FAA FORM 8130-6, APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE Form Approved O.M.B. No. 2120-0018

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Orlando Manufacturing Inspection District Office Citadel International III Building 5950 Hazeltine International Drive, Suite 405 Orlando, FL 32822

EXPERIMENTAL - OPERATING LIMITATIONS RESEARCH AND DEVELOPMENT, CREW TRAINING, or MARKET SURVEY

REGISTERED OWNER NAME:

CYBER DEFENSE SYSTEMS, INC

REGISTERED OWNER ADDRESS:

10901 ROOSEVELT BLVD. SUITE 100D ST. PETERSBURG, FL

AIRCRAFT DESCRIPTION:

ELECTRICALLY POWERED KITE

AIRCRAFT REGISTRATION:

N253CB

AIRCRAFT BUILDER:

CYBER DEFENSE SYSTEMS, INC

YEAR MANUFACTURED:

2007

AIRCRAFT SERIAL NUMBER:

253

AIRCRAFT MODEL DESIGNATION:

102-000B

ENGINE MODEL:

NEUMOTOR 1509/1.5Y/5.2

PROPELLER MODEL: APC 14-10F

The following conditions and limitations apply to all Cyber Defense Systems Cyberbug flight operations while operating in the National Airspace System (NAS):

1. GENERAL

a. For the purposes of the **Special Airworthiness Certificate and Operating Limitations**, the Cyberbug Unmanned Aircraft System (UAS), owned and operated by Cyber Defense Systems, is considered to be an integrated system. The integrated system is comprised of the Cyberbug aircraft, S/N: 253 unmanned aircraft (UA) pilot, UA control station(s) (fixed or mobile), telemetry, navigation and communications equipment. This equipment includes ground, air, and space based equipment that is used for control of the Cyberbug UA.

- **b.** Unless otherwise specified in this document, the Pilot-in-Command (PIC) and Cyber Defense Systems shall comply with all applicable sections and parts of 14 CFR including, but not limited to, parts 61 and 91. Alternative methods of compliance with specific regulations shall be annotated in this document as required.
- c. No person may operate this UAS for other than the purpose of research and development (R&D), crew training, or market surveys, to accomplish the flight operation outlined in Cyber Defense Systems Program Letter dated 6/15/07, which describes compliance with §21.193(d), and has been made available to the pilot in command of the UAS. In addition, 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(e).
- **d.** The PIC must determine that the UAS is in a condition for safe operation, and in a configuration appropriate for the intended purpose of the flight.
- **e.** 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 to document that finding in the aircraft logbook.
 - **f.** No person may operate this UA to carry property for compensation or hire.
- **g.** This UA must be marked with its U.S. Registration number in accordance with 14 CFR part 45.
 - h. This UA must display the word "EXPERIMENTAL" in accordance with §45.23(b).
- i. Prior to conducting the initial Cyberbug flight operations, Cyber Defense Systems must forward a copy of the Cyberbug, Special Airworthiness Certificate, Operating Limitations and Program Letter to: Lynda Otting, FAA Air Traffic Representative, Eastern Service Center, System Support, 1701 Columbia Ave, College Park, GA 30337, telephone (404) 305-5577, email lynda.g.otting@faa.gov.
- j. Section 47.45 requires that the FAA Aircraft Registry must be notified within 30 days of any change in the aircraft registrant's address. Such notification is to be made by submitting Form 8050-1 to AFS-750 in Oklahoma City, Oklahoma.

2. PROGRAM LETTER

The Cyber Defense Systems Program Letter, dated 6/15/07 was used as a basis for determining the operating limitations prescribed in this document. All flight operations must be conducted in accordance with the provisions contained in these operating limitations.

3. INITIAL FLIGHT TESTING

a. Flight operations shall be conducted within visual line of sight of the pilot/observer.

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Initial flight-testing shall be completed upon accumulation of 25 flight hours. Following satisfactory completion of 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 survey cannot be performed until after 50 flight hours have been accomplished. A logbook entry is required as evidence of compliance.

4. AUTHORIZED FLIGHT TEST OPERATIONS AREA

a. The base of operations for the Cyberbug shall be at:

13749 Gadstone Drive Odessa, FL 33556

- **b.** The flight test operations area authorized for the UA is depicted graphically below. This area shall be referred to as the "Primary Containment Area." Cyber Defense Systems may be permitted to operate within restricted airspace per authorization of the using agency. Under these circumstances, should the UA venture beyond the boundaries of restricted airspace (e.g., spill out), provisions of this experimental certificate shall apply, including authorization to only operate within the boundaries of the Primary Containment Area. In these circumstances, Cyber Defense Systems is responsible for notifying the FAA of any breach of the operational area. The Cyberbug is required to be operated in accordance with the conditions defined in these limitations and in compliance with FAA rules and regulations while operating in restricted airspace.
- **c.** Flight operations in the Primary Containment Area shall be conducted below 400 ft AGL within the boundaries defined below.

Flying Site Coordinate Data

Upper-Left	N 28.197756	W 82.595080
Lower-Left	N 28.194736	W 82.595135
Upper-Right	N 28.199596	W 82.590926
Lower-Right	N 28.196137	W 82.587648

Elevation range: 12.1 Meters-17.8 Meters

Dimensions: From Image

Cyber Defense - Cyberbug

North 447 Meters South 747 Meters East 502 Meters West 332 Meters

Note: These dimensions represent the maximum area as agreed to with the landowner. The FAA allowed area must be inside of this area.



