

***2008 Amateur-Built Aircraft  
Aviation Rulemaking Committee (ARC)  
Authorized under FAA Order 1110.143A***

**FINAL REPORT**

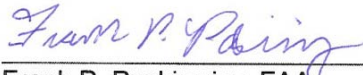
***DATE: September 11, 2009***

THIS PAGE INTENTIONALLY BLANK

**2008 Amateur-Built Aircraft  
Aviation Rulemaking Committee (ARC)  
Authorized under FAA Order 1110.143A**

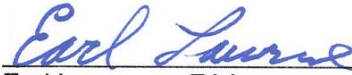
**FINAL REPORT**

SIGNED BY



Frank P. Paskiewicz, FAA  
Manager, Production and Airworthiness  
Division, AIR-200  
CO-Chairperson, Amateur-Built ARC

Date: 8-5-09



Earl Lawrence, EAA  
Vice President Industry and  
Regulatory Affairs  
CO-Chairperson, Amateur-Built ARC

Date: 8-17-09



Dick VanGrunsven  
CEO, Van's Aircraft  
Co-Chairperson, Amateur-Built ARC

Date: 8-18-09

THIS PAGE INTENTIONALLY BLANK

Table of Contents

**Signature Page... iii**

**Table of Contents... v**

**Prologue...vii**

**Executive Summary...viii**

**1.0 Introduction ..... 1**

    1.1 2006 ARC..... 1

    1.2 FAA Proposal ..... 3

    1.3 Public Comments ..... 3

    1.4 The 2008 Amateur-Built ARC..... 4

    1.5 Scope of Report ..... 5

**2.0 2008 ARC—Disposition of Public Comments.....6**

    2.1 There is No Justification for Making Any Changes to the Existing Rules ..... 6

    2.2 The FAA Should Enforce Current Regulations and Policy ..... 6

    2.3 New FAA Amateur-Built Requirements Will Stifle Aviation Development..... 7

    2.4 The FAA Has No Authority to Require Percentages of Fabrication..... 8

    2.5 The FAA’s Proposal Decreases Safety..... 9

    2.6 The Proposed Changes Create a Burden on Amateur-Builders..... 10

    2.7 The FAA Proposal Checklist is Too Complex ..... 10

    2.8 Economic Impact..... 11

    2.9 The FAA Proposal Does Not Address Abuses in Commercial Assistance..... 12

    2.10 Fabrication—Why a Minimum Percentage? (20 percent) ..... 12

    2.11 Amateur-Built or Not..... 13

    2.12 Use Time As a Variable ..... 14

    2.13 Quick Build Commercial Assistance Programs..... 14

    2.14 Fabrication Level of 20 percent is Not Appropriate to All Aircraft ..... 15

    2.15 Establish a New Category or Class of Amateur-Built Aircraft ..... 16

    2.16 Commercial Assistance, Form 8130-12, Eligibility Statement & Amateur-Built Aircraft . 17

**3.0 Defining Fabrication ..... 18**

**4.0 Grandfathering ..... 20**

**5.0 Other Issues ..... 25**

    5.1 Reevaluation of the 20/20/11 Requirement ..... 25

    5.2 New Amateur-Built Fabrication and Assembly Checklist..... 26

    5.3 Proposed FAA Order and Advisory Circular ..... 28

    5.4 National Kit Evaluation Team (NKET)..... 29

    5.5 Modification of Type-Certificated Aircraft..... 29

**6.0 Conclusion ..... 30**

<b>Appendix A—FAA Order 1110.143A.....</b>	<b>A-2</b>
<b>Appendix B—2008 ARC Members.....</b>	<b>B-1</b>
<b>Appendix C—2008 Amateur-Built Fabrication and Assembly Checklist ..</b>	<b>C-1</b>
<b>Appendix D—FAA Form 8130-12, Eligibility Statement, Amateur-Built Aircraft.....</b>	<b>D-1</b>
<b>Appendix E—Experimental Aircraft Association’s Recommended Changes to FAA Order 8130.2F and AC 20-27G.....</b>	<b>E-1</b>

## PROLOGUE

All proposals and discussions contained in this Final Report have been reviewed and accepted by the 3 co-chairs of the 2008 Amateur Built Aviation Rulemaking Committee as accurate and comprehensive of the deliberations that occurred during the three days of meetings in Washington, DC on January 27, 28 and 29, 2009.

Although the FAA will take into consideration this 2008 ARC report as published, all discussions, proposals, documents, charts, tables and recommendations produced by the committee are subject to FAA final review and may be accepted or rejected at the sole discretion of the FAA.

## EXECUTIVE SUMMARY

### BACKGROUND

---

On February 14, 2008, the 2006 Amateur-Built Aviation Rulemaking Committee (ARC) published its final report. This report found that the pertinent Federal Aviation Administration (FAA) directives setting policy for amateur-built aircraft resulted in inconsistent evaluations of manufacturers' kits offered to amateur builders. Based on the ARC's report, the FAA published a notice in the Federal Register on February 15, 2008<sup>1</sup>, temporarily suspending amateur-built aircraft kit evaluations. The FAA stated in the notice that before publishing final policy, it would solicit comments on draft policy, internal orders, and advisory circulars (AC).

Subsequently, the FAA published a notice in the Federal Register on July 15, 2008, proposing changes to and soliciting public comments on: (1) FAA Order 8130.2F, Airworthiness Certification of Aircraft and Related Products, Chapter 4, Special Airworthiness Certification, Section 9, Experimental Amateur-Built Airworthiness Certifications; and (2) AC 20-27G, Certification and Operation of Amateur-Built Aircraft<sup>2</sup>.

The comment period on the notice opened on July 15, 2008, and closed on August 15, 2008. The FAA extended the comment period to September 30, 2008.<sup>3</sup> The extension allowed interested persons, who may not have been aware of the close of comment period date listed on the FAA Web site, the opportunity to submit comments. The FAA reopened the comment period from October 31, 2008, through December 15, 2008, to allow the public additional time to comment on the proposed changes<sup>4</sup>.

---

<sup>1</sup> Notice of Temporary Suspension of Amateur-Built Aircraft Kit Evaluations Previously Conducted by the Federal Aviation Administration, Aircraft Certification Service (73 FR 8926, February 15, 2008).

<sup>2</sup> Notification of Policy Revisions, and Requests for Comments on the Percentage of Fabrication and Assembly that Must Be Completed by an Amateur Builder to Obtain an Experimental Airworthiness Certificate for an Amateur-Built Aircraft (73 FR 40652, July 15, 2008).

<sup>3</sup> Notification of Policy Revisions, and Requests for Comments on the Percentage of Fabrication and Assembly That Must Be Completed by an Amateur Builder to Obtain an Experimental Airworthiness Certificate for an Amateur-Built Aircraft; Extension of Comment Period (73 FR 43278, July 24, 2008).

<sup>4</sup> The FAA reopened the comment period because the proposed Order 8130.2F and AC 20-27G had been inadvertently removed from the FAA Web site during the comment period. (See 73 FR 65007, October 31, 2008.)



## **FAA RECHARTERS THE ARC**

---

On November 4, 2008, the FAA rechartered the ARC in FAA Order 1110.143A, Amateur-Built Aircraft Aviation Rulemaking Committee (ARC). The order renewed the ARC to consider and give advice on the following: (1) responses to comments received on the proposed changes to Order 8130.2F and AC 20-27G; (2) the definition of “fabrication” as it differs from “assembly” within the scope of Title 14, Code of Federal Regulations (14 CFR) part 21, Certification Procedures for Products and Parts, § 21.191(g); and (3) the process to minimize the impact of the proposed policy on amateur-built kits evaluated by the FAA before February 15, 2008. See appendix A to this report for a copy of the charter.

## **2008 ARC RECOMMENDATIONS**

---

The 2008 ARC met in Washington, DC, on January 27 through 29, 2009, to advise the FAA on (1) the disposition of public comments, (2) an enhanced definition of “fabrication,” and (3) grandfathering of FAA listed amateur-built aircraft kits. In addition, the ARC—

- Reevaluated the 20/20/11 requirement<sup>5</sup>;
- Updated FAA Form 8000-38, Fabrication/Assembly Operation Checklist;
- Organized the National Kit Evaluation Team, a group of FAA Aviation Safety Inspectors, to establish a standardized evaluation process, and
- Discussed the modification of type-certificated aircraft into amateur-built aircraft.

The ARC made the following recommendations discussed below.

### ***PUBLIC COMMENTS***

The ARC agreed on a joint disposition of major themes identified in the public comments. The major themes included (1) questioning the justification for the FAA to change existing rules; (2) the need for the FAA only to enforce current regulations and policy; (3) the perceived burden and complexity of the proposed changes on amateur builders; and (4) proposals for the FAA to establish a new category or class of amateur-built aircraft. These topics and their dispositions are discussed in detail in the main body of this report.

---

<sup>5</sup> The 20/20/11 requirement was an FAA proposed policy change requiring an amateur builder to fabricate a minimum 20 percent of an aircraft and assemble a minimum of 20 percent of the aircraft.

## ***DEFINITION OF FABRICATION***

The ARC reached consensus on a new definition of “fabrication,” revising it to read as follows:

...to perform work on any material, part, or component, such as layout, bending, countersinking, straightening, cutting, sewing, gluing/bonding, lay-up, forming, shaping, trimming, drilling, de-burring, machining, applying protective coatings, surface preparation and priming, riveting, welding or heat treating, transforming the material, part, or component toward or into its finished state.

## ***GRANDFATHERING***

The ARC reached consensus on grandfathering existing amateur-built kits, including a scenario-based table and the applicability of current and proposed policies. The intent is to minimize the impact of the FAA’s policy changes on industry and amateur builders and ensure a fair transition to the new policies over time.

## ***REEVALUATION OF THE NEED FOR THE 20/20/11 REQUIREMENT***

The Manager of the FAA Production and Airworthiness Division (AIR-200), agreed to consider withdrawal of the proposed 20/20/11 concept. ARC industry and association members argued that other agreed upon tools, such as the new kit evaluation checklist (discussed below) and the expanded “fabrication” definition, will lead to an adequate amount of fabrication in amateur-built projects. The Special Projects and Evaluations Branch (AIR-240) will collect trend data on amateur-built aircraft builder fabrication percentages using data from the new Amateur-Built Fabrication and Assembly Checklist to monitor the level of fabrication.

## ***NEW AMATEUR-BUILT FABRICATION AND ASSEMBLY CHECKLIST***

The ARC agreed on a revised fabrication and assembly checklist to replace the current FAA Form 8000-38. The ARC agreed on the following:

- All assembly and fabrication tasks,
- The number of tasks in the checklist,
- The percentages to credit each task (0.10 increments) as opposed to full or zero credit, and
- Designating the following four categories for credit allocation:
  - Kit manufacturer,
  - Amateur-builder as fabrication,
  - Amateur-builder as assembly, and
  - Commercial assistance.

The revised document, the 2009 Amateur-Built Fabrication and Assembly Checklist, is contained in appendix C to this report.

### ***PROPOSED FAA ORDER AND ADVISORY CIRCULAR***

The ARC reached consensus on the final language for Order 8130.2F and AC 20-27G based on an item-by-item review of the comments.

### ***FAA NATIONAL KIT EVALUATION TEAM***

The ARC reached consensus on the function of the National Kit Evaluation Team (NKET) to achieve increased standardization. The NKET will consist of approximately 10 team members. The four Aircraft Certification Service geographical directorates will each provide Aviation Safety Inspectors and representatives from the Production and Airworthiness Division, AIR-200, will manage the NKET program.

### ***FAA COMPLIANCE AND ENFORCEMENT***

The ARC agreed that ensuring compliance with § 21.191(g) is necessary and the new checklist will improve accountability for assessing commercial assistance. Compliance with § 21.191(g) is based primarily on the amateur builder meeting the major portion (over 50 percent) requirement of the regulation.

### ***FAA FORM 8130-12, ELIGIBILITY STATEMENT, AMATEUR-BUILT AIRCRAFT***

The ARC recognized that FAA Form 8130-12, Eligibility Statement, Amateur-Built Aircraft, does not require (1) the applicant to certify that an amateur builder fabricated and assembled the major portion of the aircraft or (2) an applicant declaration of commercial assistance used during construction. The FAA will revise the form to include a statement certifying the major portion of the aircraft was fabricated and assembled by an amateur builder. The proposed form includes this certifying statement. See appendix D to this report to review the revised FAA Form 8130-12.

### ***FAA-EVALUATED KIT FABRICATION AND ASSEMBLY CHECKLISTS***

The FAA agreed to post to the FAA Web site the Fabrication and Assembly Checklists (current and future) produced from all FAA kit evaluations. They will be located in the Aircraft General Aviation and Recreational Aircraft section, attached to the “List of Amateur-Built Aircraft Kits,” for kits evaluated by the FAA for amateur-built status.

## **CONCLUSION**

The 2008 ARC discussed and considered the topics and issues identified by the public comments, defined fabrication, established an aircraft amateur-built kit grandfathering policy, formed a NKET, and agreed on the new fabrication and assembly checklist. Additionally, non-FAA committee members unanimously endorsed the proposal to withdraw the 20 percent minimum fabrication and 20 percent assembly concept. The FAA views the results of the 2008 ARC as promoting fair and balanced policy directives while minimizing the negative impact of the proposed policy on the amateur-built industry.

## 1.0 INTRODUCTION

### 1.1 2006 ARC

---

#### 1.1.1 ARC Task

The Federal Aviation Administration (FAA) established the 2006 Amateur-Built Aviation Rulemaking Committee (ARC) on July 26, 2006, to enhance the FAA's knowledge on the use of commercial assistance by amateur builders when they fabricate and assemble amateur-built aircraft. The FAA's primary concern was that the typical amateur-built aircraft project, and the industry as a whole, had radically changed over the last three decades in terms of the materials, methods, and technology used. The FAA also was concerned with the development of commercial assistance programs that had grown in popularity among amateur-built kit builders. The 2006 ARC met to review and provide advice on the following:

- FAA Order 8130.2F, Airworthiness Certification of Aircraft and Related Products, chapter 4, section 9, Experimental Amateur-Built Airworthiness Certifications;
- Advisory Circular (AC) 20-27, Certification and Operation of Amateur-Built Aircraft; AC 20-139, Commercial Assistance During Construction of Amateur-Built Aircraft; and AC 90-89, Amateur-Built Aircraft and Ultralight Flight Testing Handbook;
- Definition of “builder” and “commercial assistance” when fabricating and assembling an amateur-built aircraft;
- Definition of “minor portion” as used in amateur-built aircraft to ensure that the combination of prefabricated parts and builder/commercial assistance does not exceed 49 percent of the total aircraft construction; and
- Regulatory, directive, and policy changes required for the FAA to properly perform oversight of commercial assistance to the amateur builder. This includes the dissemination of regulatory, directive, and policy changes to all parties involved in the highly evolved amateur-built industry.

