USDA FOREST SERVICE
Fire and Aviation Management

AIRCRAFT INSPECTOR GUIDE

JUNE 2018

This guide was initially developed by Gil Elmy as reference guide for incoming inspectors. Prior to its development, training was informal, nonstandard, and based on "tribal" knowledge. We owe a debt of gratitude to Gil and the work he undertook on his own initiative. It has made a lasting impact on the Forest Service Aviation Maintenance Community. Thanks.

The Aircraft Inspector Guide provides guidance and reference material for National and Regional Aviation Safety Inspectors during the day-to-day performance of their duties. It replaces the Aircraft Inspection Guide Handbook which is now obsolete. This new revision has been reformatted, edited, and reviewed by a team from the US Forest Service FAM Airworthiness Group and is 508 compliant.

To submit requests for changes and/or additions for future revisions of this guide, users should reference the Revision Request Form on Page xv.

The use of trade, firm, or corporation names or illustrations of any particular product in this guide is for the information and convenience of the reader and does not constitute an endorsement of any product, service, or aircraft make and model to the exclusion of others that may be suitable.

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Revision Request Form

Please use the following form to submit revision requests for the Aircraft Inspector Guide.

USDA Forest Service
Fire and Aviation Management
Airworthiness and Logistics
3833 S. Development Ave. Boise, Idaho 83705-5354

AIRCRAFT INSPECTOR GUIDE

REVISION REQUEST FORM

CHAPTER	SECTION OR PARAGRAPH NUMBER	PAGE
Original Text in Question:		
Description of Proposed Revision:		

Attach additional details, supporting documentation, recommendations, and/or comments for use in approval evaluation.

Change Requested By	Title and Region	Date
Change Approved By	**Title**	**Date**

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Letter of Authority

Forest Service Washington Office 1400 Independence Avenue, SW
Washington, D.C. 20250

File Code: 5700 **Date:** AUG 2 0 2018
Route To:

Subject: USDA Forest Service 2018 Aircraft Inspection Guide

To: Regional Foresters, Regional Fire Directors, Regional Aviation Officers, and Regional Aviation Safety Managers

The 2018 revision of the Forest Service (FS) Aircraft Inspector Guide is approved for use. A copy of this approval letter will be included in the front of each Guide. The Aircraft Inspector Guide provides guidance and reference material for National and Regional Aviation Safety Inspectors during the day-to-day performance of their duties. It replaces the 2008 Aircraft Inspection Guide Handbook which is now obsolete.

The objectives of this Guide are to:

1. Define and standardize aircraft maintenance management, inspection, and operating procedures to ensure safe and efficient operations.
2. Promote the ability of personnel to provide a common agency-wide approach to aircraft inspection and maintenance procedures through standardization.
3. Provide guidance and familiarization training to Forest Service personnel on the policies, procedures, and practices associated with aircraft inspection and approval.

The 2018 Aircraft Inspector Guide is available on the Fire and Aviation Management website at www.fs.fed.us/fire/aviation/.

PATRICIA HIRAMI
Acting Deputy Chief, State and Private Forestry

cc: Shawna Legarza, Frank Hahenburg, Jeff Power, Aaron Schoolcraft, John A. Nelson, Paul Linse, Kent Hamilton, Tonya Rymer, Rock Parrilla, Donna Shope

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Chapter 1 – Introduction

1-1 Objectives

The objectives of this guide are to:

1. Define and standardize National maintenance management, inspection, and operating procedures to ensure safe and efficient operations.
2. Promote the ability of personnel in all Regions to provide a common Agency-wide approach to contract aircraft inspection and maintenance procedures through standardization.
3. Provide guidance and familiarization training to Forest Service personnel on the policies, procedures, and practices associated with aircraft inspection and approval.
4. Provide Forest Service employees with broad guidance for attaining approval on the USFS Approved Aircraft and Avionics Inspector List.

1-2 Authority

The aviation management directives of FSM 5700 and FSH 5709.16 provide the authority for this guide.

1-3 Scope

The procedures contained in this guide apply to Agency, contractor and cooperator aircraft maintenance and inspection procedures for both airplane and helicopter operations.

It is understood that each Region's procedures may vary due to differences in Regional requirements and varying contract requirements. This guide provides guidance and general information for managing aircraft maintenance programs.

1-4 Revisions

This Aircraft Inspector Guide (AIG) is a complete rewrite. In the future, reference the Revision List for an update on the latest revisions to this guide. Suggested changes should be submitted on a Revision Request Form (see AIG, page xv).

1-5 Organization

The chapters of this guide are organized to assist Aircraft Inspectors in understanding the standards and requirements of Forest Service aircraft maintenance management programs.

Notes

Chapter 2 – Organization

2-1 Introduction

This chapter provides a brief overview of the Forest Service aviation organization. Regional aviation staffs may vary depending on the Region, but through various lines of authority, Aviation Safety Inspectors (Airworthiness and Avionics) can trace their authority directly back to line officers. Throughout this guide the terms Regional Aviation Maintenance Manager, Aviation Safety Inspector, and Aircraft Inspector will be used interchangeably.

The Washington Office (West) in Boise is responsible for the National program, and in coordination with the Regions, develops aviation policy and procedures. Regional staffs are responsible for the program in their Region and have the responsibility to follow and implement National policies and procedures.

The Fire and Aviation Management (FAM) Organization Chart at the end of this chapter shows the major offices below the Secretary of Agriculture and the inspector's relative position in the organization. As stated above, Regional aviation staffs vary depending upon the Region, but the primary offices are shown in this organization chart.

2-2 Key Aviation and Aircraft Inspector Positions and Duties

Key aviation and Aircraft Inspector positions are listed below. For current guidance on duties and responsibilities, review the cited references.

2-2-1 Airworthiness Branch Chief (ABC)

Duties and responsibilities can be found in FSM 5704 and FSH 5709.16, Chapter 40.

2-2-2 Regional Aviation Officer (RAO)

Duties and responsibilities can be found in FSM 5704 and FSM 5720.48c.

2-2-3 Regional Aviation Safety Manager (RASM)

Duties and responsibilities can be found in FSH 5709.16.

2-2-4 Aviation Safety Inspector – Airworthiness (ASI-Airworthiness)

Duties and responsibilities can be found in FSH 5709.16, Chapter 40.

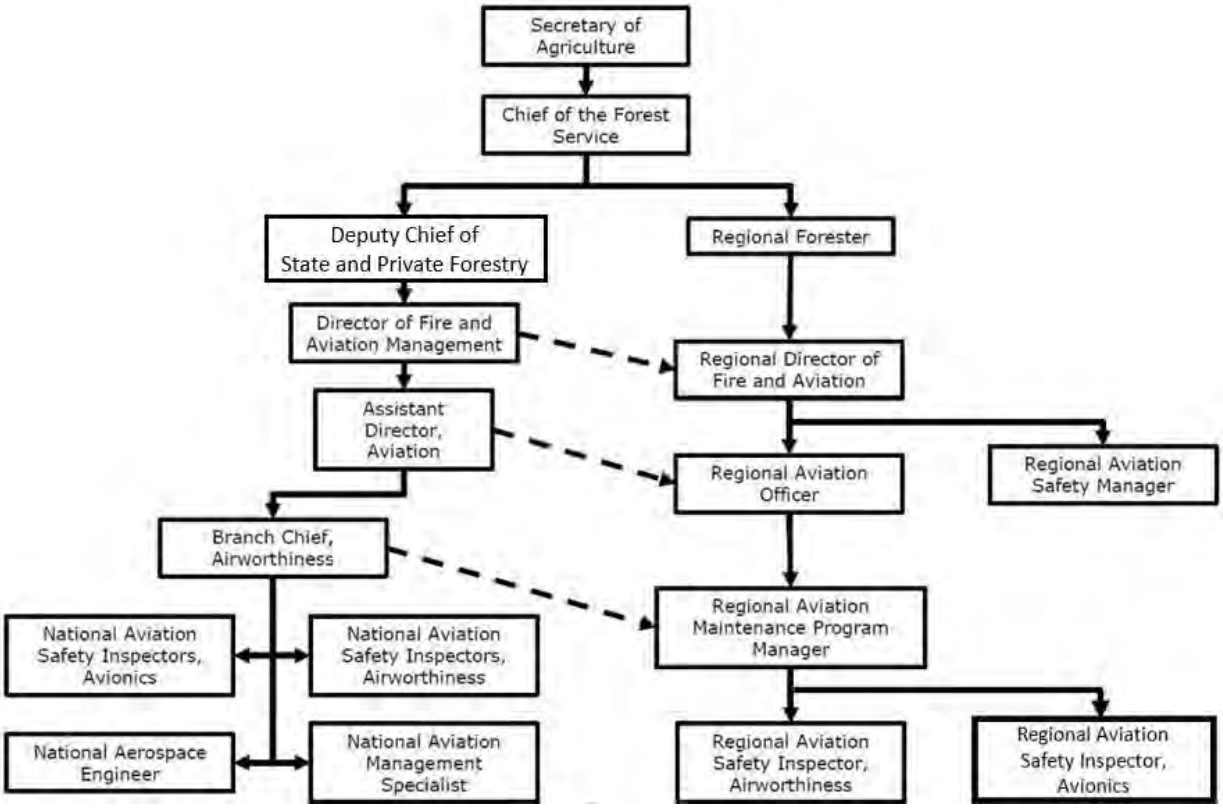
2-2-5 Aviation Safety Inspector – Avionics (ASI-Avionics)

Duties and responsibilities can be found in FSH 5709.16, Chapter 40.

2-3 Organization Chart

Figure 1: Fire and Aviation Management (FAM) Organization Chart

(Depicting General Relationship of Washington Office to Regions)



Notes

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Chapter 3 – Responsibilities, Qualifications, and Training

3-1 Introduction

This chapter establishes the common duties and responsibilities of an Aviation Safety Inspector (ASI) per FSH 5709.16, Chapter 40. A Regional Aircraft Inspector may have the dual role of Program Manager for their Region's Working Capital Fund (WCF) Aircraft Maintenance Program and Aircraft Maintenance Inspector, sometimes with National and Regional responsibilities.

To assist inspectors in understanding the knowledge requirements of their job, the Job Proficiency Subject Areas listed at the end of this chapter may be helpful in determining subject areas they need to be familiar with, as well as a list of study references. It should be used as a basis for initial study, not as an all-inclusive list of minimum knowledge requirements for inspectors. Inspectors are not expected to be completely knowledgeable of all areas listed (i.e., 14 CFR Part 21, 23, 25, etc.); instead, they should know the general requirements and be familiar enough with these parts to be able to readily understand and find a reference when needed. Inspectors shall be thoroughly familiar with the information found in FSM 5700, FSH 5709.16, and the Aircraft Inspector Guide (AIG).

3-2 Aviation Safety Inspector (ASI) - Airworthiness

Each Region operating Forest Service Working Capital Fund (WCF) aircraft will have at least one qualified ASI, Airworthiness.

Forest Service and contractor aircraft must be maintained in accordance with 14 CFR. Inspectors must also ensure that WCF aircraft are maintained in a standard configuration. Reference AIG, Chapter 13 and Regional Maintenance Procedures Guide (MPG).

3-2-1 Duties and Responsibilities

1. Provide Regional leadership for the:

    a. Inspection, maintenance, and repair of Forest Service WCF Fleet aircraft assigned to their Region and ensure assigned Forest Service aircraft are maintained in the standard configuration as determined by the Airworthiness Branch Chief (ABC).

    b. Inspection and approval of contracted aircraft. Inspectors must remain informed of problems affecting the airworthiness of contract aircraft operating in their Region and aid the field in resolving these problems. They must help managers in the field address maintenance-related contract issues and give guidance when necessary.

c. Inspection and recommendation for the approval of cooperator aircraft.

2. Provide Regional oversight and continuing evaluation of the aviation program to accomplish National, Regional, Forest, and District level aviation objectives.

3. Monitor Regional Aviation Safety Communiqués (SAFECOMs):

   a. Comment as appropriate.

   b. Communicate significant issues at the Regional and/or National organizational levels.

4. Establish and maintain a current aviation technical library specific to the types of WCF aircraft assigned to the Region. In addition, maintain a FAA regulatory library and copies of maintenance manuals for some of the more common aircraft operated by contractors in the Region..

5. Delegate inspection authority. Inspectors may delegate their inspection authority to properly qualified personnel for the inspection of contract aircraft operated by the Forest Service as provided in section FSH 5709.16, Chapter 40.

6. Provide oversight of inspection programs and airworthiness of Forest Service and contract aircraft and monitor the progress of maintenance being performed by contract maintenance shops on WCF aircraft. (Never approve WCF aircraft for return to service unless they are in compliance with their type certificate and/or standards for replacement of life-limited parts and overhaul frequencies.) Reference AIG, Chapter 13 and Regional Maintenance Procedures Guide (MPG).

3-2-2 Qualifications

All Aircraft Inspectors must possess a current Federal Aviation Administration (FAA) Mechanic's Certificate, with both Airframe and Powerplant ratings (14 CFR 65.73). Additionally, inspectors must maintain an Inspection Authorization (IA) (14 CFR 65.91).

Inspectors are not required to have an in-depth knowledge of all aircraft; however, a broad understanding of general aircraft systems is essential. This will allow ASIs to make informed decisions when returning WCF aircraft to service or contracted aircraft to contract availability.

At a minimum, ASIs shall be knowledgeable of 14 CFR in general, and must have an in-depth knowledge of the pertinent sections of the regulations listed in the figure below.

Figure 2: Sections of 14 CFR Requiring an In-Depth Knowledge

14 CFR Section	Description
Part 39	Airworthiness Directives
Part 43	Maintenance, Preventative Maintenance, Rebuilding, and Alterations
Part 65	Certification: Airmen Other Than Flight Crew Members
Part 91	General Operating and Flight Rules
Part 119	Certification: Air Carriers and Commercial Operators
Part 133	Rotorcraft External-Load Operations
Part 135	Operating Requirements: Commuter and On-Demand Operations and Rules
Part 137	Agricultural Aircraft Operations

Additionally, inspectors shall be familiar with the information contained in the following publications and interagency guides:

1. 41 CFR 102-33 Management of Government Aircraft.
2. Interagency Helicopter Operations Guide (IHOG).
3. Special Mission Airworthiness Assurance Guide (SMAAG).
4. WCF Aircraft Users Guide (if applicable).

3-3 Aviation Safety Inspector (ASI) - Avionics

Not all Regions have an Avionics Inspector position. In this case, avionics services must be coordinated with Avionics Inspectors from other Regions or the WO.

3-3-1 Duties and Responsibilities

1. Ensure that Nationally established standards are implemented for avionics equipment and systems; provide leadership regarding avionics standards for equipment and systems for Forest Service, cooperator, and contracted aircraft in support of the Forest Service aviation program.
2. Provide inspection, oversight, and continuing evaluation of the aviation program to accomplish National, Regional, Forest, and District level aviation objectives.
3. Ensure assigned Forest Service aircraft meet the National standard avionics configuration, unless otherwise approved by the Airworthiness Branch Chief (ABC).

Avionics Inspectors are required to inspect contract aircraft and oversee WCF avionics contracts. To be effective, they must be familiar with avionics contract requirements,

their history, common sources of conflict, and communications policy. Contractors will often ask for advice on avionics requirements for current and future contracts. Ensure any advice given is based on current regulations, policy, and avionics standards.

Inspectors must keep abreast of changing avionics technology, land mobile radio requirements, communications policy revisions, and fire communications. Many of the Forest Service's avionics requirements have little to do with FAA requirements and more to do with what the person on the ground needs, wants, and expects.

Finally, inspectors must be thoroughly familiar with the contents and follow the guidance of FSM 5700, FSM 6600, FSH 5709.16, and FSH 6609.14.

3-3-2 Qualifications

Avionics Inspectors shall be knowledgeable of the operations and theory of avionics systems and the installed equipment being inspected and shall have access to the appropriate test equipment to verify the integrity of the avionics systems requiring approval.

Inspecting the avionics in a basic aircraft does not require extensive knowledge, theory, or test equipment. Basic avionics knowledge is all that is required, which equates to an AV1 rating. However, an airtanker, or a Type I or Type II Air Tactical aircraft have more complex avionics systems. An AV3 rating is required to inspect one of these types of aircraft.

Point-to-point and non-fire aircraft that do not have a VHF-FM aeronautical radio installed should be inspected by an avionics inspector with a minimum of AV1 qualifications. These type aircraft have limited complex firefighting-related avionics equipment.

An AV3 should inspect avionics in an aircraft where avionics and communications are essential for mission success. The one-on-one during an inspection will greatly help, not only with the Avionics Inspector's credibility, but with fostering the contractor's respect for the Forest Service as an agency. Remember, avionics is a mystery to most people. Avionics Inspectors are relied upon to help the Agency meet its needs.

The remaining aircraft are in a "gray area" whether an AV2 Avionics Inspector is required for the inspection. It depends a great deal on the complexity of the mission, contract, or aircraft, and who may benefit or be adversely impacted by a more or less thorough inspection.

The following figure displays regulations that Avionics Inspectors must be familiar with by rating.

Figure 3: Avionics Inspector Requirements by Rating

Regulations	Description	Required for Rating(s)
14 CFR 43	Maintenance, Preventative Maintenance, Rebuilding, and Alterations	AV1, AV2, AV3
14 CFR 91	General Operating and Flight Rules	AV1, AV2, AV3
14 CFR 119	Certification: Air Carriers and Commercial Operators	AV1, AV2, AV3
14 CFR 135	Operating Requirements: Commuter and On-Demand Operations and Rules	AV1, AV2, AV3
14 CFR 137	Agricultural Aircraft Operations	AV1, AV2, AV3
47 CFR Part 80 to End	Telecommunications	AV2, AV3
Manual of Regulations and Procedures for Federal Radio Frequency Management – National Telecommunications and Information Administration (NTIA)		AV2, AV3

Additionally, inspectors should be familiar with the information contained in the following publications and interagency guides:

1. FS/AMD A-24, Avionics operational test standards for contractually required/offered equipment.
2. Interagency Helicopter Operations Guide (IHOG) (NFES 1885).
3. Interagency Air Tactical Group Supervisors Guide.
4. Military Use Handbook (NFES 2175).
5. Modular Airborne Firefighting System (MAFFS) Operating Plan.

3-4 Training

This section gives broad guidance on training and knowledge requirements necessary to be approved on the USFS Approved Inspector List. A new inspector may be included on the Approved Inspector List prior to attending the two FAA Academy Courses if approved by their Regional Aviation Officer (RAO) or the ABC. Initial training consists of FAA Academy courses and On-the-Job Training (OJT) provided in cooperation with the Washington Office and Regions. The ASI Trainee Task Book provides details on minimum training requirements (FSH 5709.16.40). This training does not include aircraft-specific training required to work on an aircraft (see AIG, Chapter 5.)

3-4-1 FAA Training

Within the first year after hire, all Aviation Safety Inspectors (Airworthiness or Avionics) are required to attend two FAA Academy courses in Oklahoma City, OK. In the event the FAA does not offer the course(s) in the required timeframe, or under certain other circumstances, this may be extended until the course(s) are offered or equivalent training is accomplished. The courses are:

1. Airworthiness Indoctrination Technical Online Courses.
2. General Aviation Airworthiness Practical Applications Workshops.

It is mandatory to complete the online courses prior to attending the workshops. Contact AWB for enrollment details.

The following FAA courses are highly recommended and should be taken as soon as practical after attending the mandatory courses:

1. 21026 Suspected Unapproved Parts (28 Hours).
2. 21811 Aircraft Alterations and Repairs (32 Hours).
3. 21016 Part 21 (32 Hours).
4. 21058 Certification/Surveillance of Part 145 Repair Station (28 Hours).
5. 21000094 Fuel Tank Safety and Electrical Wiring Interconnection Systems (EWIS) (24 Hours).

3-4-2 Contracting Officer's Representative (COR) Training

There are three levels of COR training and certification that build on training and experience:

1. **COR Level I** – Requires no experience and eight hours of COR training.
2. **COR Level II** – Requires one year of COR Level I work experience and 40 hours of COR training.
3. **COR Level III** – Requires two years of COR Level II work experience and 60 hours of COR training.

To receive certification, an application must be submitted to the Federal Acquisition Institute with copies of COR designation/appointment letters to document experience.

Training courses are available in the Federal Acquisition Institute Training Application System (FAITAS) and through the Regional acquisition offices providing classroom training. Training is also tracked in FAITAS. For account registration and course access visit: https://faitas.army.mil/faitas/.

3-4-3 Safety Management System (SMS) Training

As part of the Forest Service SMS program, each employee needs to know their SMS roles and responsibilities, understand the comprehensive approach to managing safety, and promote a safety culture by maintaining the four pillars of:

1. Agency doctrine, policy, and objectives.
2. Safety risk management.
3. Safety assurance.
4. Safety promotion.

SMS training is required initially and is recurring (every 5 years). Training could be accomplished using one of the following sources: IBAC, ARGUS, HAI course, FAA, or other approved sources. Consult Regional RASM or AWB for further information.

3-4-4 Interagency Aviation Training (IAT)

The following IAT training modules are recommended to be completed within the first 12 months of appointment. Many of these may be completed online at https://www.iat.gov/, or may be taken during the Aviation Conference and Education (ACE) conferences held annually. Some of the modules (as indicated) are recommended to be taken as refreshers every 36 months.

Figure 4: Interagency Aviation Training (IAT) Modules

Module No.	Description	Refresher Recommendations
A100	Aviation Safety	
A107	Aviation Policy and Regulations I	
A110	Aviation Transport of Hazardous Materials	Refresher recommended every 36 months
A113	Crash Survival	Refresher recommended every 36 months
A202	Interagency Aviation Organizations	
A205	Risk Management I (prerequisite for A305)	
A302	Personal Responsibility and Liability	Refresher recommended every 36 months
A303	Human Factors in Aviation	Refresher recommended every 36 months
A305	Risk Management II	Refresher recommended every 36 months
A307	Policy and Regulations II	Refresher recommended every 36 months

Module No.	Description	Refresher Recommendations
A310	Crew Resource Management	Refresher recommended every 36 months

3-4-5 Suggested Training for All Inspectors

1. Aviation Maintenance Human Factors / Maintenance Resource Management.
2. Region-Specific On-the-Job Training (OJT).
3. Aviation Management Course.
4. Aviation Contract Administration (COR).
5. Aircraft Accident Prevention Course.
6. Introduction to Incident Command System (ICS 100) and Introduction to National Incident Management System NIMS (IS 700) for Technical Specialist (THSP) Qualification in Incident Command System (ICS).

3-4-6 Recurring Educational and Training Requirements

1. Attendance at the USFS Inspector Workshop once every year.
2. At least 24 hours of aircraft maintenance training annually or 48 hours biennially (FSH 5709.16.40).

3-4-7 Suggested for All Avionics Inspectors

1. FSH 6609.14 and FSM 6600.
2. 47 CFR Part 80 to End.
3. National Telecommunications and Information Administration (NTIA) Manual.

3-4-8 Foreign Travel Training

An ASI may be tasked to travel outside the continental United States to perform their duties on aircraft owned or operated by a foreign government. Pre-planning these trips well in advance is essential. A government passport is required for all official international travel. The passport application process takes approximately 45 days, but may take 60 days or more, especially if the inspector does not already have a civilian passport. Depending on the country, the inspector may be required to complete the High Threat Security Overseas Seminar (HTSOS) and/or the Foreign Affairs Counter Threat (FACT) course. For more information, contact the Foreign Travel Specialist for Forest Service International Programs, Washington Office.

3-5 USFS Approved Pilot, Airworthiness, and Avionics Inspectors List

After ASIs complete their Task Book, they may be recommended to the ABC to be placed on the USFS Approved Inspectors List. The figures below list the categories for which an inspector may be approved.

Figure 5: Aviation Safety Inspector Approval Categories

Category	Description
MA	**Maintenance Airplane**
MA1	Airtanker Initial Approval
MA2	Smokejumper Aircraft Initial Approval
MA3	Specially Equipped Light Fixed-Wing Initial
MA4	Return to Contract Availability Approval
MH	**Maintenance Helicopter**
MH1	Type I Helicopter Initial Approval
MH2	Type II Helicopter Initial Approval
MH3	Type III & IV Helicopter Initial Approval
MH4	Return to Contract Availability Approval

Best practices and Agency intent is for all special mission aircraft to receive an AV3 inspection each year. Due to personnel and schedule limitations, this may not always be possible. The following ratings permit some avionics inspections by appropriately designated inspectors as described below.

Figure 6: Avionics Inspector Approval Categories

Category	Description
AV	**Avionics**
AV1	Perform conformity check on aircraft used for point-to-point and non-fire reconnaissance aircraft excluding aircraft with installed VHF-FM transceiver.
AV2	Performance testing on any aircraft/rotorcraft used for fire reconnaissance, Air Attack Type III & IV, and any rotorcraft missions (excluding AV3 items).

Category	Description
AV3	Performance testing on any aircraft/rotorcraft used for leadplane, airtanker/helitanker, smokejumper, aerial supervision module, Air Attack Type I & II, and any mission not previously specified.
AV4	Return aircraft to contract availability for avionics issues.

3-6 Job Proficiency Standards

The ASI should be knowledgeable of the subject areas listed at the end of this section. This list may be used as a self-study checklist and quick reference.

The codes listed in the far-right column may be used to define the importance of the different knowledge areas. These codes may be used as a guide by inspectors to determine if they have the appropriate level of knowledge and are defined as follows:

a - Ability to readily find the required information.

b - Basic knowledge and understanding of the essentials.

c - Thorough knowledge and proficiency required.

Where **AIG** is referred to in the Reference column, it means information provided in the Aircraft Inspector Guide (this guide); where **NAS** is referred to in the Reference column, it means information provided in the National Avionics Standards.

FSM 5700 and FSH 5709.16 may be in a revision process, so specific references in the figure below are not included. Review FSM and FSH for currency.

Figure 7: Job Proficiency Subject Areas

Please note the following abbreviations: **AIG** refers to the Aircraft Inspector Guide (this guide) and **NAS** refers to National Avionic Standards.

Item	Description	Reference Study Material	Level Code
A	**Forest Service Manual 5700**	**FSM 5700**	
1	Describe USFS aircraft approval policy.		b
2	Describe USFS public aircraft flight operations policy.		b
3	State the USFS civil aircraft operating policy regarding 14 CFR requirements.		b
4	Identify the major responsibilities of the Airworthiness Branch Chief.		b
5	List the major responsibilities of aviation maintenance personnel.		c
6	List the references pertinent to the Aviation Safety Inspector as identified in FSM 5700.		b
7	Describe the USFS policy standards for contract aviation services.		b
8	Describe the USFS policy standards regarding cooperators.		a
9	Explain what the following terms mean: Administrative use. Aerial Supervision Module (ASM). Air Tactical Group Supervisor (ATGS). End-product contracts. Flight services contract. Leadplane. Operational control. Special mission.		b
10	Explain the USFS policy regarding end-product contracts and how it affects ASIs.		a
11	Explain the USFS policy regarding flight services contracts and how it affects ASIs.		a
12	List the qualifications for ASIs (Airworthiness and Avionics).		c
13	Identify who may approve aircraft for USFS use.		c
14	Identify how aircraft approvals are documented.		c
15	List the type aircraft that may be approved for night operations.		b
16	Identify the PPE requirements for employees participating in low-level flight operations.		c

Item	Description	Reference Study Material	Level Code
17	Identify who must approve all major modifications to WCF aircraft.		c
B	**Forest Service Handbook 5709.16**	**FSH 5709.16**	
1	List the type of procurement documents used for obtaining aviation services.		b
2	State the minimum certification and operational requirements for contractors.		c
3	Describe USFS policy regarding operations as public aircraft.		c
4	List the minimum general requirements for contract aircraft.		b
5	List the minimum equipment requirements for contract aircraft.		b
6	List the minimum avionics requirements for contract aircraft.		b
7	Explain aircraft approval requirements for contract aircraft.		c
8	Describe the approval process and practices for contract point-to-point aircraft.		c
9	State the length of time for which a special mission aircraft can be approved.	FSH & Contracts	c
10	List the minimum certification requirements for becoming an Aviation Safety Inspector.		c
11	Identify the items to be reviewed during a pre-use contract compliance inspection.		c
12	Identify the records used for approving contract aircraft.		c
13	Identify and complete a Pre-Use Inspection Discrepancy Report.	FSH & AIG	c
14	Identify and complete an Aircraft Approval Record/Card.	FSH & AIG	c
15	Identify and complete an FS 5700-32 Aircraft Contract Status Report.	FSH & AIG	c
16	Explain the process for submitting and maintaining inspection forms.	FSH & AIG	c
17	Describe the major responsibilities of Interagency Aircraft Inspectors.		c
18	Explain the elements of a contract specification.	FSH, Contract Section B, AIG	b
19	List the elements of a contractor's FAA Operating Authority.	FSH & AIG	b
20	List the elements to be inspected during a review of an aircraft's records.	FSH & AIG	c
21	Explain the "Approval for Return to Contract Service" process and identify when it is necessary.	FSH & AIG	c

Item	Description	Reference Study Material	Level Code
22	Identify the minimum configuration and compliance requirements for former military aircraft.		b
23	State the minimum performance criteria for single-engine airplanes and why it is important to an ASI.		b
24	State the minimum performance criteria for multi-engine airplanes and why it is important to an ASI.		b
25	State when these requirements may be waived and what actions an ASI must take under these circumstances.		b
26	State the rapid refueling authorizations and restrictions for turbine-powered aircraft.		b
27	Describe the responsibilities of the Airworthiness Branch Chief.		b
28	Describe responsibilities of an Aviation Safety Inspector – Airworthiness.		c
29	Describe the responsibilities of an Aviation Safety Inspector - Avionics.		c
30	List the minimum standards to which USFS owned and operated aircraft will be maintained.		c
31	State what the maintenance personnel qualifications are for:		c
	Aviation Safety Inspector -- Airworthiness.		
	Aviation Safety Inspector – Avionics.		
32	State the minimum training requirements for maintenance personnel.		c
33	Explain the requirements for flight checks and return to service for:		c
	Fixed-wing aircraft.		
	Rotor-wing aircraft.		
34	Describe the maintenance records requirements.		c
35	Explain the minimum equipment list requirements and procedures.	FSH AIG 14 CFR 91.213	c
C	**SAFECOM System**		
1	Describe the function of the SAFECOM system and its uses.	AIG	c
2	Describe the SAFECOM process from submittal to final management review.	AIG	b
3	Use the database to review a previously submitted SAFECOM.	AIG	c
4	Make a corrective action input into the SAFECOM system.	AIG	c

Item	Description	Reference Study Material	Level Code
5	Complete a SAFECOM.	AIG	b
D	**Automated Flight Following System**		
1	Describe the function of the Automated Flight Following system.	AIG	a
2	Use the AFF System to identify type and location of specific aircraft.	AIG	a
E	**Procurement Documents**		
1	Explain the various types of procurement documents (exclusive use, call-when-needed, BPA, ARA, etc.) and their essential differences.	AIG	b
2	Identify the different sections that can be found in a contract.	Contract, AIG	b
3	State the information that is generally found in Section B of a contract.	Contract, AIG	b
4	State the information that is generally found in Section C of a contract.	Contract, AIG	b
5	State the information that can be found in the Exhibits section of a contract.	Contract, AIG	b
6	List the major responsibilities of a Contracting Officer's Representative (COR).	Contract, AIG	b
7	List the major responsibilities of a Quality Assurance Specialist.	Contract, AIG	b
F	**Federal Aviation Regulations**		
	14 CFR Part 1, Definitions and Abbreviations		
	Explain the following terms:		
1	Air carrier.		a
2	Civil aircraft.	*See Public Aircraft*	b
3	Commercial operator.		a
4	Large aircraft.		a
5	Major alteration.		c
6	Major repair.		c
7	Preventative maintenance.		a
8	Public aircraft.	AC 00-1.1, AC 20.132	b

Item	Description	Reference Study Material	Level Code
9	Rotorcraft load combinations: Class A. Class B. Class D.		a
	14 CFR Part 21, Certification Procedures for Products and Parts	**FAA Order 8130.2**	
1	Identify the malfunction and defect reporting requirements for holders of TCs, STCs, PMAs and TSO authorizations.	21.3, AC 21-9A	a
2	Explain what conditions require an airplane or rotorcraft flight manual.	21.5, AC 25-1581-1	b
3	Identify the various type certificates that may be issued to an aircraft.	21.21, 21.25, 21.27	b
4	Identify what a type design consists of.	21.31	b
5	Identify what a type certificate includes.	21.41	b
6	Identify the privileges of a supplemental type certificate holder.	21.119, AC 21-40	b
7	Explain who may apply for an airworthiness certificate.	21.173	a
8	State the two classifications of airworthiness certificates.	21.175	b
9	Identify the rules for issuance of Standard Category airworthiness certificates.	21.183	a
10	Identify the rules for issuance of Restricted Category airworthiness certificates.	21.185, AC 21.25-1	a
11	Identify the rules for issuance of a Special Flight Permit.	21.197, 21.199	b
12	Explain what Technical Standard Order (TSO) authorizations are.	21.601, AC 20-110L	b
13	Identify the marking requirements for items authorized by TSO.	21.603, AC 20-110L	a
14	Identify the main points of U.S. Military Surplus Flight Safety Critical Aircraft Parts (FSCAP) program.	AC 20-142	a
	14 CFR Part 23, Airworthiness Standards: Normal, Utility, Acrobatic, and Commuter Category Aircraft		
1	Identify the requirements for an aircraft to qualify as a Normal Category aircraft.	23.3	b

Item	Description	Reference Study Material	Level Code
2	Identify the requirements for determining empty weight and center of gravity.	23.29, AC 120-27E	a
3	Explain the general requirements for landing gear extension and retraction systems.	23.729	a
4	Explain the general requirements for tires.	23.733, AC 20-97A	a
5	Identify the cockpit control knob shape requirements.	23.781	b
6	Identify the requirements for seat, safety belts, and shoulder harnesses.	23.785, AC 12-110L, AC 21-34, AC 91-65	b
7	Identify the placard and restraint requirements for baggage and cargo compartments.	23.787	b
8	Identify the emergency exit marking requirements.	23.811	b
9	Identify the hand-held fire extinguisher requirements for aircraft.	23.851	b
10	Identify the material requirements for aircraft interiors.	23.853, AC 25.853-1	b
11	Identify the bonding requirements for aircraft components.	23.867	a
12	Identify the powerplant limitations that must be included in the airplane flight manual.	23.903(d), (e)	a
13	Identify the fuel filler opening requirements for airplanes.	23.973, AC 20-116	b
14	Identify the fireproofing requirements for engine firewalls.	23.1191	a
15	Identify the isolation requirements for air-cooled radial engines.	23.1192	a
16	Identify the requirements for engine fire detector systems.	23.1203	b
17	Identify the installation requirements for equipment.	23.1301, AC 23.1309-1, AC 25.1353-1	a
18	Identify the flight and navigation instrument requirements.	23.1303	a
19	Identify the powerplant instrument requirements.	23.1305	a
20	Identify the location requirements for flight, navigation, and powerplant instruments.	23.1321	a
21	Identify the warning, caution and advisory light requirements.	23.1322	b
22	Identify the airspeed indicating system requirements.	23.1323	a

Item	Description	Reference Study Material	Level Code
23	Identify the static pressure system requirements.	23.1325	a
24	Identify the magnetic direction indicator system requirements.	23.1327	a
25	Identify the power supply requirements for instruments.	23.1331	a
26	Identify the powerplant instruments requirements.	23.1337	a
27	Identify the electrical system capacity requirements.	23.1351	a
28	Identify the battery design and installation requirements.	23.1353, AC 25.1353-1	a
29	Identify the requirements for circuit protective devices.	23.1357, AC 25.1357-1	a
30	Identify the placarding requirements for switches.	23.1367	b
31	Identify the stowage requirements for safety equipment.	23.1411	b
32	Identify the general provisions for electronic equipment.	23.1431	a
33	Identify the minimum installation requirements for cockpit voice recorders.	23.1457, AC 25.1457-1	a
34	Identify the minimum installation requirements for flight data recorders.	23.1459, AC 20-141, AC 21-10A	a
35	Identify the general marking and placarding requirements.	23.1541	b
36	Identify the general requirements for instrument markings.	23.1543	b
37	Identify the marking requirements for airspeed indicators.	23.1545	b
38	Identify the marking requirements for magnetic direction indicators.	23.1547	b
39	Identify the marking requirements for powerplant indicators.	23.1549	b
40	Identify the marking requirements for fuel quantity indicators.	23.1553	b
41	Identify the marking requirements for fuel system cockpit control.	23.1555	b
42	Identify the placards and markings required for baggage and cargo compartments.	23.1557	b
43	Identify the operating limitations placard requirements.	23.1559	b
44	Identify the placards and markings required for safety equipment.	23.1561	b
45	Identify the placards required for airspeed indicators.	23.1563	b
46	Identify the general provisions for airplane flight manuals.	23.1581	b
47	Identify the operating requirements required to be in an airplane flight manual.	23.1583	a

Item	Description	Reference Study Material	Level Code
48	Identify the test procedures to be followed when performing burn tests of materials used in aircraft interiors.	Appendix F	a
49	Identify the requirements for Instructions for Continued Airworthiness (ICA). **Note:** *ICA requirements for Part 25 aircraft can be found in its Appendix H, and part 27 and 29 rotorcraft are found in its Appendix A.*	Appendix G, AC 33.4-1	a
	Note: *Many certification requirements specified in Part 25, 27 and 29 are located under the same paragraph suffix as in Part 23. (For example, 23.29, 25.29, 27.29, and 29.29 all reference empty weight and center of gravity requirements.) For rotorcraft unique requirements, Part 27 and 29 follow the same numbering format. Therefore, the Part 23 listing can be referred to for finding most items required by a Part 25, 27, or 29 certified aircraft. Listed below are only those items with a different reference or additional certification requirements not found in Part 23.*		
	14 CFR Part 25, Airworthiness Standards: Transport Category Aircraft.		
1	Identify the requirements for retention of equipment stowed in the crew and passenger compartments.	25.789	a
2	Identify the requirements for reinforcement near propellers.	25.875	a
3	Identify the principles and key elements of a Damage Tolerance Fatigue Evaluation of Structure as it relates to a Structural Integrity Program (SIP)	25.571, Airtanker Contract Exhibit 2	a
	14 CFR Part 27, Airworthiness Standards: Normal Category Rotorcraft.		
1	Identify the requirements for an aircraft to qualify as a Normal Category rotorcraft.	27.1	b
2	Identify what is classified as a critical part.	27.602	b
3	Identify the requirement to display the maximum rotorcraft external load.	27.865(e), *Also see 133.49(b)*	c
4	Identify the requirements for engine fire detector systems.	27.1195	b
5	Identify tail rotor visibility requirements.	27.1565	c
	14 CFR Part 29, Airworthiness Standards: Transport Category Rotorcraft.		
1	Identify the hand-held fire extinguisher requirements for aircraft.	29.853	b

Item	Description	Reference Study Material	Level Code
2	Identify the requirements for engine fire detector systems.	29.1203	b
	14 CFR Part 39, Airworthiness Directives		
1	State in general terms the requirements of 14 CFR 39.	39, AC 39-7	c
2	State why an airworthiness directive is mandatory.	39.13	c
3	State when a special flight permit may be obtained for an airworthiness directive.	21.197, 21.199, & 39.23	c
	14 CFR Part 43, Maintenance, Preventative Maintenance, Rebuilding, and Alterations	AC 43.13-1B, AC 43.13-2A, AC 43-12A	
1	Identify who is authorized to perform maintenance and complete a return to service.	43.3, 43.7	c
2	State the minimum requirements for an aircraft log entry following maintenance.	43.9, AC 43-9C	c
3	State the minimum requirements for an aircraft log entry following an inspection.	43.11, AC 43-9C	c
4	Explain the general performance rules for maintenance.	43.13	c
5	Explain the additional performance rules for inspections.	43.15	c
6	Explain the rules regarding airworthiness limitations.	43.16	c
7	Identify what constitutes a major alteration or repair.	Appendix A, AC 120-77	c
8	Identify the recording requirements for major repairs or alterations.	Appendix B, AC 43.9-1E	c
	14 CFR Part 45, Identification and Registration Marking		
1	Identify the general requirements for data plates for aircraft and engines.	45.11(a), 45.13, AC 43-17, AC 45-2C, &3	b
2	State the requirements for displaying “restricted” on restricted category aircraft.	45.23(b)	c
3	Identify the requirements for location of “N” numbers on fixed-wing aircraft.	45.25, AC 45-2C	b
4	Identify the requirements for location of “N” numbers on rotor-wing aircraft.	45.27, AC 45-2C	b
5	Identify size requirements for “N” numbers.	45.29, AC 45-2C	b

Item	Description	Reference Study Material	Level Code
	14 CFR Part 47, Aircraft Registration		
1	State the general aircraft registration requirements.	47	b
2	Identify for what length of time a temporary registration is valid.	47.31(b)	b
	14 CFR Part 65, Certification: Airmen Other Than Crewmembers		
1	Be knowledgeable of the general privileges, limitations, and recent experience requirements of an A&P Mechanic.	65.81, 65.83	c
2	Explain the privileges and limitations of an Inspection Authorization.	65.95	c
	14 CFR Parts 91, 133, 135 & 137, Operating Rules		
1	Describe airworthiness, flight manual, markings, and placard requirements for a civil aircraft.	91.7, 91.9, AC 25.1581-1	c
2	State the certification requirements for a civil aircraft.	91.203	b
3	State the Emergency Locator Transmitter (ELT) requirements for a civil aircraft.	91.207, AC 91-44A	c
4	Describe the requirements and procedures for deferring inoperative equipment.	91.213, 91.405, 135.179, AC 91-67, Ops Specs, MEL, AIG	c
5	Identify the minimum requirements for TCAS and TAWS in civil aircraft.	91.221, 91.223, 135.180, 135.154, AC 23-18	b
6	Identify the requirements for TAWS in civil aircraft.	135.153	b
7	Identify the requirements for oxygen equipment for civil aircraft under Part 135.	135.157	b
8	State the general operating limits of Restricted Category aircraft.	91.313	b
9	State the requirements for pitot-static and transponder checks.	91.411; 91.413; 43, Appendix E & F; AC 43-203	c
10	Explain the requirements for aircraft inspection of civil aircraft:	91.405	c
	Annual.	91.409a	
	100 hour.	91.409b	
	AAIP.	91.409c & f, AC 135-10A	

Item	Description	Reference Study Material	Level Code
	Progressive.	91.409d,	
	Manufacturer's program.	91.409e & f	
	Changes to inspection programs.	91.409g & h	
11	Explain the requirements for when a flight check is required following maintenance.	91.407	b
12	State the general requirements for aircraft records.	91.417, AC 43-9C	c
13	Identify where the qualification requirements for Part 135 management personnel can be located.	119.71	a
14	Identify the manual requirements for a Part 135 Operator.	135.21, 135.23	a
15	Identify Transponder requirements *installed* after 1/1/1992.	135.143(c)(2)	a
16	Identify the requirements for carrying passengers under night VFR and IFR.	135.159, 135.161, 135.163, 135.165	a
17	Identify the weight and balance requirements for Part 135 aircraft.	135.23(b) 135.185, AC 120-27E	b
18	Identify the requirements for submitting Mechanical Reliability Reports, Service Difficulty Reports, and Mechanical Interruption Reports for Part 135 aircraft.	135.415, 135.416, 135.417 AC 20-109A	a
19	Identify the policy pertaining to AAIPs.	135.419	b
20	Identify the additional maintenance requirements for Part 135 aircraft.	135.421, AC 135-7	b
21	Identify the aging airplane inspection requirements for multi-engine airplanes with 9 or less passenger seats.	135.422	a
22	Identify the rules for rotorcraft external loads.	133, AC 133-1A	b
23	State the requirement to display the maximum rotorcraft external load.	133.49(b), *Also see 27.865(e)*	c
24	Identify the rules for agricultural aircraft certified under the 14 CFR.	137, AC 137-1	b

Item	Description	Reference Study Material	Level Code
25	Identify the requirements for carrying airworthiness certificates and registrations in agricultural aircraft.	137.33(b)	b
26	Identify the rules for agricultural aircraft certified under CAR 8.	CAR8, CAM 8	b
	Part 145, Repair Station		
1	Describe in general the requirements and procedures of a Part 145 repair station.	145	
G	**FAA Operating Authority & Certificates**		
1	State the three types of FAA operating certificates, their authorizations and limitations:	14 CFR, AC 120-49, AIG	b
	14 CFR Part 133, Rotorcraft External Load Operations.	14 CFR 133, AIG	
	14 CFR Part 135, Commuter and On-Demand Operations.	14 CFR 135, AIG	
	14 CFR Part 137, Agricultural Aircraft Operations.	14 CFR 137, AC 137-1, AIG	
2	Identify the parts of the Ops Specs that must be reviewed when inspecting an aircraft during a contract compliance inspection, and the information that must be verified:	119.49, Ops Specs, AIG	
2a	Part A – General.	8900.1, Vol. 3, Chap. 18; AC 135-7	
	A-003 Aircraft Listing.	Ops Specs, AIG	b
	A15 – Autopilot In Lieu of Required Second-in-Command.	Ops Specs, AIG	b
	A-061 Electronic Flight Bag (EFB).	Ops Specs, AIG	b
2b	Part D – Aircraft Maintenance.	8900.2, Vol 3, Chapter 18	
	D73 – Approved Aircraft Inspection Program.	Ops Specs, AIG	b
	D85 – Aircraft Listing.	Ops Specs, AIG	
	D95 – MEL.	Ops Specs, AIG	
	D101 – Additional Maintenance Requirements – Airplane.	Ops Specs, AIG	
	D102 – Additional Maintenance Requirements – Rotor.	Ops Specs, AIG	
	D104 – Additional Maintenance Requirements – Emergency Equipment.	Ops Specs, AIG	
H	**Forest Service Forms**		

Item	Description	Reference Study Material	Level Code
	Identify the following forms, explain their use, and demonstrate how to properly complete them:		
1	FS-5700E, Aircraft Maintenance Log.	AIG	c
2	FS-5700-4, Aircraft Approval Card (Airtankers).	AIG	c
3	FS-5700-21, Airplane Data Record (OAS-73A & OAS-73A-1).	AIG	c
4	FS-5700-21a, Helicopter Data Record (OAS-73H & OAS-73H-1).	AIG	c
5	FS-5700-32, Aircraft Contract Status Report.	AIG	c
6	FS-5700-33, Aircraft Pre-Use Inspection Discrepancy Report.	AIG	c
7	Point-to-Point Aircraft Data Card.	AIG	c
8	Service Truck – Interagency Data Card.	AIG	c
9	Mechanic Qualification Card.	AIG	c
10	FS-5700-17, Interagency Helicopter Load Calculation (OAS-67).	AIG	c
I	**Perform a Contract Compliance Inspection of an Aircraft**		
1	Complete an inspection of a vendor's aircraft, using a contract and the appropriate approval record.	Contract, AIG	c
2	Review a vendor's contract, identifying special requirements.	Contract, AIG	c
3	Review a vendor's operating authority.	Contract, AIG	c
4	Review a vendor's Ops Specs.	Contract, AIG	c
5	Inspect a vendor's aircraft.	Contract, 14 CFR, AIG	c
6	Review a vendor's aircraft records.	Contract, 14 CFR, AIG	c
7	Complete the inspection documentation for:		
	An aircraft that has discrepancies.	Contract, AIG	c
	An aircraft without discrepancies.	Contract, AIG	
8	Enter data for a completed inspection into the current Forest Service electronic database, if not utilizing automated system.	AIG	c
9	Review a vendor's mechanic qualification against a contract.	Contract, AIG	c
10	Perform an inspection of a fuel service vehicle.	Contract, AIG	c
11	Complete the documentation for a fuel service vehicle.	AIG	c
12	Complete a load calculation to verify compliance with the specification in a contract.	Contract, AIG	b

Item	Description	Reference Study Material	Level Code
J	**Perform a Contract Compliance Inspection of Special Equipment**		
1	Inspect and review documentation for a rappel anchor.	Contract, AIG	c
2	Inspect and review documentation for a Bambi bucket.	Contract, AIG	c
3	Inspect and review documentation for a long line.	Contract, AIG	c
4	Inspect and review documentation for a remote hook.	Contract, AIG	c
5	Inspect an aircraft 3-pin plug for correct polarity and operation.	Contract, AIG	c
6	Inspect an aircraft 9-pin plug for correct polarity and operation.	Contract, AIG	c
7	Determine if an aircraft meets the requirements for Air Attack: Type I. Type II. Type III. Type IV.	Contract, AIG, NAS	c
K	**Avionics Equipment and Inspection**		
1	Identify ELT requirements for contract aircraft.	Contract, AIG	c
2	Explain the minimum requirements for VHF-AM radios.	Contract, AIG, 14 CFR 91.205	b
3	Identify the requirements for Supplemental Radio (Air Attack) Kits.	Contract, AIG	c
4	Explain what AUX-FM provisions are.	Contract, AIG	c
5	Explain the difference between an AV1, AV2, AV3, and AV4 rating.	Contract, AIG FSH 5709.16 – 42.11	b
L	**FAA Order 8900.1, Flight Standards Information Management System (FSIMS)**	8900.1	
1	Identify the requirements for an MEL.	Vol. 4, Chap 4	a
2	Inspect a Part 91 aircraft.	Vol. 6, Chap 1	a
3	Identify requirements for Ops Specs.	Vol. 3, Chap 18	a
4	Evaluate a Part 135 aircraft record.	Vol. 6, Chap 2	a
5	Identify the requirements of a Part 135 Manual.	Vol. 2, Chap 4	a
6	Evaluate a Part 135 Operators Inspection/Maintenance Requirements.	Vol. 6, Chap 2	a
7	Conduct a ramp Inspection of an aircraft.	Vol. 6, Chap 1 & 2	a
8	Monitor a Part 91 Operators Inspection Program.	Vol. 6, Chap 1	a

Item	Description	Reference Study Material	Level Code
9	Inspect a Part 91 Aircraft Maintenance Records.	Vol. 6, Chap 1	a
10	Inspect a Part 135 Air Carrier.	Vol. 6, Chap 2	a
11	Inspect a Part 135 Operators Maintenance Records.	Vol. 6, Chap 2	a
12	Inspect a Part 145 Repair Station.	Vol. 6, Chap 9	a
13	Inspect an operator's maintenance facility.	Vol. 6, Chap 9	a
M	**National Fire Protection Association (NFPA) Manuals**		
1	Explain the inspection and maintenance procedures for portable fire extinguishers.	NFPA 10	b
2	State the inspection frequency and inspection procedures for portable fire extinguishers.	NFPA 10	c
3	State the maintenance frequency for portable fire extinguishers.	NFPA 10	c
4	Identify the hydrostatic test intervals for portable fire extinguishers.	NFPA 10	b
5	Identify the minimum requirements for fuel storage tanks.	NFPA 30	a
6	State the minimum standards for aircraft fuel servicing equipment.	NFPA 407	c
7	State the operating procedures to be followed during aircraft fuel servicing.	NFPA 407	c
8	State the requirements for rapid refueling of aircraft.	NFPA 407	c
9	Identify the general requirements for heliports.	NFPA 418	b
10	Identify the minimum fire extinguisher requirements for heliports.	NFPA 418	b

Notes

Chapter 4 – Administration, Internet, and References

Note: These are the current programs of record and are subject to change as technology develops.

