


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

A	CATEGORY/DESIGNATION Experimental	
	PURPOSE Operate Amateur-Built Aircraft	
B	MANU-FACTURER	NAME N/A
		ADDRESS N/A
C	FLIGHT	FROM N/A
		TO N/A
D	N- 32PT	SERIAL NO. 04081876
	BUILDER Patton, Walter S.	MODEL Rans S-6ES Coyote
E	DATE OF ISSUANCE April 6, 2009	EXPIRY Unlimited
	OPERATING LIMITATIONS DATED 04/06/09	ARE PART OF THIS CERTIFICATE
	SIGNATURE OF FAA REPRESENTATIVE  Edmund J. DeSantis	DESIGNATION OR OFFICE NO. DARF601891NM

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).



Transport Airplane Directorate
Phoenix Manufacturing Inspection District Office
13951 N. Scottsdale Rd., Suite 123
Scottsdale, Arizona 85254-3453
(602) 640-2101, Fax: (602) 640-2113

EXPERIMENTAL OPERATING LIMITATIONS
Operating Amateur-built Aircraft

Make: Patton, Walter P.
Model: Rans S-6ES Coyote
Serial Number: 04081876
Registration Number: N32PT

THESE OPERATING LIMITATIONS MUST BE ACCESSIBLE TO THE PILOT

PHASE 1, FLIGHT TEST IN RESTRICTED AREA

This aircraft must be operated in accordance with the following limitations:

1. No person may operate this aircraft for other than the purpose of meeting the requirements of § 91.319 (b) during phase 1 flight testing, and for recreation and education after meeting these requirements as stated in the program letter dated 24 March 2009 for this aircraft. (Attachment #1). In addition, this aircraft 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). These operating limitations are a part of Form 8130-7, and are to be carried in the aircraft at all times and be available to the pilot in command of the aircraft.
2. During phase 1 flight testing to meet the requirements of § 91.319(b), all flights must be conducted within the geographical area described as follows:

A 20 Nautical mile radius around Benson Airport (E95), Benson, AZ.
Remain clear of Tucson International Airport and Davis Monthan AFB traffic areas.
3. This aircraft must be operated for at least 40 hours in the assigned geographic areas.

4. All flight tests, at a minimum, must be conducted under VFR, day only. Guidance concerning the scope and detail of test flights can be found in AC 90-89. Following satisfactory completion of the required number of flight hours in the flight test area, the 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 similarly worded, statement: **“ I certify that the prescribed flight test hours have been completed and the aircraft is controllable 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 V_{so} _____, V_x _____, and V_y _____ and the weight _____ and CG location _____ at which they were obtained.”**
5. Except for takeoffs and landings, this aircraft may not be operated over densely populated areas or in congested airways.
6. This aircraft is prohibited from operating in congested airways or over densely populated areas unless directed by air traffic control, or unless sufficient altitude is maintained to effect a safe emergency landing in the event of a power unit failure, without hazard to persons or property on the ground.
7. This aircraft is to be operated under VFR, days only.
8. After completion of phase I flight testing, unless appropriately equipped for night and/or instrument flight in accordance with § 91.205, this aircraft is to be operated under VFR, day only.
9. Aircraft instruments and equipment installed and used under § 91.205 must be inspected and maintained in accordance with the requirements of part 91. Any maintenance or inspection of this equipment must be recorded in the aircraft maintenance records.
10. During the flight testing phase, no person may be carried in this aircraft during flight unless that person is essential to the purpose of the flight.
11. No person may operate this aircraft for carrying persons or property for compensation or hire.