### **1.1.2 2006 ARC FINAL REPORT**

The 2006 ARC published its final report in the Federal Register on February 15, 2008. The ARC agreed that many amateur builders use an excessive amount of commercial assistance during aircraft construction. The 2006 ARC also found that FAA policy does not adequately define the limits of commercial assistance and noted that FAA directives do not require an amateur-built aircraft applicant(s) to document the amount of commercial assistance used in the construction project. Specifically, the 2006 ARC agreed that—

- FAA directive and advisory language for the airworthiness certification of amateur-built aircraft do not adequately address the issue of commercial assistance beyond that allowed under the regulations.
- The forms used in determining the amateur-built status of the aircraft need to be updated to more accurately reflect who actually performed the fabrication and assembly of the aircraft.
- The aircraft kit evaluation process is not standardized. The public, industry, the FAA, and individuals within those groups, have different opinions about what level of fabrication and assembly constitutes “major portion.”
- Aviation safety inspectors (ASI) and designated airworthiness representatives (DAR) may need additional training to fully understand the FAA’s expectations when determining an aircraft’s eligibility for an amateur-built certificate.

The 2006 ARC recommended proposed changes to governing FAA directives. The FAA agreed to develop a more precise method of calculating “major portion” and ensure that all affected directives are available for public comment before publication. The FAA also agreed to consider forming a team of ASIs to establish and perform standardized kit evaluations.

The 2006 ARC did not agree on how to define “major portion” when evaluating amateur-built aircraft, either in kit form at the manufacturer, or for fully assembled aircraft. As a direct result of the 2006 ARC findings, on February 15, 2008, the FAA published a notice in the Federal Register<sup>6</sup> temporarily suspending amateur-built aircraft kit evaluations.

---

<sup>6</sup> Notice of Temporary Suspension of Amateur-Built Aircraft Kit Evaluations Previously Conducted by the Federal Aviation Administration, Aircraft Certification Service. (73 FR 8926, February 15, 2008).

## 1.2 FAA PROPOSAL

---

On July 15, 2008, the FAA issued a notice in the Federal Register<sup>7</sup> requesting public comment on the proposed changes to the following FAA directives:

- Order 8130.2F, chapter 4, section 9,
- AC 20-27G (AC 20-27G is the result of combining AC 20-27F and AC 20-139), and
- The requirement for an amateur builder to fabricate a minimum of 20 percent of an aircraft and assemble another minimum 20 percent of an aircraft to be eligible for an experimental airworthiness certificate.

## 1.3 PUBLIC COMMENTS

---

The FAA's comment period opened on July 15, 2008, and closed on August 15, 2008. The FAA later extended the comment period to September 30, 2008.<sup>8</sup> The extension allowed interested persons, who may not have been aware of the close of comment period date listed on the FAA Web site, the opportunity to submit comments. The FAA reopened the comment period from October 31, 2008, through December 15, 2008,<sup>9</sup> to allow the public more time to comment on the proposed changes. This additional time was given because the proposed materials (Order 8130.2F and AC 20-27G) had been inadvertently removed from the FAA Web site during the comment period.

The FAA received 2,273 comments. Approximately 1,300 comments were letters from Experimental Aircraft Association (EAA) members that were similar in nature and that used EAA Web site/press release arguments. Approximately 900 commenters opposed the 20/20/11 component of the FAA's proposal and 300 comments included relevant suggestions.

All comments submitted are posted at <http://www.regulations.gov/search/index.jsp> under Docket Nos. FAA-2008-0823, FAA-2008-0797, and FAA-2008-1181.

Over 98 percent of the comments opposed changing current FAA policy. Many comments were identical. Those submitting form letters took the following positions: (1) the FAA should enforce current regulations; (2) the proposed changes are too complicated; (3) the FAA should pursue commercial assistance providers; and (4) the current rule has worked for 50 years and there is no need to change it.

---

<sup>7</sup> Notification of Policy Revisions, and Requests for Comments on the Percentage of Fabrication and Assembly that Must Be Completed by an Amateur Builder to Obtain an Experimental Airworthiness Certificate for an Amateur-Built Aircraft. (73 FR 40652, July 15, 2008).

<sup>8</sup> Notification of Policy Revisions, and Requests for Comments on the Percentage of Fabrication and Assembly That Must Be Completed by an Amateur Builder to Obtain an Experimental Airworthiness Certificate for an Amateur-Built Aircraft; Extension of Comment Period (73 FR 43278, July 24, 2008).

<sup>9</sup> See 73 FR 65007, October 31, 2008.

## 1.4 THE 2008 AMATEUR-BUILT ARC

---

In September 2008, AIR-200 decided to reconvene the ARC. FAA Order 1110.143A, Amateur-Built Aircraft Aviation Rulemaking Committee (ARC), dated November 4, 2008,<sup>10</sup> rechartered the ARC to consider and give advice on the following:

- Recommended responses for the FAA to consider regarding the disposition of public comments on the proposed changes to FAA Order 8130.2F and AC 20-27G.
- Definition of the term “fabrication”, and how it differs from the term “assembly” of amateur-built aircraft. This definition would be within the scope of the major portion requirement of Title 14, Code of Federal Regulations (14 CFR) part 21, Certification Procedures for Products and Parts, § 21.191(g).
- Recommended processes to minimize the proposed policy’s impact on amateur-built kits evaluated by the FAA before February 15, 2008.

The 2008 ARC met on January 27 through 29, 2009, in Washington, DC, and was hosted by AIR-200. Three co-chairs led the ARC: one FAA senior manager, one association representative, and one kit plane manufacturer. (See appendix B to this report for a list of ARC members and their respective positions.)

During the 3-day meeting, the ARC discussed and reached consensus on the following topics: (1) public comments to the FAA notice, (2) the definition of fabrication, (3) policy to grandfather existing amateur-built aircraft, (4) the updated fabrication and assembly checklist, (5) language contained in the proposed directives, (6) formation of an FAA amateur-built aircraft evaluation team, and (7) modification of type-certificated aircraft. At the end of the meeting, the FAA noted that all documents created by the ARC are subject to internal FAA review.

---

<sup>10</sup> A copy of the charter is located in appendix A to this report.



## 1.5 SCOPE OF REPORT

---

This report is divided into six sections. This section, section 1.0, presents the background of the ARC's tasking and scope of the report. Section 2.0 comprises the majority of the report and describes the ARC's discussion and disposition of public comments submitted on the FAA's notice. Section 3.0 includes the ARC's discussion of defining fabrication. Section 4.0 contains the ARC's review of grandfathering existing amateur-built kit aircraft. This section also contains a table illustrating the application of existing and proposed new procedures scenarios and provides a timeline to implement the grandfathering policy. Section 5.0, Other Issues, discusses the new amateur-built fabrication and assembly checklist, the proposed changes to Order 8130.2F and AC 20-27G, the National Kit Evaluation Team, and the modification of type-certificated aircraft as amateur-built aircraft. Section 6.0 contains the conclusion.

This report also contains appendixes that provide supplemental information.

Appendix A contains the 2008 ARC charter.

Appendix B contains the list of 2008 ARC members.

Appendix C contains the 2008 Amateur-Built Fabrication and Assembly Checklist.

Appendix D contains FAA Form 8130-12, Eligibility Statement — Amateur-built Aircraft.

Appendix E contains the Experimental Aircraft Association's (EAA) recommended changes to Order 8130.2F and AC 20-27G.

## 2.0 2008 ARC—DISPOSITION OF PUBLIC COMMENTS

The following represents the relevant topics the public presented to the FAA regarding the proposed changes to Order 8130.2F and AC 20-27G. Three Aviation Safety Analysts (ASA)s from the Aircraft Certification Service (AIR) independently reviewed and considered all public comments. The ASAs identified and categorized relevant suggestions and arguments. The ARC discussed and evaluated these comments to determine whether to modify the proposed order or AC language.

### 2.1 THERE IS NO JUSTIFICATION FOR MAKING ANY CHANGES TO THE EXISTING RULES

---

Many commenters argued that there is no justification for making any changes to the existing rules and policies. Many stated that the existing rules have worked well for the past 50 years and support maintaining the status quo.

The FAA disagrees with the premise that no problems currently exist within the amateur-built community that require changes or clarifications in the existing policy. The 2006 ARC Final Report, dated February 15, 2008, contradicts the commenters' argument and concluded that the existing procedures for evaluating aircraft kits are inadequate, not standardized, and that the associated FAA forms need updating. The 2008 ARC concurs that significant changes to FAA directives are needed.

The proposed changes reflect over 2 years of discussion and review by kit manufacturers and aviation associations in the amateur-built aircraft industry. Many commenters argued against change and for maintaining the status quo. The FAA feels this view disregards the serious noncompliance issues currently under review. Based on this, the FAA rejects the argument that the current FAA regulatory and policy guidance is sufficient and that there is no justification for policy changes.

### 2.2 THE FAA SHOULD ENFORCE CURRENT REGULATIONS AND POLICY

---

A significant number of commenters believed the FAA should improve enforcement to curtail the abuses of the amateur-built regulations and policies. Both the 2006 ARC and 2008 ARC agreed that increased FAA enforcement action is necessary.

Commenters suggested the FAA consider the following enforcement actions:

- Read the homebuilding press and locate abusive businesses in question.
- Shut down those abusive businesses under current regulation or new regulations.
- Revoke the airworthiness certificate of those aircraft for which if the FAA finds the “builder” did not perform enough work to meet major portion.
- Publicize enforcement actions as a deterrent.

- Send notices to illegal manufacturers to have them cease and desist operation.
- Send warning letters to current offenders.
- Focus on commercial assistance firms and devise guidelines for their behavior.
- Hold DAR/FAA inspectors responsible for ensuring the builder is in fact the builder.

Additional comments stated that FAA representatives or DARs can discuss details of the aircraft's construction with the applicant and determine if the builder has the requisite level of knowledge that can only be derived from building the aircraft.

The FAA stipulates that in all cases, be it a denial or revocation of an airworthiness certificate, the FAA is required to substantiate its actions. Therefore, compliance determinations must be based on clearly delineated metrics and understandable criteria so that the builder can show compliance with the applicable regulations. A comprehensive builders log, numerous photographs, and in-process inspections by technical experts will demonstrate to the FAA that an aircraft's major portion is amateur-built. Additional documentation, specifically the Amateur-Built Fabrication and Assembly Checklist, provides another tool for the builders and applicants to prove compliance.

The ARC believes that the best way to improve enforcement (as the commenters suggest) is to implement the 2008 ARC recommendations. The proposed changes should provide the improved guidance and restrictions needed by FAA representatives to prevent regulatory abuse when conducting airworthiness inspections and performing kit evaluations. The FAA may also pursue one or more of the commenters' suggestions in the future.

## **2.3 NEW FAA AMATEUR-BUILT REQUIREMENTS WILL STIFLE AVIATION DEVELOPMENT**

---

A significant number of commenters contended that the FAA's proposal would "stifle the inherent creativity of experimental builders" and that "additional rules and complexity of compliance only serve to stifle innovation and impede progress." Some 2008 ARC industry members hold a similar position.

The FAA rejects the argument that the changes the agency intends to implement would stifle aviation development, based on the following reasons:

- It seems the prevalent attitude in today's amateur-built sector is minimum build time ("built quick to fly soon"). Many of the most popular amateur-built aircraft kits have a very high level of prefabrication and preassembly. This fact, coupled with increasing use of commercial assistance, leaves little opportunity for any aeronautical innovation in design, assembly, or fabrication for the amateur builder.

- The argument that an established level of fabrication is not needed implies that it would be acceptable for the “amateur builder” to assemble a nearly ready-made aircraft, the so-called “erector set.” The FAA feels a high level of prefabrication does not encourage education or innovation at the amateur-builder level.
- The increase in “quick build commercial assistance programs” or “rapid build amateur aircraft programs” further undermines the argument that innovation is an important aspect of the kit-built aircraft industry. In this setting innovation and technical advancement are primarily relegated to the design and preassembly processes and thus rest with the kit manufacturers, not the builder/assembler.
- The FAA’s proposed changes do not restrict the amateur from engaging in original design, using new materials, building entirely from plans, or from creating new products and processes. In fact these activities are encouraged and welcomed by the FAA.

## **2.4 THE FAA HAS NO AUTHORITY TO REQUIRE PERCENTAGES OF FABRICATION**

---

A large number of commenters took the position that § 21.191(g) does not require a builder to fabricate a specific percentage of an amateur-built aircraft and that requiring a minimum of 20 percent fabrication exceeds the FAA’s authority. Some of the 2008 ARC industry members also shared this view.

The FAA recognizes that § 21.191(g), does not require specific percentages of fabrication and assembly in the construction of an amateur-built aircraft. Rather it requires that an amateur builder’s performance of both fabrication and assembly together, must produce the major portion of aircraft construction. The ARC agreed that the amateur builder must perform a substantial percentage of fabrication to adhere to the regulatory intent and also for the FAA to issue the amateur builder a repairman certificate. Although the ARC was unable to reach consensus on exactly how much fabrication would suffice to achieve these goals and fulfill the intent of the regulation, the ARC did agree that a superficial or minimal level of fabrication is unacceptable.

Regarding the comments addressing the FAA’s lack of authority in this matter, the FAA’s statutory authority to promulgate rules, establish the requirements, and issue policy guidance for issuing an airworthiness certificate for an amateur-built aircraft is not in question. The agency is empowered to conduct such activities by Title 49 U.S. Code.

However, since the ARC industry members were unanimously opposed to the 20/20/11 proposal, (as were the vast majority of the public comments) AIR-200 has agreed to consider withdrawal of the 20/20/11 proposal. Additionally, AIR-200 endorsed the need for a “strong checklist” to advance the FAA’s aim to maintain a minimum amount of fabrication in all amateur-built projects. The 2008 ARC industry and association members anticipate that this approach may make imposing a specific fabrication percentage in the FAA directives unnecessary. The Special Projects and Evaluations

Branch (AIR-240) will collect trend data on amateur-built aircraft builder fabrication percentages using data from the new Amateur-Built Fabrication and Assembly Checklist to monitor the level of fabrication. See section 5.1 for a full discussion of the FAA decision to consider withdrawal of the proposed requirements.

## **2.5 THE FAA’S PROPOSAL DECREASES SAFETY**

---

Many commenters argued that the FAA’s proposal “... ignores the safety benefits of having the manufacturer do more fabrication and the builder perform more assembly tasks” and, “... a factory can consistently produce parts within better tolerances than in someone’s garage.” Commenters emphasized that “... requiring lower-quality, owner-fabricated parts in place of higher-quality, factory produced parts, sacrifices safety...” One commenter presented that “the prefabrication of parts, ...using advanced tooling has contributed to safety.”

The proposition that factory produced parts and professional aircraft construction increases safety has some merit. However, if the FAA accepted the suggestion that the agency should encourage maximum prefabrication, preassembly, and commercial assistance in the interest of safety, it would certainly negate the intent of § 21.191(g) and possibly lead to its removal from the regulations. That is so because, if the premise is that only professionally trained people in a manufacturing setting and employing certified processes can build a safe aircraft, then the logical conclusion is that only factory produced aircraft are safe.

The FAA views with concern any comment that agency policy may impair aviation safety. The public should understand that the intent of the § 21.191(g) “major portion” addresses safety by ensuring an amateur builder constructs his own experimental aircraft as safe as practically possible. The rule requires the builder to fabricate and assemble the aircrafts’ major portion to ensure adequate knowledge of its’ structure, form, function and capabilities as only a builder can. The FAA believes this requirement promotes safety as much as possible in the experimental aircraft sector without being burdensome or overly restrictive.