4-1 Introduction

USFS SAFECOM system, Automated Flight Following (AFF), AvCheck, Pentagon 2000SQL, PRISM, Pinyon or the current USFS web/cloud-based storage drive, and Tech Pubs are databases/apps frequently used by inspectors. A list of useful websites is also provided in this chapter.

4-2 SAFECOMs

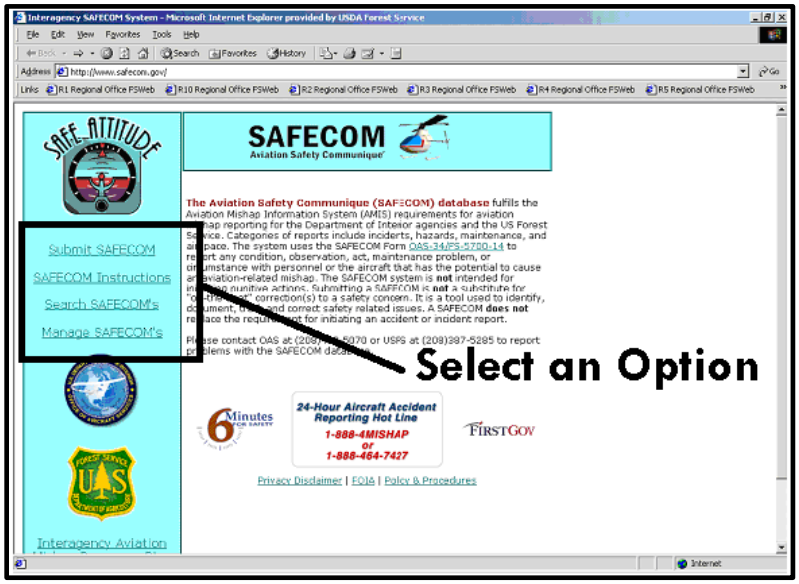
SAFECOMs are used in the documentation, tracking, and follow-up of corrective actions related to safety issues. A SAFECOM reports any condition, observation, act, maintenance problem, or circumstance with a pilot or aircraft that has the potential to cause an aviation-related mishap.

This section explains the process for viewing, submitting, searching, and managing SAFECOMs. If access to protected areas of a SAFECOM is needed, a password must be requested by the Regional Aviation Safety Manager (RASM) in coordination with the Washington Office in Boise.

RASMs have the responsibility to respond to SAFECOMs submitted in their Region. Aircraft Inspectors have a responsibility to provide follow-up information for the corrective actions on maintenance related SAFECOMs, when requested by the RASM.

Enter the website at http://www.safecom.gov/, and select one of the options on the left side of the screen:

Figure 8: SAFECOM Website Homepage



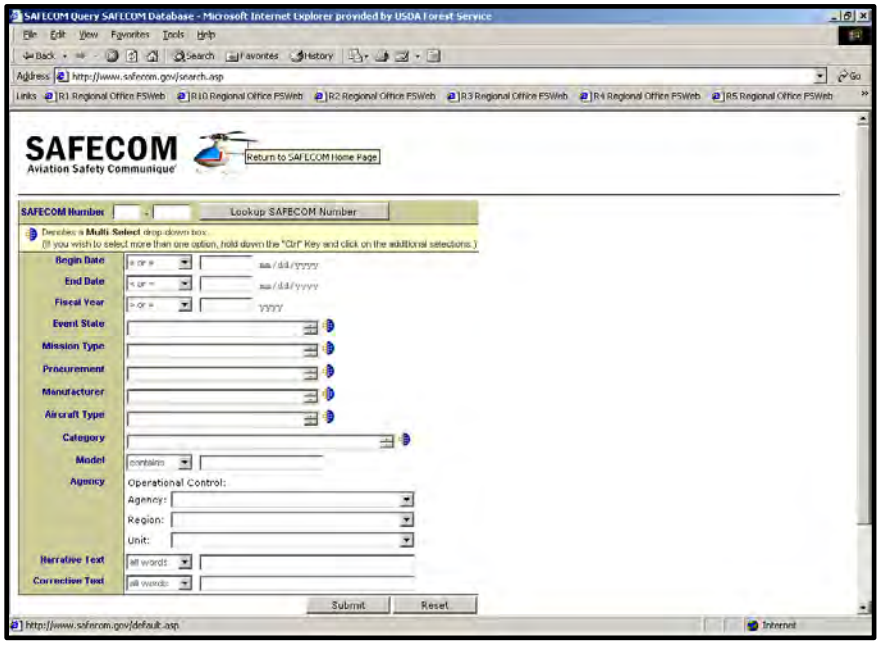
Selecting ***Submit SAFECOM*** will bring up this screen:

Figure 9: Submit SAFECOM

Fill in the information as required. Items with red arrows must be completed.

Selecting ***Search SAFECOM*** will bring up this screen:

Figure 10: Search SAFECOMs



From here SAFECOMs can be viewed, depending on the type of search selected. Protected information **cannot** be viewed from this screen.

Selecting ***Manage SAFECOMS*** will allow access to the protected parts of SAFECOMs. The screen that is accessed from this page looks much like the previous (***Search SAFECOMs***) page:

Figure 11: Manage SAFECOMs

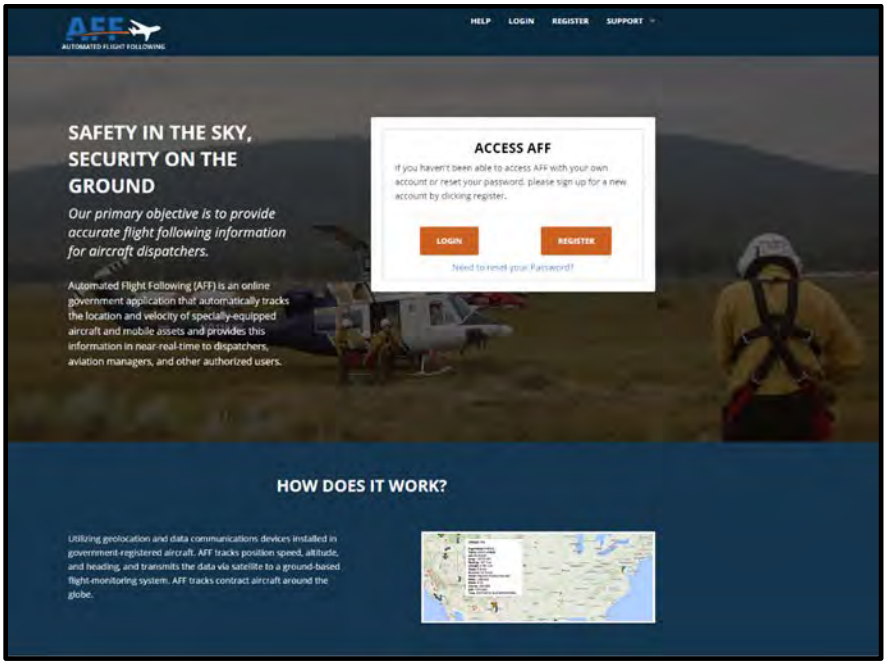
4-3 Automated Flight Following (AFF)

Automated Flight Following (AFF) is a Forest Service developed system utilizing GPS and satellite communications to report aircraft locations. Locations are reported every two minutes to dispatch offices. This allows dispatch personnel to monitor an aircraft's position on a map for safety purposes. All government and contract aircraft are required to be equipped with an AFF system except for contracted aircraft flying only point-to-point missions and flight following with the FAA.

Prior to aircraft approval, Aircraft Inspectors are required to log into AFF and verify the aircraft are actively reporting in AFF at the contractually required interval (i.e., every two minutes).

For more information, training materials, or to access AFF, go to https://www.aff.gov. A username and password are required to log in. To register for an account, click the "Register" button on the homepage.

Figure 12: Automated Flight Following (AFF) Website



4-4 AvCheck

AvCheck is an online system and central database used to perform and track aircraft inspections on Forest Service contracted and cooperator aircraft. The system is accessible via a secure website from a computer or smart device, such as an iPad. AvCheck was designed to replace the existing Microsoft Excel inspection checklist and make the inspection process more efficient. Instructions on how to navigate the website can be found on the AvCheck homepage and/or Pinyon.

4-5 Pentagon 2000SQL (P2000)

The USFS uses the Pentagon 2000SQL Aircraft Computerized Maintenance Management System (CMMS). This is a Service-wide aircraft and logistics information management system used to support Forest Service WCF aircraft at multiple associated facilities. It provides maintenance tracking and logistical support for aircraft, aircraft parts, and tooling. Pentagon 2000SQL establishes common processes for managing logistics across the Forest Service.

4-6 PRISM

PRISM is a website adopted by the Forest Service for implementing Safety Management System (SMS) into our WCF maintenance programs. Each WCF maintenance manager has been assigned 12 electronic checklists as an Internal Evaluation Program (IEP). The checklists are accomplished over a two-year period at which time they are reassessed for continuous safety assurance and safety promotion by way of audits.

4-7 Useful Websites

The following are useful websites. SharePoint provides log-in information for websites/subscriptions requiring a username and password.

Note: Websites often change; those listed below are current as of this printing.

Figure 13: Useful Websites

Website Source	URL	Description
Interagency	http://www.nifc.gov	National Interagency Fire Center homepage.
Interagency	http://www.nifc.gov/news/sitreprt.pdf	National Fire Situation Report (a great site to follow current national fire activity).
Forest Service	http://www.fs.fed.us/fire/index.html	Forest Service Fire and Aviation Management homepage.
Forest Service	https://www.nifc.gov/NIICD/documents.html	Forest Service Avionics information.
Forest Service	https://www.fs.fed.us/t-d/pubs/pdfpubs/pdf05672806/pdf05672806dpi300.pdf	Copies of the Accident Investigation Guide are provided at this site.

Website Source	URL	Description
Forest Service	http://fsweb.mtdc.wo.fs.fed.us/aerial_ign/	National Technology and Development Program's Aerial Ignition Website.
Forest Service	https://www.fs.fed.us/t-d/programs/fire/rappel/index.htm	Helicopter Rappel Program.
FAA	http://www.faa.gov/	FAA Home Page.
FAA	http://162.58.35.241/ardocs/	FAA Electronic Document Retrieval System (EDRS) (Log in Required).
FAA	http://fsims.faa.gov/	Access to Order 8900.1, Flight Standards Information Management System (FSIMS).
FAA	http://fsims.faa.gov/PICResults.aspx?mode=EBookContents	8900.1 Table of Contents.
FAA	http://fsims.faa.gov/PICResults.aspx?mode=Index&cat=A	8900.1 Index of Subjects.
FAA	http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgFAR.nsf/MainFrame?OpenFrameSet	Access to the Federal Aviation Regulations Library.
FAA	http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAD.nsf/MainFrame?OpenFrameSet	Access to the FAA Airworthiness Directive (AD) Library.
FAA	http://www2.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/MainFrame?OpenFrameSet	Access to the FAA Advisory Circular (AC) Library.
FAA	http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgMakeModel.nsf/MainFrame?OpenFrameSet	Access to the FAA Type Certificate Data Sheet (TCDS) Library.
FAA	http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgSTC.nsf/MainFrame?OpenFrameSet	Access to the FAA Supplemental Type Certificate (STC) Library.

Website Source	URL	Description
FAA	http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgTSO.nsf/MainFrame?OpenFrameSet	Access to the FAA Technical Standard Order (TSO) Library.
FAA	http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgOrders.nsf/MainFrame?OpenFrameSet	Access to the FAA Order Library.
Miscellaneous	https://www.fs.fed.us/fire/aviation/av_library/index.html	Current HAZMAT Guide.
Miscellaneous	https://www.fs.fed.us/fire/aviation/av_library/index.html	Current DOT HAZMAT Exemption letter.
Miscellaneous	https://www.redstone.army.mil/sof/safetyform.html	Aviation Safety Messages for Military aircraft can be found here. (**There is no longer general access to this site. The user must register on the Army's AKO site to gain access.**)
Miscellaneous	http://www.ecfr.gov/cgi-bin/ECFR?page=browse	The complete Code of Federal Regulations.
Miscellaneous	http://www.ibac.org/	International Business Aviation Council (IBAC) comprised of 14 business aviation associations around the world representing the industry for their 11,000 members across six continents.
Miscellaneous	http://www.ibac.org/is_bao	International Standards for Business Aircraft Operations.
Miscellaneous	http://www.ibac.org/is_bah	International Standards for Business Aircraft Handling.

4-8 FAA Orders

FAA Orders are handbooks that provide FAA Inspectors with written policy and procedures for fulfilling their responsibilities. These Orders are available electronically at the FAA's Regulatory and Guidance Library (RGL) website. The following figure lists Orders that are an excellent source of information for Aircraft Inspectors.

Figure 14: Useful FAA Orders for Aircraft Inspectors

Order No.	Description
8020.11	Aircraft Accident and Incident Notification, Investigation and Reporting.
8110.4	Type Certification Process.
8110.54	Instructions for Continued Airworthiness.
8120.10	Suspected Unapproved Parts Programs.
8120.11	Disposition of Scrap or Salvageable Aircraft Parts and Material.
8130.2	Airworthiness Certification of Aircraft and Related Parts.
8130.20	Registration Requirements for the Airworthiness Certification of U.S. Civil Aircraft.
8150.1	Technical Standard Order Program.
8900.1	Flight Standards Information Management System (FSIMS).
8320.14	Procedures for Field Approval of Supplemental Inspection Programs for Large Transport Category Aircraft.
8620.2	Applicability and Enforcement of Manufacturer's Data.

4-9 Other References

There are many publications that inspectors must reference on a regular basis besides FSH 5709.16 and 14 CFR. This section provides a list of the more common publications.

The Forest Service maintains a membership with the Radio Technical Commission for Aeronautics (RTCA) which provides access to aviation standards and guidance. The RTCA now develops standards for other aspects of aviation in addition to radios. Contact the ABC to establish an individual account.

Figure 15: Other Common Publications for Aircraft Inspectors

Publication No.	Description
NFPA 10	Standard for Portable Fire Extinguishers.
NFPA 30	Flammable and Combustible Liquids Code.
NFPA 329	Recommended Practice for Handling Releases of Flammable and Combustible Liquids and Gases.
NFPA 385	Standard for Tank Vehicles for Flammable and Combustible Liquids.
NFPA 407	Standard for Aircraft Fuel Servicing.

Publication No.	Description
NFPA 408	Standard for Aircraft Hand Portable Fire Extinguishers.
NFPA 409	Standard for Aircraft Hangers.
NFPA 410	Standard on Aircraft Maintenance.
NFPA 418	Standards for Heliports.

Notes

Chapter 5 – Working Capital Fund (WCF) Aircraft Maintenance

5-1 Introduction

This section provides processes and procedures that establish standards for USFS maintenance, inspection, and airworthiness of Working Capital Fund (WCF) aircraft. This section is also intended to provide direction to inspection and maintenance personnel in the maintenance management of USFS-owned or "bailed" Federal aircraft.

The basis for this section is Federal Management Regulation 41 CFR 103-22; Federal Aviation Regulations 14 CFR 43, 65, 91, 135, and 145; and industry best practices. The foundation for this section has also incorporated the International Standard for Business Aviation Operations (IS-BAO) and requirements from the Interagency Committee for Aviation Policy (ICAP), FSM 5700, and FSH 5709.16.

FMR 41 CFR 102-33, Management of Government Aircraft, establishes requirements Executive Branch agencies must meet in the management of their aviation programs. This regulation does not supersede 14 CFR requirements, but is equally applicable to USFS aviation. The FMR is to the General Services Administration (GSA) ICAP as 14 CFR is to the FAA.

FMR 102-33.155 (c) requires agencies to write, publish, implement, and comply with detailed, agency-specific standards which establish or require (contractually, where applicable) policies and procedures for maintenance of government aircraft. This requirement is met by the USFS through FSM 5700, FSH 5609.16, and through the Aircraft Inspectors Guide, Regional Maintenance Procedures Guide (MPG), and the Special Mission Airworthiness Assurance Guide.

The USFS Safety Management System (SMS) Policy establishes the SMS Guide. The SMS Guide, and ICAP give direction on the implementation of IS-BAO in government aircraft operations. To meet the FMR and IS-BAO, development of National and Regional specific standards and detailed procedures are required.

The WO and Regions that maintain WCF aircraft are implementing Regional MPGs based on the minimum standards and process requirements of Forest Service policy, the Aircraft Inspector Guide (AIG), and newly developed MPG Template. The implementation is expected to take until 2021 to complete Nationally.

5-2 Forest Service Aircraft

5-2-1 Federal Aircraft

FMR 102-33 defines Federal Aircraft as aircraft that an executive agency owns (holds title to) or borrows for any length of time, including aircraft that are in a loaned or "bailed" status from another government entity.

5-2-2 Public Aircraft

The definition of public aircraft can be found in 14 CFR Part 1, Definitions and Abbreviations; Advisory Circular 00-1.1, Public Aircraft Operations. Essentially, this publication states that when an aircraft (owned or contracted by the Federal government) is operating in inherently governmental operations, these aircraft are performing public aircraft operations. Regardless of "public aircraft operations," Forest Service policy is to maintain all WCF aircraft in accordance with all applicable 14 CFR requirements, FSM, FSH, AIG, and Regional MPG.

5-2-3 USFS (WCF) Aircraft

WCF aircraft are "owned" by the Washington Office and registered to the WO with the FAA. The WO is responsible for registration renewals, MELs, inspection program approvals, ELT registrations, etc. However, the WO does not manage the day-to-day operations/maintenance of these aircraft; the Regions where the aircraft are assigned are responsible for performing these functions.

The WCF Aircraft Users Guide shall be followed to manage WCF aircraft. The following paragraphs explain some common terms related to the financial management of WCF aircraft.

Fixed Operating Rate (FOR). (This is pronounced "F-O-R.") In industry, the terms "overhead costs" or "indirect costs" identify costs associated with running a business, but which produce no income. These "indirect" costs may include aircraft depreciation, insurance, hangars, crew and office personnel salaries, utilities, etc. For WCF aircraft these are called FOR. These costs are present every day of the year regardless of whether the aircraft is flown. Regions must provide the FOR costs for each aircraft operated in their annual budgets. The WCF Aircraft User Guide can assist in the calculations of FOR.

Use Rate. In industry, "direct costs" or "flight rate" are those expenditures that are directly related to the production of income. They may include mechanic and pilot salaries, fuel, maintenance costs, engine reserves, etc. Because these are directly related to income, in industry they are called "direct" costs. The term Use Rate (sometimes called Hourly Rate) is used for WCF aircraft. This rate is basically what it costs to operate an aircraft for an hour. These costs are accrued only when an aircraft is operated. When an aircraft is flown, there is a charge that must be made to pay for the use of the aircraft. This charge is at that aircraft's Use Rate and against a specific Job Code, be it the WCF Job Code or a Fire "P" Code.

Differences in FOR and Use Rate between Regions are due in part to unique costs of hangars, local factors in the cost of contracted maintenance, and other Regional differences.

5-3 Aircraft Inspection and Maintenance Program

5-3-1 Aircraft Maintenance Program Manager / Aviation Safety Inspector (Airworthiness) WCF Program Responsibilities

Inspectors are responsible for providing oversight of the inspection programs, maintenance, and airworthiness of the WCF aircraft assigned to their Region. They must provide oversight of aircraft maintenance being performed by contract maintenance to ensure compliance with standards and policy.

Inspectors are responsible for the maintenance and inspection status of assigned aircraft at all times. An aircraft may operate outside its assigned Region; this does not relieve the inspector of the responsibility of tracking the status of this aircraft or ensuring maintenance standards are followed when contract maintenance is utilized. Inspectors shall ensure pilots periodically provide updates on the flight hours, cycles, landings, and maintenance status when they are away from their main base. The Region to which the aircraft is assigned is always responsible for the aircraft unless otherwise delegated in accordance with delegation policies of the USFS. Do not assume the inspector in the Region in which the aircraft is operating is monitoring the aircraft.

5-3-2 WCF Aircraft Inspection Program

WCF Aircraft Inspection Programs shall be maintained in accordance with OEM's most recent revision of the inspection program applicable to the serial number of aircraft being inspected or an inspection program approved by the Branch Chief, Airworthiness. For non-certificated aircraft, the AWB will approve inspection programs. The list of approved inspection programs is kept by the WO and will be published in the Special Mission Airworthiness Assurance Guide. Aircraft of the same make and model will have the same inspection program regardless of Regional assignments.

Aircraft Inspection Programs shall include the requirements of FSH 5709.16 Chapter 40 and AIG, Chapter 5.

5-3-3 WCF Aircraft Maintenance

WCF aircraft with airworthiness certificates will be maintained in accordance with their type certificates and their properly altered condition. WCF aircraft without airworthiness certificates will be maintained in accordance with the AWB approved inspection and maintenance program. Forest Service policy is to inspect and maintain all WCF aircraft in accordance with all applicable 14 CFR requirements, FSM, FSH, AIG, and Regional MPG.

5-3-4 Maintenance Records and Reporting

Aircraft Maintenance Log (FS-5700E). Each WCF aircraft will carry an FS-5700E, Aircraft Maintenance Log (see AIG, Chapter 10) for recording flight hours, time in service, discrepancies, and current inspection schedule status. The FS-5700E is the provision for the aircraft's maintenance record on board the aircraft and is part of the permanent maintenance record. White pages of the FS-5700E shall be removed from the aircraft and sent to the Regional Maintenance Program Manager no later than every 14 days or upon the accumulation of 40 flight hours. This may be done electronically. All discrepancies noted in the FS-5700E will be corrected prior to flight or properly deferred in accordance with 14 CFR 91.213.

Aircraft Inspection / Life Limited Status. A listing of the current status of ADs, S/Bs, ICAs, life-limited parts, and inspection status will be maintained for each aircraft. As aircraft are quite often away from their home station, a copy of these and the current status of the aircraft shall be readily available. A current updated copy (electronic or paper) must be available following every inspection and whenever significant changes have been made. Electronic tracking systems such as Excel, Pentagon 2000SQL, CAMP or others will be used for tracking aircraft requirements by flight hours, cycles, and/or calendar times following 14 CFR and OEM requirements.

Maintenance Records. All aircraft maintenance records shall comply with 14 CFR 91.417. Permanent records shall be kept in a secure location with limited access in the Region's maintenance facility or aviation office and shall not be placed on the aircraft except for flights to a location for maintenance. Records of inspections, discrepancy lists, and other documents such as shop work orders will be maintained at the assigned base for a minimum of 24 months, or until the work is repeated or superseded.

5-3-5 Malfunction and Defect Reporting

Inspectors will report all significant maintenance defects and/or malfunctions that might affect similar aircraft operated by the Forest Service. Inspectors will report these issues to the Airworthiness Branch Chief and to the FAA on FAA Form 8010-4 (Malfunction or Defect Report). Inspectors will use the Forest Service SAFECOM reporting system for discrepancies meeting SAFECOM reporting requirements. See AIG, Chapter 4 for information on SAFECOMs and how to submit them. Each Region shall keep a list of common or repeat maintenance issues for trend monitoring and vendor accountability.

5-3-6 Return to Service

All USFS WCF aircraft will be approved for return to service by an authorized USFS Aviation Safety Inspector. This includes review of work performed by contracted maintenance. Never approve WCF aircraft for return to service unless they are in

compliance with their type certificate and/or standards for replacement times of life-limited parts and overhaul frequencies.

5-3-7 Minimum Equipment List (MEL)

WCF aircraft shall not be operated with inoperative equipment, unless it has an approved minimum equipment list (either deferred or cleared) before the aircraft can be released for further flight.

5-3-8 Special Flight Permit

The AWB will be notified whenever a Special Flight Permit is needed. Certificated aircraft needing a Special Flight Permit will request it from the local FAA Flight Standards District Office (FSDO) where the aircraft is located.

5-4 Configuration Control

Inspectors are required to ensure that WCF aircraft configurations are maintained in accordance with the standard configuration approved by the Airworthiness Branch Chief. Configuration changes shall be approved in writing by the Airworthiness Branch Chief prior to implementation.

5-5 Weight and Balance

Weight and Balance forms shall include a Weighing Record and Equipment List. For aircraft with changing roles and/or missions, an Equipment Change Record must be provided and used. A suggested format is one commonly used by the military: “Chart A - Equipment List, Chart B - Weighing Record, and Chart C - Equipment Change Record.” Ensure all loose items in the aircraft are accounted for by weight and location. Aircraft shall be weighed in accordance with FSH 5709.16, Chapter 40 schedule.

5-6 Required Inspection Items (RII)

Each make and model of aircraft in the WCF fleet should have an AWB approved Required Inspection Item (RII) list. When maintenance or inspection requires removal and installation or rigging and adjustment of items identified on the RII list, a second qualified person will ensure that the installation and/or rigging is accomplished in accordance with maintenance instructions and is safe for flight. Provisions for completing RII shall be included in the Regional MPG, once developed. Inspectors performing RII shall be identified by the Regional Maintenance Program Manager. The RII inspection is required to be performed by contract maintenance in accordance with the Regional MPG, once developed. Alternate methods of compliance for the RII program must be incorporated in the MPG and be acceptable to the ABC.

5-7 Technical and Regulatory Library

Inspectors must maintain a current aviation technical and FAA Regulatory library for the aircraft being operated or maintained by the Region. Access to tech data libraries maintained by the AWB or another Region meets this requirement. Duplication of subscription services should be avoided. Once implemented, see the Regional Maintenance Procedures Guide (MPG) for further direction on technical and regulatory information.

5-8 Maintenance Procedures Guide (MPG) Standards and Format

The MPG addresses in detail the procedures to meet standards established by policy and the AIG. Each region's MPG is tailored to meet the unique facilities, aircraft types, and operational requirements of the region. A Regional MPG is developed using a template provided by the WO which outlines the minimum scope, standards, and contents. The Regional MPG may be expanded to meet the needs of the region but may not be less restrictive or contain standards contrary to those established in policy and this chapter. Each Region's MPG shall be submitted to the AWB for acceptance.

In addition to addressing specific processes and procedures for accomplishing paragraphs 5-3 through 5-7 of this chapter, the MPG provides information and guidance for the following items:

1. **International Standard for Business Aircraft Operations (IS-BAO) Cross Reference**

2. **Organization and Personnel.** Duties or responsibilities not listed in FSM, FSH, or the official Position Description are included for all positions. The section also covers continuity of responsibilities when key positions are not covered.

3. **Facilities.** Description of Regional facilities specific to aviation maintenance, to include hangars, offices, parts, ramp spaces and housekeeping.

4. **Maintenance Training.** This section identifies fleet aircraft maintenance support training required for the Regional Maintenance Program. Regions will provide new employee indoctrination and towing, hazmat, engine run, taxi qualification, aircraft-specific, and other region-specific training.

5. **Record Keeping.** This section details the management of aircraft records and associated tracking databases.

6. **Aircraft Maintenance and Inspection Procedures.** This section contains detailed processes and procedures for accomplishing the approved inspection program and maintenance of assigned aircraft. It addresses how discrepancies are corrected or deferred, maintenance away from station is performed and monitored, parts and materials are managed, as well as the RII procedures.

7. **Fatigue Management Program.** This section establishes procedures for ensuring that each Region implements a program to manage fatigue which is an issue across all segments of aviation.

8. **Environmental Management.** This section establishes the needed procedures to ensure compliance with all national and local environmental laws and requirements affecting the maintenance program.

9. **Occupational Health and Safety**. This section establishes the needed procedures to ensure compliance with, all national and local occupational health and safety laws and requirements affecting the maintenance program.

10. **Security and Emergency Procedures.** This section establishes the needed procedures for facility security and the local Emergency Response Plan will be activated in the case of an accident or as otherwise appropriate.

11. **Forms.** Region-specific forms are identified in the MPG, along with direction on how to complete each form and the disposition and/or filing of the form.

Notes

Chapter 6 – Contracts

6-1 Introduction

This chapter provides a general overview of the potential contracting issues encountered by inspectors. Inspectors deal extensively with contractors; therefore, it is essential that the pertinent terms and conditions of government contracts are understood. Examples below apply to helicopter contracts, however they also apply to most fixed-wing contracts.

Aviation contracts are written to meet requirements of Forest Service fire and natural resource managers to facilitate accomplishing their mission. Forest Service fire and natural resource managers should be considered the customers of these contracts and customers of the inspector. The inspector ensures the end user receives a safe and mission compliant product.

An aircraft shall not be inspected or approved unless it has been listed in an awarded procurement document and a request for inspection has been made by the Contracting Officer (CO) or their representative. There should not be a contradiction between the contract and Forest Service policy. If one is found, contact the CO and COR and inform them of the contradiction with policy so the contract can be changed with a modification or at the next solicitation. Contracting Officers and/or Aircraft Inspectors cannot authorize deviations from policy.

Aircraft being inspected may have multiple contracts associated with the same aircraft. For instance, a Type 3 aircraft might be inspected for the Lolo National Forest (Region 1) under an Exclusive Use (EU) contract while that same aircraft could be under additional Call-When-Needed (CWN) contracts. The contracts could be with other Regions, or through the Department of Interior's Office of Aviation Services (OAS). To avoid duplication of effort by another inspector, the aircraft should be inspected against all applicable contracts through a page-by-page review of each contract. The initial inspector may be the only one looking over the aircraft for compliance with the contract(s). Upon completion of the inspection, the inspection results should be forwarded to the appropriate Regional ASI, National ASI, and/or Department of Interior (DOI) Inspector.

6-2 Types of Contracts

Multiple types of contracts may be encountered when procuring aircraft. They are: Exclusive Use (EU) contracts, Call-When-Needed (CWN) contracts, Blanket Purchase Agreements (BPA), OAS's Aircraft Rental Agreements (ARA), and Basic Ordering Agreements (BOA).

6-2-1 Exclusive Use Contracts

Exclusive Use (EU) contracts are usually for a set Mandatory Availability Period (MAP), generally 90 to 120 days, when it is expected that the support of an aircraft will be needed on a daily basis. During the course of the contract, the contractor agrees that the government will have exclusive use of the equipment for the MAP. Because the Agency has exclusive use of the aircraft, the operator is guaranteed revenue for the length of the contract. Typically, a lower availability (daily use) rate is paid on EU contracts as compared to CWN contracts. EU contracts generally have language specifying in detail the requirements of the contract. Vendors can be assessed unavailability (financially penalized) under the terms of the contract if the aircraft is not available as specified in the contract.

6-2-2 Call-When-Needed (CWN) Contracts

CWN contracts are with vendors who agree to supply aircraft at their convenience. The government pays a higher availability rate for CWN aircraft than for EU aircraft because there is no guarantee when or for how long an aircraft may be utilized. For helicopters, ASIs should acquire a copy of the National Type I & II Helicopter contract template and become thoroughly familiar with it. Regions use this same template as the basis for developing Regional helicopter EU and CWN contracts. Becoming familiar with this specification will enable inspectors to easily find information in most contracts they will encounter.

6-2-3 Agreements

Blanket Purchase Agreements (BPAs), Aircraft Rental Agreements (ARAs), and Basic Ordering Agreements (BOAs) are open-ended agreements with vendors to supply aircraft and/or other services. They are like CWN contracts in that the vendor has no obligation to supply aircraft or services when requested. Aircraft or services are offered at the vendor's convenience. While some specific details can be found in the language of these agreements, they are for the most part written general in nature. At a minimum, these aircraft or services must comply with applicable Forest Service policy, Federal Aviation Regulations, and if used for special missions, with applicable interagency fire and avionics standards.

Forest Service inspectors work closely with OAS inspectors. Most of the requirements found in OAS's Aircraft Rental Agreement are similar to those in most Forest Service contracts/agreements; however, occasional differences are encountered. Inspectors can download a copy of the OAS Aircraft Rental Agreement at: https://www.doi.gov/aviation/aqd/contracts.

6-3 Contract Sections

Inspectors may encounter several different contract formats, BPAs, and/or rental agreements. Below is a list of common contract sections. Section contents may vary depending on the format used.

Figure 16: Contract Sections

Section	Description
Section A	Solicitation
Section B	Schedule of Items
Section C	Description/Specification/Exhibits

6-3-1 Section A – Solicitation

Solicitation/Contract/Order for Commercial Items indicates contract number, effective award date, contracting officer with telephone number, office issued by, contractor, accounting code, and other pertinent information.

6-3-2 Section B – Schedule of Items

This section lists requirements specific to the contract/aircraft. This section contains an itemized list of required equipment for the aircraft offered and where it will be based. This section will also contain any special requirements the contractor must provide. It is important to review this section during Pre-Use Inspections to verify that the aircraft being inspected meets all the contract requirements. Examples of items that may be found in Section B include:

1. "N" number identifying the aircraft awarded under the contract.
2. Minimum seating capacity.
3. Performance specification (i.e., 850 lb. payload at 7000 ft. PA and 20 degrees C).
4. Bid weight – equipped as specified under the contract.
5. Crew coverage (pilot, fuel service vehicle driver, mechanic).
6. Minimum fuel service vehicle capacity.
7. Specific aircraft requirements.

If a vendor has not been awarded a contract, their aircraft may not be inspected, nor a card issued. If the vendor informs the inspector that they intend to substitute the aircraft, the contracting officer should be notified before proceeding with the inspection.

Two other very important items found in aviation contracts are aircraft performance specifications and aircraft bid weights. These are found in Section B, and along with cost, are probably two of the most important considerations in "Best Value" type contracts that the Forest Service uses. If an aircraft is not able to meet the contract requirements after award, it may be cause for termination.

For example: An aircraft may meet the performance specification in Section B but may weigh more than was bid. The aircraft is therefore not in compliance, which may be cause for termination. Under a best value scenario, if an aircraft is awarded a contract based on a lower than actual weight, it could have been awarded based on a payload it cannot achieve. Inspectors shall complete a Load Calculation using the Performance Specification listed in Section B, to ensure the aircraft meets the specification. In the initial year of the contract the aircraft must be at or below its Bid Weight. After the first year of the contract, the aircraft is allowed a total of 1% above the Bid Weight during the life of the contract. If an aircraft weighs more than 1% over the bid weight in the second or subsequent years of the contract, contact the contracting officer for a resolution. An example of how to complete a Load Calculation can be found at the end of AIG, Chapter 11, Contract/Cooperator Aircraft Inspection Procedures.

6-3-3 Section C – Description/Specification/Exhibits

Section C lists the standard requirements in Exclusive Use and Call-When-Needed contracts based on the Helicopter Master Specifications.

General requirements found in most National and Regional contracts are listed in Section C. Examples include listing Hobbs meters, locking fuel caps, lighting requirements, etc. Other items found in Section C include general aircraft requirements, avionics, and aircraft maintenance standards. Personnel experience requirements/qualifications and availability/duty requirements are also found in this section.

This section also contains exhibits, fuel service vehicle requirements, flight rate chart, etc., and is a "catch-all" for other information needed by the contractor and USFS personnel in managing and administering the contract. Information found in this section may include a list of the items required in a first aid or survival kit, or pin-outs for the helicopter 9-pin bucket connector.

6-4 Contract Process

The contract process can be summarized as follows:

1. A need is identified, and it is determined that a contract could meet that need.
2. Contract specifications (technical input) are written to describe requirements.

3. A contract solicitation is advertised on Federal Biz Opportunities at: https://www.fbo.gov/.
4. The Technical Evaluation Board (technical input) reviews contract proposals.
5. The contract is awarded based on evaluation factors, including cost.
6. A Pre-Use Inspection is performed prior to starting the contract. Inspections performed during use ensure vendor quality of operation is maintained throughout the contract.

6-5 Contract Roles

Inspectors may act as a Contracting Officer's Representative (COR) on a contract and frequently function as a Project Inspector (PI).

6-5-1 Contracting Officer (CO)

The CO is the first and final authority regarding contract administration. The limited authority that inspectors have regarding a contract is designated by policy and through the CO. If there is ever any doubt about what may or may not be done regarding a contract, contact the CO. The only time inspectors may act without the pre-approval of the CO is when a question of safety or airworthiness arises. If forced into this situation, at the earliest opportunity notify the CO. See AIG, Chapter 11 for a discussion on removing aircraft cards.

6-5-2 Contracting Officer's Representative (COR)

CORs are delegated in writing by the CO with the authority to represent them in fulfilling the requirements of the contract. CORs are limited to ensuring that all contract clauses are complied with by the contractor and overseeing the day-to-day performance of the contract. CORs may not re-delegate their authority to another individual. All helicopters under contract to the Forest Service will have a manager assigned who acts as COR for the contract. The COR for an airtanker is typically a tanker base manager. For light fixed-wing aircraft (LFW), leadplanes, and Aerial Supervision Module (ASM) platforms, there are various individuals who may be assigned as the COR.

COR Authority. A COR is generally given the authority to:

1. Act as the government's representative for contract administration.
2. Represent the Agency in meetings concerning technical issues.
3. Maintain a COR file.
4. Assist the contractor in understanding technical requirements of the contract.

5. Monitor contractor's time worked and recordkeeping procedures.
6. Ensure all work is in accordance with the contract requirements.
7. Advise the CO of work that is accepted or rejected.
8. Advise the CO of any changes needed in a contract.
9. Review contractor invoices for accuracy.
10. Fill out daily diaries.

COR Limitations. COR authority may not be re-delegated, and does not include the authority to:

1. Make contract modifications.
2. Obligate the government to pay any money.
3. Terminate a contract.

COR Qualification. See COR training requirements in AIG, Chapter 3.

6-5-3 Project Inspector and Technical Experts

The Project Inspector and Technical Experts assist COs and CORs by providing quality control, inspection services, and technical advice. Aircraft and Avionics Inspectors may fulfill this role. CORs appointed for helicopter and fixed-wing contracts may have very little aviation background; therefore, one of the primary duties of an inspector is to assist CORs in making decisions regarding contract compliance.

Remember: The government is the customer.

Inspectors represent the government. Some vendors may feel it is their right to supply aircraft or equipment on their terms. Do not be intimidated by this mindset. If the vendor is not willing to supply aircraft in accordance with the contract, they may be found in non-compliance, made unavailable, and/or the contract can be terminated. If an uncooperative vendor is encountered, do not get into an argument; instead, contact the CO immediately to resolve any issues. Written or electronic correspondence should always follow initial phone conversations with the CO. Keeping the CO informed and documenting correspondence in the inspector's records will ensure accurate information and may be used in later litigation.

6-6 End-Product Contract Matrix

To determine if a contract should be an end-product or flight services contract, see the matrix in the figure below (reference FSM 5711.21).

Figure 17: End-Product Contract Matrix (Reference: FSM 5711.21)

If the answer is YES to any question below you must use the flight services process and contract. If the answers are all NO, you may use the end-product contract.	Aerial photo remote sensing	Aerial application (spray/seed)	Aerial Ignition	Animal capture (net gun, dart, paintball, etc.)	Animal herding/gathering	Your project *
[1] Are Agency personnel going to be on the aircraft for this mission?						
[2, 10] Is the aircraft currently being used as a public aircraft?						
[3] Is a helicopter manager required for this mission?						
[4] Is a "chief of party" or "flight manager" required for this?						
[5] Are you asking or requiring (written or verbal) the pilot/crew to wear PPE?						
[6] Are you asking for aircraft and pilot requirements (i.e., Cessna 206 or pilot must have PPE and flight helmet)?						
[7] Are you requiring "pilot standards"?						
[8] Are you directing aircraft maintenance?						
[9] Are you controlling or directing aircraft "movement" (telling the aircraft where to go, how to do the project, how often to check in)?						
[10] Are you requesting exclusive control? Is the aircraft already under Government contract?						

* This may include incidental use of aircraft for various missions not identified in the exhibit. When evaluating such missions, local or Regional aviation managers can assist in making decisions on type of procurement to use.

[1] Agency personnel are assuming operational control of the mission from the aircraft.

[2] Public aircraft is defined in FSM 5705.

[3] Helicopter Manager requirements are listed in the Interagency Helicopter Operations Guide (IHOG).

[4] Chief of party or flight manager requirements are listed in FSH 5709.16.

[5] Requiring personal protective equipment (PPE) assigns operational control to the Forest Service. This is a vendor decision for an end-product contract.

[6] Asking for these requirements assumes operational control by the Forest Service. This is a vendor decision for an end-product contract.

[7] By placing "pilot standards" (for example, a pilot must have minimum 50 hours in make/model aircraft to be flown) the Forest Service is not only asking for an aircraft to perform the mission, it is also assuming "operational control." The vendors place their own controls on the mission for the end-product contract.

[8] By directing aircraft maintenance (verbal or written) the Forest Service assumes "operational control." This is a vendor decision for an end-product contract.

[9] Controlling or directing aircraft "movement" assumes operational control by the Forest Service. For an end-product contract, simply state that the project starts by X date and finishes by Y date. Have vendor call before the start of the project and notify dispatch (to warn other aircraft working on unit).

