Accepted BM Apr/11/2011

FAA FORM 8130-6, APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

Form Approved O.M.B. No. 2120-0018
12/31/2010

U.S. Department
of Transportation
Federal Aviation Administration

APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

INSTRUCTIONS - Print or type. Do not write in shaded areas; these are for FAA use only. Submit original only to an authorized FAA Representative. If additional space is required, use attachment. For special flight permits complete Sections II, VI and VII as applicable.

I. AIRCRAFT DESIGNATION

1. REGISTRATION MARK N2555R	2. AIRCRAFT BUILDER'S NAME *(Make)* Defense Technologies, Inc.	3. AIRCRAFT MODEL DESIGNATION Kestrel-T	4. YR. MFR. 2008	FAA CODING
5. AIRCRAFT SERIAL NO. 002	6. ENGINE BUILDER'S NAME *(Make)* RCS	7. ENGINE MODEL DESIGNATION 180		
8. NUMBER OF ENGINES 1	9. PROPELLER BUILDER'S NAME *(Make)* Bambula	10. PROPELLER MODEL DESIGNATION 20"x8", 20"x10"		11. AIRCRAFT IS *(Check if applicable)* ☐ IMPORT

II. CERTIFICATION REQUESTED

APPLICATION IS HEREBY MADE FOR: *(Check applicable items)*

A 1 ☐ STANDARD AIRWORTHINESS CERTIFICATE *(Indicate Category)* ☐ NORMAL ☐ UTILITY ☐ ACROBATIC ☐ TRANSPORT ☐ COMMUTER ☐ BALLOON ☐ OTHER

B ☑ SPECIAL AIRWORTHINESS CERTIFICATE *(Check appropriate items)*

- 7 ☐ PRIMARY
- 9 ☐ LIGHT-SPORT *(Indicate Class)* ☐ AIRPLANE ☐ POWER-PARACHUTE ☐ WEIGHT-SHIFT-CONTROL ☐ GLIDER ☐ LIGHTER THAN AIR
- 2 ☐ LIMITED
- 5 ☐ PROVISIONAL *(Indicate Class)*
  - 1 ☐ CLASS I
  - 2 ☐ CLASS II
- 3 ☐ RESTRICTED *(Indicate operation(s) to be conducted)*
  - 1 ☐ AGRICULTURE AND PEST CONTROL
  - 2 ☐ AERIAL SURVEY
  - 3 ☐ AERIAL ADVERTISING
  - 4 ☐ FOREST *(Wildlife Conservation)*
  - 5 ☐ PATROLLING
  - 6 ☐ WEATHER CONTROL
  - 0 ☐ OTHER *(Specify)*
- 4 ☑ EXPERIMENTAL *(Indicate operation(s) to be conducted)*
  - 1 ☑ RESEARCH AND DEVELOPMENT
  - 2 ☐ AMATEUR BUILT
  - 3 ☐ EXHIBITION
  - 4 ☐ AIR RACING
  - 5 ☑ CREW TRAINING
  - 6 ☑ MARKET SURVEY
  - 0 ☐ TO SHOW COMPLIANCE WITH THE CFR
  - 7 ☐ OPERATING *(Primary Category)* KIT BUILT AIRCRAFT
  - 8 ☐ OPERATING LIGHT-SPORT
    - 8A ☐ Existing Aircraft without an airworthiness certificate & do not meet § 103.1
    - 8B ☐ Operating Light-Sport Kit-Built
    - 8C ☐ Operating light-sport previously issued special light-sport category airworthiness certificate under § 21.190
- 8 ☐ SPECIAL FLIGHT PERMIT *(Indicate operation(s) to be conducted, then complete Section VI or VII as applicable on reverse side)*
  - 1 ☐ FERRY FLIGHT FOR REPAIRS, ALTERATIONS, MAINTENANCE, OR STORAGE
  - 2 ☐ EVACUATION FROM AREA OF IMPENDING DANGER
  - 3 ☐ OPERATION IN EXCESS OF MAXIMUM CERTIFICATED TAKE-OFF WEIGHT
  - 4 ☐ DELIVERING OR EXPORTING
  - 5 ☐ PRODUCTION FLIGHT TESTING
  - 6 ☐ CUSTOMER DEMONSTRATION FLIGHTS

C 6 ☐ MULTIPLE AIRWORTHINESS CERTIFICATE *(check ABOVE "Restricted Operation" and "Standard" or "Limited" as applicable)*

III. OWNER'S CERTIFICATION

A. REGISTERED OWNER *(As shown on certificate of aircraft registration)* IF DEALER, CHECK HERE → ☐

NAME Defense Technologies, Inc.	ADDRESS 2179 N Shangri-La Drive, Ste C Lexington PARK, MD. 20653

B. AIRCRAFT CERTIFICATION BASIS *(Check applicable blocks and complete items as indicated)*

☐	AIRCRAFT SPECIFICATION OR TYPE CERTIFICATE DATA SHEET *(Give No. and Revision No.)* N/A	☑	AIRWORTHINESS DIRECTIVES *(Check if all applicable AD's are complied with and give the number of the last AD SUPPLEMENT available in the biweekly series as of the date of application)* BI-WEEKLY 2011-01
☐	AIRCRAFT LISTING *(Give page number(s))* N/A	☐	SUPPLEMENTAL TYPE CERTIFICATE *(List number of each STC incorporated)* N/A

C. AIRCRAFT OPERATION AND MAINTENANCE RECORDS

☑	CHECK IF RECORDS IN COMPLIANCE WITH 14 CFR Section 91.417	TOTAL AIRFRAME HOURS 9.34	3	EXPERIMENTAL ONLY *(Enter hours flown since last certificate issued or renewed)* 0

D. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above, that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 et seq. and applicable Federal Aviation Regulations, and that the aircraft has been inspected and is airworthy and eligible for the airworthiness certificate requested.

DATE OF APPLICATION January 7, 2011	NAME AND TITLE *(Print or type)* Robert A Bryner Director of Engineering	SIGNATURE

IV. INSPECTION AGENCY VERIFICATION

A. THE AIRCRAFT DESCRIBED ABOVE HAS BEEN INSPECTED AND FOUND AIRWORTHY BY: *(Complete the section only if 14 CFR part 21.183(d) applies.*

2	☐	14 CFR part 121 CERTIFICATE HOLDER *(Give Certificate No.)*	3	☐	CERTIFICATED MECHANIC *(Give Certificate No.)*	6 ☐	CERTIFICATED REPAIR STATION *(Give Certificate No.)*
5	☐	AIRCRAFT MANUFACTURER *(Give name or firm)*					

DATE	TITLE	SIGNATURE

V. FAA REPRESENTATIVE CERTIFICATION

(Check ALL applicable block items A and B)

A. I find that the aircraft described in Section I or VII meets requirements for ☑ THE CERTIFICATE REQUESTED; 4 ☐ AMENDMENT OR MODIFICATION OF CURRENT AIRWORTHINESS CERTIFICATE

B. Inspection for a special permit under Section VII was conducted by: ☐ FAA INSPECTOR ☐ FAA DESIGNEE ☐ CERTIFICATE HOLDER UNDER ☐ 14 CFR part 65 ☐ 14 CFR part 121 OR 135 ☐ 14 CFR part 145

DATE 1/7/2011	MIDO/FSDO Office ANE MIDO-44	4	DESIGNEE'S SIGNATURE AND NO.	1	FAA INSPECTOR'S SIGNATURE HENRY K. WOTEX

FAA Form 8130-6 (01-09) Previous Edition Dated 5/01 May be Used Until Depleted, Except for Light-Sport Aircraft NSN: 0052-00-024-7006

VI. PRODUCTION FLIGHT TESTING

A. MANUFACTURER

NAME	ADDRESS

B. PRODUCTION BASIS *(Check applicable item)*

☐ PRODUCTION CERTIFICATE *(Give production certificate number)* →

☐ TYPE CERTIFICATE ONLY

☐ APPROVED PRODUCTION INSPECTION SYSTEM

C. GIVE QUANTITY OF CERTIFICATES REQUIRED FOR OPERATING NEEDS

DATE OF APPLICATION	NAME AND TITLE *(Print or Type)*	SIGNATURE

VII. SPECIAL FLIGHT PERMIT PURPOSES OTHER THAN PRODUCTION FLIGHT TEST

A. DESCRIPTION OF AIRCRAFT

REGISTERED OWNER	ADDRESS
BUILDER *(Make)*	MODEL
SERIAL NUMBER	REGISTRATION MARK

B. DESCRIPTION OF FLIGHT — CUSTOMER DEMONSTRATION FLIGHTS ☐ *(Check if applicable)*

FROM	TO	
VIA	DEPARTURE DATE	DURATION

C. CREW REQUIRED TO OPERATE THE AIRCRAFT AND ITS EQUIPMENT

☐ PILOT ☐ CO-PILOT ☐ FLIGHT ENGINEER ☐ OTHER *(Specify)*

D. THE AIRCRAFT DOES NOT MEET THE APPLICABLE AIRWORTHINESS REQUIREMENTS AS FOLLOWS:

E. THE FOLLOWING RESTRICTIONS ARE CONSIDERED NECESSARY FOR SAFE OPERATION: *(Use attachment if necessary)*

F. CERTIFICATION – I hereby certify that I am the registered owner (or his agent) of the aircraft described above; that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 <u>et seq.</u> and applicable Federal Aviation Regulations; and that the aircraft has been inspected and is safe for the flight described.

DATE	NAME AND TITLE *(Print or Type)*	SIGNATURE

VIII. AIRWORTHINESS DOCUMENTATION (FAA/DESIGNEE use only)

X	A. Operating Limitations and Markings in Compliance with 14 CFR Section 91.9, as applicable.		G. Statement of Conformity, FAA Form 8130-9 *(Attach when required)*
X	B. Current Operating Limitations Attached		H. Foreign Airworthiness Certification for Import Aircraft *(Attach when required)*
	C. Data, Drawings, Photographs, etc. *(Attach when required)*	X	I. Previous Airworthiness Certificate Issued in Accordance with 14 CFR Section 21.191a,c,f CAR ______ *(Original Attached)*
X	D. Current Weight and Balance Information Available in Aircraft		
	E. Major Repair and Alteration, FAA Form 337 *(Attach when required)*	X	J. Current Airworthiness Certificate Issued in Accordance with 14 CFR Section 21.191 a, c, f *(Copy Attached)*
X	F. This inspection Recorded in Aircraft Records		K. Light-Sport Aircraft Statement of Compliance, FAA Form 8130-15 *(Attach when required)*

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION

SPECIAL AIRWORTHINESS CERTIFICATE

COPY

A	CATEGORY/DESIGNATION	EXPERIMENTAL		
	PURPOSE	Research & Development, Market Survey, Crew Tng.		
B	MANU-FACTURER NAME	N/A		
	MANU-FACTURER ADDRESS	N/A		
C	FLIGHT FROM	N/A		
	FLIGHT TO	N/A		
D	N-	2555R	SERIAL NO.	002
	BUILDER	Defense Technolgies, Inc.	MODEL	Kestral - T
E	DATE OF ISSUANCE	January 7, 2011	EXPIRY	January 6, 2012
	OPERATING LIMITATIONS DATED	01/07/2011	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).

FAA FORM 8130-7 (07/04) *SEE REVERSE SIDE* *NSN: 0052-00-693-4000*

A	This airworthiness certificate is issued under the authority of Public Law 104-6, 49 United States Code (USC) 44704 and Title 14 Code of Federal Regulations (CFR).
B	The airworthiness certificate authorizes the manufacturer named on the reverse side to conduct production flight tests, and only production flight tests, of aircraft registered in his name. No person may conduct production flight tests under this certificate: (1) Carrying persons or property for compensation or hire: and/or (2) Carrying persons not essential to the purpose of the flight.
C	This airworthiness certificate authorizes the flight specified on the reverse side for the purpose shown in Block A.
D	This airworthiness certificate certifies that as of the date of issuance, the aircraft to which issued has been inspected and found to meet the requirements of the applicable CFR. The aircraft does not meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention On International Civil Aviation. No person may operate the aircraft described on the reverse side: (1) except in accordance with the applicable CFR and in accordance with conditions and limitations which may be prescribed by the Administrator as part of this certificate; (2) over any foreign country without the special permission of that country.
E	Unless sooner surrendered, suspended, or revoked, this airworthiness certificate is effective for the duration and under the conditions prescribed in 14 CFR, Part 21, Section 21.181 or 21.217.

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION

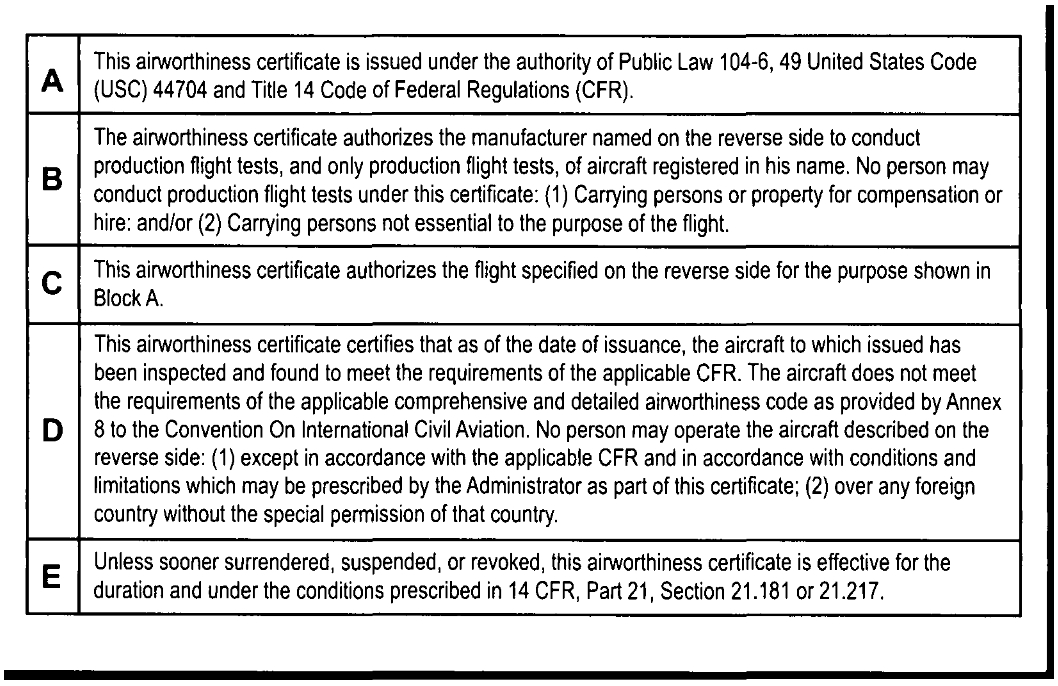
SPECIAL AIRWORTHINESS CERTIFICATE

CANCELLED

A	CATEGORY/DESIGNATION EXPERIMENTAL		
	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- 2555R		SERIAL NO. 002
	BUILDER Defense Technologies, Inc.		MODEL Kestral - T
E	DATE OF ISSUANCE January 7, 2010		EXPIRY January 6, 2011
	OPERATING LIMITATIONS DATED 01/07/10		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).

FAA FORM 8130-7 (07/04) *SEE REVERSE SIDE* *NSN: 0052-00-693-4000*



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E	Unless sooner surrendered, suspended, or revoked, this airworthiness certificate is effective for the duration and under the conditions prescribed in 14 CFR, Part 21, Section 21.181 or 21.217.

FEDERAL AVIATION ADMINISTRATION

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

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

Registered Owner Name: Defense Technologies, Inc.	**Year Manufactured:** 2008
Registered Owner Address: 21795 Shangri-La Dr Lexington Park Maryland 20653	**Aircraft Serial Number:** 002
Aircraft Description: Kestrel-T: Giant Scale Rc Size Standard Wing And Tail Configuration Tricycle Gear Configuration	**Aircraft Model Designation:** Kestrel – T
Aircraft Registration: N2555R	**Engine:** RCS 180
Aircraft Builder: Defense Technologies, Inc.	**Propeller:** Bambula 20 x 8 wood

The following conditions and limitations apply to all unmanned aircraft system (UAS) flight operations for the Kestrel – T, RCS 180 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 Kestrel – T, RCS 180 operated by Defense Technologies, Inc., is considered to be an integrated system. The system is composed of the following:

(1) Kestrel – T, RCS 180, serial number 002,
(2) UAS control station(s), that is, fixed, mobile, ground-based, or airborne.
(3) Telemetry, launch, and recovery equipment.

(4) Communications and navigation equipment, including ground and/or airborne equipment used for command and control of the Kestrel – T, RCS 180.

(5) Ground or airborne equipment used for communication with the chase aircraft, 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 Defense Technologies, Inc., 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 Defense Technologies, Inc., program letter dated 01/07/2011, Rev. 1.6, 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) Defense Technologies, Inc., 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. Before conducting the initial flight of the Kestrel – T, RCS 180, Defense Technologies, Inc., must forward a copy of the Kestrel – T, RCS 180 program letter, special airworthiness certificate, and operating limitations to the following personnel:

(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) 267-9538, 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, Investigative and Enforcement Procedures, to Defense Technologies, Inc.

2. Program Letter. The Kestrel – T, RCS 180 program letter, dated 01/07/2011, Rev.1.6, 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 must be 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 flight operations area is located in Clements, MD. Clements Field, 4MD4 is a private airport located at:

Latitude	38° 20.408N
Longitude	76° 44.432W

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.