Secondly, the spirit and intent of § 21.191(g) is to preserve the time honored privilege and freedom of an amateur builder to fabricate and assemble an aircraft of unique design and configuration. That privilege is respected by the agency and valued by the public. To adulterate that tradition by accusing the FAA of promoting unsafe practices is misguided.

The 2008 ARC supported the principle that safety is a concern with any airplane. The FAA conducts an airworthiness inspection before issuing an amateur-built experimental airworthiness certificate to determine if the aircraft is in a condition for safe operation. The FAA rejects the argument that its proposal to change the directives on amateur-built policy is detrimental to safety.

## **2.6 THE PROPOSED CHANGES CREATE A BURDEN ON AMATEUR-BUILDERS**

---

Commenters contended that the FAA’s policy changes to prevent abuses of the rule will instead create more problems for amateur builders and kit manufacturers.

One commenter stated that “the proposed change to require more accounting for the percentages of work done, category by category are not necessary.” Another commenter stated “the proposed changes would overcomplicate the design and building process, would lead to unnecessary record keeping and more emphasis on documentation than freedom of design, ability to change and improve.” Another commenter added “the process of accounting for every construction task in a matrix of needless detail is counter to the spirit and intent of an amateur-built project that is undertaken for education and recreation.”

The FAA disagrees with the commenters. The 2006 ARC found the lack of detail in the existing Form 8000-38 had “resulted in lax interpretation, permitted manipulation of the data and allowed deviations.” The 2008 ARC agreed that additional evidence of builder fabrication and assembly may have to be presented for a major portion determination. This is especially true when commercial assistance is used.

The proposed checklist is primarily used by FAA representatives for kit evaluations and to make “major portion” determinations. The amateur builder may decide to use the new checklist as a personal guide in the aircraft project. This is not mandatory but will assist the builder in determining that the project progresses towards eligibility for airworthiness certification.

The applicant must present satisfactory evidence to show that the “major portion” of the aircraft was amateur-built. More clearly defined and a wider range of acceptable tools to achieve this result should not be viewed as an undue burden.

## **2.7 THE FAA PROPOSAL CHECKLIST IS TOO COMPLEX**

---

Many commenters stated that the FAA’s proposal, including the new “Amateur-Built Fabrication and Assembly Checklist” is “too complex” and contended that “the proposed change to require more cumbersome accounting for the percentages of work done [new checklist], category by category, is unnecessary.” Hundreds of commenters requested a higher level of enforcement of the existing regulations.

The revised fabrication and assembly checklist is the primary tool that will enable the FAA to enhance its oversight and control in this area. (See appendix C to this report.) The additional task columns on the checklist will assist the builder in more accurately documenting the construction project. These additional columns also compliment the builder’s log.

Specifically, columns A and B allow for differentiating between the kit manufacturer and commercial assistance; columns C and D segregate builder fabrication from builder assembly. This supports the builder's efforts when compared to what is provided by the kit manufacturer and any commercial assistance used. In addition, the FAA added tasks (with a 1/10<sup>th</sup> fractional breakdown) to the checklist, allowing for precise calculation of credit allocation for fabrication and assembly of the aircraft.

The FAA disagrees that the proposed new checklist is too complex. Amateur builders who engage in aircraft construction have, as a group, demonstrated a high degree of mechanical aptitude and technical ability since the 1950s. Those qualities certainly permit a more sophisticated method of calculating credit allocation as found in the proposed Amateur-Built Fabrication and Assembly Checklist.

The 2008 ARC agreed that the new checklist answers the 2006 ARC recommendation to improve the documentation of work accomplished by the amateur builder(s). Credit allocation for tasks in fractional increments provides increased potential for builder credit and gives the builder a better tool to assess progress towards major portion determination.

## **2.8 ECONOMIC IMPACT**

---

Several commenters raised the issue of economic harm, and contended that "... any change of significant rules such as these inevitably produces economic damage, as those who must comply expend energy on adapting to the changes rather than on more productive activities." Another commenter voiced "a requirement for any builder fabrication will severely disadvantage American builders and producers, when many aircraft producers around the world are applying evolving fabrication technologies that are furthering aviation safety, performance, and reliability."

The 2008 ARC industry members have mixed opinions on the economic impact of the proposed changes. Some members felt that a positive economic impact could result from the standardization effect, but others strongly disagreed. One industry member stated that professional builders will assist with fewer kits, negatively impacting the amateur-built sector in that amateur builders will purchase fewer kits. Another industry member praised the FAA for proposing a reasonable and logical change to the policy. The member stated that "without proper FAA action, we could have lost everything."

Most industry ARC members felt that the FAA's proposed changes had a recent negative impact on the amateur-built sector because of the uncertainty of adopted final policy and the anticipated restrictions on the amateur-built community. However, the balance of members felt that future economic impact should be positive because uncertainty would be removed and the FAA has agreed to consider withdrawal of the minimum fabrication requirement (20/20/11) proposal. See section 5.1 for a full discussion of the FAA decision to consider withdrawing the proposed requirements.



## **2.9 THE FAA PROPOSAL DOES NOT ADDRESS ABUSES IN COMMERCIAL ASSISTANCE**

---

A large number of commenters argued that the FAA proposal does little to address a primary purpose of policy revision as identified by the 2006 ARC—“excessive commercial assistance.” Several commenters had “no quarrel with the intent of the rule requiring 51 percent of the construction being done by the builder” and “have no doubts that some of the modern kits and procedures violate that provision.” Concurrently, many commenters felt that they would ultimately “pay the price for those not in compliance” because of commercial assistance abuse.

Excessive commercial assistance occurs when a person or company is hired by an amateur builder and performs a portion of the aircraft assembly and fabrication beyond the point that will allow a builder to complete the “major portion” of the aircraft construction. If the amateur builder then submits a Form 8130-12, Eligibility Statement, certifying that he or she completed more than 50 percent of the aircraft, it is a fraudulent statement. Some builders fabricate successive aircraft (serial production) selling the aircraft to persons who took no part in the construction project. These “builders” are actually in the business of aircraft production, do not meet the education and recreation element of the regulation, and are clearly violating § 21.191(g).

The new Amateur-Built Fabrication and Assembly Checklist directly addresses this problem. The increased detail and number of tasks in the checklist will promote a precise accounting of what the builder and the manufacturer accomplished, and the portion of commercial assistance used in the construction process. This process, along with the following, will provide increased control:

- A comprehensive builder’s log,
- Numerous photos,
- In-process inspections, and
- Sales receipts for construction materials.

However, total prevention of the abuse of commercial assistance in the amateur-built aircraft sector may not be possible without direct FAA surveillance and oversight.

## **2.10 FABRICATION—WHY A MINIMUM PERCENTAGE? (20 PERCENT)**

---

The FAA has agreed to consider withdrawal of the proposal for a 20 percent minimum fabrication requirement. The ARC’s senior FAA member, AIR-200, agreed to consider the withdrawal during the 2008 ARC meeting. See section 5.1 for a full discussion of the FAA decision to consider withdrawal of the proposed requirements.



## 2.11 AMATEUR-BUILT OR NOT

---

The commenters raised the question of amateur-built aircraft authenticity. An FAA primary concern has been to prevent the “erector set” aircraft kit, where the amateur builder only performs assembly of prefabricated parts and components.

Many commenters argued that it is almost impossible for an amateur to build some of the aircraft kits. A commenter argued that “any definition of what is assembly or fabrication has the potential to place some experimental aircraft out of the market for many builders or worse yet commit a builder to fabrication for which they lack expertise.”

The commenters also argued that “potentially, some better designed aircraft dictate that some fabrication is best accomplished with sophisticated manufacturing processes and equipment outside of what most homebuilders have available.” One commenter stated that “kit manufacturers should be able to sell kits built to any level of completion including 100%, flight tested...”. The FAA feels it is highly improbable that an amateur builder can meet the major portion requirement if an aircraft cannot be built without sophisticated manufacturers processes and commercial assistance.

Some commenters added that parts fabrication is often beyond amateur capabilities and requires professional assistance. Another commenter stated “... some fabrication techniques may be well beyond the capabilities of most amateurs and could lead to serious defects by the builder.” One commenter openly declared “I don't feel that my ability to have the equipment or the expertise to fabricate parts should be a qualification for homebuilding” and “as I examine what work is already fabricated, I realize it is in those areas where most owners would not have the skill to do the work resulting in the precision or safety that is required.”

Many commenters argued that the FAA should permit manufacturers to fabricate as much as possible because it would be safer that having the amateur builder do the fabrication. Others claimed the same point regarding commercial assistance. Some reasoned that the FAA should allow manufacturers to sell flight tested assembled kits because it would be safer. The FAA notes that if these suggestions are followed to their logical conclusion, they would destroy the amateur-built aircraft sector by eliminating the amateur builder's fabrication and assembly element. If that requirement is removed, the basis for § 21.191(g) also evaporates.

The 2008 ARC recognized that the primary test for issuing an experimental amateur-built airworthiness certificate is a major portion determination. However, some members felt the existing regulation was restrictive or inflexible in restricting higher levels of technical sophistication. Adoption of the new checklist will directly address this concern and the level of commercial assistance a builder may use. New materials and manufacturing processes have produced aircraft kits where the kit manufacturer performs more of the primary fabrication tasks, and the builder performs more of the finish fabrication and assembly tasks. The FAA does not object to this point.

## 2.12 USE TIME AS A VARIABLE

---

As an alternative, one commenter noted that “the FAA should consider the use of total labor hours as a metric for accepting an aircraft as amateur-built. For example, the rule could state that the amateur builder must devote at least 500 hours to the building of his airplane. This labor could be documented in the regular manner using photographs, log books, videos, receipts for materials, etc. This simple standard would remove the need to comply with a 51 percent rule... which would be replaced by a 500-hour rule.”

Depending upon equipment, skills, and assistance, builders almost always do things differently. This will change the actual number of tasks performed for fabrication and assembly of same-type aircraft. One commenter maintained “... it’s better for all experimental aircraft builders to log the hours worked on their planes. Total hours are a better measure of the amount of effort performed by the home builder.”

The FAA is not in favor of using time as a metric for making a “major portion” determination. The FAA has never measured or credited amateur-built construction in this way. It might only require a few minutes to stamp out a dozen perfectly symmetrical wing ribs in the factory, compared to the hours it would take to hand build each one. The variables of builder proficiency and technical ability are too difficult to quantify for this metric to be considered a primary factor to measure “major portion” determination.

The 2008 ARC agreed that the “major portion” rule pertains to the actual percentage of physical construction of the total aircraft completion that is performed by the builder. However, an applicant is free to present any and all evidence of aircraft construction, including logs, pictures and time dedication on specific dates. The 2008 ARC reached a general consensus that the use of time as a metric for evaluating amateur-built aircraft was impractical, if not impossible, for the FAA to define, measure, and implement in a fair and objective manner.

## 2.13 QUICK BUILD COMMERCIAL ASSISTANCE PROGRAMS

---

Many commenters questioned the legitimacy of “quick build” commercial assistance programs that assist an amateur builder to fabricate and assemble an aircraft in a few weeks. One commenter stated that there “... is no way to build an aircraft in approximately 100 hours...” Another commenter argued “these programs abuse the intent of § 21.191(g)” because “there is no way, in my humble opinion that owner participation can possibly satisfy the 51 percent ruling in this short time.”

One commenter noted that the “real problem for the homebuilding community are builder assist programs that obviously do not conform to the existing rule.” Another commenter explains that “there are a large number of independent commercial assist facilities that do the assembly required of the amateur builder” and that “fraud on the part of builders is now all too commonplace.”

Some commenters believed that “such programs...so grossly violate the letter and the spirit of the law that I am amazed the FAA has not clamped down on them ...” and

“I cannot fathom how a person can rightly claim to be the builder of an aircraft created in two weeks.” Another commenter stated “...if you [FAA] must regulate something, regulate the quick build commercial assistance programs.”

A few 2008 ARC members had concerns about the legitimacy of amateur-built quick build commercial assistance programs of 2 or 3 weeks duration. One member felt that time was not the major issue preventing the viability of such a program. Another member felt that task completion guided the major portion determination and that the reduced time was secondary and should not be viewed in a negative light without objective verification. One ARC member supported this view.

The FAA agrees that eligibility for an experimental amateur-built airworthiness certificate is meeting the major portion determination within § 21.191(g). That assessment is task oriented and means the amateur builder completes greater than 50 percent of the fabrication and assembly tasks when compared to the total construction of the aircraft. Time is not a primary determinant or restriction. The ARC agreed that the best way to determine major portion is to continue with task based criteria where the builder performs more than 50 percent of the required fabrication and assembly tasks to construct the aircraft. Time to build cannot be the single qualifying criteria used for major portion evaluation.

## **2.14 FABRICATION LEVEL OF 20 PERCENT IS NOT APPROPRIATE TO ALL AIRCRAFT**

---

Several commenters questioned the practicality of imposing minimum levels of fabrication to other than fixed-wing aircraft. One commenter argued that “redefining of the 51 percent rule as now applied would result in unintended restrictions in regards to other than fixed wing aircraft.” In particular, commenters noted that in the case of Auto gyros and weight shift control aircraft (Trikes) that “these aircraft being unique require the rotor blades and head assembly and weight shift control aircraft (Trike) to be considered critical components as these items are beyond the ability of most builders to construct.” Other commenters addressed the intricacies of balloon construction and how the FAA’s proposal did not consider those aircraft types. Many balloon components are not represented in the proposed new checklist.

Several 2008 ARC members agreed that because of varying complexities in design and manufacturer, some aircraft such as rotorcraft and balloons would never meet the 20 percent fabrication minimum requirement of the proposed changes. In addition, the 20 percent minimum fabrication is not appropriate to all aircraft. The FAA has agreed to consider withdrawal of the 20/20/11 component of the proposal. See section 5.1 for a full discussion of the FAA decision to consider withdrawing the proposed policy.

The FAA recognizes that the proposed fabrication and assembly checklist is focused on traditional fixed-wing airplane designs and needs further development to adequately address other aircraft categories. The ARC agreed that the new checklist may need to be adjusted to identify tasks applicable to aircraft other than fixed-wing airplane construction.

## 2.15 ESTABLISH A NEW CATEGORY OR CLASS OF AMATEUR-BUILT AIRCRAFT

---

Several commenters suggested that “a new category should be invented to cure the problems with some existing kits”, or have “more than just a Light Sport Aircraft category but also medium aircraft categories, heavy, high-performance...” amateur-built aircraft. Or the FAA could “make a new category like light plane classification for ‘commercially’ built aircraft.”

Another commenter argued that “... a new category for high performance aircraft where far more than 51 percent would be completed in a professional shop” may be appropriate. Additionally, “if any allowance of second party construction is to be permitted, it should become a NEW category and separated from the amateur-built experimental category all together,” and that in those cases the FAA could “call it a different category-professionally-built experimental...and regulate that as necessary.” Finally, “the FAA should create a ‘Custom Built’ category and tailor it in the fashion surrounding the LSA Regs.”