[10] The aircraft cannot be under the exclusive control of the government for an end-product contract. For example:

a. Under an end-product contract, NEVER use any flight services contracted aircraft, such as an Exclusive Use or Call-When-Needed (CWN) helicopter, that is currently working under that contract. However, if the helicopter is released from contract, the end-product contractor could hire the same vendor to perform the end-product service.

b. Under an end-product contract, participation by Forest Service employees is limited to end-product contract administration only.

c. Forest Service Grants of Exemption (defined in FSM 5710.5; for extensive direction, see FSM 5714) from the Department of Transportation, Federal Aviation Administration (FAA) regulations, do not apply to end-product contracts. If departures from applicable regulations are necessary, the contractor is responsible for obtaining them.

Notes

Chapter 7 – Contract Aircraft Standard Requirements

7-1 Introduction

This chapter list the general requirements for contract aircraft per FSH 5709.16. These represent minimum requirements only. Most often these requirements will be supplemented in a contract. The exception might be a BPA or ARA. Therefore, inspectors must be familiar with these requirements as they may not be listed in some BPAs or ARAs. Do not inspect an aircraft until thoroughly familiar with the requirements of the applicable procurement document.

7-2 General Requirements (FSH 5709.16, 40)

All aircraft furnished under a contract or rental agreement must possess a standard category airworthiness certificate, except for special mission aircraft such as airtankers which may have a "restricted" category airworthiness certificate.

In accordance with FSM 5713, the condition and equipment of cooperator aircraft must "provide a level of safety and mission effectiveness comparable to contract aircraft." In other words, they must meet similar standards as contract aircraft as defined in the NASF Cooperator's Aviation Standards for Interagency Fire. The following guidelines also apply to cooperator aircraft.

Single-engine airplanes used for special missions such as reconnaissance and survey must have a horsepower loading of not more than 13.5 pounds per horsepower. This can be determined by dividing the gross takeoff weight by the engine horsepower. If the result is greater than 13.5, the aircraft does not meet the requirement. (FSH 5709.16, 30)

Multi-engine airplanes must be capable of at least 200 horsepower per engine. Any engine developing less than 240 horsepower must be turbo-charged.

> **Note:** RAOs may grant an exemption for these horsepower requirements provided the mission does not take place over mountainous terrain (FSH 5709.16, 30).

Unless operated with an FAA-approved Minimum Equipment List (MEL), aircraft will not be carded or used if any accessory or instrument listed in the Aircraft Equipment List or Type Certificate is inoperative.

Aircraft upholstery, paint, and Plexiglass must be in good condition. Inspectors must use their best judgment when making determinations of good condition.

Aircraft may not be approved if any engine, propeller, rotor, or other component time in service exceeds the manufacturer's recommended Time Between Overhaul (TBO), unless approved under an extension by the FAA.

Operational check flights must be performed in daylight visual flight rules (VFR) conditions. The aircraft must return to the departure airfield where the pilot shall review the check flight results with maintenance personnel. Maintenance personnel shall make a final check of the work performed before releasing the aircraft. New or overhauled reciprocating engines must accumulate three hours of operating time, including two hours of flight prior to Forest Service use. Some Regional contracts require five hours of operating time after engine change before an aircraft can be used. Always check the procurement document to determine the correct break-in period.

7-3 Equipment (FSH 5709.16, 40)

Aircraft type and mission dictate minimum equipment requirements. These minimum standards can be found in FSH 5709.16, 40.

Aircraft used for point-to-point passenger and cargo operations will be equipped in accordance with 14 CFR and with the following minimum equipment:

1. Helicopters carrying passengers shall be equipped with FAA-approved wire strike protection systems.
2. Helicopters carrying passengers shall be equipped with engine inlet air filtration system/particle air separator.
3. An FAA-approved shoulder harness is required for each front seat occupant.
4. A flight meter or recording tachometer displaying actual flight time in hours and tenths.
5. A first aid kit.

7-4 Avionics

All aircraft will be equipped with the minimum avionics equipment required for day visual flight rules (VFR) operations as per FSH 5709.16, 40.

One 760 Channel VHF-AM transceivers is required.

Two 760 Channel VHF-AM transceivers are required for fixed wing fire operations.

An Automatic Flight Following System (AFF) is required.

One VHF-FM transceiver is required for all fire operations.

Multi-engine aircraft will meet the Part 135 night and Instrument Flight Rules (IFR) passenger requirements, if dispatched for that type mission.

Vendors are responsible for loss or damage to Government furnished equipment, when specifically stated in the contract.

Note: See AIG, Chapter 8, Avionics Requirements, for more detail on equipment requirements for special mission aircraft.

7-5 Contract and Aircraft Rental Agreement (ARA) Requirements and Approvals

Only carded aircraft approved by authorized interagency inspectors will be utilized.

Only single-engine turbine or multi-engine aircraft will be used for IFR flights. Night flights for ferry and cargo missions are authorized for single reciprocating engine aircraft, if approved by the Agency, at the option of the vendor (FSM 5700 and FSH 5709.16, 40).

Notes

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Chapter 8 – Avionics Requirements

8-1 Introduction

Aircraft are a major resource used in firefighting. Air-to-Air and Air-to-Ground coordination is essential to safe and efficient operations. Without excellent communication between air and ground personnel, effective use of resources would not be possible. This chapter addresses avionics issues and the standards required by all aviation contracts.

As communications technology and operational requirements change, so do the avionics standards, therefore driving many of the contract revisions. The most current National avionics standards and specifications can be viewed and downloaded at: https://www.nifc.gov/NIICD/documents.html.

Avionics issues can be difficult for operators to identify. Unlike an oil leak or a popped rivet, issues with modulation, frequency, or sensitivity require test equipment to evaluate. Knowing the equipment and being diplomatic will help prevent conflicts when identifying avionics problems. They may manifest in a gradual reduction of performance leading to an unconscious acceptance of poor functionality.

8-2 Equipment Requirements

Per FSH 5709.16, 40, aircraft must be equipped for day VFR operations. Special mission aircraft must have one 760 channel VHF-AM transceiver and Automated Flight Following (AFF). Airplanes must have two 760 channel VHF-AM transceivers for fire operations. Multi-engine aircraft must meet 14 CFR Part 135 avionics requirements for night and IFR passenger flights prior to use for that type of mission.

Avionics requirements vary depending on the required mission. For contract point-to-point aircraft, the Federal Aviation Regulations must be followed. For special mission aircraft, requirements are determined by the mission in which the aircraft is being used. All aircraft that operate beyond simply carrying passengers point-to-point are considered special mission aircraft. Because they are considered special mission aircraft, they will be required to be equipped with additional items beyond what the FAA requires. These additional items require that we inspect the aircraft to ensure that our customers have a safe, reliable product.

Special mission aircraft include helicopters ranging in size from a Bell 206 to a Sikorsky Skycrane, as well as large and light fixed-wing aircraft. All have different avionics requirements because each plays a different role in fire operations.

Call-When-Needed aircraft normally have simple avionics requirements. Almost all avionics requirements are listed in Contract Section C. The requirements often overlooked are listed in Section B as checkbox options. Once checked, these options

are now requirements. If the contractor lists an option as "available," but not "required" by the contract solicitation, it should still be inspected. The aircraft still passes if the "available" options do not meet specifications, but make a note on the inspection form for the CO. The Agency should not pay for something it cannot use.

Exclusive Use aircraft normally have more complex requirements. Airtankers have complex avionics requirements. Multiple radios, navigational aids, and audio systems are standard. Whether the aircraft or contract requirements are simple or complex, for all inspections, go through the entire contract slowly, item by item.

Smokejumper aircraft are almost as complex as airtankers and have detailed requirements which vary by aircraft type.

Light fixed-wing aircraft are used for a myriad of purposes ranging from forest health surveys to highly demanding Air Attack missions. Light fixed-wing aircraft missions fall into two basic categories: Reconnaissance and Air Attack. Reconnaissance missions include resource reconnaissance (bug surveys, snow surveys, etc.) and fire reconnaissance (looking for smoke). Demanding Air Attack missions require an Air Tactical Group Supervisor (ATGS) to coordinate all fixed and rotary wing aircraft over an incident/fire.

Reconnaissance aircraft have minimal avionics requirements beyond standard Part 135. Air Attack aircraft require numerous radios and more complex audio systems. Good communication is critical for the Air Attack aircraft which are complex communication platforms.

8-3 Required Item Background and Tips

Special mission aircraft require several items beyond what the FAA requires. Some of these items are unique to our mission and some are common aviation equipment items. This section briefly explains why some items are required and when they are required. Most items require the inspector to have equipment for performance testing.

1. **Emergency Locator Transmitter (ELT).** The Forest Service requires that ELTs be installed on all helicopters and does not accept the exclusions allowed by 14 CFR 91.207(f). Operations are often over inhospitable terrain and an ELT is required for every flight. Inspectors must ensure that ELTs are operational, properly installed, have been inspected in accordance with 91.207(d), and that 406 MHz ELTs are properly registered.

2. **Aeronautical VHF-FM Radios (also called FMs).** These radios are the backbone of Forest Service communications. Without an FM, communicating with the Forest, ground personnel, or interagency partners would be almost impossible. Additionally, the FM is the emergency communications link to every aircraft via the Air Guard capability in each radio. Multimode (P25) digital VHF-FM radios

are required for fire operations. Because heavy reliance is placed on FM radios, the type of equipment accepted is very limited. Check the avionics web site at https://www.nifc.gov/NIICD/documents.html for a current list of acceptable radios. Check frequency, modulation, tones, reception, programmability, etc.

3. **Supplemental Radio Kits**. These are slip-in radio kits giving enhanced radio capabilities to fixed-wing aircraft. These kits are not used in helicopters. These kits may be complex enough for Air Attack work or simple enough for basic flight following. If the contractor provides a kit, ensure it meets the intent of the contract and standards for radios. Check the intercom, audio panels, and power input.

4. **AUX-FM Provisions.** The AUX-FM is a controversial requirement. It may be seldom used, and pre-use inspections often reveal problems. The AUX-FM allows *any* handheld radio to be operated through the aircraft's audio system. When crews need additional communications, unique capabilities, or an auxiliary communications capability, the AUX-FM provides this option. However, the AUX-FM has never been intended to replace an approved Aeronautical VHF-FM Radio. Bring an adapter cable and portable radio. Check for operation and antenna VSWR.

5. **GPS.** Many aircraft require a TSO approved aeronautical GPS. Some aircraft are allowed a portable aviation GPS. Database currency is dependent on type of contract, i.e., VFR vs. IFR.

6. **Automatic Dependent Surveillance-Broadcast (ADS-B).** The FAA has mandated that aircraft operating in airspace that now requires a Mode C transponder must be equipped with ADS-B OUT by January 1, 2020. Contract aircraft which require a transponder will require ADS-B OUT at this time. When ADS-B IN is required by contract, units must receive both UAT and 1090ES signals.

7. **Transponders, Encoders, and Static Systems.** This equipment requirement is normally limited to helicopters and fire mission airplanes. We require these items so our TAS equipped aircraft can "see" all other fire aircraft in their vicinity. 14 CFR 91.411 and 91.413 logbook entries are normally an acceptable measure of operation.

8. **Audio Control Systems.** Use headset(s) with the correct impedance and audio jack connections. Check each station, each switch, and each button.

9. **Rappel Capability**. Helicopters with rappel capability require additional communications capability. The rappel contracts cover these requirements in detail.

10. **Fuel Service Vehicle FM.** Helicopter fuel trucks are required to have a mobile FM radio when selected in Section B of the contract. These radios are often

overlooked when the fuel truck is inspected. The specifications are in Exhibit 8 of the contract. Test the radio in the fuel service vehicle in the same manner as the aircraft's FM radio is tested.

8-4 Avionics Matrices

The following matrices can be used to help determine the mission(s) for which an aircraft may be used. This list is based on the National standard. Contracts are normally modified to suit the needs of the contracting Forest or Region. Forests and Regions may increase a requirement (make more stringent) but may not lessen (weaken) a requirement.

> **Note:** The complete National Air Attack/Reconnaissance Standards can be found in Appendix D.

Aircraft can be configured in different ways and still meet the minimum requirements for a specific mission. For instance, in the first matrix in Figure 18, Fire Reconnaissance has two columns. Looking at the columns, it is shown that an aircraft could be configured with an FM radio, intercom, and audio panel; or instead have the capability to have a portable radio kit installed. Either would meet the Fire Reconnaissance standard, as long as they also had an ELT, were equipped for Night VFR, two VHF-AM radios, and had a GPS. Darkened blocks in the different columns are non-required items for the mission in question.

8-4-1 Back Country and Reconnaissance Matrix Reference

This matrix shows minimum required avionics items on standard contracts. Contract amendments could change any requirement. Contract requirements and mission approvals are the determining factors on what is and is not required. Any aircraft with higher capability may substitute for a lesser capable aircraft. For example, a Fire Reconnaissance aircraft can substitute for a Resource Reconnaissance aircraft.

Figure 18: Back Country and Reconnaissance Matrix

Equipment	Back Country Either column is acceptable		Resource Recon Any column is acceptable			Fire Recon Either column is acceptable	
ELT (91.207 excluding f)							
Night VFR Lighting							
#1 VHF-AM (760 Channel)							
#2 VHF-AM (760 Channel)							
GPS (Panel-Mounted or Handheld)							
Automated Flight Following (AFF)[1]							
Audio Panel							
Intercom							
VHF-FM						(P25)[2]	
AUX-FM Provisions							
VHF-FM Antenna							
Space for Portable Reconnaissance VHF-FM Radio Kit[3]							
Auxiliary Power Source Connector							

[1] AFF is required on all Forest Service special mission aircraft. AFF is required within the Department of the Interior on a Bureau by Bureau basis.
[2] All VHF-FM radios must be multimode (P25) digital for fire operations.
[3] The portable reconnaissance radio kit need not be as sophisticated as an Air Attack Kit. These kits are generally supplied by the ordering unit.

8-4-2 Air Tactical Matrix Reference

This matrix shows minimum required avionics items on standard contracts. Contract requirements and mission approvals are the determining factors on what is and is not required. Any aircraft with higher capability may substitute for a lesser capable aircraft.

Figure 19: Air Tactical Matrix

Equipment	Type I DOI	Type I Either column is acceptable		Type II Either column is acceptable		Type III	Type IV
ELT (91.207 excluding f)	Without TAS Type I will be classed as a Type II						
Night VFR Lighting							
#1 760 channel VHF-AM							
#2 760 channel VHF-AM (720 for DOI)							
Transponder (91.411 & 413) / Static							
GPS (Panel-mounted or Handheld)		(Panel-Mounted Only for DOI)		(Panel-Mounted Only for DOI)			
#1 VHF-FM[1]							
#2 VHF-FM[2]							
#3 VHF-FM[3]							
AUX-FM Provisions							
Automated Flight Following (AFF)							
Intercom							
#1 Audio Panel							
#2 Audio Panel for Copilot/ATGS							
Audio Jacks for ATGS Instructor with radio PTT							
#1 Supplemental VHF-FM Antenna							
#2 Supplemental VHF-FM Antenna							
Auxiliary Power Source							
Space for Air Attack Kit							
TAS[4]							

[1] VHF-FM – All VHF-FM aeronautical radios must be multimode (P25) digital for fire operations.
[2] Same as above.
[3] Same as above.
[4] If an approved TAS is furnished, the card will show "w/TAS" following the Air Attack Type.

8-4-3 Airtanker/SEAT/Helo/Smokejumper Matrix Reference

This matrix shows minimum required avionics items on standard contracts. Contract requirements and mission approvals are the determining factors on what is and is not required. Contract amendments could modify any requirement. Type III helicopter contracts may have additional requirements to meet local needs.

Figure 20: Airtanker/SEAT/Helo/Smokejumper Matrix

Equipment	Airtanker	SEAT	Helicopter			Smokejumper
			Type 1	Type 2	Type 3	
ELT (91.207 excluding f)						
#1 760 channel VHF-AM						
#2 760 channel VHF-AM						
#1 VHF-FM[1]						
#2 VHF-FM[2]						
AUX-FM Provisions						
GPS	TSO	TSO				TSO
Transponder/Encoder/Static System						
#1 VOR/ILS System						
#2 VOR						w/ILS
Marker Beacon						
ADF						Or IFR GPS
DME	Or IFR GPS					Or IFR GPS
TAS		FS Only		EU Only		
Automated Flight Following (AFF)					3	4
Additional Telemetry Unit (ATU)[5]	FS Only	FS Only	FS Only: EU Tanked	FS Only: EU Tanked and Buckets		
#1 Audio Panel						
#2 Audio Panel						
#3 Audio Panel	Or Check Pilot ICS			EU only		Spotter
Intercom (ICS)						
Cockpit Voice Recorder						
Detection System (e.g. RADAR)						

[1] VHF-FM – All VHF-FM aeronautical radios must be multimode (P25) digital for fire operations.
[2] Same as above.
[3] AFF is required on all Forest Service special mission aircraft. AFF is required within the Department of the Interior on a Bureau by Bureau basis.
[4] Same as above.
[5] ATU reports drop events (fill, open, close, and volume with a GPS position report) in near real time through the AFF device. ATU is currently required on all Forest Service contracted Airtankers, Scoopers, SEAT, EU Type 1 tanked, and EU Type 2 tanked and bucketed helicopters. This requirement is evolving and may be required on additional aircraft in the near term. Inspectors should review the contract requirements to determine if ATU is applicable.

Flight Data Recorder	[redacted]	[redacted]	[redacted]		[redacted]	+20 PAX
Public Address System				EU Only		
Accessory Power Source Connector (3 pin)				Standard Category only		[redacted]
9-Pin Cargo Hook Connector						

8-5 Acceptable VHF-FM Radios

Only VHF-FM radios designed for aeronautical use are acceptable. Acceptable radios must be capable of a nominal 6 to 10 watts power output, have separate main and Air Guard receivers, display frequency and/or channel alpha-numeric, transmit CTCSS tones, be capable of at least 15 preset channels, and be operator/pilot programmable while in flight. Operator programmability does not refer to devices being externally attached to the radio, such as a laptop computer.

Photos of acceptable radios can be found in Appendix C of this guide, Avionics Special Equipment.

The following P25 Digital Aeronautical VHF-FM Radios are known to be acceptable as of this revision. *As technology advances, this list will change.* A current list of acceptable radios can be found on the avionics website: https://www.nifc.gov/NIICD/documents.html.

Figure 21: Acceptable P25 Digital Aeronautical VHF-FM Radios

Manufacturer	No.
Cobham (formerly Northern Airborne Technology (NAT)	NPX136D-000 NPX136D-070
Technisonic Industries	TDFM-136 TDFM-136NV TDFM-136A TDFM-136A/NV TDFM-136B TDFM-136B/NV TDFM-9000 TDFM-9000/NV TDFM-9100 TDFM-9100/NV TDFM-9200 TDFM-9200/NV TDFM-9300 TDFM-9300/NV

Notes

Chapter 9 - FAA Operations Specifications (Ops Specs)

9-1 Introduction

Most Forest Service contracted aircraft are required to operate under some form of FAA operating authority, be it Part 133 – Rotorcraft External Load Operations, 135 – Commuter and On-Demand Operations, or 137 – Agricultural Aircraft Operations. Operators approved under Part 135 have developed an Operations Manual that is submitted and approved by the FAA. These essentially tell the FAA how they intend to operate. The FAA will then issue Operations Specifications (Ops Specs) with the specific terms, conditions, and limitations under which the certificate holder must operate. Ops Specs are as legally binding on the operator as 14 CFR. The Ops Specs provide a listing of the aircraft the certificate holder may use, along with any additional requirements mandated by the FAA.

It is essential that inspectors be familiar with the location and type of information that can be found in Ops Specs. Per 14 CFR 135.21(f), operators are required to "carry appropriate parts of the manual on each aircraft when away from the principal base." Also per 119.43(b), they are required to "insert pertinent excerpts of its operations specifications thereto, in its manual." Finally, Part 133 operators are required to renew their operating authority every two years.

This chapter will provide an overview of the items pertinent to inspector duties found in **Part D – Aircraft Maintenance** and **Part A – General** of the certificate holder's Ops Specs. The FAA now issues Ops Specs electronically and normally FAA Inspectors will sign them electronically, so original signatures will very rarely be found on these documents anymore. Samples of both methods can be found in the examples provided.

The information provided in this chapter is applicable to most of the vendors used by the Forest Service. A few contractors operate aircraft in the "10 or More Passenger" category. There are additional Ops Specs for these operators which can be found below in 9-14. More detail on Ops Specs can be found in FAA Order 8900.1, (FSIMS) Volume 3, and Chapter 18 Operations Specifications.

9-2 Table of Contents

The Table of Contents lists pages that should be present in a vendor's Ops Specs. The simplicity of this statement may be questioned, but some valuable information is provided in the Table of Contents. An example of a Table of Contents is provided below. In the example, it can be ascertained from the effective date and amendment number columns that this operator has at least one aircraft on an Approved Aircraft Inspection Program (AAIP) and at least one has an approved Minimum Equipment List (MEL). On the other hand, if an Ops Spec page shows an Effective Date and

Amendment number in the Table of Contents, as in the example below, but Page D104, Additional Maintenance Requirements – Emergency Equipment, is missing from the contractors Ops Specs, the reason why should be questioned.

Figure 22: Sample Ops Specs Table of Contents

U.S. Department of Transportation
Federal Aviation Administration

Operations Specifications

TABLE OF CONTENTS

Part D – Aircraft Maintenance

		HQ Control Date	Effective Date	Amendment No.
71	Additional Maintenance Requirements	02/19/99	(Not Used)	
72	Aircraft Maintenance – Continued Airworthiness Maintenance Program Authorization	08/15/97	(Not Used)	
73	Approved Aircraft Inspection Program (AAIP)	02/20/14	09/09/15)	5
74	Reliability Program Authorization: Entire Aircraft	08/15/97	(Not Used)	
75	Reliability Program Authorization: Airframe, Powerplant, Systems or Selected Items	08/15/97	(Not Used)	
76	Short-Term Escalation Authorization	08/15/97	(Not Used)	
77	Maintenance Contractual Arrangement Authorization: For Entire Aircraft	08/15/97	(Not Used)	
78	Maintenance Contractual Arrangement Authorization: For Specific Maintenance	08/15/97	(Not Used)	
79	Reliability Program Contractual Agreement Authorization	08/15/97	(Not Used)	
80	Leased Aircraft Maintenance Program Authorizations: U.S. - Registered Aircraft	08/15/97	(Not Used)	
82	Prorated Time Authorization	08/15/97	(Not Used)	
83	Short-Term Escalation Authorization for Borrowed Parts Subject to Overhaul Requirements	04/01/99	(Not Used)	
84	Special Flight Permit with Continuous Authorization to Conduct Ferry Flights	04/01/98	(Not Used)	
85	Aircraft Listing	02/06/14	04/18/14	13
87	Maintenance Program Authorization for Leased Foreign-Registered Aircraft Operated by U.S. Air Carriers	08/15/97	(Not Used)	
88	Maintenance Time Limitations Authorization	08/15/97	(Not Used)	
89	Maintenance Time Limitations section	08/15/97	(Not Used)	
90	Coordinating Agencies for Suppliers Evaluation (CASE)	08/15/97	(Not Used)	
92	Maintenance Program Authorization for Airplanes Used for Operations in Designated Reduced Vertical Separation Minimum (RVSM) Airspace	08/15/97	(Not Used)	
93	Helicopter Night Vision Goggle Operations (HNVGO) Maintenance Program	02/04/99	(Not Used)	
95	Minimum Equipment List (MEL) Authorization	08/15/13	12/08/15	0
101	Additional Maintenance Requirements – Aircraft Engine, Propeller and Propeller Control (Governor)	08/22/10	12/08/10	5
102	Additional Maintenance Requirements – Rotor	08/22/10	09/15/01	6
103	Additional Maintenance Requirements – Single-Engine IFR	08/22/10	(Not Used)	
104	Additional Maintenance Requirements – Emergency Equipment	08/22/10	09/15/11	2

Print Date: 07/15/2015 OK CORRAL AVIATION, INC. CERTIFCATE NO: WOKA285D

9-3 Approved Aircraft Inspection Program (AAIP) – D073

The D073 will list the aircraft that are approved to be inspected under an AAIP. Be aware that an AAIP is approved for a specific "N" Number/serial number aircraft. An operator may have several of the same type aircraft listed on their D085, but not all "N" numbers may be approved on the AAIP.

See below for an example of a D073.

Figure 23: Sample D073 Approved Aircraft Inspection Program (AAIP)

U.S. Department of Transportation
Federal Aviation Administration

Operations Specifications

D073. Approved Aircraft Inspection Program (AAIP) **HQ Control: 02/20/14** **HQ Revision: 00b**

The certificate holder is authorized to use each aircraft listed in the following table for Title 14 CFR Part 135 operations provided each aircraft listed is inspected in accordance with the certificate holder's Approved Aircraft Inspection Program (AAIP).

Registration Number	Serial Number	Aircraft M/M/S	Maintenance Document	Time Limitations Document
N1234S	210-56789	Cessna T210M	Cessna Maintenance Manual C06234	This Operator T210 AAIP
N987CS	421C-1100	Cessna 421C	Cessna Maintenance Manual C08124	This Operator 421C AAIP

1. Issued by the Federal Aviation Administration.
2. These Operations Specifications are approved by the direction of the Administrator.

U.R. Currius

Currius, Uriah R., Principal Maintenance Inspector, NR09

3. Date Approval is Effective: 09/09/2016 Amendment Number: 5
4. I hereby accept and receive the Operations Specifications in this paragraph.

I.M. Kool

Kool, Igor M., Director of Maintenance Date: 09/09/2016

Print Date:09/09/2016 D073-1 CERTIFCATE NO: WOKA285D

OK CORRAL AVIATION, INC.

9-4 Aircraft Listing – D085

This is probably the most important Ops Spec page that needs to be checked. All approved aircraft will be listed on the D085. If the aircraft in question is not listed here, then it cannot be carded. For point-to-point aircraft, this will be the only document that will normally be checked. For Part 133 and 137 Operators, the D085 is the only Maintenance Ops Spec presently being issued. Some Flight Standards District Offices (FSDO) may not be issuing D085s for Part 137 Operations.

An example of a D085, which is similar to the A003, is below.

Note: Page A003 of the contractor Ops Specs will have an Aircraft Listing that looks like the example shown below for the D085. For Part 133 and Part 137 aircraft, there will not be a D085 Aircraft Listing, only an A003. See Section 9-10 below for more detail on the A003.

Figure 24: Sample D085 Aircraft Listing

U.S. Department of Transportation
Federal Aviation Administration

Operations Specifications

D085. **Aircraft Listing** **HQ Control:** **02/06/14**

HQ Revision: **02a**

The certificate holder is authorized to conduct operations under 14 CFR Part 135 using the aircraft identified on this operations specification.

Registration No.	Serial No.	Aircraft M/M/S
N1234S	210-56789	Cessna T210M
N987CS	421C-1100	Cessna 421C
N166ER	421B-0678	Cessna 421B
N369RT	436	deHavilland DHC-6-300
N567DB	3522	Bell 206 L-IV
N23456	7536	Bell 407

1. The Certificate Holder applies for the Operations in this paragraph
2. Issued by the Federal Aviation Administration.
3. These Operations Specifications are approved by the direction of the Administrator.

DIGITALLY FAA SIGNED 4/18/04 3:56:10 PM

Currius, Uriah R.

Principal Operations Inspector

4. Date Approval is Effective: 04/18/2004Amendment Number: 13
5. I hereby accept and receive the Operations Specifications in this paragraph.

DIGITALLY INDUSTRY SIGNED 4/15/04 5:54:10 PM

Kool, Igor M.

Director of Maintenance Date: 04/15/2004

Print Date: 04/18/2015 D085-1 CERTIFCATE NO: WOKA285D

OK CORRAL AVIATION, INC.

9-5 Minimum Equipment List (MEL) Authorization – D095

If an operator elects to have an MEL for their aircraft, it will be approved on D095. Only the type aircraft listed are authorized to use an MEL. On the D095 the make and model of an operator's aircraft with approved MELs will be listed. In a few cases the D095 will also list the MMEL it was derived from, along with the approval date for the MEL in question, although these are usually left off. Ensure that MELs carried in aircraft are approved for that specific model aircraft.

See below for an example of one page of a D095.

Non-Part 135 MELs (Parts 91, 133 & 137) must be approved by a **Letter of Authorization (LOA)**. **The LOA is authorized on a D095.** See AIG 9-15 for the link and instructions for accessing the FAA's MMEL website.

Each aircraft model with a U.S. Type certificate has an MMEL, except for single-engine piston airplane which has a generic "Single-Engine Airplane" MMEL. Many aircraft will have an MMEL version for commercial air carrier operators and another for Part 91 operators. For Part 135 air carriers, the operator will use the MMEL to develop a company MEL. For Part 91 operators (includes Part 133 & 137) the LOA authorizes them to "*use the MMEL as an MEL.*"

The FAA periodically revises MMELs. Revisions are classified as mandatory or non-mandatory.

1. **Mandatory revisions** are "number" changes. For mandatory "number" revisions, Part 135 operators must update their MELs as soon as possible (FAA Order 8900.1, Volume 4, Chapter 4, Section 8), and Part 91 operators are required to start using the revised MMEL within 30 days (FAA Order 8900.1, Volume 4, Chapter 4, Section 2).

2. **Non-mandatory revisions** are identified by a lower-case letter following the revision number, i.e., 7a. Non-mandatory revisions do not need to be incorporated until the next mandatory "number" change.

Figure 25: Sample D095 Minimum Equipment List (MEL) Authorization

U.S. Department of Transportation

Federal Aviation Administration

Operations Specifications

D095. **Minimum Equipment List (MEL) Authorization** **HQ Control:** **08/15/13**

HQ Revision: **020**

The certificate holder is authorized to use an approved Minimum Equipment List (MEL) provided the conditions and limitations of this paragraph are met. The certificate holder shall not use an MEL for any aircraft that is not specifically authorized by this paragraph.

a. Authorized Aircraft. The certificate holder is authorized to use an approved MEL for the aircraft listed below provided the conditions and limitations of this paragraph are met:

Aircraft M/M/S
Cessna T210M
Cessna 421C
Cessna 421B

b. Maximum Times Between Deferral and Repair. Except as provided in subparagraph d, the certificate holder shall have items repaired within the time intervals specified for the categories of item listed below:

(1) Category A. Items in this category shall be repaired within the time interval specified in the remarks column of the certificate holder's approved MEL.

(2) Category B. Items in this category shall be repaired within 3 consecutive calendar days (72 Hours) excluding the calendar day the malfunction was recorded in the aircraft maintenance log and/or record.

(3) Category C. Items in this category shall be repaired within 10 consecutive calendar days (240 Hours) excluding the calendar day the malfunction was recorded in the aircraft maintenance log and/or record.

(4) Category D. Items in this category shall be repaired within one hundred and twenty consecutive calendar days (2,880 Hours), excluding the calendar day the malfunction was recorded in the aircraft maintenance log and/or record.

c. MEL Management Program. The certificate holder shall develop and maintain a comprehensive program for managing the repair of items listed in the approved MEL. The certificate holder shall include in a document or its manual a description of the MEL management program. The MEL management program must include at least the following provisions:

(1) A method which provides for tracking the date and when appropriate, the time an item was deferred and subsequently repaired. The method must include a supervisory review of the number of deferred items per aircraft and a supervisory review of each deferred item to determine the reason for any delay in repair, length of delay, and estimated date the item will be repair.

(2) A plan for bringing together parts, maintenance personnel, and aircraft at a specific time and place for repair.

(3) A review of items deferred because of unavailability of parts to ensure that a valid back order exists with a firm delivery date.

Print Date: 12/08/2015 D095-1 CERTIFCATE NO: WOKA285D

OK CORRAL AVIATION, INC.

9-6 Additional Maintenance Requirements – Fixed Wing – D101

The D101 is issued to fixed-wing operators to show the required Time Between Overhaul (TBO) for the equipment used by the operator. It will list the models of aircraft, associated equipment installed, TBOs, and maintenance documents that must be utilized by the operator.

See below for an example of one page of a D101.

Figure 26: Sample D101 Additional Maintenance Requirements

Aircraft Engine, Propeller, and Propeller Control (Governor)

U.S. Department of Transportation

Federal Aviation Administration

Operations Specifications

D101. Additional Maintenance Requirements – Aircraft Engine, Propeller, and Propeller Control (Governor **HQ Control: 08/22/10** **HQ Revision: 000**

The certificate holder is authorized to use the following aircraft type identified below in its 14 CFR Part 135 nine seats or less operations provided these aircraft have met the additional maintenance requirements of Section 135.421:

a. Aircraft Engine. Each installed engine, to include turbo superchargers, appurtenances and accessories necessary for its function shall be maintained in accordance with the maintenance documents listed in the following table. The engine shall be overhauled on or before the time-in-service interval shown in the table.

b. Propeller and Propeller Control (governor). Each installed propeller and propeller control components supplied by its manufacturer shall be maintained in accordance with the maintenance documents listed in the following table. The propeller and propeller control shall be overhauled on or before the time-in-service interval shown in the table.

Aircraft Engine, Propeller, and Propeller Control (Governor)

Airplane Type	Engine			Propeller			Governor		
M/M/S	Make & Model	Maint Doc	Time-in-Service Int	Make & Model	Maint Doc	Time-in-Service Int	Make & Model	Maint Doc	Time-in-Service Int
Cessna T210M	Continental TSIO520L	P/N X30656	1600 Hrs.	Hartzell HC-A2Yk-4	P/N 202B	2000 Hrs. or 5 Yrs. Whichever comes first	Hartzell 2AF31C	P/N X30656	2000 Hrs. or 6 Yrs. Whichever comes first
Cessna 421C	Continental GTSIO520H	P/N X5623	1400 Hrs.	Hartzell HC-A3XK-4	P/N 703A	1800 Hrs. or 5 Yrs. Whichever comes first	Hartzell 2AH34H	P/N X30656	2000 Hrs. or 6 Yrs. Whichever comes first
deHavilland DHC-6-300	Pratt & Whitney PT6A-34	P/N X301342	3600 Hrs. O/H 1800 Hrs. HSI	Hartzell BeTN-3	P/N 146	3000 Hrs. or 6 Yrs. Whichever comes first	Woodward 210625	P/N X30656	3500 Hrs. or 6 Yrs. Whichever comes first

Print Date: 12/08/2015 D101-1 CERTIFCATE NO: WOKA285D

OK CORRAL AVIATION, INC.

9-7 Additional Maintenance Requirements – Rotor – D102

These pages will list the engine TBO times along with the maintenance manuals to be used.

See below for a sample of a D102.

Figure 27: Sample D102 Additional Maintenance Requirements – Rotor

U.S. Department of Transportation
Federal Aviation Administration

Operations Specifications

D102. Additional Maintenance Requirements – Rotor **HQ Control:** **08/22/10 HQ Revision: 000**

The certificate holder is authorized to use the following rotorcraft type identified below in its 14 CFR Part 135 nine seats or less operations provided these rotorcraft have met the additional maintenance requirements of Section 135.421. Rotor. Each installed main and auxiliary rotor shall be maintained in accordance with the manufacturer maintenance documents listed in the following table.

Airplane Type	Engine			Rotor Main and Auxiliary
M/M/S	Make & Model	Maintenance	Time-in	Maintenance
Bell 407	Allison 250-C47B	CSP 21001	2000 Hours	BHT-407-MM
Bell 206	Allision 250-C20R	GTP 5232-2	3500 Hours	BHT-206-A/B-MM

1. Issued by the Federal Aviation Administration.

2. These Operations Specifications are approved by the direction of the Administrator.

U.R. Currius

Currius, Uriah R., Principal Maintenance Inspector, NR09

3. Date Approval is Effective: 09/15/2011 Amendment Number: 6

4. I hereby accept and receive the Operations Specifications in this paragraph.

I.M. Kool

Kool, Igor M., Director of Maintenance Date: 09/15/2011

Print Date: 09/15/2014 D102-1 CERTIFCATE NO: WOKA285D

OK CORRAL AVIATION, INC.

9-8 Additional Maintenance Requirements – Emergency Equipment – D104

Maintenance requirements for emergency equipment such as oxygen bottles, fire extinguishers, etc., are listed in the D104.

See below for an example of a D104.

Figure 28: Sample D104 Additional Maintenance Requirements – Emergency Equipment

U.S. Department of Transportation
Federal Aviation Administration

Operations Specifications

D104. Additional Maintenance Requirements – Emergency Equipment HQ Control: 08/22/10 HQ Revision: 000

The certificate holder is authorized to use the following emergency equipment in its 14 CFR Part 135 nine seats or less operations, provided the applicable aircraft have met the additional maintenance requirements of Section 135.421:

a. Emergency equipment. Each item of installed emergency equipment shall be maintained in accordance with the manufacturer's maintenance documents and/or the limitations listed in the following table.

(1) In addition to the maintenance document listed in this table, the following specifications must be followed for the applicable listed emergency equipment items:

(a) Oxygen (O2) bottles and liquid fire extinguishers. Inspections, hydrostatic tests, and life limits of pressure vessels manufactured under DOT specification are accomplished as set forth in 49 CFR Part 173, as amended.

(b) Fire extinguishers. Inspections, hydrostatic tests, and life limits of portable fire extinguishers are accomplished as set forth in 46 CFR Sections 71.25 and 162.028, as amended.

(c) Military manufactured. Pressure vessels manufactured under MIL-SPEC are maintained in accordance with applicable military specifications.

(d) Foreign-manufactured. Foreign-manufactured pressure cylinders are maintained in accordance with the applicable foreign manufacturer's specifications.

(e) Other. Pressure cylinders not manufactured under DOT, foreign, or U.S. MIL-SPECS are maintained in accordance with the applicable aircraft manufacturer's specifications.

Emergency Equipment

Emergency Equipment	Maintenance Document	Limitations and Provisions
HALON FIRE EXTINGUISHER	OK CORRAL AVIATION, INC. OPERATIONS MANUAL APPENDIX 7	
OXYGEN SYSTEM, BOTTLE REGULATOR AND MASK		

Print Date: 09/15/2015 D104-1 CERTIFICATE NO: WOKA285D

OK CORRAL AVIATION, INC.

9-9 Aging Airplane Inspection and Records Review – D485

The D485 identifies aircraft that are required to have inspections and record checks in accordance with 14 CFR 135.422. Essentially, multi-engine aircraft used in Scheduled Operations that are more than 15 years old require an initial inspection and recurring inspections every seven years.

See below for an example of a D485.

Figure 29: Sample D485 Aging Airplane Inspection and Records Review

U.S. Department of Transportation
Federal Aviation Administration

Operations Specifications

D485. Aging Airplane Inspection and Records Review **HQ Control:11/12/13** **HQ Revision: 000**

a. The Aging Aircraft Safety Act of 1991 requires the Administrator to make inspections and review the maintenance and other records of each aircraft an air

carrier uses to provide air transportation. The certificate holder who conducts operations under 14 CFR 121, Part 135, or Part 129 using the airplanes

identified on this Operation Specification may not use those airplanes in air transportation unless the inspections are accomplished as required by the applicable

regulations in 14 CFR Part 121, Part 135, or Part 129, as applicable.

b. The airplanes that this inspection and records review is applicable to include:

(1) All Part 121 airplanes (14 CFR Section 121.368)

(2) All Part 135 multi-engine airplanes used in scheduled service (14 CFR Sect ion 135.422/423

(3) All Part 129 U.S. registered multi-engine airplanes (14 CFR Section 129.33)

c. The airplanes that may be excluded from this inspection and records review are:

(1) Airplanes operated solely within the state of Alaska

(2) Airplanes that are operated under 14 CFR Part 135 as "On-Demand"

(3) Airplanes in storage and not currently being operated under 14 CFR Part 121, 135, or 129 operations (However, the required records review and

inspections must be accomplished before such airplanes in storage may be placed into service after applicable compliance date in accordance with the

sections of the CFR listed in subparagraph above)

(4) Airplanes that have not reached the age of the required records review and inspection.

d. This paragraph serves as notification to the FAA of the completion of the required records review and airplane inspection to comply with the Aging Airplane

Safety Act. Official Notification to the operator will be made by the CHDO and this date will be used to determine due date of next required inspection.

e. Paragraph Completion Instructions. The following are to be used to complete the required records and airplane inspection in Table 1 of this

Paragraph. Remember: ALL cells in the table MUST be filled out before activating the paragraph!

(1) Load ALL airplanes in the certificate holder's Aircraft Authorization Information into Columns 1, 2, 3 and 4.

(2) For each airplane that requires this records review and inspection:

a. Enter the date of airplane manufacture as indicated on the airframe data plate or the original airworthiness certificate, whichever is oldest, in

Column 5.

Enter Not Completed in Column 6, Column 7, and Column 8, as applicable, to indicate that the inspection and/or records review has not yet been completed.

Print Date: 04/19/2016 D485-1 CERTIFCATE NO: WOKA285D

OK CORRAL AVIATION, INC.

Figure 30: Sample D485 Aging Airplane Inspection and Records Review (Continued)

U.S. Department of Transportation
Federal Aviation Administration

Operations Specifications

c. When the appropriate inspection is complete, insert the month and year of the accomplishment in Column 6 and Column 7, as applicable.

d. When both inspections are complete, enter the date (month/year) that the official notification was sent to the certificate holder in Column 9.

(3) For airplanes that are operated solely within the state of Alaska:

a. Load the airplanes in Columns 1 through 4 per Item (1) above

b. Select and enter Alaska Intrastate- N/A (for not applicable) in EACH of the following columns: Column 5, Column 6, Column 7, and Column 8.

(4) For airplanes that are operated under 14 CFR Part 135 as "On-Demand":

a. Load the airplanes in Columns 1 through 4 per Item (1) above

b. Select and enter On-Demand (135)-N/A (for not applicable) in EACH of the following columns: Column 5, Column 6, Column 7, and Column 8.

(5) For airplanes in storage that will not have the required records review and inspection accomplished:

a. Load the airplanes in Columns 1 through 4 per Item (1) above

b. Select and enter Storage-Not Completed in EACH of the following columns: Column 5, Column 6, Column 7, and Column 8.

(6) For airplanes that have not reached the age where the required records review and inspection must be accomplished:

a. Load the airplanes in Columns 1 through 4 per Item (1) above

b. Select and enter Below Threshold-N/A (for not applicable) in EACH of the following columns: Column 5, Column 6, Column 7, and Column 8.

Process the paragraph and activate it. This paragraph may be considered valid if completed, signed, and activated by the FAA. It does not require the signature of the operator for the paragraph and its data to be considered valid.

TABLE 1

(*These will be loaded from the Certificate Holder Aircraft Authorization airplane information.)

Registration No.	Serial No.	Nose Number if Applicable	Airplane M/M/S	Date of Airplane Manufacture	Airplane Inspection Completed	Records Review Completed	Operator Notification
N421BB	421B-0876	N/A	Cessna 421B	On Demand (135)-N/A	On Demand (135)-N/A	On Demand (135)-N/A	On Demand (135)-N/A
N421CC	421C-701	N/A	Cessna 421C	December 3, 1979	June 17, 2003	June 17, 2003	July 3, 2003

Print Date: 12/08/2015 D485-2 CERTIFCATE NO: WOKA285D

OK CORRAL AVIATION, INC.

9-10 Airplane/Aircraft Authorization or Rating and Limitations – A003

Two types of A003 may be encountered:

1. **A003 – Airplane/Aircraft Authorization.** For Part 133, 135 and 137 Operators, the A003 will provide the same information as the D085.

2. **A003 – Ratings and Limitations (Repair Station).** For Certified Repair Stations (CRS) the A003 will identify the ratings the CRS holds. A Class rating authorizes a CRS to work on multiple models of aircraft, engine, propellers, etc., whereas a Limited rating restricts them to specific models of aircraft, engines, propeller, radios, instruments and accessories. The A003 may list the specific aircraft, engines or propellers, etc., or will specify a separate Capabilities List that will identify the authorizations. See 14 CFR §145.59 and §145.61 for more detail on CRS ratings.

9-11 Autopilot in Lieu of Required Second-in-Command – A015

This page may need to be checked in Part A of the Ops Spec, to determine if an airplane is authorized to operate with a single pilot.

See below for an example of an A015.

Figure 31: Sample A015 Autopilot in Lieu of Required Second-in-Command

U.S. Department of Transportation
Federal Aviation Administration

Operations Specifications

A015. **Autopilot in Lieu of Required Second-in-Command** **HQ Control:** **04/30/15**
HQ Revision: **01b**

The certificate holder is authorized to use the aircraft and its autopilot system listed below, in IFR operations, in lieu of a required second-in-command provided the following provisions are met.

a. The pilot is command has satisfactorily completed the proficiency requirements of 14 CFR Section 135.297(g).

b. The installed autopilot system is operational in accordance with Section 135.105(c)(1).

AIRCRAFT M/M/S	AUTOPILOT SYSTEM MANUFACTURER/MODEL	ADDITIONAL CONDITIONS/LIMITATIONS
CESSNA CE-T210M	CESSNA / 400B	
CESSNA CE-421B	BENDIX / KING KAP 140	
CESSNA CE-421C	CESSNA / ARC 800B IFCS	
DEHAVILLAND DHC-6-300	COLLINS AP-105	

1. Issued by the Federal Aviation Administration.
2. These Operations Specifications are approved by the direction of the Administrator.

I. B. Good

Good, Ivan B., Principal Operations Inspector, NR09

3. Date Approval is Effective: 09/27/2015 Amendment Number: 8
4. I hereby accept and receive the Operations Specifications in this paragraph.

I.M. Kool

Kool, Igor M., Director of Maintenance Date: 09/27/2015

Print Date: 07/10/2015 A015-1 CERTIFCATE NO: WOKA285D

OK CORRAL AVIATION, INC.