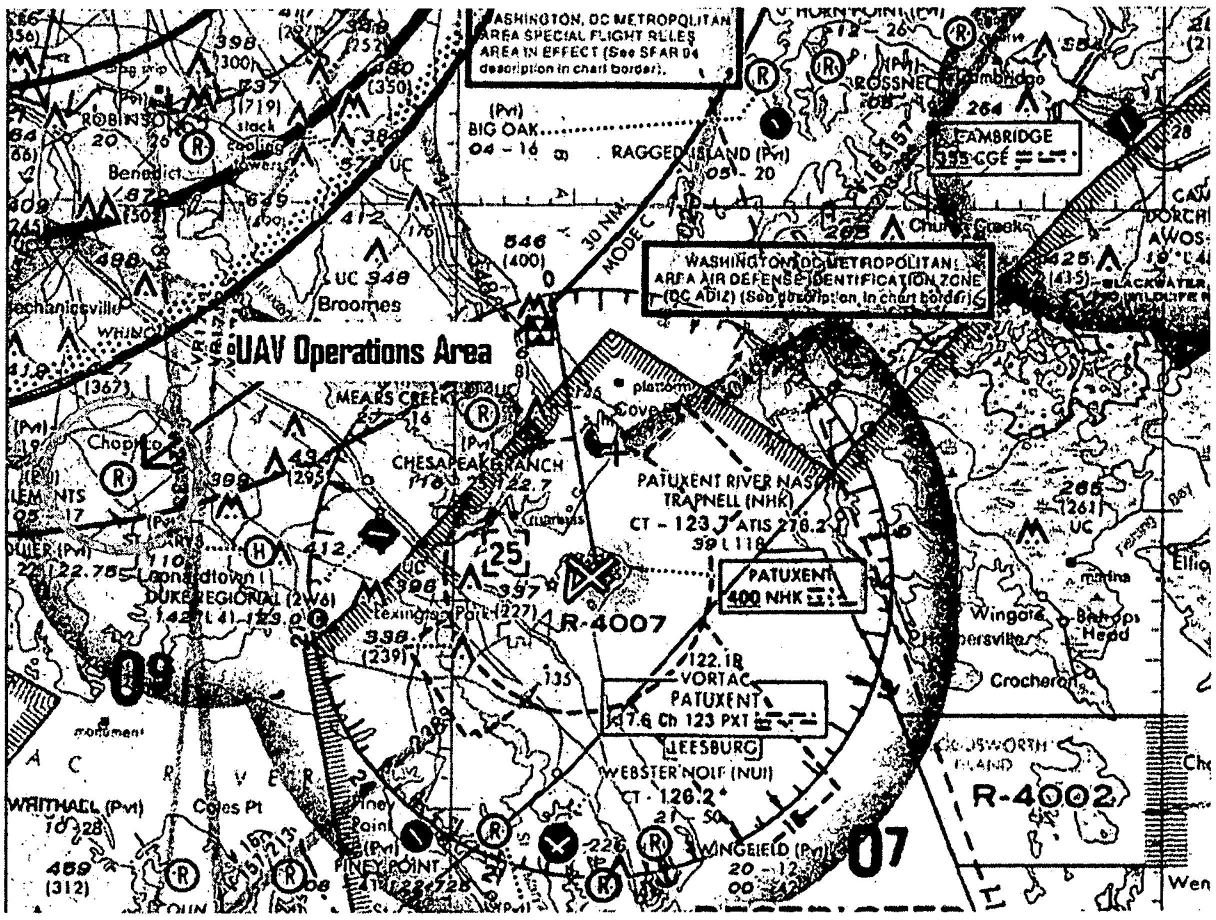

Figure 1. Aeronautical Chart

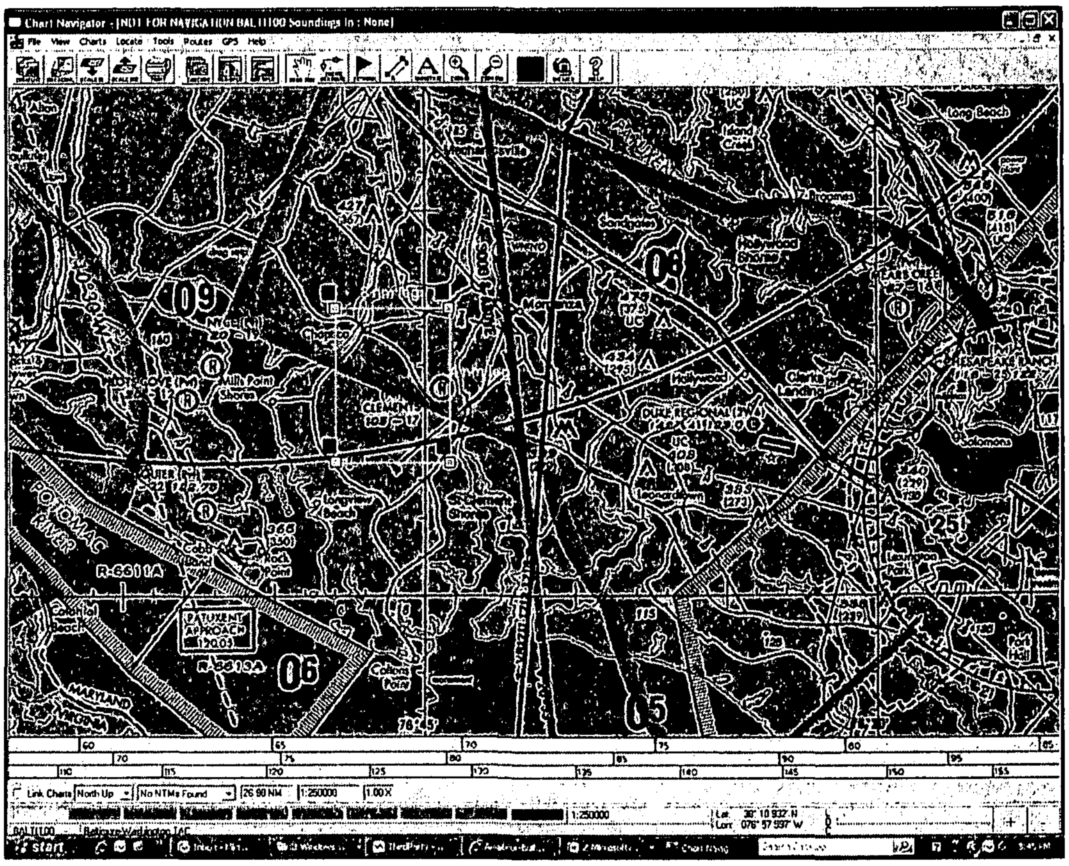

Figure 2. Kestrel – T Flight Test Area

Waypoints for Proposed Kestrel-T Experimental Flight Box - 4MD4 Operations		
Point Name	**Latitude**	**Longitude**
Point 1	**38° 18.418′ N**	**076° 44.136′ W**
Point 2	**38° 22.440′ N**	**076° 44.153′ W**
Point 3	**38° 22.448′ N**	**076° 47.988′ W**
Point 4	**38° 18.447′ N**	**076° 47.967′ W**

c. Authorized flight times and conditions. All flight operations must be conducted during daylight hours under visual flight rules (VFR). Potomac TRACN (PCT) will NOT be requiring VHF/UHF monitoring or communication. The following conditions will be included in your operating limitations.

(1) Operations shall be conducted below 1000 MSL.

(2) Flight operations shall be contained in an area west of 4MD4. The primary containment area is identified as being 2nm north, 2nm south, and 3nm west of the airport as identified in Figure 2 above. All flight operations must remain clear of the ADIZ.

(3) The UAS PIC must notify the PCT TRACON Operations Manager

at (540) 349-7541 and PAX River NAS at (301) 342-3740 at least 30 minutes prior to launch and immediately upon termination of operations each day. DTI must provide PCT with an on-site contact name and phone number for two-way communications with ATC for each flight.

(4) The Kestrel UAS shall transmit the assigned beacon code 0377 and altitude information (Mode-C) for the duration of the flight. Any failure of the transponder or inability to properly squawk the assigned code shall be reported to PCT and flight operations shall be terminated.

(5) The Kestrel pilot shall have the capability of maneuvering the UAS or suspending operations as instructed by PCT.

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

(7) A Notice to Airmen (NOTAM) shall be issued when UAS operations are being conducted. (Note: Do not use 'distant' or D here as the NOTAM classification and codes have recently been changed.) DTI shall contact the Automated Flight Service Station (FSS) no less than 48 hours prior to the operation and provide:

i) Name, address, and telephone number of the person giving notice.
ii) Nature of the activity.
iii) Date, time, and duration of the activity.
iv) Size of the affected area in nautical mile radius and affected altitudes.
v) Location of center of affected area in relation to airport.
vi) Location of center of affected area in relation to nearest VOR/DME or VORTAC.

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, AFS-407. AFS-407 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.ntsb.gov. Further flight operations must not be conducted until the incident is reviewed by AFS-407 and authorization to resume operations is provided to DTI.

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 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 Defense Technologies, Inc. company procedures.

(4) The UA PIC must have a flight review in unmanned aircraft every 24 calendar months in accordance with Defense Technologies, Inc., procedures.

(5) All UA PICs must have successfully completed applicable Defense Technologies, Inc. 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.

(1) The supplemental 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 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.

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

(1) All UA pilots must maintain currency in unmanned aircraft in accordance with Defense Technologies, Inc. company procedures.

(2) All UA pilots must have a flight review in unmanned aircraft every 24 calendar months in accordance with Defense Technologies, Inc., procedures.

(3) All UA pilots must have successfully completed applicable Defense Technologies, Inc., 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 1nm 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) An observer may be positioned in a chase aircraft. When a chase aircraft is used, it must maintain a reasonable proximity, and must position itself relative to the UA to reduce the hazard of collision in accordance with § 91.111, Operating near other aircraft. When the observer is located in a chase aircraft, the observer's duties must be dedicated to the task of observation only. Concurrent duty as pilot of the chase aircraft is not authorized.

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

(7) 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 Defense Technologies, Inc., program letter.

(2) All observers must have successfully completed applicable Defense Technologies, Inc., training for the UAS.

6. Equipage.

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

b. The UA and chase aircraft 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. 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.

b. During UA flights.

(1) Appropriate air traffic frequencies must be monitored during flight operations.

(2) All UA 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 while remaining within the flight test area 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), including cloud clearance minimums as specified in § 91.155, Basic VFR weather minimums. Flight operation in instrument meteorological conditions (IMC) is not permitted.

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. (See § 91.303, Aerobatic 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. Transponder requirements.

(1) The UA must operate an approved operational Mode C or Mode S altitude encoding transponder during all flight operations.

(2) Chase aircraft transponders must be on standby while performing chase operations flight with the UA.

d. Transponder failure.

(1) In the event of transponder failure on either the UA or the chase aircraft, the UA must conclude all flight operations and expeditiously return to its base of operations within the prescribed limitations of this authorization.

(2) In the event of UA transponder failure, a chase aircraft will operate its transponder in Mode C.

e. Notice to airman. Defense Technologies, Inc., must request the issuance of a Notice to Airman (NOTAM) through the Automated Flight Service Station at least 24 hours before flight operation.

9. Flight Termination and Lost Link Procedures.

a. Flight termination. In accordance with Defense Technologies, Inc., program letter, Rev. 1.4, dated 12/30/09, 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 chase aircraft or observer, all other UAS control stations, and the appropriate ATC facility will be immediately notified of the lost link condition and the expected UA response.

10. Maintenance and Inspection. (Ref.: DTI-UAS-MAIN-INSP-01, Kestral-T UAS Maintenance and Inspection Policy, Rev. 2.3, 12/28/09, AEA-FSDO-27-accepted 12/30/09).

a. General requirements. The UAS must not be operated unless it is inspected and maintained in accordance with the Defense Technologies, Inc., Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Aircraft Discrepancy Form, Rev. 2.3, dated 12/28/09, and Daily Ground Station Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Ground Station Discrepancy Form, Rev. 2.3, dated 12/28/09, or later accepted FAA revision. Defense Technologies, Inc., must establish and maintain aircraft maintenance records (see paragraph 10(d) below).

b. Inspections. No person may operate this UAS within the preceding 12 calendar months unless it has had a condition inspection performed according to the Defense Technologies, Inc., Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Aircraft Discrepancy Form, Rev. 2.3, dated 12/28/09, and Daily Ground Station Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Ground Station Discrepancy Form, Rev. 2.3, dated 12/28/09, or later accepted FAA revision. 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 Defense Technologies, Inc., 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, the UAS's total time-in-service, 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 Defense Technologies, Inc.,* Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Aircraft Discrepancy Form, Rev. 2.3, dated 12/28/09, and Daily Ground Station Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Ground Station Discrepancy Form, Rev. 2.3, dated 12/28/09, or later accepted FAA revision*, 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 the *Defense Technologies, Inc.* 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 § 91.411, Altimeter system and altitude reporting equipment tests and inspections, and § 91.413, ATC transponder tests and inspections. These inspections will be recorded in the UAS maintenance records.

11. Information Reporting. Defense Technologies, Inc., will provide the following information to Donald.E.Grampp@FAA.GOV on a monthly basis. A copy of the report shall be provided to AIR-200.

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 Defense Technologies, Inc., 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. DTI 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. (Ref.: DTI-UAS-MAIN-INSP-01, Kestral-T UAS Maintenance and Inspection Policy, Rev. 2.3, dated 12/28/09, AEA-FSDO-27-accepted 12/30/09) All revisions to Defense Technologies, Inc., Kestral-T UAS UAS Maintenance and Inspection Policy, Rev. 2.3, dated 12/28/09, AEA-FSDO-27-accepted 12/30/09, Daily Aircraft Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Aircraft Discrepancy Form, Rev. 2.3, dated 12/28/09, and Daily Ground Station Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Ground Station Discrepancy Form, Rev. 2.3, dated 12/28/09, must be reviewed and accepted by the Washington 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 Defense Technologies, Inc., Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Aircraft Discrepancy Form, Rev. 2.3, dated 12/28/09, and Daily Ground Station Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Ground Station Discrepancy Form, Rev. 2.3, dated 12/28/09, or later accepted FAA revision. 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 needs 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

JAN 07 2011
Issuance Date:

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

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 (add date), for the purposes of research and development, market survey, and/or crew training. This special airworthiness certificate is issued for Kestrel – T, RCS 180, serial number ~~003~~, registration number ~~N2554R~~.

002

N2555R.

Applicant (signature)

2-15-11
Date:

Name (Printed): Donald Jackson

Title: Senior Vice President

Company: Defense Technologies, Inc.

FEDERAL AVIATION ADMINISTRATION

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

CANCELLED

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

Registered Owner Name: Defense Technologies, Inc.	**Year Manufactured:** 2008
Registered Owner Address: 21795 Shangri-La Dr Lexington Park Maryland 20653	**Aircraft Serial Number:** 002
Aircraft Description: Kestrel-T: Giant Scale Rc Size Standard Wing And Tail Configuration Tricycle Gear Configuration	**Aircraft Model Designation:** Kestrel – T **Engine:** RCS 180
Aircraft Registration: N2555R	**Propeller:** Bambula 20 x 8 wood
Aircraft Builder: Defense Technologies, Inc.	

The following conditions and limitations apply to all unmanned aircraft system (UAS) flight operations for the Kestrel – T, RCS 180 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 Kestrel – T, RCS 180 operated by Defense Technologies, Inc., is considered to be an integrated system. The system is composed of the following:

(1) Kestrel – T, RCS 180, serial number 002,
(2) UAS control station(s), that is, fixed, mobile, ground-based, or airborne.
(3) Telemetry, launch, and recovery equipment.

(4) Communications and navigation equipment, including ground and/or airborne equipment used for command and control of the Kestrel – T, RCS 180.

(5) Ground or airborne equipment used for communication with the chase aircraft, 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 Defense Technologies, Inc., must comply with all applicable sections and parts of 14 CFR including, but not limited to, parts 61 and 91.

c. Operational requirements.

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(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 Defense Technologies, Inc., program letter dated 01/07/2011, Rev. 1.6, 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) Defense Technologies, Inc., 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. Before conducting the initial flight of the Kestrel – T, RCS 180, Defense Technologies, Inc., must forward a copy of the Kestrel – T, RCS 180 program letter, special airworthiness certificate, and operating limitations to the following personnel:

(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) 267-9538, 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, Investigative and Enforcement Procedures, to Defense Technologies, Inc.

2. Program Letter. The Kestrel – T, RCS 180 program letter, dated 01/07/2011, Rev.1.6, 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 must be 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.*

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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 flight operations area is located in Clements, MD. Clements Field, 4MD4 is a private airport located at:

Latitude	38° 20.408N
Longitude	76° 44.432W

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.