On the issue of complex aircraft, one commenter stated that the “problem is with a tiny minority of owners and kit manufacturers, and mostly involves very expensive, complex composite aircraft.” The commenter added that the FAA should “consider an approach based on performance; if the manufacturer claims more than 250 knots and the aircraft is turbine powered, the proposed rule would apply.” The commenter suggested that “the FAA should focus its effort on creating a new class of experimental aircraft that satisfies this market [high-performance commercial assist programs]” with overall performance limits such as the following:

- No more than four seats;
- No more than 5,000 pounds MTOW;
- Category A: Aircraft with  $V_{ne}$ <sup>11</sup> of 150 knots and a service ceiling of less than 12,000 feet; and
- Category B: Aircraft with a  $V_{ne}$  of 210 knots and a service ceiling of less than 18,000 feet.

Some 2008 ARC members remembered that the issue of creating a new category of amateur-built aircraft was presented at the 2006 ARC meeting and noted that industry may petition the FAA for rulemaking. FAA managers stated that § 21.191(g) currently does not provide for a new category/class of amateur-built aircraft. The ARC has no current knowledge of any petition for rulemaking, therefore the FAA has no plans to initiate such action at this time.

---

<sup>11</sup>  $V_{ne}$  means never-exceed speed.

## **2.16 COMMERCIAL ASSISTANCE AND FORM 8130-12, ELIGIBILITY STATEMENT, AMATEUR-BUILT AIRCRAFT**

---

The FAA received the following remarks on commercial assistance:

- “the FAA should look at the option of allowing professional assistance within a format similar to FAR Part 145 certificated repair stations,”
- “the FAA ought to allow a builder to hire an A&P mechanic any time he wants help with anything, as long as the builder is there helping, watching, and therefore learning,” and
- “FAA should have oversight of commercial assistance providers.”

Some commenters argued for an unlimited amount of commercial assistance and others urged the FAA to restrict and regulate the entities involved.

The 2008 ARC discussed commercial assistance and recognized the need to define its limitations regarding legitimacy and abuse. The ARC’s primary focus was documenting commercial assistance through utilization of the new Fabrication and Assembly checklist and a FAA dedicated performing standardized kit evaluations. Proper use of the checklist will assist the amateur builder to stay within limits of commercial assistance.

The FAA noted that an FAA representative performing an airworthiness evaluation is responsible for ensuring the documentation presented is sufficient to find major portion compliance. This is critical in all situations and especially when commercial assistance is used. Also, the proposed guidance requires the FAA representative performing the airworthiness inspection to use the new fabrication and assembly checklist in all cases where the builder used commercial assistance.

Finally, both the 2006 ARC and the 2008 ARC recognized that current Form 8130-12 is deficient in two areas: (1) It does not require the applicant to certify who fabricated and assembled the major portion of the aircraft, and (2) It does not require the amateur builder to identify any commercial sources of fabrication and assembly used. As a result, the 2008 ARC discussed the need to revise the form. The proposed new form contains qualifying criteria to include the above information with no opposition from the ARC. See appendix D to this report for a copy of Form 8130-12.

### 3.0 DEFINING FABRICATION

At its January 2009 meeting, the ARC undertook the task to consider and give advice on the definition of “fabrication” as it differs from “assembly” within the scope of § 21.191(g). The members noted that definition of “fabrication” as it pertains to the major portion determination under § 21.191(g) was a critical subject in the public comments. Some commenters were skeptical about the definition of fabrication and added that fabrication may include tasks such as drilling, de-burring and finishing parts. Others defined fabrication as “to create a useable part by performing one or more of the following tasks; layout, cutting, trimming, de-burring, forming, machining, bending, drilling, dimpling, countersinking, welding, straightening, cold working, cleaning, corrosion protection, surface prep and priming, and surface finish coat.”

ARC members began with the question, what does “fabrication” mean? They felt that once the ARC reached consensus on a definition, the same text should be included in FAA Order 8130.2F and AC 20-27G.

The FAA noted that a more precise definition of “fabrication” would improve the process of determining the level of fabrication actually performed by an amateur builder. As a result, the proposed 20/20/11 fabrication and assembly minimum requirements could be revised before concluding the 2008 ARC.<sup>12</sup> The 2008 ARC members agreed that the definition of fabrication needed to be improved to consider all materials used, such as aluminum, fiberglass and composites.

The 2008 ARC discussions raised the issue of composites with respect to defining fabrication. The nature of composite construction makes it difficult to split the fabrication from assembly. One commenter said, “composite fabrication could be considered to include all tasks necessary to transform the raw material selected (cloth, tape, winding) combined with the selected resin to create a useable end item. Tasks typically include rough trimming of raw material, resin mixing, lay-up, vacuum bagging, cure, final trim, and drilling. Fillers, primers, sealers and finish coats would also apply. Bonding of composite parts to each other or to metal would be fabrication. Mechanical fastening of conduits, clamps, bonding straps, nut plates, for example, to the composite part constitutes “assembly.”

Based on the above logic, one could classify the vast majority of composite work as fabrication with little assembly. The issue then becomes who performs the task. Preassembled and almost finished composite structures, such as those in modern kits (especially quick build kits), are classified and assigned to items fabricated or assembled by the kit manufacturer, not the builder. The fabrication work required by the builders on prefabricated composite kit parts is reduced to primarily finishing work.

---

<sup>12</sup> See section 5.1 for a full discussion of the FAA decision to consider withdrawal of the proposed requirement.

Specifically, the current sophistication level of composite aircraft provides little fabrication that can be claimed by the builder, probably less than either wood or metal aircraft construction. Thus, kit manufacturers and builders must be aware that, due to the high level of prefabrication of some kits, enough tasks must remain available to the builder to meet the requirements of § 21.191(g).

The FAA maintains that the required evaluation of work in constructing an amateur-built aircraft is task oriented. This requires an expansion of the definition of “fabrication” to include tasks such as bending, drilling, cutting, and de-burring.

The FAA determined that a new definition will improve proper credit allocation for construction, especially in conjunction with the new checklist. The FAA reiterated that if fabrication tasks are properly credited, fabrication minimums may not be needed. The FAA rejected the premise that zero or little fabrication is an acceptable interpretation of the fabrication requirement in § 21.191(g).

The FAA presented a revised definition of the term “fabrication” and the ARC agreed on a task based definition. The definition would expand the existing definition referencing the term “raw materials” as its main element. The proposed text is as follows:

...to perform work on any material, part or component, such as layout, bending, countersinking, straightening, cutting, sewing, gluing/bonding, lay-up, forming, shaping, trimming, drilling, de-burring, machining, applying protective coatings, surface preparation and priming, riveting, welding or heat treating, transforming the material, part or component toward or into its finished state.



## 4.0 GRANDFATHERING

The ARC assumed its task to consider and give advice on recommended processes to minimize the proposed policy's impact on amateur-built kits evaluated by the FAA before February 15, 2008. The members noted that the intent of "grandfathering" existing amateur-built kits is to reduce the impact of any new FAA policy on kit manufacturers and builders of all kits purchased before the implementation of the policy changes.

The FAA's original position was that only those kits on the FAA kit list before the new policy was implemented would be eligible for grandfathering. However, the FAA will consider the industry proposition that non-evaluated kits purchased before the effective date of any new policies should also be evaluated under the policies in place at that time.

The ARC agreed on the concepts applicable to grandfathering existing evaluated and non-evaluated kits. The ARC also agreed on a scenario-based table, to be included in the Order 8130.2F and AC 20-27, to illustrate the application of existing and proposed new procedures.

The proposed policy states that aircraft constructed from kits placed on the FAA kit list of evaluated kits before February 14, 2008 (date of kit moratoriums), be evaluated in accordance with the directives in place at the time the kit was purchased. Future aircraft kits offered by manufacturers will be subject to the new policy including the new checklist in the proposed changes to Order 8130.2F and AC 20-27.

Additionally, non-evaluated kits purchased before the effective date of any new policies should be evaluated under the policies in place at that time of purchase. This requires the guidance and instructions of the old checklist (Form 8000-38) to be maintained in the future. The builder must document purchase dates and provide a bill of sale and invoices.

Specifically, ARC members proposed the following concepts:

- Grandfathering applies to aircraft on the FAA kit list, before the FAA suspension of kit evaluations imposed on February 14, 2008.
- Kits on the FAA list would be subject to the old checklist past the publishing date of the changes to Order 8130.2F and AC 20-27 for purposes of determining "major portion" and granting of airworthiness certificates.
- Kits currently included on the FAA kit list may be purchased in the future and still retain the percentage of completion available to the amateur builder, as established by the previous FAA kit evaluation using the old checklist (Form 8000-38).
- Kits on the FAA kit list that are subsequently changed will be subject to the new checklist for kit re-evaluation and a re-determination of major portion.



- If the builder uses commercial assistance in constructing the aircraft, then the new checklist should be used by the FAA representative when seeking major portion determination and airworthiness certification.

The ARC outlined the process by which the FAA would determine major portion for amateur built aircraft built from aircraft kits that were never evaluated by the FAA. These aircraft will be subject to the new standard unless both the purchase date of the kit acquisition pre-dates the implementation date of the new policies, and (2) no commercial assistance was used.

The ARC agreed to consider a phase-in period in which the old procedures will be replaced by the new procedures. Members accepted a table of information containing scenario based examples. This table provides criteria for using the checklist under the appropriate policy (old/new) and to make “major portion” determination. (See Table 1 below). Table 2 provides a timeline to implement the grandfathering policy.

The concept of phasing in a new process is consistent with public comments, including, consideration should be “given to home builders who have purchased plans/kits and have not completed construction” and a “phase-in period [should] be allowed for in-process projects to be certificated under the current policy.”

The ARC discussed a scenario that, at some future date, all sold kits must meet the new procedures. The intent is to provide sufficient time for previously sold kits to be completed. Then at a future date, the observance of two concurrent procedures for amateur-built airworthiness certification (old and new policy) would cease. The ARC did not reach consensus on this issue. The FAA will consider all ARC Grandfathering proposals for inclusion in the final policy/procedures.

**TABLE 1 PROPOSED GRANDFATHERING POLICY**

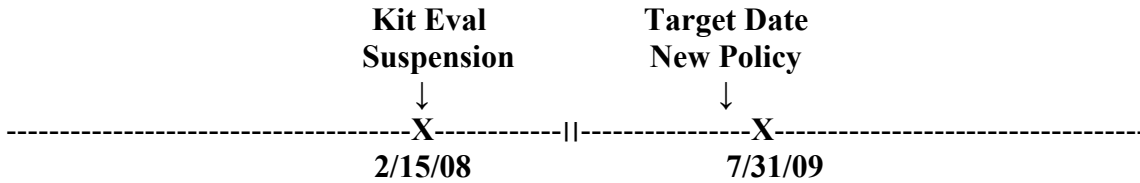
<p><b>Scenario</b>  <b>Kit Evaluation Status</b>  <b>Use of Commercial Assistance (C/A) Status</b></p>	<p><b>Impact on Kit Manufacturer</b>  <b>(Eligible Kit)</b></p>	<p><b>Impact on Builder</b>  <b>(Eligible Kit + C/A evaluation)</b></p>
<p>(1)                      ELIGIBLE KIT (Listed prior to 2/15/2008)                       No Major Change by Kit Manufacturer                       No Commercial Assistance</p>	<p>Fabrication/Assembly Checklist in effect on date of kit evaluation used for FAA Eligibility.</p>	<p>Prior Policy may be used to determine major portion.                       New Policy used for all kits placed on the eligibility list after New Policy effective date.</p>
<p>(2)                      ELIGIBLE KIT (Listed prior to 2/15/2008)                       No Manufacturer Change to Kit                       Commercial Assistance used by builder</p>	<p>Fabrication/Assembly Checklist in effect on date of kit evaluation used for FAA Eligibility</p>	<p>Previously Eligible Kits sold after effective date of New Policy; use New Policy, but may use old FAA Form 8000-38.                       New Policy used for all kits placed on the eligibility list after new policy effective date.</p>
<p>(3)                      Non-evaluated Kit:                       Sold by manufacturer <b>BEFORE</b> New Policy effective date</p>	<p>NO IMPACT (Kit never evaluated)</p>	<p>No C/A used: Builders option to choose Prior Policy or New Policy used by FAA representative to determine major portion.                       C/A used: New Policy must be used to determine major portion.</p>
<p>(4)                      Non-evaluated Kit:                       Sold by manufacturer <b>AFTER</b> New Policy effective date</p>	<p>NO IMPACT (Kit never evaluated)</p>	<p>Commercial Assistance is immaterial.                       New Policy must be used to determine major portion.</p>
<p>(5)                       ELIGIBLE KIT previously on FAA Listing with subsequent Major Change to kit and no FAA re-evaluation, and sold <b>BEFORE</b> new policy effective date.</p>	<p>NO IMPACT if manufacturer does not seek re-evaluation.                       If manufacturer seeks re-evaluation for kit modifications use New Policy after implementation date.</p>	<p>No C/A used: Builders option to choose Prior Policy or New Policy used by FAA representative to determine major portion.                       C/A used: New Policy must be used to determine major portion.</p>
<p>(6)                       ELIGIBLE KIT previously on FAA Listing with subsequent Major Change to Kit and no FAA re-evaluation, and sold <b>AFTER</b> new policy effective date.</p>	<p>NO IMPACT if manufacturer does not seek re-evaluation.                       If manufacturer seeks re-evaluation for kit modifications use New Policy after implementation date.</p>	<p>No C/A: Builders option to choose Prior Policy or New Policy used by FAA representative to determine major portion.                       C/A used: New Policy must be used to determine major portion.</p>

NOTES:

1. ELIGIBLE KIT means an FAA evaluated kit found to be eligible (amateur builder can meet major portion) for a Special Airworthiness Certificate in the Experimental Amateur-Built category, and placed on the FAA eligibility list.
2. A Checklist must be used: 1.) by an *inspector during an airworthiness inspection* if compliance with major portion is in doubt, 2.) when new kit evaluations are performed, 3.) when builder used commercial assistance, 4.) when a builder modified the kit. See FAA Order 8130.2F, Para 148a, and figure 4-15.
3. The National Kit Evaluation Team will use the New Checklist for all kit evaluations upon implementation of new policy and “any requested commercial assistance program evaluation.”
4. FAA will require all applicants to use the FAA Form 8130-12 in effect on date of airworthiness application.
5. "Prior Policy" means: Old FAA Form 8000-38, AC 20-27F, September 26, 2003, or FAA Order 8130.2F (chg 3).
6. "New Policy" means: The new Amateur-Built Fabrication and Assembly Checklist, AC 20-27G or latest revision, revised 8130.2F (chg 4) or later.
7. "Manufacturer Major Change to Kit" means: A kit design change that, in an FAA representatives' opinion, would change the allocation of task credit, sufficient to affect the major portion determination.
8. Commercial Assistance means: Assistance in the building of an amateur-built aircraft in exchange for compensation. This does not include one builder helping another without compensation.
9. When a builder has the option to use the old or new policy, the FAA representative performing the airworthiness inspection will advise the builder which policy is most advantageous in meeting “major portion.”