9-12 Single-Engine IFR Passenger-Carrying Operations Under 14 CFR Part 135 – A046

If an operator has single-engine aircraft that are authorized to carry passengers under IFR conditions, it will be approved on this Ops Spec. What needs to be remembered is that per 14 CFR 135.421(c) all aircraft approved under A046 must be on some type of approved Engine Trend Monitoring program which includes an oil analysis program. The records for both the monitoring program and oil analysis must be maintained with the engine maintenance records.

9-13 Operating Certificate Numbers

Certificate Numbers have four specific elements. The first three alphanumeric characters are unique and designate a specific operator. The **fourth character** is always a letter, either **"A" for Air Carrier, "G" for Agricultural operator, "L" for Rotorcraft External - Load operator, or "R" for a Certified Repair Station.** The next element will consist of a three-number identifier. The final element is a letter suffix A through Z. This letter should never be a P, as this is only used during pre-certification.

Note: The Part 135 Certificate Number or Operator Name must be clearly visible from outside the aircraft while sitting on the ground per 14 CFR 119.9.

9-14 Other Ops Spec Pages

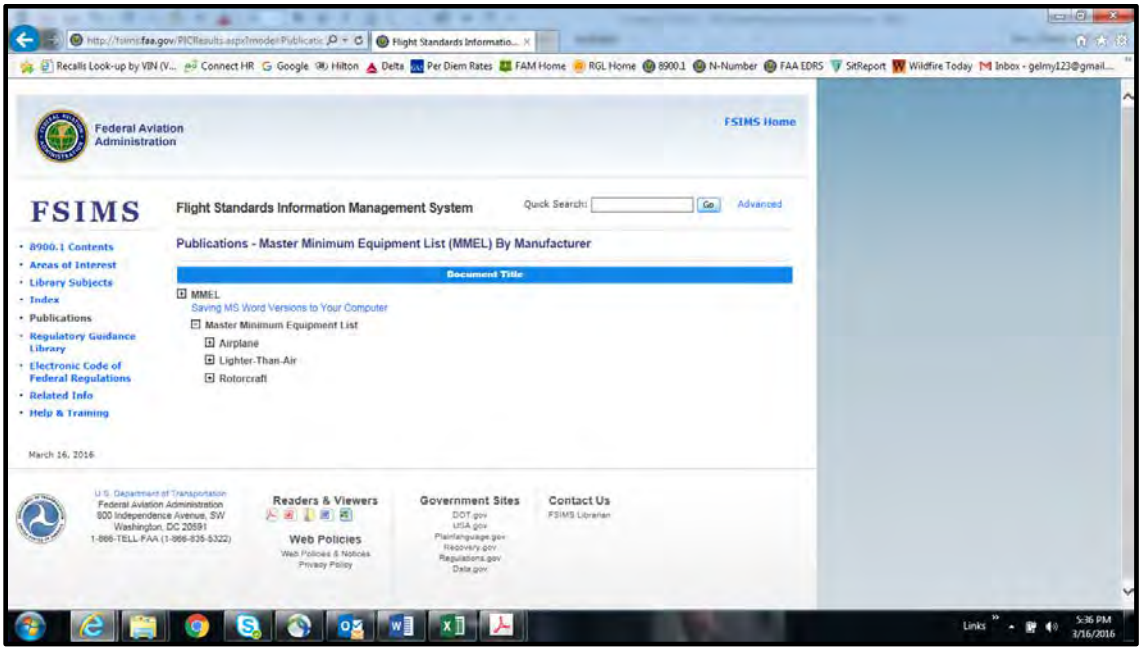
Depending on the operator, the following lists some of the other Ops Spec pages that may be encountered.

1. A016 Single Pilot.
2. A061 Electronic Flight Bag (EFB).
3. D072 Continuous Airworthiness Maintenance Program Authorization.
4. D074 Reliability Program Authorization – Entire Aircraft.
5. D075 Reliability Program Authorization – (Parts of Aircraft).
6. D076 Short Term Escalation.
7. D084 Special Flight Permits.
8. D088 Maintenance Time Limitations Authorization.
9. D089 Maintenance Time Limitations Section.

9-15 Master Minimum Equipment Lists (MMEL)

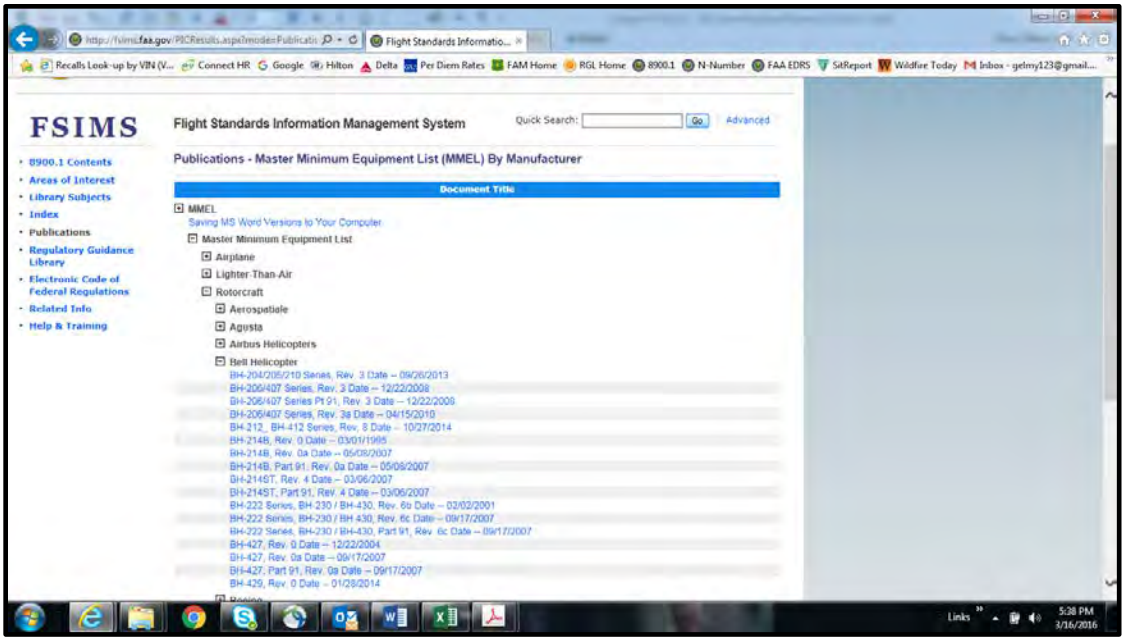
http://fsims.faa.gov/PICResults.aspx?mode=Publication&doctype=MMEL

Figure 32: Master Minimum Equipment List (MMEL) Webpage 1



Select **Airplane** or **Rotorcraft** as applicable.

Figure 33: Master Minimum Equipment List (MMEL) Webpage 2



If there is not an MMEL listed for single-engine airplane, use the Single Engine MEL.

Notes

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Chapter 10 – Forest Service Forms

10-1 Introduction

There are numerous forms inspectors use on a frequent basis. Most of these are Forest Service forms; however, as inspectors work closely with the Department of Interior's Office of Aviation Services (OAS), inspectors need to be familiar with OAS forms, as aircraft approved by OAS are accepted by the Forest Service.

The following figure lists forms used by inspectors in the performance of their duties. Sample forms are displayed on the following pages.

Figure 34: Aircraft Inspector Forms

FS Form No.	Description
FS-5700E	Aircraft Maintenance Log
FS-5700-4	Aircraft Approval Card (Airtankers)
FS-5700-21	Airplane Data Record
FS-5700-21a	Helicopter Data Record
FS-5700-32	Aircraft Contract Status Report
FS-5700-33	Aircraft Pre-Use Inspection Discrepancy Report
	Point-To-Point Aircraft Data Card (Forest Service)
	Service Truck – Interagency Data Card
	Mechanic Qualification Form
	Mechanic Qualification Card
FS-5700-17	Interagency Helicopter Load Calculation
	Return to Contract Availability Tracking Sheet (Suggested)

The Forest Service uses electronic checklists online and in the Excel format. These checklists automatically complete all required FS-5700 forms and cards. The online version enables inspectors to complete the checklists at the aircraft and then electronically email a card to the contractor.

For the FS-5700-4 Airtanker and Point-to-Point cards, the original is given to the vendor for placement in the aircraft and a copy is placed in the contract file. Again, electronic versions are available.

10-2 FS-5700E – Aircraft Maintenance Log

Figure 35: FS-5700E Aircraft Maintenance Log

A/C NO.	TYPE & MODEL	USDA FOREST SERVICE AIRCRAFT MAINTENANCE LOG	REGION	PAGE

PILOT	DATE	TACH TIME	OIL ADDED	LANDINGS	ENGINE CYCLES	TOTALS CYCLES / LANDINGS

		END	START	TOTAL							PREVIOUS TOTAL			
1															
2												LANDING/CYCLES THIS PAGE			
3												TOTAL TO DATE:			
4												INSPECTION STATUS			
5												TYPE DUE	TIME DUE		
	TOTALS														

TIM EIN SERVICE	AIRFRAME	ENG NO. 1	ENG NO. 2
PREVIOUS TOTAL			
HOURS THIS PAGE			
TOTAL HOURS TO DATE			

VOR CHECK (91.25) DATE _____

LOCATION _____ BEARING NO. 1_____ NO.2 _____

ERROR_____TYPE TEST _____

DATE DUE _____

SINATURE _____

ANNUAL DUE	SPECIAL INSP.

NO.	DISCREPANCIES – DATE & INITIAL EACH ENTRY	NO.	CORRECTIVE ACTION	SIGNATURE
	MAINTENANCE FILE COPY			

10-3 FS-5700-4 – Aircraft Approval Card (Airtanker)

Figure 36: FS-5700-4 Aircraft Approval Card (Airtanker)

(USED FOR AIRTANKERS ONLY)

AIRCRAFT APPROVAL

(Reference FSM 5710)

Expiration Date

Make/Model

Operator Name and Address

FAA No.

Serial No.

Empty Weight

Gross Wt.

Contract/Rental Agreement No.

EU:

CWN:

AUTHORIZED AIRCRAFT USE *(Inspector initial)*

2018

~~Passengers~~	~~Smokejumper~~	~~Helitanker~~
~~Cargo~~	~~Paracargo~~	~~Bucket~~
~~Recon~~		~~Slingload~~
~~Air Attack~~		~~Helitorch~~
~~Airtanker~~		

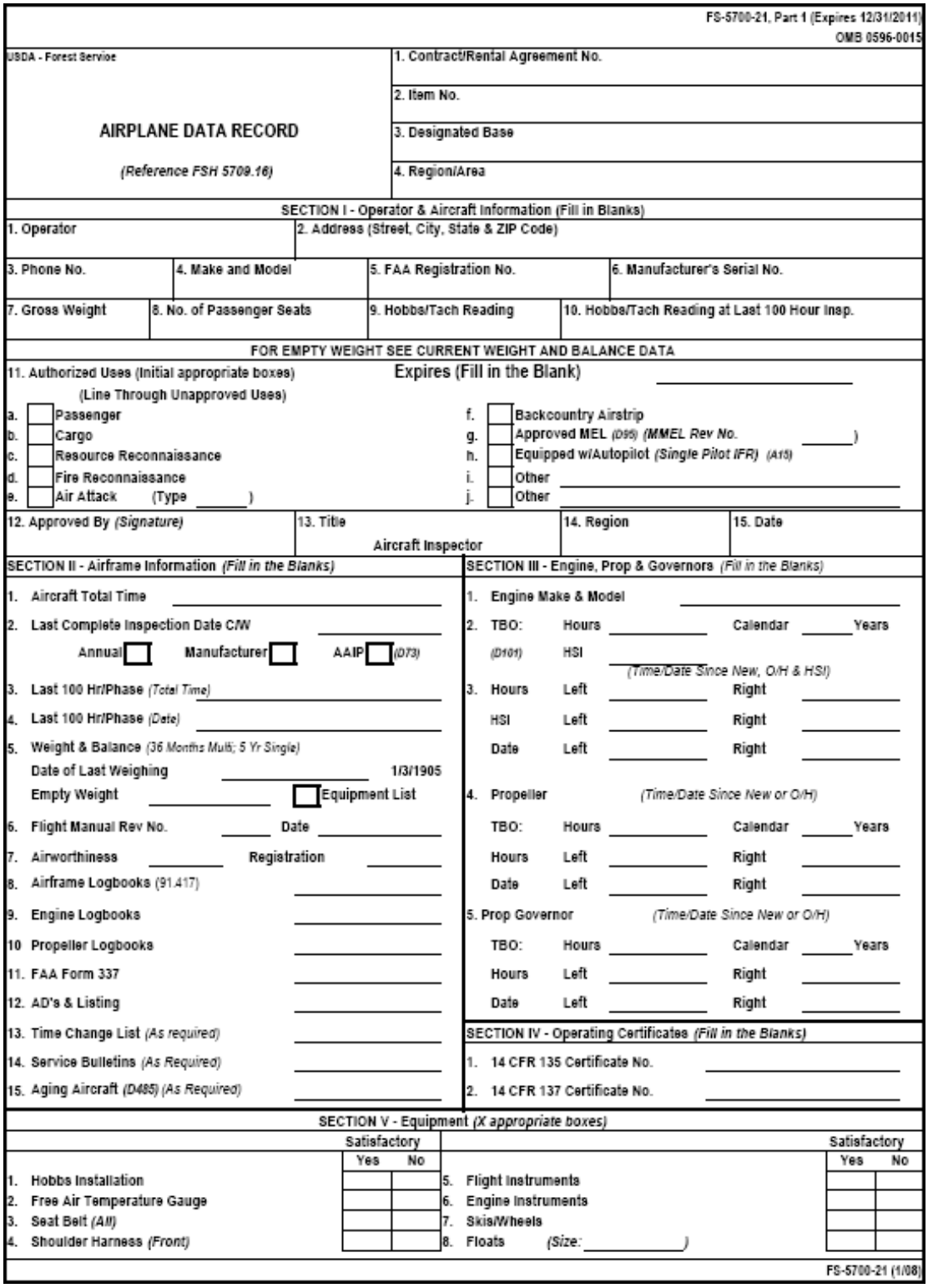
Authorized Inspector Signature | Region | Date

U.S. GOVERNMENT PRINTING OFFICE: 1997-591-065/61013

← *Card with electronic signature* ***invalid*** *without date stamp*

10-4 FS-5700-21 – Airplane Data Record

Figure 37: FS-5700-21 (Front Page)



FS-5700-21, Part 1 (Expires 12/31/2011)
OMB 0596-0015

USDA - Forest Service

AIRPLANE DATA RECORD

(Reference FSH 5709.16)

1. Contract/Rental Agreement No.
2. Item No.
3. Designated Base
4. Region/Area

SECTION I - Operator & Aircraft Information (Fill in Blanks)

1. Operator	2. Address (Street, City, State & ZIP Code)		
3. Phone No.	4. Make and Model	5. FAA Registration No.	6. Manufacturer's Serial No.
7. Gross Weight	8. No. of Passenger Seats	9. Hobbs/Tach Reading	10. Hobbs/Tach Reading at Last 100 Hour Insp.

FOR EMPTY WEIGHT SEE CURRENT WEIGHT AND BALANCE DATA

11. Authorized Uses (Initial appropriate boxes) — Expires (Fill in the Blank) _____
(Line Through Unapproved Uses)

a. ☐ Passenger
b. ☐ Cargo
c. ☐ Resource Reconnaissance
d. ☐ Fire Reconnaissance
e. ☐ Air Attack (Type _____)
f. ☐ Backcountry Airstrip
g. ☐ Approved MEL *(D95)* *(MMEL Rev No.* _____)
h. ☐ Equipped w/Autopilot *(Single Pilot IFR)* *(A15)*
i. ☐ Other _____
j. ☐ Other _____

12. Approved By *(Signature)*	13. Title	14. Region	15. Date
	Aircraft Inspector		

SECTION II - Airframe Information *(Fill in the Blanks)*

1. Aircraft Total Time _____
2. Last Complete Inspection Date C/W _____
   Annual ☐ Manufacturer ☐ AAIP ☐ *(D73)*
3. Last 100 Hr/Phase *(Total Time)* _____
4. Last 100 Hr/Phase *(Date)* _____
5. Weight & Balance *(36 Months Multi; 5 Yr Single)*
   Date of Last Weighing _____ 1/3/1905
   Empty Weight _____ ☐ Equipment List
6. Flight Manual Rev No. _____ Date _____
7. Airworthiness _____ Registration _____
8. Airframe Logbooks (91.417) _____
9. Engine Logbooks _____
10. Propeller Logbooks _____
11. FAA Form 337 _____
12. AD's & Listing _____
13. Time Change List *(As required)* _____
14. Service Bulletins *(As Required)* _____
15. Aging Aircraft *(D485)* *(As Required)* _____

SECTION III - Engine, Prop & Governors *(Fill in the Blanks)*

1. Engine Make & Model _____
2. TBO: Hours _____ Calendar _____ Years
   (D101) HSI _____
   (Time/Date Since New, O/H & HSI)
3. Hours Left _____ Right _____
   HSI Left _____ Right _____
   Date Left _____ Right _____
4. Propeller *(Time/Date Since New or O/H)*
   TBO: Hours _____ Calendar _____ Years
   Hours Left _____ Right _____
   Date Left _____ Right _____
5. Prop Governor *(Time/Date Since New or O/H)*
   TBO: Hours _____ Calendar _____ Years
   Hours Left _____ Right _____
   Date Left _____ Right _____

SECTION IV - Operating Certificates *(Fill in the Blanks)*

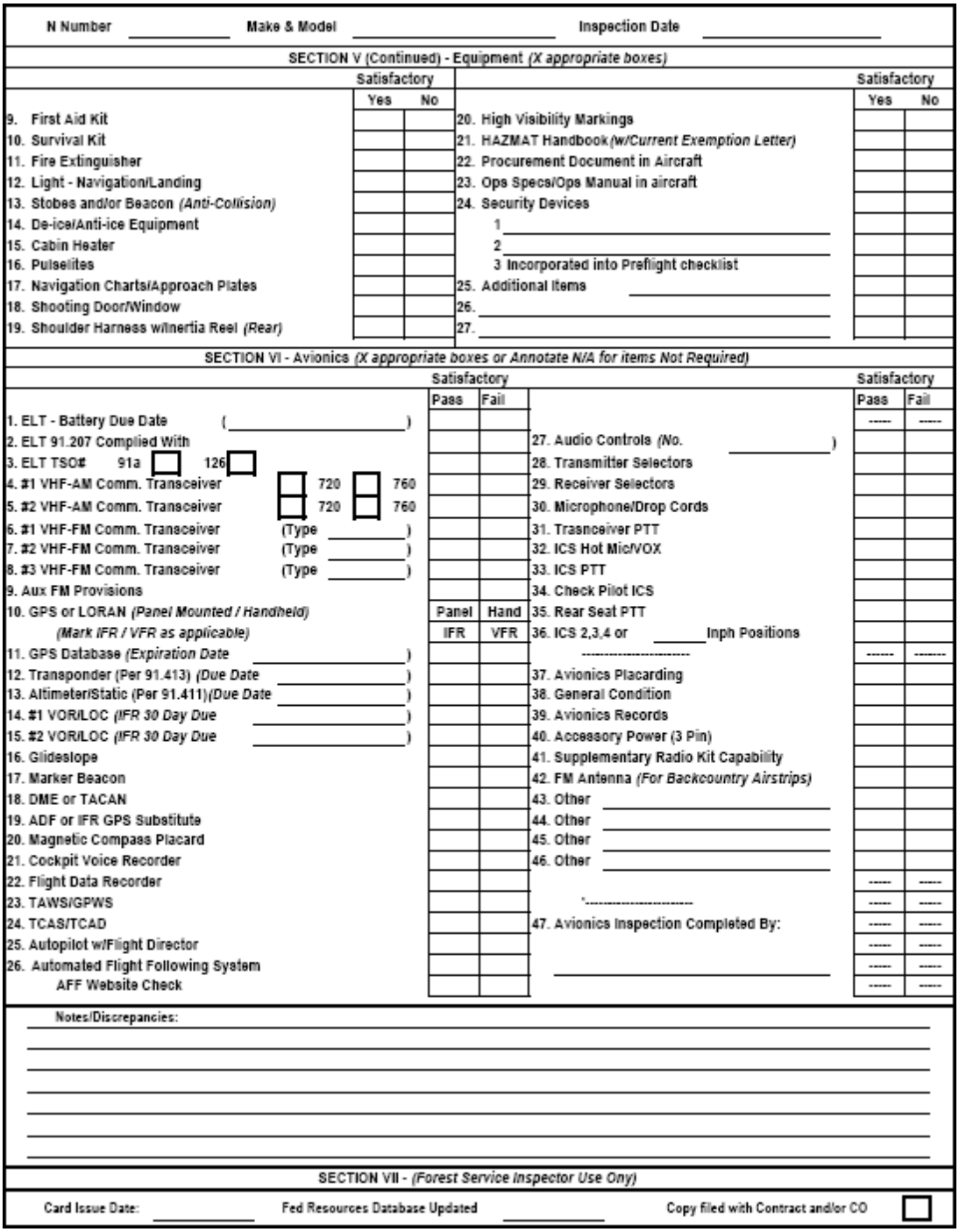
1. 14 CFR 135 Certificate No. _____
2. 14 CFR 137 Certificate No. _____

SECTION V - Equipment *(X appropriate boxes)*

	Satisfactory Yes	Satisfactory No		Satisfactory Yes	Satisfactory No
1. Hobbs Installation			5. Flight Instruments		
2. Free Air Temperature Gauge			6. Engine Instruments		
3. Seat Belt *(All)*			7. Skis/Wheels		
4. Shoulder Harness *(Front)*			8. Floats *(Size:* _____)		

FS-5700-21 (1/08)

Figure 38: FS-5700-21 (Back Page)



N Number _____ Make & Model _____ Inspection Date _____

SECTION V (Continued) - Equipment *(X appropriate boxes)*

	Satisfactory Yes	Satisfactory No		Satisfactory Yes	Satisfactory No
9. First Aid Kit			20. High Visibility Markings		
10. Survival Kit			21. HAZMAT Handbook *(w/Current Exemption Letter)*		
11. Fire Extinguisher			22. Procurement Document in Aircraft		
12. Light - Navigation/Landing			23. Ops Specs/Ops Manual in aircraft		
13. Strobes and/or Beacon *(Anti-Collision)*			24. Security Devices		
14. De-ice/Anti-ice Equipment			1 _____		
15. Cabin Heater			2 _____		
16. Pulselites			3 Incorporated into Preflight checklist		
17. Navigation Charts/Approach Plates			25. Additional Items _____		
18. Shooting Door/Window			26. _____		
19. Shoulder Harness w/Inertia Reel *(Rear)*			27. _____		

SECTION VI - Avionics *(X appropriate boxes or Annotate N/A for items Not Required)*

	Satisfactory Pass	Satisfactory Fail		Satisfactory Pass	Satisfactory Fail
1. ELT - Battery Due Date (_____)				-----	-----
2. ELT 91.207 Complied With			27. Audio Controls *(No.* _____)		
3. ELT TSO# 91a ☐ 126 ☐			28. Transmitter Selectors		
4. #1 VHF-AM Comm. Transceiver ☐ 720 ☐ 760			29. Receiver Selectors		
5. #2 VHF-AM Comm. Transceiver ☐ 720 ☐ 760			30. Microphone/Drop Cords		
6. #1 VHF-FM Comm. Transceiver (Type _____)			31. Trasnceiver PTT		
7. #2 VHF-FM Comm. Transceiver (Type _____)			32. ICS Hot Mic/VOX		
8. #3 VHF-FM Comm. Transceiver (Type _____)			33. ICS PTT		
9. Aux FM Provisions			34. Check Pilot ICS		
10. GPS or LORAN *(Panel Mounted / Handheld)*	Panel	Hand	35. Rear Seat PTT		
(Mark IFR / VFR as applicable)	IFR	VFR	36. ICS 2,3,4 or _____ Inph Positions		
11. GPS Database *(Expiration Date* _____)			----------	------	-------
12. Transponder (Per 91.413) *(Due Date* _____)			37. Avionics Placarding		
13. Altimeter/Static (Per 91.411)*(Due Date* _____)			38. General Condition		
14. #1 VOR/LOC *(IFR 30 Day Due* _____)			39. Avionics Records		
15. #2 VOR/LOC *(IFR 30 Day Due* _____)			40. Accessory Power (3 Pin)		
16. Glideslope			41. Supplementary Radio Kit Capability		
17. Marker Beacon			42. FM Antenna *(For Backcountry Airstrips)*		
18. DME or TACAN			43. Other _____		
19. ADF or IFR GPS Substitute			44. Other _____		
20. Magnetic Compass Placard			45. Other _____		
21. Cockpit Voice Recorder			46. Other _____		
22. Flight Data Recorder				-----	-----
23. TAWS/GPWS			----------	-----	-----
24. TCAS/TCAD			47. Avionics Inspection Completed By:	-----	-----
25. Autopilot w/Flight Director				-----	-----
26. Automated Flight Following System			_____	-----	-----
AFF Website Check				-----	-----

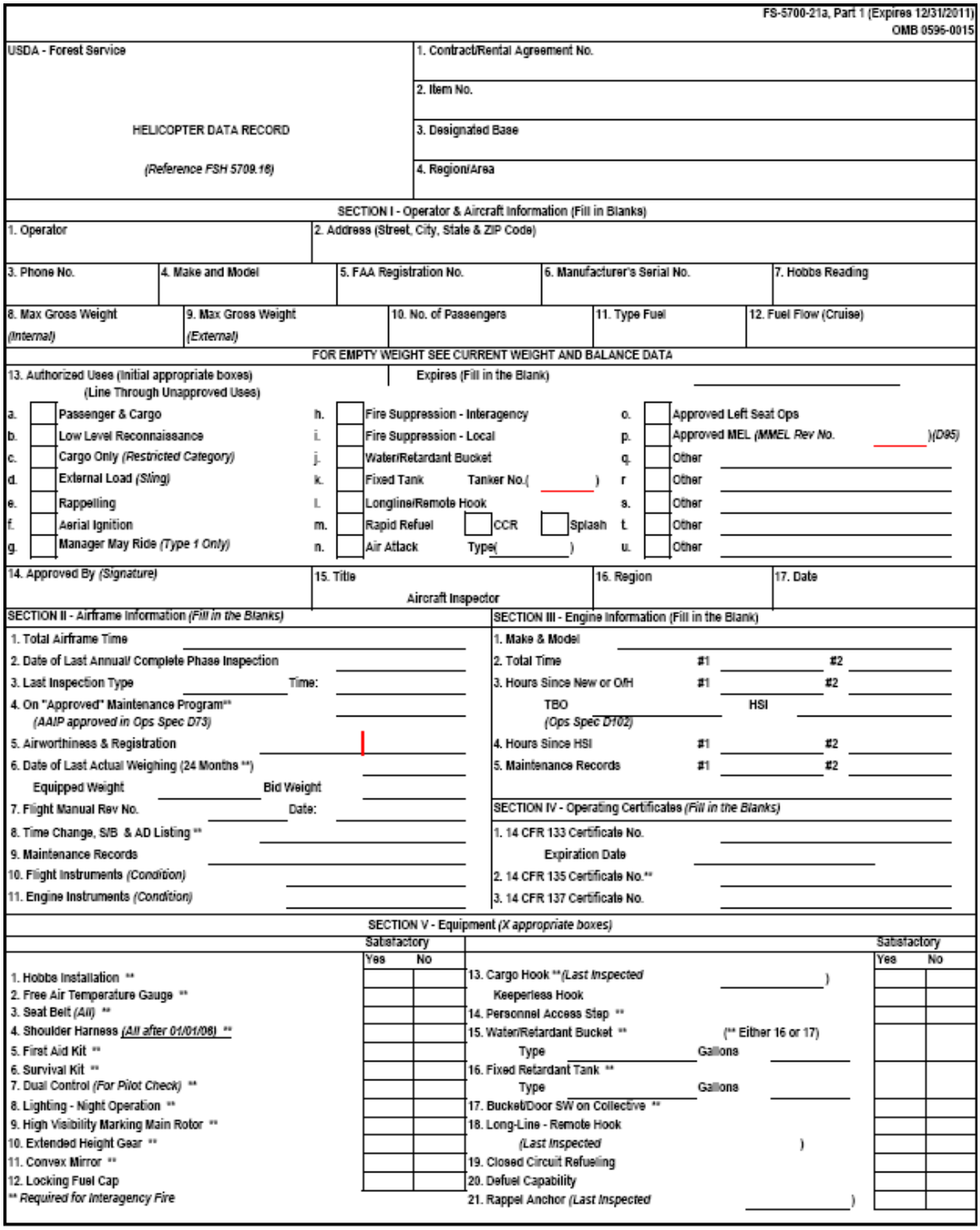
Notes/Discrepancies: _____

SECTION VII - *(Forest Service Inspector Use Only)*

Card Issue Date: _____ Fed Resources Database Updated _____ Copy filed with Contract and/or CO ☐

10-5 FS-5700-21a – Helicopter Data Record

Figure 39: FS-5700-21a (Front Page)



FS-5700-21a, Part 1 (Expires 12/31/2011)
OMB 0595-0015

USDA - Forest Service	1. Contract/Rental Agreement No.
	2. Item No.
HELICOPTER DATA RECORD	3. Designated Base
(Reference FSH 5709.16)	4. Region/Area

SECTION I - Operator & Aircraft Information (Fill in Blanks)

1. Operator	2. Address (Street, City, State & ZIP Code)			
3. Phone No.	4. Make and Model	5. FAA Registration No.	6. Manufacturer's Serial No.	7. Hobbs Reading
8. Max Gross Weight *(Internal)*	9. Max Gross Weight *(External)*	10. No. of Passengers	11. Type Fuel	12. Fuel Flow (Cruise)

FOR EMPTY WEIGHT SEE CURRENT WEIGHT AND BALANCE DATA

13. Authorized Uses (Initial appropriate boxes) (Line Through Unapproved Uses) — Expires (Fill in the Blank) _____

a. ☐ Passenger & Cargo	h. ☐ Fire Suppression - Interagency	o. ☐ Approved Left Seat Ops
b. ☐ Low Level Reconnaissance	i. ☐ Fire Suppression - Local	p. ☐ Approved MEL *(MMEL Rev No.* ____ *)(D95)*
c. ☐ Cargo Only *(Restricted Category)*	j. ☐ Water/Retardant Bucket	q. ☐ Other
d. ☐ External Load *(Sling)*	k. ☐ Fixed Tank Tanker No.(____)	r. ☐ Other
e. ☐ Rappelling	l. ☐ Longline/Remote Hook	s. ☐ Other
f. ☐ Aerial Ignition	m. ☐ Rapid Refuel ☐ CCR ☐ Splash	t. ☐ Other
g. ☐ Manager May Ride *(Type 1 Only)*	n. ☐ Air Attack Type(____)	u. ☐ Other

14. Approved By *(Signature)*	15. Title Aircraft Inspector	16. Region	17. Date

SECTION II - Airframe Information *(Fill in the Blanks)*

1. Total Airframe Time
2. Date of Last Annual/ Complete Phase Inspection
3. Last Inspection Type ____ Time: ____
4. On "Approved" Maintenance Program** *(AAIP approved in Ops Spec D73)*
5. Airworthiness & Registration
6. Date of Last Actual Weighing (24 Months **) Equipped Weight ____ Bid Weight ____
7. Flight Manual Rev No. ____ Date: ____
8. Time Change, S/B & AD Listing **
9. Maintenance Records
10. Flight Instruments *(Condition)*
11. Engine Instruments *(Condition)*

SECTION III - Engine Information (Fill in the Blank)

1. Make & Model
2. Total Time #1 ____ #2 ____
3. Hours Since New or O/H #1 ____ #2 ____ TBO ____ HSI ____ *(Ops Spec D102)*
4. Hours Since HSI #1 ____ #2 ____
5. Maintenance Records #1 ____ #2 ____

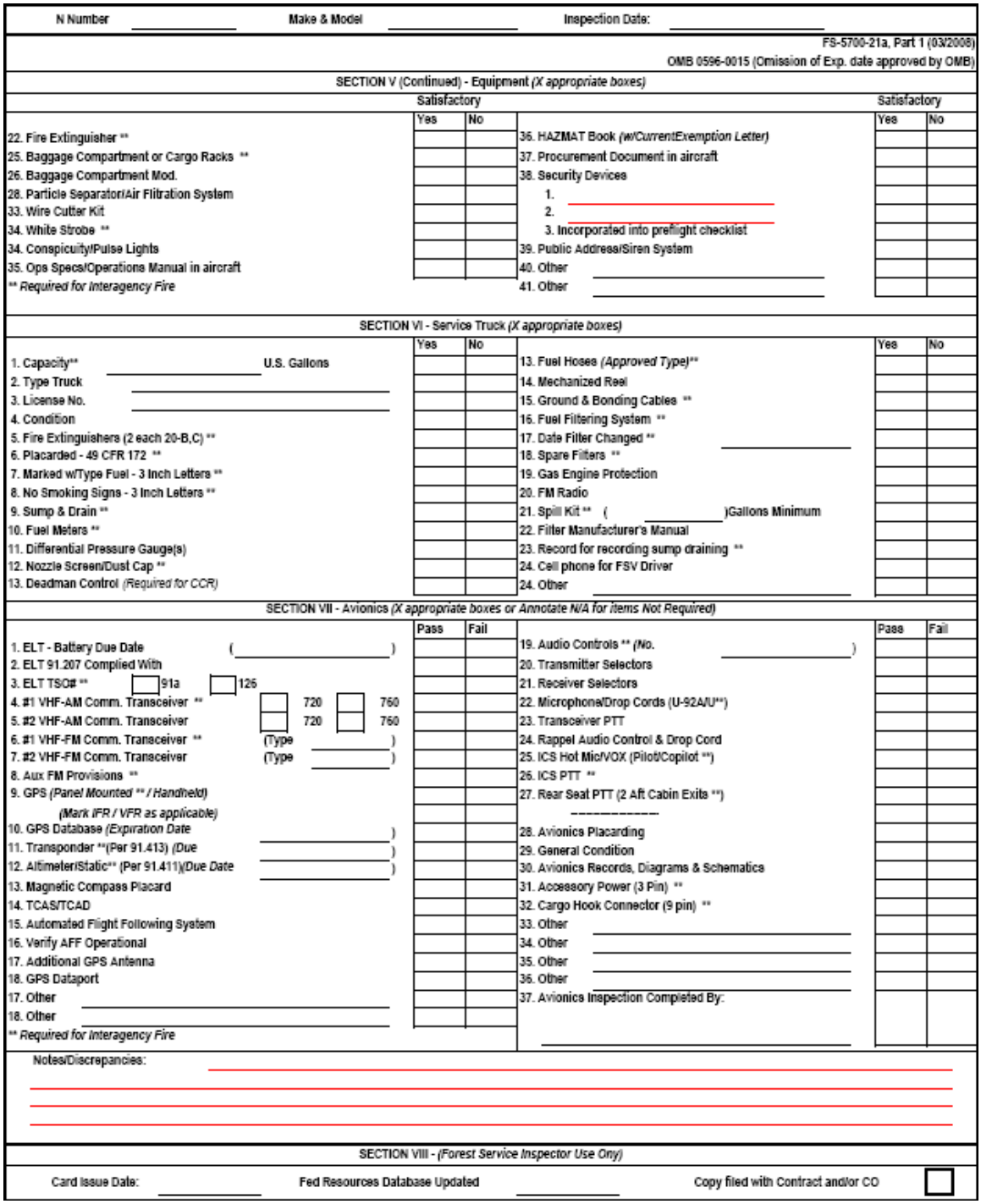
SECTION IV - Operating Certificates *(Fill in the Blanks)*

1. 14 CFR 133 Certificate No. ____ Expiration Date ____
2. 14 CFR 135 Certificate No.**
3. 14 CFR 137 Certificate No.

SECTION V - Equipment *(X appropriate boxes)*

	Satisfactory Yes	Satisfactory No		Satisfactory Yes	Satisfactory No
1. Hobbs Installation **			13. Cargo Hook **(*Last Inspected* ____)		
2. Free Air Temperature Gauge **			Keeperless Hook		
3. Seat Belt *(All)* **			14. Personnel Access Step **		
4. Shoulder Harness *(All after 01/01/06)* **			15. Water/Retardant Bucket ** (** Either 16 or 17)		
5. First Aid Kit **			Type ____ Gallons ____		
6. Survival Kit **			16. Fixed Retardant Tank **		
7. Dual Control *(For Pilot Check)* **			Type ____ Gallons ____		
8. Lighting - Night Operation **			17. Bucket/Door SW on Collective **		
9. High Visibility Marking Main Rotor **			18. Long-Line - Remote Hook		
10. Extended Height Gear **			*(Last Inspected* ____)		
11. Convex Mirror **			19. Closed Circuit Refueling		
12. Locking Fuel Cap			20. Defuel Capability		
** *Required for Interagency Fire*			21. Rappel Anchor *(Last Inspected* ____)		

Figure 40: FS-5700-21a (Back Page)



N Number _____ Make & Model _____ Inspection Date: _____

FS-5700-21a, Part 1 (03/2008)
OMB 0596-0015 (Omission of Exp. date approved by OMB)

SECTION V (Continued) - Equipment *(X appropriate boxes)*

	Satisfactory Yes	Satisfactory No		Satisfactory Yes	Satisfactory No
22. Fire Extinguisher **			36. HAZMAT Book *(w/CurrentExemption Letter)*		
25. Baggage Compartment or Cargo Racks **			37. Procurement Document in aircraft		
26. Baggage Compartment Mod.			38. Security Devices		
28. Particle Separator/Air Filtration System			1. _____		
33. Wire Cutter Kit			2. _____		
34. White Strobe **			3. Incorporated into preflight checklist		
34. Conspicuity/Pulse Lights			39. Public Address/Siren System		
35. Ops Specs/Operations Manual in aircraft			40. Other _____		
** *Required for Interagency Fire*			41. Other _____		

SECTION VI - Service Truck *(X appropriate boxes)*

	Yes	No		Yes	No
1. Capacity** _____ U.S. Gallons			13. Fuel Hoses *(Approved Type)***		
2. Type Truck _____			14. Mechanized Reel		
3. License No. _____			15. Ground & Bonding Cables **		
4. Condition			16. Fuel Filtering System **		
5. Fire Extinguishers (2 each 20-B,C) **			17. Date Filter Changed ** _____		
6. Placarded - 49 CFR 172 **			18. Spare Filters **		
7. Marked w/Type Fuel - 3 Inch Letters **			19. Gas Engine Protection		
8. No Smoking Signs - 3 Inch Letters **			20. FM Radio		
9. Sump & Drain **			21. Spill Kit ** (_____)Gallons Minimum		
10. Fuel Meters **			22. Filter Manufacturer's Manual		
11. Differential Pressure Gauge(s)			23. Record for recording sump draining **		
12. Nozzle Screen/Dust Cap **			24. Cell phone for FSV Driver		
13. Deadman Control *(Required for CCR)*			24. Other _____		

SECTION VII - Avionics *(X appropriate boxes or Annotate N/A for Items Not Required)*

	Pass	Fail		Pass	Fail
1. ELT - Battery Due Date (_____)			19. Audio Controls ** *(No.* _____)		
2. ELT 91.207 Complied With			20. Transmitter Selectors		
3. ELT TSO# ** ☐ 91a ☐ 126			21. Receiver Selectors		
4. #1 VHF-AM Comm. Transceiver ** ☐ 720 ☐ 760			22. Microphone/Drop Cords (U-92A/U**)		
5. #2 VHF-AM Comm. Transceiver ☐ 720 ☐ 760			23. Transceiver PTT		
6. #1 VHF-FM Comm. Transceiver ** (Type _____)			24. Rappel Audio Control & Drop Cord		
7. #2 VHF-FM Comm. Transceiver (Type _____)			25. ICS Hot Mic/VOX (Pilot/Copilot **)		
8. Aux FM Provisions **			26. ICS PTT **		
9. GPS *(Panel Mounted ** / Handheld)*			27. Rear Seat PTT (2 Aft Cabin Exits **)		
(Mark IFR / VFR as applicable)			_____		
10. GPS Database *(Expiration Date* _____)			28. Avionics Placarding		
11. Transponder **(Per 91.413) *(Due* _____)			29. General Condition		
12. Altimeter/Static** (Per 91.411)*(Due Date* _____)			30. Avionics Records, Diagrams & Schematics		
13. Magnetic Compass Placard			31. Accessory Power (3 Pin) **		
14. TCAS/TCAD			32. Cargo Hook Connector (9 pin) **		
15. Automated Flight Following System			33. Other _____		
16. Verify AFF Operational			34. Other _____		
17. Additional GPS Antenna			35. Other _____		
18. GPS Dataport			36. Other _____		
17. Other _____			37. Avionics Inspection Completed By:		
18. Other _____			_____		
** *Required for Interagency Fire*					

Notes/Discrepancies: _____

SECTION VIII - *(Forest Service Inspector Use Only)*

Card Issue Date: _____ Fed Resources Database Updated _____ Copy filed with Contract and/or CO ☐

10-6 FS 5700-32 – Aircraft Contract Status Report

Figure 41: FS 5700-32

UNTIED STATES
DEPARTMENT OF AGRICULTURE
FOREST SERVICE

AIRCRAFT CONTRACT STATUS REPORT

Contractor	Gov't Team Members	Contract No
		Item No.
		Start Date

The following pilot(s) and/or aircraft have been inspected for compliance with the specifications of the referenced contract:

Pilot(s)	Mechanic	Aircraft

☐ Personnel and/or aircraft listed above are approved.

☐ Personnel and/or aircraft listed above will be approved when the identified deficiencies are corrected. Prior to placing the above listed aircraft or pilots into service, an authorized inspector shall determine that each deficiency listed has been corrected. The contractor will provide a signed copy of documentation of corrective action taken to the FS National Aviation Manager.

☐ Reinspection of personnel and/or aircraft above required prior to placing into service. The contractor shall notify the inspector when they are ready for reinspection.