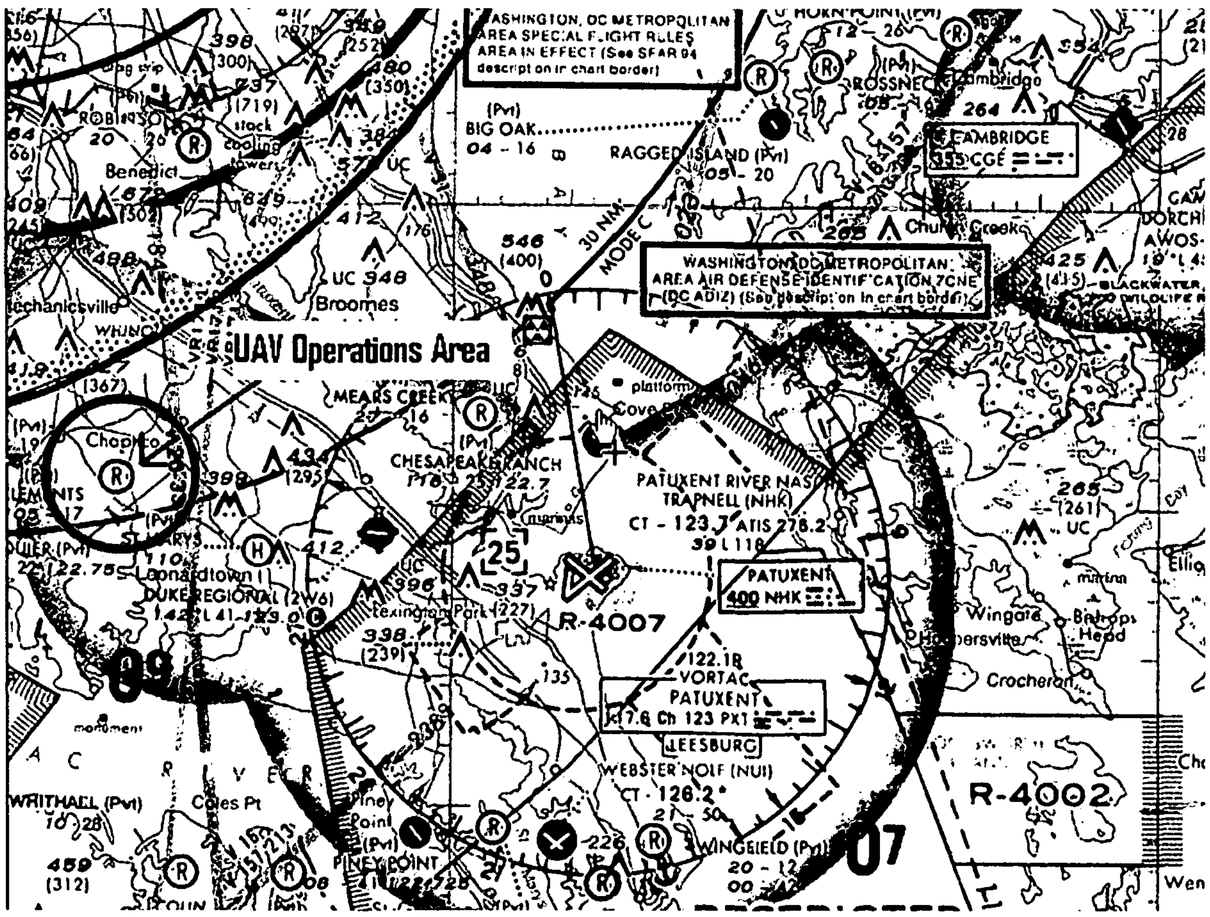

Figure 1. Aeronautical Chart

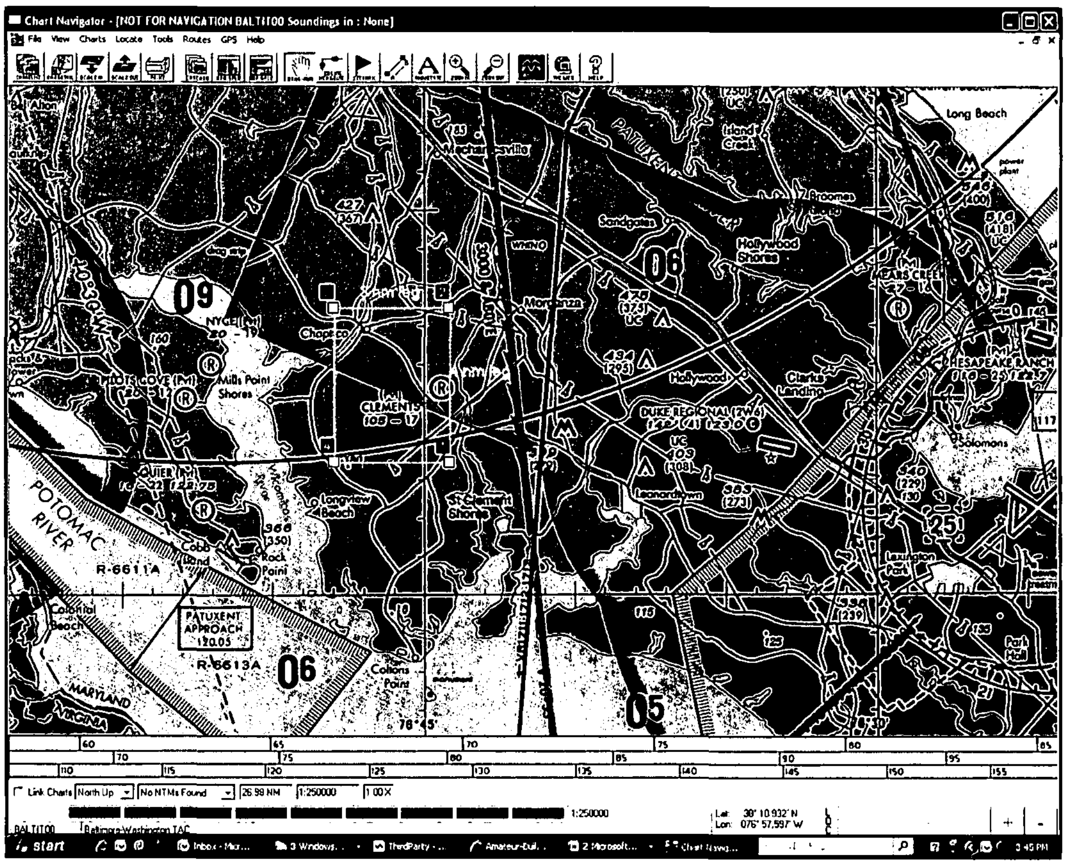

Figure 2. Kestrel – T Flight Test Area

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Waypoints for Proposed Kestrel-T Experimental Flight Box - 4MD4 Operations		
Point Name	**Latitude**	**Longitude**
Point 1	**38° 18.418′ N**	**076° 44.136′ W**
Point 2	**38° 22.440′ N**	**076° 44.153′ W**
Point 3	**38° 22.448′ N**	**076° 47.988′ W**
Point 4	**38° 18.447′ N**	**076° 47.967′ W**

c. Authorized flight times and conditions. All flight operations must be conducted during daylight hours under visual flight rules (VFR). Potomac TRACN (PCT) will NOT be requiring VHF/UHF monitoring or communication. The following conditions will be included in your operating limitations.

(1) Operations shall be conducted below 1000 MSL.

(2) Flight operations shall be contained in an area west of 4MD4. The primary containment area is identified as being 2nm north, 2nm south, and 3nm west of the airport as identified in Figure 2 above. All flight operations must remain clear of the ADIZ.

(3) The UAS PIC must notify the PCT TRACON Operations Manager

at (540) 349-7541 and PAX River NAS at (301) 342-3740 at least 30 minutes prior to launch and immediately upon termination of operations each day. DTI must provide PCT with an on-site contact name and phone number for two-way communications with ATC for each flight.

(4) The Kestrel UAS shall transmit the assigned beacon code 0377 and altitude information (Mode-C) for the duration of the flight. Any failure of the transponder or inability to properly squawk the assigned code shall be reported to PCT and flight operations shall be terminated.

(5) The Kestrel pilot shall have the capability of maneuvering the UAS or suspending operations as instructed by PCT.

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

(7) A Notice to Airmen (NOTAM) shall be issued when UAS operations are being conducted. (Note: Do not use 'distant' or D here as the NOTAM classification and codes have recently been changed.) DTI shall contact the Automated Flight Service Station (FSS) no less than 48 hours prior to the operation and provide:

i) Name, address, and telephone number of the person giving notice.
ii) Nature of the activity.
iii) Date, time, and duration of the activity.
iv) Size of the affected area in nautical mile radius and affected altitudes.
v) Location of center of affected area in relation to airport.
vi) Location of center of affected area in relation to nearest VOR/DME or VORTAC.

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, AFS-407. AFS-407 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.ntsb.gov. Further flight operations must not be conducted until the incident is reviewed by AFS-407 and authorization to resume operations is provided to DTI.

5. UA Pilots and Observers.

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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 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 (applicant name) company procedures.

(4) The UA PIC must have a flight review in unmanned aircraft every 24 calendar months in accordance with Defense Technologies, Inc., procedures.

(5) All UA PICs must have successfully completed applicable (applicant name) 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.

(1) The supplemental 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 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.

CANCELLED

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

(1) All UA pilots must maintain currency in unmanned aircraft in accordance with (applicant name) company procedures.

(2) All UA pilots must have a flight review in unmanned aircraft every 24 calendar months in accordance with Defense Technologies, Inc., procedures.

(3) All UA pilots must have successfully completed applicable Defense Technologies, Inc., 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 1000 ft 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) An observer may be positioned in a chase aircraft. When a chase aircraft is used, it must maintain a reasonable proximity, and must position itself relative to the UA to reduce the hazard of collision in accordance with § 91.111, Operating near other aircraft. When the observer is located in a chase aircraft, the observer's duties must be dedicated to the task of observation only. Concurrent duty as pilot of the chase aircraft is not authorized.

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

(7) 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.

CANCELLED

(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 Defense Technologies, Inc., program letter.

(2) All observers must have successfully completed applicable Defense Technologies, Inc., training for the UAS.

6. Equipage.

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

b. The UA and chase aircraft 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. 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.

b. During UA flights.

(1) Appropriate air traffic frequencies must be monitored during flight operations.

(2) All UA 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 while remaining within the flight test area 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), including cloud clearance minimums as specified in § 91.155, Basic VFR weather minimums. Flight operation in instrument meteorological conditions (IMC) is not permitted.

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. (See § 91.303, Aerobatic 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.

CANCELLED

c. Transponder requirements.

(1) The UA must operate an approved operational Mode C or Mode S altitude encoding transponder during all flight operations.

(2) Chase aircraft transponders must be on standby while performing chase operations flight with the UA.

d. Transponder failure.

(1) In the event of transponder failure on either the UA or the chase aircraft, the UA must conclude all flight operations and expeditiously return to its base of operations within the prescribed limitations of this authorization.
(2) In the event of UA transponder failure, a chase aircraft will operate its transponder in Mode C.

e. Notice to airman. Defense Technologies, Inc., must request the issuance of a Notice to Airman (NOTAM) through the Automated Flight Service Station at least 24 hours before flight operation.

9. Flight Termination and Lost Link Procedures.

a. Flight termination. In accordance with Defense Technologies, Inc., program letter, Rev. 1.4, dated 12/30/09, 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 chase aircraft or observer, all other UAS control stations, and the appropriate ATC facility will be immediately notified of the lost link condition and the expected UA response.

10. Maintenance and Inspection. (Ref.: DTI-UAS-MAIN-INSP-01, Kestral-T UAS Maintenance and Inspection Policy, Rev. 2.3, 12/28/09, AEA-FSDO-27-accepted 12/30/09).

a. General requirements. The UAS must not be operated unless it is inspected and maintained in accordance with the Defense Technologies, Inc., Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Aircraft Discrepancy Form, Rev. 2.3, dated 12/28/09, and Daily Ground Station Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Ground Station Discrepancy Form, Rev. 2.3, dated 12/28/09, or later accepted FAA revision. Defense Technologies, Inc., must establish and maintain aircraft maintenance records (see paragraph 10(d) below).

b. Inspections. No person may operate this UAS within the preceding 12 calendar months unless it has had a condition inspection performed according to the Defense Technologies, Inc., Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Aircraft Discrepancy Form, Rev. 2.3, dated 12/28/09, and Daily Ground Station Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Ground Station Discrepancy Form, Rev. 2.3, dated 12/28/09, or later accepted FAA revision. 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.

CANCELLED

c. Authorized inspectors. Only those individuals trained and authorized by Defense Technologies, Inc., 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, the UAS's total time-in-service, 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 Defense Technologies, Inc.,* Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Aircraft Discrepancy Form, Rev. 2.3, dated 12/28/09, and Daily Ground Station Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Ground Station Discrepancy Form, Rev. 2.3, dated 12/28/09, or later accepted FAA revision*, 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 the *Defense Technologies, Inc.* 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 § 91.411, Altimeter system and altitude reporting equipment tests and inspections, and § 91.413, ATC transponder tests and inspections. These inspections will be recorded in the UAS maintenance records.

11. Information Reporting. Defense Technologies, Inc., will provide the following information to Donald.E.Grampp@FAA.GOV on a monthly basis. A copy of the report shall be provided to AIR-200.

CANCELLED

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 Defense Technologies, Inc., 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. DTI 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. (Ref.: DTI-UAS-MAIN-INSP-01, Kestral-T UAS Maintenance and Inspection Policy, Rev. 2.3, dated 12/28/09, AEA-FSDO-27-accepted 12/30/09)

All revisions to Defense Technologies, Inc., Kestral-T UAS UAS Maintenance and Inspection Policy, Rev. 2.3, dated 12/28/09, AEA-FSDO-27-accepted 12/30/09, Daily Aircraft Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Aircraft Discrepancy Form, Rev. 2.3, dated 12/28/09, and Daily Ground Station Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Ground Station Discrepancy Form, Rev. 2.3, dated 12/28/09, must be reviewed and accepted by the Washington 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 Defense Technologies, Inc., Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Aircraft Discrepancy Form, Rev. 2.3, dated 12/28/09, and Daily Ground Station Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Ground Station Discrepancy Form, Rev. 2.3, dated 12/28/09, or later accepted FAA revision. 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

CANCELLED

authorization needs 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

1/7/2010
Issuance Date:

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

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 (date), for the purposes of research and development, market survey, and/or crew training. This special airworthiness certificate is issued for Kestrel – T, RCS 180, serial number 003, registration number N2554V.

Applicant (signature)

1-7-2010
Date:

Name (Printed): Donald Jackson

Title: Senior Vice President

Company: Defense Technologies, Inc.

CANCELLED

FAA FORM 8130-6, APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

Form Approved O.M.B. No. 2120-0018
12/31/2010

Accepted TM Mar/08/2010

U.S. Department of Transportation
Federal Aviation Administration

APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

INSTRUCTIONS - Print or type. Do not write in shaded areas; these are for FAA use only. Submit original only to an authorized FAA Representative. If additional space is required, use attachment. For special flight permits complete Sections II, VI and VII as applicable.

I. AIRCRAFT DESIGNATION

1. REGISTRATION MARK N2555R	2. AIRCRAFT BUILDER'S NAME *(Make)* Defense Technologies, Inc	3. AIRCRAFT MODEL DESIGNATION Kestrel-T	4. YR. MFR. 2008	FAA CODING
5. AIRCRAFT SERIAL NO. 002	6. ENGINE BUILDER'S NAME *(Make)* RCS	7. ENGINE MODEL DESIGNATION 180		
8. NUMBER OF ENGINES 1	9. PROPELLER BUILDER'S NAME *(Make)* Bambula	10. PROPELLER MODEL DESIGNATION 20" x 8"	11. AIRCRAFT IS *(Check if applicable)* ☐ IMPORT	

II. CERTIFICATION REQUESTED

APPLICATION IS HEREBY MADE FOR: *(Check applicable items)*

A 1 ☐ STANDARD AIRWORTHINESS CERTIFICATE *(Indicate Category)* ☐ NORMAL ☐ UTILITY ☐ ACROBATIC ☐ TRANSPORT ☐ COMMUTER ☐ BALLOON ☐ OTHER

B ☒ SPECIAL AIRWORTHINESS CERTIFICATE *(Check appropriate items)*

- 7 ☐ PRIMARY
- 9 ☐ LIGHT-SPORT *(Indicate Class)* ☐ AIRPLANE ☐ POWER-PARACHUTE ☐ WEIGHT-SHIFT-CONTROL ☐ GLIDER ☐ LIGHTER THAN AIR
- 2 ☐ LIMITED
- 5 ☐ PROVISIONAL *(Indicate Class)*
  - 1 ☐ CLASS I
  - 2 ☐ CLASS II
- 3 ☐ RESTRICTED *(Indicate operation(s) to be conducted)*
  - 1 ☐ AGRICULTURE AND PEST CONTROL
  - 2 ☐ AERIAL SURVEY
  - 3 ☐ AERIAL ADVERTISING
  - 4 ☐ FOREST *(Wildlife Conservation)*
  - 5 ☐ PATROLLING
  - 6 ☐ WEATHER CONTROL
  - 0 ☐ OTHER *(Specify)*
- 4 ☒ EXPERIMENTAL *(Indicate operation(s) to be conducted)*
  - 1 ✓ RESEARCH AND DEVELOPMENT
  - 2 ☐ AMATEUR BUILT
  - 3 ☐ EXHIBITION
  - 4 ☐ AIR RACING
  - 5 ✓ CREW TRAINING
  - 6 ✓ MARKET SURVEY
  - 0 ☐ TO SHOW COMPLIANCE WITH THE CFR
  - 7 ☐ OPERATING *(Primary Category)* KIT BUILT AIRCRAFT
  - 8 OPERATING LIGHT-SPORT
    - 8A ☐ Existing Aircraft without an airworthiness certificate & do not meet § 103.1
    - 8B ☐ Operating Light-Sport Kit-Built
    - 8C ☐ Operating light-sport previously issued special light-sport category airworthiness certificate under § 21.190
- 8 ☐ SPECIAL FLIGHT PERMIT *(Indicate operation(s) to be conducted, then complete Section VI or VII as applicable on reverse side)*
  - 1 ☐ FERRY FLIGHT FOR REPAIRS, ALTERATIONS, MAINTENANCE, OR STORAGE
  - 2 ☐ EVACUATION FROM AREA OF IMPENDING DANGER
  - 3 ☐ OPERATION IN EXCESS OF MAXIMUM CERTIFICATED TAKE-OFF WEIGHT
  - 4 ☐ DELIVERING OR EXPORTING
  - 5 ☐ PRODUCTION FLIGHT TESTING
  - 6 ☐ CUSTOMER DEMONSTRATION FLIGHTS

C 6 ☐ MULTIPLE AIRWORTHINESS CERTIFICATE *(check ABOVE "Restricted Operation" and "Standard" or "Limited" as applicable)*

III. OWNER'S CERTIFICATION

A. REGISTERED OWNER *(As shown on certificate of aircraft registration)* IF DEALER, CHECK HERE ☐

NAME
Defense Technologies, Inc.

ADDRESS
21795 North Shangri-La Drive
Lexington Park, MD 20653

B. AIRCRAFT CERTIFICATION BASIS *(Check applicable blocks and complete items as indicated)*

☐	AIRCRAFT SPECIFICATION OR TYPE CERTIFICATE DATA SHEET *(Give No. and Revision No.)* N/A	✓	AIRWORTHINESS DIRECTIVES *(Check if all applicable AD's are complied with and give the number of the last AD SUPPLEMENT available in the biweekly series as of the date of application)* Bi-Weekly 2010-01
☐	AIRCRAFT LISTING *(Give page number(s))* N/A	☐	SUPPLEMENTAL TYPE CERTIFICATE *(List number of each STC incorporated)* N/A

C. AIRCRAFT OPERATION AND MAINTENANCE RECORDS

✓	CHECK IF RECORDS IN COMPLIANCE WITH 14 CFR Section 91.417	TOTAL AIRFRAME HOURS 9.34	3	EXPERIMENTAL ONLY *(Enter hours flown since last certificate issued or renewed)* 9.34

D. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above, that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 et seq. and applicable Federal Aviation Regulations, and that the aircraft has been inspected and is airworthy and eligible for the airworthiness certificate requested.