**TABLE 2 TIMELINE**

**TIMELINE**



**AMATEUR-BUILT AIRCRAFT KITS**  
**GRANDFATHERING POLICY**

OLD POLICY	NEW POLICY
Applies	Applies
FAA Listed Kit No Major Change NO EXPIRATION	New Kit or FAA Listed Kit with Major Change sold after New Policy implementation date
Unlisted Kit Purchased Before New Policy	Unlisted Kit Purchased After New Policy

**NOTES:**

This Timeline is a graphic representation of the FAA amateur-built aircraft kit Grandfathering Policy table on page 23 of this report. That table presents 6 different scenarios for aircraft kits and the impact each scenario has on the kit manufacturer and amateur builder. FAA’s purpose in applying grandfathering is to minimize the negative effects, as best it can, to kit manufacturers and individual builders that may occur as a result of FAA policy changes to the amateur-built aircraft sector.

As depicted in the Timeline above, each of the Grandfather scenarios in the table falls neatly into a status before or after the NEW POLICY implementation date (target - 7/31/09) except the “*FAA Listed Kit, No Major Change*” box. This kit status has “NO EXPIRATION” date because as long as commercial assistance is not used and the kit’s components and construction remain unchanged, the builder may elect to fall under the OLD POLICY indefinitely regardless of sale date.

A Listed Kit is a kit evaluated by the FAA prior to the FAA kit suspension on February 15, 2008. These kits are listed on the FAA Web site as eligible for a Special Airworthiness Certificate in the Experimental amateur-built category if fabricated and assembled by manufacturer’s instructions.

This TIMELINE does not take “Commercial Assistance” (C/A) into consideration for status placement. For C/A policy application please consult the Grandfather table on page 23 of this report.

## 5.0 OTHER ISSUES

In addition to accomplishing the tasks set forth in the 2008 ARC charter, the ARC discussed the following: (1) reevaluation of the proposed 20/20/11 requirement; (2) updated fabrication and assembly operation checklist; (3) language contained in the proposed directives; (4) formation of an FAA amateur-built aircraft evaluation team; and (5) modification of type-certificated aircraft. The details of these discussions and their resolutions are presented below.

### 5.1 REEVALUATION OF THE 20/20/11 REQUIREMENT

---

The proposed policy to meet the major portion requirement is, “Within the 51 percent, the amateur builder must fabricate at least 20 percent of the aircraft kit and assemble at least another 20 percent. The remaining 11 percent may vary between fabrication and assembly.” The ARC had extensive conversations and deliberated on the 20/20/11 proposal.

Commenters posed two major question: “Why is fabrication required?” and “Why 20 percent?” Approximately 900 commenters specifically opposed the 20/20/11 proposal. In addition, non-FAA 2008 ARC members unanimously opposed a specific percentage required for fabrication or assembly.

Although no data was presented, 2008 ARC industry members argued that imposing a minimum 20 percent fabrication requirement will worsen their current economic problems. Many argued that there was no apparent benefit in a 20 percent requirement and that the FAA can achieve its objective using other tools. Numerous commenters argued that “specifying a minimum amount of fabrication -- is not supported by history of the rule or policy” or “... there are too many different materials and types of aircraft to slap one general percentage rule onto tasks performed by the builder.”

One ARC industry member stated that of the 2,300 comments submitted to the FAA, only a handful offered support for the 20/20/11 requirement. Several industry members stated that § 21.191(g) did not authorize the FAA to specify a percentage of either fabrication or assembly. Virtually all industry members supported using the new checklist and opposed the 20 percent minimum fabrication requirement.

The FAA emphasized that amateur builders seem to have a propensity to do less fabrication and instead increasingly rely on manufacturers to prefabricate these aircraft and then use commercial assistance for completion. FAA management stated that if the current trend continues, amateur builders eventually would only assemble aircraft kits, which does not meet the intent of § 21.191(g).

After much deliberation among ARC members, AIR-200 agreed to consider withdrawal of the 20/20/11 proposal. AIR-200 endorsed the need for a “strong checklist” to advance the FAA’s aim to maintain a minimum amount of fabrication in all amateur-built projects. The 2008 ARC industry and association members anticipate that this approach may make imposing a specific fabrication percentage in the FAA directives unnecessary.

## **5.2 NEW AMATEUR-BUILT FABRICATION AND ASSEMBLY CHECKLIST**

---

The 2006 ARC agreed that existing FAA Form 8000-38, Fabrication/Assembly Operation Checklist, should be updated to more accurately reflect the actual fabrication and assembly of amateur-built aircraft. The proposed new checklist includes significantly more fabrication and assembly tasks to accurately account for these tasks.

The builder can also receive credit for fabricating a component normally provided by outside sources. The FAA emphasized that amateur builders always should receive credit for any item that they actually fabricate, even if that component generally is allowed to be purchased.

The FAA also noted that any part or component made, contracted for, or provided by the kit manufacturer will be credited in the kit manufacturer column. Thus, if a kit manufacturer used a third party to obtain any commonly purchased components discussed in Order 8130.2F (for example, engines and propellers), the third party would not negatively impact the kit manufacturer.

For example, if a particular propeller spinner can be acquired in standard sizes from after market sources, the propeller spinner will not be credited in the manufacturer’s or amateur builder’s column. However, a windshield, molded by a supplier to kit manufacturer’s specifications, would be credited in the manufacturer’s column. Similarly, the FAA added that if a common part is available and procured on the market, but it is not included in the kit, the part will not be assigned to the manufacturer’s or amateur builder’s column on the new checklist.

All checklist tasks “not applicable” (N/A) to a particular aircraft project should be excluded from credit assignment and therefore not penalize the builder. Designees should subtract the N/A’s from the “Total Number of Tasks” block in the checklist Summary calculations prior to computing percentages.

The FAA will revise the checklist instructions to make the described situation neutral and indicate that an N/A in a task credit box will not affect the total percentage awarded to any column for or against the builder. The revised instructions will ensure that an N/A in a task credit box will not affect the final outcome of percentage assigned to the builder in the determination of major portion.

The 2008 ARC discussed assigning credit on the checklist for task accomplishment during new kit evaluations and also upon application for airworthiness certification. The division of credit for tasks will quantify the pre-fabricated portion done by the kit manufacturer when totaled, (must be 49 percent or less). Using fractional credit (0.1 or 0.2 points) is a major improvement over the existing system which credits all or none of the construction for each task.

The amateur builder may elect to present an Amateur-Built Fabrication and Assembly Checklist to an FAA designee at time of airworthiness certification. If the amateur builder used commercial assistance during construction, the amateur builder must include with the checklist an addendum identifying who performed the assistance and what tasks and functions were performed. Checklist instructions require the amateur builder to notify the FAA in advance if it is planning to use commercial assistance during the project.

The 2008 ARC found that, while specifically required by the new policy for kit evaluations, the new checklist will not be mandatory for all airworthiness certifications. The need for a checklist may be negated if the amateur builder can provide sufficient documentation or in cases when an aircraft is built from a grandfathered kit or from plans (no kit). The new checklist will benefit the builder, manufacturing inspection district offices (MIDO), Flight Standards district offices (FSDO), and DARs.

The FAA recognized that the checklist has some limitations because it was not designed for non-fixed-wing aircraft. Further guidance is needed for those types of aircraft, possibly even different checklists.

Finally, the 2008 ARC agreed that existing kit manufacturers with kits currently on the FAA kit list should be encouraged to convert to the new checklist. They should be able to do this without losing the original percentage scores determined by old FAA Form 8000-38.

The 2008 ARC agreed on the new fabrication and assembly checklist to replace existing FAA Form 8000-38. The ARC reached consensus and decided that the new checklist is an accurate and comprehensive task list that accurately allocates credit to the proper categories of amateur builder, kit manufacturer, and commercial assistance provider.

Specifically, the 2008 ARC agreed on the following:

All the assembly and fabrication tasks in the proposed form with a few changes:

- The number of such tasks in the checklist,
- The percentages of credit for particular tasks (10 percent increments) rather than crediting all or nothing, and
- Assignment of credits to four categories, allocating credit to—
  - The kit manufacturer,
  - The amateur builder (fabrication),

- The amateur builder (assembly), and
- Commercial assistance.

The FAA noted that the Web site containing the listed kits before February 15, 2008, is under development. The FAA Web site has recently been updated to include the original FAA evaluations and Form 8000-38 for each listed kit, and further improvements are planned.

### **5.3 PROPOSED FAA ORDER AND ADVISORY CIRCULAR**

---

The 2006 ARC final report held that existing FAA directives for the airworthiness certification of amateur-built aircraft do not fully address the use of commercial assistance. The final report recommended rewriting AC 20-27 and AC 20-139 to include—

- Instructions on how to get an aircraft evaluated by the FAA when using commercial assistance.
- Instructions on how to quantify and document commercial assistance.
- Clarification of the definitions regarding commercial assistance terms.
- Examples of fabrication and assembly values in table format.
- Revision of FAA Forms 8130-12 and 8000-38.

The 2006 ARC also recommended revising FAA Order 8130.2F, chapter 4, section 9 to provide more detailed information on determining major portion, including—

- A structured process to evaluate amateur-built aircraft fabrication and assembly;
- A more in-depth interview process at the time of aircraft certification. This will assist the FAA in determining whether the applicant is familiar with all the fabrication and assembly tasks documented in the individual builder's log and FAA Form 8000-38;
- Informing applicants of the proposed requirement to identify the individuals or companies that participated in the construction of the aircraft; and
- Combining AC 20-27F and AC 20-139 into revised AC 20-27G.

Consistent with these 2006 ARC recommendations and as previously discussed above, the FAA published the proposed changes to FAA Order 8130.2F and AC 20-27F. The 2008 ARC agreed on final language for these FAA directives based on its review of the most relevant and detailed comments. The final language was also based on the 2008 ARC's review of suggested revisions to the order and AC made by the EAA. The entire collection of EAA comments with the FAA's responses are contained in appendix E to this report.



## **5.4 NATIONAL KIT EVALUATION TEAM (NKET)**

---

The 2006 ARC found that the evaluation process was not standardized and recommended the FAA form a group of ASIs to establish a standardized evaluation process.

The purpose of an FAA kit evaluation is to determine whether fabrication and assembly of a manufactured kit will allow an amateur builder to fabricate and assemble the major portion of an aircraft. Eligible kits are added to the FAA's list of eligible kits and are posted on the FAA's Web site. While not required by regulation, the FAA offers the kit evaluations to manufacturers as a courtesy and to amateur builders as a public service. The kit evaluations advise prospective applicants that their finished aircraft is eligible for an experimental amateur-built airworthiness certificate if they fabricate and assemble their aircraft in accordance with manufacturers' instructions.

The FAA will organize a National Kit Evaluation Team (NKET). The team will perform all initial amateur-built aircraft kit evaluations requested by kit producers. The team will also review all modifications to evaluated kits that could change the kit's eligibility status. The NKET will implement standardized policy for interpreting the Amateur-Built Fabrication and Assembly checklist and other new policy guidance.

The 2008 ARC endorsed the scope and role of the National Kit Evaluation Team and its rapid implementation. FAA inspectors who are specifically trained on kit evaluation requirements will perform all evaluations in the future. The FAA estimates that it will perform 20 new kit evaluations or reevaluations, due to design changes, per year.

ARC industry members proposed that the FAA Kit Evaluation Team also evaluate "fast-build" and traditional commercial assistance providers for compliance with FAA amateur-built regulations. This evaluation would provide a marketing advantage to industry and may also improve commercial assistance standardization. ARC members estimate there are 10 to 20 companies that routinely perform commercial assistance. FAA management agreed to consider the ARC's proposal.

## **5.5 MODIFICATION OF TYPE-CERTIFICATED AIRCRAFT**

---

The 2008 ARC discussed the modification and conversion of type-certificated aircraft into amateur-built aircraft. The FAA has recently refused to issue an experimental amateur-built certificate where a modified and essentially complete type-certificated airframe was altered with the intent to seek an amateur-built aircraft status.

The FAA explained that although the use of salvaged parts is allowed in amateur-built aircraft, these actions, including rebuilding and restoration required to return these components to their original condition, cannot be credited to the amateur builder as either fabrication or assembly.

The FAA received no public comments regarding this matter.

## 6.0 CONCLUSION

The Amateur-Built ARC is a transparent process used to reach consensus on issues of primary interest to the FAA and the amateur-built aircraft industry. The 2008 ARC discussed and considered the topics and issues identified by the public comments, defined fabrication, established an aircraft amateur-built kit grandfathering policy, formed a NKET, and agreed on the new fabrication and assembly checklist. Additionally, non-FAA committee members unanimously endorsed the decision to withdraw the 20 percent minimum fabrication proposal as an unbiased position by the agency. The FAA views the results of the 2008 ARC as promoting fair and balanced policy directives while minimizing the negative impact of the proposed policy on the amateur-built industry.

The Amateur-Built ARC members agreed that the ARC met all objectives in the charter and that it was unnecessary to meet again in the immediate future. However, the members felt the FAA should not wait another 10 to 15 years before meeting again. The FAA will consider convening another Amateur-Built ARC on or before the 2014 timeframe. The purpose of the future ARC would be to analyze and discuss the success of the 2008 ARC's efforts and recommend changes as necessary.



U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION  
National Policy

**ORDER  
1110.143A**

Effective Date:  
11/04/2008

**SUBJ: Amateur-Built Aircraft Aviation Rulemaking Committee**

---

**1. Purpose of this order.**

**a.** This order renews the Amateur-Built Aircraft Aviation Rulemaking Committee (ARC) to consider and give advice on the following:

(1) Recommended responses for FAA's consideration regarding disposition of public comments received from the proposed changes to FAA Order 8130.2F, Airworthiness Certification of Aircraft and Related Products and Advisory Circular 20-27G, Certification and Operation of Amateur-Built Aircraft.

(2) Definition of the term "fabrication" as it differs from "assembly" of amateur-built aircraft within the scope of the major portion (51%) requirement of Title 14 of the Code of Federal Regulations (14 CFR), §21.191(g).

(3) Recommended process to minimize the impact of the proposed policy on the amateur-built kits evaluated by the FAA before February 15, 2008.

**b.** The committee is designated and established by the Administrator's authority under Title 49 of the United States Code (49 U.S.C.), §106(p) (5).

**Note:** The FAA will not reconsider its proposal to require a minimum level of fabrication and assembly (e.g., requiring that an amateur builder fabricate a minimum of 20 percent of an aircraft and assemble a minimum of 20 percent of the aircraft) within the major portion requirement.

**2. Audience.** This order is written for the FAA's Office of Rulemaking, Flight Standards Service and Aircraft Certification Service.

**3. Where to Find This Order.** You can find this order on the FAA's Regulatory and Guidance Library (RGL) website at <http://rgl.faa.gov> or the My FAA Employee website at [https://employees.faa.gov/tools\\_resources/order\\_notices](https://employees.faa.gov/tools_resources/order_notices).

**4. What This Order Cancels.** This order cancels FAA Order 1110.143, Amateur-Built Aircraft Aviation Rulemaking Committee, dated 07/26/2006.

**5. Effective Date And Duration.** This committee will be reconstituted on the date this order is signed. The committee will exist for 6 months unless sooner terminated or extended by the Administrator.

