Amateur-Built Fabrication and Assembly Checklist (2011)
(Helicopter)

Name(s): Vertical Aviation Technologies, Inc.

Address: 1609 Hangar Road, Sanford Florida 32773

Aircraft Model: Hummingbird 300L Quickbuild

Date: January 26, 2024

Remarks: Desk Audit Evaluation completed by Arlan Euler NKET Team Lead in San Antonio Texas, January 26, 2024.

NOTE: This checklist is only applicable to Helicopter aircraft. Evaluation of other types of aircraft (i.e., Fixed Wing, Gyroplane, Balloons, Lighter than air) will not be accomplished with this form.

NOTE: This checklist is invalid for and will not be used to evaluate an altered or modified type certificated aircraft with the intent to issue an Experimental Amateur-built Airworthiness Certificate. Such action violates FAA policy and DOES NOT meet the intent of § 21.191(g).

INSTRUCTIONS FOR USING THE AMATEUR-BUILT AIRCRAFT FABRICATION AND ASSEMBLY CHECKLIST (2011):

A point (each task equals 1 point) can be divided over multiple categories (Manufacturer, Commercial Assistance, Amateur Builder Assembly and Amateur Builder Fabrication) into 1/10 fractions. A Manufacturer may be a kit manufacturer, a component manufacturer or a part(s) manufacturer. Commercial assistance (for hire or compensation) may include assistance provided by kit manufacturers, commercial assistance centers, individuals (e.g. A& P mechanics or avionics technicians).

For example, 0.5 (half point) can be assigned to the Manufacturer, 0.3 (3/10 - 3 tenths) as Commercial Assistance, 0.2 to the Amateur Builder as Fabrication, for a total of 1 point.

Enter "N/A" in any box where a listed task is not applicable to the particular aircraft being evaluated. Use the "Add item" boxes at the end of each section to add applicable unlisted tasks and award credit

FABRICATION AND ASSEMBLY TASKS			A	B	C	D
			Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
Task		**Fuselage – 20 Listed Tasks**				
F1	1	Fabricate Longitudinal/Tubing Structural Members	1			0.0
F2	1	Fabricate Airframe Composite Cores or Shells	1			0.0
F3	1	Fabricate Bulkheads, Formers or Cross Members	1			0.0
F4	1	Assemble Components from F1, F2 or F3 to form Fuselage Primary Structure	1		0.0	
F5	1	Fabricate All Fuselage Brackets, Pulleys and Fittings	0.3			0.7
F6	1	Assemble Brackets, Pulleys and Fittings to Fuselage Structure			1.0	
F7		Assemble Any Structural Components not included in F1, F2 or F3 to Fuselage (Likely N/A)	N/A			
F8	1	Fabricate All Fuselage Cables, Wires, and Lines (Includes but not limited to Pitot Static and Fuel Lines)	0.2			0.8

FABRICATION AND ASSEMBLY TASKS			A	B	C	D
			Mfr Kit/Part/	Commercial	Am-Builder	Am-Builder
			Component	Assistance	Assembly	Fabrication
F9	1	Assemble Cables, Wires, and Lines to Fuselage Structure			1.0	
F10	1	Fabricate Fuel Tanks	0.5			0.5
F11	1	Assemble Fuel Tanks to Fuselage			1.0	
F12	1	Assemble Fuel System Components (Valves, Pumps, Vents) to Fuselage			1.0	
F13	1	Fabricate Fuselage Covering or Skin	1			0.0
F14	1	Assemble Covering or Skin to Fuselage Structure	1		0.0	
F15	1	Fabricate Windshield/Windscreen	1			0.0
F16	1	Assemble Windshield/Windscreen to Fuselage	1		0.0	
F17	1	Fabricate Windows	1			0.0
F18	1	Assemble Windows to Fuselage Structure	1		0.0	
F19	1	Fabricate Doors, Canopy Components	1			0.0
F20	1	Assemble Doors/Canopy to Fuselage	1		0.0	
F21		Add Fab item:				
F22		Add Assy item:				
F23		Add Fab item:				
F24		Add Assy item:				
Total # of Fuselage Tasks		**Fuselage Subtotal**	Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
19		**Fulselage Total Points** ►	13.0	0.0	4.0	2.0

Fuselage Comments:

FABRICATION AND ASSEMBLY TASKS			A	B	C	D
			Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
Task		**Main Rotor Drive System and Control Mechanism – 9 Listed Tasks**				
MR1	1	Assemble Main Rotor Drive Train to Next Level Structure			1.0	
MR2	1	Assemble Main Rotor Shaft/Mast to Next Level Structure			1.0	
MR3	1	Assemble Main Rotor Hub Assy to Next Level Structure			1.0	
MR4	1	Fabricate Main Rotor Rotating Controls	1			0.0
MR5	1	Assemble Main Rotor Rotating Controls to Next Level Structure			1.0	
MR6	1	Fabricate Main Rotor Non-Rotating Controls	1			0.0
MR7	1	Assemble Main Rotor Non-Rotating Controls to Next Level Structure			1.0	
MR8	1	Assemble Rotor Blades to Rotor Hub			1.0	
MR9	1	Perform all Main Rotor System Static and Dynamic Track and Balance Requirements (Treat as Assembly Function)			1.0	
MR10		Add Fab item:				
MR11		Add Assy item:				
MR12		Add Fab item:				
MR13		Add Assy item:				
Total # of Main Rotor Tasks		**Main Rotor Subtotal**	Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
9		**Main Rotor Total Points ►**	2	0	7	0

RotorWing Comments:

FABRICATION AND ASSEMBLY TASKS			A	B	C	D
			Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
Task		**Tail Boom & Tail Rotor Drive System and Control Mechanism – 16 Listed Tasks**				
T1	1	Fabricate Tail Boom or Frame Structural Components	0.8			0.2
T2	1	Assemble Tail Boom or Frame Structural Components to Form Primary Tail Structure	0.7		0.3	
T3	1	Fabricate Tail Boom Skin or Covering	1			0.0
T4	1	Assemble Skin or Covering to Tail Boom Structure	1		0.0	
T5	1	Assemble Tail Boom or Frame to Fuselage Structure	0.2		0.8	
T6	1	Fabricate All Stabilizer(s) Components (Includes Structural Components and Skin)	0.2			0.8
T7	1	Assemble All Stabilizer(s) Components in Task T6 to Form Stabilizer Structures			1.0	
T8	1	Assemble All Stabilizer(s) to Next Level Structure			1.0	
T9	1	Assemble Tail Rotor Drive Train to Next Level Structure			1.0	
T10	1	Assemble Tail Rotor Shaft and Hub Assy to Next Level Structure			1.0	
T11	1	Assemble Tail Rotor Blades to Next Level Structure			1.0	
T12	1	Fabricate Tail Rotor Rotating Controls	1			0.0
T13	1	Assemble Tail Rotor Rotating Controls to Next Level Structure.			1.0	
T14	1	Fabricate Tail Rotor Non-Rotating Controls	1			0.0
T15	1	Assemble Tail Rotor Non-Rotating Controls to Next Level Structure.			1.0	
T16	1	Perform all Tail Rotor System Static and Dynamic Track and Balance Requirements (Assembly Function)			1.0	
T17		Add Fab item:				
T18		Add Assy item:				
T19		Add Fab item:				
T20		Add Assy item:				
Total # of Tail Group Tasks		**Tail Group Subtotal**	Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
16		**Tail Group Total Points ►**	5.9	0	9.1	1

Tail Group Comments:

FABRICATION AND ASSEMBLY TASKS			A	B	C	D
			Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
Task		**Landing Gear – 6 Listed Tasks**				
LG1	1	Fabricate Struts, Skids, Tubes, Braces or Leg Components	1			0.0
LG2	1	Assemble All Components in LG1	1		0.0	
LG3	1	Fabricate Landing Gear Bracket and Fittings	1			0.0
LG4	1	Assemble Landing Gear Bracket and Fittings to Landing Gear System	1		0.0	
LG5	1	Assemble Wheels and Tires and Brakes to L/G	0.8		0.2	
LG6	1	Assemble Landing Gear System to Next Level Structure	1		0.0	
LG7		Add Fab item:				
LG8		Add Assy item:				
Total # of Land Gear Tasks		**Landing Gear Subtotal**	Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
6		**Landing Gear Total Points ►**	5.8	0	0.2	0

Landing Gear Comments:

FABRICATION AND ASSEMBLY TASKS			A	B	C	D
			Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
Task		**Propulsion – 19 Listed Tasks**				
P1	1	Fabricate Engine Mounts	1			0.0
P2	1	Assemble Engine Mounts to Next Level Structure			1.0	
P3	1	Fabricate Engine Cooling System/Baffles	0.2			0.8
P4	1	Assemble Engine Cooling System Baffles to Engine			1.0	
P5	1	Fabricate Induction System	0.2			0.8
P6	1	Assemble Induction System to Engine			1.0	
P7	1	Fabricate Exhaust System	0.8			0.2
P8	1	Assemble Exhaust System to Engine			1.0	
P9	1	Fabricate Engine Controls	0.2			0.8
P10	1	Assemble Engine Controls to Next Level Structure			1.0	
P11	1	Fabricate All Engine Compartment Brackets and Fittings				1.0
P12	1	Assemble Brackets and Fittings to Next Level Structure			1.0	
P13	1	Fabricate Firewall	0.8			0.2
P14	1	Assemble Firewall to Airframe	1			
P15		Assemble Engine (Likely N/A)				
P16	1	Assemble Engine to Engine Mount			1.0	
P17	1	Fabricate Engine Cowling	0.3			0.7
P18	1	Assemble Engine Cowling to Airframe			1.0	
P19	1	Assemble Engine Fuel System Components to Next Level Structure (Gascolator, Valves etc.)			1.0	
P20		Add Fab item:				
P21		Add Assy item:				
P22		Add Fab item:				
P23		Add Assy item:				
Total # of Propulsion Tasks		**Propulsion Subtotal**	Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
18		**Propulsion Total Points ►**	4.5	0	9	4.5

Propulsion Comments:

FABRICATION AND ASSEMBLY TASKS			A	B	C	D
			Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
Task		**Cockpit and Flight Controls - 20 Listed Tasks**				
C1	1	Fabricate Instrument Panel, Sub Panels, Brackets and Fittings				1.0
C2	1	Assemble Panels, Brackets and Fittings to Next Level Structure			1.0	
C3	1	Fabricate Seats and All Seat Brackets and Fittings	0.2			0.8
C4	1	Assemble Seats, Brackets and Fittings to Next Level Structure			1.0	
C5	1	Fabricate All Seat Belts/Harnesses Brackets and Fittings				1.0
C6	1	Assemble Seat Belts/Harnesses, Brackets and Fittings to Next Level Structure			1.0	
C7	1	Fabricate Electrical System Wiring, Controls and Switches	0.5			0.5
C8	1	Assemble Electrical System Wiring, Controls and Switches to Next Level Structure			1.0	
C9	1	Fabricate Floor/Close-out Panels				1.0
C10	1	Assemble Floor/Close Out Panels to Next Level Structure			1.0	
C11	1	Fabricate Anti-Torque Pedals	0.8			0.2
C12	1	Assemble Anti-Torque Pedals to Next Level Structure			1.0	
C13	1	Fabricate All Flight Control Tubes/Cables	1			0.0
C14	1	Assemble All Flight Control Tubes/Cables to Next Level Structure			1.0	
C15	1	Fabricate Cyclic Control Components	0.8			0.2
C16	1	Assemble Cyclic Control Components to Next Level Structure			1.0	
C17	1	Fabricate Collective Control Components	0.8			0.2
C18	1	Assemble Collective Control Components to Next Level Structure			1.0	
C19	1	Fabricate Rotor Brake Components	0.8			0.2
C20	1	Assemble Rotor Brake System to Next Level Structure			1.0	
C21		Add Fab item:				
C22		Add Assy item:				
C23		Add Fab item:				
C24		Add Assy item:				
Total # of Cockpit Tasks		**Cockpit & Flight Controls Subtotal**	Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
20		**Cockpit & Flight Controls Total Points ►**	4.9	0	10	5.1

Cockpit Comments:

Total # of Aircraft Tasks	
88	**◄ SUM #1**

▶ TOTAL TASKS AND LINE ITEMS ↓ ↓ ↓ ↓

FABRICATION AND ASSEMBLY SUMMARY	**A**	**B**	**C**	**D**
	Mfr Kit/Part/ Component	Commercial Assistance	Am Builder Assembly	Am Builder Fabrication
1. Total Number Of Aircraft Tasks (Note 1)	**(SUM #1) ►**		**88**	
2. Total Points for Each Category. (Note 2)	**36.1**	**0.0**	**39.3**	**12.6**
3. Total Points for Complete Aircraft Construction (SUM # 2 should equal SUM # 1 above). (Note 3)	**(SUM #2) ►**		**88.0**	
4. Percentage of Each Category as Part of Total Aircraft Construction. (Note 4)	**41.02%**	**0.00%**	**44.66%**	**14.32%**
5. Total Percentages for Complete Aircraft Construction (Add all percentages in row 4) Total should equal 100% (± . 5%). (Note 5)		**100.0%**		
6. Total Builder Points – Add points in row 2, column C and D only, together. (Note 6)			**51.9**	
7. Total Builder Percentage- Add percentages in row 4, columns C and D only, together. (Note 7)			**58.98%**	