DATE OF APPLICATION January 7, 2010	NAME AND TITLE *(Print or type)* Donald R. Jackson, Senior Vice President	SIGNATURE

IV. INSPECTION AGENCY VERIFICATION

A. THE AIRCRAFT DESCRIBED ABOVE HAS BEEN INSPECTED AND FOUND AIRWORTHY BY: *(Complete the section only if 14 CFR part 21.183(d) applies.*

2	☐	14 CFR part 121 CERTIFICATE HOLDER *(Give Certificate No.)*	3	☐	CERTIFICATED MECHANIC *(Give Certificate No.)*	6	☐ CERTIFICATED REPAIR STATION *(Give Certificate No.)*
5	☐	AIRCRAFT MANUFACTURER *(Give name or firm)*					

DATE	TITLE	SIGNATURE

V. FAA REPRESENTATIVE CERTIFICATION

(Check ALL applicable block items A and B)

A. I find that the aircraft described in Section I or VII meets requirements for
- ✓ THE CERTIFICATE REQUESTED
- 4 ☐ AMENDMENT OR MODIFICATION OF CURRENT AIRWORTHINESS CERTIFICATE

B. Inspection for a special permit under Section VII was conducted by:
- ☐ FAA INSPECTOR
- ☐ FAA DESIGNEE
- ☐ CERTIFICATE HOLDER UNDER
- ☐ 14 CFR part 65
- ☐ 14 CFR part 121 OR 135
- ☐ 14 CFR part 145

DATE 1/7/2010	MIDO/FSDO Office ANE-MIDO-44	4	DESIGNEE'S SIGNATURE AND NO.	1	FAA INSPECTOR'S SIGNATURE HENRY K. COOPER

VI. PRODUCTION FLIGHT TESTING

A. MANUFACTURER		
NAME	ADDRESS	
B. PRODUCTION BASIS *(Check applicable item)*		
☐ PRODUCTION CERTIFICATE *(Give production certificate number)* →		
☐ TYPE CERTIFICATE ONLY		
☐ APPROVED PRODUCTION INSPECTION SYSTEM		
C. GIVE QUANTITY OF CERTIFICATES REQUIRED FOR OPERATING NEEDS		
DATE OF APPLICATION	NAME AND TITLE *(Print or Type)*	SIGNATURE

VII. SPECIAL FLIGHT PERMIT PURPOSES OTHER THAN PRODUCTION FLIGHT TEST

A. DESCRIPTION OF AIRCRAFT

REGISTERED OWNER	ADDRESS
BUILDER *(Make)*	MODEL
SERIAL NUMBER	REGISTRATION MARK

B. DESCRIPTION OF FLIGHT CUSTOMER DEMONSTRATION FLIGHTS ☐ *(Check if applicable)*

FROM	TO	
VIA	DEPARTURE DATE	DURATION

C. CREW REQUIRED TO OPERATE THE AIRCRAFT AND ITS EQUIPMENT

☐ PILOT ☐ CO-PILOT ☐ FLIGHT ENGINEER ☐ OTHER *(Specify)*

D. THE AIRCRAFT DOES NOT MEET THE APPLICABLE AIRWORTHINESS REQUIREMENTS AS FOLLOWS:

E. THE FOLLOWING RESTRICTIONS ARE CONSIDERED NECESSARY FOR SAFE OPERATION: *(Use attachment if necessary)*

F. CERTIFICATION – I hereby certify that I am the registered owner (or his agent) of the aircraft described above; that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 et seq. and applicable Federal Aviation Regulations; and that the aircraft has been inspected and is safe for the flight described.

DATE	NAME AND TITLE *(Print or Type)*	SIGNATURE

VIII. AIRWORTHINESS DOCUMENTATION (FAA/DESIGNEE use only)

✓	A. Operating Limitations and Markings in Compliance with 14 CFR Section 91.9, as applicable.		G. Statement of Conformity, FAA Form 8130-9 *(Attach when required)*
✓	B. Current Operating Limitations Attached		H. Foreign Airworthiness Certification for Import Aircraft *(Attach when required)*
✓	C. Data, Drawings, Photographs, etc. *(Attach when required)* IN PROGRAM LETTER	✓	I. Previous Airworthiness Certificate Issued in Accordance with 14 CFR Section 21.19(a, c, f. CAR ______ (Original Attached)
✓	D. Current Weight and Balance information Available in Aircraft		
	E. Major Repair and Alteration, FAA Form 337 *(Attach when required)*	✓	J. Current Airworthiness Certificate Issued in Accordance with 14 CFR Section 21.19(a, c, f. *(Copy Attached)*
✓	F. This inspection Recorded in Aircraft Records		K. Light-Sport Aircraft Statement of Compliance, FAA Form 8130-15 *(Attach when required)*

FAA Form 8130-6 (01-09) Previous Edition Dated 5/01 May be Used Until Depleted, except for Light-Sport Aircraft NSN: 0052-00-024-7006

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION

SPECIAL AIRWORTHINESS CERTIFICATE

COPY

A	CATEGORY/DESIGNATION EXPERIMENTAL			
	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- 2555R			SERIAL NO. 002
	BUILDER Defense Technologies, Inc.			MODEL Kestral - T
E	DATE OF ISSUANCE January 7, 2010			EXPIRY January 6, 2011
	OPERATING LIMITATIONS DATED 01/07/10			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).

FAA FORM 8130-7 (07/04) *SEE REVERSE SIDE* *NSN: 0052-00-693-4000*

A	This airworthiness certificate is issued under the authority of Public Law 104-6, 49 United States Code (USC) 44704 and Title 14 Code of Federal Regulations (CFR).
B	The airworthiness certificate authorizes the manufacturer named on the reverse side to conduct production flight tests, and only production flight tests, of aircraft registered in his name. No person may conduct production flight tests under this certificate: (1) Carrying persons or property for compensation or hire: and/or (2) Carrying persons not essential to the purpose of the flight.
C	This airworthiness certificate authorizes the flight specified on the reverse side for the purpose shown in Block A.
D	This airworthiness certificate certifies that as of the date of issuance, the aircraft to which issued has been inspected and found to meet the requirements of the applicable CFR. The aircraft does not meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention On International Civil Aviation. No person may operate the aircraft described on the reverse side: (1) except in accordance with the applicable CFR and in accordance with conditions and limitations which may be prescribed by the Administrator as part of this certificate; (2) over any foreign country without the special permission of that country.
E	Unless sooner surrendered, suspended, or revoked, this airworthiness certificate is effective for the *duration and under the conditions prescribed in* 14 CFR, Part 21, *Section* 21.181 *or* 21.217.

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

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

Registered Owner Name:

Defense Technologies, Inc.

Registered Owner Address:

21795 Shangri-La Dr
Lexington Park Maryland 20653

Aircraft Description:

Kestrel-T:
Giant Scale Rc Size
Standard Wing And Tail Configuration
Tricycle Gear Configuration

Aircraft Registration:

N2555R

Aircraft Builder:

Defense Technologies, Inc.

Year Manufactured:

2008

Aircraft Serial Number:

002

Aircraft Model Designation:

Kestrel – T

Engine:

RCS 180

Propeller:

Bambula 20 x 8 wood

COPY

The following conditions and limitations apply to all unmanned aircraft system (UAS) flight operations for the Kestrel – T, RCS 180 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 Kestrel – T, RCS 180 operated by Defense Technologies, Inc., is considered to be an integrated system. The system is composed of the following:

(1) Kestrel – T, RCS 180, serial number 002,
(2) UAS control station(s), that is, fixed, mobile, ground-based, or airborne.
(3) Telemetry, launch, and recovery equipment.

1[illegible]

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(4) Communications and navigation equipment, including ground and/or airborne equipment used for command and control of the Kestrel – T, RCS 180.

(5) Ground or airborne equipment used for communication with the chase aircraft, 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 Defense Technologies, Inc., 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 Defense Technologies, Inc., program letter dated 12/30/2009, Rev. 1.5, 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) Defense Technologies, Inc., 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.

COPY

h. Required documentation. Before conducting the initial flight of the Kestrel – T, RCS 180, Defense Technologies, Inc., must forward a copy of the Kestrel – T, RCS 180 program letter, special airworthiness certificate, and operating limitations to the following personnel:

(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) 267-9538, 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, Investigative and Enforcement Procedures, to Defense Technologies, Inc.

2. Program Letter. The Kestrel – T, RCS 180 program letter, dated 12/30/2009, Rev.1.5, 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 must be 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 flight operations area is located in Clements, MD. Clements Field, 4MD4 is a private airport located at:

Latitude	38° 20.408N
Longitude	76° 44.432W

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.

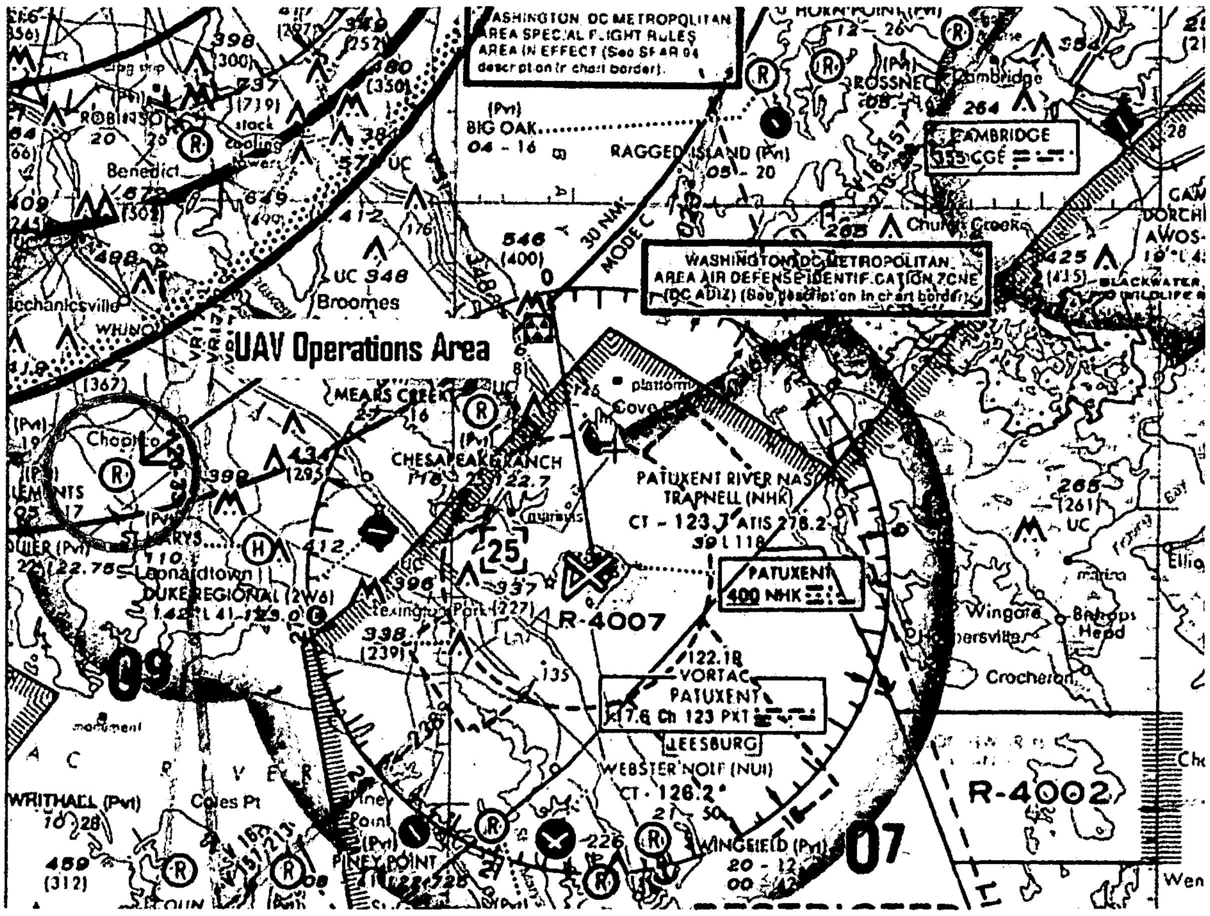

Figure 1. Aeronautical Chart

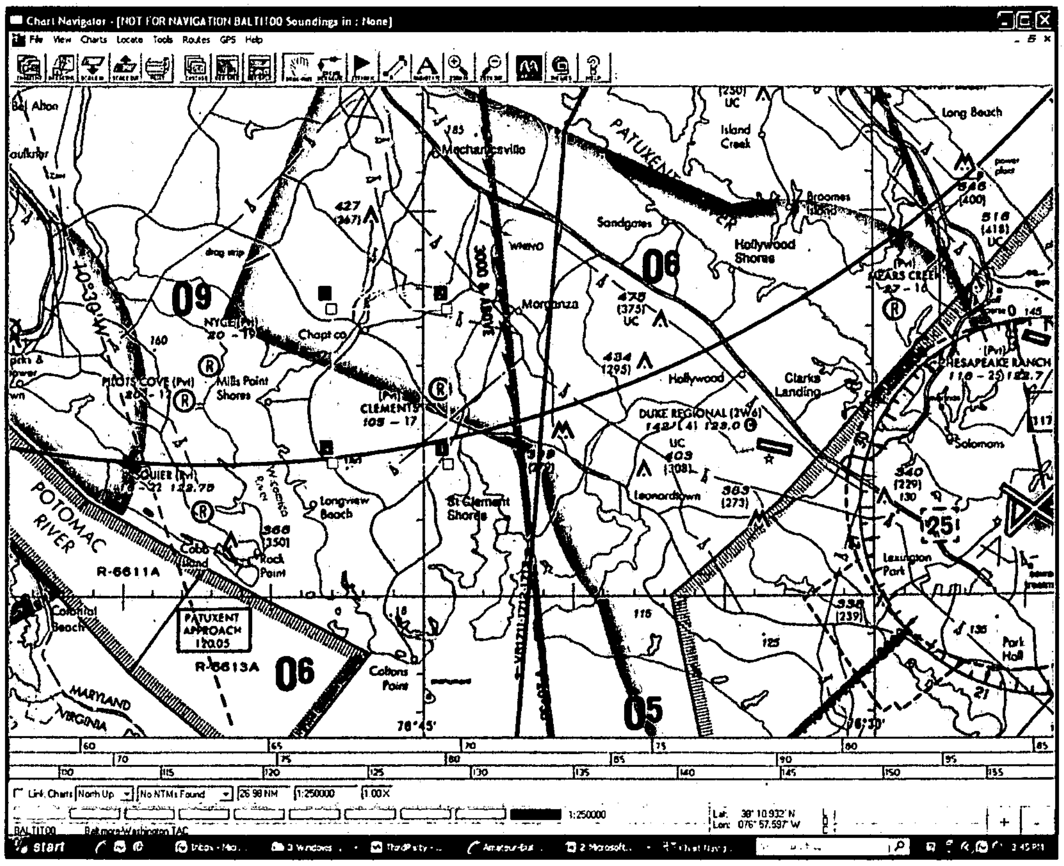

Figure 2. Kestrel – T Flight Test Area

Waypoints for Proposed Kestrel-T Experimental Flight Box - 4MD4 Operations		
Point Name	**Latitude**	**Longitude**
Point 1	**38° 18.418′ N**	**076° 44.136′ W**
Point 2	**38° 22.440′ N**	**076° 44.153′ W**
Point 3	**38° 22.448′ N**	**076° 47.988′ W**
Point 4	**38° 18.447′ N**	**076° 47.967′ W**

c. Authorized flight times and conditions. All flight operations must be conducted during daylight hours under visual flight rules (VFR). Potomac TRACN (PCT) will NOT be requiring VHF/UHF monitoring or communication. The following conditions will be included in your operating limitations.

(1) Operations shall be conducted below 1000 MSL.

(2) Flight operations shall be contained in an area west of 4MD4. The primary containment area is identified as being 2nm north, 2nm south, and 3nm west of the airport as identified in Figure 2 above. All flight operations must remain clear of the ADIZ.

(3) The UAS PIC must notify the PCT TRACON Operations Manager

at (540) 349-7541 and PAX River NAS at (301) 342-3740 at least 30 minutes prior to launch and immediately upon termination of operations each day. DTI must provide PCT with an on-site contact name and phone number for two-way communications with ATC for each flight.

(4) The Kestrel UAS shall transmit the assigned beacon code 0377 and altitude information (Mode-C) for the duration of the flight. Any failure of the transponder or inability to properly squawk the assigned code shall be reported to PCT and flight operations shall be terminated.

(5) The Kestrel pilot shall have the capability of maneuvering the UAS or suspending operations as instructed by PCT.

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

(7) A Notice to Airmen (NOTAM) shall be issued when UAS operations are being conducted. (Note: Do not use 'distant' or D here as the NOTAM classification and codes have recently been changed.) DTI shall contact the Automated Flight Service Station (FSS) no less than 48 hours prior to the operation and provide:

i) Name, address, and telephone number of the person giving notice.
ii) Nature of the activity.
iii) Date, time, and duration of the activity.
iv) Size of the affected area in nautical mile radius and affected altitudes.
v) Location of center of affected area in relation to airport.
vi) Location of center of affected area in relation to nearest VOR/DME or VORTAC.

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.ntsb.gov. Further flight operations must not be conducted until the incident is reviewed by AIR-160 and authorization to resume operations is provided to DTI.

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 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 (applicant name) company procedures.

(4) The UA PIC must have a flight review in unmanned aircraft every 24 calendar months in accordance with Defense Technologies, Inc., procedures.

(5) All UA PICs must have successfully completed applicable (applicant name) 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. The supplemental UA PIC need not be a certificated pilot, but must have successfully completed a recognized private pilot ground school program.

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

(1) All UA pilots must maintain currency in unmanned aircraft in accordance with (applicant name) company procedures.

(2) All UA pilots must have a flight review in unmanned aircraft every 24 calendar months in accordance with Defense Technologies, Inc., procedures.

(3) All UA pilots must have successfully completed applicable Defense Technologies, Inc., 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 1000 ft 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) An observer may be positioned in a chase aircraft. When a chase aircraft is used, it must maintain a reasonable proximity, and must position itself relative to the UA to reduce the hazard of collision in accordance with § 91.111, Operating near other aircraft. When the observer is located in a chase aircraft, the observer's duties must be dedicated to the task of observation only. Concurrent duty as pilot of the chase aircraft is not authorized.

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

(7) 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 third-class (or higher) airman medical certificate issued under part 67. A valid second-class airman medical certificate is required after 9/10/2008.

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 Defense Technologies, Inc., program letter.

(2) All observers must have successfully completed applicable Defense Technologies, Inc., training for the UAS.

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6. Equipage.

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

b. The UA and chase aircraft 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. 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.

b. During UA flights.

(1) Appropriate air traffic frequencies must be monitored during flight operations.

(2) All UA 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 while remaining within the flight test area 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), including cloud clearance minimums as specified in § 91.155, Basic VFR weather minimums. Flight operation in instrument meteorological conditions (IMC) is not permitted.

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. (See § 91.303, Aerobatic 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. Transponder requirements.

(1) The UA must operate an approved operational Mode C or Mode S altitude encoding transponder during all flight operations.

(2) Chase aircraft transponders must be on standby while performing chase operations flight with the UA.

d. Transponder failure.

(1) In the event of transponder failure on either the UA or the chase aircraft, the UA must conclude all flight operations and expeditiously return to its base of operations within the prescribed limitations of this authorization.

(2) In the event of UA transponder failure, a chase aircraft will operate its transponder in Mode C.

e. Notice to airman. Defense Technologies, Inc., must request the issuance of a Notice to Airman (NOTAM) through the Automated Flight Service Station at least 24 hours before flight operation.

