

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

A4EA
Revision 16
HELIO
HST-550
HST-550A (USAF AU-24A)
August 21, 2015

TYPE CERTIFICATE DATA SHEET NO. A4EA

This data sheet, which is a part of Type Certificate No. A4EA, prescribes conditions and limitations under which the product, for which the type certificate was issued, meets the airworthiness requirements of the Civil Air Regulations/Federal Aviation Regulations.

Type Certificate Holder Helio Aircraft, LLC
(See Note 5 for Holder Record) 38400 N. Schoolhouse Road, #17
Cave Creek, Arizona 85331

I. Model HST-550, Stallion, 10 PCLM (Normal Category), approved August 26, 1965

Engine United Aircraft of Canada, Ltd. PT6A-6A (turboprop)
Fuel JP-1, JP-4, and JP-5 fuels conforming to P&WA Spec. No. 522
Oil (Engine and Gearbox) UACL PT-6 Engine Service Bulletin No. 1 lists approved brand oils

Engine Limits

Static Sea Level Ratings (see NOTE 4 for additional limits)

	Shaft H.P.	Jet Thrust	ESHP	Gas Gen. RPM -%	Propeller Shaft Speed	Max. Perm. Turbine Inlet Temp. °C.	Max. Torque PSIG
Takeoff (2 min.)	550	70	578	38,100-101.5	2,200	994	42.5
Max. continuous	500	62	525	38,100-101.5	2,200	952	38.5
Starting trans. (2 sec.)						1,038	
Max. reverse (1 min.)	500			38,100-101.5	2,000	994	42.5

At low altitude and low ambient temperature, the engines may produce more power at takeoff than the airplane has been certified for. Under these conditions, the placarded torquemeter limitations should not be exceeded.

Oil Temperature Minus 40°F. to 185°F. maximum continuous
Minus 40°F. to 195°F. not to exceed 5 minutes

Propeller and Propeller Hartzell Model HC-B3TN-3/T-10173C
Limits Diameter: 101 in. (2 percent reduction allowable for repairs)
Pitch settings at 30 in. station:
Low 16°
Feathered 78°
Reverse -17°

Airspeed Limits (CAS) Maneuvering V_P 121 m.p.h. (105 knots)
Maximum structural cruising V_{NO} 201 m.p.h. (175 knots)
Never exceed V_{NE} 226 m.p.h. (197 knots)
Flap extended V_{FE} 109 m.p.h. (95 knots)

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I. Model HST-550 (cont'd)

C.G. Range	At gross weight	127.70 in. to 137.80 in.
	At reduced weight	3,298 lb. 123.30 in.
	Straight line variation between points given	
Leveling Means	For leveling the airplane, use the floorboards under the pilot's or co-pilot's seat	
Empty Weight C.G. Range	None	
Maximum Weight	5,100 lbs.	
Minimum Crew	One pilot in the left front seat	
Number of Seats	10 (2 at +103.5 in., 3 at +131 in. (aft-facing), 3 at +171 in., 2 at +209 in.)	
Maximum Baggage	See cargo limits in NOTE 2(c).	
Fuel Capacity	120 gallons (total usable in 2 tip tanks - 51 gallons each) 61 gallons (total usable in 2 auxiliary tanks - 30.5 gallons each) 61 gallons (total usable in 2 main tanks - 30.5 gallons each)	
Oil Capacity	1.5 gallons (total usable in engine integral tank. See NOTE 1(a) for undrainable oil.	
Control surface movements	Wing flaps	Up 0° Down 40°
	Aileron ($\pm 1^\circ$)	Up 20° Down 20°
	Stabilator (trailing edge) ($\pm 1^\circ$)	Up 25° Down 8°, from neutral Neutral is 2.5° (down) from horizontal reference.
	Stabilator (trim tabs ($\pm 2^\circ$))	Measured from horizontal stabilator chordline Tab trailing edge up (+) Tab trailing edge down (-)
	Stabilator neutral	$\pm 19.1^\circ$ pilot's trim indicator full nose down -31.7° pilot's trim indicator full nose up
	Stabilator trailing edge	$+37.9^\circ$ pilot's trim indicator full nose down
	Full up	$+30.4^\circ$ pilot's trim indicator full nose up
	Stabilator trailing edge	$+4^\circ$ pilot's trim indicator full nose down
	Full down	-44.3° pilot's trim indicator full nose up
	Stabilator anti-balance	Same tabs as trim tabs - measured in same manner
	Tabs ($\pm 2^\circ$)	
	Trim indicator neutral	
	Stabilator neutral,	0°
	Stabilator T.E. full up	
	25° from neutral	$+42.9^\circ$
	Stabilator T.E. full	-20°
	down 8° from neutral	
	Flap trim interconnect tab	
	Flaps full down	$+40^\circ +2^\circ, -1^\circ$
	Rudder	Right 25° Left 25°
	Rudder trim tab	Right 25° Left 25° measured from rudder chordline
Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the aircraft for certification.	
	In addition, the following items of equipment are required:	
	(a) Shoulder harnesses as well as seat belts must be installed for first row of seats.	
	(b) FAA Approved Flight Manual, Helio Model HST-550, dated August 26, 1965, revised November 9, 1965.	
Serial Nos. Eligible	1 and up	

