040 Glebe Park Drive Easton, MD 21601 Aircraft Description: Viking 100 Unmanned Aerial System Aircraft Registration: N721UA	Aircraft Builder: L-3 BAI Aerosystems Year Manufactured: 2008 Aircraft Serial Number: #106 Aircraft Model Designation: Viking 100 UAS Engine Model: 3W Modellmotoren 3W157iBTF-TS
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The following conditions and limitations apply to all unmanned aircraft system (UAS) flight operations for the Viking 100 UAS while operating in the National Airspace System (NAS).

1. General Information.

a. Integrated system. For the purposes of this special airworthiness certificate and operating limitations, the Viking 100 UAS operated by L-3 BAI Aerosystems is considered to be an integrated system. The system is composed of the following:

- (1) Viking 100 UA, serial number 106.
- (2) UAS control station(s), that is, fixed, mobile, or ground-based.
- (3) Telemetry, launch, and recovery equipment.
- (4) Communications and navigation equipment, including ground and/or air equipment used for command and control of the Viking 100.
- (5) Equipment on the ground and in the air used for communication with other members of the flight crew, observers, air traffic control (ATC), and other users of the NAS.

b. Compliance with 14 CFR part 61 (Certification: Pilots, Flight Instructors, and Ground Instructors) and part 91 (General Operating and Flight Rules). Unless otherwise specified in this document, the UA pilot-in-command (PIC) and L-3 BAI Aerosystems must comply with all applicable sections and parts of 14 CFR including, but not limited to, parts 61 and 91.

c. Operational requirements.

(1) No person may operate this UAS for other than the purpose of research and development, market survey, and/or crew training, to accomplish the flight operation outlined in L-3 BAI Aerosystems program letter dated 02/18/2009, which describes compliance with § 21.193(d), Experimental certificates: General, and has been made available to the UA PIC.

(2) This UAS must be operated in accordance with applicable air traffic and general operating rules of part 91 and all additional limitations herein prescribed under the provisions of § 91.319(i), Aircraft having experimental certificates: Operating limitations.

(3) L-3 BAI Aerosystems must accumulate at least 50 flight hours under its experimental airworthiness certificate before customer crew training is permitted, in accordance with § 21.195(d), Experimental certificates: Aircraft to be used for market surveys, sales demonstrations, and customer crew training.

d. UA condition. The UA PIC must determine that the UA is in a condition for safe operation, and in a configuration appropriate for the purpose of the intended flight.

e. Multiple-purpose operations. When changing between operating purposes of a multiple purpose certificate, the operator must determine that the aircraft is in a condition for safe operation and appropriate for the purpose intended. A record entry will be made by an appropriately rated person (that is, an individual authorized by the applicant and acceptable to the FAA) to document that finding in the maintenance records.

f. Operation exceptions. No person may operate this UA to carry property for compensation or hire (§ 91.319(a)(2)).

g. UA markings.

(1) This UA must be marked with its U.S. registration number in accordance with part 45 or alternative marking approval issued by the FAA Production and Airworthiness Division (AIR-200).

(2) This UA must display the word *Experimental* in accordance with § 45.23(b), Display of marks, unless otherwise granted an exemption from this requirement.

h. Required documentation. Prior to conducting the Viking 100 initial flight operations, L-3 BAI Aerosystems must forward a scanned copy of the Viking 100 Program Letter, Special Airworthiness Certificate, and Operating Limitations to the following persons:

(1) Peter Acevedo, FAA Air Traffic Representative, Eastern Service Center, System Support, 1701 Columbia Ave, College Park, GA 30337, telephone (404) 305-5598, email peter.k.acevedo@faa.gov.

(2) Richard Posey, Aviation Safety Inspector, Production and Airworthiness Division, AIR-200, 800 Independence Ave, SW, Washington, DC 20591, telephone (202) 385-6378, email, richard.posey@faa.gov.

i. Change in registrant address. Section 47.45, Change of address, requires that the FAA Aircraft Registry be notified within 30 days of any change in the aircraft registrant's address. Such notification is to be made by providing AC Form 8050-1, Aircraft Registration Application, to the FAA Aircraft Registration Branch (AFS-750) in Oklahoma City, Oklahoma.

j. Certificate display and manual availability. The airworthiness and registration certificates must be displayed, and the aircraft flight manual must be available to the pilot, as prescribed by the applicable sections of 14 CFR, or as prescribed by an exemption granted in accordance with 14 CFR part 11, General Rulemaking Procedures, to L-3 BAI Aerosystems.