Figure 1: Primary Containment Area

d. The PIC shall ensure that all UA flight operations remain within the lateral and vertical boundaries of the Primary Containment Area or any restricted area approved by the using agency. Furthermore, the PIC shall take into account all factors that may affect the capability

of remaining within the containment areas. 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 Primary Containment Areas or any restricted airspace shall be reported to the FAA, Mr. Doug Davis, Manager Unmanned Aircraft Systems Program Office, AIR-160, as soon as practicable, but always within 24 hours. Accidents shall be reported to the National Transportation Safety Board per the instructions contained on the NTSB website: www.ntsb.gov. Mr. Davis can be reached at telephone number 202-385-4636, or by fax at 202-385-4651. The report may be provided by either phone, or e-mail to kenneth.d.davis@faa.gov. Further flight operations shall not be conducted until the incident / accident is reviewed by ATO, AFS, and AIR-160, and authorization to resume operations is received.
- **f.** If the review reveals issues with the operating limitations, the FAA may revise/amend the operating limitations as part of the authorization to resume operations.

5. UA PILOT AND OBSERVER

- **a.** All flight operations conducted in the Primary Containment Area shall have an observer to perform traffic avoidance and visual observation to fulfill the "see and avoid" requirement of §91.113.
- **b.** The UA PIC shall hold, at a minimum, an FAA Private Pilot certificate, Instrument Rating, and have it in their possession.
 - c. All observers shall:
 - 1) Hold at a minimum, an FAA Private Pilot certificate, or
 - 2) Successfully completed specific observer training acceptable to the FAA.
 - d. The UA PIC shall maintain currency in manned aircraft per 14 CFR §61.57.
- e. All UA pilots shall maintain currency in unmanned aircraft in accordance with Cyber Defense Systems company procedures.
- f. The UA PIC shall have a Flight Review in manned aircraft every 24 calendar months per 14 CFR §61.56.
- g. All UA pilots shall have a Flight Review in unmanned aircraft every 24 calendar months in accordance with Cyber Defense Systems company procedures.
- **h.** The UA PIC shall have operational override capability over any Supplemental Pilot, regardless of position.
- i. The Supplemental Pilot need not be a certificated pilot. If the Supplemental Pilot is not a certificated pilot, the Supplemental Pilot must have successfully completed a recognized

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Private Pilot ground school or successfully completed the private pilot written test within 90 days of the issuance of these limitations.

- j. Pilots and observers shall have successfully completed applicable manufacturer training for high level systems and operational understanding of the UAS.
- **k.** Pilots and observers must have in their possession a valid third class (or higher) airman medical certificate that has been issued under 14 CFR part 67.
- I. A PIC must be designated at all times and be responsible for the safety of the UAS and 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. The PIC shall avoid densely populated areas (14 CFR § 91.319) and exercise increased vigilance when operating within published airway boundaries.
 - m. UA pilots and observers shall perform crew duties for only one UA at a time.
- n. All observers must be thoroughly trained, familiar with, and possess, operational experience with the equipment being utilized for observation and detection of other aircraft for collision avoidance purposes as outlined in Cyber Defense Systems Program Letter.
- o. Visual Observer Responsibilities: The task of the observer is to provide the pilot of the UA with instructions to maneuver the UA clear of any potential collision with other traffic. Visual observer duties require continuous visual contact with the UA at all times in such a manner as to be able to discern UA attitude and trajectory. At no time shall the visual observer permit the UA to operate beyond line-of-sight necessary to ensure that maneuvering information can be reliably determined. At no time shall visual observers conduct their duties more than 1000 ft laterally or 400 feet vertically from the UA. Observers must maintain continuous visual contact with the UA.

6. COMMUNICATIONS

- **a.** Each UAS Flight operation must be coordinated by telephone with Tampa Approach Control at telephone (813) 371-7750 no less than 1 hour and no more than 2 hours prior to the start of the flight operations.
- **b.** Cyber Defense Systems shall provide the Tampa Approach Control with an on-site contact name and phone number for communications with ATC for each flight.
- **c.** The UA pilot shall have the capability of maneuvering the UAS or suspending operations as instructed by Tampa Approach Control.
- **d.** A distant (D) Notice to Airmen (NOTAM) shall be issued when UAS operations are being conducted. Cyber Defense Systems shall contact the Automated Flight Service Station (FSS) no less than 48 hours prior to the operation and provide:
 - 1) Name, address, and telephone number of the person giving notice.
 - 2) Nature of the activity.

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- 3) Date, time, and duration of the activity.
- 4) Size of the affected area in nautical mile radius and affected altitudes.
- 5) Location of center of affected area in relation to airport.
- 6) Location of center of affected area in relation to nearest VOR/DME or VORTAC.
- e. Upon initial contact with ATC, the PIC must indicate the experimental nature in accordance with 14 CFR § 91.319.
- f. The PIC and observer(s) must maintain two-way communications with each other during all operations.
- **g.** If communications cannot be maintained between the PIC, observer(s) and appropriate ATC facility, the UA will expeditiously return to its base of operations while remaining within the primary containment area, and conclude the flight operation.
- h. Spectrum used for operation and control of the UA must be approved by the FCC or other appropriate government oversight agency prior to operations being conducted.

7. FLIGHT CONDITIONS

- **a.** All flight operations must be conducted under visual flight rules (VFR) in visual meteorological conditions (VMC), including cloud clearance minimums as specified in 14 CFR § 91.155. Flight operations under instrument flight rules (IFR) or in instrument meteorological conditions (IMC) are not authorized. Flight operations shall not be conducted under the Special VFR criteria specified in 14 CFR § 91.157, nor shall flight operations be conducted when flight visibility is less than three statute miles.
- **b.** All flight operations within the Primary Containment Area as specified in Section 4c shall be conducted during daylight hours only.
- **c.** 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 (§91.303).
- **d.** Flight operations must not involve carrying hazardous material or the dropping of any objects or external stores.
- **e.** The UA shall be equipped with strobe/anti-collision lights and shall be illuminated at all times.