II. Model HST-550A (USAF AU-24A), Stallion, 10 PCLM (Normal Category), approved August 1, 1969

Engine United Aircraft of Canada, Ltd. PT6A-27 (turboprop)

Fuel JP-1, JP-4, and JP-5 fuels conforming to P&WA Spec. No. 522

(Engine and gearbox) synthetic type conforming to CPN Spec. 202 as revised.
UACL Engine Service Bulletin No. 1 lists approved brand oils

Engine Limits Static Sea Level Ratings (see NOTE 4 for additional limits)

	Shaft H.P.	Jet Thrust	ESHP	Gas Gen. RPM -%	Propeller Shaft Speed	Max. Perm. Turbine Inlet Temp. °C.	Max. Torque PSIG
Takeoff (2 min.)	680	90	715	38,100-101.5	2,200	725	53
Max. continuous	500	70	528	38,100-101.5	2,200	695	38.5
Starting trans. (2 sec.)						1,090	
Max. reverse (1 min.)	620			38,100-101.5	2,100	725	53

At low altitude and low ambient temperature, the engines may produce more power at takeoff than the airplane has been certified for. Under these conditions, the placarded torquemeter limitations should not be exceeded.

Oil Temperatures Minus 40° F. to 210°F. maximum continuous

Propeller and Propeller Limits Hartzell Model HC-B3TN-3/T-10178CH
Diameter: 101 in. (2 percent reduction allowable for repairs)
Pitch settings at 30 in. station:
Low 14° ± 1°
Feathered 87° ± 1°
Reverse -12° ± 1°

Airspeed Limits (CAS) Maneuvering V_P 124 m.p.h. (108 knots)
Maximum structural cruising V_{NO} 194 m.p.h. (169 knots)
Never exceed V_{NE} 218 m.p.h. (190 knots)
Flap extended V_{FE} 109 m.p.h. (95 knots)

C.G. Range At gross weight 127.70 in. to 137.80 in.
At reduced weight 3,624 lb. 121.90 in.
Straight line variation between points given

Empty Wt. C.G. Range None

Leveling Means For leveling the airplane, use lower surface of wing carry through structure which is 4.5° nose up to W.L. zero

Maximum Weight 5,100 lbs.
Minimum Crew One pilot in the left front seat
No. of Seats 10 (2 at +103.5 in., 3 at +144 in., 3 at +176 in., 2 at +209 in.)

Maximum Baggage See cargo limits in NOTE 2(c).

Fuel capacity 60 gallons (total usable in 2 auxiliary tanks - 29.5 gallons each)
60 gallons (total usable in 2 main tanks - 29.5 gallons each)

Oil capacity 1.5 gallons (total usable in engine integral tank. See NOTE 1(b) for data on system fuel and oil.

II. Model HST-550A (USAF AU-24A) (cont'd)

Control surface movements	Wing flaps	Up 0°	Down 40°
	Aileron ($\pm 1^\circ$)	Up 20°	Down 20°
	Stabilator (trailing edge)	Up 25°	Down 8°, from neutral
		Neutral is 2.5° (down) from horizontal reference	
	Stabilator (trim tabs ($\pm 2^\circ$))	Measured from horizontal stabilator chordline	
		Tab trailing edge up (+)	
		Tab trailing edge down (-)	
	Stabilator neutral	+19.1° pilot's trim indicator full nose down	
		-31.7° pilot's trim indicator full nose up	
	Stabilator trailing edge	+37.9° pilot's trim indicator full nose down	
	Full up	+30.4° pilot's trim indicator full nose up	
	Stabilator trailing edge	+4° pilot's trim indicator full nose down	
	Full down	-44.3° pilot's trim indicator full nose up	
	Stabilator anti-balance	Same tabs as trim tabs - measured in same manner	
	Tabs ($\pm 2^\circ$)		
	Trim indicator neutral		
	Stabilator neutral	0°	
	Stabilator T.E. full up 25° from neutral	+42.9°	
	Stabilator T.E. full down 8° from neutral	-20°	
	Flap down interconnect tab		
	Flaps full down	+40° +0°, -2°	
	Rudder	Right 25° $\pm 2^\circ$	Left 25° $\pm 2^\circ$
	Rudder trim tab	Right 25° $\pm 1^\circ$	Left 10° $\pm 1^\circ$
measured from rudder chordline			

Additional Requirements and Limitations for HST-550A Airplanes for 5,800 lbs. Gross Weight Certification

The airplane must incorporate the modifications listed on Helio Aircraft Limited Drawing 550-000-051.