2. Program Letter. The L-3 BAI Aerosystems Viking 100 Program Letter, dated 02/18/2009, will be used as a basis for determining the operating limitations prescribed in this document. All flight operations must be conducted in accordance with the provisions of this document.

3. Initial Flight Testing.

a. Requirements. Flight operations must be conducted within visual line of sight of the pilot/observer. Initial flight testing is completed upon accumulation of 25 flight hours. Following satisfactory completion of initial flight testing, the operations manager or chief pilot must certify in the records that the aircraft has been shown to comply with § 91.319(b). Compliance with § 91.319(b) must be recorded in the aircraft records with the following, or a similarly worded, statement:

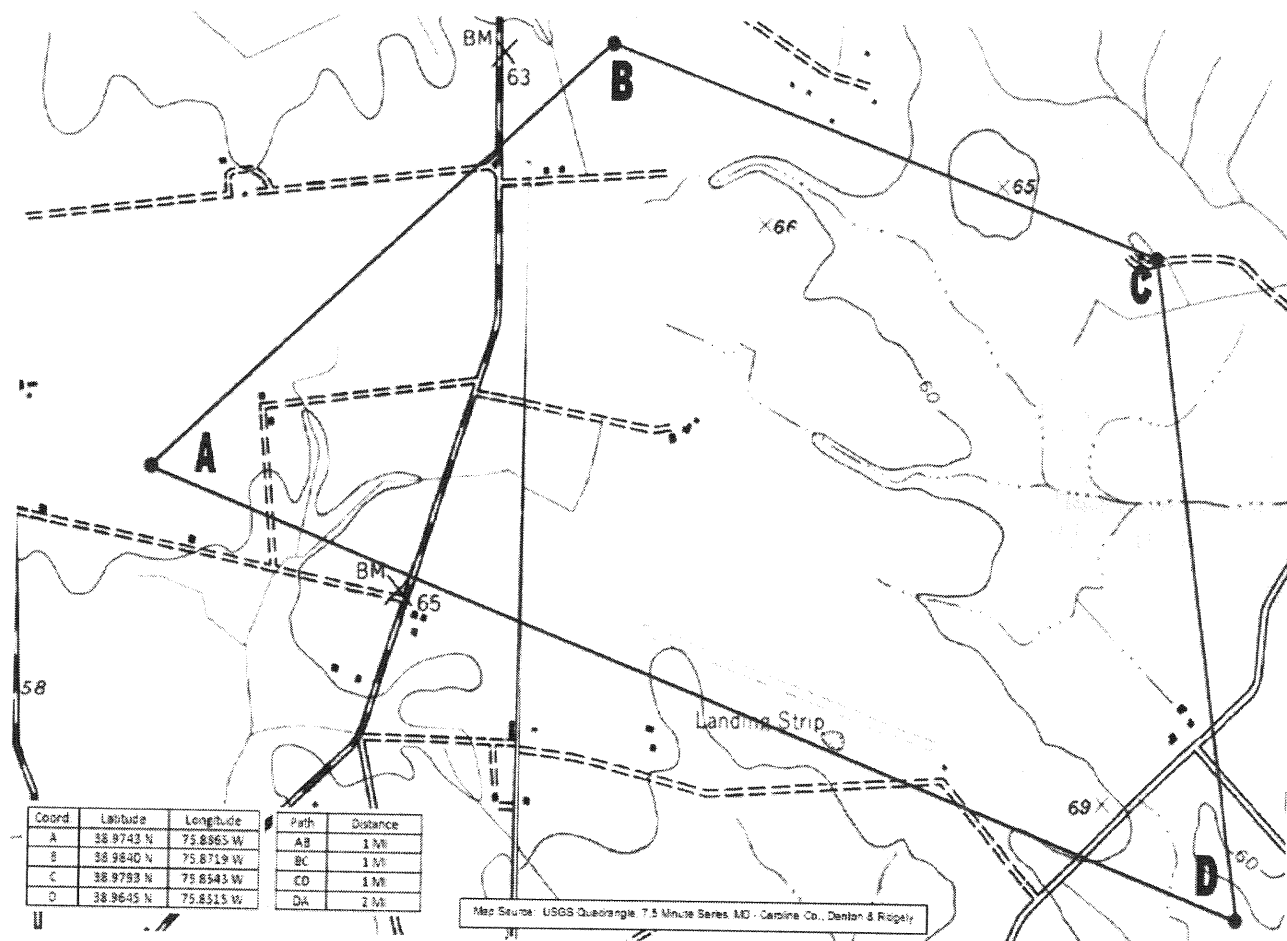
I certify that the prescribed flight test hours have been completed and the aircraft is controllable throughout its normal range of speeds and throughout all maneuvers to be executed, has no hazardous operating characteristics or design features, and is safe for operation. The following aircraft operating data has been demonstrated during the flight testing: speeds Vx _____, and Vy _____, and the weight _____ and CG location _____ at which they were obtained.