8. FLIGHT TERMINATION & LOST LINK PROCEDURES

a. In accordance with Cyber Defense Program Letter, dated 6/15/07 flight operations must be discontinued at any point when the approved primary containment area is breached and/or the control of the UA is questionable. If it is determined that the UA is still under control of the PIC, the UA shall return to base (RTB).

b. 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 primary containment area. The UAS PIC will immediately notify ATC of the loss of link condition and what the expected UA response will be.

9. MAINTENANCE

- **a.** This UAS must not be operated unless it is inspected and maintained in accordance with the Cyber Defense Cyberbug-B Maintenance Program dated 6/15/07. Each inspection must be recorded in the UAS maintenance records.
- **b.** No person may operate this UAS unless within the preceding 12 calendar months it has had a condition inspection performed in accordance with, FAA-approved, Cyber Defense Cyberbug-B Maintenance Program dated 6/15/07 and was found to be in a condition for safe operation. This inspection will be recorded in the UAS maintenance records.
- **c.** Only those individuals authorized by Cyber Defense Systems, and acceptable to the FAA, may perform inspections required by these operating limitations. The person(s) shall possess an FAA Repairman Certificate or an FAA Airframe and Powerplant Certificate.
- d. Inspections of the UAS must be recorded in the UAS maintenance records showing the following, or a similarly worded, statement: "I certify that this UAS has been inspected on [insert date] in accordance with the scope and detail of the Cyber Defense Cyberbug-B Maintenance Program dated 6/15/07, and was found to be in a condition for safe operation." The entry will include the UA's total time-in-service, the name, signature, type of certificate and certificate number of the person performing the inspection.
- e. UAS instruments and equipment installed must be inspected and maintained in accordance with the requirements of the Cyber Defense Cyberbug-B Maintenance Program dated 6/15/07. Any maintenance or inspection of this equipment must be recorded in the UAS maintenance records.

10. EQUIPAGE

- a. The GCS shall be equipped with two-way communications equipment allowing communications between the UAS pilot and Tampa Approach Control.
- **b.** The requirement for the operation and use of a transponder within the airspace designated in 14 CFR §91, Appendix D and as specified by 14 CFR §91.215(b)(2) is waived for this operation.

11. INFORMATION REPORTING

Cyber Defense Systems shall provide the following information to <u>Kenneth.d.Davis@faa.gov</u> on a monthly basis.

- a. Number of flights conducted under this certificate.
- **b.** Pilot duty time per flight.

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- c. Unusual equipment malfunctions (hardware or software), if any.
- d. Deviations from ATC instructions.
- e. Unintended entry into lost link flight mode that results in a course change.

12. REVISIONS

- a. The experimental certificate, Cyber Defense Systems FAA-accepted program letter, and operating limitations cannot be reissued, renewed, or revised without application being made to the Orlando MIDO, and coordinated with the North Florida Flight Standards District Office Tampa and the Production and Airworthiness Division, AIR-200. AIR-200 will be responsible for headquarters internal coordination with the Aircraft Certification Service, Flight Standards Service, Air Traffic, Office of Chief Council, and Office of Rulemaking.
- **b.** No Certificate of Authorization or Waiver may be issued in association with this Experimental Certificate unless coordinated with the Orlando MIDO and the Production and Airworthiness Division, AIR-200.
- **c**. The provisions and limitations annotated in this operational approval may be amended or cancelled at any time as deemed necessary by the FAA.
- **d.** All revisions to Cyber Defense Cyberbug-B Maintenance Program dated 6/15/07 must be reviewed and approved by the North Florida Flight Standards District Office Tampa.

13. UA MODIFICATIONS

- **a.** All software and system changes will be documented as part of the normal maintenance procedures and be available for inspection. All software and system changes shall be inspected and approved per Cyber Defense Cyberbug-B Maintenance Program dated 6/15/07. All software changes to the aircraft and GCS are categorized as major changes, and shall be provided in summary form at the time they are incorporated.
- **b.** All major modifications, whether performed under the experimental certificate, COA, or other authorizations, that could potentially effect the safe operation of the system, shall be documented and shall be provided to the FAA prior to operating the aircraft under this certificate. Major modifications incorporated under COA or other authorization need only be provided if the aircraft is flown under these authorizations during the effective period of the experimental certificate.
 - c. All information requested shall be provided to AIR-200.

End of Limitations.

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Larry Adams

Aviation Safety Inspector (Mfg)

Orlando Manufacturing Inspection District Office

Citadel International III Building

5950 Hazeltine International Drive, Suite 405

Orlando, FL 32822

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 June 15, 2007 for the purpose of Research and Development, Crew Training, or Market Survey.

This Airworthiness Certificate is issued for Cyber Defense Systems UAS model Cyberbug serial number 253, registration number N253CB. This certification expires on October 15, 2007.

Note: If the so stated limitations or conditions cannot be complied with, Cyberbug flight operations shall be discontinued.

Applicant (signature)

Date: 6-15-07

June 15, 2007

Name (Printed): James Alman

Title: Vice President Engineering/Pilot

Company: Cyber Defense Systems Inc.

PROGRAM LETTER FOR UNMANNED AIRCRAFT SYSTEMS

REGISTERED OWNER NAME:

CYBER DEFENSE SYSTEMS, INC.

REGISTERED OWNER ADDRESS:

10901 ROOSEVELT BLVD, SUITE 100D

ST. PETERSBURG, FLORIDA 33716

AIRCRAFT DESCRIPTION:

CYBERBUG "B"

AIRCRAFT REGISTRATION:

N253CB

AIRCRAFT BUILDER:

CYBER DEFENSE SYSTEMS, INC.