12. The pilot in command of this aircraft must advise each passenger of the experimental nature of this aircraft, and explain that it does not meet the certification requirements of a standard certificated aircraft.
13. This aircraft must contain the placards, markings, etc., required by § 91.9. In addition, the placards and markings must be inspected for legibility and clarity, and the associated systems inspected for easy access and operation, to ensure they function as intended by the builder /owner during each condition inspection.
14. This aircraft must display the word “EXPERIMENTAL” in accordance with § 45.23(b).
15. This aircraft is prohibited from aerobatic flight, that is, an intentional maneuver involving an abrupt change in the aircraft’s attitude, an abnormal attitude, or abnormal acceleration not necessary for normal flight.
16. The pilot in command of this aircraft must hold a pilot certificate or an authorized instructor’s logbook endorsement. The pilot in command also must meet the requirements of § 61.31(e), (f), (g), (h), (i), and (j), as appropriate.
17. After incorporating a major change as described in § 21.93, the aircraft owner is required to reestablish compliance with § 91.319(b) **and notify the geographically responsible FSDO of the location of the proposed test area. The aircraft owner must obtain concurrence from the FSDO as to the suitability of the proposed test area.** If the major change includes installing a different type of engine (reciprocating to turbine) or a change of a fixed-pitch from or to a controllable propeller, the aircraft owner must fill out a revised Form 8130-6 to update the aircraft’s file in the FAA Aircraft Registry. All operations must be conducted under day VFR conditions in a sparsely populated area. The aircraft must remain in the flight test area for a minimum of 5 hours. The FSDO might require additional time depending on the extent of the modification. Persons nonessential to the flight must not be carried. The owner must make a detailed logbook entry describing the change before the test flight. Following satisfactory completion of the required number of flight hours in the flight test area, the 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 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 characteristics or design features, and is safe for operation. The following aircraft operating data has been demonstrated during the flight testing: speeds V_{so} _____, V_x _____, and V_y _____, and the weight and CG location _____ at which they were obtained.”

18. This aircraft must not be used for glider towing, banner towing or intentional parachute jumping.
19. This 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. The owner/operator of this aircraft must obtain written permission from another CAA prior to operating this aircraft in or over that country. That written permission must be carried aboard the aircraft together with the U.S. airworthiness certificate and, upon request, be made available to an ASI or the CAA in the country of operation.
20. No person may operate this aircraft unless within the preceding 12 calendar months it has had a condition inspection performed in accordance with the scope and detail of appendix D to part 43, or other FAA-approved programs, and found to be in a condition for safe operation. As part of the condition inspection, cockpit instruments must be appropriately marked and needed placards installed in accordance with §91.9. In addition, system essential controls must be in good condition, securely mounted, clearly marked, and provide for ease of operation. This inspection will be recorded in the aircraft maintenance records.
21. Condition inspections must be recorded in the aircraft maintenance records showing the following, or a similarly worded, statement: **“I certify that this aircraft has been inspected on (insert date) in accordance with the scope and detail of appendix D to part 43, and found to be in a condition for safe operation.”** The entry will include the aircraft’s total time-in-service, and the name, signature, certificate number and type of certificate held by the person performing the inspection.
22. An experimental aircraft builder certificated as a repairman for this aircraft under § 65.104 or an appropriately rated FAA-certificated mechanic may perform the condition inspection required by these operating limitations.

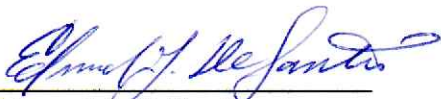
23. Application must be made to the geographically responsible FSDO or MIDO for any revisions to these operating limitations.
24. The pilot in command of this aircraft must notify air traffic control of the experimental nature of this aircraft when operating into or out of airports with an operational control tower. When filing instrument flight rules (IFR), the experimental nature of this aircraft must be listed in the remarks section of the flight plan.

THE FOLLOWING PHASE II OPERATING LIMITATIONS APPLY WHEN OPERATING OUTSIDE THE FLIGHT TEST AREA AFTER COMPLETING THE ENTRY STATED IN LIMITATION NUMBER 4:

25. Limitations 1, 6, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 24 from phase I still apply.

Attachment #1, Applicants Program Letter dated 24 March 2009.

Attachment #2, Graphic representation of phase 1 test area, Benson Airport.



Edmund J. DeSantis

Designated Airworthiness Representative

DARF601891NM

These limitations issued 6 April 2009 in Glendale, Arizona.