b. Aircraft operations for the purpose of market surveys, sales demonstrations, and customer crew training. These operations cannot be performed until 50 flight hours have been accomplished. An entry in the maintenance records is required as evidence of compliance.

4. Authorized Flight Operations Area.

a. Description of the authorized flight operations area. The requested area of operations is Ridgley Airpark (KRJD) near Ridgley, MD.

b. Flight test area. The flight operations area authorized for the UA will be referred to as the flight test area, and is depicted graphically below. **All flights are limited to an altitude of 1000 ft AGL.**



c. Authorized flight times and conditions. All flight operations must be conducted during daylight hours under visual flight rules (VFR), Monday through Friday, with at least 3 miles of visibility and a 3000 ft ceiling.

d. Criteria for remaining in the flight test area. The UAS PIC must ensure all UA flight operations remain within the lateral and vertical boundaries of the flight test area. Furthermore, the UAS PIC must take into account all factors that may affect the capability of the UA to remain within the flight test area. This includes, but is not limited to, considerations for wind, gross weight, and glide distances.

e. Incident/accident reporting. Any incident/accident and any flight operation that transgresses the lateral or vertical boundaries of the flight test area or any restricted airspace must be reported to the FAA within 24 hours. This information must be reported to the Unmanned Aircraft Program Office, AIR-160. AIR-160 can be reached by telephone at 202-385-4636 and fax at 202-385-4651. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.nts.gov. Further flight operations must not be conducted until the incident is reviewed by AIR-160 and authorization to resume operations is provided to L-3 BAI Aerosystems.

5. UA Pilots and Observers.

a. UA PIC roles and responsibilities.

- (1) The UA PIC must perform crew duties for only one UA at a time.
- (2) All flight operations must have a designated UA PIC. The UA PIC has responsibility over each flight conducted and is accountable for the UA flight operation.
- (3) The UA PIC is responsible for the safety of the UA as well as persons and property along the UA flight path. This includes, but is not limited to, collision avoidance and the safety of persons and property in the air and on the ground.
- (4) The UA PIC must avoid densely populated areas (§ 91.319) and exercise increased vigilance when operating within or in the vicinity of published airway boundaries.

b. UA PIC certification and ratings requirements.

- (1) The UA PIC must hold and be in possession of, at a minimum, an FAA private pilot certificate, with either an airplane, rotorcraft, or powered-lift category; and single- or multiengine class ratings, or the military equivalent, appropriate to the type of UA being operated.
- (2) The UA PIC must have and be in possession of a valid second-class (or higher) airman medical certificate issued under 14 CFR part 67, Medical Standards and Certification.

c. UA PIC currency, flight review, and training.