YEAR MANUFACTURED:

2007

AIRCRAFT SERIAL NUMBER:

253

AIRCRAFT MODEL DESIGNATION:

CyberBug P/N 102-000B

ENGINE MODEL:

Neumotor 1509/1.5Y/5.2

PROPELLER MODEL:

APC 14-10F

1. DEFINE THE EXPERIMENTAL PURPOSE(S) UNDER WHICH THE AIRCRAFT IS TO BE OPERATED (14 CFR § 21.191). Testing new aircraft design concepts, new aircraft equipment, new aircraft installations, new aircraft operating techniques, or new uses for aircraft. Conducting flight tests and other operations to show compliance with the airworthiness regulations including flights to show compliance for issuance of type and supplemental type certificates, flights to substantiate major design changes, and flights to show compliance with the function and reliability requirements of the regulations. (c) *Crew training*. Training of the applicant's flight crews. (d) *Exhibition*. Exhibiting the aircraft's flight capabilities, performance, or unusual characteristics at air shows, motion picture, television, and similar productions, and the maintenance of exhibition flight proficiency, (f) *Market surveys*. Use of aircraft for purposes of conducting market surveys, sales demonstrations, and customer crew training only as provided in § 21.195 which states: A manufacturer of aircraft manufactured within the United States may apply for an experimental certificate for an aircraft that is to be used for market surveys, sales demonstrations, or customer crew training.

2. DESCRIBE THE PURPOSE/SCOPE OF THE EXPERIMENTAL PROGRAM FOR EACH 14 CFR § 21.191 EXPERIMANTAL PURPOSE SOUGHT (14 CFR §§ 21.193(b)(d)). Testing new aircraft design concepts, new aircraft equipment, new aircraft installations, new aircraft operating techniques, or new uses for aircraft. The number of flights per aircraft should be less than twenty. The areas are generally model airplane operating areas. The vehicle is in sight at all times.

3. DEFINE THE AREA(S) IN WHICH THE EXPERIMENTAL FLIGHTS WILL BE CONDUCTED.

- a. Describe the areas over which the flights are to be conducted and address of base operation (14 CFR § 21.193(d)(3)). The proposed flight area is on a ranch in Pasco County. It was a model aircraft field but that club has relocated. There are some cows on the land and the property is locked 24 hours a day. To the south is SR 54 which is the only road that would be in the vicinity of the site. There was an airport to the west but that was closed several years ago. The location is in the class B airspace in an area where the floor of the class B is at 3000 feet.
 - **b.** Identify all proposed flight areas using latitude and longitude on aeronautical maps. See image on page six (6). Position of runway is 28.197515 and 82.591452. The field is a ranch with a model aircraft club runway located in the center.
- c. Include information on airspeed, altitude, number of flight hours, number of flights and program duration for each test flight area. All tests will be conducted below 400 feet AGL, Speed ranges are from 20 mph to 31 mph. Not more than 30 flights per aircraft
 - d. What class of airspace will be used? Class E and Class G
 - e. Will minimum fuel requirements of 14 CFR § 91.151 be met? N/A- Electric powered
 - f. Will flight-testing include payload testing? Yes
 - g. What considerations need to be taken with regard to payloads? Cameras only
 - h. Will the aircraft perform any aerobatic maneuvers? No
 - i. Flight Conditions (e.g., VFR, IFR, VMS, etc.) VFR only
- 4. AIRCRAFT CONFIGURATION. Attach three-view drawings or three-view dimensioned photographs of the aircraft (14 CFR § 21.193(b)(4)). Describe Unmanned Aircraft System configuration including ground control station. Include a description of aircraft/system performance characteristics including: See manual for all details
 - a. Wing span 62 inches
 - b. Length 41 inches

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- c. Powerplant DC Electric Motor
- d. Max gross take off weight 8.5 pound
- e. Fuel capacity none
- f. Payload capacity none
- g. Max altitude Operations at or below 400 feet AGL
- h. Endurance 60 Minutes
- i. Max airspeed 15 meters/sec
- j. Control/data frequencies 900 Mhz
- **k.** Guidance and navigation control Procerus Kestral Autopilot with Procerus virtual cockpit

5. INSPECTION AND MAINTENANCE (14 CFR Part 91 Subpart E).

- a. Describe the inspection and maintenance program that will be used to maintain the aircraft and related systems (includes ground stations and/or other support systems). The MX program consists of preflight and post flight visual inspections as well as physical inspections of all flight critical parts prior to flight.
- **b.** Provide copy of flight manual, if applicable, current weight and balance report, equipment list.

6. PILOT QUALIFICATION (14 CFR §§ 61.3, 61.5).

- **a.** Describe the qualifications for each pilot. Private pilot with multi engine and instrument ratings.
- **b.** Pilots must be qualified/certificated in the appropriate type of aircraft, i.e., rotorcraft, powered lift, fixed wing, etc.
 - **b.** Describe internal training program to qualify pilots. Cyber Defense Systems conducts training for operation of the CyberBug UAS
 - **c.** Describe the qualifications and training of observers. Part of CyberBug training
- 7. AIRCRAFT MARKING (14 CFR Part 45). All Unmanned Aircraft System (UAS) are required to be registered and identified with the registration number. Aircraft must be marked in accordance with part 45. The aircraft has a registration number and the size and location has been reviewed by the FAA.
- 8. ATC TRANSPONDER AND ALTITUDE REPORTING SYSTEM EQUIPMENT AND USE (14 CFR § 91.215). Describe the aircraft altitude reporting system. The aircraft altitude is displayed for the operator at all times.