Airspeed Limits (CAS)	Maneuvering	V_P 111 m.p.h.
	Maximum structural cruising	V_{NO} 159 m.p.h.
	Never exceed	V_{NE} 199 m.p.h.
	Flaps extended	V_{FE} 95 m.p.h.
C.G. Range	At gross weight	130.5 in. to 137.8 in.
	At 3,624 lbs. or less	121.9 in. to 137.8 in.
	Straight line variation between points given.	
Maximum Weight	5,800 lbs.	
Fuel Capacity	102 gallons (total usable in 2 tip tanks - 51 gallons each)	
	60 gallons (total usable in 2 auxiliary tanks - 29.5 gallons each)	
	60 gallons (total usable in 2 main tanks - 29.5 gallons each)	
Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the aircraft for certification.	
	In addition, the following items of equipment are required:	
	(a) Shoulder harnesses as well as seat belts must be installed for first row of seats.	
	(b) FAA Approved Flight Manual, Helio Model HST-550A (USAF AU-24A) Revision F dated October 19, 1972, for airplanes with 5,100 lbs. gross weight.	
	(c) Stick-force augmentation system must be installed and operative.	
	(d) Stabilator hydraulic damper must be installed and operative.	
	(e) FAA Approved Flight Manual, Helio Model HST-550A, dated June 20, 1978, for airplanes with 5,100 lbs. and 5,800 lbs. gross weight.	

II. Model HST-550A (USAF AU-24A) (cont'd)

Serial Nos. Eligible	Serial Numbers -001 and up. Prior to civil certification, AU-24A airplanes must be modified in accordance with Helio Drawing 550-000-050 which may be obtained from the manufacturer. An FAA representative, upon determination of compliance with the above mentioned drawing, may issue an airworthiness certificate.
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DATA PERTINENT TO ALL MODELS

Datum	Longitudinal reference Station 0 located 114 in. forward of leading edge of wing proper (slats in). 115,83 in. forward of leading edge of wing with slats extended. Horizontal reference is 38.75 in. below centerline of and parallel to fuselage lower longeron.
Certification Basis	Application for type certificate dated October 8, 1963. Part 3 of the Civil Air Regulations dated May 15, 1956, as amended by 3-1 through 3-8. Special Conditions for CAR 3 turbine-powered aircraft submitted with February 11, 1964, FAA letter to Helio and amended by September 9, 1964, FAA letter to Helio. Type Certificate No. A4EA issued August 26, 1965.
Production Basis	None. Prior to original certification, an FAA representative must perform a detailed inspection for workmanship, materials, and conformity with the approved technical data, a final inspection of the completed aircraft, and a check of the flight characteristics.

NOTE 1. (a) Current Model 550 weight and balance report including list of equipment included in the certificated empty weight and loading instructions when necessary must be provided for each aircraft at the time of original certification. The certificated empty weight and corresponding center of gravity location must include unusable fuel of 16 lb. main and auxiliary (+160); 15 lb. tip tanks at (+144) and undrainable oil of 0.8 lb. at (+43).

(b) Current Model 550A weight and balance report including list of equipment included in the certificated empty weight and loading instructions when necessary must be provided for each aircraft at the time of original certification. The certificated empty weight and corresponding center of gravity location must include unusable fuel of 16 lb. main and auxiliary (+160); and undrainable oil of 0.8 lb. at (+43).

NOTE 2. (a) The following placards must be in view of the pilot:

(1) "This airplane must be operated as a normal category airplane in compliance with the operating limitations stated in the form of placards, markings, and manual."

(2) "No acrobatic maneuvers (including spins) are approved."

(b) All other placards required in the approved airplane flight manual must be installed in the appropriate locations.

(c) On Model 550 fuselage tailcone bulkhead at tailcone station 22.53:

- "1. Total cargo load carried on the floor not to exceed 2153 lbs.
- 2. Cargo density not to exceed 68 lbs. per square foot.
- 3. Maximum cargo weight per cargo lug 312 lbs."

(d) On Model 550A fuselage tailcone bulkhead at tailcone station 22.53:
"See AFM for cargo loading and tie-down instructions."

NOTE 3. Airworthiness Limitations for any mandatory retirement life or mandatory inspection are included in the Maintenance Manual (Instructions for Continued Airworthiness) for each model.

NOTE 4. The maximum propeller shaft overspeed limit is 110 percent at all ratings and may be employed for sustained periods in emergencies. Gas generator speeds up to 102.7 percent are permissible for 10 seconds and 101.6 percent for unlimited periods, subject to applicable temperature and other limits.

NOTE 5. Type Certificate Holder Record:

Reissued to Helio Aircraft Company August 1, 1969
Reissued to Helio Aircraft Limited November 8, 1976
Reissued to Helio Inc. August 10, 1984
Reissued to Helio Aircraft, Inc. August 23, 1984
Reissued to Helio Enterprises, Inc. August 11, 1994
Reissued to Alliance Aircraft Group, LLC September 18, 1997
Reissued to Alliance Aircraft Group, LLC dba Helio Aircraft Company April 10, 2001
Reissued to Helio Aircraft, LLC July 14, 2005

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