- (1) No person may act as pilot in command of an unmanned aircraft unless that person has made at least three takeoffs and three landings in manned aircraft within the preceding 90 days acting as the sole manipulator of the flight controls.
- (2) The UA PIC must have a flight review in manned aircraft every 24 calendar months in accordance with § 61.56, Flight review.
- (3) The UA PIC must maintain currency in unmanned aircraft in accordance with L-3 BAI Aerosystems company procedures.
- (4) The UA PIC must have a flight review in unmanned aircraft every 24 calendar months in accordance with L-3 BAI Aerosystems procedures.
- (5) All UA PICs must have successfully completed applicable L-3 BAI Aerosystems training for the UAS.

d. Supplemental UA pilot roles and responsibilities.

- (1) Any additional UA pilot(s) assigned to a crew station during UA flight operations will be considered a supplemental UA pilot.
- (2) A supplemental UA pilot assists the PIC in the operation of the UA and may do so at the same or a different control station as the PIC. The UA PIC will have operational override capability over any supplemental UA pilots, regardless of position.
- (3) A supplemental UA pilot must perform crew duties for only one UA at a time.

e. Supplemental UA pilot certification and ratings requirements.

(1) The supplemental UA pilot need not be a certificated pilot, but must have successfully completed a recognized private pilot ground school program.

(2) The supplemental UA pilot must have and be in possession of a valid second-class (or higher) airman medical certificate issued under 14 CFR part 67, Medical Standards and Certification.

f. Supplemental UA pilot currency, flight review, and training.

(1) All supplemental UA pilots must maintain currency in unmanned aircraft in accordance with L-3 BAI Aerosystems company procedures.

(2) All supplemental UA pilots must have a flight review in unmanned aircraft every 24 calendar months in accordance with L-3 BAI Aerosystems procedures.

(3) All supplemental UA pilots must have successfully completed applicable L-3 BAI Aerosystems training for the UAS.

g. Observer roles and responsibilities. The task of the observer is to provide the UA PIC(s) with instructions to maneuver the UA clear of any potential collision with other traffic. To satisfy these requirements:

(1) The observer must perform crew duties for only one UA at a time.

(2) At no time will the observer permit the UA to operate beyond the line-of-sight necessary to ensure maneuvering information can be reliably determined.

(3) At no time will the observer conduct his/her duties more than **1 mile laterally or 1000 ft. vertically** from the UA.

(4) An observer must maintain continuous visual contact with the UA to discern UA attitude and trajectory in relation to conflicting traffic.

(5) Observers must continually scan the airspace for other aircraft that pose a potential conflict.

(6) All flight operations conducted in the flight test area must have an observer to perform traffic avoidance and visual observation to fulfill the see-and-avoid requirement of § 91.113, Right-of-way rules: Except water operations.

h. Observer certification.

(1) All observers must either hold, at a minimum, an FAA private pilot license or military equivalent, or must have successfully completed specific observer training acceptable to the FAA. An observer does not require currency as a pilot.

(2) All observers must have in their possession a valid second-class (or higher) airman medical certificate issued under part 67.

i. Observer training.

(1) All observers must be thoroughly trained, be familiar with, and possess operational experience with the equipment being used. Such training is necessary for observation and detection of other aircraft for collision avoidance purposes as outlined in L-3 BAI Aerosystems program letter.

(2) All observers must have successfully completed applicable L-3 BAI Aerosystems training for the UAS.

6. Equipage.

a. The UAS must be equipped with an operable Mode C transponder, and two-way communications equipment allowing communications between the UA pilot, observers, all UAS control stations, and ATC.

b. The UA must be equipped with operable navigation, position, and/or strobe/anti-collision lights. Strobe/anti-collision lights must be illuminated during all operations.

7. Communications.

a. Before UA flights.

(1) Before conducting operations, the frequency spectrum used for operation and control of the UA must be approved by the Federal Communications Commission or other appropriate government oversight agency.

(2) L-3 BAI Aerosystems shall contact the Maryland State Police, Trooper 6 Heliport, and notify them of planned UAS flight operations.

b. During UA flights.

(1) Ridgley Airpark frequency must be monitored during flight operations.

(2) All UA flight crew positions must maintain two-way communications with each other during all operations. If unable to maintain two-way communication, the UA PIC will expeditiously return the UA to its base of operations and conclude the flight operation.