- **9. METHOD FOR SEE AND AVOID (14 CFR § 91.113a).** In what manner, or by what means, will the requirement to "see and avoid" other aircraft be met? What performance will the chase plane have? Ground observers in the vicinity of the operator.
- **10. SAFETY RISK MANAGEMENT.** An applicant must provide a safety checklist that identifies and analyzes the hazards of UAS operations that are described in the program letter. Additional information is available by contacting the FAA Aviation Safety Inspector. The checklist has been provided and it is in the CyberBug manual.
- 11. SYSTEM CONFIGURATION. Provide a description of aircraft system configuration and all on-board and ground-based equipment. The CyberBug system consists of a CyberBug airframe with a Procerus Technologies Kestrel autopilot system. The command/control link is provided by a Maxstream modem in both the aircraft and the GCS. The CyberBug is powered by a 14.8 volt lithium polymer battery system which provides electrical power to the flight control system as well as the motor. There is a minimum battery voltage cut off which provides margin between the minimum motor voltage and the minimum autopilot voltage. The aircraft is equipped with a color gimbaled camera with a 2.4 Ghz analog video transmitter. The GCS consists of a laptop computer which is connected to a communication box via a serial cable. The communications box has a maxstream modem and provides the data link with the aircraft. There is a video receiver in the GCS which receives analog video signals from the CyberBug. The GCS is equipped with antennas for both the 900 Mhx command and control and the 2.4 Ghz video receiver. The GCS has a battery backup to run the video receiver and provide a charger for the communication box.
- 12. SYSTEM SAFETY FLIGHT TERMINATION AND LOST LINK. What is the expectation of aircraft "Flight" if fuel is starved? Electric powered

Briefly describe/explain aircraft lost link and emergency recovery procedures. Provide a brief explanation of the flight termination system (FTS). Permit aircraft LOL failsafe to initiate. Attempt to diagnose problem on ground by following procedure outlined in checklist (E.g. recheck antenna connections, antenna pointing, etc). Once link is re-established, land aircraft, diagnose problem. If link is not re-established, permit UAS to autoland, diagnose problem.

13. COMMAND AND CONTROL. Provide a brief description of the system and/or procedures for command and control of the UAS. The Kestrel Autopilot (KAP)

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System provides intelligent, autonomous flight control, GPS waypoint navigation as well as autonomous takeoff, flight, and auto-landing routines. Along with the ground station hardware and software control system, it offers a highly effective avionics package for a variety of military and commercial applications.

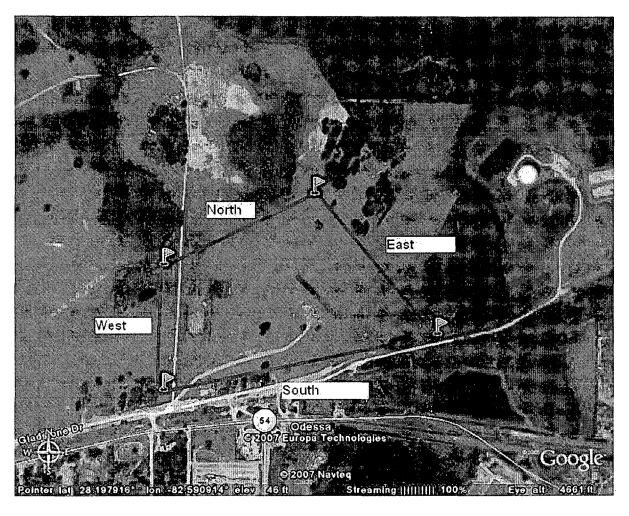
The autopilot is the heart of the Kestrel system. The autopilot board contains a 29Mhz processor and a suite of sensors used by the autopilot software to measure and estimate the states of the aircraft. The autopilot interfaces directly to the digital communication link which enables it to send real-time status telemetry to the ground station and receive commands in-flight. The GPS plugs into the autopilot board and provides inertial navigation information to the autopilot. The autopilot controls the aircraft through two servos (rudder and elevator).

The Virtual Cockpit ground control software makes "click 'n fly" operation easy while providing powerful mission planning, monitoring, and in-flight adjustment on a notebook computer, allowing the user to interact with the UAV in a variety of different modes that include stick & rudder, altitude-heading-velocity commands, and dynamic waypoint specification.

14. CONTROL STATIONS. Provide a brief description of the ground/airborne stations used to control the UAS. The Kestrel system is used with a bi-directional data link. The data link is used to setup and configure the autopilot as well as monitor and re-direct the aircraft in flight. Your CyberBUG operates with a 1 watt Maxstream modem. In normal operations, strong signal strength is available from 3-5km. Actual range is affected by foliage and obstructions, CyberBUG altitude and background noise. In ideal conditions, the modems have been tested beyond 10km with directional antennas.

To support the control of multiple aircraft from one ground station, each aircraft is assigned a unique 16 bit address. This is known as the Aircraft Address and can be changed by the user if desired.

15. CONTROL FREQUENCIES. Provide a description/listing of the frequencies used to control the UAS. 900 Mhz



Flying Site Coordinate Data

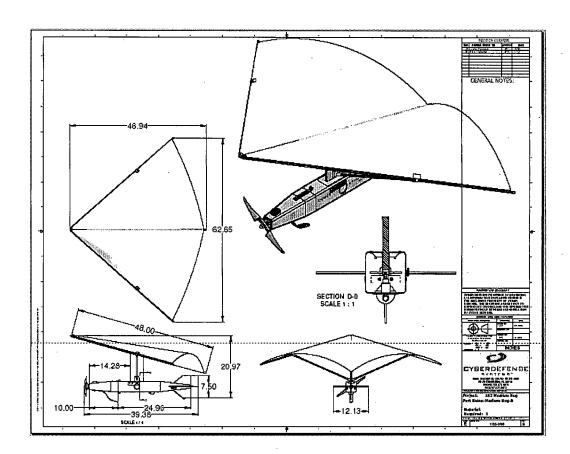
Upper-Left	28.197756	-82.595080
Lower-Left	28.194736	-82.595135
Upper-Right	28.199596	-82.590926
Lower-Right	28.196137	-82.587648