Reinspection Schedule: Date _____ Location _____ Inspector _____

Remarks:

☐ INSPECTED WITH _____ DISCREPANCIES (SEE ATTACHED LIST)	SIGNATURE	DATE
☐ DISCREPANCIES CORRECTED (ATTACH DOCUMENTATION)	SIGNATURE	DATE
☐ REINSPECTION REQUIRED AS NOTED	SIGNATURE	DATE
☐ APPROVED	SIGNATURE	DATE

I acknowledge receipt of this report _____ Signature of Contractor/Representative _____ Date

Reported By: _____ Signature of Government Representative Title: *Aircraft Inspector* Date: _____

CONTRACTING

10-7 FS 5700-33 – Aircraft Pre-Use Inspection Discrepancy Report

Figure 42: FS 5700-33

AIRCRAFT PRE-USE INSPECTION DISCREPANCY REPORT

v3.0

OPERATOR _____ AIRCRAFT TYPE _____

BASE _____ AIRCRAFT NUMBER _____

CONTRACT NUMBER _____

Contract Page # _____ Item No. _____	Discrepancy #1
Corrective Action By _____	
Contract Page # _____ Item No. _____	Discrepancy #2
Corrective Action By _____	
Contract Page # _____ Item No. _____	Discrepancy #3
Corrective Action By _____	
Contract Page # _____ Item No. _____	Discrepancy #4
Corrective Action By _____	

Discrepancies written by: _____ _____

Corrective action inspected by: _____ _____

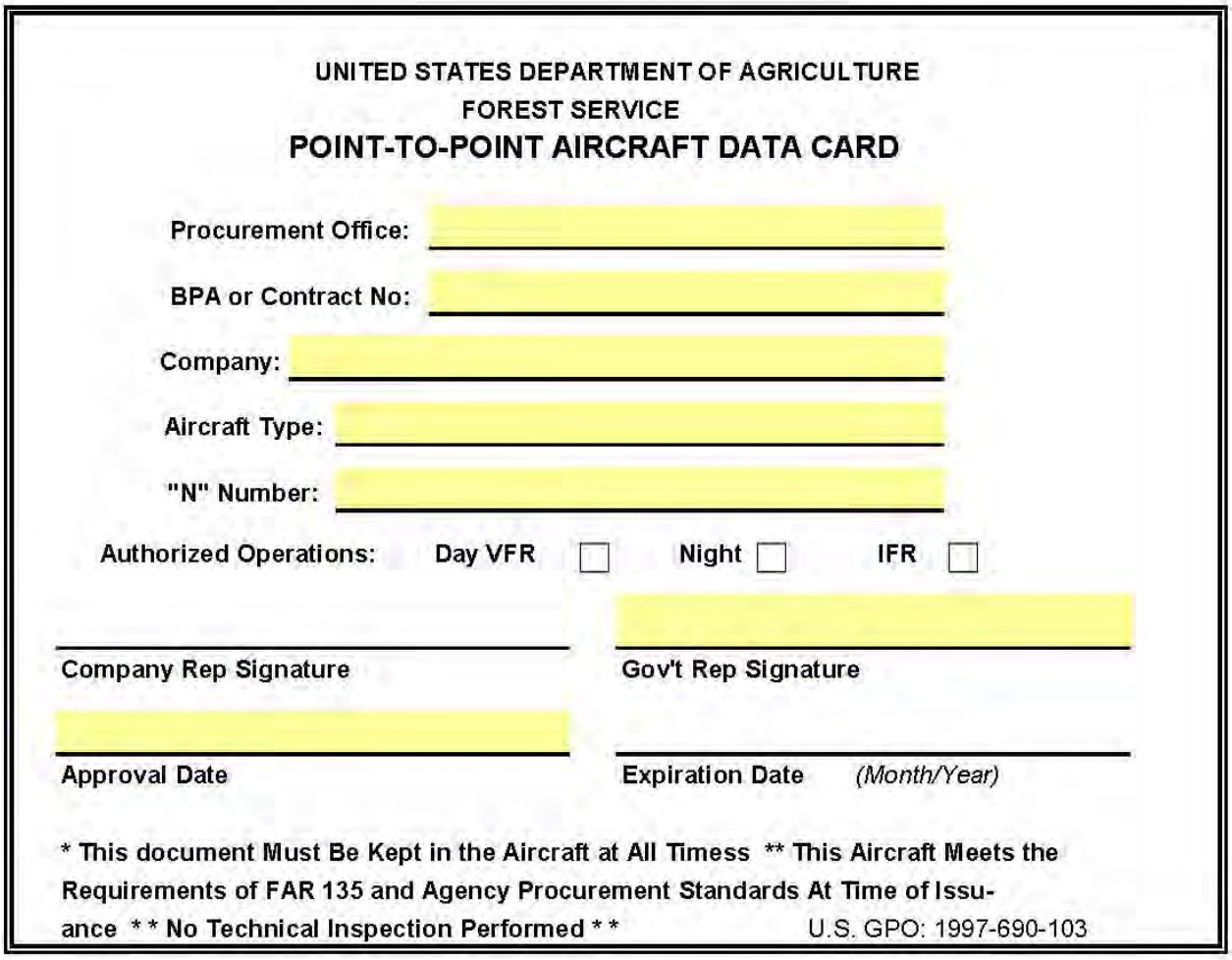
Authorized Contractor Maintenance Supervisor Date

A&P / IA / REPAIR STATION NUMBER _____

(Send to Inspector when Discrepancies Corrected)

10-8 Point-to-Point Aircraft Data Card (Forest Service)

Figure 43: Point-to-Point Card



UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
POINT-TO-POINT AIRCRAFT DATA CARD

Procurement Office: _____

BPA or Contract No: _____

Company: _____

Aircraft Type: _____

"N" Number: _____

Authorized Operations: Day VFR ☐ Night ☐ IFR ☐

_____ _____
Company Rep Signature Gov't Rep Signature

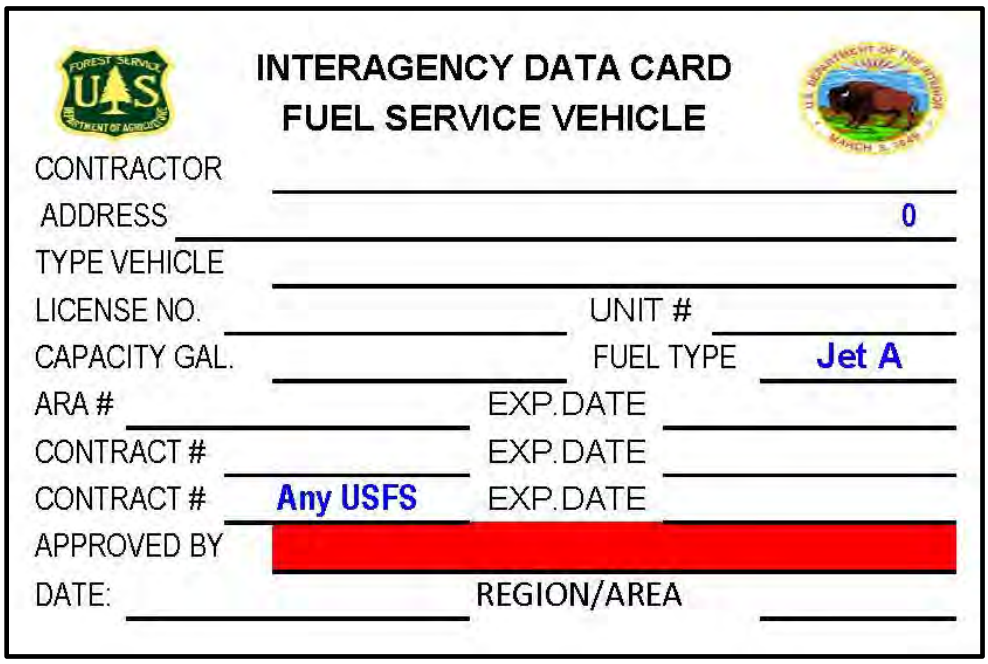
_____ _____
Approval Date Expiration Date *(Month/Year)*

* This document Must Be Kept in the Aircraft at All Timess ** This Aircraft Meets the Requirements of FAR 135 and Agency Procurement Standards At Time of Issuance * * No Technical Inspection Performed * *

U.S. GPO: 1997-690-103

10-9 Service Truck – Interagency Data Card

Figure 44: Service Truck – Interagency Data Card



10-10 Mechanic Qualification Form

Figure 45: Mechanic Qualification Form (Page 1)

U.S. Department of Agriculture -
AIRCRAFT MECHANIC (HELICOPTER) Forest Service

Contract No. _____

Name _____ Date of Birth _____

Employer _____ Office Phone _____

FAA Certificates: Type _____ No. _____ Date Issued _____

Total Years Experience _____ Total Years Experience as Licensed Mechanic _____

Record of Special Training (Factory Schools, etc.)

Name of Course	Location	Year Attended

Record of Past Performance (Previous Three Years)

Dates	Location	Employer/Supervisor	Phone No.

Record of maintaining helicopters Under Field Conditions:*

Dates	Location (Designated Base)	Type of Contract	Type Helicopter

* "Field Condition" is defined as maintaining the helicopter away from the contractor's base of operation with minimal supervision

I certify that the information listed by me on this form is a true and correct summary of my aircraft maintenance experience. I have read the Maintenance Section of this contract and understand the terms and conditions.

_____ _____
Date Mechanic Signature

_____ _____
Date Company Representative

Figure 46: Mechanic Qualification Form (Page 2)

(Inspectors Use Only)

Mechanic meets the Experience Requirements of the Contract and is approved to perform maintenance on:

Type and Model of Helicopter(s)	Type and Model Engine(s)

Date	Region	Inspector Initials	USFS Maintenance Inspector

10-11 Mechanic Qualification Card

Figure 47: Mechanic Qualification Card

10-12 Interagency Helicopter Load Calculation

Figure 48: Interagency Helicopter Load Calculation (OAS-67/FS 5700-17)

INTERAGENCY HELICOPTER LOAD CALCULATION Electronic Version 1.0 (3/04)	MODEL	
	N#	
PILOT(S)	DATE	
MISSION	TIME	
1 DEPARTURE	PA	OAT
2 DESTINATION	PA	OAT
3 HELICOPTER EQUIPPED WEIGHT		
4 FLIGHT CREW WEIGHT		
5 FUEL WEIGHT gals X lbs/gal		
6 OPERATING WEIGHT (3 + 4 + 5)		

	Non-Jettisonable		Jettisonable
	HIGE	HOGE	HOGE- J
7a PERFORMANCE REFERENCE (List chart/supplement from Flight Manual)			
7b COMPUTED GROSS WEIGHT (From Flight Manual **Performance** Section)			
8 WEIGHT REDUCTION (Required for all Non-Jettisonable loads)			
9 ADJUSTED WEIGHT (7b minus 8)			
10 GROSS WEIGHT LIMITATION (From Flight Manual **Limitations** Section)			
11 SELECTED WEIGHT (**Lowest** of 9 or 10)			
12 OPERATING WEIGHT (From Line 6)			
13 ALLOWABLE PAYLOAD (11 minus 12) ***Exceeds = Allowable Exceeded***			

14 PASSENGERS/CARGO	
15 ACTUAL PAYLOAD (Total of all weights listed in Item 14) **Line 15 must not exceed Line 13 for the intended mission (HIGE, HOGE or HOGE-J)**	
PILOT SIGNATURE	HazMat Onboard
MANAGER SIGNATURE	YES ☐ NO ☐

HCM-8 (03/2006)

Electronic Load Calculation Guidelines

The electronic load calculation is available as a training tool or may be used in lieu of the booklet form. The form is an Excel worksheet and makes automatic computations as data is entered by the pilot or government representative. It is really no different than the paper version; ***Equipped Weight, Computed Gross Weight and Gross Weight Limitations must be derived by flight manual reference and entered by the pilot.***

Please be aware of the following important notes:

1) If you receive this as an E-mail attachment, save to hard drive prior to using.
2) The entire worksheet is protected. The format and function cannot be altered.
3) Worksheets can be completed, named and saved individually.
4) As the cursor is moved over a field, a Comment Box will appear offering explanation or instruction for that
5) Information is entered into the yellow fields by the user.
6) The blue cells are locked and data cannot be entered by the user. They perform automatic functions.
7) If the electronic format is used for actual helicopter operations, the form must be printed out in black & white, signed by the Pilot and Helicopter Manager and retained.

10-13 Return to Contract Availability Tracking Sheet (Suggested)

Figure 49: Return to Contract Availability Tracking Sheet (Front Side)

Return to Contract Availability

Date_____ Time _____

Manager Name _____ Phone Number _____

Aircraft Location _____

Vendor _____

Registration Number _____ Aircraft Type _____

Discrepancy/Repair: _____

_____

_____

_____

When did the problem occur?

In-flight? _____ On the Ground? _____

Flight Terminated? _____ Emergency Declared? _____ FAA/Safety notified? _____

Were other systems affected?_____ Flight Check C/W?_____ *(Per 91.407)*

Corrective Action

What does M/M require? _____ Parts? _____ Ops/Leak Check? _____ **CRS W/O**_____

For Fuel Systems Discrepancies - is there an **Airworthiness Limitations Instruction (ALI)** or **Critical Design Configuration Control Limitation (CCDCL)** _____

Flight Critical Component? _____ **Was NEW Hardware Used?** _____ **Could Fatigue be a Factor?** _____

RII? _____ Flight Check required? _____ AMI Inspection Required? _____

Is there an MEL _____ Is it MEL'able? _____ Repair Interval? _____

Notifications RAO/RASM/WO _____ Other AMI _____

SAFECOM #_____ **FAX Requested** ☐ **Received** ☐

Service Difficulty Report **Requested** ☐ **Submitted** ☐

Unavailability? _____ Hrs

Return to Contract Availability Date _____ Time _____

Contracting Officer (Representative) notified. Date _____ Time _____

Notes

Chapter 11 – Contract/Cooperator Aircraft Inspection Procedures

11-1 Introduction

Before an aircraft can be used by the Forest Service it must be inspected by an approved Aircraft Inspector; per FSH 5709.16 Chapter 40 this is often referred to as "carding."

The following pages give broad guidelines on what should be checked when "carding" an aircraft and present one possible format for conducting inspections. Inspectors should tailor their inspections to meet their needs. To ensure policy and contract requirements are met, inspectors shall use an AWB approved aircraft Pre-Use Inspection Checklist.

> **Note:** Aircraft Pre-Use Inspection Checklists are extensive. At a minimum, policy and contract requirements must be met by the contractor and aircraft.

There are four forms required by FSH 5709.16 to document inspections:

1. FS-5700-21, Airplane Data Record.
2. FS-5700-21a, Helicopter Data Record.
3. FS-5700-4, Aircraft Approval Card, Airtanker.
4. Point-to-Point Card, which does not have a form number.

These forms are addressed at the end of this chapter and automatically filled out by the Pre-Use Inspection checklist programs.

> **Note:** Large Airtankers are on a National contract and are normally carded by teams selected by the AWB. Regions may contract for Single-Engine Airtankers (SEATs). For inspection purposes, SEATs shall be considered airtankers, *not light fixed-wing aircraft.*

The contract itself and the Pre-Use Inspection checklists shall be used as a guide to ensure all required items are checked. The Pre-Use Inspection checklists come in two formats: Excel and AvCheck versions. Either may be used until the AvCheck format, which is still in development, is completed or as directed by the ABC.

The responsibility for airworthiness of contracted aircraft lies with the **operator**. Forest Service Aircraft Inspectors are responsible to ensure aircraft meet contract specifications and policy. Contract language should never contradict Forest Service policy. If an inspector encounters a contract with language that is contrary to policy,

they must contact the responsible program office and CO to resolve the issue before issuing a card. There will be instances when a vendor might complain that the contract specification exceeds the requirements of 14 CFR. It should be understood the contract is with the USFS and not the FAA. The contract requirements are in addition to 14 CFR to meet Forest Service mission requirements.

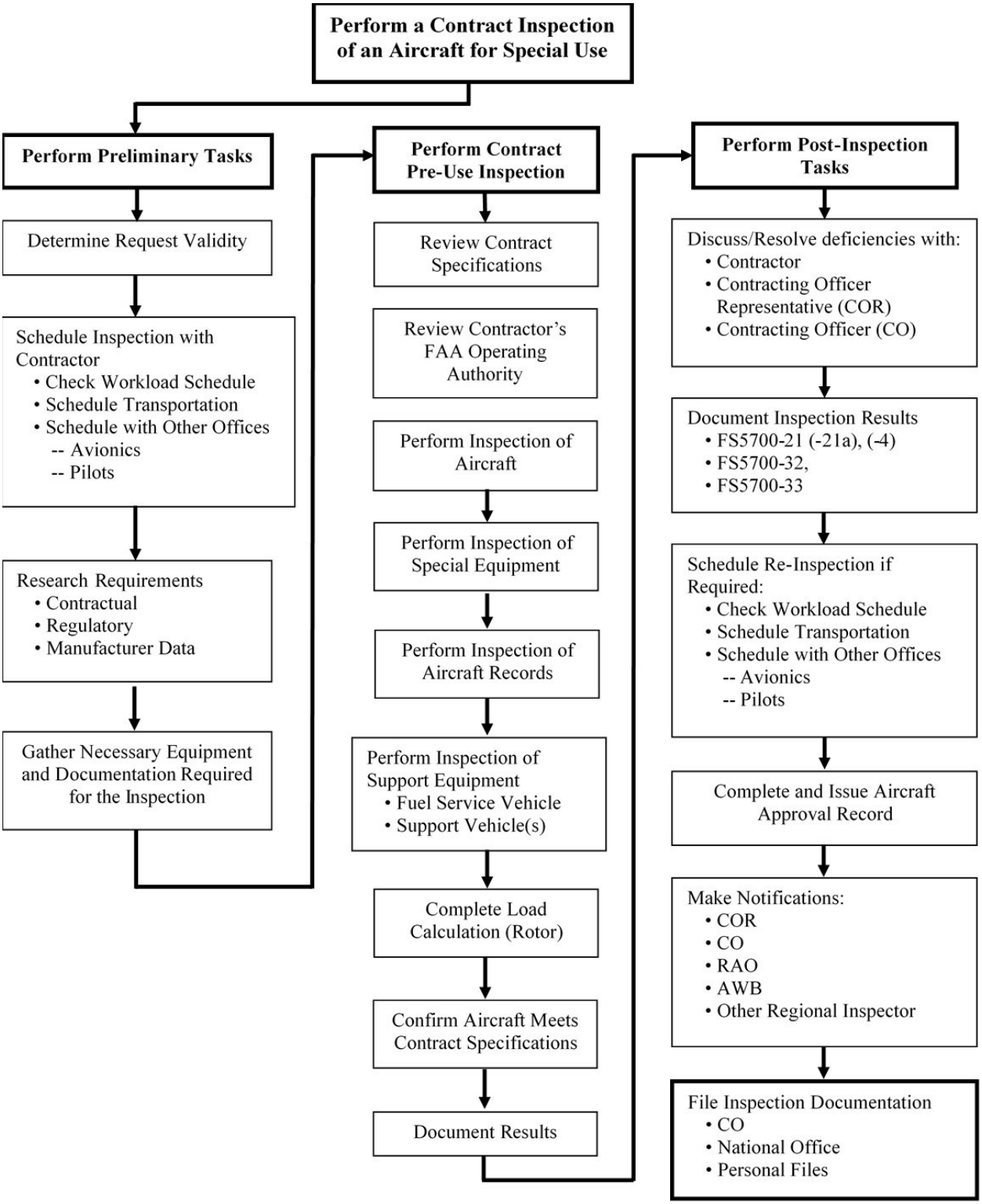
Examples:

1. Airtanker contracts require a TAS, but the approved MMEL allows it to be deferred. It may not be deferred under the contract because it is a requirement.

2. 14 CFR does not require ELTs in helicopters; USFS contracts do.

Cooperator Aircraft (i.e., non-Federally owned and operated aircraft). While these aircraft may be classified as Public Aircraft, can be non-certificated, and therefore may not be required by law to be maintained in accordance with 14 CFR, per FSM 5700 they must meet the same requirements as the current National Association of State Foresters (NASF) Co-Op Standards regarding condition of the aircraft and equipment installed. NASF Co-Op Standards can be accessed on the current USFS web/cloud-based storage drive. Contact AWB for the location of this information and log-in access if necessary.

Figure 50: Pre-Use Inspection Flow Diagram



11-2 Aircraft, Avionics, and Equipment Inspection Policy

Requirements and standards for inspections are set forth in the applicable procurement document and USFS policy. Inspections will be conducted objectively and in accordance with applicable requirements and standards. USFS inspectors will inspect aircraft or equipment only when an official request has been made and there is a procurement document, or Interagency Standard for cooperator aircraft, that can be referenced. Inspection requirements are unique to each procurement document, contract, or purchase/rental agreement. The inspector must be familiar with each contract. The most effective and efficient way to perform a contract conformity inspection is to use a copy of the contract and Pre-Use Inspection checklist together to ensure all contract requirements are met.

> **Note:** Do not take any action to deviate from the requirements of the procurement document or Forest Service policy. Approvals will not be granted if there are any un-addressed deficiencies.

An aircraft may have multiple contracts associated with the same aircraft. A helicopter may have contracts with several different Forests or Regions, and each contract awarded for the same aircraft may require something a little different. Inspect all awarded contracts page by page, as the first inspection may be the only one that aircraft will receive. After the inspection, send the inspection results to the appropriate ASIs and CO. Send inspection results for Nationally-contracted aircraft to the WO AWB POC.

If an inspector finds a problem with a contract specification, or the aircraft does not meet the specification, and determines that it is in the best interest of the Forest Service to change the requirement, the ASI **must** contact the contract CO for further guidance. **Any** deviation from the original procurement document must be accompanied by a contract modification issued by the contract CO.

Only approved ASIs may perform inspections and complete inspection forms. USFS inspection forms may be completed only by USFS approved inspectors. Should an inspector note a deficiency which is outside their area of responsibility (i.e., avionics for an Aircraft Inspector, or vice-versa), they will notify an inspector within the area of responsibility the deficiency falls. If an appropriate inspector cannot be contacted, the inspector who discovered the deficiency will document it and forward it to the appropriate ASI and/or CO, or contact the AWB for guidance.

11-3 Aircraft, Avionics, and Equipment Inspection Procedures

Inspections will be accomplished to ascertain that procured aircraft and equipment are in compliance with the appropriate procurement document specifications and that they appear to be in a condition for safe flight. All inspection test equipment shall be maintained and calibrated in accordance with aviation industry standards. Special

mission aircraft must have a valid Aircraft Data Card, annotated for the special use to be performed. See Special Mission Airworthiness Assurance Guide (SMAAG) for further information on airworthiness of special mission aircraft.

The vendor will be requested to provide access to any area of the aircraft the inspector determines a more detailed inspection is required. Inspectors will request assistance from the operator to have panels opened, and to apply aircraft power if needed. Inspectors will not close opened panels.

Note: Inspectors shall identify and eliminate any unnecessary personal safety risks involved in the inspection process. Ensure no unacceptable hazards (aircraft on jacks, etc.) exist in the area where the inspection will be conducted and that there is an environment conducive to a safe and efficient inspection of the equipment.

11-4 Termination of Inspection Prior to Completion

If in the inspector's opinion the vendor/operator has failed to make a reasonable attempt to prepare their personnel, aircraft, or equipment to meet requirements, the inspection may be terminated prior to completion. In such cases the FS-5700-32, Aircraft Contract Status Report Form (see AIG, Chapter 10) shall be annotated "Inspection Terminated." Complete the Re-inspection Schedule section of the contract status report, obtain the vendor's signature, and provide them with a copy. If the vendor fails to maintain a helpful and courteous atmosphere, the inspector will depart and inform their supervisor and the Contracting Officer. Inspectors must remain courteous and professional.

11-5 Aircraft Pre-Use Inspections

This section outlines the main points of a Pre-Use Inspection.

1. **Interagency Fire Requirements.** Inspectors must ensure that all items that are an Interagency Fire Requirement are available for all aircraft that are approved for fire operations. The Interagency Fire requirements can be identified in the Excel and AvCheck checklists. A link to the interagency agreement can be found in Appendix A-12.

2. **Water Buckets.** Verify that the Model Number on the control head matches the Model Number on the bucket, to ensure the capacity of the control head is not exceeded. Appendix A-3 contains information on the various models, capacities, nomenclatures, and inspection criteria for Bambi Buckets. Other bucket models may be encountered.

3. **Rappel Anchors** must be inspected in accordance with the manufacturer's Instructions for Continued Airworthiness.

4. **Security Devices** are required by contract and must be two independent devices, either electrical and/or mechanical. Locked windows or doors are normally not acceptable, and removal of security devices must be incorporated into the preflight checklist. Security devices that prevent the aircraft from being started do not need to be incorporated into the preflight checklist.

11-5-1 Contract Specifications

1. The Schedule of Items should be checked to determine that the aircraft is the one in fact offered.

2. Check the contract specifications. Inspector should check the special and/or unique requirements listed in Section B. Section C, Description/Specification of Work, should also be checked.

3. Determine if the aircraft meets the performance specifications and verify that the aircraft weight meets the bid weight for the base year of the contract or is within 1% of the bid weight for option years.

a. A sample of a completed Helicopter Load Calculation can be found in AIG, Chapter 11-11. An explanation of how to fill it out based on a performance specification is also given. To ensure the correct charts are used, inspectors may want to have the operator's pilot complete the Load Calculation.

11-5-2 Contractor's Operating Authority

Inspectors should verify the vendor's FAA operating authority (14 CFR Part 133, 135, 137). If the aircraft offered for use is not listed in the vendor's Operations Specifications (Ops Specs), there is no need to proceed with the inspection. This check is to ensure the aircraft offered is listed on Page D085 - Aircraft Listing (or A003 for Part 133 and Part 137 aircraft) of the Ops Specs.

Per 14 CFR 135.21(f) operators are required to "carry appropriate parts of the manual on each aircraft when away from the principal base." Also, per 14 CFR 119.9, the Part 135 Certificate Number or Operator name must be clearly visible from outside the aircraft while sitting on the ground.

11-5-3 Aircraft Inspection

This is where the knowledge and expertise of the inspector comes into play. Some inspectors are more familiar with certain aircraft and therefore may only do a cursory check, with emphasis on areas they know from experience are susceptible to problems. If an inspector is not familiar with the aircraft under inspection, they may elect to perform a thorough inspection of the complete aircraft. Each inspector's background is varied; therefore, inspections vary. The depth of inspection of the aircraft is determined by the inspector's knowledge of the aircraft type. At a minimum, contract

specifications and USFS policy shall be followed. It is acceptable to do a more in-depth inspection on aircraft types unfamiliar to the inspector.

For various helicopter firefighting equipment options, see Appendix A.

Note: Inspectors are not responsible for the airworthiness of the aircraft. This is the responsibility of the operator. Inspectors are not expected to perform an annual inspection. Their job is to determine the general overall condition of the aircraft and determine if the aircraft is contract compliant.

Inspectors should keep in mind that passengers on these aircraft are relying on ASIs to help ensure they arrive safely at their destination.

11-5-4 Review of Records

This should consist of a general check of the records. There are several items found in the records that need documenting on the Pre-Use Inspection Checklist. These include but are not limited to Airworthiness Directive compliance, current inspections status, Weight and Balance data, and TBO requirements. Also, while inspecting the aircraft, serial numbers of some of the components (i.e., rotor blades) can be noted and a spot check made against the records.

Restrictions and Limitations

1. Do not inspect a vendor's aircraft without the vendor's knowledge and permission. **This does not restrict "Inspections During Use" of aircraft while being used under USFS procurement agreements.** If a discrepancy is noted with an aircraft, it should be brought to the operator's attention.

2. Do not apply power to vendor's aircraft. The same applies for opening inspection panels and doors. Always request assistance from the operator. No matter how familiar an inspector is with an aircraft, the Agency becomes responsible if something goes wrong. Also, if an operator later discovers a problem after an inspector has applied power themselves, they could hold the Agency at fault.

3. Never perform maintenance or preventive maintenance to non-Forest Service owned aircraft or equipment during Pre-Use Inspections.

The specifications stated in the procurement document should be used as the inspection standard for contract aircraft.

Note: Inspectors may request a ground run-up or operational check of any system to ensure conformity, function, and/or performance.

Avionics inspections. All special mission aircraft will have an avionics conformity inspection performed by a USFS-approved inspector with an AV1, AV2 or AV3 rating. The rating required depends on the mission the aircraft is required to perform.

11-5-5 Documentation

FS-5700-4, -21 & -21a are used to document the aircraft inspection. Currently, Excel-based Pre-Use Inspection checklists are used during the inspection. The checklist automatically completes all the required documents required by FSH 5709.16 (Card, FS-5700-33 - Discrepancy Report, FS-5700-4, FS-5700-21, FS-5700-21a and FS-5700-32). A new inspection tool called AvCheck is currently in development to replace the Excel checklists and will also complete all required documentation. Use the currently approved method to inspect and document Pre-Use Inspections.

The last thing an inspector will normally accomplish is print (either hard-copy or pdf) the “Card” and the FS-5700-32, Aircraft Contract Status Report. The card is the top portion of Data Records FS-5700-4, -21 and -21a, and is used to approve the aircraft and the FS-5700-32 is used to notify the CO of the results of the inspection. After the aircraft has been inspected and it meets all the requirements of the contract, the inspector will give a copy of the card (printed or electronically) to the vendor/operator to be placed in the aircraft.

A completed copy of the inspection form (FS-5700-4, -21, or -21a) may be printed for filing with the contract file if requested by the CO.

The Aircraft Contract Status Report Form (FS-5700-32) will be completed for each inspection initiated whether the inspection is completed or terminated (see AIG, Chapter 10-6 for a sample form). Multiple aircraft may be listed on the form.

If there are deficiencies noted with an aircraft which may delay the use of the aircraft or equipment, a separate Aircraft Contract Status Report Form needs to be prepared. This form, listing the aircraft or equipment with discrepancies, will be maintained by the inspector until the deficiencies are corrected or until the contract period is over. The date and location of the scheduled re-inspection are to be written in the "Re-inspection Schedule" block of the Aircraft Contract Status Report with the contractor or representative acknowledging receipt by signing the form.

All discrepancies must be corrected or acceptably addressed before the aircraft can be used by the Agency. Inspectors may elect to re-inspect the aircraft at their option or issue the card once the discrepancies are cleared. If required by the procurement document, approved mechanics will also be listed.

If there are discrepancies noted with the aircraft, they need to be annotated on FS-5700-33, Aircraft Pre-Use Inspection Discrepancy Report (see AIG, Chapter 10-7 for a sample form). Distribution of the three copies of the Pre-Use Inspection Discrepancy Report is listed at the bottom of the form. The aircraft will not be approved until an

authorized maintenance technician has signed off the discrepancies on the Aircraft Pre-Use Inspection Discrepancy Report form. There may be times when a minor discrepancy is noted that the inspector wants addressed but does not deem serious enough to warrant writing up as a discrepancy on the pre-use report or holding up the card. Use good judgment when deciding what to do. Normally a card is not issued until all non-compliant discrepancies are cleared.

11-5-6 Duration of Approval

The maximum approval duration on the Aircraft Data Card is one year or until the expiration date of the procurement agreement. Expiration dates should be noted by month and year and are valid through the last day of the expiration month. Point-to-Point cards may be issued for up to two years.

USFS contracted aircraft are normally approved for a maximum 12 calendar months from the date of issue, and usually expire the last day of the 12th month, or the expiration date of the contract, whichever is earlier. However, inspectors have the latitude to approve an aircraft for a shorter period of time. There may be a case where an aircraft is carded "out of cycle." In other words, a certain operator is normally inspected in April and the aircraft in question is not inspected until June. To get it back in cycle, the inspector may want to issue the card with an April expiration.

Note: The exception to this is airtankers. The Airtanker Program Manager requests that all cards be issued with an expiration date of December 31st.

11-5-7 Extension of Approval

If an aircraft's data card is about to expire and an inspector is unavailable to inspect it prior to the expiration date, the card may be extended for a short period of time to enable continued operation of the aircraft. The ASI should use caution when extending expiration dates and should avoid extensions longer than 90 days. Extensions are granted for the convenience of the government.

11-5-8 Inspection Reporting

Nationally-contracted aircraft are to be inspected, discrepancies documented, approval cards issued, and status reported to AWB. For Regional aircraft, follow Regional guidance for inspection reporting.

Remember, it is extremely important to report the completed inspections to the appropriate Regional and/or National office promptly. **Delay of reporting causes confusion, expense, and can hamper availability of aircraft for use.**

11-5-9 Inspection Records

Completed Aircraft Contract Status Reports and Aircraft Pre-Use Inspection Discrepancy Report forms for Nationally-contracted aircraft will be sent to the AWB or Regional office at the earliest convenience. ASIs should follow the guidance in FSH 5709.16, 40 for maintaining inspection records.

11-6 Other Contractor Personnel Qualifications

When required by contract, maintenance personnel must complete an Aircraft Mechanic Qualification Form (see AIG, Chapter 10). The inspector will review the information submitted to ensure that the experience and training requirements are in compliance with the procurement agreement. A Mechanic Qualification Card will be issued if the procurement document requires one. Mechanic cards are operator specific. The card must reflect the company the mechanic is representing/working for. If the operator no longer employs that mechanic, the card is no longer valid.

> **Note:** Many vendors have multiple contracts, which means an aircraft could be on Exclusive Use and Call-When-Needed contracts at the same time. To avoid noting multiple contract numbers on one card and/or issuing multiple cards for the same vehicle or mechanic, it is acceptable to annotate "Any USFS" on Mechanic and Fuel Service Vehicle cards.

11-7 Fuel Service Vehicle

Fuel service vehicles are normally provided for all helicopters. The Pre-Use Inspection Checklist has a list of items to inspect on the fuel truck. There may be various additional equipment items required by some contracts; check the contract for specific items. Normally the card expiration date will be the same as the helicopter or one year if the truck is used for multiple contracts or aircraft.

11-8 Aircraft Inspection Scheduling

1. **Type I & II Helicopters and Airtankers.** Regional ASIs usually inspect helicopter operators located in their Region. The AWB has responsibility for scheduling National helicopter and airtanker inspections. For operators with large numbers of aircraft, Regional ASIs may be requested to assist in these inspections. Regional ASIs with high inspection workloads should ask for assistance as soon as possible.

2. **Type III and Light Fixed-Wing Aircraft.** Type III and light fixed-wing aircraft are contracted regionally and are the responsibility of the Regional ASI. If a large workload is anticipated, contact the AWB for assistance at the earliest opportunity.

3. **Point-to-Point Cards.** Point-to-Point cards are normally issued for two years. Inspections of the aircraft are not required. These aircraft are available for charter

by the public, and the FAA provides all the oversight necessary. The only requirement inspectors have regarding issuance of these cards is to verify that the aircraft is approved in the Ops Specs of the vendor's D085 and for the contracted mission type (i.e., passenger/cargo).

If the aircraft is listed in the Ops Specs as passenger/cargo, the contractor must demonstrate to the satisfaction of the ASI the necessary equipment to safely satisfy each configuration. Any further inspection done by the ASI would be a duplication of effort. However, if an inspector notices a discrepancy, it should be brought to the attention of the vendor.

When carding point-to-point aircraft, if discrepancies are noted, a card should not be issued until rectifications have been made. Additionally, these aircraft must meet the minimum requirements of FSH 5709.16 40, which is covered in AIG, Chapter 7. See AIG, Chapter 10 for a sample Point-to-Point Card.

11-9 Return to Contract Availability (RTCA)

When an aircraft is unavailable and declared "out of service" for aircraft maintenance purposes, the process for returning the aircraft to contract availability by the Agency is as follows:

1. **Maintenance "Approval for Return to Service**." A maintenance release signed and dated by the contractor's maintenance representative on an *operating document*, which identifies the work done, and states that the maintenance is complete, the aircraft is airworthy and approved for return to service.

   An *operating document* is any document or form that the operator uses to document aircraft maintenance activity and airworthiness, such as daily flight log, pilot daily log, aircraft daily flight and maintenance log, and/or aircraft maintenance logs.

   The appropriate Agency ASI should be contacted for approval for return to contract availability for any unscheduled maintenance. Most of the time inspectors will be able to do this over the phone. The normal practice under these circumstances is to either have the contractor send copies of the log entries for inspector review, or have the manager retain the copies with their daily diary. Some inspectors want copies of all repairs, while others only keep them for major items. It is a judgment call on the inspector's part which way to handle it, and whether they need to re-inspect an aircraft. As a minimum, copies of the logs for these type repairs should be retained by the COR/manager with their diaries.

   For Airtanker RTCA, single points of contact have been assigned. Single points of contact shall notify Regional ASIs when an Airtanker is unavailable in their Region.

2. **Re-inspect an aircraft following a major repair or component replacement**. Be advised, once an operator notifies the COR that an aircraft is approved for return to service, their availability begins at that point (unless there are still problems with the aircraft during the re-inspection). If a decision on whether to re-inspect is not made until the last minute, and it takes the inspector several hours or more to arrive at the aircraft, the vendor will be paid for the time they are sitting on the ground awaiting the inspector's arrival. Most managers will provide plenty of notice to allow inspectors to get to the aircraft before maintenance is completed. Do not wait until the last minute to decide to inspect an aircraft under these circumstances. Proper planning can save the government hundreds and possibly thousands of dollars.

   The Agency COR/manager must notify the Regional ASI before the aircraft is returned to contract availability for major items listed in FSH 5709.16, 40, Maintenance, Operational and Functional Check Flights.

   These items are also listed in the Interagency Helicopter Operations Guide (IHOG), Chapter 14, Helicopter Maintenance. The IHOG requires helicopter managers to contact a maintenance inspector for a return to contract service for any of the following:

   a. Engine removal and replacement.

   b. Rotor removal and replacement.

   c. Power train component removal and replacement.

3. **Flight Check.** A flight check, if required, is performed by a pilot qualified in the type aircraft and a statement in the operating document stating the aircraft is returned to service, dated and signed by the pilot performing this duty, in accordance with 14 CFR 91.407(b).

Note: Operational checks required by an ASI must be reasonable. If a contractor indicates they believe an operational check is unreasonable, contact the CO for resolution before proceeding.

11-10 Removal of Aircraft Data Cards

Aircraft Inspectors are the only persons authorized to approve aircraft and issue cards. Once a card is issued it is valid until the expiration date entered on the card. Inspectors may discover an aircraft in use that has a safety or airworthiness issue that must be corrected before the aircraft can continue to be used.

The CO/COR should be informed to suspend operations until the aircraft is repaired. Typically, a COR will call an Aircraft Inspector whenever they become aware of a

discrepancy on an aircraft, and will not allow the aircraft to be dispatched until the issue is resolved to the inspector's satisfaction.

An Air Tactical Group Supervisor (ATGS) is assigned as COR for exclusive-use Air Attack aircraft. Very rarely is a COR assigned to the remainder of the light fixed-wing fleet. This is always true for point-to-point aircraft. A problem arises since these aircraft may operate in more than one Forest or Region, with little to no centralized control. In this situation, a problem may be identified and the operator may elect to fly the aircraft somewhere else and continue to operate.

When there is not a COR, or the CO is not available to demand suspension of operations, and there is a safety or airworthiness issue that requires suspending operations, the ASI has the authority to suspend the card until repairs are made.

Caution: Once a card is suspended, the operator is liable to the government for any re-inspection costs. Do not put the government into a situation where it causes a vendor unwarranted expense. Do not remove the aircraft card unless the vendor is being grossly negligent or jeopardizing lives by continuing to operate the aircraft. Also, as soon as possible, contact the CO and inform them of the reasons for suspending the card.

11-11 Load Calculation

The following is an explanation on how to complete a Load Calculation during a Pre-Use Inspection. In this example, we will assume Section B of the contract lists a performance specification of **5000** feet pressure altitude, **20** degrees C, with a non-jettisonable payload of **950** pounds, using the Hovering Out of Ground Effect (HOGE) Charts. The specification also states that a pilot weight of **200** pounds and fuel for 1 hour and 30 minutes will be used.

1. Fill in Model, "N" Number, and Date.
2. Enter information in **PA and OAT** (**5000 feet and 20°C**). It does not matter if Item 1 or 2 is completed as the most restrictive condition is not of interest in this case; instead, the goal is to ensure the aircraft meets the specification.
3. Enter the Equipped Weight from the aircraft Weight & Balance in Item 3. **2915**.
4. In Item 4, enter a pilot weight of **200** pounds.
5. Calculate Fuel and enter it in Item 5. In this case, a Bell 407 burns 45 gallons per hour. 45 gph. X 1.5 hrs. = **67.5** gallons. Standard weight for Jet A fuel is **7** pounds. 67.5 gallons X 7 lbs. = **473** lbs.
6. Add Items 3, 4 and 5, and insert the total in Item 6. **3588**.

7. From the Bell 407 Flight Manual, Hover Out of Ground Effect chart, determine the computed gross weight for 5000 feet and 20°C, and enter it in item 7b. **5400**. The chart used should be listed in Item 7a. Incorrect charts are often used when making these calculations, so this reference is needed in case a question arises about which chart was used. Also, as stated above, the goal is to verify the aircraft meets the specification, so only the HOGE part of the form needs to be filled out when checking against a specification.

8. Enter the Weight Reduction (download) in Item 8. For a Bell 407, it is **155** pounds. The download for most aircraft is listed inside the front cover of the forms book. The current download figures can also be found in the contract exhibits. The download represents a "margin of safety" to ensure the aircraft always operates well below its certificated maximum gross weight.

9. Subtract 155 pounds from the computed gross weight of Item 7 and enter the result in Item 9. **5245**.

10. Determine what the maximum gross weight is from the Limitations Section of the Flight Manual and enter it in Item 10. **5250**.

11. For Item 11, enter the lowest of Item 9 or 10. **5245**.

12. For Item 12, enter the weight from Item 6. **3588**.

13. Subtract Item 12 from Item 11 and enter the result in Item 13. **1657**.

If the Allowable payload in Item 13 is **less** than the spec payload, in this case **950** pounds, the aircraft does **not** meet the performance spec and the next step would be to notify the Contracting Officer.

Figure 51: FS-5700-17 Interagency Helicopter Load Calculation

INTERAGENCY HELICOPTER LOAD CALCULATION OAS-67/FS 5700-17 (11/03)		MODEL Bell 407
		N# 23456
PILOT(S)	O.K. Corral Aviation CWN	DATE 07/05/04
MISSION		TIME

1 DEPARTURE	PA	OAT ☐
2 DESTINATION	PA 5000	OAT 20C ☐
3 HELICOPTER EQUIPPED WEIGHT		2915
4 FLIGHT CREW WEIGHT		200
5 FUEL WT (67.5 gallons X 7 lbs. per gal)		473
6 OPERATING WEIGHT (3 + 4 + 5)		3588

	Non-Jettisonable		Jettisonable
	HIGE	HOGE	HOGE-J
7a PERFORMANCE REF (List page/chart from FM)		P49, fig 4-5	
7b COMP GROSS WT (FM Performance Section)		5400	
8 WT REDUCTION (Req for all Non-Jettisonable)		155	
9 ADJUSTED WEIGHT (7b minus 8)		5245	
10 GROSS WT LIMIT (FM Limitations Section)		5250	
11 SELECTED WEIGHT (Lowest of 9 or 10)		5245	
12 OPERATING WEIGHT (From Line 6)		3588	
13 ALLOWABLE PAYLOAD (11 MINUS 12)		1657	

14 PASSENGERS/CARGO MANIIFEST	
15 ACTUAL PAYLOAD (Total of all weights listed in Item 14) Line 15 must not exceed Line 13 for the intended mission.	

PILOT SIGNATURE	HazMat
MGR SIGNATURE	Yes____ No____

Notes

Chapter 12 – Oversight of Aircraft/Operator Programs

12-1 Introduction

This chapter reviews the processes and procedures for conducting oversight of contractors. The job aids are divided into three parts:

1. Operator Inspections.
2. Contract Compliance Inspections.
3. Aircraft Inspections While on Contract.

The following is provided as a guide to help in developing standards and procedures when performing oversight of contractors and their aircraft. It is not formulated to be all inclusive. Depending on time available and the intent of the oversight only select sections may be addressed. It can also be handy in finding specific references. Procedures Manual in the following references refers to either the Air Carrier Operations Manual or Repair Station Manual, depending on the type of operation in question. For FAA Order 8900.1 references, the Volume and Chapter are listed, (i.e., 8900.1, 3-131, would indicate Volume 3, Chapter 131).