8. Flight Conditions.

a. **Daylight operations.** All flight operations must be conducted during daylight hours in visual meteorological conditions (VMC).

b. Prohibitions.

(1) The UA is prohibited from aerobatic flight, that is, an intentional maneuver involving an abrupt change in the UA's attitude, an abnormal acceleration, or other flight action not necessary for normal flight.

(2) Flight operations must not involve carrying hazardous material or the dropping of any objects or external stores.

(3) Each UA must be operated by only one control station at a time. A control station may not be used to operate multiple UAs.

c. **Fuel quantity.** Fuel quantity shall be limited to 2.5 U.S. gallons per flight.

d. **Transponder requirements.** The UA must operate an approved operational Mode C altitude encoding transponder during all flight operations.

e. **Transponder failure.** In the event of transponder failure, the UA must conclude all flight operations and expeditiously return to its base of operations.

f. Notice to airman. L-3 BAI Aerosystems must request the issuance of a Notice to Airman (NOTAM) through the local Automated Flight Service Station at least 24 hours before flight operation.

9. Flight Termination and Lost Link Procedures.

a. Flight termination. In accordance with L-3 BAI Aerosystems program letter, dated 02/18/2009, flight termination must be initiated at any point that safe operation of the UA cannot be maintained or if hazard to persons or property is imminent.

b. Lost link procedures. In the event of lost link, the UA must provide a means of automatic recovery that ensures airborne operations are predictable and that the UA remains within the flight test area. The observer, all other UAS controls stations, and the appropriate ATC facility will be immediately notified of the lost link condition and the expected UA response.

10. Maintenance and Inspection.

a. General requirements. The UAS must not be operated unless it is inspected and maintained in accordance with the L-3 BAI Aerosystems Maintenance Program document ID 999-1022, dated 02/18/2009 or later accepted FAA revision. L-3 BAI Aerosystems must establish and maintain aircraft maintenance records (see paragraph 10(d) below).

b. Inspections. No person may operate this UAS unless it has had a condition inspection within the preceding 12 calendar months performed according to the FAA-accepted L-3 BAI Aerosystems Maintenance Program document ID 999-1022, dated 02/18/2009. The UAS must also have been found to be in a condition for safe operation. This inspection will be recorded in the UAS maintenance records as described in paragraph 10(d) below.

c. Authorized inspectors. Only those individuals trained and authorized by L-3 BAI Aerosystems and acceptable to the FAA may perform the inspections and maintenance required by these operating limitations.

d. Maintenance and inspection records. Maintenance and inspections of the UAS must be recorded in the UAS maintenance records. The following information must be recorded:

(1) Maintenance record entries must include a description of the work performed, the date of completion for the work, and the name and signature of the person performing the work.

(2) Inspection entries must contain the following, or a similarly worded, statement: *I certify that this UAS was inspected on (date), in accordance with the scope and detail of the (applicant name) Inspection and Maintenance Program, and was found to be in a condition for safe operation.*

(3) UAS instruments and equipment required to be installed must be inspected and maintained in accordance with the requirements of L-3 BAI Aerosystems Maintenance Program document ID 999-1022, dated 02/18/2009. Any maintenance or inspection of this equipment must be recorded in the UAS maintenance records.

(4) No person may operate this UAS unless the altimeter system and transponder have been tested within the preceding 24 calendar months in accordance with § 91.413, ATC transponder tests and inspections. These inspections will be recorded in the UAS maintenance records.

11. Information Reporting. L-3 BAI Aerosystems shall provide the following information to Donald.E.Grampp@faa.gov and AIR-200 on a monthly basis:

- a. Number of flights conducted under this certificate.
- b. Pilot duty time per flight.
- c. Unusual equipment malfunctions (hardware or software).
- d. Deviations from ATC instructions.
- e. Unintended entry into lost link flight mode that results in a course change.