Amateur-built Program Letter to accompany Application for Special Airworthiness Certificate.
Page 1 of 2

To: Cindy Napolitano - ASI
VNY-MIDD

Date: 3/24/09

CC: Ted De Santis - DAR

In accordance with section 21.193, I request a Special Airworthiness Certificate for my aircraft for the purpose of Operating Amateur-built aircraft. The aircraft description is as follows;

Builder: WALTERS PATTON Registration Number: N 32PT
Model: S-6ES Covered Serial Number: 04081876
Number of Engines: 1 Number of seats: 2
Design criteria: My own design , Built from plans , Built from kit X.

The aircraft is complete and the following items have been accomplished:

- No I enclose FAA Form 8130-6 with Sections I, II & III completed.
- No I enclose FAA Form 8130-12 with Sections I, II and III completed, and notarized in Section IV.
- No I enclose AC Form 8050-3.
- No I enclose 3 view drawings or photographs of the aircraft.
- No I have weighed the aircraft to determine that the most forward and most aft center of gravity locations are within established limits. The Weight and Balance report is available at the aircraft and a copy is submitted with this request.
- No I have maintained a construction log for this project, including photographs showing methods of construction and workmanship. Log entries describe all inspections conducted during construction.
- No The marking requirements of Part 45 have been complied with, including permanent attachment of a fireproof identification plate, appropriate registration marking, and the word "EXPERIMENTAL" displayed near each entrance to the cabin or cockpit.
- No The following placard is displayed in the cockpit in full view of all occupants. (Not required for single place aircraft).

Amateur-built Program Letter Page 2 of 2

The aircraft will be available for inspection at this location (and directions are as follows, if required).

Glendale Airport, Hanger 21

I request airworthiness certification and operating limitations be issued permitting me to operate the aircraft within the following geographical area for flight testing (attachments as required).

test area 1 is a triangle with Glendale as the Apex, Casa Grande airport will be the East Base and Gila Bend the west base, Area 2 will be within a 20nm radius of Benson Airport
Test Area #1 attachments enclosed

Initial flights will determine engine reliability and flight control characteristics. A flight test plan has been developed using guidance in AC 90-89 and is available for review.

After Phase 1 flight test completion, I plan to operate the aircraft under VFR , IFR _____ conditions.

This aircraft is capable of aerobatic flight. Circle Yes / No.

My best daytime phone number is: 520-548-8581

E-mail pwalter4@MSN.COM

Alternate/Cell # _____


Signature of owner/builder



CTC TUCSON APP WITHIN
20 NM ON 119.4 318.1

CTC TUCSON APP WITHIN
20 NM ON 125.1 269.55

Attachment #2 to Operating
Limitations for Patton,
S-6ES, N32PT, dated 4/6/09.

Phase 1 test area, Benson
Airport(E95).

CONTIGUOUS U.S. 110°

Airplane Weight and Balance N32PT

Builder: Walter Patton	Date: 2-13-09 <i>Walter Patton</i>
Model: Rans S-6S Coyote II	Registration: N32PT
Gross Weight: 1250 lbs.	Serial # 04081876
CG Range: 62.5 - 73.0 inches	
Datum: Back side of propeller flange	Aircraft empty weight with required engine oil & radiator coolant. No fuel

EMPTY WEIGHT & CG	WEIGHT (lbs.)	ARM (in.)	MOMENT (in.-lbs.)
Left wheel	234.5	78	18,291.0
Right wheel	231.0	78	18,018.0
Nose wheel	256.0	27	6,912.0
Baggage			
Totals Aircraft empty weight	721.5		43,221.0
Empty CG = 59.90			

Most aft weight & CG	WEIGHT (lbs.)	ARM (in.)	MOMENT (in.-lbs.)
Left wheel	234.5	78	18,291.0
Right wheel	231.0	78	18,018.0
Nose wheel	256.0	27	6,912.0
Pilot (left seat)	170.0	72	12,240.0
Co-pilot (right seat)	170.0	72	12,240.0
Fuel (18 gal.)	108.0	72	7,776.0
Baggage	35.0	90	3,150.0
Totals	1,204.5		78,627.0
CG = 65.28			

Most forward weight & CG	WEIGHT (lbs.)	ARM (in.)	MOMENT (in.-lbs.)
Left wheel	234.5	78	18,291.0
Right wheel	231.0	78	18,018.0
Nose wheel	256.0	27	6,912.0
Pilot (left seat)	170.0	72	12,240.0
Co-pilot (right seat)		72	
Fuel (7.08 gal.) HP/12X6	42.5	72	3,060.0
Baggage		90	
Totals	934.0		58,521.0
CG = 62.66			