9. Flight Termination and Lost Link Procedures.

a. Flight termination. In accordance with Defense Technologies, Inc., program letter, Rev. 1.5, dated 12/30/09, 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 chase aircraft or observer, all other UAS control stations, and the appropriate ATC facility will be immediately notified of the lost link condition and the expected UA response.

10. Maintenance and Inspection. (Ref.: DTI-UAS-MAIN-INSP-01, Kestral-T UAS Maintenance and Inspection Policy, Rev. 2.3, 12/28/2009, AEA-FSDO-27-accepted 12/30/2009)

a. General requirements. The UAS must not be operated unless it is inspected and maintained in accordance with the Defense Technologies, Inc., Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Aircraft Discrepancy Form, Rev. 2.3, dated 12/28/09, and Daily Ground Station Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Ground Station Discrepancy Form, Rev. 2.3, dated 12/28/09, or later accepted FAA revision. Defense Technologies, Inc., must establish and maintain aircraft maintenance records (see paragraph 10(d) below).

b. Inspections. No person may operate this UAS within the preceding 12 calendar months unless it has had a condition inspection performed according to the Defense Technologies, Inc., Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Aircraft Discrepancy Form, Rev. 2.3, dated 12/28/09, and Daily Ground Station Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Ground Station Discrepancy Form, Rev. 2.3, dated 12/28/09, or later accepted FAA revision. 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 Defense Technologies, Inc., 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, the UAS's total time-in-service, 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 Defense Technologies, Inc.,* Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Aircraft Discrepancy Form, Rev. 2.3, dated 12/28/09, and Daily Ground Station Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Ground Station Discrepancy Form, Rev. 2.3, dated 12/28/09, or later accepted FAA revision*, 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 the *Defense Technologies, Inc.* 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 § 91.411, Altimeter system and altitude reporting equipment tests and inspections, and § 91.413, ATC transponder tests and inspections. These inspections will be recorded in the UAS maintenance records.

11. Information Reporting. Defense Technologies, Inc., will provide the following information to Donald.E.Grampp@FAA.GOV on a monthly basis. A copy of the report shall be provided to AIR-200.

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 Defense Technologies, Inc., 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. DTI 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. (Ref.: DTI-UAS-MAIN-INSP-01, Kestral-T UAS Maintenance and Inspection Policy, Rev. 2.3, dated 12/28/09, AEA-FSDO-27-accepted 12/30/09)

All revisions to Defense Technologies, Inc., Kestral-T UAS UAS Maintenance and Inspection Policy, Rev. 2.3, dated 12/28/09, AEA-FSDO-27-accepted 12/30/09, Daily Aircraft Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Aircraft Discrepancy Form, Rev. 2.3, dated 12/28/09, and Daily Ground Station Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Ground Station Discrepancy Form, Rev. 2.3, dated 12/28/09, must be reviewed and accepted by the Washington 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 Defense Technologies, Inc., Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Aircraft Discrepancy Form, Rev. 2.3, dated 12/28/09, and Daily Ground Station Condition Inspection Checklist, Rev. 2.3, dated 12/28/09, reportable on the Ground Station Discrepancy Form, Rev. 2.3, dated 12/28/09, or later accepted FAA revision. 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

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authorization needs 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

1/7/2010
Issuance Date:

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

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 (date), for the purposes of research and development, market survey, and/or crew training. This special airworthiness certificate is issued for Kestrel – T, RCS 180, serial number 003, registration number N2554V.

Applicant (signature)

1-7-2010
Date:

Name (Printed): Donald Jackson

Title: Senior Vice President

Company: Defense Technologies, Inc.

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION

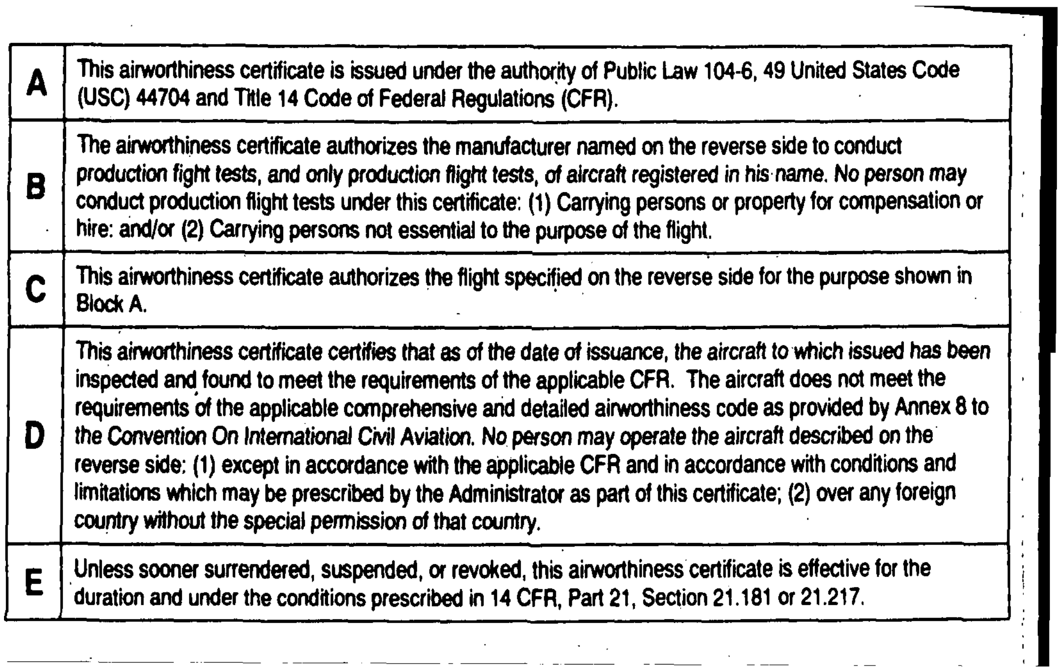
SPECIAL AIRWORTHINESS CERTIFICATE

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- 2555R		SERIAL NO.	002
	BUILDER	Defense Technologies, Inc.	MODEL	Kestral - T
E	DATE OF ISSUANCE	January 9, 2009	EXPIRY	January 8, 2010
	OPERATING LIMITATIONS DATED	01/09/09	ARE PART OF THIS CERTIFICATE	
	SIGNATURE OF FAA REPRESENTATIVE	Henry K. Cooper	DESIGNATION OR OFFICE NO.	ANE-MIDO-44

CANCELLED
JAN 07 2010

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).

FAA Form 8130-7 (07/04) *SEE REVERSE SIDE* *NSN: 0052-00-693-4000*



A	This airworthiness certificate is issued under the authority of Public Law 104-6, 49 United States Code (USC) 44704 and Title 14 Code of Federal Regulations (CFR).
B	The airworthiness certificate authorizes the manufacturer named on the reverse side to conduct production fight tests, and only production flight tests, of aircraft registered in his name. No person may conduct production flight tests under this certificate: (1) Carrying persons or property for compensation or hire: and/or (2) Carrying persons not essential to the purpose of the flight.
C	This airworthiness certificate authorizes the flight specified on the reverse side for the purpose shown in Block A.
D	This airworthiness certificate certifies that as of the date of issuance, the aircraft to which issued has been inspected and found to meet the requirements of the applicable CFR. The aircraft does not meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention On International Civil Aviation. No person may operate the aircraft described on the reverse side: (1) except in accordance with the applicable CFR and in accordance with conditions and limitations which may be prescribed by the Administrator as part of this certificate; (2) over any foreign country without the special permission of that country.
E	Unless sooner surrendered, suspended, or revoked, this airworthiness certificate is effective for the duration and under the conditions prescribed in 14 CFR, Part 21, Section 21.181 or 21.217.

FEDERAL AVIATION ADMINISTRATION

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

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JAN 07 2010

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

Registered Owner Name: Defense Technologies, Inc. **Registered Owner Address:** 21795 Shangri-La Dr Lexington Park Maryland 20653 **Aircraft Description:** Kestrel-T: Giant Scale Rc Size Standard Wing And Tail Configuration Tricycle Gear Configuration **Aircraft Registration:** N2555R **Aircraft Builder:** Defense Technologies, Inc.	**Year Manufactured:** 2008 **Aircraft Serial Number:** 002 **Aircraft Model Designation:** Kestrel – T **Engine:** RCS 180 **Propeller:** Bambula 20 x 8 wood

The following conditions and limitations apply to all unmanned aircraft system (UAS) flight operations for the Kestrel – T, RCS 180 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 Kestrel – T, RCS 180 operated by Defense Technologies, Inc., is considered to be an integrated system. The system is composed of the following:

(1) Kestrel – T, RCS 180, serial number 002,
(2) UAS control station(s), that is, fixed, mobile, ground-based, or airborne.
(3) Telemetry, launch, and recovery equipment.

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(4) Communications and navigation equipment, including ground and/or airborne equipment used for command and control of the Kestrel – T, RCS 180.

(5) Ground or airborne equipment used for communication with the chase aircraft, 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 Defense Technologies, Inc., 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 Defense Technologies, Inc., program letter dated 11/25/2008, Rev. 1.3, 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) Defense Technologies, Inc., 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. Before conducting the initial flight of the Kestrel – T, RCS 180, Defense Technologies, Inc., must forward a copy of the Kestrel – T, RCS 180 program letter, special airworthiness certificate, and operating limitations to the following personnel:

(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) 267-9538, 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, Investigative and Enforcement Procedures, to Defense Technologies, Inc.

2. Program Letter. The Kestrel – T, RCS 180 program letter, dated 11/25/2008, Rev.1.3, 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 must be 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:

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JAN 07 2010

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 flight operations area is located in Clements, MD. Clements Field, 4MD4 is a private airport located at:

Latitude	38° 20.408N
Longitude	76° 44.432W

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.

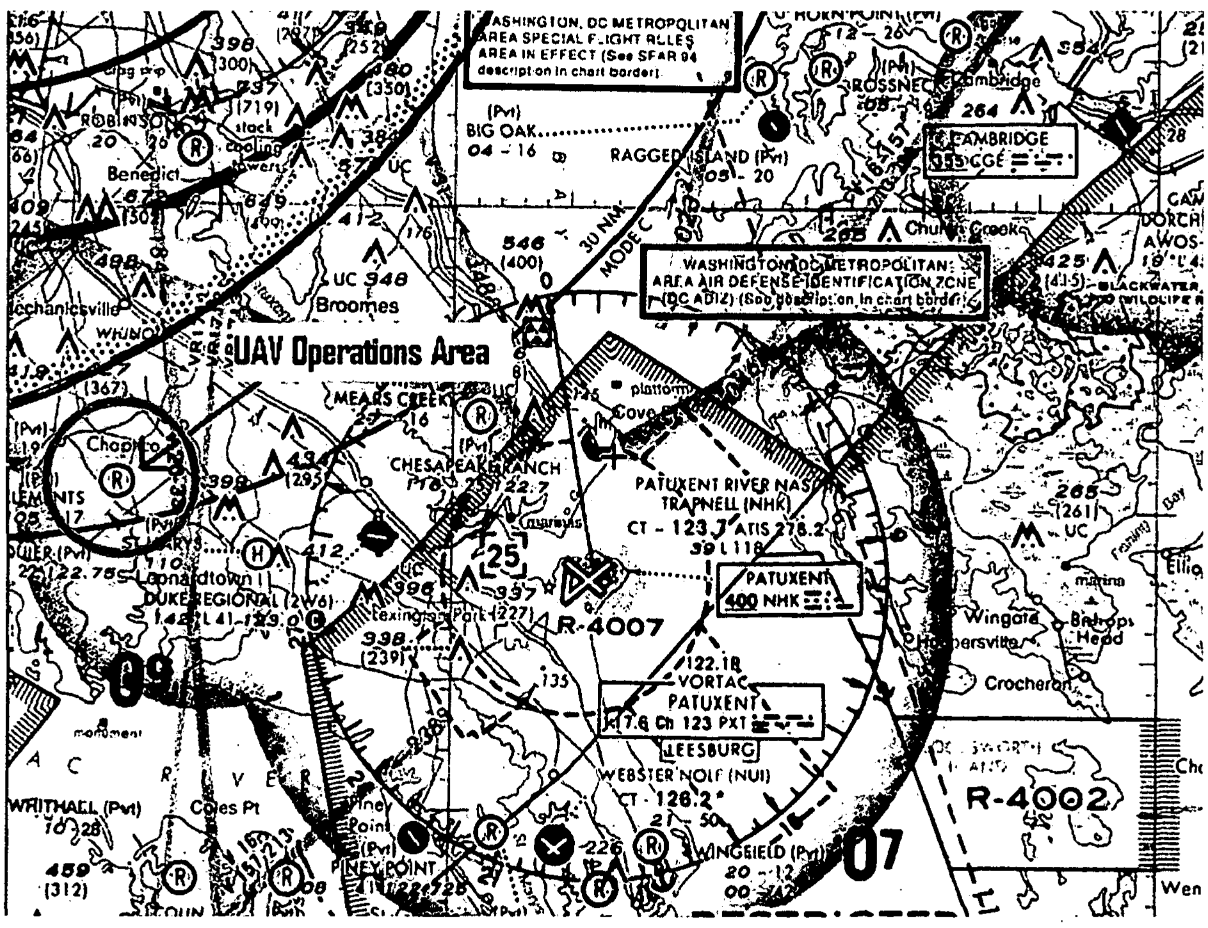

Figure 1. Aeronautical Chart

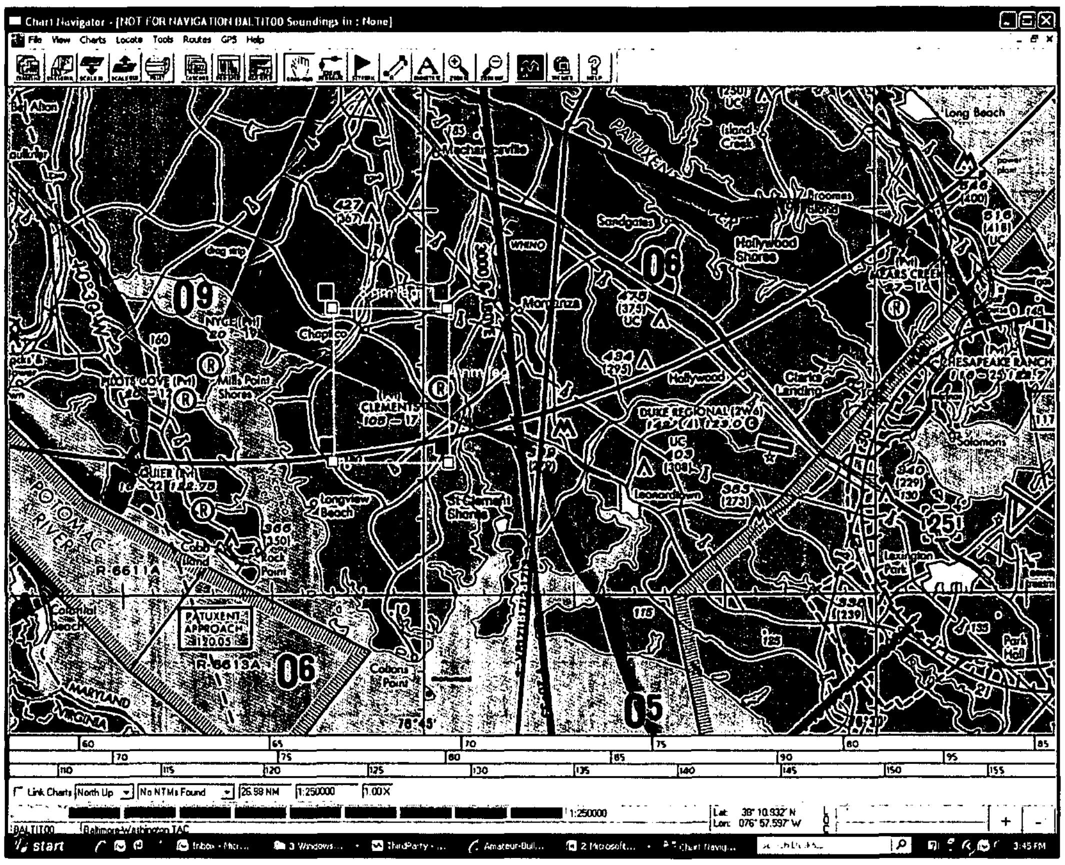

Figure 2. Kestrel – T Flight Test Area

Waypoints for Proposed Kestrel-T Experimental Flight Box - 4MD4 Operations		
Point Name	**Latitude**	**Longitude**
Point 1	**38° 18.418′ N**	**076° 44.136′ W**
Point 2	**38° 22.440′ N**	**076° 44.153′ W**
Point 3	**38° 22.448′ N**	**076° 47.988′ W**
Point 4	**38° 18.447′ N**	**076° 47.967′ W**

c. Authorized flight times and conditions. All flight operations must be conducted during daylight hours under visual flight rules (VFR). Potomac TRACN (PCT) will NOT be requiring VHF/UHF monitoring or communication. The following conditions will be included in your operating limitations.

(1) Operations shall be conducted below 1000 MSL.

(2) Flight operations shall be contained in an area west of 4MD4. The primary containment area is identified as being 2nm north, 2nm south, and 3nm west of the airport as identified in Figure 2 above. All flight operations must remain clear of the ADIZ.

(3) The UAS PIC must notify the PCT TRACON Operations Manager at (540) 349-7541 and PAX River NAS at (301) 342-3740 at least 30 minutes prior to launch and immediately upon termination of operations each day. DTI must provide PCT with an on-site contact name and phone number for two-way communications with ATC for each flight.

(4) The Kestrel UAS shall transmit the assigned beacon code 0377 and altitude information (Mode-C) for the duration of the flight. Any failure of the transponder or inability to properly squawk the assigned code shall be reported to PCT and flight operations shall be terminated.

(5) The Kestrel pilot shall have the capability of maneuvering the UAS or suspending operations as instructed by PCT.

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

(7) A Notice to Airmen (NOTAM) shall be issued when UAS operations are being conducted. (Note: Do not use 'distant' or D here as the NOTAM classification and codes have recently been changed.) DTI shall contact the Automated Flight Service Station (FSS) no less than 48 hours prior to the operation and provide:

i) Name, address, and telephone number of the person giving notice.
ii) Nature of the activity.
iii) Date, time, and duration of the activity.
iv) Size of the affected area in nautical mile radius and affected altitudes.
v) Location of center of affected area in relation to airport.
vi) Location of center of affected area in relation to nearest VOR/DME or VORTAC.

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.ntsb.gov. Further flight operations must not be conducted until the incident is reviewed by AIR-160 and authorization to resume operations is provided to DTI.