12. Revisions and Other Provisions.

a. Experimental certificates, program letters, and operating limitations. The experimental certificate, FAA-accepted L-3 BAI Aerosystems program letter, and operating limitations cannot be reissued, renewed, or revised without application being made to the New Cumberland Manufacturing Inspection District Office (MIDO), in coordination with AIR-200. AIR-200 will be responsible for FAA Headquarters internal coordination with the Aircraft Certification Service, Flight Standards Service, Air Traffic Organization, Office of the Chief Council, and Office of Rulemaking.

b. Certificates of waiver or authorization. L-3 BAI Aerosystems shall immediately notify the Production and Airworthiness Division, AIR-200, and the New Cumberland MIDO, if there is any plan for requesting a Certificate of Authorization or Waiver (COA) for UAS operations during the time the experimental certificate is in effect. An entry in the aircraft logbook is required to document that the aircraft flight authority has been changed from the experimental certificate to COA. When COA operations are concluded and the aircraft resumes flying under the experimental certificate, a record entry will be made in the aircraft logbook by an appropriately rated person to document that the aircraft is in a condition for safe operation and appropriately configured.

c. Amendments and cancellations. The provisions and limitations annotated in this operational approval may be amended or cancelled at any time as deemed necessary by the FAA.

d. Reviews of revisions. All revisions to L-3 BAI Aerosystems, FAA-accepted, inspection and maintenance program must be reviewed and accepted by the Baltimore Flight Standards District Office (FSDO).

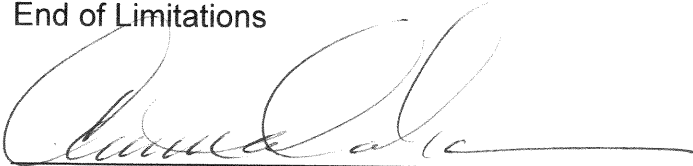
13. UAS Modifications.

a. Software and system changes. All software and system changes will be documented as part of the normal maintenance procedures and will be available for inspection. All software and system changes must be inspected and approved per L-3 BAI Aerosystems Maintenance Program document ID 999-1022, dated 02/18/2009. All software changes to the aircraft and control station are categorized as major changes, and must be provided in summary form at the time they are incorporated.

b. Major modifications. All major modifications, whether performed under the experimental certificate, COA, or other authorizations, that could potentially affect the safe operation of the system, must be documented and provided to the FAA before operating the aircraft under this certificate. Major modifications incorporated under COA or other authorization need to be provided only if the aircraft is flown under these authorizations during the effective period of the experimental certificate.

c. Submission of modifications. All information requested must be provided to AIR-200.

End of Limitations



Henry K. Cooper
Aviation Safety Inspector
New Cumberland Manufacturing Inspection District Office
Bldg. 201, Room 102, 400 Airport Drive
New Cumberland, PA 17070-3419

2/18/09
Date:

I certify that I have read and understand the operating limitations and conditions that are a part of the special airworthiness certificate, FAA Form 8130-7, issued on 02/18/2009, for the purposes of [research and development, market survey, and/or crew training.

This special airworthiness certificate is issued for L-3 BAI Aerosystems Viking 100 UAS, serial number 106, registration number N721UA.



Applicant (signature)

2/18/09
Date:

Name: Mark Ensor

Title: Vice President and General Manager

Company: L-3 BAI Aerosystems

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION
SPECIAL AIRWORTHINESS CERTIFICATE

A	CATEGORY/DESIGNATION		EXPERIMENTAL (UNMANNED AIRCRAFT)
	PURPOSE Research & Development, Market Survey, Crew Tng.		
B	MANU-FACTURER	NAME	N/A
		ADDRESS	N/A
C	FLIGHT	FROM	N/A
		TO	N/A
D	N- 721UA		SERIAL NO. 106
	BUILDER L-3 BAI Aerosystems		MODEL Viking 100
E	DATE OF ISSUANCE February 18, 2009		EXPIRY February 17, 2010
	OPERATING LIMITATIONS DATED 02/18/09		ARE PART OF THIS CERTIFICATE
	SIGNATURE OF FAA REPRESENTATIVE Henry K. Cooper		DESIGNATION OR OFFICE NO. ANE-MIDO-44

Any alteration, reproduction or misuse of this certificate may be punishable by a fine not exceeding \$1,000 or imprisonment not exceeding 3 years, or both. THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE TITLE 14, CODE OF FEDERAL REGULATIONS (CFR).