Flight test weight & CG	WEIGHT (lbs.)	ARM (in.)	MOMENT (in.-lbs.)
Aircraft empty weight	721.5		43,221.0
Pilot (left set)	170.0	72	12,240.0
Fuel (15 gal.)	90.0	72	6,480.0
Totals	981.5		61,941.0
CG = 63.11			

OBSERVATIONS DURING PHASE 1 FLIGHT TESTING OF N32PT

- #1. With enough right rudder to maintain the ball in the center on takeoff, left stick must be held to keep the aircraft level and tracking straight.
- #2. Turns must be lead with rudder and stick used to coordinate the turns.
- #3. Flap retraction and application results in minimal trim change. Application of flaps does result in a lower nose position for better vision over the nose in the landing task.
- #4. The directly coupled nose wheel is a large lateral area ahead of the aircraft CG and can cause a destabilizing effect when trying to attain turn coordination.
- #5. Left turns to 30* produce no noticeable pull to maintain altitude (low maneuvering stability). Right turns require left stick to keep the bank angle from increasing in a steady turn. This indicates a lack of spiral stability.
- #6. Laterally (ailerons) and Longitudinally (elevator) the stick will not center on its own. Control system friction?
- #7. Longitudinal trim has a null of seven full rotations of the trim wheel from nose up to nose down.
- #8. No noticeable speed stability. With the aircraft trimmed for 100 MPH, varying the airspeed between 115 MPH and 70 MPH produced no noticeable longitudinal stick force changes.
- #9. Cruise flight requires slight right rudder to track a straight course. It then requires light left stick to level the wings. The tendency to roll off, a lack of speed stability, and the null of the trim wheel makes pilot workload much higher than necessary in all phases of flight.
- #10. The stick and rudder in all direction of movement require very little input to move the aircraft about all axis of rotation. This makes the aircraft very easy to over control. This will make the early stages of pilot training difficult. The flight instructor will have to be very vigilant to ensure a safe learning environment.

PERFORMANCE – SPECIFICATIONS SUMMARY AS TESTED

Rans E-6ES Coyote II

GROSS WEIGHT	1250 lbs
SPEED	
Top Speed at 6500 ft	120 mph
Cruise Speed at 6500 ft	115 mph
RANGE	
Cruise 75% Power at 6500 ft	440 mi
18 gallons, no reserve	4.0 hrs
RATE OF CLIMB AT 3800 ft	600 fpm
SERVICE CEILING **	10,000 ft
TAKE OFF	
Ground roll at sea level*	220 ft
LANDING	
Landing roll at sea level*	260 ft
EMPTY WEIGHT	721.5 lbs
BAGGAGE	50 lbs
WING LOADING	
Pounds/Sq Foot	9.08
POWER LOADING	
Pounds/HP	10.2
FUEL CAPACITY	18 gals
OIL CAPACITY	6 qts
PROPELLER	
Fixed Pitch (Diameter) Wood	66-72 in. Sensenich
ENGINE: Jabiru Engine	3300A
107 rated HP at 2750 RPM	

*Manufacturers Rating

** Sport Pilot Limitation

GROSS WEIGHT AT TESTING HOURS 25.1 THROUGH 29.1

	<u>Weight</u>	<u>Arm (in)</u>	<u>Moment (in lbs)</u>
Aircraft Empty Weight	721.5		43221.0
Pilot Left Seat	250	72	18000.0
Co-Pilot Right Seat	180	72	12960.0
Fuel (max 18 Gals)	108	72	7776.0
Baggage	10	90	900.0
Total Weight	1269.0	Total Moment	82857.0

$$\begin{array}{r} \text{Total Moment} \quad 82857.0 = \\ \text{Total Weight} \quad 1269.0 = \end{array} \quad \mathbf{65.26}$$

Most Aft CG = 65.28

Most Forward CG = 62.66

CG envelope is 2.62 inches

CG AS TESTED JUST INSIDE THE MOST REAR OF THE ENVELOPE = OK