Elevation range: 12.1 Meters-17.8 Meters

Dimensions: From Image

North 447 Meters South 747 Meters East 502 Meters West 332 Meters

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Date 6/		SIN	253	
Subsection	Component	Number		ts Weight
•			Lb	Oz
		_		
Fuselage	Fuselage w/tail, paint, holes, horns	1	1	1.65
	Sail/mast mounting bracket	1	0	4.00
	GPS cover	1 .	0	0.10
	Pitot tube and white fitting	1	0	0.15
	Sail/mast locking pin and carbon spring	1	0	0.25
	Nose locking pin and carbon spring	2	0	0.25
	Dipole antenna	1	0	0.15
	Bulkhead	2	0	1.10
	Servo and pushrod	2	0	2.80
	Battery bridge	1	0	1.00
	Battery retention plate	1 1	0	0.30
	Power distrubution board and wire harness	1	0	3.50
	GPS antenna and cable	1 1	0	0.65
	Video transmitter w/antenna and cable	1 1	0	2.00
	Camera	1	0	2.55
	Assorted nuts and bolts	N/A	0	1.00
	Velcro	N/A	Ö	0.20
	Servo interference chokes	2	Ö	0.25
	Antenna cover plate	1	Ö	0.40
	Subtotal	N/A	2	6.3
	Measured Weight	N/A	2	7.4
		Delta	0	1.1
Battery	Battery	2	2	13.50
	Subtotal	N/A	2	13.5
				
Nose	Landing skid w/2 bolts	1	0	0.90
	Heat sink and bolts	1	0	0.65
	Nose	1	0	4.95
	Motor and speed controller	1	0	14.65
	Prop adapter	1	0	0.80
	Motor mount plate	1	0	0.50
	Motor mount backing plate	1 1	0	0.30
	Prop	1	0	1.50
	Subtotal	N/A	1	8.25
	Measured Weight	N/A	1	8.5
	<u> </u>	Delta	· 0	0.25
Wing	Wing Assembly	1	1	3.75
5	Subtotal	N/A	1	3.75
			<u> </u>	*****

TOTAL	N/A	7	15.8
Actual assembled weight	N/A	8	7
DELTA	N/A	0	7.20

Signature:

Date: 6-15-0)

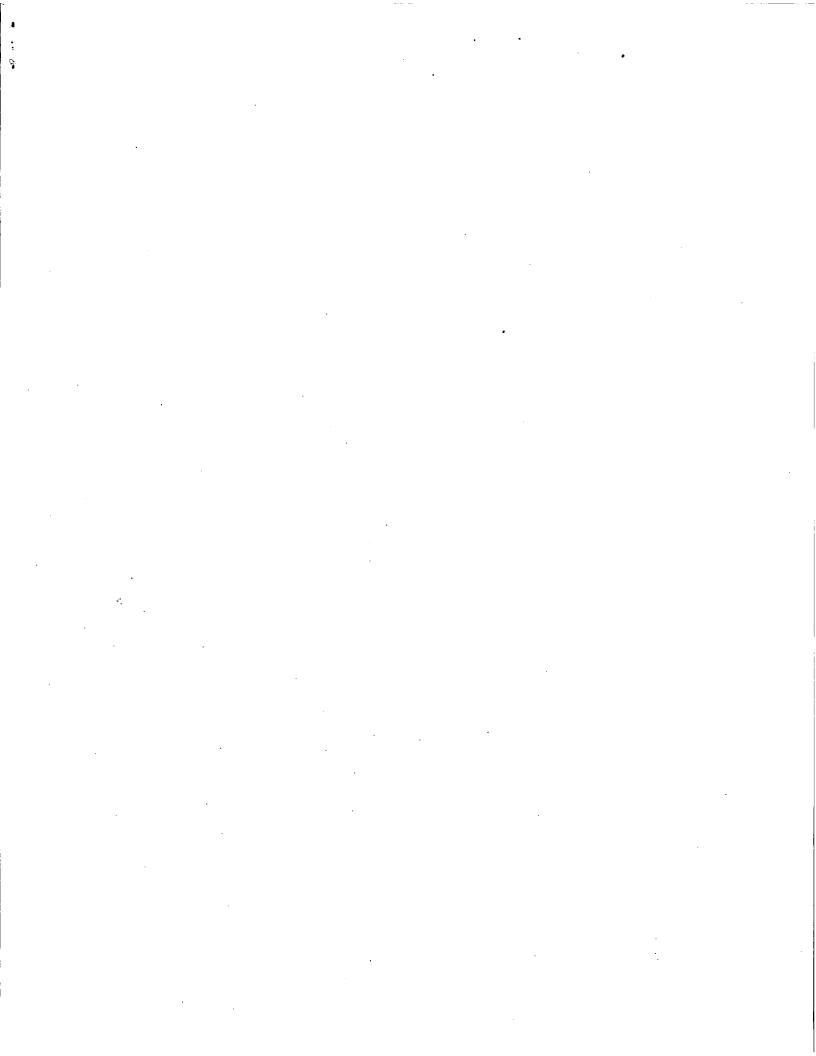
Co	nformity Inspection Record	1. Project Number, TIA	/Request Date	2:				2. Sheet 1	of 3 Sheets	
3. Applican		stems Inc. 10901 Roose St. Petersburg, FL 337		4. Beginning Date:		5. Ending Date: 6/15/07				
6. Model:	CyberBug P/N 102-000B Seri	al Number 253	7. Inspected	By: Larry B	Adams & Gre	gory J Gauli	n - Orland	o MIDO		
8. Item No.	9. Nomenclature of Item Inspected	10. Drawing, Document, Specetc.	ification,	11. Revision and Date	12, No. of Items SAT.	Determined UNSAT.	13. Commen	ts	,	
	DOCUMENTATION									
1	Application for Airworthiness Certificate	FAA Form 8130-6 (A sec 3) (A&P Mech. se			1			d: 6/13/07 Ex	perimental, R&l Survey.	D,
2	Eligibility Statement (for Amateur built)	FAA Form 8130-12			N/A		UAS, Uni	manned Aircra	ft System	
3	Aircraft Registration (IAW Part 47)	AC Form 8050-3			1 .			reviewed appl on form 8050-1		
4	De-registration from exporting country				N/A					
5	Type Certificate from exporting country, FAR 21.29				N/A					
6 -	Applicant's Program Letter, FAR 21.193 - 8130.2 par 122.c				1		Reviewed N253CB		r dated 6/15/07	for
·7	Weight & Balance Report				1		Dated 6/1	5/07 -		
. 8	Flight Test Plan				1			plan included	in program lette	er
9	Flight Manual, (English)	Bug B Operation Man		Release C Dated 6/12/07	1		i .		l on aircraft on (see item 36)	-
10	Maintenance Manual, (English)				1		Initial relea		Linda Nevin, Tan	npa
11	Aircraft Logbook				1		Acceptabl	le		
12	Operating Limitations				1				n 6/15/07 by AI d by Applicant/	R
								n 6/15/07.		
						,	-		-	
	INSPECTION								<u> </u>	
14	Wings: (Rotors) Inspect for cracks, scratches, pressure marks (gelcoat finish)				. 1			nposite stitche	d with nylon bon wound pole	s.
. 15	Fuselage: Inspect surface, wing attachment points				1			e construction,	free of and crac	
16	Horizontal Tail: Inspect surface finish, attachment point & flight control linkage				1				s to flight contro	1