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 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 (applicant name) company procedures.

(4) The UA PIC must have a flight review in unmanned aircraft every 24 calendar months in accordance with Defense Technologies, Inc., procedures.

(5) All UA PICs must have successfully completed applicable (applicant name) 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. The supplemental UA PIC need not be a certificated pilot, but must have successfully completed a recognized private pilot ground school program.

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

(1) All UA pilots must maintain currency in unmanned aircraft in accordance with (applicant name) company procedures.

(2) All UA pilots must have a flight review in unmanned aircraft every 24 calendar months in accordance with Defense Technologies, Inc., procedures.

(3) All UA pilots must have successfully completed applicable Defense Technologies, Inc., 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 1000 ft 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) An observer may be positioned in a chase aircraft. When a chase aircraft is used, it must maintain a reasonable proximity, and must position itself relative to the UA to reduce the hazard of collision in accordance with § 91.111, Operating near other aircraft. When the observer is located in a chase aircraft, the observer's duties must be dedicated to the task of observation only. Concurrent duty as pilot of the chase aircraft is not authorized.

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

(7) 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 third-class (or higher) airman medical certificate issued under part 67. A valid second-class airman medical certificate is required after 9/10/2008.

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 Defense Technologies, Inc., program letter.

(2) All observers must have successfully completed applicable Defense Technologies, Inc., training for the UAS.

6. Equipage.

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

b. The UA and chase aircraft 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. 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.

b. During UA flights.

(1) Appropriate air traffic frequencies must be monitored during flight operations.

(2) All UA 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 while remaining within the flight test area 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), including cloud clearance minimums as specified in § 91.155, Basic VFR weather minimums. Flight operation in instrument meteorological conditions (IMC) is not permitted.

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. (See § 91.303, Aerobatic 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. Transponder requirements.

(1) The UA must operate an approved operational Mode C or Mode S altitude encoding transponder during all flight operations.

(2) Chase aircraft transponders must be on standby while performing chase operations flight with the UA.

d. Transponder failure.

(1) In the event of transponder failure on either the UA or the chase aircraft, the UA must conclude all flight operations and expeditiously return to its base of operations within the prescribed limitations of this authorization.

(2) In the event of UA transponder failure, a chase aircraft will operate its transponder in Mode C.

e. Notice to airman. Defense Technologies, Inc., must request the issuance of a Notice to Airman (NOTAM) through the Automated Flight Service Station at least 24 hours before flight operation.

9. Flight Termination and Lost Link Procedures.

a. Flight termination. In accordance with Defense Technologies, Inc., program letter, dated 11/25/2008, 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 chase aircraft or observer, all other UAS control stations, and the appropriate ATC facility will be immediately notified of the lost link condition and the expected UA response.

10. Maintenance and Inspection. (Ref.: DTI-UAS-MAIN-INSP-01, Kestral-T UAS Maintenance and Inspection Policy, AEA-FSDO-27-accepted 6/10/08)

a. General requirements. The UAS must not be operated unless it is inspected and maintained in accordance with the Defense Technologies, Inc., Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 1.3, dated 6/9/08, reportable on the Aircraft Discrepancy Form, Rev. 1.1, dated 6/9/08, and Daily Ground Station Condition Inspection Checklist, Rev. 1.2, dated 6/9/08, reportable on the Ground Station Discrepancy Form, Rev. 1.1, dated 6/9/08, or later accepted FAA revision. Defense Technologies, Inc., must establish and maintain aircraft maintenance records (see paragraph 10(d) below).

b. Inspections. No person may operate this UAS within the preceding 12 calendar months unless it has had a condition inspection performed according to the Defense Technologies, Inc., Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 1.3, dated 6/9/08, reportable on the Aircraft Discrepancy Form, Rev. 1.1, dated 6/9/08 and Daily Ground Station Condition Inspection Checklist, Rev. 1.2, dated 6/9/08, reportable on the Ground Station Discrepancy Form, Rev. 1.1, dated 6/9/08, or later accepted FAA revision. 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 Defense Technologies, Inc., 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, the UAS's total time-in-service, 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 Defense Technologies, Inc.,* Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 1.3 dated 6/9/08, reportable on the Aircraft Discrepancy Form, Rev. 1.1 dated 6/9/08, and Daily Ground Station Condition Inspection Checklist, Rev. 1.2, dated 6/9/08, reportable on the Ground Station Discrepancy Form, Rev. 1.1, dated 6/9/08, or later accepted FAA revision, *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 the *Defense Technologies, Inc.* 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 § 91.411, Altimeter system and altitude reporting equipment tests and inspections, and § 91.413, ATC transponder tests and inspections. These inspections will be recorded in the UAS maintenance records.

11. Information Reporting. Defense Technologies, Inc., will provide the following information to Donald.E.Grampp@FAA.GOV on a monthly basis. A copy of the report shall be provided to AIR-200.

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 Defense Technologies, Inc., 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. DTI 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. (Ref.: DTI-UAS-MAIN-INSP-01, Kestral-T UAS Maintenance and Inspection Policy, AEA-FSDO-27-accepted 6/10/08)

All revisions to Defense Technologies, Inc., Kestral-T UAS UAS Maintenance and Inspection Policy, AEA-FSDO-27-accepted 6/10/08, the Daily Aircraft Condition Inspection Checklist, Rev. 1.3 dated 6/9/08, Aircraft Discrepancy Form, Rev. 1.1, dated 6/9/08, Daily Ground Station Condition Inspection Checklist, Rev. 1.2 dated 6/9/08, and Ground Station Discrepancy Form, Rev. 1.1 dated 6/9/08, must be reviewed and accepted by the Washington 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 Defense Technologies, Inc., Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 1.3, dated 6/9/08, reportable on the Aircraft Discrepancy Form, Rev. 1.1, dated 6/9/08, and Daily Ground Station Condition Inspection Checklist, Rev. 1.2, dated 6/9/08, reportable on the Ground Station Discrepancy Form, Rev. 1.1, dated 6/9/08, or later accepted FAA revision. 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.

CANCELLED
JAN 07 2010

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 needs 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

1/9/09
Issuance Date:

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

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 (date), for the purposes of research and development, market survey, and/or crew training. This special airworthiness certificate is issued for Kestrel – T, RCS 180, serial number 003, registration number N2554V.

Robert J Mudd Jr
for Donald R. Jackson
Applicant (signature)

1/9/09
Date:

Name (Printed): Donald Jackson

Title: Senior Vice President

Company: Defense Technologies, Inc.

FAA FORM 8130-6, APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

Form Approved O.M.B. No. 2120-0018
09/30/2007

Accepted JH Apr/16/2009

U.S. Department of Transportation
Federal Aviation Administration

APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

INSTRUCTIONS - Print or type. Do not write in shaded areas; these are for FAA use only. Submit original only to an authorized FAA Representative. If additional space is required, use attachment. For special flight permits complete Sections II, VI and VII as applicable.

I. AIRCRAFT DESIGNATION

1. REGISTRATION MARK N2555R	2. AIRCRAFT BUILDER'S NAME *(Make)* Defense Technologies, Inc.	3. AIRCRAFT MODEL DESIGNATION Kestrel-T	4. YR. MFR. 2008	FAA CODING
5. AIRCRAFT SERIAL NO. 002	6. ENGINE BUILDER'S NAME *(Make)* RCS	7. ENGINE MODEL DESIGNATION 180		
8. NUMBER OF ENGINES 1	9. PROPELLER BUILDER'S NAME *(Make)* Bambula	10. PROPELLER MODEL DESIGNATION 20" x 8"	11. AIRCRAFT IS *(Check if applicable)*	☐ IMPORT

II. CERTIFICATION REQUESTED

APPLICATION IS HEREBY MADE FOR: *(Check applicable items)*

A 1 ☐ STANDARD AIRWORTHINESS CERTIFICATE *(Indicate Category)* ☐ NORMAL ☐ UTILITY ☐ ACROBATIC ☐ TRANSPORT ☐ COMMUTER ☐ BALLOON ☐ OTHER

B ☐ SPECIAL AIRWORTHINESS CERTIFICATE *(Check appropriate items)*

7	PRIMARY							
9	LIGHT-SPORT *(Indicate Class)*	☐ AIRPLANE	☐ POWER-PARACHUTE	☐ WEIGHT-SHIFT-CONTROL	☐ GLIDER	☐ LIGHTER THAN AIR		
2	LIMITED							
5	PROVISIONAL *(Indicate Class)*	1 ☐	CLASS I					
		2 ☐	CLASS II					
3	RESTRICTED *(Indicate operation(s) to be conducted)*	1 ☐	AGRICULTURE AND PEST CONTROL	2 ☐	AERIAL SURVEY	3 ☐	AERIAL ADVERTISING	
		4 ☐	FOREST *(Wildlife Conservation)*	5 ☐	PATROLLING	6 ☐	WEATHER CONTROL	
		0 ☐	OTHER *(Specify)*					
4	EXPERIMENTAL *(Indicate operation(s) to be conducted)*	1 ✓	RESEARCH AND DEVELOPMENT	2 ☐	AMATEUR BUILT	3 ☐	EXHIBITION	
		4 ☐	AIR RACING	5 ✓	CREW TRAINING	6 ✓	MARKET SURVEY	
		0 ☐	TO SHOW COMPLIANCE WITH THE CFR	7 ☐	OPERATING *(Primary Category)* KIT BUILT AIRCRAFT			
		8	OPERATING LIGHT-SPORT	8A ☐	Existing Aircraft without an airworthiness certificate & do not meet § 103.1			
				8B ☐	Operating Light-Sport Kit-Built			
				8C ☐	Operating light-sport previously issued special light-sport category airworthiness certificate under § 21.190			
8	SPECIAL FLIGHT PERMIT *(Indicate operation(s) to be conducted, then complete Section VI or VII as applicable on reverse side)*	1 ☐	FERRY FLIGHT FOR REPAIRS, ALTERATIONS, MAINTENANCE, OR STORAGE					
		2 ☐	EVACUATION FROM AREA OF IMPENDING DANGER					
		3 ☐	OPERATION IN EXCESS OF MAXIMUM CERTIFICATED TAKE-OFF WEIGHT					
		4 ☐	DELIVERING OR EXPORTING	5 ☐	PRODUCTION FLIGHT TESTING			
		6 ☐	CUSTOMER DEMONSTRATION FLIGHTS					

C 6 ☐ MULTIPLE AIRWORTHINESS CERTIFICATE *(check ABOVE "Restricted Operation" and "Standard" or "Limited" as applicable)*

III. OWNER'S CERTIFICATION

A. REGISTERED OWNER *(As shown on certificate of aircraft registration)* IF DEALER, CHECK HERE → ☐

NAME Defense Technologies, Inc.	ADDRESS 21795 Shangri-La Drive, Ste C Lexington Park, MD 20653

B. AIRCRAFT CERTIFICATION BASIS *(Check applicable blocks and complete items as indicated)*

☐	AIRCRAFT SPECIFICATION OR TYPE CERTIFICATE DATA SHEET *(Give No. and Revision No.)* N/A	X	AIRWORTHINESS DIRECTIVES *(Check if all applicable AD's are compiled with and give the number of the last AD SUPPLEMENT available in the biweekly series as of the date of application)* BI-WEEKLY 2009-01
☐	AIRCRAFT LISTING *(Give page number(s))* N/A	☐	SUPPLEMENTAL TYPE CERTIFICATE *(List number of each STC incorporated)* N/A

C. AIRCRAFT OPERATION AND MAINTENANCE RECORDS

✓	CHECK IF RECORDS IN COMPLIANCE WITH 14 CFR Section 91.417	TOTAL AIRFRAME HOURS 0	3	EXPERIMENTAL ONLY *(Enter hours flown since last certificate issued or renewed)* 0

D. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above, that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 et seq. and applicable Federal Aviation Regulations, and that the aircraft has been inspected and is airworthy and eligible for the airworthiness certificate requested.

DATE OF APPLICATION January 7, 2008	NAME AND TITLE *(Print or type)* Donald R. Jackson, Senior Vice President	SIGNATURE

IV. INSPECTION AGENCY VERIFICATION

A. THE AIRCRAFT DESCRIBED ABOVE HAS BEEN INSPECTED AND FOUND AIRWORTHY BY: *(Complete the section only if 14 CFR part 21.183(d) applies.*

2 ☐ 14 CFR part 121 CERTIFICATE HOLDER *(Give Certificate No.)*	3 ☐ CERTIFICATED MECHANIC *(Give Certificate No.)*	6 ☐ CERTIFICATED REPAIR STATION *(Give Certificate No.)*	
5 ☐ AIRCRAFT MANUFACTURER *(Give name or firm)*			
DATE	TITLE	SIGNATURE	

V. FAA REPRESENTATIVE CERTIFICATION

(Check ALL applicable block items A and B)

A. I find that the aircraft described in Section I or VII meets requirements for ☒ THE CERTIFICATE REQUESTED 4 ☐ AMENDMENT OR MODIFICATION OF CURRENT AIRWORTHINESS CERTIFICATE

B. Inspection for a special permit under Section VII was conducted by: ☐ FAA INSPECTOR ☐ FAA DESIGNEE ☐ CERTIFICATE HOLDER UNDER ☐ 14 CFR part 65 ☐ 14 CFR part 121 OR 135 ☐ 14 CFR part 145

DATE 1/9/09	DISTRICT OFFICE ANE MIDO-44	4 DESIGNEE'S SIGNATURE AND NO.	1 FAA INSPECTOR'S SIGNATURE HENRY K. LOOPER

FAA Form 8130-6 (10-04) Previous Edition Dated 5/01 May be Used Until Depleted, Except for Light-Sport Aircraft NSN: 0052-00-024-7006

VI. PRODUCTION FLIGHT TESTING

A. MANUFACTURER	
NAME	ADDRESS

B. PRODUCTION BASIS *(Check applicable item)*

- ☐ PRODUCTION CERTIFICATE *(Give production certificate number)* ⟶
- ☐ TYPE CERTIFICATE ONLY
- ☐ APPROVED PRODUCTION INSPECTION SYSTEM

C. GIVE QUANTITY OF CERTIFICATES REQUIRED FOR OPERATING NEEDS

DATE OF APPLICATION	NAME AND TITLE *(Print or Type)*	SIGNATURE

VII. SPECIAL FLIGHT PERMIT PURPOSES OTHER THAN PRODUCTION FLIGHT TEST

A. DESCRIPTION OF AIRCRAFT

REGISTERED OWNER	ADDRESS
BUILDER *(Make)*	MODEL
SERIAL NUMBER	REGISTRATION MARK

B. DESCRIPTION OF FLIGHT — CUSTOMER DEMONSTRATION FLIGHTS ☐ *(Check if applicable)*

FROM	TO	
VIA	DEPARTURE DATE	DURATION

C. CREW REQUIRED TO OPERATE THE AIRCRAFT AND ITS EQUIPMENT

☐ PILOT ☐ CO-PILOT ☐ FLIGHT ENGINEER ☐ OTHER *(Specify)*

D. THE AIRCRAFT DOES NOT MEET THE APPLICABLE AIRWORTHINESS REQUIREMENTS AS FOLLOWS:

E. THE FOLLOWING RESTRICTIONS ARE CONSIDERED NECESSARY FOR SAFE OPERATION: *(Use attachment if necessary)*

F. CERTIFICATION – I hereby certify that I am the registered owner (or his agent) of the aircraft described above; that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 <u>et seq.</u> and applicable Federal Aviation Regulations; and that the aircraft has been inspected and is safe for the flight described.

DATE	NAME AND TITLE *(Print or Type)*	SIGNATURE

VIII. AIRWORTHINESS DOCUMENTATION (FAA/DESIGNEE use only)

X	A. Operating Limitations and Markings in Compliance with 14 CFR Section 91.9, as applicable.		G. Statement of Conformity, FAA Form 8130-9 *(Attach when required)*
X	B. Current Operating Limitations Attached		H. Foreign Airworthiness Certification for Import Aircraft *(Attach when required)*
X	C. Data, Drawings, Photographs, etc. *(Attach when required)*		I. Previous Airworthiness Certificate Issued in Accordance with 14 CFR Section ____________ CAR ____________ *(Original Attached)*
X	D. Current Weight and Balance Information Available in Aircraft		
	E. Major Repair and Alteration, FAA Form 337 *(Attach when required)*	X	J. Current Airworthiness Certificate Issued in Accordance with 14 CFR Section 21.191(a) (c) AND (f) *(Copy Attached)*
X	F. This inspection Recorded in Aircraft Records		K. Light-Sport Aircraft Statement of Compliance, FAA Form 8130-15 *(Attach when required)*

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION

SPECIAL AIRWORTHINESS CERTIFICATE

COPY

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- 2555R		SERIAL NO. 002
	BUILDER Defense Technologies, Inc.		MODEL Kestral - T
E	DATE OF ISSUANCE January 9, 2009		EXPIRY January 8, 2010
	OPERATING LIMITATIONS DATED 01/09/09		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).

FAA Form 8130-7 (07/04) *SEE REVERSE SIDE* *NSN: 0052-00-693-4000*

A	This airworthiness certificate is issued under the authority of Public Law 104-6, 49 United States Code (USC) 44704 and Title 14 Code of Federal Regulations (CFR).
B	The airworthiness certificate authorizes the manufacturer named on the reverse side to conduct production fight tests, and only production flight tests, of aircraft registered in his name. No person may conduct production flight tests under this certificate: (1) Carrying persons or property for compensation or hire: and/or (2) Carrying persons not essential to the purpose of the flight.
C	This airworthiness certificate authorizes the flight specified on the reverse side for the purpose shown in Block A.
D	This airworthiness certificate certifies that as of the date of issuance, the aircraft to which issued has been inspected and found to meet the requirements of the applicable CFR. The aircraft does not meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the *Convention On International Civil Aviation.* No person may operate the aircraft described on the reverse side: (1) except in accordance with the applicable CFR and in accordance with conditions and limitations which may be prescribed by the Administrator as part of this certificate; (2) over any foreign country without the special permission of that country.
E	Unless sooner surrendered, suspended, or revoked, this airworthiness certificate is effective for the duration and under the conditions prescribed in 14 CFR, Part 21, Section 21.181 or 21.217.

FEDERAL AVIATION ADMINISTRATION

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

COPY

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

Registered Owner Name:

Defense Technologies, Inc.

Registered Owner Address:

21795 Shangri-La Dr
Lexington Park Maryland 20653

Aircraft Description:

Kestrel-T:
Giant Scale Rc Size
Standard Wing And Tail Configuration
Tricycle Gear Configuration

Aircraft Registration:

N2555R

Aircraft Builder:

Defense Technologies, Inc.