---

Distribution: A-W(VS/IR/RM/GC/FS/BU/FM)-1

Initiated By: AIR-230

**6. Deliverables.** The ARC will deliver its recommendations within 60 days following conclusion of its meeting(s).

**7. Procedures.**

**a.** The committee provides advice, guidance and recommendations to the Director of the Aircraft Certification Service. The committee acts solely in an advisory capacity.

**b.** The committee will discuss and present advice, guidance and recommendations presented by its members that address the tasks identified in paragraph 1 above. The committee co-chairs will determine the earliest time that the committee members are able to convene to discuss these matters. The committee co-chairs will conduct such meetings of the committee as are deemed appropriate to dispose of the issues tasked to it.

**8. Organization and Administration.**

**a.** The Director of the Aircraft Certification Service is solely responsible to appoint members or organizations to the committee. The committee, as chosen in June 2006, consists of members of the aviation community, including the public and other Federal government entities, which represent various viewpoints. The FAA will provide administrative support.

**b.** The Director of the Aircraft Certification Service is the sponsor of the committee. The previously selected co-chairs (chosen by the Director from the committee membership) will continue at the pleasure of the Director. The designated co-chairs will:

(1) Determine, in coordination with the other members of the committee, when a meeting is required and where it will be held;

(2) Notify all committee members of the time and place for each meeting;

(3) Form an agenda for and conduct each meeting; and

(4) Ensure that detailed minutes are kept for each meeting and certify accuracy of the minutes.

**c.** The Director of the Aircraft Certification Service may wish to have a representative from the FAA's Office of the Chief Counsel in attendance at committee meetings to provide legal advice regarding any recommendations that may be made. The Director may also wish to have a representative from the FAA's Office of Policy and Planning present to provide economic advice. To promote international harmonization, the Director may also wish to have observers from other civil aviation authorities attend committee meetings.

**9. Membership.** The FAA selected the committee membership in June 2006 from industry associations and organizations (Aircraft Certification Service's Production and Airworthiness Division and Manufacturing Inspection District Offices; Flight Standards Service's General Aviation and Commercial Division and Aircraft Maintenance Division; Experimental Aircraft Association; kit manufacturers, etc.). The membership is balanced in points of view, interests, and knowledge of the

objectives and scope of the committee's tasks. Additional participants may be added as subject matter experts to support sub-committees or work groups, or to provide support to committee members. Each member or participant should represent the identified interest of the affected community.

**10. Cost and Compensation.** The estimated travel cost to the Federal government for the ARC is approximately \$20,000 (\$15,000 for travel and \$5,000 for contract fees). Non-government representatives serve without government compensation and bear all costs related to their participation on the committee.

**11. Public Participation.** Interested persons or organizations who are not committee members but plan to attend a meeting must first acquire approval from the Director of the Aircraft Certification Service, or his/her delegate. While the committee's meetings are generally not open to the public, anyone in attendance may make comments or provide input. However, such comments or input must be made through one of the committee members.

**12. Availability Of Records.** Subject to the conditions of the Freedom of Information Act, Title 5 of the United States Code §522, records, reports, agendas, working papers, and other documents given to or prepared by the committee will be available for public inspection and copying at this address: Federal Aviation Administration, Aircraft Certification Service, 800 Independence Avenue, SW, Washington, DC 20591. Fees will be charged for information furnished to the public per the fee schedule in part 7 of Title 49 CFR.

**13. Public Interest.** The formation of the ARC is in the public interest in connection with the performance of duties imposed on the FAA by law.

**14. Distribution.** This order is distributed to the Associate Administrator for Aviation Safety, and to the director level in the Aircraft Certification Service, the Office of Rulemaking, Office of the Chief Counsel, and Flight Standards Service.

**15. Background.**

a. The original Order 1110.143, Amateur-Built Aircraft Aviation Rulemaking Committee was established July 26, 2006. Of primary concern to the FAA was that the typical amateur-built aircraft project and the industry as a whole had radically changed over the last three decades in terms of the materials, methods and technology used. With the introduction of light-weight materials (i.e., fiberglass and composites) and sophisticated construction techniques, the state of the art amateur-built project had far exceeded that which was imagined when the governing regulations were promulgated. Further, the FAA was concerned with the development of builder/commercial assistance programs which had grown in popularity among amateur-built kit builders. If the level of technical expertise of aircraft construction requires that an amateur-built aircraft be fabricated with the commercial assistance contribution exceeding 50% of the aircraft construction, the amateur builder will fail to comply with 14 CFR §21.191(g). This regulation requires that a "major portion" of the amateur built aircraft be "fabricated and assembled by persons who undertook the construction project solely for their own education or recreation." With these concerns, the ARC met to review and advise on the following:

- (1) 14 CFR §21.191(g);
- (2) FAA Order 8130.2;
- (3) Advisory circulars: AC 20-27, *Certification and Operation of Amateur-Built Aircraft*, AC 20-139, *Commercial Assistance During Construction of Amateur-Built Aircraft*, and AC 90-89, *Amateur-Built Aircraft and Ultralight Flight Testing Handbook*;
- (4) Definition of builder and commercial assistance when fabricating and assembling an amateur-built aircraft;
- (5) Definition of minor portion as it is used in amateur-built aircraft so the combination of prefabricated parts and builder/commercial assistance do not exceed 49% of the total aircraft construction; and
- (6) Identification and recommended regulatory, directive and policy changes required for the FAA to properly perform oversight of builder/commercial assistance to the amateur builder, and also to convey respective responsibilities of all parties involved in the highly evolved amateur-built industry.

b. The ARC made several recommendations which are detailed in the final report published in the Federal Register on February 15, 2008. The FAA subsequently published the proposed changes to FAA Order 8130.2 Airworthiness Certification of Aircraft and Related Products and AC 20-27 Certification and Operation of Amateur-Built Aircraft on July 15, 2008, to address the items reviewed by the ARC. The period for public comment ran from July 15, 2008, to September 30, 2008.



Robert A. Sturgell  
Acting Administrator

## APPENDIX B—2008 ARC MEMBERS

<b>Name</b>	<b>Affiliation</b>
<b>Committee Members</b>	
Frank Paskiewicz <i>Committee Co-chair</i>	AIR-200, Production and Airworthiness Division Manager
Earl Lawrence <i>Committee Co-chair</i>	EAA, Vice President Industry and Regulatory Affairs
Dick VanGrunsven <i>Committee Co-chair</i>	CEO, Van's Aircraft
Joe Bartels	CEO, Lancair
Stephen Buczynski	Van Nuys MIDO
Paul Fidducia	Small Aircraft Manufacturing Association
Joe Gauthier	Designated Airworthiness Representative
Caleb Glick	AFS-350, Aviation Safety Analyst
Don Lausman	Project Lead AIR-230, Airworthiness Certification Branch Manager
Jeremy Monnett	President, Sonex Aircraft
Dave Saylor	Aircrafters, LLC
Rick Schramek	CEO, Epic Aircraft
Matt Tomsheck	Manager, Cleveland MIDO
Mikael Via	President, Glasair
<b>Committee Participants</b>	
Nic Davidson	AIR-230, Aviation Safety Analyst
Greg Janosik	AIR-230, Aviation Safety Analyst
Tim Ong	Lancair
Joe Palmisano	AIR-230, Aviation Safety Analyst
Miguel Vasconcelos	AIR-230, Aviation Safety Analyst



# APPENDIX C—2008 AMATEUR-BUILT FABRICATION AND ASSEMBLY CHECKLIST

## Amateur-Built Fabrication and Assembly Checklist (2009) (Fixed Wing)

Name(s):.....  
 Address:.....  
 Aircraft Model:.....  
 Date:.....  
 Remarks:.....  
 .....

NOTE: This checklist is only applicable to fixed wing aircraft. Evaluation of other types of aircraft (i.e., rotorcraft, 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).

NOTE: 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.

<b>FABRICATION AND ASSEMBLY TASKS</b>		<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
		Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
<b>Task #</b>	<b>Fuselage – 24 Listed Tasks</b>				
F1	Fabricate Longitudinal Members				
F2	Fabricate Composite Cores or Shells, Skins				
F3	Fabricate Bulkheads or Crossmembers				
F4	Fabricate Control Yokes/Sticks				
F5	Assemble Control Yokes/Sticks				
F6	Fabricate Flt Control Push Pull Tubes/Cables				
F7	Assemble Flt Control Push Pull Tubes/Cables				
F8	Assemble Fuselage Basic Structure				
F9	Fabricate Brackets and Fittings				
F10	Assemble Brackets and Fittings				
F11	Fabricate Cables, Wire, and Lines				
F12	Assemble Cables, Wire, and Lines				
F13	Fabricate Fuselage Fuel System Components				
F14	Assemble Fuselage Fuel System Components				
F15	Fabricate Fuselage Covering or Skin				
F16	Assemble Fuselage Covering or Skin				
F17	Fabricate Windshield				
F18	Assemble Windshield to Fuselage				
F19	Fabricate Windows				
F20	Assemble Windows to Fuselage				



F21	Fabricate Doors/Canopy				
F22	Assemble Doors/Canopy to Fuselage				
F23	Fabricate Mast and Strut Assembly				
F24	Assemble Mast and Strut Assembly				
	Add item:				
	Add item:				
	Add item:				
	Add-item:				
Total of # Fuselage Tasks	<b><u>Fuselage Subtotal</u></b>	Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
	<b><u>Fuselage Total Points</u></b> ▶				

<b>FABRICATION AND ASSEMBLY TASKS</b>		<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
		Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
<b>Task #</b>	<b>Wings – 51 Listed Tasks</b>				
W1	Fabricate Wing Spars				
W2	Assemble Wing Spars to Wing				
W3	Fabricate Wing Ribs or Cores				
W4	Assemble Wing Ribs or Cores to Wing				
W5	Fabricate Composite Cores				
W6	Assemble Composite Cores to Wing				
W7	Fabricate Wing Leading and Trailing Edges				
W8	Assemble Wing Leading & Trailing Edges to Wing				
W9	Fabricate Drag/Anti-drag Truss Members				
W10	Assemble Drag/Anti-drag Truss Members to Wing				
W11	Fabricate Wing Brackets and Fittings				
W12	Assemble Wing Brackets and Fittings to Wing				
W13	Fabricate Wing Tips				
W14	Assemble Wing Tips to Wings				
W15	Fabricate Special Tools or Fixtures				
W16	Fabricate Aileron Spars				
W17	Fabricate Aileron Ribs or Cores				
W18	Assemble Aileron Ribs or Cores to Aileron				
W19	Assemble Aileron Primary Structure				
W20	Fabricate Aileron Leading and Trailing Edges				
W21	Assemble Aileron Leading and Trailing Edges				
W22	Fabricate Aileron Brackets and Fittings				
W23	Assemble Aileron Brackets & Fittings to Aileron				
W24	Fabricate Aileron covering or Skin				
W25	Assemble Aileron Covering or Skin to Aileron				
W26	Fabricate Aileron Roll Trim				
W27	Assemble Aileron Trim Tab/Roll Trim to Aileron				
W28	Assemble Aileron to Wing				
W29	Fabricate Flap Spars				
W30	Assemble Flap Spars to Flap				
W31	Fabricate Flap Ribs or Cores				

W32	Assemble Flap Ribs or Cores to Flap				
W33	Assemble Flap Primary Structure				
W34	Fabricate Flap Leading and Trailing Edges				
W35	Assemble Flap Brackets and Fittings to Flap				
W36	Fabricate Flap Covering or Skin				
W37	Assemble Flap Covering or Skin to flap				
W38	Assemble Flaps to Wing				
W39	Fabricate Wing External Lighting Components				
W40	Assemble Wing Ext Lighting Components to Wing				
W41	Assemble Basic Wing Structure				
W42	Fabricate Wing Fuel System components				
W43	Assemble Wing Fuel System Components to Wing				
W44	Fabricate Cables Wires and Lines				
W45	Assemble Cables Wires and Lines to Wing				
W46	Fabricate Wing Covering or Skin				
W47	Assemble Wing Covering or Skin to Wing				
W48	Fabricate Wing Struts/Wires				
W49	Fabricate Fuel Tank				
W50	Assemble Fuel Tank to Wing				
W51	Calibrate Fuel System Components				
	Add item:				
	Add item:				
	Add item:				
	Add item:				
Total # of Wings Tasks	<b><u>Wings Subtotal</u></b>	Mfr Kit/Part/Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
	<b><u>Wings Total Points ►</u></b>				

<b>FABRICATION AND ASSEMBLY TASKS</b>		<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
		Mfr Kit/Part/Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
<b>Task #</b>	<b>Empennage – 57 Listed Tasks</b>				
E1	Fabricate Horizontal Stabilizer Spars				
E2	Assemble Horizontal Stabilizer Spars to Stabilizer				
E3	Fabricate Ribs or Cores				
E4	Assemble Horizontal Stabilizer Ribs or Cores to Stabilizer				
E5	Fabricate Horizontal Stabilizer Leading and Trailing Edge				
E6	Assemble Horizontal Stabilizer Leading and Trailing Edges to Stabilizer				
E7	Fabricate Horizontal Stabilizer Brackets & Fittings				
E8	Assemble Horizontal Stabilizer Brackets and Fittings to Stabilizer				
E9	Assemble Horizontal Stabilizer Structure				
E10	Fabricate Horizontal Stabilizer Lead/Trailing Edges				
E11	Assemble Horizontal Stabilizer Lead/Trailing				

	Edges to Stabilizer				
E12	Fabricate Horizontal Stabilizer Cables, Wires and Lines				
E13	Assemble Horizontal Stabilizer Cables, Wires and Lines to stabilizer				
E14	Fabricate Horizontal Stabilizer Empennage Covering or Skin				
E15	Assemble Horizontal Stabilizer Empennage Covering or Skin to Stabilizer				
E16	Assemble Horizontal Stabilizer Structure to Fuselage				
E17	Fabricate Elevator Spars				
E18	Assemble Elevator Spars to Elevator				
E19	Fabricate Elevator Ribs or Cores				
E20	Assemble Elevator Ribs or Cores to Elevator				
E21	Assemble Elevator Structure				
E22	Fabricate Elevator Leading and Trailing Edge				
E23	Assemble Elevator Leading and Trailing Edges to Elevator				
E24	Fabricate Elevator Brackets and Fittings				
E25	Assemble Elevator Brackets and fittings to Elevator				
E26	Fabricate Elevator Covering or Skins				
E27	Assemble Elevator Covering or Skins to Elevator				
E28	Fabricate Elevator Trim Tab				
E29	Assemble Elevator Trim Tab to Elevator				
E30	Fabricate Special Tools or Fixtures				
E31	Fabricate Vertical Stabilizer Spars				
E32	Assemble Vertical Stabilizer Spar to the Vertical Stabilizer				
E33	Fabricate Vertical Stabilizer Ribs or Cores				
E34	Assemble Ribs or Cores to Vertical Stabilizer				
E35	Fabricate Vertical Stabilizer Leading/Trailing Edges				
E36	Assemble Leading and Trailing Edges to Vertical Stabilizer				
E37	Fabricate Vertical Stabilizer Brackets and Fittings				
E38	Assemble brackets and Fittings to Vertical Stabilizer				
E39	Fabricate Vertical Stabilizer Cables, Wires, Lines				
E40	Assemble Cables, Wires, Lines to Vertical Stabilizer				
E41	Fabricate Vertical stabilizer Empennage Covering or Skin				
E42	Assemble Vertical stabilizer Empennage Covering or Skin to Vertical Stabilizer				
E43	Assemble Vertical Stabilizer Structure to Fuselage				
E44	Fabricate Rudder Spar				
E45	Assemble Rudder Spar to Rudder				
E46	Fabricate Rudder Ribs or Cores				
E47	Assemble Rudder Ribs or Cores to Rudder				
E48	Assemble Rudder Structure				
E49	Fabricate Rudder Leading and Trailing Edge				
E50	Assemble Rudder Leading and Trailing Edge to Rudder				
E51	Fabricate Rudder Brackets and Fittings				
E52	Assemble Rudder Brackets and Fittings to Rudder				
4					