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Co	onformity Inspection Record	1. Project Number, TIA/Request Da	ite:			2. Sheet 2 of 3 Sheets
3. Applican		Systems Inc. 10901 Roosevelt 0D St. Petersburg, FL 33716	t 4. Beginning Date:	6/14/07		5. Ending Date: 6/15/07
6. Model:	CyberBug P/N 102-000B Seria		towns	Adams & Grego	ory J Gardii	in - Orlando MIDO
8. Item No.	9. Nomenclature of Item Inspected	10. Drawing, Document, Specification, etc.	11. Revision and Date	12. No. of Items Det		13d Comments
	INSPECTION (continued)					
17	Vertical Tail: Inspect vert. stabilizer surface finish, ventilation & ballast drain			1		Mylar hinge connections appear free of any visible defects.
18	Rudder, Flaps, Ailerons, Spoilers, Elevator, Elevons, Trim Tabs	Flight control surfaces, cables & locking pins, airbrake structure for wear & cracks		1		Actuated movement of flight control surfaces, movement and all connections
19	Aerodynamic Control Systems: for proper travel, trim locking device and binding			1		Viewed flight controls for 30 degree deflection as controlled by UAS autopilot.
20	Cockpit: structure, control levers, valve controls, instruments	CK for placement, clear marking, easy access & operation		N/A		Unmanned aircraft
21	Canopy /Wind Screen / Windows: for scratches, cracks, obstructions			. N/A		
22	Seat(s), Lap Belt(s), Shoulder Harness(es)			N/A		
23	Display of Marking IAW 45.23 (Experimental 2 inch, cockpit)	Registration / Tail # N253CB		1		Marking approved by letter from F. Paskiewicz AIR 200 manager
. 24	Instrumentation , Flight: inspect to flight manual			1		Current instrumentation configuration matches flight manual.
. 25	Engine/Propeller Installation & associated instrumentation	Ck for operation to manufacturing instructions		1		Battery powered motor with centrifugal force fold out plastic propeller blades.
26	Fuel System / FQI System			N/A		Battery powered.
27	Landing Gear / Brakes / Tires			1		Nose and tail skid surfaces
28	Battery / Electrical System: Ops check			1		Electrical system table checked with external battery.
29	ELT (if required) 91.207			N/A		
30	Aircraft / Engine Data Plates: IAW Flight Manual / 8130.2 / 45.11 & .13			1		Plate contained company name, model number and serial number, mounted on bottom of aircraft.
31	Water Ballast (if Glider)	,		. N/A		
32	Tow Hook & Release (if Glider)	, , , , , , , , , , , , , , , , , , , ,		N/A		
33	Radio / Avionics Installation: IAW Flight Manual			1		Radio controlled with GPS and autopilot controls
34	Marking & Placards FAR 91.9 & 21.182			1		Marked with "Experimental" in accordance with requirements and AFR200 approval.

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Co	nformity Inspection Record	1. Project Number, 11A/	Request Date:					2. Sneet 3 of 3 Sneets
3. Applican		Systems Inc. 10901 Ro D St. Petersburg, FL		4. Beginning Date:	6/14/07		5. Ending Date:	6/15/07
6. Model:	CyberBug P/N 102-000B Seria	al Number 253	7. Inspected	Zain.	Adams & Gre	In.	. 1 Seul	Á
8. Item No.	9. Nomenclature of Item Inspected	10. Drawing, Document, Specietc.	fication,	11. Revision and Date	12, No. of Items SAT.	Determined UNSATE	13. Comments	
35	Modifications inspected, recorded – Safe condition				N/A			
36	Discrepancies				1		AIR200 tear	list provided to applicant by m, items to be resolved within the
							120 day airv	worthiness certification limits.
	CERTIFICATION				·			
36	Certificated Mechanic Entry				N/A		•	
•								
37	Overall workmanship for this Aircraft was	POOR			1			scription: UAS Aircraft, 3, owned and operated by Cyber
		EXCELLENT X	_				Defense Sys	stems Inc.
38	Acknowledgement of operating limitations				1			by: James Alman, Vice Engineering/Pilot, acknowleded
							6/15/07	
39	FAA Aircraft Logbook Entry	•		·.	1			, " I find that the aircraft meets the for the certificate requested and
							have issued a dated 6/15/07	Special Airworthiness Certificate The next inspection is due 6/14/08
					-		Signed: Larry	B Adams
40	FAA Airworthiness Certificate 8130.7 (2 tickets w/ carbon paper)	Original for the Aircraft, cop AFS-750 (Xerox for file / FS			1		Issued 8130-7 Dated: .6/15/6	with operating limitations 07