Year Manufactured:

2008

Aircraft Serial Number:

002

Aircraft Model Designation:

Kestrel – T

Engine:

RCS 180

Propeller:

Bambula 20 x 8 wood

The following conditions and limitations apply to all unmanned aircraft system (UAS) flight operations for the Kestrel – T, RCS 180 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 Kestrel – T, RCS 180 operated by Defense Technologies, Inc., is considered to be an integrated system. The system is composed of the following:

(1) Kestrel – T, RCS 180, serial number 002,
(2) UAS control station(s), that is, fixed, mobile, ground-based, or airborne.
(3) Telemetry, launch, and recovery equipment.

(4) Communications and navigation equipment, including ground and/or airborne equipment used for command and control of the Kestrel – T, RCS 180.

(5) Ground or airborne equipment used for communication with the chase aircraft, 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 Defense Technologies, Inc., 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 Defense Technologies, Inc., program letter dated 11/25/2008, Rev. 1.3, 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) Defense Technologies, Inc., 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. Before conducting the initial flight of the Kestrel – T, RCS 180, Defense Technologies, Inc., must forward a copy of the Kestrel – T, RCS 180 program letter, special airworthiness certificate, and operating limitations to the following personnel:

(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) 267-9538, 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, Investigative and Enforcement Procedures, to Defense Technologies, Inc.

2. Program Letter. The Kestrel – T, RCS 180 program letter, dated 11/25/2008, Rev.1.3, 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 must be 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 flight operations area is located in Clements, MD. Clements Field, 4MD4 is a private airport located at:

Latitude	38° 20.408N
Longitude	76° 44.432W

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.

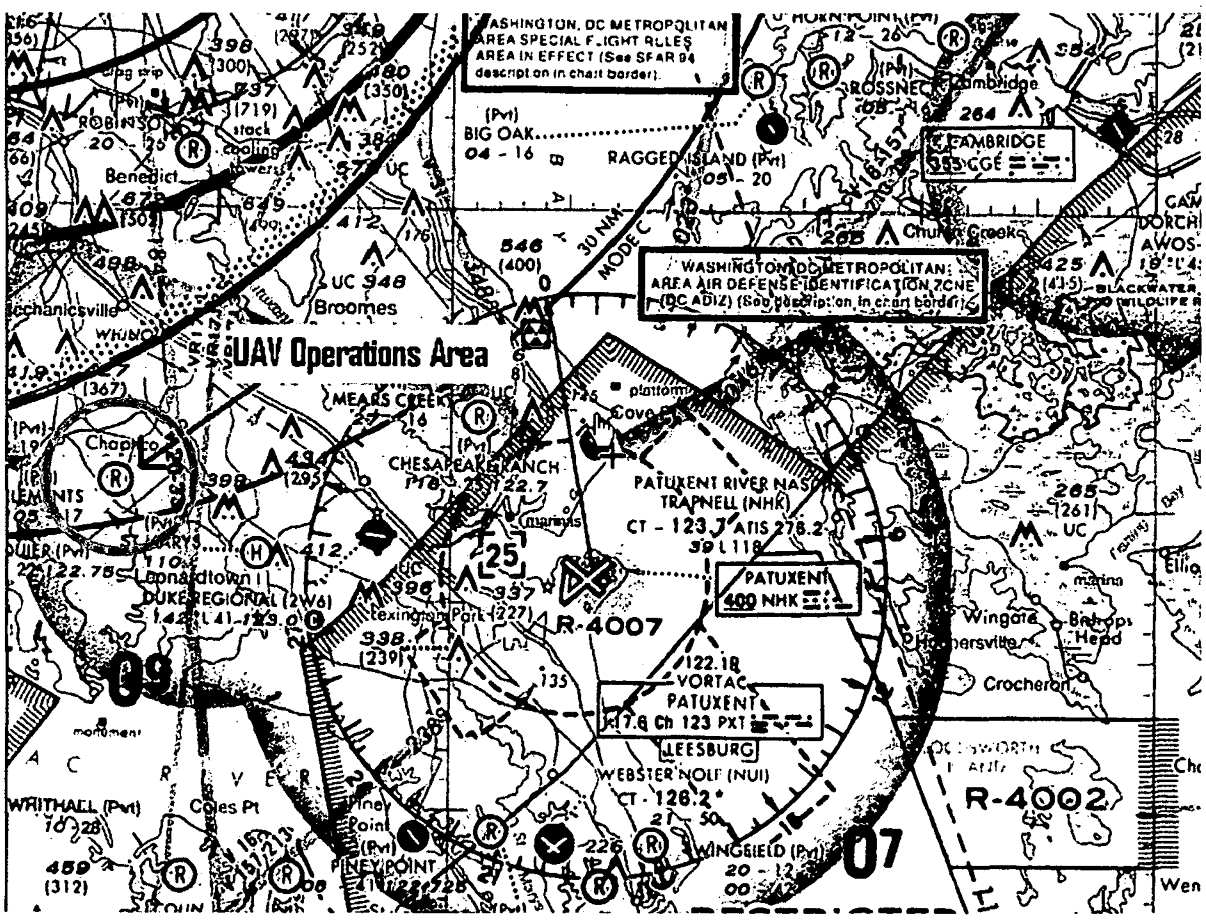

Figure 1. Aeronautical Chart

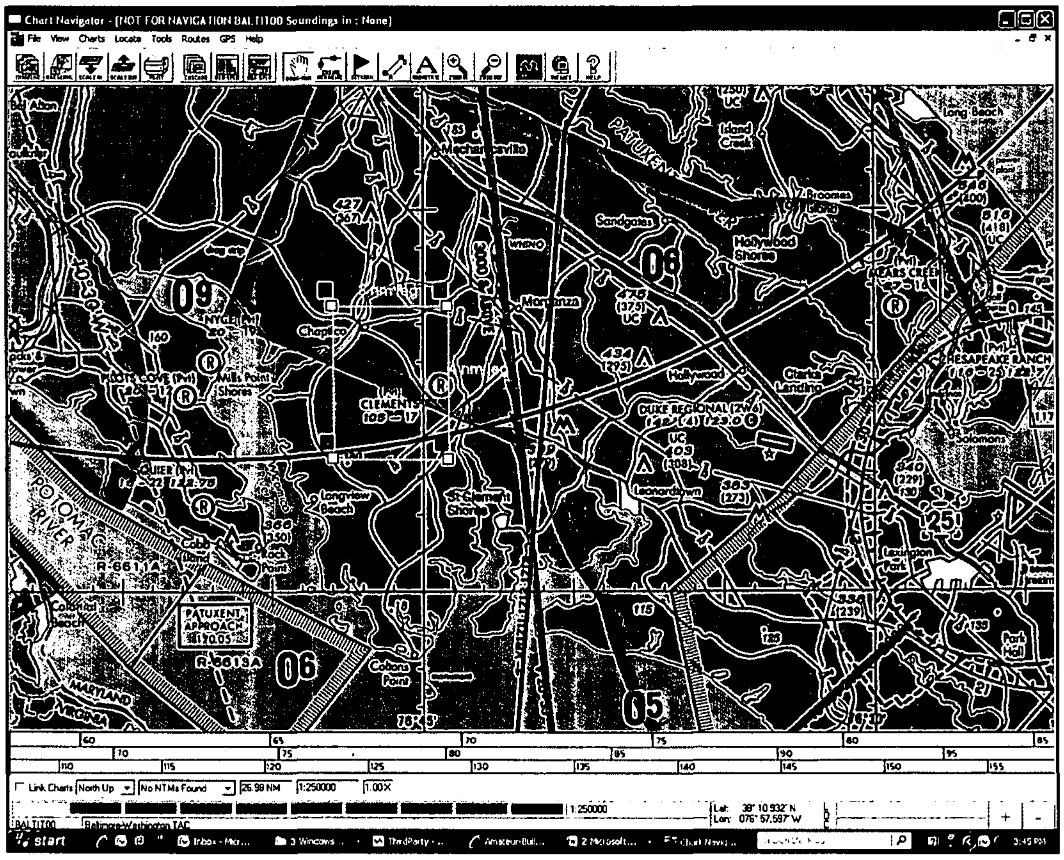

Figure 2. Kestrel – T Flight Test Area

Waypoints for Proposed Kestrel-T Experimental Flight Box - 4MD4 Operations		
Point Name	**Latitude**	**Longitude**
Point 1	**38° 18.418′ N**	**076° 44.136′ W**
Point 2	**38° 22.440′ N**	**076° 44.153′ W**
Point 3	**38° 22.448′ N**	**076° 47.988′ W**
Point 4	**38° 18.447′ N**	**076° 47.967′ W**

c. Authorized flight times and conditions. All flight operations must be conducted during daylight hours under visual flight rules (VFR). Potomac TRACN (PCT) will NOT be requiring VHF/UHF monitoring or communication. The following conditions will be included in your operating limitations.

(1) Operations shall be conducted below 1000 MSL.

(2) Flight operations shall be contained in an area west of 4MD4. The primary containment area is identified as being 2nm north, 2nm south, and 3nm west of the airport as identified in Figure 2 above. All flight operations must remain clear of the ADIZ.

(3) The UAS PIC must notify the PCT TRACON Operations Manager at (540) 349-7541 and PAX River NAS at (301) 342-3740 at least 30 minutes prior to launch and immediately upon termination of operations each day. DTI must provide PCT with an on-site contact name and phone number for two-way communications with ATC for each flight.

(4) The Kestrel UAS shall transmit the assigned beacon code 0377 and altitude information (Mode-C) for the duration of the flight. Any failure of the transponder or inability to properly squawk the assigned code shall be reported to PCT and flight operations shall be terminated.

(5) The Kestrel pilot shall have the capability of maneuvering the UAS or suspending operations as instructed by PCT.

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

(7) A Notice to Airmen (NOTAM) shall be issued when UAS operations are being conducted. (Note: Do not use 'distant' or D here as the NOTAM classification and codes have recently been changed.) DTI shall contact the Automated Flight Service Station (FSS) no less than 48 hours prior to the operation and provide:

i) Name, address, and telephone number of the person giving notice.
ii) Nature of the activity.
iii) Date, time, and duration of the activity.
iv) Size of the affected area in nautical mile radius and affected altitudes.
v) Location of center of affected area in relation to airport.
vi) Location of center of affected area in relation to nearest VOR/DME or VORTAC.

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.ntsb.gov. Further flight operations must not be conducted until the incident is reviewed by AIR-160 and authorization to resume operations is provided to DTI.

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 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 (applicant name) company procedures.

(4) The UA PIC must have a flight review in unmanned aircraft every 24 calendar months in accordance with Defense Technologies, Inc., procedures.

(5) All UA PICs must have successfully completed applicable (applicant name) 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. The supplemental UA PIC need not be a certificated pilot, but must have successfully completed a recognized private pilot ground school program.

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

(1) All UA pilots must maintain currency in unmanned aircraft in accordance with (applicant name) company procedures.

(2) All UA pilots must have a flight review in unmanned aircraft every 24 calendar months in accordance with Defense Technologies, Inc., procedures.

(3) All UA pilots must have successfully completed applicable Defense Technologies, Inc., 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 1000 ft 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) An observer may be positioned in a chase aircraft. When a chase aircraft is used, it must maintain a reasonable proximity, and must position itself relative to the UA to reduce the hazard of collision in accordance with § 91.111, Operating near other aircraft. When the observer is located in a chase aircraft, the observer's duties must be dedicated to the task of observation only. Concurrent duty as pilot of the chase aircraft is not authorized.

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

(7) 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 third-class (or higher) airman medical certificate issued under part 67. A valid second-class airman medical certificate is required after 9/10/2008.

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 Defense Technologies, Inc., program letter.

(2) All observers must have successfully completed applicable Defense Technologies, Inc., training for the UAS.

6. Equipage.

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

b. The UA and chase aircraft 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. 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.

b. During UA flights.

(1) Appropriate air traffic frequencies must be monitored during flight operations.

(2) All UA 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 while remaining within the flight test area 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), including cloud clearance minimums as specified in § 91.155, Basic VFR weather minimums. Flight operation in instrument meteorological conditions (IMC) is not permitted.

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. (See § 91.303, Aerobatic 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. Transponder requirements.

(1) The UA must operate an approved operational Mode C or Mode S altitude encoding transponder during all flight operations.

(2) Chase aircraft transponders must be on standby while performing chase operations flight with the UA.

d. Transponder failure.

(1) In the event of transponder failure on either the UA or the chase aircraft, the UA must conclude all flight operations and expeditiously return to its base of operations within the prescribed limitations of this authorization.

(2) In the event of UA transponder failure, a chase aircraft will operate its transponder in Mode C.

e. Notice to airman. Defense Technologies, Inc., must request the issuance of a Notice to Airman (NOTAM) through the Automated Flight Service Station at least 24 hours before flight operation.

9. Flight Termination and Lost Link Procedures.

a. Flight termination. In accordance with Defense Technologies, Inc., program letter, dated 11/25/2008, 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 chase aircraft or observer, all other UAS control stations, and the appropriate ATC facility will be immediately notified of the lost link condition and the expected UA response.

10. Maintenance and Inspection. (Ref.: DTI-UAS-MAIN-INSP-01, Kestral-T UAS Maintenance and Inspection Policy, AEA-FSDO-27-accepted 6/10/08)

a. General requirements. The UAS must not be operated unless it is inspected and maintained in accordance with the Defense Technologies, Inc., Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 1.3, dated 6/9/08, reportable on the Aircraft Discrepancy Form, Rev. 1.1, dated 6/9/08, and Daily Ground Station Condition Inspection Checklist, Rev. 1.2, dated 6/9/08, reportable on the Ground Station Discrepancy Form, Rev. 1.1, dated 6/9/08, or later accepted FAA revision. Defense Technologies, Inc., must establish and maintain aircraft maintenance records (see paragraph 10(d) below).

b. Inspections. No person may operate this UAS within the preceding 12 calendar months unless it has had a condition inspection performed according to the Defense Technologies, Inc., Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 1.3, dated 6/9/08, reportable on the Aircraft Discrepancy Form, Rev. 1.1, dated 6/9/08 and Daily Ground Station Condition Inspection Checklist, Rev. 1.2, dated 6/9/08, reportable on the Ground Station Discrepancy Form, Rev. 1.1, dated 6/9/08, or later accepted FAA revision. 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 Defense Technologies, Inc., 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, the UAS's total time-in-service, 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 Defense Technologies, Inc.,* Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 1.3 dated 6/9/08, reportable on the Aircraft Discrepancy Form, Rev. 1.1 dated 6/9/08, and Daily Ground Station Condition Inspection Checklist, Rev. 1.2, dated 6/9/08, reportable on the Ground Station Discrepancy Form, Rev. 1.1, dated 6/9/08, or later accepted FAA revision, *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 the *Defense Technologies, Inc.* 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 § 91.411, Altimeter system and altitude reporting equipment tests and inspections, and § 91.413, ATC transponder tests and inspections. These inspections will be recorded in the UAS maintenance records.

11. Information Reporting. Defense Technologies, Inc., will provide the following information to Donald.E.Grampp@FAA.GOV on a monthly basis. A copy of the report shall be provided to AIR-200.

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 Defense Technologies, Inc., 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. DTI 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. (Ref.: DTI-UAS-MAIN-INSP-01, Kestral-T UAS Maintenance and Inspection Policy, AEA-FSDO-27-accepted 6/10/08)

All revisions to Defense Technologies, Inc., Kestral-T UAS UAS Maintenance and Inspection Policy, AEA-FSDO-27-accepted 6/10/08, the Daily Aircraft Condition Inspection Checklist, Rev. 1.3 dated 6/9/08, Aircraft Discrepancy Form, Rev. 1.1, dated 6/9/08, Daily Ground Station Condition Inspection Checklist, Rev. 1.2 dated 6/9/08, and Ground Station Discrepancy Form, Rev. 1.1 dated 6/9/08, must be reviewed and accepted by the Washington 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 Defense Technologies, Inc., Kestral-T UAS, Daily Aircraft Condition Inspection Checklist, Rev. 1.3, dated 6/9/08, reportable on the Aircraft Discrepancy Form, Rev. 1.1, dated 6/9/08, and Daily Ground Station Condition Inspection Checklist, Rev. 1.2, dated 6/9/08, reportable on the Ground Station Discrepancy Form, Rev. 1.1, dated 6/9/08, or later accepted FAA revision. 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 needs 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

1/9/09
Issuance Date:

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

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 (date), for the purposes of research and development, market survey, and/or crew training. This special airworthiness certificate is issued for Kestrel – T, RCS 180, serial number 003, registration number N2554V.

Robert J. Mudd Jr.
for Donald R. Jackson
Applicant (signature)

1/9/09
Date:

Name (Printed): Donald Jackson

Title: Senior Vice President

Company: Defense Technologies, Inc.

Defense Technologies, Inc.

Kestrel-T UAS Maintenance and Inspection Policy

DTI Control Number: DTI-UAS-MAIN-INSP-01

Corporate Headquarters
Two Urban Centre
4890 W. Kennedy Blvd. Ste. 490
(813) 286-7606

Research & Development Center
21795-C North Shangri-La Drive
Lexington Park, MD 20653
(301) 737-8893

Research & Development Center
2721 X-Ray Drive
Gastonia, NC 28054
(704) 824-0199

FAA ACCEPTED
D.O. IDENTIFIER: FSDO-27
EFFECTIVE DATE: 06/10/2008
SIGNATURE:

DTI CHANGE RECORD

THIS SHEET IS A RECORD OF EACH ISSUE OF THIS DOCUMENT. **WHEN** THE REVISED DOCUMENT IS ISSUED, THE PREVIOUS ISSUE IS AUTOMATICALLY SUPERCEDED

Rev.	**Date**	**Name/Signature**	**Reason for Change**
1.0	07/02/07	Jerry Mudd	Initial Release.
2.0	05/09/08	Jerry Mudd	Added maintenance of ground station systems.
2.1	06/04/08	Jerry Mudd	Added maintenance of generator.
2.2	06/10/08	Jerry Mudd	Changed APPROVAL to ACCEPTANCE on Change Record.