E53	Fabricate Rudder Covering or Skin				
E54	Assemble Rudder Covering or Skin to Rudder				
E55	Fabricate Rudder Trim Tab				
E56	Assemble Rudder Trim Tab to Rudder				
E57	Assemble Rudder to Vertical Stabilizer				
	Add item:				
	Add item:				
	Add item:				
	Add item:				
Total # of Empennage Tasks	<b><u>Empennage Subtotal</u></b>	Mfr Kit/Part/Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
	<b><u>Empennage Total Points ►</u></b>				

<b>FABRICATION AND ASSEMBLY TASKS</b>		<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
		Mfr Kit/Part/Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
<b>Task #</b>	<b>Landing Gear – 12 Listed Tasks</b>				
LG1	Fabricate Struts				
LG2	Fabricate Brake System Components				
LG3	Fabricate Landing Gear Actuation System Components				
LG4	Fabricate Landing Gear System Cables, Wires and Lines				
LG5	Assemble Wheels				
LG6	Assemble Brakes, Tires				
LG7	Assemble Landing Gear				
LG8	Assemble Landing Gear System Components Next Level Structure				
LG9	Align Landing Gear				
LG10	Fabricate Landing Gear Fairings/Gear Doors				
LG11	Assemble Landing Gear Fairings/Gear Doors to Next Level Structure				
LG12	Perform Landing Gear Operational Check (Normal, Emergency Systems)				
	Add item:				
	Add item:				
	Add item:				
	Add item:				
Total # of Land Gear Tasks	<b><u>Landing Gear Subtotal</u></b>	Mfr Kit/Part/Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
	<b><u>Landing Gear Total Points ►</u></b>				

<b>FABRICATION AND ASSEMBLY TASKS</b>		<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
		Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
<b>Task #</b>	<b>Propulsion – 27 Listed Tasks</b>				
P1	Fabricate Engine Mount(s)				
P2	Assemble Engine Mount(s) to Next Level Structure				
P3	Fabricate Engine Cooling System/Baffles				
P4	Assemble Engine Cooling System Baffles to Engine				
P5	Fabricate Engine Compartment Overheat/Fire Detection System				
P6	Assemble Engine Compartment Overheat/Fire Detection System to Engine Compartment				
P7	Fabricate Induction System				
P8	Assemble Induction System to Engine				
P9	Fabricate Exhaust System				
P10	Assemble Exhaust System to Engine				
P11	Fabricate Engine Control Installation Brackets				
P12	Assemble Engine Controls to Next Level Structure				
P13	Rig and Adjust Engine Controls				
P14	Fabricate Brackets and Fittings				
P15	Assemble Brackets and Fittings to Next Level Structure				
P16	Fabricate Cables, Wires and Lines				
P17	Assemble Cables, Wires and Lines to next Level Structure				
P18	Assemble Engine (Likely N/A)				
P19	Assemble Engine to Engine Mount				
P20	Fabricate Engine Propeller (Likely N/A)				
P21	Fabricate Propeller Spinner Components				
P22	Assemble Propeller to Engine				
P23	Rig and Track Propeller				
P24	Fabricate Engine Cowling				
P25	Assemble Engine Cowling to Airframe				
P26	Fabricate Engine Fuel System Components				
P27	Assemble Engine Fuel System Components to Next Level Structure				
	Add item:				
	Add item:				
	Add item:				
	Add item:				
Total # of Propulsion Tasks	<b><u>Propulsion Subtotal</u></b>	Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
	<b><u>Propulsion Total Points ►</u></b>				

<b>FABRICATION AND ASSEMBLY TASKS</b>		<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
		Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
<b>Task #</b>	<b>Cockpit Interior – 11 Listed Tasks</b>				
C1	Fabricate Instrument Panel				
C2	Fabricate Instrument Panel Bracket and Fittings				
C3	Assemble Instrument Panel with Fittings and Brackets				
C4	Assemble Avionics to Instrument Panel				
C5	Fabricate Seats				
C6	Fabricate Seat Brackets and Fittings				
C7	Assemble Seats to Cockpit				
C8	Fabricate Seat Belts Fittings and Shoulder Harness Fittings				
C9	Assemble Seat Belts and Shoulder Harness to Structure				
C10	Fabricate Electrical Wiring, Controls and Switches				
C11	Assemble Electrical Systems Controls and Switches to Next Level Structure				
	Add item:				
	Add item:				
	Add item:				
	Add item:				
Total # of Cockpit Tasks	<b><u>Cockpit Subtotal</u></b>	Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
	<b><u>Cockpit Total Points ►</u></b>				
Total # of Aircraft Tasks	<b>See NOTE 2</b>				
	<b>◀ SUM #1</b>				





**TOTAL TASKS AND LINE ITEMS**



<b>FABRICATION AND ASSEMBLY SUMMARY</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
	Mfr Kit/Part/ Component	Commercial Assistance	Am-Builder Assembly	Am-Builder Fabrication
<b>1. Total Points for Each Category. (Note 1)</b>				
<b>2. Total Points for Complete Aircraft Construction (SUM # 2 should equal SUM # 1 above). (Note 2)</b>	<b>(SUM #2) ►</b> <input type="text"/>			
<b>3. Percentage of Each Category as Part of Total Aircraft Construction. (Note 3)</b>				
<b>4. Total Percentages for Complete Aircraft Construction (Add all percentages in row 3) Total should equal 100% (± .5%). (Note 4)</b>	<input type="text"/>			
<b>5. Total Builder Points – Add points in row 1, column C and D only, together. (Note 5)</b>			<input type="text"/>	
<b>6. Total Builder Percentage – Add percentages in row 3, columns C and D only, together. (Note 6)</b>			<input type="text"/>	

## NOTES: INSTRUCTIONS FOR COMPLETING FABRICATION AND ASSEMBLY CHECKLIST

**1: TOTAL POINTS FOR EACH CATEGORY** [Columns A, B, C and D]. Each column's total points are tallied by adding the sum of the points awarded to the tasks in each section (i.e., Fuselage, Wings, Empennage, etc.). Include points assigned to 'Additional Items' in each section. Boxes with a N/A (not applicable) have zero points.

**2: TOTAL POINTS FOR COMPLETE AIRCRAFT CONSTRUCTION. SUM #1.)** To find total points, add up the six "Total # of Tasks" blocks at the bottom left of each aircraft tasks section. **SUM #2.)** In the FABRICATION AND ASSEMBLY SUMMARY section, add the four blocks from each column's category total, (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  $\pm 0.5$ ). Total points will vary from aircraft to aircraft depending on number of N/As (Not Applicable), and 'Additional Items' applied. (184 listed task points + 'Additional Items' - N/As)

**3: PERCENTAGE OF EACH CATEGORY.** To compute percentages, divide each of the point totals in each column (row 1) individually by the number derived in row 2. For example if the total points of Mfr Kit/Part/Component category (Column A) = 60 and the number in row 2 = 170, then divide 60 by 170 to equal 35.3%. Do this for each category column. Percentages may be rounded to the nearest tenth, (i.e., 22.86% is rounded up to 22.9%).

**4: TOTAL PERCENTAGES FOR COMPLETE AIRCRAFT CONSTRUCTION.** Add the percentages of each of the four categories together (Columns A+B+C+D). Total must be equal to 100% with a ( $\pm$ ) deviation limited to  $\frac{1}{2}$  % (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 1, 2 or 3.

**5: TOTAL BUILDER POINTS.** Add the two point tallies from Column C and Column D derived in row 1. Total will vary from aircraft to aircraft depending on number of N/As applied.

**6: TOTAL BUILDER PERCENTAGE.** Add the two percentage tallies from Column C and Column D derived in row 3. Total must exceed 50% to be eligible for amateur built status and to meet major portion requirement under 14 CFR Part 21.191(g).

## EXPLANATIONS and EXAMPLES

► 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 as Commercial Assistance, 0.2 to the Amateur Builder as Fabrication, for a total of 1 point.

► 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.

# APPENDIX D—FAA FORM 8130-12, ELIGIBILITY STATEMENT, AMATEUR-BUILT AIRCRAFT

*Form Approved*  
OMB NO. 2120-0018

 <small>US Department of Transportation Federal Aviation Administration</small>	<h2 style="margin: 0;">ELIGIBILITY STATEMENT AMATEUR-BUILT AIRCRAFT</h2>	<b>Instructions:</b> Print or type all information except signature. Submit original to an authorized FAA representative. Applicant completes Section I thru III. Notary Public Completes Section IV.
<b>I. REGISTERED OWNER INFORMATION</b>		
Name(s) _____		
Address(es) _____		
No. & Street	City	State      Zip
Telephone No.(s) (    ) _____ (    ) _____		
Residence	Business	
<b>II. AIRCRAFT INFORMATION</b>		
Model _____		Engine(s) Make _____
Assigned Serial No. _____		Engine(s) Serial No. _____
Registration No. _____		Prop./Rotor(s) Make _____
Aircraft Fabricated:    Plan <input type="checkbox"/> Kit <input type="checkbox"/>		Prop./Rotor(s) Serial No.(s) _____
<b>III. MAJOR PORTION ELIGIBILITY STATEMENT OF APPLICANT</b>		
I certify that the major portion of this aircraft (identified in Section II above) was fabricated and assembled by		
_____		
Names of all builders (Please Print)		
solely for my (our) education or recreation, in accordance with 14 CFR part 21, Certification Procedures for Products and Parts, § 21.191(g), Operating amateur-built aircraft. I have records to support this statement and will make them available to the FAA upon request.		
During the fabrication and assembly of this project, // we used the following commercial assistance (mark N/A if no commercial assistance was used):		
_____	_____	_____
Name of company or individual(s)	City & State	Phone
_____	_____	_____
Name of company or individual(s)	City & State	Phone
<b>-NOTICE-</b>		
Whoever in any matter within the jurisdiction of the executive, legislative, or judicial branch of the Government of the United States, knowingly and willfully falsifies, conceals or covers up by any trick, scheme, or device a material fact, or who makes any false, fictitious or fraudulent statement or representation, or makes or uses any false writing or document knowing the same to contain any materially false, fictitious or fraudulent statement or entry, shall be fined or imprisoned not more than 5 years, or if the offense involves international or domestic terrorism, imprisoned not more than 8 years, or both. (U.S. Code, Title 18, Sec. 1001)		
<b>APPLICANT'S DECLARATION</b>		
I hereby certify that all statements and answers provided by me in this statement form are complete and true to the best of my knowledge, and I agree that they are to be considered part of the basis for issuance of any FAA certificate to me. I have also read and understand the Privacy Act statement that accompanies this form.		
Signature of Applicant ( <i>In Ink</i> ) _____		Date _____
<b>IV. NOTARIZATION STATEMENT</b>		

Form 8130-12 (X-X) Supersedes Previous Edition

NSN: 0052-00-889-9002

## APPENDIX E—EXPERIMENTAL AIRCRAFT ASSOCIATION'S RECOMMENDED CHANGES TO FAA ORDER 8130.2F AND AC 20-27G

The following information is the Experimental Aircraft Association (EAA)'s item-by-item response to FAA's proposed policy changes to FAA Order 8130.2F. The document appears with recommended deletions (line outs) and revisions (italics) in the format submitted by the EAA. The FAA's response (Disposition) is included to each of EAA's Proposed Revisions.

### **PROPOSED REVISIONS/COMMENTS TO FAA ORDER 8130.2F—SECTION 9**

---

#### ***PARAGRAPH 146, GENERAL***

Acceptable as drafted.

#### ***PARAGRAPH 147, ELIGIBILITY***

Subparagraph a. Proposed Revision/Change: “Kit aircraft manufactured and assembled by a business for sale to other persons are not considered amateur-built and do not meet the education or recreation requirements of § 21.191(g)” to “Aircraft manufactured and assembled by an individual or a business ....”

Disposition: This proposed revision was not accepted because it is too difficult to determine the intent of a person. FAA offered that the addition of “an individual” was not supported by the regulation in that it attempted to ascertain a person's mindset prior to an act. The example of a commercial builder contracting with a second party to build an aircraft prior to construction for the intent of sale at completion is already covered in the current policy as illegitimate.

Subparagraph b. Proposed Revision/Change: Remove “within that 51 percent, the amateur builder must fabricate at least 20 percent of the aircraft kit and assemble at least another 20 percent. The remaining 11 percent may vary between fabrication and assembly.”

Disposition: As part of the ARC discussions, the FAA agreed to consider withdrawal of the 20/20/11 component from its proposal.

Subparagraph b(2). Proposed Revision/Change: Remove the word “main” as follows: “...Ultralights & Amateur-Built Aircraft” section under the ~~main~~ “Aircraft” topic tab on the FAA's ~~main~~ Web page as www.faa.gov.”

Disposition: Editorial. The FAA agreed to revise to reflect the proper information.

## ***PARAGRAPH 148, DETERMINATION OF MAJOR PORTION***

Subparagraph a(4). Proposed Revision/Change: “The aircraft was built from prefabricated major components that are readily available from aircraft parts suppliers, *other than those components listed in paragraph 149 a (2).*”

Disposition: The FAA concurs in principle and agreed to review and revise as necessary.

## ***PARAGRAPH 149, DESIGN AND CONSTRUCTION***

Subparagraph a. Proposed Revision/Change: Remove text to read “...satisfactory evidence must be presented to show that the aircraft was not ~~fabricated and~~ assembled from completely prefabricated parts or kits.”

Disposition: The FAA concurs in principle and agreed to review and revise as necessary.

Subparagraph b(3). Proposed Revision/Change: Add more specific language as follows “amateur builders should be made aware that excessive use of *prefabricated or salvaged* major assemblies.....”

Disposition: The FAA concurs in principle and agreed to review and revise as necessary.

Subparagraph b(3). Proposed Revision/Change: Define “Fabrication is defined as “to perform work on a part or component, such as gluing, forming, shaping, trimming, drilling, applying protective coatings, riveting, welding or heat-treating, transforming the part or component into its finished state. This excludes rebuilding or restoring activities.”

Disposition: A new definition of fabrication was developed and accepted by the ARC based on the public comments. The FAA will consider inclusion of the new definition in the final policy.

