

MINIMUM INSTRUMENT AND EQUIPMENT REQUIREMENTS FOR POWERED AMATEUR BUILT EXPERIMENTAL AIRCRAFT

Introduction: The table below is intended to give the builder of amateur built experimental aircraft a ready reference for the instrument and equipment requirements for his aircraft. The builder should note that some items required by the FAR's are described in the FAR's as needing to be approved, but since there are no certification standards established for amateur built experimental aircraft no formal individual item approval, such as meeting a TSO (Technical Standard Order) or FAR Part 23, is required.

However, depending upon other portions of the FAR's, some items in certain circumstances must not only be installed in amateur built experimental aircraft, but must interface properly with ATC (Air Traffic Control) equipment, other aircraft, or other entities external to the aircraft. Altitude encoders, Transponders, communication radios, exterior lighting, some IFR navigation equipment, and ELT's (Emergency Locator Transmitters) are examples of such equipment. Usually TSO performance criteria are cited to ensure this compatibility compliance. The FAR's must be consulted for proper compliance in these arenas.

Therefore, the builder could expect that evidence that this type of equipment in the aircraft is acceptable to the FAA could be required at some point. The burden for complying with the provisions of the aircraft's Special Airworthiness Certificate (which includes the Operating Limitations), and the relevant FAR's, rests with the builder / pilot.

The Special Airworthiness Certificate issued for each amateur built experimental aircraft includes specific Operating Limitations. Per FAA Order 8130.2F the Operating Limitations state: "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." The FAR's, FAA Order 8130.2F, and current FAA policy have been used in constructing the below amateur built experimental aircraft configuration requirements table.

THIS TABLE DOES NOT PROVIDE RECOMMENDATIONS FOR BEST PRACTICES. INSTALLING ONLY THE MINIMUM REQUIRED ITEMS MAY NOT BE PRUDENT OR SAFE.

MINIMUM INSTRUMENT AND EQUIPMENT REQUIREMENTS FOR POWERED AMATEUR BUILT EXPERIMENTAL AIRCRAFT

<u>FAR SEC & ITEM DESCRIPTION (See Notes Below Table)</u>	<u>DAY VFR</u>	<u>NIGHT VFR</u>	<u>DAY OR NIGHT IFR</u>
1. 91.205 (b) (1) Airspeed Indicator	NR	R	R
2. 91.205 (b) (2) Altimeter	NR	R	R
3. 91.205 (b) (3) Magnetic Direction Indicator	NR	R	R
4. 91.205 (b) (4) Tachometer for Each Engine	NR	R	R
5. 91.205 (b) (5) Oil Pressure Gauge for Each Engine Using a Pressure System	NR	R	R
6. 91.205 (b) (6) Temperature Gauge for Each Liquid Cooled Engine	NR	R	R
7. 91.205 (b) (7) Oil Temperature Gauge for Each Air Cooled Engine	NR	R	R
8. 91.205 (b) (8) Manifold Pressure Gauge for Each Altitude Engine	NR	R	R

9.	91.205 (b) (9) Fuel Gauge Indicating Quantity of Fuel In Each Tank	NR	R	R
10.	91.205 (b) (10) Landing Gear Position Indicator, If Retractable	NR	R	R
11.	91.205 (b) (11) Anti-Collision Light System - (Small civil airplanes certified after 3/11/96)	NR	R	R
12.	91.205 (b) (13) Approved Safety Belts With Metal to Metal Buckles for Each Occupant (2 yrs or older)	NR	R	R
13.	91.205 (b) (14) Approved Shoulder Harness for Each Front Seat - For Small Civil Airplanes Manufactured After 7/18/78	NR	R	R
14.	91.205 (b) (15) ELT (If required by Sec. 91.207, i.e. >one seat and >50 miles)	AR	AR	AR
15.	91.205 (b) (16) Approved Shoulder Harness for Each Seat – Airplanes With 9 or Less Seats Manufactured After 12/12/86	NR	R	R
16.	91.205 (b) (17) Shoulder Harness for Each Seat For Rotorcraft – Manufactured After 9/16/92	NR	R	R
17.	91.205 (c) (2) Approved Position (navigation) Lights	NR	R	R
18.	91.205 (c) (3) Anti-Collision Light System (Systems installed after 8/11/71- see reference)	NR	R	R
19.	91.205 (c) (5) Adequate Source of Electrical Energy for Installed Equipment	NR	R	R
20.	91.205 (c) (6) One Spare Set of Fuses or Three Fuses of Each Kind Required, Must be Accessible to Pilot In Flight	NR	R	R
21.	91.205 (d) (2) Two-Way Radio Communication System and Navigational Equipment Appropriate to Ground Facilities Used	NR	NR	R
22.	91.205 (d) (3) Gyroscopic Rate of Turn Indicator (Some Exceptions, See Reference)	NR	NR	R
23.	91.205 (d) (4) Slip-Skid Indicator	NR	NR	R
24.	91.205 (d) (5) Sensitive Altimeter Adjustable for Barometric Pressure, (See FAR 91.411, Altimeter System Inspection Required Every 24 Calendar Months)	NR	NR	R
25.	91.205 (d) (6) Clock Displaying Hours, Minutes, and Seconds – Sweep Second Pointer or Digital	NR	NR	R
26.	91.205 (d) (7) Electrical Generator or Alternator of Adequate Capacity	NR	NR	R
27.	91.205 (d) (8) Gyroscopic Bank and Pitch Indicator (Artificial Horizon)	NR	NR	R
28.	91.205 (d) (9) Gyroscopic Direction Indicator (Directional Gyro or Equivalent)	NR	NR	R
29.	91.205 (e) DME Above FL 240	N/A	N/A	AR
30.	91.215, Transponder in Certain Airspace, (See FAR 91.413 & 91.411, Re Inspection Required Every 24 Calendar Months)	AR	AR	AR

Notes:

(1) AR = As Required, NR = Not Required, N/A = Not Applicable, R = Required

(2) A fourth flight operation category, Day (only) Instruments, is not included above.

By Owen C. Baker with appreciation to Richard E. Koehler

ABEA Minimum Inst Requirements 10.doc 1/31/2010