Figure 52: Job Aids for Oversight of Contractors

✓	Job Aid Item	Reference
	A. Operator Inspections	
	Review Operating Provisions/Procedures	
	Review operating certificates for: a. Certified for all operations conducted.	
	1) Part 133.	133.11, Contract
	2) Part 135.	119.1, 135.1, Contract
	3) Part 137.	137.11, Contract
	4) Part 145.	145.5, 145.59, 145.61
	b. Operations Specifications current and complete.	119.43; 119.49(c); 8900.1, 3-18
	c. Operations Manuals current and complete.	119.43; 135.21; 8900.1, 3-32
	Is there sufficient staffing for the work being performed?	135.423(a)(b)(c); 135.425(b); 135.429(b); 145.151; 145.153; 145.157; 8900.1, 6-2
	Are personnel properly trained, qualified and authorized?	43.3, 43.7, 43.13, 65.81, 91.403(c), 135.429(b), 145.151, 145.155, 145.157, 145.163, 145.211(c)(1)(iv), Procedures Manual

✓	Job Aid Item	Reference
	Are Maintenance and Inspection functions accomplished in accordance with the Operator's Procedures Manual?	Procedures Manual; 8900.1, 6-9
	Are aircraft inspection programs FAA approved?	
	a. 100/Annual.	91.409(a)(b)
	b. Progressive Inspections.	91.409(d),91.409(f)4)
	c. Manufacturer's Inspection Program.	91.409(f)(3)
	d. Approved Aircraft Inspection Program (AAIP).	91.409(f)(2); 135.419; 8900.1, 3-38
	e. Continuous Airworthiness Inspection Program.	91.409(f)(1)
	Are there procedures for ensuring the PIC reports and records mechanical irregularities, before, during and after flight?	91.213(a)91.405(c), 135.23(f), Procedures Manual
	Are there procedures for ensuring the PIC knows that required inspections have been made?	43.5, 43.11, 91.417(a), 135.23(e), Procedures Manual
	Are there procedures for ensuring the PIC knows the aircraft has been approved for return to service?	43.5, 43.9, 91.405(b), 91.417(a)(1), Procedures Manual
	Are there procedures to be followed by the PIC to determine that mechanical irregularities or defects previously reported or recorded have been corrected or deferred?	43.5, 43.9, 91.213, 91.405(b), 135.23(g), Procedures Manual
	Are there procedures to be followed for deferring items?	43.5, 91.213, 135.23(i), Procedures Manual
	Are there procedures under 14 CFR 91.213 (inoperable instruments and equipment) for release or continuation of flight if items become inoperative?	43.5, 91.213, Procedures Manual
	Are there procedures for preparing airworthiness release?	43.5, 43.9, 43.11, 91.407, 145.211(c)(1)(vii), Procedures Manual
	Is there a procedure established for keeping copies of the maintenance logs in the aircraft?	Procedures Manual, Contract
	Does the operator have an approved drug testing program?	135.251, (Part 121, App I), Procedures Manual
	Weight and Balance	8900.1, 3-47; 8900.1, 3-48
	Are there procedures for ensuring compliance with weight and balance limitations?	91.9 (a), 135.23(b), 135.63(c), Contract
	Are the following areas covered? a. How equipment or weight changes are recorded. b. Where the pilot locates the latest empty weight and center of gravity figures. c. Loading procedures. d. Instructions for weighing aircraft including forms used, documenting scale calibrations.	91.9 (a), 135.23(b), Contract
	How does the operator determine the weight of all cargo?	135.23(b), 135.63(c), Contract
	Have gross weight increases for CAR 8 aircraft been documented in accordance with CAM 8?	CAM 8
	Are weight and balance documents completed in accordance with procedures?	91.9, 135.23(b), 135.63(c)

✓	Job Aid Item	Reference
	Mechanical Reporting Procedures	8900.1, 6-2; 8900.1, 6-9; 8900.1, 8-5
	Does the operator have procedures for maintenance personnel to report and record mechanical irregularities?	43.5, 43.9, 91.405, 135.443, Procedures Manual
	Has the operator established procedures for keeping copies of aircraft maintenance logs in the aircraft for access by appropriate personnel?	Procedures Manual, Contract
	Does each aircraft have a maintenance log?	91.417, Contract
	Does the operator have procedures for recording mechanical discrepancies found during inspections or other maintenance?	43.5, 43.9, 43.11, 91.417, Procedures Manual
	Does the operator have procedures for completing and submitting malfunction or defect reports? If so, are they following these procedures?	135.415, 135.416, 145.221, Procedures Manual, Contract
	Records System	8900.1, 6-1; 8900.1, 6-2; 8900.1, 6-9
	Are all records available to show that requirements for issuance of airworthiness release have been met?	43.9, 135.439(a)(1)
	Are there records to reflect the total times in service on each: a. Airframe. b. Engine. c. Propeller. d. Rotor.	91.417(a)(2)(i); 135.439(a)(2)(i); 8900.1, 6-1; 8900.1, 6-2; Contract
	Status of life-limited parts on: a. Airframe. b. Engine. c. Propeller. d. Rotor. e. Appliance.	91.417(a)(2)(ii); 135.439(a)(2)(ii); 8900.1, 6-1; 8900.1, 6-2; Contract
	Time since overhaul on items required to be overhauled?	91.417(a)(2)(iii); 135.439(a)(2)(iii); 8900.1, 6-1; 8900.1, 6-2; Contract
	Time since last inspection?	91.417(a)(2)(iv); 135.439(a)(2)(iv); 8900.1, 6-1; 8900.1, 6-2; Contract
	Do records for all maintenance include the following? a. Description of work performed. b. Date of completion. c. Signature and certificate number of person approving the aircraft for return to service.	43.9; 135.443(b); 145.211(c)(1)(vii); 8900.1, 6-1; 8900.1, 6-2; 8900.1, 6-9; Procedures Manual; Contract
	Do records for inspections include the following? a. Type inspection. b. Brief description of the extent of the inspection. c. Date of the inspection. d. Total time in service of the aircraft. e. Signature and certificate number of person approving the aircraft for return to service. f. A statement certifying the airworthiness of the aircraft.	43.11; 135.443(b); 145.211(c)(1)(vii); 8900.1, 6-1; 8900.1, 6-2; Procedures Manual; Contract
	AD/Mandatory S/B Compliance	

✓	Job Aid Item	Reference
	Are aircraft records maintained in accordance with 91.417(a)(2)(v)? Do they include the following? a. Method of compliance. b. AD number and revision date. c. Time and date of any recurring actions required by the AD.	91.417(a)(2)(v);135.439(a)(2)(v);145.211(c)(1)(vii); 8900.1, 6-1; 8900.1, 6-2; Procedures Manual; Contract
	Is a current list of all ADs and mandatory S/Bs maintained in accordance with the procurement document?	91.417(a)(2)(v), 135.439(a)(2)(v), Contract
	Does the operator maintain records of approvals for alternate methods of compliance of ADs?	39.19; 39.21; 8900.1, 6-1; 8900.1, 6-2
	Does the operator's method of compliance meet the requirements of the ADs? Select a representative number of ADs where it is possible to physically verify compliance status.	39.3, 39.11, 39.13, 39.19, 39.21
	If required, has the operator complied with all applicable TCTOs and/or Navy Service Bulletins?	43.13, TCDS, Contract
	Major Repair and Alteration Conformity	8900.1, 6-1; 8900.1, 6-2; 8900.1, 6-9
	Does the operator have procedures for use when performing alterations?	43.5; 43.9; 43.13; 43, Appendix A & B
	Does the operator maintain a list of current major alterations and repairs to: a. Airframe? b. Engine? c. Propeller? d. Rotor? e. Appliance?	91.417(a)(2)(vi); 135.439(a)(2)(vi); Contract
	Does the operator keep copies of the forms prescribed by 14 CFR 43.9 for each major alteration to: a. Airframe? b. Engine? c. Propeller? d. Rotor? e. Appliance?	43.9(d); 43 Appendix B; 91.417(a)(2)(vi); 135.439(a)(2)(vi)
	Does the operator have procedures to determine if repairs and alterations are major?	43.7; 43.9; 43 Appendix A & B; 14 CFR 1
	MEL/Deferred Maintenance	8900.1, 4-4; 8900.1, 6-1; 8900.1, 6-2
	Are the operator's MEL approved?	91.213, Ops Specs, LOA
	Is the operator's MEL current?	91.213, Ops Specs, LOA
	Is the operator making repairs within the time frame specified?	91.213, MEL, LOA
	Are the flight crews using approved MEL procedures to defer inoperable equipment?	91.213, MEL, LOA
	Is the operator following the procedures of their MEL Management Program?	Ops Spec D95
	Is the MEL less restrictive than the MMEL?	91.213
	Maintenance Manuals	8900.1, 3-32; 8900.1, 6-9
	Is all required technical data current and available? a. Airframe Maintenance Manuals. b. Engine Maintenance Manuals. c. Accessory/Component Maintenance Manuals.	43.13(a), 91.403(c), 135.421, 145.109(a), 145.211(c)(1)(v)
	If microfiche readers are used, are enough readers available/serviceable?	135.425(b), 145.103(a)(1), 145.109(a)

✓	Job Aid Item	Reference
	If electronic versions are used, are enough computers available/serviceable?	135.425(b), 145.103(a)(1), 145.109(a)
	Maintenance Program	8900.1, 6-2; 8900.1, 6-9
	Are the aircraft maintained by an approved maintenance program?	43.3, 43.7, 43.13, 91.403(c), 135.423(a)(c), 135.425
	Does the operator have an adequate organization to perform the tasks?	43.13, 91.403(c), 135.423(a)(b)(c), 135.425(b), 135.429, 145.103, 145.109, 145.151, 145.153, 145.155, 145.157
	Are personnel properly trained, qualified and authorized?	43.3, 43.7, 43.13, 65.81, 91.403(c), 135.425(b), 135.429, 135.433, 145.151, 145.153, 145.155, 145.157, 145.163, 145.211(c)(1)(iv)
	Has the operator approved a pilot to perform specific preventative maintenance items? If so, has the required approved training been accomplished?	43.3(g); 43.3(h); 43.3(i); Part 43, Appendix A; 135.433; Procedures Manual
	Are shift turnover procedures in place and utilized?	Procedures Manual
	Inspection Department	8900.1, 6-2; 8900.1, 6-9
	Is staff adequate for complexity of operation?	135.423(b), 135.423(c), 145.151
	Are personnel properly trained, qualified and authorized?	43.13, 43.15, 65.81 135.429(a), 135.433, 145.151, 145.155, 145.163, 145.211(c)(1)(iv)
	Are shift turnover procedures in place and utilized?	Procedures Manual
	Are functions accomplished in accordance with the Operator's Procedures Manual?	Procedures Manual
	Inspection System	8900.1, 6-2; 8900.1, 6-9
	Does the operator's inspection program meet all the requirements of 14 CFR 43, Appendix D?	43.3; 43.5; 43.7; 43.15; 43, Appendix D
	If the operator utilizes a progressive inspection program has the program been reviewed and accepted?	91.409(d)
	If the operator utilizes an Approved Aircraft Inspection Program (AAIP) under 135.419 are all affected aircraft listed in paragraph D73 in the Ops Specs?	91.409(f)(2), 135.419
	Is the AAIP approved?	91.409(f)(2); 135.419; 8900.1, 3-38

✓	Job Aid Item	Reference
	Does the AAIP contain inspection requirements for the following items? a. Airframe. b. Aircraft engine. c. Propellers/rotors. d. Survival and emergency equipment. e. Component parts for the above items. f. Required test and checks in accordance with manufacturer's instructions. g. Person responsible. h. Instruction, procedures and standards to accomplish inspection. i. Program for control of life-limited parts. j. Schedule of inspections and overhauls. k. Procedures for reporting and correcting mechanical irregularities.	135.419
	Does the operator have adequate instructions and procedures for inspection buy-back and countermand requirements?	Procedures Manual
	Does the operator have procedures to ensure all required inspections are performed?	91.403, 145.211(c)(1)(vii), Procedures Manual
	Are there procedures for all required inspections to ensure they are done by someone other than the person that did the work?	135.429(c), 145.211(c)(1)(vii) Procedures Manual
	Does the operator have a procedure to ensure that required inspections and work left incomplete as a result of shift change or interrupted work are properly completed before the aircraft is released for service?	Procedures Manual
	Are shift turnover procedures in place and utilized?	Procedures Manual
	Training Programs	
	Does the operator's training program contain procedures to inform all personnel about techniques relating to equipment in use?	135.433, 145.155, 145.163, Procedures Manual
	Does the operator's training program contain procedures and instructions for inspection personnel?	135.429, 135.433, 145.155, 145.211(c)(1)(iv), Procedures Manual
	Are personnel performing maintenance adequately trained or qualified to perform those duties?	65.81, 65.83, 135.429, 135.433, 145.155, 145.211(c)(1)(iv), Procedures Manual
	Is there adequate documentation for the training program? Determine maintenance personnel qualifications.	135.429(e), 135.433, 145.163, 145.211(c)(1)(iv), Procedures Manual
	Does the operator's training program contain procedures for training contractor personnel, or for determining acceptability of contractor's training program?	135.429(e), Procedures Manual
	Maintenance Facilities	8900.1, 6-2; 8900.1, 6-9
	Does the operator have their own maintenance facilities? If so: a. Are facilities adequate for the work being performed?	135.425(b), 145.103(a)(1)(2), 145.109(a)(b)(c)
	b. Are required technical documents available for use current and applicable to equipment being operated?	43.13(a), 91.403(c), 135.421, 145.109(d), 145.211(c)(1)(v)
	c. Are receiving inspections accomplished in accordance with the Procedures Manual?	145.211(c)(ii), Procedures Manual

✓	Job Aid Item	Reference
	d. Are parts and storage adequate?	135.425(b), 145.103(a)(2)(iv), Procedures Manual
	e. Are shelf life-limits established for items, and are these items controlled?	43.10, 135.425(b), Procedures Manual
	g. Are serviceable and unserviceable components segregated?	43.10, 145.103(a)(2)(iv), Procedures Manual
	h. Are required special tools and test equipment serviceable and calibrated?	43.13, 145.109(a)(b)(c), 145.211(c)(1)(viii), Procedures Manual
	i. Are fuel/oil/hazardous materials storage facilities maintained?	135.425(b), Procedures Manual
	j. Are hazardous materials segregated and properly stored?	135.425(b), 145.103(a)(2)(iv), Procedures Manual
	k. Is safety equipment available and serviceable?	135.425(b), 145.103(a)(1), 145.109(a)(c), Procedures Manual
	l. Are equipment/aircraft storage areas maintained?	135.425(b), 145.103(a)(2)(iii), Procedures Manual
	m. Do work areas conflict with each other (space, dust, noise, etc.?)	135.425(b), 145.103(a)(2)(ii), Procedures Manual
	n. Is there satisfactory lighting and ventilation?	135.425(b), 145.103(a)(2)(v), Procedures Manual
	o. Are safety procedures in place and adhered to?	145.109(c), Procedures Manual
	p. Is hangar ground support equipment serviceable and appropriate for the work being performed?	135.425(b), 145.103(a)(1), Procedures Manual
	Special Tools and Test Equipment	8900.1, 6-2; 8900.1, 6-9
	Are all required items serviceable and traceable to one of the following standards: a. A standard acceptable to the FAA (NIST, ASTM, etc.). b. Standard established by the manufacturer.	43.13, 145.109(b), 145.211(c)(1)(viii)
	Appropriate type and quantity are available per: a. Procedures Manual. b. Manufacturer's Manual requirements.	43.13, 145.109(a)(b)(c)
	Is proper protection and storage available and used?	135.425(b)
	Support Shops (if applicable) (Avionics, Engine, Accessory, etc.)	8900.1, 6-2; 8900.1, 6-9
	Are facilities adequate for the work being performed?	135.425(b), 145.103(a)(1)(2), 145.109(a)(b)(c)
	All required technical data is current and available: a. Engine Maintenance Manuals. b. Accessory/Component Maintenance Manuals.	43.13(a), 91.403(c), 135.421, 145.109(d), 145.211(c)(1)(v)
	If on microfiche readers are used, are enough readers available/serviceable?	135.425(b), 145.103(a)(1), 145.109(a)

✓	Job Aid Item	Reference
	If electronic versions are used, are enough computers available/serviceable?	135.425(b), 145.103(a)(1), 145.109(a)
	Is there sufficient staffing for the work being performed?	135.423(a)(b)(c), 135.425(b), 135.429(b), 145.151, 145.153, 145.157
	Are personnel properly trained, qualified and authorized?	43.3, 43.7, 43.13, 65.81, 91.403(c), 135.429(b), 145.151, 145.155, 145.157, 145.163, 145.211(c)(1)(iv), Procedures Manual
	Are shift turnover procedures in place and utilized?	145.211(c)(vii), 145.213, Procedures Manual
	Are Maintenance and Inspection functions accomplished in accordance with the Operator's Procedures Manual?	Procedures Manual
	Are receiving inspections accomplished in accordance with the Procedures Manual?	145.211(c)(ii), Procedures Manual
	Are shelf-life limits established for items, and are these items controlled?	43.10, 135.425(b), Procedures Manual
	Are components and hardware properly identified, protected and tagged as to serviceability?	Procedures Manual
	Are serviceable and unserviceable components segregated?	43.10, 145.103(a)(2)(ii), Procedures Manual
	Are hazardous materials segregated and properly stored?	135.425(b), 145.103(a)(2)(iv), Procedures Manual
	Is safety equipment available and serviceable?	145.103(a)(1), 145.109(a)(c), Procedures Manual
	Are equipment storage areas maintained?	135.425(b), 145.103(a)(2)(iii), Procedures Manual
	Do work areas conflict with each other (space, duct, noise, etc.)?	135.425(b), 145.103(a)(2)(ii), Procedures Manual
	Is there satisfactory lighting and ventilation?	135.425(b), 145.103(a)(2)(v), Procedures Manual
	Is general housekeeping maintained?	Procedures Manual
	Are safety procedures in place and adhered to?	145.109(c), Procedures Manual
	Is support equipment serviceable and appropriate for work being performed?	135.425(b), 145.103(a)(1), Procedures Manual
	Contractual Arrangements (if applicable)	8900.1, 6-2; 8900.1, 6-9
	Does the operator contract maintenance? If so: a. Is the contractor's facility adequate for the work being performed? b. Does the contractor have current copies of the operator's maintenance manuals, inspection procedures and instructions? c. Are technical documents current and applicable to the equipment being operated? d. Is the contractor appropriately certificated for the work being done?	135 Ops Specs, D77, D78, D79, 145.217

✓	Job Aid Item	Reference
	Does the operator have a program to determine that: a. Competent personnel and facilities are provided? b. Each aircraft returned to service is airworthy and there is supporting documentation to support airworthiness release?	145.217
	B. Contract Compliance Inspection	
	Aircraft General	
	Does the aircraft meet all the requirements of its Type Certificate?	Part 21, TCDS, Contract
	Is the tank system approved under an STC and/or by the Interagency Airtanker Board?	Contract
	Are modifications or alterations which affect the aircraft performance, flight characteristics or operational limitations approved by the Interagency Airtanker Board?	Contract
	Has the aircraft been actually weighed in accordance with contract requirements?	Contract
	Contract Specifications	
	Does the aircraft meet the requirements of Section B? a. Performance Specification. b. Bid Weight. c. Special Equipment (i.e., Rappel, buckets, baskets, etc.). d. Mechanic coverage. e. Fuel Truck.	Contract
	Does the aircraft meet the requirements of Section C? a. Operating certifications. b. Aircraft requirements (14 CFR requirements, condition of equipment, etc.). c. Aircraft maintenance requirements. d. Equipment requirements. e. Aircraft security requirements. f. Avionics equipment. g. Personnel requirements.	Contract
	Does the aircraft meet the Special requirements and equipment identified in the Exhibits (when required)? a. First aid/survival kit. b. Restraint systems. c. High visibility markings. d. Additional avionics equipment. e. Fuel servicing equipment.	Contract
	Is a copy of the contract on board the aircraft?	Contract
	FAA Operating Authority	
	Is the Operator/Aircraft authorized under 14 CFR Part 133?	133.11, Contract
	Is the 14 CFR Part 133 Certificate current?	133.13
	Is the Operator/Aircraft authorized under 14 CFR Part 135?	119.1, 135.1, Contract
	Is the Operator/Aircraft authorized under 14 CFR Part 137?	137.11, Contract
	Is a Rotorcraft-Load Combination Flight Manual in the aircraft?	133.47
	Are copies of these certificates in the aircraft?	133.27, 137.33, Contract
	Is a copy of the FAA Operations Specification on board the aircraft?	135.21, Contract
	Is a copy of the Company's Operations Manual on board the aircraft?	135.21, Contract
	Aircraft Records	8900.1, 6-1; 8900.1, 6-2; 8900.1, 6-9

✓	Job Aid Item	Reference
	Is there a list of all Airworthiness Directives and their current status?	91.417(a)(2)(v), Contract
	Is there a list of all Manufacturers Mandatory Service Bulletins?	Contract
	Is there a list of all items with inspection requirements, and their due dates?	91.417(a)(2)(iv), Contract
	Is there a list of all items with time-calendar life retirement/overhaul requirements and their due dates?	91.417(a)(2)(ii), 91.417(a)(2)(iii), Contract
	Aircraft Inspection	8900.1, 6-1; 8900.1, 6-2
	For a thorough aircraft inspection checklist, see Interior and Exterior Inspection Guidelines in AIG, Chapter 12.	
	Special Equipment	
	Inspect and review documentation for a Rappel Anchor.	STC, ICA, etc.
	Inspect and review documentation for a Bambi Bucket.	Bambi Bucket Manual
	Inspect and review documentation for a Long Line.	
	Inspect and review documentation for a Remote Hook.	ICA
	Inspect the 3-pin plug for correct polarity and operation.	
	Inspect the 9-pin plug for correct polarity and operation.	
	Miscellaneous	
	Verify mechanic qualification against a contract.	
	Perform an inspection of a Fuel Service Vehicle.	
	C. Aircraft Inspections While on Contract	
	Aircraft General	
	Does the aircraft meet all the requirements of its Type Certificate?	Part 21, TCDS, Contract
	Is the tank system approved under an STC and by the Interagency Airtanker Board?	Contract
	Are modifications or alterations which affect the aircraft performance, flight characteristics or operational limitations approved by the Interagency Airtanker Board?	Contract
	Has the aircraft been actually weighed in accordance with contract requirements?	Contract
	Aircraft Ramp Inspection	8900.1, 6-1; 8900.1, 6-2
	Is required documentation on board the aircraft? a. Airworthiness Certificate.	91.203(a)(1)
	b. Aircraft Registration.	91.203(a)(2)
	Note: Neither certificate is required to be on board Part 137 aircraft.	137.33(a)
	c. Daily Maintenance Log.	Contract
	If a Temporary Certificate, is it current?	91.203(a)(2), 47.31(b)
	For Part 133 & 137 aircraft, is a copy of the Operating Certificate on board?	133.27(b), 137.33(b)
	Is the Aircraft Flight Manual on the aircraft if required by 14 CFR 91.9?	91.9
	Is a Rotorcraft-Load Combination Flight Manual in the aircraft?	133.47
	Are the maintenance manuals, or appropriate parts of manuals, required by the operator's Procedures Manual available?	Contract
	Are mechanical discrepancies entered in the maintenance log either corrected or deferred using approved methods?	91.213
	Were any mechanical discrepancies noted during a visual inspection of the exterior and interior of the aircraft?	Contract
	For Part 135 aircraft are Certificate Numbers displayed and readable from outside the aircraft?	119.9
	For a thorough aircraft inspection checklist, see Interior and Exterior Inspection Guidelines in AIG, Chapter 12.	

✓	Job Aid Item	Reference
	Aircraft Spot Inspection of In-Progress Work	8900.1, 6-1; 8900.1, 6-2; 8900.1, 6-9
	Is the aircraft properly certificated and registered?	91.203
	Are maintenance personnel using the approved procedures for the maintenance being performed? Latest manual revision and date.	43.13
	Are maintenance personnel appropriately certificated for the maintenance being performed?	43.3
	Are the required special tools and test equipment available and within calibration due date?	43.13(a)
	Are inspection personnel properly trained, qualified and authorized?	43.13
	Are the maintenance facilities and equipment adequate for the maintenance being performed?	43.13

Figure 53: Interior Inspection Guidelines

ITEM	8900.1, 6-1; 8900.1, 6-2; 8900.1, 6-9
Examine airworthiness and registration certificates to ensure the following:	
• Airworthiness and Registration certificates are current and valid.	
• Both certificates contain the same model, serial number, and registration markings.	
• (If temporary registration, is it current).	
• Signatures are in permanent ink.	
Note: Copies are only authorized on Part 137 aircraft.	
⊙ **Flight Deck Inspection.** Inspect the following:	
• Aircraft Logbook for a journey record section and maintenance record section.	
• Instrument security and range markings.	
• Windshields/windows for delamination, scratches, crazing, and general visibility.	
• Seat belts and shoulder harnesses (TSO markings, metal to metal latching and general condition).	
⊙ **Emergency equipment.** All equipment requiring periodic inspections should have an inspection date marked on it. Inspect the following:	
• First aid kit.	
• Survival kit.	
• Emergency oxygen bottles and masks (proper pressure, security and conditions.	
• Fire extinguishers (security, pressure, seal, and type).	
• Placement of all “Emergency Exit” signs.	
• Presence and legibility of “Emergency Exit” operating instructions.	
• Location of all emergency equipment identified by placards.	
• Emergency Escape Ropes.	

Figure 54: Exterior Inspection Guidelines

Have a crewmember available during the exterior inspection, if possible, and inspect the following items, as applicable.

ITEM	8900.1, 6-1; 8900.1, 6-2
⊙ **Landing gear and wheel well areas.** Check for the following:	
• Any indication of wear, chaffing lines, chaffing wires, cracks, dents, or other damage.	
• Structural integrity of gear doors (cracks, dents, or other damage).	
• Hydraulic leaks (gear struts, actuators, steering valves, etc.).	
• Tire condition and pressure (if pressure indicators installed).	
• Wheel installation and safety locking devices.	
• Wear, line security, leaks, and installation of brakes.	
• Corrosion.	
⊙ **Fuselage and Pylons.** Inspect the following:	
• Structure for cracks, corrosion, dents, or other damage.	
• Fasteners (loose, improper, missing).	
• Condition of radome.	
• Condition of pitot tubes.	
• Static ports (cleanliness and free from obstructions).	
• Stall warning devices and other sensors.	
• Antennas (security, and indication of corrosion).	
• Stains of other indications of leaks.	
• Cargo compartments for integrity of fire protective liners (no holes, or duct tape used for repairs) Blow-out panels not taped closed.	
• Emergency exit identification/marking (Two-inch contrasting borders outlining exits).	
• Registration markings (match airworthiness and registration certificates).	
• All lights (general condition, broken lenses, etc.).	
⊙ **Wings and Pylons.** Inspect the following:	
• Structure for cracks, corrosion, dents or other damage.	
• Leading edge (dents and/or damage in line with engine inlets).	
• Leading edge devices (when open for actuator leaks, general condition of line, wires, and plumbing).	
• Evidence of fuel leaks (if found, maintenance must prove leak is within limits).	
• All lights (general condition, broken lenses, etc.).	
• Flaps (cracks, corrosion, dents, and delamination).	
• Flap wells (general condition of lines, wires, and plumbing).	
• Static eliminators (number missing in accordance with MEL/CDL).	
• Ailerons and aileron tabs (cracks, corrosion, dents, delamination).	
• Missing, loose, or improperly secured access door/inspection panels and blow-out panels.	

ITEM	8900.1, 6-1; 8900.1, 6-2
⊙ **Engines.** Inspect the following:	
• Intakes for fan blade damage and oil leaks.	
• Ring cowl for security and proper fit.	
• Cowling doors for security and proper fit.	
• Lower cowling for security and evidence of fluid leaks.	
• Exhaust for turbine and tailpipe damage and evidence of fluids.	
• Reverser doors for stowage and security, evidence of leaks.	
• Access doors for security.	
⊙ **Propellers.** Inspect the following:	
• Leading edge of propeller for cracks, dents, and other damage.	
• De-ice boots for signs of deterioration and security.	
• Spinners for security, cracks, and evidence of fluid leaks.	
⊙ **Empennage.** Inspect the following:	
• Leading edge for dents.	
• All lights (general condition, broken lenses, etc.).	
• Missing static discharge eliminators (in accordance with MEL/CDL).	
• Elevators, rudders, and tabs (cracks, corrosion, dents delamination).	
• Evidence of elevator and rudder power units for hydraulic leaks.	
⊙ **Cargo/Baggage.**	
• Baggage restraining system (in-place and proper use).	
• Load distribution in accordance with weight placard instructions.	
⊙ **Refueling Procedures.**	
• Positioning of ground support equipment (GSE).	
• Fueling of aircraft to include the following:	
→ Refueling pressure.	
→ Condition of refueling units (leaks, filter change dates, exhaust system, etc.).	
→ Ground connections and procedures.	
→ Fire protection.	
→ General fueling procedures.	
⊙ **Hazardous Material.**	
• Determine crew knowledge of the following:	
• Location and labeling of hazardous material.	
• Special requirements, if any.	
• HAZMAT Booklet and current Exemption Letter.	

Notes

Chapter 13 – Quality Assurance

13-1 Introduction

Two of the primary responsibilities of the AWB and Regional ASI are to (1) provide initial approval of contracted aircraft, and (2) provide oversight of the maintenance being performed on Forest Service owned, operated, and contracted aircraft. To effectively perform these responsibilities, inspectors must ensure that thorough Pre-Use Inspections are performed and proactively conduct surveillance of aircraft maintenance operations to fulfill the assurance element of the Agency's Safety Management System (SMS) program. This chapter presents the AWB's Quality Assurance Strategy for accomplishing these goals.

For contracted aircraft, the primary means of ensuring the safety of Forest Service operations is by conducting thorough Contract Pre-Use Inspections before an aircraft begins operating and then providing ongoing oversight of contractor maintenance. An important element of the oversight function consists of in-depth Field and Facility Audits during use. For Forest Service owned and operated aircraft, audits to ensure compliance with Forest Service policy are the focus. The key component in accomplishing both these functions is the Aircraft Inspector. It is essential that Aircraft Inspectors are proficient and knowledgeable of contractual, regulatory and manufacturer's requirements to ensure the quality of inspections and oversight of maintenance operations. A sound Quality Assurance program will help ensure these objectives.

Regional maintenance managers should adapt the procedures in this chapter to their own Regional programs and may request assistance from the AWB in setting up a similar program for auditing Regional aviation assets.

The plan encompasses five program areas:

1. Aircraft Inspector Proficiency.
2. Working Capital Fund (WCF) and Nationally-Contracted Light Fixed-Wing Aircraft.
3. Type I & II Helicopters.
4. Airtankers.
5. Smokejumper Aircraft.

Each section contains an audit plan representing the minimum number of audits by area considered necessary to assure operational safety.

13-2 Airworthiness Branch Policy and Procedures

To fulfill the responsibility for providing initial approval of contracted aircraft, and ongoing oversight of maintenance being performed on Forest Service owned, operated and contracted aircraft, inspectors will ensure that thorough Pre-Use Inspections are performed and actively conduct surveillance of aircraft maintenance operations. The policies and procedures for accomplishing these goals are laid out in this chapter as defined by Forest Service SMS policy and IS-BAO best practices.

Airworthiness Branch auditors will be designated by the ABC. The prerequisites for selection as an auditor are: 1) approved as an Aircraft Inspector and 2) IS-BAO Auditor accreditation. An Auditor may be designated for only those aircraft they are approved for on the USFS Approved Inspectors List. Regional Auditors meeting these requirements, with concurrence of their Regional Aviation Officer (RAO), may be approved by the ABC to perform audits of National aircraft. However, audits of ASIs will be performed only by AWB personnel.

Auditors will use AWB job aids when performing audits. A list of currently approved job aids can be found in AIG, Chapter 13-9; contact the AWB for the latest job aid revisions. These are not formulated to be all inclusive. Depending on time available and the intent of the audit only select sections may be addressed.

Auditors will coordinate with Regional management when auditing inspectors and aircraft based/operating in the Regions. The same principle applies to aircraft assigned to an incident. Coordination with Regional, incident management, CO, and CORs is mandatory to ensure cooperation and avoid conflicts.

Audits will be conducted to minimize impact on operations. The only time an operation should be terminated as a result of an audit is when a clear safety of flight issue arises. At all other times, auditors should work with Regional and incident officials, the CO, and the operator to resolve issues at the lowest level to limit impact on operations.

A team approach with Operations, Safety, etc., while not essential, should be taken whenever possible during Contractor Field and Facility Audits. However, the principal goal of the AWB QA strategy is to provide the maximum level of ongoing oversight consistent with the personnel and assets available, and this goal should not be compromised for the convenience of a team approach.

Auditors should encourage Regional ASIs to participate in Contractor Field and Facility Audits conducted in their Region on Nationally-contracted aircraft.

For a flow chart of the Pre-Use Inspection process, see the Pre-Use Inspection Flow Diagram in AIG, Chapter 11.

Regions operating WCF aircraft are required to participate in ARGUS International's PRISM Internal Evaluation Program (IEP) as part of the Forest Service SMS Program.

The program is a good cross check to uncover latent program deficiencies. The program provides 12 maintenance-specific audit checklists every other month over a two-year period (see the figure below). Dividing the IEP into sections allows maintenance managers to focus closely on smaller elements of their program in shorter segments. This helps better manage their time while ensuring a comprehensive review of their program every two years. It is anticipated that a Region with a robust IEP should have few if any deficiencies noted during a National WCF audit.

Figure 55: PRISM IEP Maintenance Checklists

ID	Description
Mx 1	Maintenance Management
Mx 2	Maintenance Personnel
Mx 3	Quality Assurance
Mx 4	Inspection
Mx 5	Maintenance Training
Mx 6	Maintenance Control/Planning
Mx 7	Aircraft Condition
Mx 8	Maintenance Records
Mx 9	Fueling and Servicing
Mx 10	Maintenance Manuals
Mx 11	Facilities
Mx 12	Stores/Shelf-Life

Contractor Field and Facility Audits will sample the subject areas listed in the figure below and will focus on contractual, regulatory (FAA, OSHA, EPA, USFS, etc.) and safety issues, with an emphasis on promoting compliance with industry best practices. The International Standard for Business Aircraft Operations (IS-BAO) is the benchmark that will be used to evaluate best practices. Gaps should be identified and brought to the attention of operators and users for resolution. Improvements to contractual specifications and operational issues should be the goal of any audit. While not required, a general airworthiness check of aircraft should be conducted whenever aircraft are available. Depending on time available and the intent of the oversight only select sections may be addressed.

Figure 56: Field and Facility Areas Subject to Audit

No.	Area Subject to Audit
1	Certificate and Operations Specifications

No.	Area Subject to Audit
2	Management, Control, and Administration
3	Quality Assurance
4	Manuals
5	Training
6	Records System
7	Facilities (Repair Stations only)
8	Contract Maintenance
9	Maintenance Performed at Other Locations (Repair Stations only)
10	Technical Data
11	Inspection System (Repair Stations only)
12	Special Tools
13	Aircraft Maintenance and Inspection Status
14	Aircraft Physical Inspection
15	Occupational Health and Safety

Auditors must out-brief contractors, and Regional and incident management at the completion of audits. Additionally, audit reports will be completed and filed with the AWB and CO, with recommended remedial/follow-up actions to be performed. See 13-9-4 for a sample Field Audit Report.

13-3 Aircraft Inspector Proficiency

Auditing an ASI's proficiency encompasses two principal areas: training and over-the-shoulder audits. Maintaining minimum training requirements is the responsibility of the individual inspector. Minimum training requirements are listed in FSH 5709.16, 40 and in Chapter 3. To ensure these requirements are met, the AWB uses an Excel spreadsheet to track the training of inspectors on the USFS Approved Inspectors List. An example of a Training Record is provided at the end of this section. Deficiencies are brought to the attention of the inspector and their supervisor when noted.

The AWB conducts an annual Inspector Workshop at which inspectors are briefed on the latest developments in contractual, regulatory, manufacturer, and industry standard requirements. Attendance at the workshop is mandatory (FSH 5709.16, 40).

RAOs and the ABC designate Aircraft Inspectors to approve aircraft for government use. There are three approval designations for airplanes, three for helicopters, and one for

Unmanned Aircraft Systems (UAS). Nationally-contracted aircraft are generally limited to MA-1 & 2, and MH-1 & 2 (see AIG, Chapter 3). The focus of inspector audits will be on Nationally-contracted helicopters and airplanes.

New Aircraft Inspectors receive extensive training and must complete a Task Book prior to being listed on the Aircraft Inspectors List. However, many inspectors were grandfathered in when the Task Book was implemented and so to ensure proficiency of both new and long-term Aircraft Inspectors, all are audited during a Pre-Use Inspection at least once every five years for MA 1 & 2, or MH 1 & 2 designations held. AIG, Chapter 11, Figure 50 shows a flow diagram of the tasks normally associated with a Pre-Use Inspection. Audits will evaluate an inspector's proficiency in performing the tasks shown in the flow diagram along with the appropriate Pre-Use Inspection (see AIG, Chapter 13-9-1). Inspectors are encouraged to perform a self-audit using the Job Proficiency Subject Areas list found in Chapter 3-6, Figure 7. See sample ASI training record below.

Figure 57: Aircraft Inspector Training and Approval Record (Sample)

	Name: Roy Smith						**Completion Date**
1	**Forest Service Aircraft Inspector Indoctrination**						**PCW**
2	**FAA Academy Indoctrination**						
	21054	Airworthiness Indoctrination Technical Core (72 Hours)					Dec-05
	21056	General Aviation Airworthiness Indoctrination (40 Hours)					Mar-06
3	**Contracting Officer's Representative (COR) Training**						Jan-03
4	**Inspector Qualification Aircraft Specific Training**						
	Model	**Type** (Field Mx, Recurrent)		**Rating**			
	S-64	Field Mx		**MH1**			Dec-01
	Bell 407	Field Mx		**MH2/3**			Jan-00
	BAe-146	Line Maintenance		**MA1**			Oct-12
	DHC-6	Mx Initial		**MA2**			Mar-01
	C-90	Initial		**MA3**			Apr-04
	Basic	Flight Safety/RVSM		**AV**			Dec-00
5	**Experience**						
	Ratings		**Experience** (List Models)				
MH1	Type I Helicopter						
MH2/3	Type II / III Helicopter	206L					
MA1	Airtanker	B-737	KC-10A				
MA2	Smokejumper	DC3					
MA3	Light Fixed Wing	C-206	C-210	C-340	PA-31		

	Name: Roy Smith			**Completion Date**
AV1	Avionics Conformity			
AV2	Air Attack Type III & below			
AV3	Air Attack Type II & above			
6	**Other Recommended Training**			
	21811	Aircraft Alteration and Repairs (32 Hours)		Apr-07
	21016	Part 21 (32 Hours)		Dec-11
	21051	Structural Inspections Programs Evaluation (24 Hours)		Mar-09
		(Suggested for VLAT Approvers)		
	21058	Part 145 Repair Stations		
	21026	Suspected Unapproved Parts (SUPs)		Mar-10
		Human Factors for Aircraft Maintenance Technicians		Feb-05
		Aircraft Accident Investigation		May-02
		Qualified Technical Investigator (QTI)		Jun-02
		S217 Interagency Helicopter		May-00
		IS-BAO Auditor Certification **Next Due:**	Nov-14	
7	**IAT Training**			
	A101	Aviation Safety		Oct-01
	A107	Aviation Policy and Regulations I		Oct-01
	A201	Overview of Safety and Accident Prevention Program		Oct-01
	A202	Interagency Aviation Organizations		Oct-01
	A302	Personal Responsibility and Liability		Oct-01
	A303	Human Factors in Aviation		May-03
	A305	Risk Management		
	A307	Policy and Regulations II		
8	**Aircraft / Aircraft Systems Specific Training**			
	Model	**Type** (i.e., Field Mx, Component O/H, etc.)	**Date**	
	AS350	Field Mx (AS350B3 Differences)	Mar-00	
	PT6A	Small Engine Field Mx	May-01	
	CE-500	Mx Initial	Nov-02	
	TCM	Advanced Engine	Dec-02	
	Cessna HPSE	Mx	Jun-05	
9	**Record of Inspector Workshop Attendance (Most Recent)**			
	Location		**Date**	
	Riverside, CA		Jan-13	

	Name: Roy Smith	**Completion Date**
10	**Record of Training (Course Name)**	
	Airplane Structural Design Loads	Apr-02
	OSHA Training	Feb-02
	Simplified Acquisition Procedures (SAP)	Mar-03
	NDT Level II (Liquid Penetrant)	Nov-04
	King Air Wing Structure Inspection	Dec-04
	Trainair Course Developer Workshop	Dec-04
	DAR Standardization Seminar Initial	Oct-05
	OMB Circular A-76	Jan-06
	Contract Administration	Nov-07
	CON 100: Shaping Smart Business Arrangements	Dec-09
	IS-BAO Certification	Apr-10
	CONN 110: Mission Support Planning	Dec-10
	CON 111: Mission Strategy Execution	Nov-11
	Federal Contract Law	Dec-13
11	**Record of Performing National/Regional Responsibilities (as required)** **Include short explanation/details (i.e., SMA Audit Team, Type I & II Carding, etc.).**	
	R-4 Helibase Inspections	Jul-00
	N785DM Accident Investigation	Jul-01
	MAFFS Mx Liaison	May-03
	Leadplane Contract Evaluation	Jan-04
	WO Detail	Jan-05
	N85BH Accident Investigation	Mar-05
	T-26 Accident Investigation	Apr-05
	Siller Brothers Review	Aug-05
	Competitive Out-Sourcing	Apr-06
	N455TG IWP	Jul-06
	N6156U Accident Investigation	Aug-06
	T-488 IWP	Sep-06
	NAOO-A&L Detail	Jan-07
	N612AZ Accident Investigation	Sep-08
	SMS / Contract Compliance Audits	Jul-09
	T-44 Accident Investigation	Jun-10
	SMS Audits	Aug-10
	HTSI Audits	Jun-11

Name: Roy Smith	**Completion Date**
HTSI Follow-up Audits	Sep-11

RAOs may request that Regional inspectors be audited for Regionally-contracted aircraft (MA-3 & MH-3).

Whenever possible, audits of ASIs should consist of an over-the-shoulder Pre-Use Inspection; however, scheduling conflicts may prevent this. Under these circumstances a thorough review of the Pre-Use Inspection process will be done with the inspector being audited.

For planning purposes, approximately 20% of the Aircraft Inspector cadre will be audited annually. The following figure provides a representation of a projected audit schedule based on an Aircraft Inspector cadre of 20 (one each in R1, R2, R3, R8, and R9; two in R5; three in R4 and R6; five in WO; and two in State). Most inspectors perform Pre-Use Inspections of National helicopters, but not all inspectors approve Large Airplanes. The example below is based on a projection that not all of the cadre are approving Large Airplanes. As the number of inspectors change, the audit schedule should be updated based on the principle of one audit per platform type every five years. The projection represents the target number of audits considered essential to quality assurance.

Figure 58: Aircraft Inspector Audit Schedule Example

Calendar Year	Large Airplane Approval Designations	Type I & II Helicopter Approval Designations	Inspector Audits
CY 1	**1**	**3**	**4**
CY 2	**2**	**4**	**6**
CY 3	**2**	**4**	**6**
CY 4	**2**	**4**	**6**
CY 5	**1**	**4**	**5**
Total	**8**	**19**	**27**

13-4 Working Capital Fund (WCF) and Nationally-Contracted Light Fixed-Wing Aircraft

Audits of WCF aircraft will be performed at least once every five years. Audits will determine whether aircraft are operated, maintained, and configured in accordance with Forest Service Handbook (FSH) 5709.16 and 14 Code of Federal Regulations (CFR). Regions operating WCF aircraft are required to participate in ARGUS International's PRISM Internal Evaluation Program (IEP), since a strong IEP should identify any deficiencies long before a National audit.

One-third of the Nationally-contracted light fixed-wing fleet will be audited for contract compliance annually.

The audit schedule will ensure that every WCF aircraft is audited at least once every five years and every contracted aircraft is audited at least once during any three-year cycle.

For planning purposes an average of 20% of the Regional WCF aircraft and 33% of the leadplane fleet will be audited annually. The following example provides a representation of a projected schedule based on a WCF fleet of 25 aircraft and a contracted leadplane fleet of 14 aircraft. As the number of WCF and contracted aircraft changes, the schedule should be revised based on the principle of WCF aircraft audited once every five years and one-third of the Nationally-contracted light fixed-wing aircraft audited annually. The projection represents the target number of audits considered essential to assure operational safety.

Figure 59: WCF/Leadplane Audit Schedule Example

Calendar Year	Regional WCF Audits	Nationally-Contracted Light Fixed-Wing Aircraft	Aircraft Audited
CY 1	1 & 3	4	7
CY 2	4	2	8
CY 3	2 & 5	4	9
CY 4	6/10	3	9
CY 5	8 & 9	1	6

13-5 Type I & II Helicopters

One third (33%) of all Exclusive Use Type I & II helicopters will receive contract compliance audits annually during their Mandatory Availability Period (MAP). The schedule of audits will ensure that each helicopter is audited at least once in every three-year cycle. When Call-When-Needed (CWN) aircraft are activated, audits will be conducted as auditors become available. The preference is to audit all CWN aircraft, but this may not be feasible, so priority may be placed on auditing CWN aircraft operators that have fewer aircraft on Exclusive Use (EU) contracts first. For instance, if two CWN aircraft are activated, one from a vendor with four EU contracts, and one with none, the priority will be placed on auditing the vendor without other EU contracts.

The following figure provides a representation of a projected schedule based on a contracted fleet of 66 Type I & II Exclusive Use helicopters (34 Type I Exclusive Use Large Fire Support (LFS) and 32 Type II Initial Attack (IA) aircraft). The audit schedule will ensure that every contracted aircraft is audited at least once during any three-year

cycle. As the number of contracted aircraft changes, the schedule should be revised based on the principle of one-third aircraft audited annually. The projection represents the target number of audits considered essential to assure operational safety. The example does not consider CWN aircraft which would be audited above and beyond what is shown here.

Figure 60: Exclusive Use Helicopter Audit Schedule Sample

Fire Season	Aircraft Audited
#1	22
#2	22
#3	22

Because of the criticality of Night Operations, an audit schedule is not included here. It is expected that extensive oversight of these aircraft will occur with a goal of at least an unofficial audit happening monthly, with more formal audits several times a year.

As more qualified auditors become available, audits of helicopter contractor facilities will occur. The goal will be for each contractor to receive a facility audit once during each contract cycle.

Regional managers may request assistance from the AWB for performing audits of Type III helicopters and LFW Regional assets, or in setting up an audit program of their own.

13-6 Airtankers

One third (33%) of all airtankers will be audited annually while on contract, with the goal of having every aircraft audited at least once every three years. The annual schedule will include at least one airtanker from each operator. Except in the case of operators with less than three EU and/or CWN aircraft, the schedule of audits will ensure that each airtanker is only audited once in a three-year cycle. All CWN aircraft (100%) will be scheduled for an audit once they are activated.

To ensure issues are identified early in the season before they become a problem, airtanker audits should usually be scheduled no earlier than one month and no later than two months after the aircraft's Mandatory Availability Period (MAP) begins. However, experience shows that many problems do not become apparent until operations begin in earnest. Audit schedules should be tailored to the tempo of operations.

The following figure provides a representation of a projected schedule based on a contracted fleet of 15 EU / CWN aircraft. As the number of contracted aircraft changes, the schedule will be revised based on the principle of each operator and/or one-third

aircraft audited annually. The audit schedule will ensure that every contracted airtanker receives at least one audit during any three-year cycle. The projection represents the target number of audits considered essential to assure operational safety.

In this example, each of the single-aircraft operators will be audited annually. Operators with two aircraft will have at least one of their aircraft audited annually, and the eight-aircraft operator would have six of its aircraft audited the first two years and the last two aircraft audited in the final year of the three-year cycle. Audits of the two-aircraft operators should alternate aircraft so that each aircraft gets an audit every other year. This audit schedule accounts for CWN aircraft only as an example. Depending on the number activated each year, they will be integrated in the audit schedule as they come on.

Figure 61: Airtanker Audit Schedule Example

Exclusive Use / CWN Contracted Aircraft

Operator	Model Aircraft	Number of Aircraft	Fire Season #1	Fire Season #2	Fire Season #3
A	1	2	1	1	1
B	2	2	1	1	1
C	3	4	2	1	1
D	4	1	1	1	1
E	5	4	1	2	1
F (CWNs)	Any activated	2	1	1	1
TOTAL		**15**	**7**	**7**	**6**

All Airtanker Operators will receive a Facility Audit at least once every five years. Facility audits should be performed if time permits in conjunction with Pre-Use Inspections.

Figure 62: Airtanker Facility Audit Schedule Example

Calendar Year	Number of Facilities Audited
CY 1	**2**
CY 2	**1**
CY 3	**1**
CY 4	**1**
CY 5	**1**

13-7 Smokejumper Aircraft

One third (33%) of all smokejumper aircraft will be audited annually while on contract. At least one aircraft from each operator will be audited annually. There are presently five aircraft on contract: one operator with two aircraft and another operator with three aircraft.

The following figure provides a representation of a projected schedule based on a contracted fleet of five aircraft. The audit schedule will ensure that every contracted aircraft is audited at least once during any three-year cycle. As the number of contracted aircraft changes, the schedule will be updated based on the principle of each operator and/or one-third aircraft audited annually. The projection represents the target number of audits considered essential to assure operational safety.

In this example, operators with two aircraft will have one aircraft audited annually, alternating between the two aircraft every year. Operators with three aircraft will have one aircraft audited annually.

Figure 63: Smokejumper Audit Schedule Example

Fire Season	Operator with 2 Aircraft on Contract	Operator with 3 Aircraft on Contract	Total Aircraft Audited
#1	Aircraft #1	Aircraft #1	2
#2	Aircraft #2	Aircraft #2	2
#3	Aircraft #1	Aircraft #3	2

Smokejumper aircraft operators will receive facility audits at least once every five years. There are presently two operators on contract.

Figure 64: Smokejumper Facility Audit Schedule Example

Calendar Year	Number of Facilities Audited
CY 1	1
CY 2	1
CY 3	0
CY 4	0
CY 5	0

13-8 Projected Annual Audit Schedule

The following figure represents the minimum number of audits that will be accomplished in a calendar year. Additional audits will be conducted of CWN aircraft and at the request of National or Regional management.

Figure 65: Projected Quality Assurance (QA) Audits by Calendar Year (CY)

Audit Type	CY 1	CY 2	CY 3	CY 4	CY 5
Aircraft Inspector	4	6	6	6	6
WCF/LFW	9	8	8	8	9
Type I & II Helicopter	22	22	22	22	22
Helicopter Facility	TBD	TBD	TBD	TBD	TBD
Airtankers	7	7	6	7	7
Airtanker Facility	2	1	1	1	1
Smokejumper	2	2	2	2	2
Smokejumper Facility	1	1	0	0	0
TOTAL	**47**	**47**	**45**	**46**	**47**

13-9 Airworthiness Branch Checklists and Job Aids

This section lists currently approved Pre-Use Checklists and Field/Facility Audit Job Aids. Contact the AWB for the latest version.

13-9-1 Pre-Use Inspection Checklists

1. Airplane Pre-Use Inspection (see latest version).
2. Helicopter Pre-Use Inspection (see latest version).
3. Airtanker-Smokejumper Pre-Use Inspection (see latest version).
4. LFW Pre-Use Inspection (AvCheck).
5. Large Airplane Pre-Use Inspection (AvCheck).
6. Helicopter Pre-Use Inspection (AvCheck).