Subparagraph c. Proposed Revision/Change: Proposed that modifications to salvaged Major Assemblies that may be credited as follows: “If an amateur builder uses a salvaged major assembly from a type-certificated aircraft, ~~changes the original design~~ and then fabricates entirely new parts from raw stock or materials, some of the fabrication may be creditable. For example, an amateur builder uses a salvaged wing, keeps the wing spar, and fabricates new wing ribs *from raw stock of his own design*, the amateur builder could be given credit for the rib fabrication. However, amateur builders need to be made aware that:”

Disposition: Accepted. Will coordinate with section discussing “Attempting to Convert a Type-Certificated Aircraft.” The FAA will review and compare both sections and provide clear and consistent information in the final policy that the alteration, modification and repair of type-certificated aircraft is inconsistent with amateur-built airworthiness certification.

Subparagraph c(2). Proposed Revision/Change: Proposed change: “~~Alterations, modifications and~~ repairs to a type-certificated aircraft will be categorized as falling under 14 CFR Part 43. As a result, ~~such alterations, modifications and~~ repairs will not be accounted as fabrication or assembly conducted by the amateur builder towards an amateur-built aircraft project.”

Disposition: Rejected. Additional text to clarify the intent will be considered. As mentioned, alterations, modifications and repairs to type-certificated aircraft are clearly part of the language included in the reference (14 CFR Part 43) cited above and those applications performed on any type-certificated aircraft will not qualify the aircraft as amateur-built. The builder can receive no construction credit classified towards “major portion” for such an endeavor. The EAA advised that they intended to submit further clarification on this topic.

Subparagraph d. Proposed Revision/Change: propose revision to “Attempting to Convert a Type-Certificated Aircraft to an Amateur-Built Aircraft” as follows: “The practice of attempting to convert a type-certificated aircraft to amateur-built aircraft by crediting rebuilding, ~~alterations~~ or repairs, does not meet the intent of § 21.191(g). Applications for such aircraft will not be accepted.”

Disposition: Rejected. Additional text to clarify the intent will be considered. Addition of a scenario based chart would be considered. See previous comments. Also, it is the FAA’s intent to stop conversions of Type-Certificated aircraft from being converted into and certified as experimental amateur-built aircraft as has occurred on several occasions in recent years.

Subparagraph e(1). Proposed Revision/Change: Revise as follows: “An aircraft that is fabricated and assembled from a kit may be eligible for amateur-built certification, provided the major portion of the aircraft has been fabricated and assembled by ~~the applicant~~ *amateur builder(s)* for education or recreation purposes....”

Disposition: The FAA concurs in principle. Text will be reviewed and revise as necessary.

Subparagraph e(2). Proposed Revision/Change: Revise “... An aircraft assembled from a kit composed entirely of completely finished prefabricated components, ~~parts, and precut/predrilled materials~~ is not eligible for an experimental amateur-built airworthiness certificate.”

Disposition: The FAA agreed to delete “precut/predrilled materials,” but “parts” is to remain and possibly the word “assemblies” is to be added.

## ***PARAGRAPH 150, FAA EVALUATION OF AMATEUR-BUILT AIRCRAFT KITS***

Subparagraph b. Proposed Revision/Change: Revise as follows “.....However, this does not mean that all the credit for the ~~fabrication~~ tasks may then be given on the Amateur-Built Fabrication and Assembly Checklist to the amateur builder. Rather, an adequate percentage of a task ~~will~~ may be accounted for on the Amateur-Built Fabrication and Assembly Checklist in the kit manufacturer column. ~~If there is insufficient work for a particular task, the credit will be placed in the Kit Manufacturer or Commercial Assistance columns.~~”

Disposition: Partly accepted. FAA will evaluate the comment in full context of this section based on this and additional comments addressing credit beyond instruction. Along these lines, the FAA will consider eliminating “fabrication” from the paragraph. The word “adequate” is not precise in its meaning and revision will be considered.

Subparagraphs e and f. Proposed Revision/Change: Remove sections e. and f. from paragraph 150 and place under paragraph 148 and renumber as appropriate.

Disposition: Partial concurrence. In the case of paragraph 150e, this paragraph allows that a kit manufacturer may use the checklist as a guide to assist in developing its kit and as such it is appropriately placed in FAA Order 8130.2F under the “FAA Evaluation of Amateur-Built Kits” paragraph. The paragraph will be revised to convey that concept. In the case of paragraph 150f, the FAA concurs that the paragraph is not appropriately placed and will review its content for proper placement under paragraph 148.

Subparagraph f. Proposed Revision/Change: Revise providing commercial and/or educational assistance as follows: “... The FAA will not credit toward the major portion determination any tasks completed by the commercial assistance provider ~~for educational purposes.~~”

Disposition: The FAA agreed to add text that makes clear that educational instruction provided on how to perform a task as opposed to accomplishing the task is allowable and credited to the builder. However, this does not mean that the policy will allow all educational assistance to be credited to the amateur builder at the discretion of the evaluator. Instructors who actually demonstrate on actual parts (of the amateur-built aircraft) will be restricted to only the instruction that is needed to learn a technique will be credited to the builder.

Subparagraph f(2). Proposed Revision/Change: Revise paragraph 150f(2) by removing the last sentence follows: “...A reasonable level of fabrication knowledge is necessary for the FAA to issue the amateur builder a repairman certificate as the primary builder of the aircraft to which the privileges of the certificate are applicable as provided under 14 CFR § 65.104.”

Disposition: The FAA agreed to coordinate with Flight Standards and consider whether any change on this subject is necessary compared to the previous version of the document. The FAA realizes that this sentence is vague in nature (“reasonable”) and if an exact percentage figure is not stipulated then it will be revised. However, some fabrication is related to one’s ability to exercise the privileges of the repairman’s certificate.

Subparagraph k. Proposed Revision/Change: Remove k. from paragraph 150, renumber and place under paragraph 147 Eligibility.

Disposition: The FAA concurs and will revise as necessary.

**PARAGRAPH 151, ADVISING APPLICANTS**

Acceptable as drafted.

**PARAGRAPH 152, CERTIFICATION PROCEDURES**

Subparagraph b. Proposed Revision/Change: Revise b. Major Portion Determination table as follows:

Method of Construction	FAA Must Determine Major Portion?	
	Yes	No
The aircraft was fabricated and assembled from a kit on the FAA kit listing, no modifications to the kit were made, and commercial assistance was not used.		X
The aircraft was fabricated and assembled from a kit on the FAA kit listing. However, the kit was modified and/or the builder(s) used commercial assistance.	X	
The aircraft was fabricated and assembled from a kit that does not appear on the FAA kit listing.	X	
The aircraft was fabricated and assembled from plans, used no salvaged major assemblies, and commercial assistance was not used.	X	X
The aircraft was fabricated and assembled from plans, However, the amateur builder used salvaged major assemblies and/or commercial assistance.	X	

Disposition: The FAA concurs in principle and will review and revise as necessary.

Subparagraph c. Proposed Revision/Change: Revise c. as follows: "...Deviations from the AIR-200-identified kit configuration or changes that would result in an increase in the amount of commercial assistance require AIR-200 to determine (prior to fabrication and assembly, and using Amateur-Built Fabrication and Assembly Checklist) that the kit still meets the major portion requirement. ~~This is necessary in order to determine whether the amateur builder(s) still fabricated at least 20 percent of the aircraft and assembled at least another 20 percent within the scope of the major portion requirements discussed in paragraph 147.~~

Disposition: The FAA agrees because, as part of the ARC discussions, the FAA agreed to consider withdrawal of the 20/20/11 component from its proposal.

Subparagraph e(4). Proposed Revision/Change: Revise paragraph 152e(4) as follows: "...Because the FAA usually will not perform any in-process inspections, the amateur builder's documentation ~~must~~ should indicate in-process inspections by knowledgeable persons such as other builders, EAA technical counselors or certificated mechanics...."

Disposition: The FAA concurs in principle and will review and revise as necessary.

### **PARAGRAPH 153, FLIGHT TEST AREA**

Subparagraph c(2). Proposed Revision/Change: Revise paragraph 153c(2) as follows: "In the case of an aircraft located at any airport surrounded by a densely populated area and lacking any acceptable approach/departure route of flight, ~~the FAA must deny the airworthiness certificate and process the denial in accordance with paragraph 88 of this order.~~ The applicant must be advised to relocate the aircraft by other means to a suitable airport *before operating limitations can be issued.*"

Disposition: The FAA concurs in principle although this issue is viewed as flight standards operational requirement and not restricted to an airworthiness issue. Review and revise as necessary.

### **PARAGRAPH 154, ISSUANCE OF EXPERIMENTAL AMATEUR-BUILT OPERATING LIMITATIONS**

Subparagraph c(3). Proposed Revision/Change: Revise paragraph 154c(3) as follows: "The FAA ~~requires~~ recommends a minimum of 25 hours of flight testing for an aircraft with a type-certificated engine and propeller combination installed. A minimum of 40 hours is ~~required~~ recommended when a non-type-certificated engine, propeller, or engine/propeller combination is installed. The FAA may assign longer test hours when it is necessary to determine compliance with § 91.319(b)."



Disposition: The FAA does not concur. The minimums have historically been part of FAA policy and the FAA sees continuing value in maintaining the minimums as represented in the current policy. Besides, this is outside of the scope of the proposed policy changes. .

### **FIGURE 9-1, DEPICTION OF MAJOR PORTION**

Proposed Revision/Change: Delete figure 9-1 visually depicting the 20/20/11 proposal.

Disposition: The FAA agrees because, as part of the ARC discussions, the FAA agreed to consider withdrawal of the 20/20/11 component from its proposal.

## **PROPOSED REVISIONS/COMMENTS TO FAA ADVISORY CIRCULAR AC 20-27G**

---

### **PARAGRAPH 1, PURPOSE OF THE ADVISORY CIRCULAR**

Subparagraph c(1). Proposed Revision/Change: Major portion, as follows: “The determination of major portion is made by evaluating the amount of work accomplished by the amateur builder(s) against the total amount of work necessary to complete the aircraft, excluding standard procured items. The major portion of the aircraft is defined as more than 50 percent of the fabrication and assembly tasks (51 percent). This is sometimes referred to as the “51 percent rule.” ~~Within that 51 percent, the amateur builder must fabricate at least 20 percent of the aircraft kit and assemble at least another 20 percent. The remaining 11 percent may vary between fabrication and assembly.”~~

Disposition: The FAA agrees because, as mentioned above, as part of the ARC discussions, the FAA agreed to consider withdrawal of the 20/20/11 component from its proposal.

### **PARAGRAPH 6, WHAT TO DO AND KNOW BEFORE BUILDING AN AMATEUR-BUILT AIRCRAFT**

Subparagraph a(2). Proposed Revision/Change: Revise paragraph 6a(2) as follows: “The major portion of the aircraft is defined as more than 50 percent of the fabrication and assembly tasks (51 percent). ~~Within that 51 percent, the amateur builder must fabricate at least 20 percent of the total aircraft and at least assemble 20 percent. Any fabrication or assembly tasks contracted to another party (for hire) or provided by a commercial assistance center must not reduce the amateur builder’s fabrication/assembly percentage below 51 percent. The graph below provides a visual depiction of this.”~~

Disposition: With regards to the 20% minimum fabrications, the FAA agrees because, as part of the ARC discussions, the FAA agreed to consider withdrawing the 20/20/11 component from its proposal. Regarding the second sentence strike out starting with “Any fabrication or assembly tasks contracted...” the FAA does not concur and the sentence must remain. The concept of commercial assistance not providing more construction application then is allowed under the regulation which limits that assistance

to the difference between what the kit manufacturer provides and the 51 percent “major portion” required by the amateur builder is well established and not up for negotiation. For example, if a kit is evaluated as providing 40% of the fabrication and assembly needed to complete the aircraft, then the limit of construction that can be fabricated and assembled by commercial assistance is 10%, leaving a minimum of 51% of the construction for the amateur builder.

Subparagraph a(3). Proposed Revision/Change: Delete paragraph 6a(3) in its entirety and renumber paragraph 6a(4) to paragraph 6a(3).

Disposition: The FAA agrees because, as mentioned above, as part of the ARC discussions, the FAA agreed to consider withdrawal of the 20/20/11 component from its proposal.

### ***PARAGRAPH 7, DESIGNING AND CONSTRUCTING AN AMATEUR-BUILT AIRCRAFT***

Subparagraph d(3). Proposed Revision/Change: Revised as follows: “Fabrication is defined as “to perform work on a part or component, such as gluing, forming, shaping, trimming, drilling, applying protective coatings, riveting, welding or heat-treating, transforming the part or component into its finished state.” This excludes rebuilding or restoring activities.”

Disposition: As discussed above, a new definition of fabrication developed and accepted by the ARC based on comments. AIR-200 agreed to accept the new definition in the final policy.

Subparagraph e(2). Proposed Revision/Change: Revise paragraph 7e(2) as follows: “~~Alterations, modifications and~~ repairs to a type-certificated aircraft will be categorized as falling under 14 CFR Part 43. As a result, such ~~alterations, modifications and~~ repairs will not be accounted as fabrication or assembly conducted by the amateur builder towards an amateur-built aircraft project.”

Disposition: Rejected as submitted. Additional text to clarify the intent will be considered. As mentioned, alterations, modifications and repairs to type-certificated aircraft are clearly part of the language included in the reference (14 CFR Part 43) cited above and those applications performed on any type-certificated aircraft will not qualify the aircraft as amateur-built. The builder can receive no construction credit classified towards “major portion” for such an endeavor. The EAA advised that they intended to submit further clarification on this topic.

Subparagraph f(2). Proposed Revision/Change: Revise paragraph 7f(2) as follows: (note: this is the second “f.” section in paragraph 7. This section needs to renumber/letter section as appropriate)

“Install ~~FAA TSO approved~~ seatbelts and shoulder harnesses.”

Disposition: The FAA agreed and will review and clarify as required.

Proposed Revision/Change: Revise chart that immediately precedes paragraph 8, Registering your amateur-built aircraft, as follows:

Type of Kit Aircraft	FAA Evaluation Need?
Completed amateur-built aircraft built from a kit evaluated and published in the listing of eligible amateur-built aircraft kits with no commercial assistance used	<del>NO-Yes. The FAA has already evaluated the aircraft kit for compliance. will evaluate the aircraft for compliance with the major portion rule during airworthiness certification.</del>

Disposition: The FAA concurs in principle and will review and revise as necessary.

#### ***PARAGRAPH 17, SAFETY RECOMMENDATION***

Subparagraph a(1). Proposed Revision/Change: Revise paragraph 17a(1) as follows: “...You should test these operations by conducting taxi tests before attempting flight operations. You ~~may~~ are not authorized to take off during taxi tests without an airworthiness certificate.

Disposition: The FAA agreed and will review and clarify as required.

#### ***APPENDIX 1, DEFINITIONS RELEVANT TO THIS AC***

Proposed Revision/Change: Revise definition of fabricate as follows: “To perform work on a part or component, such as gluing, forming, shaping, trimming, drilling, applying protective coatings, riveting, welding or heat-treating, transforming the part or component into its finished state.”

Disposition: The ARC agreed on a new definition of fabrication developed during deliberations and based on public comments. AIR-200 agreed to accept the new definition in the final policy.

#### ***APPENDIX 9, SAMPLE AERONAUTICAL CENTER FORM 8050-88, AFFIDAVIT OF OWNERSHIP FOR AMATEUR-BUILT AIRCRAFT***

Proposed Revision/Change: Replace with most current revision of this form.

Disposition: The FAA concurs, the new form is under development.