U.S. Department of Transportation

Federal Aviation Administration

June 7, 2007

Mr. James D. Alman Cyber Defense Systems, Inc. 10901 Roosevelt Blvd Suite 100D St. Petersburg, Florida 33716

Dear Mr. Alman:

Thank you for your letter dated June 6, 2007, requesting approval for a different marking procedure for Cyber Defense's unmanned aircraft system. Title 14 Code of Federal Regulations § 45.22(d) permits persons to apply to the Administrator for a different marking procedure if it is impossible to mark an aircraft in accordance with §§ 45.21 and 45.23 through 45.33.

The marking information depicted in the photograph you provided with your letter has been reviewed. You are hereby authorized to identify the CyberBug aircraft with the following markings:

 Nationality and Registration markings that are 2 inches tall and displayed horizontally when the aircraft is in its normal flight attitude; the word "EXPERIMENTAL" in letters ¼ inches tall.

This marking procedure applies to all CyberBug aircraft of the same configuration for which future certification may be requested.

The following must be kept with the airworthiness certificate for each CyberBug aircraft:

- A copy of your original request letter dated June 6, 2007.
- A copy of the model-specific picture that was submitted with that letter, showing the size and location of the Nationality and Registration markings, and
- A copy of this response letter.

If there are any questions, please contact Mr. Richard Posey at telephone 202-267-9538.

Sincerely,

Frank P. Paskievicz

Manager, Production and Airworthiness

Division, AIR-200



June 6, 2007

Mr. Frank Paskiewicz
Manager: Production and Airworthiness Division
Federal Aviation Administration
800 Independence Ave SW
Washington, DC 20591

Dear Mr. Paskiewicz

Cyber Defense Systems recently applied for a registration number for the CyberBug UAS. The Nirumber that has been reserved is N253CB. Due to the size of the aircraft, it would be very difficult if not impossible to comply with all of the requirements in CFF Part 45. I have attached a picture of the requested alternative configuration for an Ninumber and the required "Experimental" lettering, which will be placed on both sides of the fuselage with your approval.

45.22(d) states. If due to the configuration of an aircraft, it is impossible for a person to mark it in accordance with §§45.21 and 45.23 through 45.33, he may apply to the Administrator for a different marking procedure.

Please let me know if this configuration is acceptable. We are scheduled to have FAA personnel at our facility on 14 June and 15 June. If possible, I would like to have the N number applied prior to their arrival. Thank you in advance for you consideration of this matter.

Sincerely

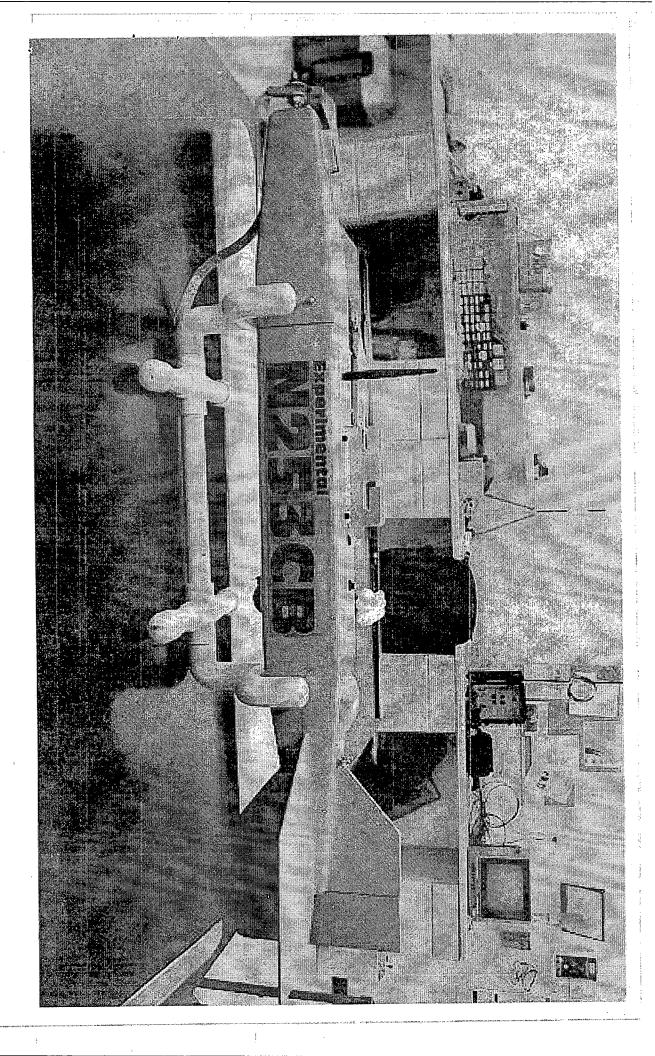
James D. Alman

Cyber Defense Systems, Inc.

727-577-0878

iim@cduav.com

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Experimental is in 3/4 inch lettering N253CB is in two inch lettering

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