13-9-2 Field/Facility Audit Job Aids

Audit Job Aids are available in initial and recurring formats. Initial Audit Job Aids are geared toward an in-depth audit of new vendors and their programs, with an emphasis

on their policies and processes. Recurring Audit Job Aids are more appropriate for aircraft during contract "option" years with the focus on continuing performance.

1. Airtanker QA Facility (see latest version).
2. Airtanker QA Field Maintenance (Initial) (see latest version).
3. Airtanker QA Field Maintenance (Recurring) (see latest version).
4. Cooperator QA Field Maintenance (see latest version).
5. Helicopter QA Facility (see latest version).
6. Helicopter QA Field Maintenance (Initial) (see latest version).
7. Helicopter QA Field Maintenance (Recurring) (see latest version).
8. LFW QA Field Maintenance (Initial) (see latest version).
9. LFW QA Field Maintenance (Recurring) (see latest version).
10. Repair Station QA Audit (Draft) (see latest version).
11. SMKJUMPER QA Field Maintenance (Recurring) (see latest version).
12. Regional WCF QA Audit (see latest version).

13-9-3 Quality Assurance Procedural Checklist

Figure 66: Quality Assurance Procedural Checklist

	Task	Initial
1	Determine aircraft / individuals to be audited.	
2	Research contractual requirements, as applicable.	
3	Research regulatory and maintenance requirements, as applicable.	
4	Coordinate with appropriate individuals (Regional and/or incident managers, COs, CORs).	
5	Coordinate with other team members, as applicable.	
6	Complete audit.	
7	Perform critique and make recommendations.	
8	Out-brief managers, as applicable.	
9	Document audit findings.	
10	Follow-up on corrective actions.	
11	Feedback and make recommendations on policy and process changes.	

13-9-4 Field Audit Report (Sample)

Airtanker Quality Assurance Audit – {Month/Year}

{Aircraft Model & "N" Number} {Date} {Location}

Company Rep: {Names}

Aircraft Current Status: Both a Maintenance and Flight Log are maintained in the aircraft. The Flight log is used by the pilots to record flight time and the Maintenance Log is used in conjunction with the Repair Station to record discrepancies. The procedures for documented for recording discrepancies are well defined and are being followed. An electronic database is used to track aircraft status on the aircraft due to the large number of inspections, overhaul, and time change items that require tracking. The aircraft status is also tracked by Company Maintenance Control and Management.

Management and Control: The lead technician has a good grasp of the requirements of the company procedures, however knowledge of the Repair Station Manual (RSM) and Quality Control Manual (QCM) was more limited. Since the aircraft is maintained in the field under the Repair Station it is essential to have thorough knowledge of requirements of these manuals. The lead technician indicated that yearly audits are performed of field operations by QA, but one has not been performed yet this year. Management closely monitors aircraft in the field ensuring that Required Inspection Items (RII) procedures are followed. The technician has a personal informal policy for Dual Check of non-RII items. The crew chief is aware the company has an SMS program but has limited knowledge of the policy or procedures.

Maintenance Control: The Company has a well-defined maintenance control system in place with very good checks and balances to control field operations. {Name}, provides Factory-type Tech Rep support. The RSM is available electronically, but the crew chief has limited knowledge of procedures such as the General, Incoming, etc. requirements. Parts are ordered through Maintenance Control, and the crew chief understands they has primary responsibility to ensure only approved parts are installed. An inventory of parts on the support trailer is available. The crew chief has no knowledge of the FAA's SDR/MDR system. There is no known program for tracking repetitive discrepancies. Tools and equipment on the trailer that were checked were in calibration.

Technical Data: The Company uses manufacturer's online technical data system to ensure access to the latest data.

Organization and Personnel: The lead technician has the necessary training and experience to maintain the aircraft. They also feel there is a good Drug and Alcohol Program with counseling available to employees. The company does not have a formal "fatigue" program, but crew chief feels they have the authority to call "time out," and has done this without negative consequences.

Training: The Company appears to provide annual training on company and Repair Station policies. They also are aggressively getting their workforce trained on the {Model of aircraft}. No Human Factors training is provided to maintenance personnel, but other ancillary training such as CPR training is provided.

Aircraft Maintenance: Aircraft seems to be well maintained and all inspections, time-life items, etc. were up to date. The Company does not out-source maintenance functions.

OSHA, Environmental, and HAZMAT: Right-To-Know Material Safety Data Sheets (MSDS) were available. Crew Chief self-disclosed that "Solvent XYZ" MSDS was not available but was working on acquiring one.

Aircraft, Equipment, and Airworthiness: The aircraft had all its required operational and required information such as Flight Manuals, Weight and Balance, etc. were available, along with contractually required first aid and survival kits. Critical aircraft equipment such as seat and shoulder harnesses appeared to be airworthy.

Team Members: {Names}

Recommended Follow-up Actions: The technician should review the RSM to ensure compliance with the requirements. The Company should provide more training on RSM and QCM procedures. MSDS sheets should be located and made available in the trailer.

Notes

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Appendix A – Rotor-Wing Aircraft Firefighting Equipment

A-1 Introduction

Inspectors often encounter equipment that is used exclusively for firefighting. Depending on the inspector's background, some of it may be familiar. This appendix provides some general information on some of the more common pieces of equipment used in helicopters. Much of the special firefighting equipment covered in this chapter is used under the authority of 14 CFR Part 133 – External Load Operations. Definitions of the various classes of external load operations can be found in the Glossary.

Note: Information shown in this appendix is **for reference only**.

A-2 Helicopter Fixed Tanks

A-2-1 Bell 205/212 (Isolair)

Eliminator II for Bell 205A-1, 212, 412 and 412EP.

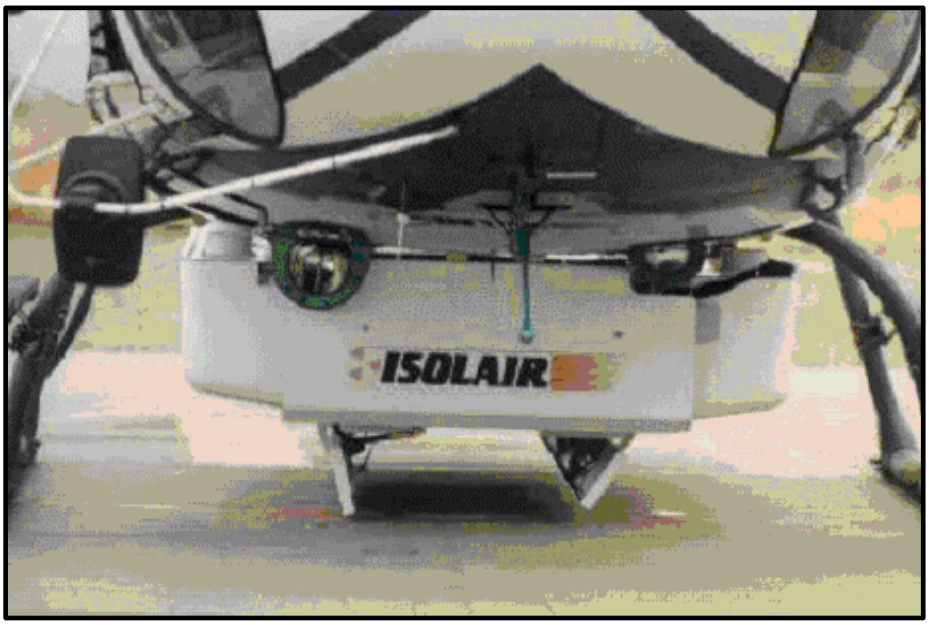
Height	14 inches	**Net Weight**	418 lbs.
Width	88 inches	**Gross Weight**	3342 lbs.
Length	90 inches	**Capacity**	323 U.S. gallons
Fill Rate	270 gpm	**Fill Time**	55 to 75 seconds

4600–212

A-2-2 Airbus (Eurocopter) AS350 B (Isolair)

Eliminator II model 4600-350B2 for AS350 B1, B2, and B3.

Height	13 inches	**Net Weight**	330 lbs.
Width	52 inches	**Gross Weight**	2537 lbs.
Length	96 inches	**Capacity**	250 U.S. gallons
Fill Rate	270 gpm	**Fill Time**	25 to 35 seconds



A-2-3 Bell 205/212 with High Skid Gear (Simplex)

Net Weight	360 lbs.
Gross Weight	3487 lbs.
Capacity	375 U.S. gallons
Fill Rate	320 gpm

A-2-4 RADS III Firehawk™ for the S-70A/UH-60L Blackhawk Helicopter

Retardant Aerial Delivery System III

At the request of Sikorsky Aircraft, Aero Union designed and manufactured a 1,000-gallon water tank for the S-70A/UH-60L (Blackhawk) Helicopter. This Aero Union RADS III/Helitack tank comes equipped with a 30-gallon foam tank, a 1000 gallon per minute snorkel, and Aero Union's patented computer-controlled doors.

The Firehawk™ can pick up 15 firefighters, deliver them close to the fire, and then commence dropping water/foam on the fire. Using the snorkel hose, the tank can be filled in approximately 60 seconds from a variety of water sources.

Aero Union now offers the Firehawk™ conversion:

A Kit: Fixed Provisions

1. Water tank fuselage attachment lugs.
2. Wiring associated with cockpit control panel and civilian radios.
3. Landing gear extension fitting.

B Kit: Removable Provisions

1. Water tank (1,000 gallons/3,785 liters).
2. Water pump-snorkel (1,000 gallons/3,785 liters per minute).
3. Extended landing gear.
4. Cockpit control panel.
5. Civilian radios.
6. Pilot lower rearview mirror.

Four hours are required for installation or removal of water tank (estimated).

A-2-5 S-64 Skycrane Helitanker

Since initial operation, this Skycrane Helitanker has proven to be an effective firefighting platform. The snorkel system rapidly fills the 2,000-gallon tank in well under one minute, even from the shallowest of reservoirs, while the foam injection system allows for various concentration levels to suit any given scenario. This helitanker also comes equipped with the Aero Union patented constant flow tank door actuation design providing excellent coverage level and drop control.

A-3 Bambi Buckets

SEI Industries.

References:

Bambi Bucket Repair Assessment Manual.

Bambi Bucket Operator's Manual.

Figure 67: Bambi Bucket Diagram

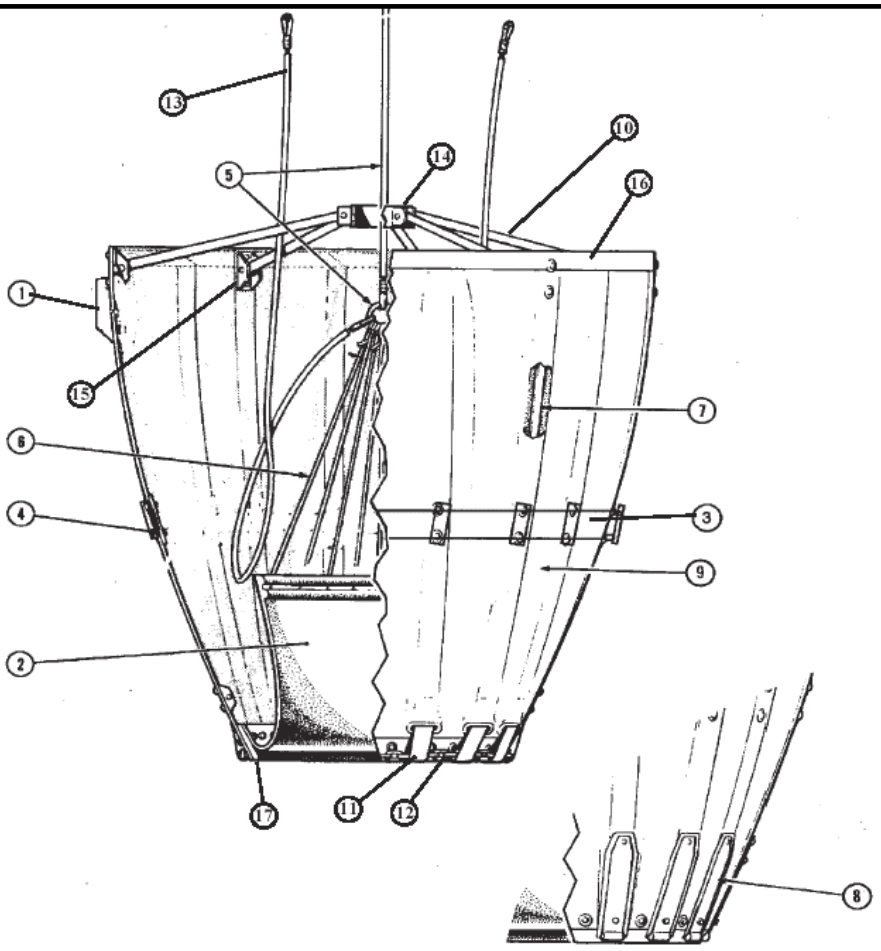


Diagram #	Description	Diagram #	Description
1	Ballast Plates	9	Bambi Bucket Shell
2	Dump Valve	10	IDS Hub Spokes
3	Cinch Strap	12	Bottom Chain
4	Cinch Strap Bar	11	Bottom Webbing Loops
5	Riser Cable and Riser Ring	13	Valve Restrainer Cable
6	Purse String Set	14	IDS Hub
7	Side Battens	15	IDS Brackets
8	Bottom Webbing Loop Wear Strip	16	Top Webbing
		17	Bottom Webbing

The riser cable (5) is attached to the control head (not shown), which is attached to the aircraft cargo hook, and electrically to the 9-pin plug. By depressing a switch on the collective, the pilot actuates a solenoid in the control head, which releases the riser cable (5), allowing the water in the bucket to be dumped.

Figure 68: Bambi Bucket Diagram (IDS Hub)

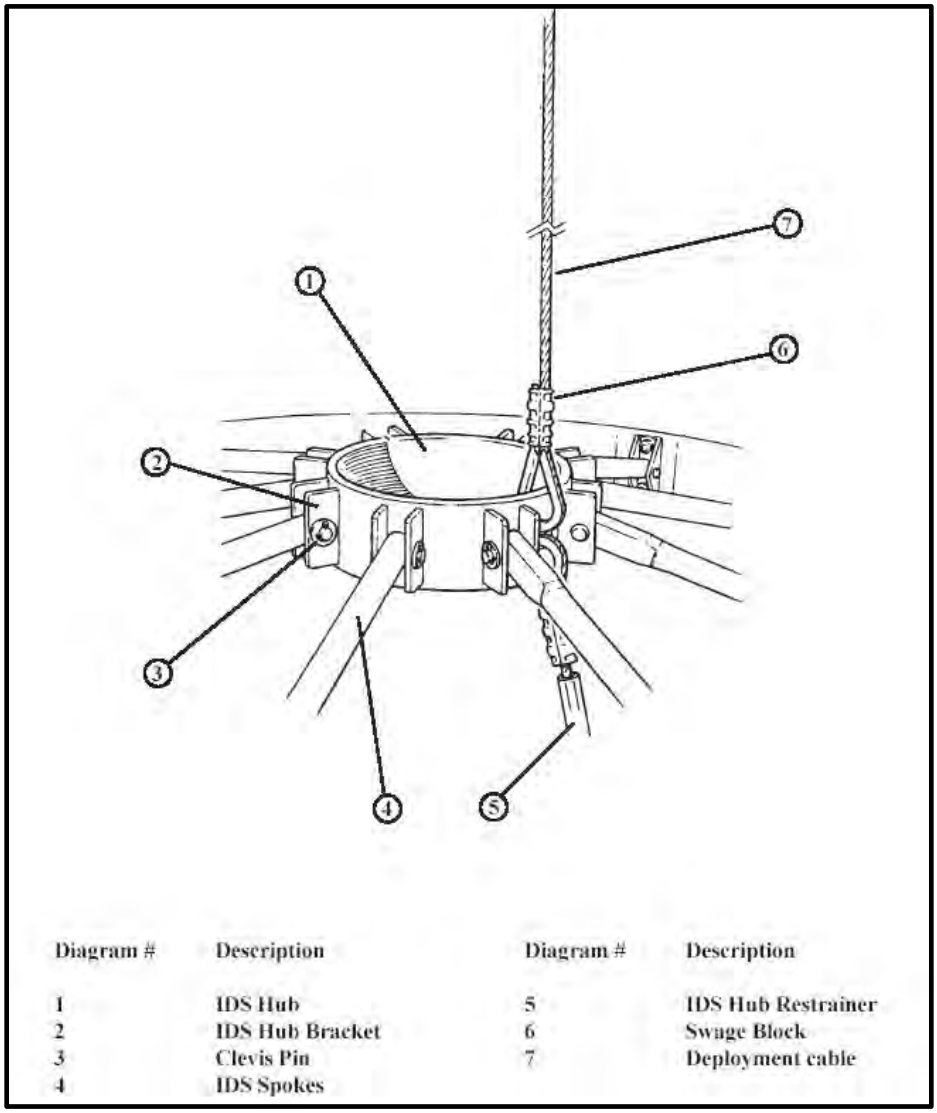


Diagram #	Description	Diagram #	Description
1	IDS Hub	5	IDS Hub Restrainer
2	IDS Hub Bracket	6	Swage Block
3	Clevis Pin	7	Deployment cable
4	IDS Spokes		

Torrentula Valve – Allows partial release of water.

Powerfill I – Bucket with Torrentula Valve.

Powerfill II – Smaller Buckets.

Figure 69: Bambi Bucket Capacity

	Capacity			Gross Weight		Empty Weight	
Model	**Imp. Gal**	**U.S. Gal**	**Liters**	**Lbs.**	**Kg**	**Lbs.**	**Kg**
6072	60	72	270	666	303	66	30
8096	80	96	365	870	395	70	32
9011	90	108	410	971	441	70	32

	Capacity			Gross Weight		Empty Weight	
Model	**Imp. Gal**	**U.S. Gal**	**Liters**	**Lbs.**	**Kg**	**Lbs.**	**Kg**
1012	100	120	455	1072	487	72	33
1214	120	144	545	1273	579	73	33
1518	150	180	680	1574	797	75	34
1821	175	210	795	1876	853	76	35
2024	200	240	910	2135	970	135	61
2732	270	324	1225	2853	1300	154	70
3542	350	420	1590	3667	1667	167	76
4453	440	530	2000	4587	2085	170	85
5566HD	550	660	2500	5805	2638	304	138
5870HD	585	700	2655	6170	2805	330	150
6578HD	650	780	2955	6846	3111	356	162
7590	750	900	3405	7775	3534	375	170
HL5000	1100	1320	5000	11390	5177	390	177
HL7600	1667	2000	7570	17115	7780	465	211
HL9800	2167	2600	9840	22180	10081	530	241

The capacity of *most* Bambi Buckets can be easily determined from the model number. Generally, the first two digits are the capacity in Imperial Gallons, and the second two digits are the capacity in U.S. Gallons, as in the example below for a Model 6072 bucket. If the capacity is greater than 99 gallons, only the first two digits of the capacity are shown, as in the example below for a Model 1214 Bucket. Reference the manufacturer's website and/or operations manual for specifics and more detailed information.

Figure 70: Bambi Bucket Capacity Format Examples

Model # 6072

XX : XX

60 Imperial Gallons : 72 U.S. Gallons

60 : 72

Model # 1214

XX : XX

120 Imperial Gallons : 144 U.S. Gallons

12 : 14

A-3-1 Bambi Bucket Category 1 Defects

The following are considered Category 1 defects that affect safety. If any of these occur, operations should be terminated until repairs are accomplished.

> **Note:** Check the Bambi Bucket Repair Assessment Manual for current guidance.

Shell

- One or more broken top loop knots (M-strap attachment point to the shell).
- Gross punctures through shell that cut or severely damage one or more panel strips.
- Separation of fabric welds longer than three inches.
- Punctures or cuts through shell longer than three inches.
- Two or more broken bottom webbing loops.

Shell Cinch Strap

- Broken or missing cinch strap.
- Field-modified cinch strap (i.e., knots).
- Broken or missing cinch strap retaining brackets.
- Broken or missing cinch strap hook or mating ring.

Bucket Cables

- One or more broken suspension cables or end fittings.
- Broken riser cable.
- Broken deployment cable.

Bucket Valve

- Broken valve restrainer cable.
- Five or more broken purse strings.

IDS Hub

- Cracks or breaks across the major section of the IDS hub.
- Two or more broken or cracked spoke brackets.

- Two or more broken or missing spokes, clevis pins, shell brackets.
- Three or more bent spokes (in excess of 20 degrees equals broken).

M-Straps and Top Chains

- Broken top chains.
- Broken or missing shackles.
- Two or more broken M-straps.

Control Head

- Any visible crack or break on the base plate.
- Visibly bent shackles or suspension line bolts.
- Broken or missing safety wire on shackle pins.
- Missing, broken, or loose valve release mechanism parts.
- Broken or exposed electrical conductors.
- Broken or missing break-away plug.
- Broken or cracked shackle yoke.

General

- 6-inch clearance from tail rotor (**OR 50 feet or greater longline**).
- Excessive gross bucket weight.

Note: When inspecting a bucket, it should be laid out full length to verify that when attached to the belly hook there is at least six inches of clearance from the tail rotor.

Note: During a Pre-Use Inspection, verify that the model number on the control head matches the model number on the bucket. Using a bucket larger than what the control head is rated for could cause the control head to fail.

A-4 Rappel Anchors

Rappel anchors are required to be inspected periodically. Review the anchor's Instructions for Continued Airworthiness (ICA) to determine the type and frequency of inspections. A CD is available from the National Technology and Development Program

(NTDP) with the approved rappel anchor's Supplemental Type Certificates (STC), Flight Manual Supplements, and ICAs.

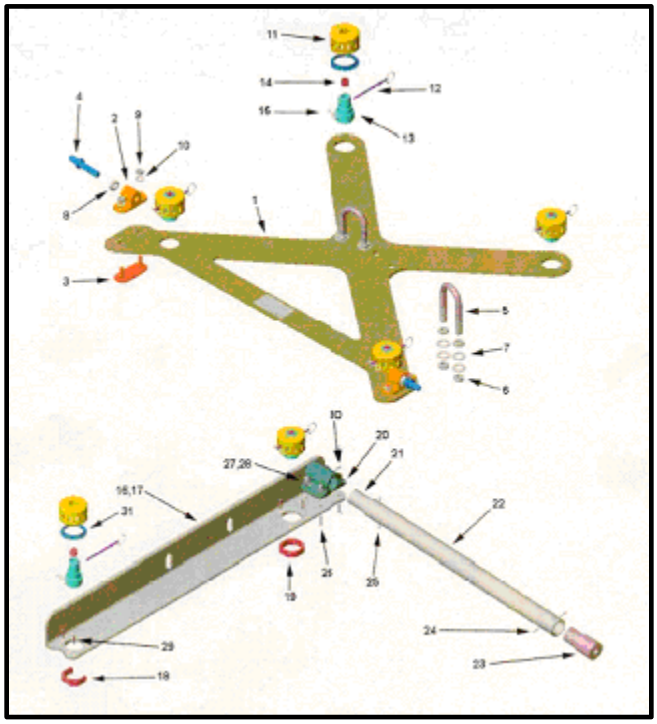
The approved anchor for USFS Bell medium helicopters is the USDA Forest Service External Load Attach Mechanism (ELAM) Rappel Anchor: STC SH261WE. Anchor shall be inspected and documented by the vendor daily in accordance with the ELAM Rotorcraft Maintenance Manual Supplement (RMMS).

STC SH261WE

Bell 205, 212, 214

Figure 71: Bell 214B-1 Installation Conformity

Figure 72: Bell Medium Overhead Rappel Anchor



Bell 205, 212, 214

STC SH261WE	**Overhead Anchor**	**STC Holder**
Bell 212	USDA Forest Service	

100 Hour Inspection Required

Bell 205A++ (with FAA Field Approval)

Requires NAS 1211B or equivalent for Spotter Tether

If aircraft has had a Rescue Hoist installed, it will need longer bolts on ring and stud than 0.625.

A-5 Remote Cargo Hooks

A remote cargo hook is an electrically operated cargo hook attached to the aircraft with a longline and is controlled from the pilot's position. The upper end of the longline is attached to the aircraft cargo hook.

The following is an excerpt from the current Master Specification on which the National Type I & II CWN Helicopter Contract is based:

2. Remote Cargo Hook

a. As a minimum, the cargo hook shall be completely disassembled and inspected with repairs made as required, lubricated, and a full-load operational check in accordance with manufacturer's recommendations.

b. All work shall be done in accordance with manufacturer's maintenance manuals, as applicable.

A-5-1 Onboard Hooks

Figure 73: TALON Carousel Cargo Hook

Figure 74: TALON Long Line Hook

Figure 75: Bell 204, 205, 212 & 412 Cargo Hook Kit - TALON MC Keeperless

Part Number	200-246-00
Description	Bell 204, 205, 212 & 412 Cargo Hook Kit - TALON MC Keeperless
Certification	FAA STC: SR00699SE Transport Canada STC: SH99-217
Price Estimate	*$8,050 (January 2018)*

Figure 76: Items Included with Each 200-246-00 Cargo Hook Kit

The following items are included with each 200-246-00 cargo hook kit:

Part Number	Description	Quantity
528-020-02	TALON MC Keeperless Cargo Hook	1
220-040-00	Bumper Ring	1
510-314-00	Cap Screw	2
290-210-01	Spacer	4
510-104-00	Nut	2
120-083-00	Owner's Manual	1

Figure 77: 200-246-00 Cargo Hook Kit Specifications

Specification	Limit
Design Load	6,000 lb. (2,721 kg)
Design Ultimate Strength	27, 000 lb. (12, 247 kg)
Electrical Release Capacity	15,000 lb. (6,804 kg)
Mechanical Release Capacity	15,000 lb. (6,804 kg)
Force Required for Mechanical Release at 6,000 lb.	18 lb. max. (0.400” travel)
Electrical Requirements	22-28 VDC, 9 amps
Minimum Released	0 lb.
Unit Weight	11.75 LB (5.33 kg)
Mating Electrical Connector	MS3106F16S-5S

Onboard product information is available at https://www.onboardsystems.com/.

A-5-2 Breeze Eastern Hooks

Figure 78: Breeze Eastern Hook FE-7590

Figure 79: Breeze Eastern Hook C-160

Figure 80: Breeze Eastern Hooks

Model	Load Capacity
FE-7590	9,000 lb. (4091 kg)
C-160	20,000 lb. (9071 kg)

Breeze Eastern product information is available at https://www.breeze-eastern.com/.

A-5-3 Technical Bulletins

OAS-37
06/04

UNITED STATES DEPARTMENT OF THE INTERIOR
AVIATION MANAGEMENT

TECH BULLETIN

INSPECTION

July 13, 2004

NUMBER: 04-01

DISTRIBUTION: DOI Aviation Management Approved Inspectors

SUBJECT: Cargo Hook Inspection

During a routine pre-season inspection for an exclusive use helicopter contract, a cracked load beam was detected in a new remote hook assembly. The crack appears to be a manufacturing defect radiating from the pivot hole to the inside face of the load beam.

/S/ Allen P. Rice
Chief, Division of Technical Services

OAS-37
06/04

UNITED STATES DEPARTMENT OF THE INTERIOR
AVIATION MANAGEMENT

TECH BULLETIN

INSPECTION

July 16, 2004

NUMBER: 04-03

DISTRIBUTION: DOI Aviation Management Approved Inspectors

SUBJECT: Inadvertent Cargo Hook Releases and Cable Adjustment

A check of SAFECOM "hook releases" within the last 18 months (January 2003 to June 2004) revealed 90 occurrences involving numerous types of helicopters. Five SAFECOMs received in the last 45 days pertain to inadvertent hook releases with the AS350 helicopter.

A defined search of AS350, SA 316, and SA315 helicopters (all using a similar type suspension swing for the cargo hook) from May 7, 2004, to June 21, 2004, resulted in eight SAFECOMs.

The Eurocopter AS350 parts manual lists three different (aft) manual release cables all approved for the aircraft serial number. The manual doesn't list any use codes for different configurations.

Most AS350s were originally equipped with a Siren cargo hook, which has the release cable connected to the front of the hook and requires use of the shorter cable (p/n AS22-19). When installing a Breeze-Eastern or Onboard Systems hook, which has the release cable connected to the rear of the hook, the longer cable (p/n AS22-18 or 704A31-813-010) is required.

Research of the hook manufacturer's (Onboard Systems) data shows there are three different cargo hooks approved for the AS350 series helicopters. Each hook or hook kit has an owners manual, installation manual, and flight manual (FM) supplement as part of the supplemental type certificate (STC) approval.

The information contained in these manuals is very specific as to the rigging procedures, aft manual release cable part number usage, and inspection/testing for inadvertent hook release. The SA315 system and manuals are very similar.

Onboard Systems does not, at this time, have any approved hooks or provisions for the SA316 helicopter.

(continued)

Conclusions:

1. The owners and installation manuals are not being utilized for configuration and rigging procedures and, in some cases, are not available to mechanics in the field.

2. The flight manual supplements are not being inserted into the FM.

3. The correct length (p/n) manual release cables are not being installed.

4. Rigging dimensions for manual release cable to cargo hook internal connection are not being followed.

5. The most strain (tension) is placed on the manual release cable when the swing/hook assembly is in the most forward right-hand or left-hand position, and the aircraft is just starting a low speed right or left turn with the load on the hook.

6. A hook load of 200+ pounds will move the swing/hook farther forward left or right than can be duplicated by the hand on the ground.

Inspections: <u>All</u> Helicopters and Cargo Hooks

1. Verify that owners manuals, installation manuals, and flight manual supplements are with the aircraft and are appropriate to the equipment installed.

2. Perform normal visual and manual inspections.

3. Remove any bungee cords that interfere with full swing/hook or assembly movement in any direction. Determine which direction the hook assembly needs to travel to produce the greatest tension (pulling) on the manual release cable and electrical connector wires.

4. Move the hook assembly the maximum direction of cable tension. Any tension (pulling) or cable tightening of manual release cable or electrical wires indicates that the rigging is not correct.

5. Move the hook assembly to the extreme opposite direction and check for any binding or fouling of the manual release cable or electrical wires. Verify that the manual cable and electrical connectors are tight, cannot be loosened by hand, and are safetied if applicable.

6. Verify that the manual releases operate smoothly and easily and that they can be returned to the locked position without binding. The manual releases must have free travel (minimum ½"+) from locked to release positions. This check should be done in both extreme positions listed above.

/S/ Allen P. Rice
Chief, Division of Technical Services

A-6 Longlines

A longline is any cable or lead line, 50 feet or longer, attached to the cargo hook of the aircraft for carrying an external load.

The following is an excerpt from the current Master Specification on which the National Type I & II CWN Helicopter Contract is based:

3. Long-lines (as applicable)

    a. Rotation resistant wire rope

        1. Rotation resistant wire rope with swaged fittings rated in accordance with ANSI Standards.

        2. Fabrication and installation methods shall be in accordance with aircraft and ANSI Standards.

A-6-1 Synthetic Longlines

The following is an excerpt from the current Master Specification on which the National Type I & II CWN Helicopter Contract is based:

b. Synthetic Long Line

    A. Helicopter synthetic long-lines shall be constructed from the HMWPE (High Molecular Weight Polyethylene Equipment) or HMPE (High Molecular Polyethylene Equipment) family of rope fibers including brand names such as Spectra™ by Allied Signal or fibers with similar properties.

    B. Working or Rated Load

        1. The working or rated load of a rope is the maximum static load that will be lifted by the rope. Working loads are based on a percentage of the approximate breaking or ultimate strength of the rope when new and unused. The working load shall be appropriate to the lifting capability of the helicopter.

        2. For reference, lifting capability for each category of helicopter is as follows:

            Type I (Heavy) 4500 to 30,000 lbs. or greater

            Type II (Medium) 1600 lbs. to 4500 lbs.

            Type III (Light) 750 lbs. to 1600 lbs.

    C. Factor of Safety

A safety factor of seven shall be used for helicopter synthetic long-lines. Therefore, all ropes shall have an ultimate strength of seven times the rated or working load. For example, if a Type II (Medium) helicopter line will have a working load of 4,500 pounds, the rope shall have strength, when new, of at least 31,500 pounds. Rope diameters will vary depending on strength and type of rope.

D. Knots and Splices

Knots are not permitted in the synthetic long-line. Knots can decrease rope strength by as much as 50%. Splices may be used in the assembly of the long-line, but no mid-line splicing repairs may be done. Re-splicing at the end of the line is permitted only if the rope is in good condition, and the new splice is done per manufacturer's recommended splicing practices. Splices should always follow the manufacturer's recommended splicing practices.

E. Maintenance and Inspections

Manufacturer's recommended maintenance and inspection procedures shall be complied with.

A-7 Common Bell 205 Supplemental Type Certificates (STC)

Figure 81: Common Bell 205 STCs (Not All-Inclusive)

STC Number	Description	Model(s)
SH5132NM	**212 Rotor Blades**	205A-1
SH2394NM	**-17 Engine Installation** -17A Engine -17B Engine	205A-1, 205B
SH5976NM	**-17A/B & 212 Rotor Blades**	205A-1
SH5977NM	**Nine (9) Passenger or Less**	205A-1
SH4305NM	**Particle Separator**	205A, 205A-1, 205B
SH5122NM	**EGT/MGT Gage** EGT -13B/-17A Engines MGT – 17B Engine	204B, 205A-1, 205B
SR01226SE	**Left- or Right-Hand Pilot-in-Command**	205A, 205A-1, 205B
SH2692NM	**Dual Electric Boost Pump**	205A-1

STC Number	Description	Model(s)
SH4775NM	**Manual Fuel Start Switch**	205A-1
SH5797NM	**T53-HC Engine Wash Kit**	205A-1
SH2697NM	**Vertical Reference Door**	205A-1

A-8 Ex-Military Aircraft

A-8-1 Restricted Category – Ex-Military Helicopters

In the last several years, numerous older surplus military aircraft have been made available in the civilian market. At first, these surplus aircraft only went to government agencies under Federal Excess Personal Property (FEPP) Program, mostly state and local governments. Today, more and more of these surplus aircraft are being certificated under Restricted Category Type Certificates (TC). The majority of these surplus aircraft come from the U.S. Army. There has been an increase recently in surplus/restricted aircraft in the field. The CH-46 and CH-47 as well as UH-60 are just now coming online with vendors, along with the popular UH-1H with several new STCs which has become a "work horse" in the Type II category.

There are also OH-58 helicopters mostly operated by state and local governments, a small number having received a Type Certificate under restricted category. The models that have TCs are the OH-58A, OH-58A+, and OH-58C. There are not many of these aircraft in use by civilian vendors, but the OH-58A+ and OH-58C may soon be approved for restricted Type III work. Their civilian counterpart is the Bell 206BIII.

The UH-1H helicopter has become more prevalent in the firefighting industry. With the installation of the T53-L-703 engine and Composite Main Rotor Blades, this aircraft is becoming more competitive for fire use. There are several different models of UH-1s being used under CWN contracts. The civilian counterpart is the Bell 204/205A/205A1.

UH-1B – There are 19 STCs for the UH-1B. The main STC is the installation of the Honeywell (Lycoming) T53-L-13 (1400 shp) series engine. It replaced the smaller T53-L-9 (1100 shp) and T53-L-11 (1100 shp) series engines.

UH-1E, F, L, P, and TH-1L – There are 4 to 8 STCs for these five airframe models. The main STC is the installation of the Honeywell (Lycoming) T53-L-13 series engine. It replaced the General Electric T58-GE-3 engine.

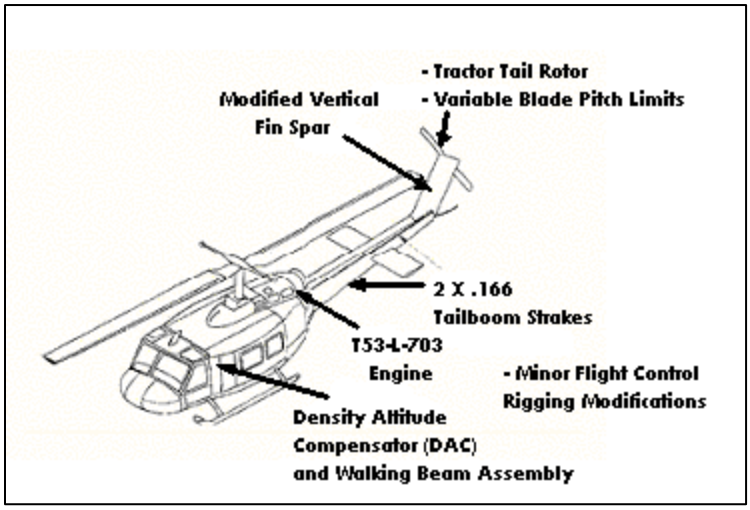
UH-1H – There are 24 STCs for the UH-1H and more are sure to come. The main STC is the installation of Honeywell's (Lycoming) T53-L-703 (1800 shp) engine. It is being used to replace the T53-L-13B and has made the UH-1H more competitive in the Type II category. A discussion of the upgrade to the 703 configuration is given below.

The engine upgrades on all the above UH-1 aircraft are to enhance the performance of the airframe. The most noticeable is the installation of the Bell Cobra T53-L-703 into the UH-1H airframe. The power-to-weight ratio has been a big improvement over the T53-L-13B. One result of this modification is operators are having a difficult time meeting the STC requirements. Topping the engine is difficult. An explanation of topping can be found in Appendix A-8-2, Engine Health Monitoring. Most of the time, the operator has to fly higher than the stated chart values in order to top the helicopter. The topping check is very important for establishing the power checks and performance trends. The STC requires using military charts and manuals. These charts and manuals do not take into account this type of airframe to engine combination.

Besides the usual ADs that the FAA issues on aircraft, the military releases its own form of airworthiness directive. Only the Army directives will be mentioned here, but other military service directives may apply also. Depending on how the aircraft was certificated, compliance may be required with FAA Airworthiness Directives, the Military Safety of Flights message (SOF), and Aviation Safety Action Message (ASAM). The difference between the SOF and ASAM is the time requirement for compliance. An SOF immediately grounds the aircraft until the discrepancy is corrected. An ASAM normally requires a discrepancy to be corrected within a certain time frame. The website for the Army's Aviation Safety Messages can be found in AIG, Chapter 4.

Bell UH-1H with T53-L-703 Upgrade. The following is a discussion of one of the upgrade packages available for the UH-1.

Figure 82: Bell UH-1H with T53-L-703 Upgrade



The UH-IH upgrade features:

1. Complete engine overhaul and fully modernized upgrade to the enhanced Honeywell T53-L-703 configuration. The upgrade from the T53-L-13B engine

alone provides approximately 30% more power at high/hot conditions along with greatly reduced operating and support costs.

2. Low cost airframe modifications to enhance directional control power by over 40% at high/hot conditions, necessary to match the more powerful T53-L-703.

Upgrade Features and Benefits. The upgrade provides significantly greater useful load, improved directional control, and provides 1500 to 2500 pounds more payload from 3000 to 10,000 feet altitude on an ISA + 30°C day. This is accomplished by a combination of the following engine and airframe modifications.

The existing T53-L-13B turbine engine is modified by the installation of a kit supplied by Honeywell that increases engine performance by 400 shaft horsepower while enhancing component life/durability. Installation of this kit along with complete engine overhaul re-identifies the engine as a T53-L-703. Only minor engine-specific changes are required such as basic instrument markings, start fuel switch, and electric engine oil cooler blower for increased cooling efficiency.

The improved design of the T53-L-703 lowers the operating cost via extended Time Between Overhaul (TBO) to 5000 hours and by use of Original Equipment Manufacturer (OEM) parts during the overhaul and upgrade process. The overhaul and upgrade kit, results in a 30% increase in shaft horsepower of the T53-L-703 compared to the current T53-L-13B model for a range of operating altitudes.

To fully and safely utilize this increased power and supply FAA-required tail rotor controllability, the upgrade incorporates a directional control power improvement system. This dramatically extends the UH-IH high/hot takeoff and landing operations when combined with the higher engine power of the T53-L-703. These enhancements consist of the following four approaches:

1. Installation of strakes on the tail boom.

2. Conversion to a tractor tail rotor configuration.

3. Control of increased tail rotor blade pitch limit by an electro-mechanical Density Altitude Compensator (DAC).

Brief highlights of these enhancements are identified in the figure above and are discussed below:

Tail boom Strakes. NASA data and subsequent BLR FAA STC testing show that incorporation of tail boom strakes will decrease the requirement for tail rotor anti-torque by about 10% in those flight regimes where tail rotor anti-torque is critical, such as right sideward flight or hover flight with winds from the right. The tail boom strake acts as a spoiler of downwash flow over the left side (U.S. main rotor rotation) of the

tail boom, reducing the pedal input required for hover flight, aiding the tail rotor in critical right sideward flight.

Conversion to Tractor Tail Rotor This modification requires significant changes to the tail boom configuration, utilizing the existing tail rotor gearbox. The modification provides approximately 20% increase in tail rotor control power, while requiring no additional drive train power.

A-8-2 Engine Health Monitoring (Bell UH-1 Helicopter)

Health Indicator Test (HIT) – UH-1 Helicopter. The HIT is the method by which the pilot, in day to day flying, monitors the aircraft engine condition. This check is performed prior to the first flight of the day. It is also known as a Performance Check. The HIT check data is based on information established from the aircraft topping check and TEAC check. The pilot uses N1, OAT, and EGT/TGT for this check.

Topping Check – Bell UH-1 Helicopter. The topping check is performed to determine maximum engine power output (torque) when maximum fuel flow is demanded from the fuel control. The pilot will climb the aircraft to the highest obtainable altitude and confirm that the maximum torque is available without exceeding any engine limits. The engine must provide at least maximum torque per the aircraft charts without N2 bleed or exceeding limitations. The pilot is looking at N1, torque, EGT/TGT, OAT, and PA during this check.

Turbine Engine Analysis Check (TEAC) – Bell UH-1 Helicopter. The purpose of the TEAC check is to systematically check and verify engine/aircraft indicating systems and overall engine performance. The TEAC and topping check together establish a performance baseline which can be used to check engine performance.

Power Checks – Power checks are used to see how much torque the aircraft engine will produce without exceeding engine limitations. Each civilian and military aircraft manufacturer has its own way of performing and recording these checks. Refer to the Aircraft Flight Manual and Aircraft Maintenance Manual for power check parameters.

A-9 Helicopter Specifications

The figure below is only an initial reference source for some helicopter specifications. Always check performance data by make, model, series designations, engine installed, and any Flight Manual Supplements that might enhance performance.

Figure 83: Helicopter Specifications

Jet A = 7.0 lbs. /gal

AVGAS = 6.0 lbs. /gal

Model	Engine	Max Internal	Max External	Fuel Flow
UH-1H	T53-L-13	9500	9500	89
UH-1N	PWC T400	10000	10000	89
204 (UH-1)	T5309/T5311A	8500	8500	88
205A	T5311A	8500	8500	89
205A-1	T5313A/B	9500	10500	89
205B	T5317A	10500	11200	89
205+ (Eng.)	T5317A	9500	10500	89
205++ (Eng. & Blades) STC SH5977NM	T5317A/B	10200	10500	89
206B3	250-C20J/R	3200	3350	27
206L	250-C20B/J	4000	4000	32
206L1	250-C28B	4050	4250	32
206L1	250-C30P	4150	4250	32
206L3	250-C30P	4150	4250	38
206L4	250-C30P	4450	4450	38
212	PT6T-3/3B	11200	11200	100
214ST	GE T700/2C	17500	17500	133
407	250-C47B	5000 / 5250	6000	45
412	PT6T-3	11900	11900	110
AS350B	Arriel 1B	4300	4988	45
AS50BA	Arriel 1B	4630	4988	45
AS350B1	Arriel 1D	4850	5402	46
AS350B2	Arriel 1D1	4961	5512	48
AS350B3	Arriel 2B	4961	6172	50
AS355	250-C20F	5070		
SA315B Lama	Artouste III B	4300	5070	58
SA316B Allouette	Artouste III	4850		58
SA316C Allouette	Artouste III D	4960	4960	58
SA319B Allouette	Astazou XIV B	4960	4960	55

Model	Engine	Max Internal	Max External	Fuel Flow
SA330J Puma	Turmo IV C	16300		179
Hughes 369	250-C18/C20/C30	3000	3550	
Kaman K-1200	T5317A	6500	12000	85
S-61L	GE CT58-140	19000	22000	170
S-61N	GE CT58-140	19000	22000	170
S64E / CH-54A	JFTD 12A-4A		42000	525
S-64F / CH-54B	JFTD 12A-5A		42000 / 47000	525
BV107 (CH-46) (Sea Knight)	GE CT58-110	17900 (Category A)	22000	180
BV107 (CH-46) (Sea Knight)	GE CT58-110	19000 (Category B)	22000	180
BV234 (CH-47) (Chinook)	Lyc AL5512	48500	51000	405

A-10 Helicopter Designations

Bell 205++ (Plus Plus)

There are several variants of the Bell 205 encountered in firefighting. Terms used are 205, 205+ (plus), and 205++ (plus-plus). The Bell 205 variant is based on the aircraft's STC(s). The following is a short synopsis of what each STC consists of, and how to determine what designation an aircraft would have. For the purposes of this discussion, a 205+++ (plus-plus-plus) is added to emphasize a performance issue related to aircraft with and without the 9 or Less Passenger STC **SH5977NM**.

Caution: There is no such thing as a 205+++. It is only discussed in this manner so that inspectors will understand that a performance issue exists for these aircraft regarding STC SH5977NM.

Figure 84: Bell 205+, 205++, 205+++

STC SH5132NM 212 Rotor Blades

STC SH2394NM T5317A or T5317B Engine

STC SH5976NM Rotor System (**SH5132NM**) & T5317A or T5317B (**SH2394NM**)

STC SH5977NM 9 or Less Passenger

205+	205++	205+++
SH2394NM	**SH2394NM**	**SH2394NM**
	SH5132NM	**SH5132NM**
	OR SH5976NM	**OR SH5976NM**
		AND SH5977NM

An aircraft modified with the 212 Rotor System and the -17 engine is identified as a Bell 205++. However, **without** also having STC **SH5977NM** for 9 or Less Passengers, the aircraft will suffer from a substantial performance penalty, compared to one **with** the 9 or Less STC. Using the Takeoff and Landing Limitations Charts in the Flight Manual Supplement for a Bell 205++, an aircraft without the additional 9 or Less STC, will experience a decrease of approximately 1000 pounds in its takeoff and landing gross weight, compared to an aircraft with the 9 or Less STC.