ACCEPTANCE		
TITLE	SIGNATURE	DATE

FAA ACCEPTED
D.O. IDENTIFIER: FSDO-27
EFFECTIVE DATE: 06/10/2008
SIGNATURE:

Reference Documents

1. *Daily Aircraft Condition Inspection Checklist*
2. *Aircraft Log Book*
3. *Aircraft Discrepancy List*
4. *Surface Checklist*
5. *Airframe Equipment List*
6. *Maintenance Summary*
7. *Weight and Balance*
8. *Cloud Cap Technology documentation*
9. *Ground Station Log Book*
10. *Ground Station Configuration*
11. *Daily Ground Station Condition Inspection Checklist*
12. *Ground Station Discrepancy List*
13. *Ground Station Maintenance Log*
14. *DTI Generator Usage Log Sheet*
15. *DTI Hours Log Sheet*
16. *THPSafetyWarnings.pdf*

Maintenance and Inspection Overview

This document has been developed from Defense Technologies, Inc. (DTI) experience garnered over the previous two (2) years of supporting UAS operations. DTI's Maintenance and Inspection Policy for all UAS is as follows.

1. Each aircraft features its own log book.
   Log books hold the following items:
   - a. *Daily Aircraft Condition Inspection Checklists*
   - b. *Aircraft Discrepancy Lists*
   - c. *Surface Checklists*
   - d. *Flight Plan Logs*
   - e. *Equipment List*
   - f. *Maintenance Summary*
   - g. *Weight and Balance*

a) *Daily Aircraft Condition Inspection Checklist*

The *Daily Aircraft Condition Inspection Checklist* is derived from the Part 43 100 hour / annual inspection, suitably modified to cover items unique to a UAS.

DTI policy is to perform an inspection using the *Daily Aircraft Condition Inspection Checklist* prior to the first flight, for each flight day. Essentially, DTI performs a 100 hour / annual inspection every flying day.

Any discrepancies or issues are noted on the *Aircraft Discrepancy List*. The PIC will determine how to resolve these issues prior to flight.

b) *Aircraft Discrepancy List*
This form is used to note any issues or discrepancies found on the aircraft during the *Daily Aircraft Condition Inspection Checklist* procedure and during post-flight inspections. Post-flight inspections are held after each flight and are analogous to a pre-flight inspection of an aircraft. DTI prefers to inspect each aircraft upon landing.

c) *Surface Checklists*
The *Surface Checklists* is used to note the control surface movements when calibrating the autopilot to the aircraft. A surface calibration is performed anytime control surface, linkage or servo maintenance is performed. Only the affected surface needs to be calibrated.
There will be a matching *Surface Checklists* for each logged maintenance item with respect to a control surface, linkage or servo.

d) *Flight Plan Log*
A *Flight Plan Log* is filled out for every flight day. Any issues noted during the flight are recorded on this document. Flight times, weather conditions, location, modification since last flight, and flight objectives are also recorded.

e) *Airframe Equipment List*
The *Airframe Equipment List* details the components installed in the aircraft and covers items such as engine, propeller, wheels, Piccolo autopilot serial number, transponder and strobe.

f) *Maintenance Summary*
The *Maintenance Summary* is a summary of maintenance and alterations made to a particular aircraft.

g) *Weight and Balance*
Current weight and balance for the particular aircraft.

2. The ground control system has its own log book listing the following information:
   a) *Ground Station Configuration* to include:
      i) part numbers and serial numbers of primary and secondary ground stations.
      ii) Autopilot software version and date.
      iii) Antenna descriptions.
      iv) Spectrum analyzer model, serial number and calibration date.
      v) Crew communication radio details.
      vi) Primary and secondary ground control computer details.
   b) *Daily Ground Station Condition Inspection Checklist*
   c) *Ground Station Discrepancy List*
   d) *Ground Station Maintenance Log*

FAA ACCEPTED
D.O. IDENTIFIER: FSDO-27
EFFECTIVE DATE: 06/10/2008
SIGNATURE:

General Maintenance Procedures

1. Perform a daily aircraft inspection using the *Daily Aircraft Condition Inspection Checklist* prior to the first flight of the day.
2. Note and discrepancies on the *Daily Aircraft Condition Inspection Checklist* when found.
3. Record these discrepancies on the *Aircraft Discrepancy List.*
4. Resolve issues and note resolutions on *Aircraft Discrepancy List.*
5. If any issues affected any part of a flight control surface, perform a surface calibration procedure.
6. Perform a daily ground station inspection using the *Daily Ground Station Condition Inspection Checklist.*
7. Note and discrepancies on the *Daily Ground Station Condition Inspection Checklist* when found.
8. Record these discrepancies on the *Ground Station Discrepancy List.*
9. Resolve issues and note resolutions on the *Ground Station Discrepancy List* and the *Ground Station Maintenance Log.*
10. Note any relevant information on the *Flight Plan Log.*
11. PIC reviews *Flight Plan Log* and aircraft pilot log book.
12. Perform flight operations.
13. Perform post-flight inspection and any items from 1 to 8 as required prior to next flight.
14. Log all applicable information and changes in the *Maintenance Summary* and the *Airframe Equipment List.*
15. Additionally, the first week of every month, update all ground station computers from the Microsoft Update site.
16. Note date of system updates in the *Ground Station Maintenance Log.*

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EFFECTIVE DATE: 06/10/2008
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Daily Aircraft Condition Inspection Checklist

Aircraft Make/Model:______________________ **S/N:**____________

Engine Make/Model:______________________

Autopilot Make/Model:____________________ **S/N:**____________

Date of Inspection:______________ **Performed By:**______________

Scope and detail of items (as applicable to the particular aircraft) to be included in daily inspection.

Each person performing a daily inspection shall, before that inspection, remove or open all necessary inspection plates, access doors, fairing and cowling and wing as applicable.

1. Each person performing a daily inspection shall inspect (where applicable) the following components of the fuselage and hull group:
   a. __Pass __Fail: Covering and skin-for deterioration, distortion, other evidence of failure, and defective or insecure attachment of fittings.
   b. __Pass __Fail: Systems and components-for improper installation, apparent defects, and unsatisfactory operation.
2. Each person performing a daily inspection shall inspect (where applicable) all components and systems that make up the complete empennage assembly:
   a. __Pass __Fail: General condition, fabric or skin deterioration, distortion, evidence of failure, insecure attachment, improper component installation, and improper component operation.
   b. __Pass __Fail: Servo condition, improper mounting, linkages and freedom of movement.
3. Each person performing a daily inspection shall inspect (where applicable) the following components of the cabin and cockpit group:
   a. This section replaced with *Daily Ground Station Inspection Checklist.*
4. Each person performing a daily inspection shall inspect (where applicable) components of the engine and nacelle group as follows:
   a. __Pass __Fail: Engine section for visual evidence of excessive oil, fuel, or hydraulic leaks, and sources of such leaks.

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D.O. IDENTIFIER: FSDO-27
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    b. __Pass __Fail: Engine mount(s) for cracks, looseness of mounting, and looseness of engine to mount.
    c. __Pass __Fail: Flexible vibration dampeners for poor condition and deterioration.
    d. __Pass __Fail: Engine controls for defects, improper travel.
    e. __Pass __Fail: Lines, hoses, and clamps for leaks, improper condition and looseness.
    f. __Pass __Fail: Exhaust stacks for cracks, defects, and improper attachment.
    g. __Pass __Fail: All systems for improper installation, poor general condition, defects, and insecure attachment.
    h. __Pass __Fail: Cowling for cracks, and defects.

5. Each person performing a daily inspection shall inspect (where applicable) the following components of the propeller group:
    a. __Pass __Fail: Propeller assembly for cracks, nicks, bind, tightness to adapter.
6. Each person performing a daily inspection shall inspect (where applicable) the following components of the fuel system group:
    a. __Pass __Fail: Fuel tank(s) for damage, evidence of leaks and proper installation.
    b. __ Pass __Fail: Fuel lines for proper routing and installation.
7. Each person performing a daily inspection shall inspect (where applicable) the following components of the landing gear group:
    a. __Pass __Fail: All units for poor condition and insecurity of attachment.
    b. __Pass __Fail: Wheels for cracks, defects, and condition of bearings.
    c. __Pass __Fail: Tires for wear and cuts.
8. Each person performing a daily inspection shall inspect (where applicable) the following components of the radio group:
    a. __Pass __Fail: Avionics equipment for improper installation and insecure mounting.
    b. __Pass __Fail: Wiring and conduits for improper routing, insecure mounting, and obvious defects.
    c. __Pass __Fail: Bonding and shielding for improper installation and poor condition.
    d. __Pass __Fail: Antenna including trailing antenna for poor condition, insecure mounting, and improper operation.

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Install wing at this point in the inspection.

9. Each person performing a daily inspection shall inspect (where applicable) all components of the wing and center section assembly.
    a. __Pass __Fail: General condition, fabric or skin deterioration, distortion, evidence of failure, and insecurity of attachment.
    b. __Pass __Fail: Servo condition, mount and linkages.
10. Each person performing a daily inspection shall inspect (where applicable) each installed miscellaneous item that is not otherwise covered by this listing for improper installation and improper operation.
    a. __Pass __Fail

Notes and explanation of un-airworthy items found:

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AIRCRAFT DISCREPANCY LIST

Name:		**Date:**
Aircraft :	**Tail #**	**Piccolo #**

	General Description	Work Completed	Final Inspection
A			
B			
C			
D			
E			
F			
G			
H			
I			
J			
K			
L			
M			
N			
O			
P			
Q			
R			
S			
T			
U			
V			

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Daily Ground Station Condition Inspection Checklist

Ground Station Make/Model:____________________ **S/N:**____________

Firmware Version and Date: ____________________

Ground Station Software Version:__________________

Date of Inspection:_______________

Ground Station Inspection Performed By:_____________

1. Inspect all cables and connections to the primary and secondary **Ground Stations**.
   a. COM Port Cables: __Pass __Fail
   b. Power Cables: __Pass __Fail
   c. Antenna Connections: __Pass __Fail
2. Inspect all cables and connections to the primary and secondary **Antenna.**
   a. Connections to amplifier power: __Pass __Fail
   b. Connections to external antenna: __Pass __Fail
3. Inspect all cables and connections to the primary and secondary **Control Computer.**
   a. All connections secure to PC: __Pass __Fail
   b. Boots correctly without errors: __Pass __Fail
4. Inspect all cables and connections to the Spectrum Analyzer.
   a. Boots correctly: __Pass __Fail
   b. Within calibration dates: __Pass __Fail
5. UPS
   a. Correct power light indications: __Pass __Fail
6. Inspect all cables and connections to the primary and secondary **Hand Controllers.**
   a. Cable connections secured at both ends: __Pass __Fail
7. **Crew Communications Radios.**
   a. All radios properly charged: __Pass __Fail
8. **Generator.**
   a. Nuts and bolts seture: __Pass __Fail

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b. Engine oil: __Pass __Fail
c. Sufficient fuel: __Pass __Fail
d. Test run: __Pass __Fail
e. No required maintenance due: __Pass __FAIL

Notes and explanation of un-airworthy items found:

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GROUND STATION DISCREPANCY LIST

Name:		Date:
GS# :	SN #	Firmware #

	General Description	Work Completed	Final Inspection
A			
B			
C			
D			
E			
F			
G			
H			
I			
J			
K			
L			
M			
N			
O			
P			
Q			
R			
S			
T			
U			
V			

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SIGNATURE:

Defense Technologies, ınc
Date: 6/9/2008

Surface Check List
Version 1.1

Plane Type		
Plane Number		
Piccolo Serial Number		
Performed By		
Date Performed		

Test Value	Left Aileron	Right Aileron	Left Rudder	Left Elevator	Right Elevator	Left Flap	Right Flap	Nose Gear
1500								
1926								
1837								
1745								
1653								
1531								
1470								
1378								
1286								
1194								
1103								
1500								

FAA ACCEPTED
D.O. IDENTIFIER: FSDO-27
EFFECTIVE DATE: 06/10/2008
SIGNATURE:

Defense Technologies, inc
Date: 6/9/2008

Surface Check List
Version 1.1

Surfaces							
Test Value	Left Throttle	Right Throttle					
1500							
1110	0.000						
1180	0.111						
1250	0.222						
1320	0.333						
1390	0.444						
1460	0.555						
1530	0.666						
1600	0.777						
1670	0.888						
1740	1.000						

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WARNING: Please read before charging or using battery

IMPORTANT SAFETY INSTRUCTIONS AND WARNINGS

- You must read these safety instructions and warnings before using or charging your batteries.
- ***Lithium Polymer batteries are volatile.*** Failure to read and follow the below instructions may result in fire, personal injury and damage to property if charged or used improperly.
- Thunder Power, its distributors or retailers assume no liability for failures to comply with these warnings and safety guidelines.
- **By purchasing this battery, the buyer assumes all risks associated with lithium batteries. If you do not agree with these conditions, return the battery immediately before use.**

General Guidelines and Warnings

1) ***Use specific Lithium Polymer charger only. Do not use a NiMH or NiCd charger*** - Failure to do so may a cause fire, which may result in personal injury and property damage.
2) ***Never charge batteries unattended.*** When charging LiPo batteries you should always remain in constant observation to monitor the charging process and react to potential problems that may occur.
3) Some LiPo chargers on the market may have technical deficiencies that may cause it to charge the LiPo batteries incorrectly or at an improper rate. It is your responsibility solely to assure the charger you purchased works properly. Always monitor charging process to assure batteries are being charged properly. Failure to do so may result in fire.
4) ***If at any time you witness a battery starting to balloon or swell up, discontinue charging process immediately, disconnect the battery and observe it in a safe place for approximately 15 minutes.*** This may cause the battery to leak, and the reaction with air may cause the chemicals to ignite, resulting in fire.
5) Since delayed chemical reaction can occur, it is best to observe the battery as a safety precaution. Battery observation should occur in a safe area outside of any building or vehicle and away from any combustible material.
6) ***Wire lead shorts can cause fire!*** If you accidentally short the wires, the battery **must** be placed in a safe area for observation for approximately 15 minutes. Additionally, if a short occurs and contact is made with metal (such as rings on your hand), severe injuries may occur due to the conductibility of electric current.
7) A battery can still ignite even after 10 minutes.
8) In the event of a crash, you must remove battery for observation and place in a safe open area away from any combustible material for approximately 15 minutes.
9) If for any reason you need to cut the terminal wires, it will be necessary to cut each wire separately, ensuring the wires to not touch each other or a short may occur, potentially causing a fire.
10) To solder a connector: Remove insulating tape of Red wire and solder to positive terminal of a connector, then remove insulating tape of Black wire and solder to the negative terminal of connector. Be careful not to short the wire lead. If you accidentally cause the battery to short, place it in a safe open space and observe the battery for approximately 15 minutes. ***A battery may swell or even possibly catch fire after a short time.***
11) Never store or charge battery pack inside your car in extreme temperatures, since extreme temperature could ignite fire.

Charging Process

1) Never charge batteries unattended.
2) ***Charge in an isolated area, away from other flammable materials.***
3) Let battery cool down to ambient temperature before charging.
4) ***Do not charge batteries packs in series.*** Charge each battery pack individually. Failure to do so may result in incorrect battery recognition and charging functions. Overcharging may occur and fire may be the result.
5) When selecting the cell count or voltage for charging purposes, select the cell count and voltage as it appears on the battery label. As a safety precaution, please confirm the information printed on the battery is correct.
    a. Example: The label on a 2-Cell battery pack in series will read – "Charge as 2-Cell (7.4V), or may cause fire" – You must select 2-Cell for charging.
    b. Example: The label on a 3-Cell battery pack in series will read – "Charge as 3-Cell (11.1V), or may cause fire" – You must select 3-Cell for charging.
6) Selecting a cell count other than the one printed on the battery (always confirm label is correct), can cause fire.

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7) ***You must check the pack voltage before charging.*** Do not attempt to charge any pack if open voltage per cell is less than 3.3v
   Example Do not charge a 2-cell pack if below 6.6v
   Do not charge a 3 cell pack if below 9.9v

8) ***You must select the charge rate current that does not to exceed 1C (one times the capacity of the battery).*** A higher setting may cause fire. The below chart is calculated at 1 x capacity of pack.
   Example 730 mAh: Charge below 730 mA
   860 mAh: Charge below 860 mA
   1320 mAh: Charge below 1.32 Amps
   1900 mAh: Charge below 1.9 Amps
   2100 mAh: Charge below 2.1 Amps
   7800 mAh: Charge below 7.8 Amps
   8000 mAh: Charge below at 8 Amps

First Discharge

Keep the flight time to 6-minute sessions with 15-minute breaks.

Storage & Transportation

1) Store battery at room temperature between 40 and 80 degrees F for best results.
2) Do not expose battery pack to direct sunlight (heat) for extended periods.
3) When transporting or temporarily storing in a vehicle, temperature range should be greater than 20 degrees F but no more than 150 degrees F.
4) ***Storing battery at temperatures greater than 170 degrees F for extended periods of time (more than 2 hours) may cause damage to battery and possible fire.***

Caring for Battery

1) Charge battery with good quality Lithium Polymer charger. A poor quality charger can be dangerous.
2) Set voltage and current correctly (failure to do so can cause fire).
3) Please check cell voltage after the first charge.
   Example 1-Cell: 4.2V (4.15 to 4.22)
   2-Cell: 8.4V (8.32 to 8.44)
   3-Cell: 12.6V (12.48 to 12.66)
   4-Cell: 16.8V (16.64 to 16.88)
   5-Cell: 18.5V (18.30 to 18.60)
4) ***Do not discharge battery to a level below 3V per cell under load.*** Deep discharge below 3V per cell can deteriorate battery performance.
5) Use caution to avoid puncture of the cell. Puncture of cells may cause a fire.

Operating Temperature

Charge: 32 to 113 degrees F
Discharge: 32 to 140 degrees F

1) Let battery cool down to an ambient temperature before charging.
2) During discharge and handling of batteries, do not exceed 160 degrees F.

Battery Life

Batteries that lose 20% of their capacity must be removed from service and disposed of properly.
Discharge the battery to 3V/Cell, making sure output wires are insulated, then wrap battery in a bag for disposal.

Product Warranty

Product warranty is limited to original defects in material and workmanship. Warranty does not cover collateral damage. Due to the nature and use of this product there is no term warranty. Misuse, abuse, incorrect charging and other inappropriate use of this product are not covered under warranty.

Thunder Power Batteries
4720 West University Ave., Las Vegas, NV 89103
Phone: (702) 228-8883 Fax: (702) 228-8885
www.thunderpower-batteries.com

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DTI UAS Maintenance Performed Log Defense Technologies, Inc.

Revision: 1.0 Date: 06/06/08

System	
ID	

Issue	**Work Performed**	**Date Completed**	**Total Time**	**Person Performing Work**	**Signature**

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SIGNATURE:

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DTI Hours Log Sheet

Aircraft, Engine or Ground Station #		Year	
Description			

Date	Hours	Total Hours	Remarks