NOTES: Instructions For Completing Fabrication and Assembly Checklist Summary

1. TOTAL NUMBER OF AIRCRAFT TASKS (Sum #1): To find the total points awarded for all tasks, add together the six individual "Total # of Tasks" blocks located at the bottom left of each aircraft tasks section.

2: TOTAL POINTS FOR EACH CATEGORY: [Columns A, B, C and D]. Each columns' total points are tallied by adding the sum of the points awarded in each respective column for each of the tasks in the section (i.e. Fuselage/Airframe, Wings, Empennage, Landing Gear, Propulsion, Main and Tail Rotor and Cockpit). Include points assigned to 'Additional Items' at the end of each section. Boxes with a N/A (not applicable) or an asterisk, have zero points.

3: Total POINTS FOR COMPLETE AIRCRAFT CONSTRUCTION: (SUM#2) In row 3 of the Summary section, add together the numbers in each block in row 2, tallied from each of the four column category totals, (Columns A+B+C+D). Compare SUM #1 to SUM #2. SUM #1 should be equal to SUM #2, (Verify the two sums are equal within a deviation of ± 0.5). Total points will vary from aircraft to aircraft depending on number of add items and N/As (Not Applicable) applied. (e.g., 133 listed task points, plus 5 Add items, minus 22 N/As = 116 tasks).

4: PERCENTAGE OF EACH CATEGORY AS PART OF TOTAL AIRCRAFT CONSTRUCTION: To compute category percentages, divide the number in each individual block found on row 2 by Sum #2 on row 3. For example if the total points of Mfr Kit/Part/Component category (Column A) = 40 and Sum #2 = 120, then divide 40 by 120 to reach 33.3%. Do this for each invidual block on row 4 for each column. Percentages may be rounded to the nearest tenth, (22.86% is rounded to 22.9%).

5: TOTAL PERCENTAGES FOR COMPLETE AIRCRAFT CONSTRUCTION: Add up the percentages of each of the four categories (Columns A+B+C+D) found on row 4. Total must be equal to 100% with a (±) deviation limited to ½ % (0.5%). Example; a derived percentage between 99.5% and 100.5% is acceptable. If this computation falls outside the accepted deviation then an error has occurred in row 2, 3 or 4.

6: TOTAL BUILDER POINTS: Add together the two point tallies from row 2, Columns C and D blocks only. Total will vary from aircraft to aircraft depending on number of N/As applied.

7. TOTAL BUILDER PERCENTAGE: Add together the two percentage tallies from row 4 Columns C and D blocks only. Total must exceed 50% to be eligible for amateur built status and to meet major portion requirement under 14 CFR, Part 21.191(g) Operating amateur-built aircraft.

EXPLANATIONS AND EXAMPLES

► All Points are added at the end of the form in the Summary section under their respective categories. The point total is comprised of all the credits awarded for primary delineated tasks plus any credits given for 'Additional items.

► "Additional Items" may be assigned points the same as primary listed tasks if work or parts not reflected in the main entries need to be credited.

► The applicants completion of tasks can be documented in a number of ways and may include:

(1) Builder's logs.
(2) Photographs/video/DVD.
(3) Drawings.
(4) Engineering data when necessary.
(5) Relevant documentation (e.g., plans) and references (e.g., handbooks) used.
(6) Documentation concerning any commercial assistance used.
(7) Documentation concerning any non-commercial assistance used.
(8) Part inventories and histories.
(9) Receipts, Catalogs.
(10) Log book entries.

In addition to using this checklist, the builder should document the entire fabrication and assembly process. To issue an airworthiness certificate the FAA must make a major portion determination (the major portion of an aircraft was fabricated and assembled by an amateur builder (s)). Making this finding requires sufficient, credible and adequate documentation.