Bell 212 HP (High Performance)

Although there are two versions of the Bell 212HP, the Forest Service considers only one to be a true B212HP. Only aircraft configured in accordance with Bell Technical Bulletin 212-91-138, Revision C, with **both** Flight Manual Supplements 29 and 35 are true high-performance Bell 212s. Aircraft without the Tail Rotor Kit **(SI 212-68)** are not eligible for the increased Weight, Altitude and Temperature **(WAT)** provided in Flight Manual Supplement 35. A short description of this configuration is provided below.

Transmission & Mast Assembly	212-540-002-101
Transmission Assembly	212-540-002-103
Mast Assembly	212-540-002-105, 204-040-336-113, or 212-540-002-111
Intermediate Gearbox	212-540-002-105 or 212-040-003-023
Tail Rotor Gearbox	212-510-001-107 or 212-040-004-009

The Main Rotor head requires installation of improved stainless-steel yoke.

(P/N 212-011-102-109).

The pylon structure requires a minor modification.

The **Torque Indicators** redline is increased from 100% to 104.3%.

An **Engine Beep Trim System** is added.

Flight Manual Supplement BHT-212-FMS-29 increases the 5-minute takeoff horsepower rating.

Flight Manual Supplement BHT-212-FMS-35 provides an increased Weight, Altitude and Temperature (WAT) Chart, when **both Tail Rotor Hub/Blade Assembly Kit and Increased Horsepower Kit** are installed.

A-11 ICS Type Specifications for Helicopters

Figure 85: ICS Type Specifications for Helicopters

Source: IHOG, February 2013, Chart 6-1.

Type	1	2	3
Useful Load @ 59° F. @ Sea Level	5000	2500	1200
Passenger Seats	15 or more	9-14	4-8
Retardant or Water Carrying Capability (gallons)	700	300	100
Maximum Gross Takeoff/Landing Weight (lbs.)	12,501+	6,000-12,500	Up to 6000

A-12 Interagency Fire Helicopter Standards

In order to approve a helicopter for interagency use, it must meet the interagency standard. A current copy of the Interagency Fire Helicopter Standards can be found on the DOI website, OAS Memorandum of Understanding Index, USDA, under USFS: https://www.doi.gov/aviation/library/mou.

Notes

Appendix B – Fixed-Wing Aircraft Firefighting Equipment

B-1 Introduction

Inspectors often encounter equipment that is used exclusively for firefighting. Depending on the inspector's background, some of it may be familiar. This appendix provides general information on some of the more common fixed-wing aircraft and equipment used in firefighting.

Note: Information shown in this appendix is for reference only.

B-2 Smokejumper Equipment

Anchor Cables (Primary and Secondary). Smokejumpers attach their parachute static lines to the primary cable prior to jumping, which will automatically deploy their parachutes. The secondary cable is used by spotters as a safety device.

Note: Bureau of Land Management (BLM) smokejumpers use square steerable parachutes which are deployed manually by the jumper after they exit the aircraft. Forest Service smokejumpers are in the process of transitioning from circular parachutes (called round parachutes) to square parachutes. Round parachutes are automatically deployed after the jumper exits the aircraft. This is mentioned here because at times "mixed" loads of jumpers are sometimes deployed from the same aircraft.

Simula Seats. Some contract smokejumper aircraft have Simula seats installed. See the Simula seat ICA and installation requirements available from the AWB.

USFS Smokejumper STC for the SD3-60. The SD3-60 is used for smokejumper missions and has an STC available from the AWB that incorporates all the equipment installed in the aircraft to meet the smokejumper mission.

United States Department of Agriculture
Forest Service

Aviation Technical Alert

Number 2004-01
Date: July 13, 2004
Distribution: Aviation Operations
Subject: Static Line and Anchor Installation

There have been two recent incidents of the vertical static line cable stanchions in two different Sherpas being either installed incorrectly or a tension screw being significantly loose so as not to be properly secured. In one instance the stanchion assembly became detached from the floor track during a cargo drop but was kept from being pulled out the door by the vertical rod above the assembly, which is non-structural in nature.

In 2002 there were some problems with mounting bolts backing out of the horizontal overhead static line cable installed in a contract DC-3TP. When investigating this occurrence, discrepancies in attachment bolts and installations were found between all of the DC3-TPs. It was even noted that one of the overhead cables was installed backward in the contract aircraft.

Vertical static line cable installations are the same or very similar to the C-23A in the Twin Otters, Dornier and Casa. In the case of the stanchion that became detached from the floor, had the weight of a smokejumper rather than a cargo bundle been applied to the rod that kept the stanchion from leaving the aircraft, a total malfunction could have been the result. Please install these accessories carefully, and inspect daily.

Recommendation: When accessories that are as essential as the static line cable anchors are removed and re-installed, they must be in conformance with the STC or MTDC drawings, and installed by a certified mechanic. After removal or installation, an appropriate logbook entry shall be made.

Additionally, it is imperative that all static line cables be thoroughly looked at during every pre-flight inspection for security and proper installation.

Contact: Pat Norbury, NAOO (208) 387-5646 or Asher Williams, NALO (208) 387-5617

/s/ Ron Hanks
National Aviation Safety and Training Manager
U.S. Forest Service

B-3 Large Airtankers

The following is a general list of Large Airtankers. It is not intended to be all inclusive. Please contact the WO for a current list.

Figure 86: Airtanker Identification

Tanker No.	Owner/Operator	A/C Model	"N" Number
02	Neptune, Inc.	BAE-146	N474NA
03	Neptune, Inc.	BAE-146	N192DD
10	Neptune, Inc.	BAE-146	N472NA
12	Neptune, Inc.	BAE-146	N193DD
40	Neptune, Inc.	BAE-146	N146FF
41	Neptune, Inc.	BAE-146	N471NA
101	Aero Air	MD-87	N291EA
103	Aero Air	MD-87	N293EA
105	Aero Air	MD-87	M295EA
116	USFS	HC130H	N/A
131	Coulson	C-130Q	N130FF
132	Coulson	L-382G	N405LC
133	Coulson	L-382G	N405LC
160	Aero Flite	RJ85	N839AC
161	Aero Flite	RJ85	N354AC
162	Aero Flite	RJ85	N355AC
163	Aero Flite	RJ85	N366AC
164	Aero Flite	RJ85	N374AC
910	10 Tanker STC, LLC	DC-10-30	N612AX
911	10 Tanker STC, LLC	DC-10-30	N17085
912	10 Tanker STC, LLC	DC-10-30	N522AX
944	Global Supertanker	747-400	N744ST

B-3-2 C-130 Hercules Modular Airborne Firefighting System (MAFFS II)

The MAFFS II replaced the original MAFFS firefighting system that the Air National Guard had used in its C-130s for more than thirty years. The MAFFS II development was a team effort of the Forest Service, the USAF, Air National Guard, Aero Union, and Lockheed with respect to fighting wildland fires from the air.

The MAFFS II is capable of delivering up to 4000 gallons of retardant or water/foam using a variety of drop profiles required to attack various fire conditions. The system is fully capable of delivering up to Coverage Level 8, which is the maximum level required by the Forest Service and represents the application of eight gallons of firefighting fluid per one hundred square feet of surface. This coverage level is double that of the older MAFFS unit. Furthermore, the MAFFS II has 1000 gallons more capacity than the MAFFS.

Just like the older system it replaces, the MAFFS II requires ground support compressors for recharge, but also employs a self-contained compressor system that is integral to the design. This system permits in-flight recharging to and from a drop.

A significant problem with other airborne firefighting systems is that they often "painted" the external tail sections of the aircraft in which they were installed with firefighting fluid. This fluid can be somewhat corrosive to aircraft metal. Operators of such systems would incur the considerable expense of cleaning this fluid off their airtankers.

To avoid this problem and to save the Air National Guard the associated cost of having to clean retardant off its C-130s, Aero Union designed the MAFFS II to use an innovative scheme for expelling firefighting agent out the C-130's sealed paratroop door on the left side of the aircraft. This design ensures that no contamination of the aircraft's surfaces occurs during a drop.

An added advantage of this design is that now an MAFFS II-equipped C-130 can fly fully pressurized to and from the fire and remain pressurized during the actual drop. Doing so affords the MAFFS II operator major advantages over older systems in both crew safety and aircraft operating efficiency.

B-4 Single-Engine Airtankers (SEATs)

Restricted Category Agricultural aircraft certificated under the Civil Aeronautics Regulations (CARs) may be operated above the Maximum Gross Weight limitations listed in their Type Certificate.

Note: In the Civil Aeronautics Manual (CAM) 8, there are provisions for increasing the Maximum Gross Weight to whatever weight the aircraft can be demonstrated to be safely operated. A logbook entry must be made reflecting the special purpose load with which the aircraft is capable of operating. The maximum capacities (weights) must be placarded adjacent to the filler port covers.

For further information on this subject review CAM 8, paragraphs 8.10-3 and 8.10-4.

B-4-1 Air Tractor AT-802

The AT-802 series is the world's largest (take-off weight) single-engine aircraft, and its popularity reflects the industry's trend to larger high-production turbine equipment. Whether it is used for fertilizing forests, spraying huge cotton fields, or spraying dispersant on oil spills, this plane has the productivity and performance to get big jobs done efficiently.

Figure 87: Air Tractor AT-802 Specifications

Specification	Limit
Hopper capacity	800 U.S. gallons
Engine type	PT6A-65AG (-67AG opt.)
Engine horsepower and RPM	1295 @ 1700
Take-off weight	16000 lbs.
Landing weight	16000 lbs.
Empty weight w/ spray equipment installed	6320 lbs.
Useful Load	9680 lbs.
Fuel capacity	254 U.S. gallons (308 or 380 gal. opt.)
Wing span	58 ft.

Notes

Appendix C – Avionics Special Equipment

C-1 Introduction

This appendix will provide some general information on some of the more common pieces of avionics equipment used in firefighting aircraft. All drawings can be found at: https://www.nifc.gov/NIICD/documents.html.

Note: Information shown in this section is **for reference only**.

C-2 3-Pin Auxiliary Power

A 3-pin auxiliary plug is often required on aircraft the Forest Service uses in special missions. It supplies aircraft power for portable equipment such as Air Attack radio kits, infrared equipment, and Plastic Sphere Dispensers (PSD). See Figure 81 for a current pin out of the 3-pin accessory power source connector.

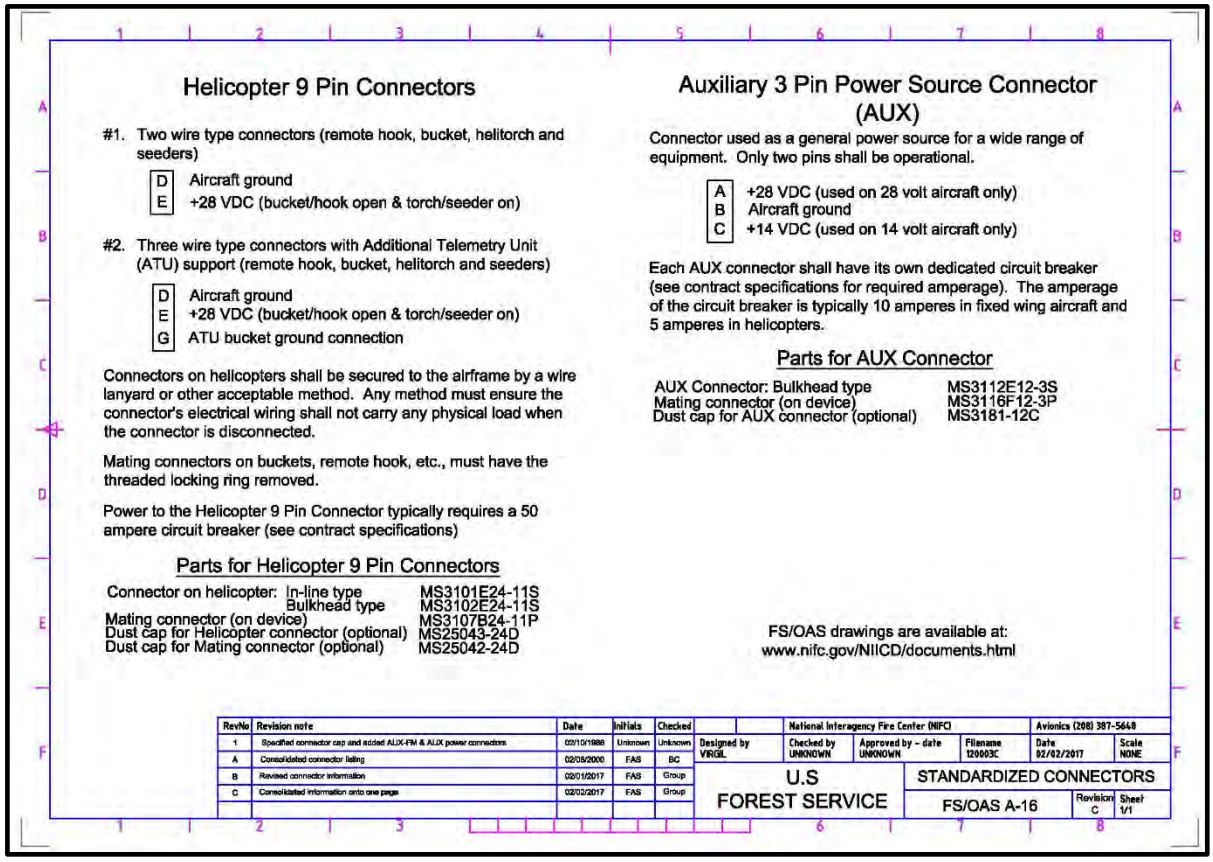
A test plug or multimeter is required to test auxiliary power connectors. The MS numbers are listed in Figure 81, and the schematics can be found in Appendix D-2, Figure 95, or on the avionics website above.

C-3 Helicopter 9-Pin Connector

The 9-pin connector is used to power water buckets, some torches, and remote cargo hooks. These connectors are normally required only on Type II & III helicopters. Figure 88 shows the standard requirement.

The MS numbers for the 9-pin test plug are listed in Figure 88; the schematics can also be found in Appendix D-2, Figure 90, or on the avionics website above.

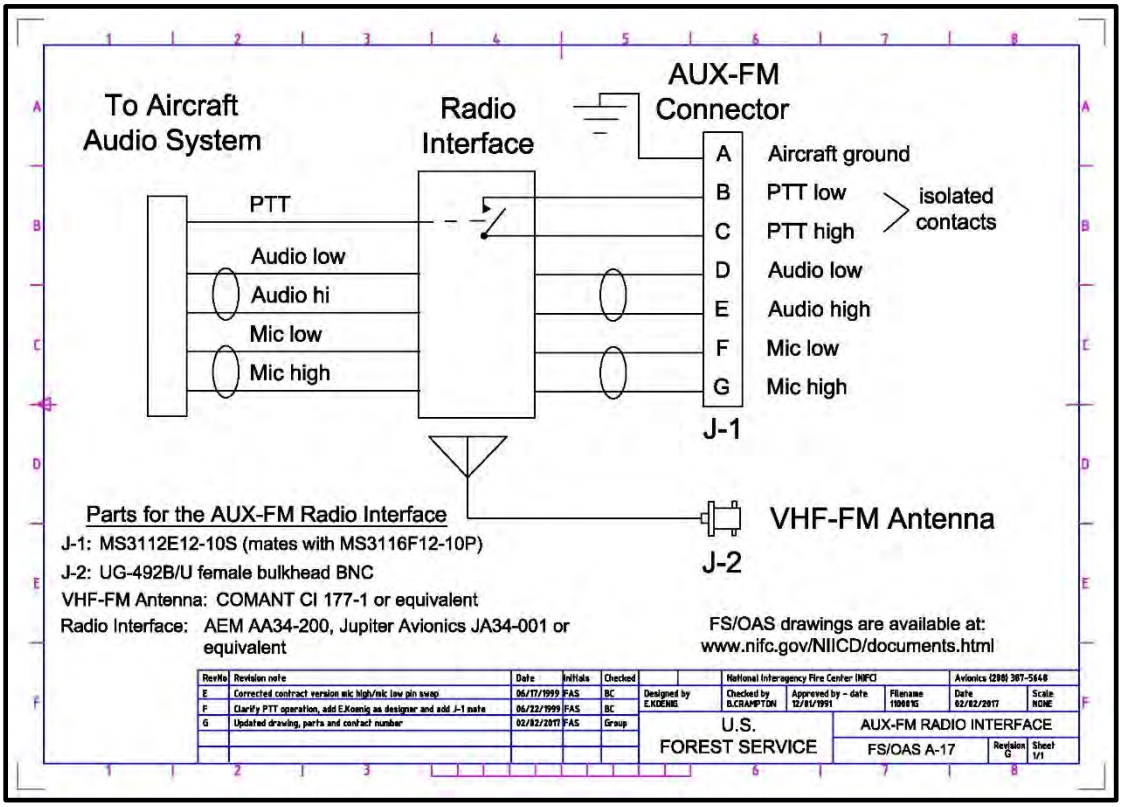
Figure 88: Standardized Connectors, FS/OAS A-16, Revision C



C-4 AUX-FM Provisions

AUX-FM provisions allow the operation of a portable FM radio through an aircraft audio system. It consists of an FM antenna and a 10-pin connector which is interfaced with the aircraft audio control system.

Figure 89: AUX-FM Radio Interface, FS/OAS A-17, Revision G



C-5 USB Tester

A USB tester is recommended to test 5 VDC output and 2 amps provided from an aircraft USB port. Example below:

Figure 90: Example of a USB Tester

C-6 Supplemental Radio Kits

Supplemental Radio kits are used to provide enhanced communications features to a fixed-wing aircraft when needed. Helicopters do not use Supplemental Radio kits. Supplemental Radio kits can be in any variety of configurations depending on the intended task.

Simple kits would generally be used for reconnaissance missions so pilots can flight follow with the local dispatch office. These kits could consist of a handheld radio with earphone to a locally manufactured kit. Other locally manufactured kits may include an Aeronautical VHF-FM. The aircraft provides power to these kits. Only those kits with the below capabilities can be substituted for an Air Attack kit.

Complex kits are used for Air Attack missions. National minimum specifications for Air Attack kits are on the avionics web site. Minimally, these kits are required to have:

1. One (minimum) or two Aeronautical VHF-FM radios.
2. One AUX-FM radio interface connector.
3. Separate audio control systems for the pilot and ATGS.
4. A remote set of audio/mic jacks (JJ-034/JJ-033) with PTT capability and a volume adjustment for an ATGS instructor at the rear of the kit.
5. An ICS system.
6. Ability to operate on both +12 and +24 VDC, although not simultaneously.
7. A power cord mating to the aircraft's accessory power source.
8. Audio (PJ-055) & mic (PJ-068) plugs to interface the kit with the aircraft's audio system.
9. Bulkhead mounted female BNC connectors for the kit's FM radio. This is for connection to the aircraft's FM antenna.
10. A means to secure the kit while in flight.

Figure 91: Supplemental Radio Kit

C-7 Acceptable Radios

The following are pictures of some of the current acceptable VHF-FM radios.

For a current list of acceptable VHF-FM radios visit: https://www.nifc.gov/NIICD/documents.html.

Figure 92: NPX136D (P25 Digital) Radio

Figure 93: TDFM-136 Series (P25 Digital) Radio

Series includes: TDFM-136, TDFM-136/NV, TDFM-136A, TDFM-136A/NV, TDFM-136B and TDFM-136B/NV.

Figure 94: TDFM-9000 Series (P25 Digital) Radio

Series includes: TDFM 9000, TDFM 9100, TDFM 9200, and TDFM 9300.

Notes

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Appendix D – Avionics Contract Requirements

D-1 Contract Language

Always contact the AWB for access to the most current avionics contract language.

D-1-1 Avionics Requirements

Required avionics systems and contractor offered avionics/communication equipment shall meet the performance specifications as specified in FS/AMD A-24 at: https://www.nifc.gov/NIICD/documents.html.

D-1-2 Avionics Installation and Maintenance Standards

A. All avionics systems used in or on the aircraft for this contract and their installation and maintenance shall comply with all manufacturers' specifications and applicable Federal Aviation Regulations contained within 14 CFR.

B. Strict adherence to the recommendations in FAA AC 43.13-1B Chapter 11, Aircraft Electrical Systems, and Chapter 12, Aircraft Avionics Systems, as well as AC 43.13-2A Chapter 1, Structural Data, Chapter 2, Radio Installation, and Chapter 3, Antenna Installation, is required.

C. Antennas shall be polarized as required by the avionics system and have a VSWR less than 2.5 to 1.

D. All avionics systems requiring an antenna shall be installed with a properly matched aircraft-certified, broadband antenna unless otherwise specified.

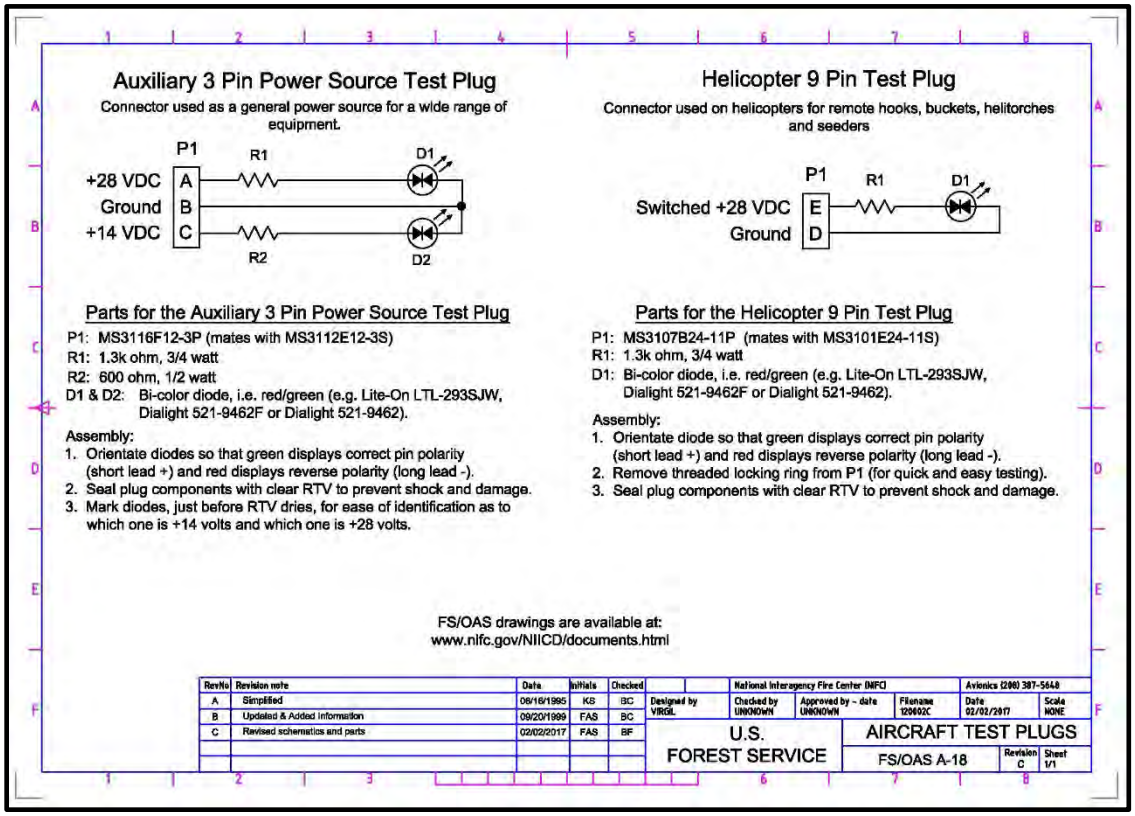
E. Labeling and marking of all avionics controls and equipment shall be clear, understandable, legible, and permanent. Electronic label maker marking is acceptable.

F. Avionics equipment mounting location and installation shall not interfere with crew or passenger safety, space, and comfort. Avionics equipment will not be mounted under seats designed for deformation during energy attenuation. In all instances, the designated areas for collapse shall be protected.

D-2 Avionics Test Plugs

Avionics inspectors can use a test plug to determine proper wiring of aircraft connectors during inspections. See the figure below or visit: https://www.nifc.gov/NIICD/documents.html for the current drawing.

Figure 95: Aircraft Test Plugs, FS/OAS A-18, Revision C



D-3 Terrain Awareness and Warning System (TAWS)

Terrain Awareness and Warning System (TAWS) is required on some turbine aircraft. The figures below reflect the specific TAWS requirements.

Figure 96: Alert Mode Comparison

GPWS Mode	GPWS	Class A	Class B
Forward Looking Terrain Alert (FLTA)		Yes	Yes
Premature Descent Alter (PDA)		Yes	Yes
Excessive Rate of Descent	1	Yes	Yes
Excessive Closure Rate to Terrain	2	Yes	No
Negative Climb Rate or Altitude Loss After Takeoff	3	Yes	Yes
Flight into Terrain when NOT in Landing Configuration	4	Yes	No
Excessive Downward Deviation from an ILS Glideslope	5	Yes	No
Voice Call-outs	6	Yes	Yes

Class B TAWS incorporates five types of alerting modes, FLTA, PDS and must include GPWS 1, 3 & 6.

Figure 97: Equipment Interface

Equipment	Class A	Class B
2D Terrain Display	Required	Optional
Air Data Computer[1]	Required	Optional
Instrument Landing System (ILS)	Required	N/A
Annunciators	Required	Required
Audio System	Required	Required
GPS (approach certified)	Required	Required
Flap Position, Gear Position	Required	Optional
Weight on Wheels	Optional	Optional

Figure 98: Applicable Aircraft – Fixed-Wing Turbine

14 CFR	Class A	Class B
Part 121	All	Not Allowed
Part 135	10 or more Pax seats	6-9 Pax Seats
Part 91	Not Required	6 or more Pax Seats

[1] Air Data Computer is required for Landmark TAWS8000, but not 8100.

Notes

Appendix E – Air Transportation Association (ATA) Chapters

E-1 Introduction

The Air Transportation Association (ATA) numbering system is a common referencing standard for all commercial aircraft documentation. The standard numbering system was published by the Air Transport Association on June 1, 1956.

The Joint Aircraft System/Component (JASC) Code Table is a modified version of the Air Transport Association of America (ATA), Specification 100 code. It was developed by the FAA's Regulatory Support Division (AFS-600). This code table is constructed by using the new JASC code four-digit format, along with an abbreviated code title.

In 2000 the ATA Technical Information and Communications Committee (TICC) developed a new consolidated specification for the commercial aviation industry: ATA iSpec 2200. It includes an industry-wide approach for aircraft system numbering, as well as formatting and data content standards for documentation output. The main objectives of the new specification are to minimize cost and effort expended by operators and manufacturers, improve information quality and timeliness, and facilitate manufacturers' delivery of data that meet airline operational needs.

A unique aspect of the chapter numbers is their relevance for all aircraft. Thus, a chapter reference number for a Boeing 747 will be the same for other Boeing aircraft, a BAe 125, and Airbus Aircraft. Examples of this include Oxygen (Chapter 35), Electrical Power (Chapter 24), and Doors (Chapter 52).

E-2 Chapter List

Figure 99: Air Transportation Association (ATA) Chapters

Category	No.	Title	Category	No.	Title
Aircraft General	5	Time Limits / Miscellaneous Checks	Standard	51	Standard Practices – Structures
Aircraft General	6	Dimensions and Areas	Standard	52	Doors
Aircraft General	7	Lifting and Shoring	Standard	53	Fuselage
Aircraft General	8	Leveling and Weighing	Standard	54	Nacelles/Pylons
Aircraft General	9	Towing and Taxiing	Standard	55	Stabilizers
Aircraft General	10	Parking and Mooring	Standard	56	Windows
Aircraft General	11	Placards and Markings	Standard	57	Wings

Category	No.	Title	Category	No.	Title
Aircraft General	12	Servicing	Propeller/Rotor	60	Standard Practices – Prop/Rotor
Aircraft General	14	Hardware	Propeller/Rotor	61	Propellers
Airframe Systems	20	Standard Practices – Airframe	Propeller/Rotor	62	Rotor(s)
Airframe Systems	21	Air Conditioning	Propeller/Rotor	63	Rotor Drive(s)
Airframe Systems	22	Auto Flight	Propeller/Rotor	64	Tail Rotor
Airframe Systems	23	Communications	Propeller/Rotor	65	Tail Rotor Drive
Airframe Systems	24	Electrical Power	Propeller/Rotor	66	Folding Blades/Pylon
Airframe Systems	25	Equipment/Furnishings	Propeller/Rotor	67	Rotors Flight Controls
Airframe Systems	26	Fire Protection	Powerplant	70	Standard Practices – Engine
Airframe Systems	27	Flight Controls	Powerplant	71	Powerplant
Airframe Systems	28	Fuel	Powerplant	72	Engine
Airframe Systems	29	Hydraulic Power	Powerplant	73	Engine Fuel and Control
Airframe Systems	30	Ice and Rain Protection	Powerplant	74	Ignition
Airframe Systems	31	Indicating/Recording Systems	Powerplant	75	Air
Airframe Systems	32	Landing Gear	Powerplant	76	Engine Controls
Airframe Systems	33	Lights	Powerplant	77	Engine Indicating
Airframe Systems	34	Navigation	Powerplant	78	Exhaust
Airframe Systems	35	Oxygen	Powerplant	79	Oil
Airframe Systems	36	Pneumatic	Powerplant	80	Starting
Airframe Systems	37	Vacuum	Powerplant	81	Turbines
Airframe Systems	38	Water/Waste	Powerplant	82	Water Injection
Airframe Systems	41	Water Ballast	Powerplant	83	Accessory Gearboxes
Airframe Systems	45	Central Maintenance System	Powerplant	84	Propulsion Augmentation
Airframe Systems	46	Information System	Powerplant	91	Charts
Airframe Systems	49	Airborne Auxiliary Power			

Notes

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Appendix F – Regulatory Information

F-1 Title 14 Code of Federal Regulations

http://rgl.faa.gov/

Subchapter A - Definitions

1 Definitions

3 General Requirements

5 Safety Management Systems

Subchapter B – Procedural Rules

11 General Rulemaking Procedures

13 Investigative and Enforcement Procedures

14 Rules Implementing the Equal Access to Justice Act of 1980

15 Administrative Claims under Federal Tort Claims Act

16 Rules of Practice for Federally-Assisted Airport Enforcement Proceedings

17 Procedures for Pro-tests and Contract Disputes

Subchapter C – Aircraft

21 Certification Procedures for Products and Parts

23 Airworthiness Standards: Normal, Utility, Acrobatic, and Commuter Category Aircraft

25 Airworthiness Standards: Transport Category Aircraft

26 Continued Airworthiness and Safety Improvements for Transport Category Airplanes

27 Airworthiness Standards: Normal Category 29 Airworthiness Standards: Transport Category Rotorcraft

29 Airworthiness standards: Transport category rotorcraft

31 Airworthiness Standards: Manned Free Balloons

33 Airworthiness Standards: Aircraft Engines

34 Fuel Venting and Exhaust Emission Requirements for Turbine Powered Airplanes

35 Airworthiness Standards: Propellers

36 Noise Standards: Aircraft Type and Airworthiness Certifications

39 Airworthiness Directives

43 Maintenance, Preventative Maintenance, Rebuilding and Alteration

45 Identification and Registration Marking

47 Aircraft Registration

49 Recording of Aircraft Titles and Security Documents

50-59 [Reserved]

Subchapter D – Airmen

60 Flight Simulation Training Device Initial and Continuing Qualification and Use

61 Certification: Pilots, Flight Instructors, and Ground Instructors

63 Certification: Flight Crewmembers Other Than Pilots

65 Certification: Airmen Other Than Flight Crewmembers

67 Medical Standards and Certification

Subchapter E – Airspace

71 Designation of Class A, B, C, D and E Airspace Areas; Air Traffic Service Routes; and Reporting Points

73 Special Use Airspace

75 [Reserved]

77 Objects Affecting Navigable Airspace

Subchapter F – Air Traffic and General Operating Rules

91 General Operating and Flight Rules

93 Special Air Traffic Rules and Airport Traffic Patterns

95 IFR Altitudes

97 Standard Instrument Approach Procedures

99 Security Control of Air Traffic

101 Moored Balloons, Kites, Unmanned Rockets and Unmanned Free Balloons

103 Ultralight Vehicles

105 Parachute Operations

107 Small Unmanned Aircraft Systems

Subchapter G – Air Carriers and Operators for Compensation or Hire: Certification and Operations

110 General Requirements

111-116[Reserved]

117 Flight Duty Limitations and Rest Requirements

118 [Reserved]

119 Certification: Air Carriers and Commercial Operators 121 Operating Requirements: Domestic, Flag and Supplemental Operations

125 Certification and Operations: Airplanes Having a Seating Capacity of 20 or More Passengers or a Maximum Payload Capacity of 6,000 Pounds or more; and Rules Governing Persons on Board Such Aircraft

129 Operations: Foreign Air Carriers and Foreign Operators of U.S. - Registered Aircraft Engaged in Common Carriage

133 Rotorcraft External-Load Operations

135 Operating Requirements: Commuter and On-Demand Operations and Rules Governing Persons on Board Such Aircraft

136 National Parks Air Tour Management

137 Agricultural Aircraft Operations

139 Certifications and Operations: Land Airport Serving Certain Air Carriers

Subchapter H – Schools and Other Certificated Agencies

140 [Reserved]

141 Pilot Schools

142 Training Centers

145 Repair Stations

147 Aviation Maintenance Technician Schools

Subchapter I - Airports

150 Airport Noise Compatibility Planning

151 Federal Aid to Airports

152 Airport Aid Program

153 Airport Operations

155 Release of Airport Property from Surplus Property Disposal Restrictions

156 State Block Grant Pilot Program

157 Notice of Construction, Alteration, Activation, and Deactivation of Airports

158 Passenger Facility Charges (PFCs)

161 Notice and Approval of Airport Noise and Access Restrictions

169 Expenditure of Federal Funds for Nonmilitary Airports or Air Navigation Facilities Thereon

Subchapter J – Navigational Facilities

170 Establishment and Discontinuance Criteria for Air Traffic Control Services and Navigational Facilities

171 Non-Federal Navigation Facilities

Subchapter K – Administrative Regulations

183 Representatives of the Administrator

185 Testimony by Employees and Production of Records in Legal Proceedings, and Service of Legal Process and Pleadings

187 Fees

189 Use of Federal Aviation Administration Communications Services

193 Protection of Voluntary Submitted Information

Subchapter N – War Risk Insurance

Aviation Insurance

198 [Reserved]

F-2 Understanding 14 CFR References

It is imperative that an inspector read the 14 CFR references carefully to fully understand and interpret the regulations. An inspector must understand the various parts of the code, such as: Chapter, Subchapter, Part, Subpart, Section, Paragraph, and Subparagraph. 14 CFR Subchapters and Parts are listed above in F-1. Below is a breakdown of Part 21 to be used as an example. Part 21 falls under Subchapter C. Part 21 Sections 1-9 fall under Subpart A while Part 21 Sections 11-55 fall under Subpart B, and so forth.

Figure 100: 14 CFR Part 21 Breakdown Example

Title	Volume	Chapter	Browse Parts	Regulatory Entity
Title 14 Aeronautics and Space	1 2 3	I	1-59 60-109 110-199	Federal Aviation Administration, Department of Transportation

TITLE 14—Aeronautics and Space

CHAPTER I—Federal Aviation Administration, Department of Transportation

SUBCHAPTER C—Aircraft

PART 21—Certification Procedures for Products and Articles

Subpart A—GENERAL

§21.1 Applicability and definitions.

§21.2 Falsification of applications, reports, or records.

§21.3 Reporting of failures, malfunctions, and defects.

§21.4 ETOPS reporting requirements.

§21.5 Airplane or Rotorcraft Flight Manual.

§21.6 Manufacture of new aircraft, aircraft engines, and propellers.

§21.7 Continued airworthiness and safety improvements for transport category airplanes.

§21.8 Approval of articles.

§21.9 Replacement and modification articles.

Subpart B—TYPE CERTIFICATES

§21.11 Applicability.

§21.13 Eligibility.

§21.15 Application for type certificate.

§21.16 Special conditions.

§21.17 Designation of applicable regulations.

§21.19 Changes requiring a new type certificate.

§21.20 Compliance with applicable requirements.

Note: Part 21 Section 11 listed below applies to a SUBPART while Part 21 Section 17 below applies to a SUBCHAPTER. Read carefully. Also, Part 21 Section 17 shows examples of paragraphs and subparagraphs (a)(1)(i).

21.11 Applicability

This **subpart** prescribes—

(a) Procedural requirements for the issue of type certificates for aircraft, aircraft engines, and propellers; and

(b) Rules governing the holders of those certificates.

21.17 Designation of applicable regulations.

(a) Except as provided in §§25.2, 27.2, 29.2, and in parts 26, 34, and 36 of this **subchapter**, an applicant for a type certificate must show that the aircraft, aircraft engine, or propeller concerned meets—

(1) The applicable requirements of this subchapter that are effective on the date of application for that certificate unless—

(i) Otherwise specified by the FAA; or

(ii) Compliance with later effective amendments is elected or required under this section; and

(2) Any special conditions prescribed by the FAA.

F-3 Civil Aviation Regulations (CAR)

The Civilian Aviation Regulations (CARs) were superseded by 14 CFR in 1965; however, inspectors need to be familiar with the CARs because many of the aircraft they will encounter were originally certified prior to 1965. In the following list of CARs, if there is a corresponding 14 CFR Part, it will be listed in bold with an effective date.

http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgCCAB.nsf/MainFrame?OpenFrameSet

1 Certification, Identification and Marking of Aircraft and Related Parts **(effective 1938) (14 CFR 21)**.

2 Aircraft Identification Mark **(effective 1938) (14 CFR 45)**.

3 Aircraft Airworthiness – Normal, Utility, Acrobatic, and Restricted Purposes Categories **(effective 1949) (14 CFR 23)**.

4 Airplane Airworthiness **(effective 1937)**.

4a Airplane Airworthiness **(<12,500) (effective 1947) (14 CFR 23)**.

4b Airplane Airworthiness; Transport Categories **(effective 1953) (14 CFR 25)**.

5 Glider Airworthiness **(effective 1952)**.

6 Rotorcraft Airworthiness; Normal Category **(effective 1946) (14 CFR 27)**.

7 Rotorcraft Airworthiness; Transport Category **(effective 1956) (14 CFR 29)**.

8 Aircraft Airworthiness; Restricted Category **(effective 1950)**.

9 Aircraft Airworthiness; Limited Category **(effective 1946)**.

10 Certification and Approval of Import Aircraft and Related Parts **(effective 1955)**.

13 Aircraft Engine Airworthiness **(effective 1937) (14 CFR 33)**.

14 Aircraft Propeller Airworthiness **(effective 1937) (14 CFR 35)**.

15 Aircraft Equipment Airworthiness **(effective 1937)**.

16 Aircraft Radio Equipment Airworthiness **(effective 1941)**.

17 Aircraft Instrument Airworthiness **(effective 1942)**.

18 Repair and Alteration of Aircraft **(effective 1937) (14 CFR 43)**.

F-4 National Transportation and Safety Board (NTSB)

Title 49, Chapter VIII

Part 830, Notification and Reporting of Aircraft Accidents or Incidents

Part 831, Accident/Incident Investigation Procedures

Aircraft accident means an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or *serious injury*, or in which the aircraft receives *substantial damage*.

Aircraft Incident as an occurrence other than an accident, associated with the operation of an aircraft, which affects or could affect the safety of operations. Operators should review the full list of reportable incidents,

Serious injury means any injury in which any of the following apply:

1. Requires hospitalization for more than 48 hours;
2. Results in a fracture of any bone (except simple fractures of fingers, toes, or nose);
3. Causes severe hemorrhages, nerve, muscle, or tendon damage;
4. Involves any internal organ; or
5. Involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.

Substantial damage means damage or failure which adversely affects the structural strength, performance, or flight characteristics of the aircraft, and which would normally require major repair or replacement of the affected component. Engine failure or damage limited to an engine if only one engine fails or is damaged, bent fairings or cowling, dented skin, small punctured holes in the skin or fabric, ground damage to rotor or propeller blades, and damage to landing gear, wheels, tires, flaps, engine accessories, brakes, or wingtips are not considered "substantial damage" for the purpose of this part.

F-5 Airworthiness Certificates

Figure 101: Standard (§21.175(a) and §21.183)

Airplane Categories	14 CFR Part	Weight	Passenger Seats	Other
Normal	23	12,500 or Less	9 or Less	N/A
Utility	23	12,500 or Less	9 or Less	Limited Acrobatic
Acrobatic	23	12,500 or Less	9 or Less	Unlimited Acrobatic
Commuter	23	19,000 or Less	19 or Less	Multi-Engine Propeller
Transport	25	12,500 or More	N/A	Turbine
Transport	25	19,000 or More	N/A	Propeller
Transport	25	N/A	10 or More	Turbine
Transport	25	19,000 or More	20 or More	Multi-Engine Propeller
Rotorcraft Categories	**14 CFR Part**	**Weight**	**Passenger Seats**	**Other**
Normal	27	6,000 or Less	N/A	**Before 10/18/1999**
Normal	27	7,000 or Less	9 or Less	**After 10/18/1999**
Transport	29	6,000 or More	N/A	**Before 10/18/1999**
Transport	29	7,000 or More	N/A	**After 10/18/1999**

Figure 102: Special §21.175(b)

Categories	Reference
Primary	§21.184
Restricted	§21.185
Limited	§21.189
Light Sport	§21.190
Provisional	§§21.211 – 21.225
Special	§§21.197 – 21.199
Experimental	§§21.191 – 21.195

F-6 Rotorcraft Transport Categories

Figure 103: Rotorcraft Transport Categories

Weight	Passenger Seats	Engine(s)	Category	
			A	B
Over 20,000	10 or More	Must Have 2	**X**	--
Over 20,000	9 or Less	1	--	**X**
Over 20,000	9 or Less	2	**Either**	
20,000 or Less	10 or More	2	**Either**	
20,000 or Less	9 or Less	1	-	**X**
20,000 or Less	9 or Less	2	**Either**	

F-7 FAA Order 8900.1

An FAA Order is a directive that the FAA uses to issue policy, instructions and work information to its own personnel and designees. It spells out how the FAA expects its employees to carry out their responsibilities.

Order 8900.1, Flight Standards Information Management System (FSIMS), is the Order that FAA Aviation Airworthiness Inspectors (ASI) use. It is now only available on line at: http://fsims.faa.gov/RelatedInfoResults.aspx?mode=eCFR.

F-8 Advisory Circulars

http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/MainFrame?OpenFrameSet.

Note: The following is NOT a complete list of available Advisory Circulars.

Figure 104: Advisory Circulars

Circular ID	Advisory Circular Topic
AC 00-33A	Nickel-Cadmium Battery Operational, Maintenance, and Overhaul Practices
AC 00-34A	Aircraft Ground Handling and Servicing
AC 00-41B	FAA Quality Control System Certification Program
AC 00-44II	Status of Federal Aviation Regulations
AC 00-46E	Aviation Safety Reporting Program
AC 00-58B	Voluntary Disclosure Reporting Program
AC 00.1-1A	Government Aircraft Operations
AC 20-24D	Qualification of Fuels
AC 20-29B	Use of Aircraft Fuel Anti-Icing Additives
AC 20-30B	Aircraft Position Light and Anti-collision Light Installations
AC 20-33B	Technical Information Regarding Civil Aeronautics Manuals 1, 3, 4a, 4b, 5, 6, 7, 8, 9, 13, and 14
AC 20-37E	Aircraft Propeller Maintenance
AC 20-41A	Substitute Technical Standard Order (TSO) Aircraft Equipment
AC 20-42D	Hand Fire Extinguishers for Use in Aircraft
AC 20-43C	Aircraft Fuel Control
AC 20-44	Glass Fiber Fabric for Aircraft Covering
AC 20-45	Safetying of Turnbuckles on Civil Aircraft
AC 20-47	Exterior Colored Band around Exits on Transport Airplanes
AC 20-48	Practice Guide for Decontaminating Aircraft

Circular ID	Advisory Circular Topic
AC 20-60	Accessibility to Excess Emergency Exits
AC 20-62E	Eligibility, Quality, and Identification of Aeronautical Replacement Parts
AC 20-65A	U.S. Airworthiness Certificates and Authorizations for Operation of Domestic and Foreign Aircraft
AC 20-69	Conspicuity of Aircraft Instrument Malfunction Indicators
AC 20-71	Dual Locking Devices on Fasteners
AC 20-74	Aircraft Position and Anti-collision Light Measurements
AC 20-76	Maintenance Inspection Notes for Boeing
AC 20-77B	Use of Manufacturers' Maintenance Manuals
AC 20-88A	Guidelines on the Marking of Aircraft
AC 20-94A	Digital Clock Installation in Aircraft
AC 20-97B	Aircraft Tire Maintenance and Operational Practices
AC 20-99	Antiskid and Associated Systems
AC 20-103	Aircraft Engine Crankshaft Failure
AC 20-105B	Reciprocating Engine Power-Loss Accident Prevention and Trend Monitoring
AC 20-106	Aircraft Inspection for the General Aviation Aircraft Owner
AC 20-107B	Composite Aircraft Structure
AC 20-109A	Service Difficulty Program (General Aviation)
AC 20-114	Manufacturers' Service Documents
AC 20-116	Marking Aircraft Fuel Filler Openings with Color Coded Decals
AC 20-119	Fuel Drain Valves
AC 20-122A	Anti-Misfuelling Devices: Their Availability and Use
AC 20-125	Water in Aviation Fuels
AC 20-142	Eligibility and Evaluation of U.S. Military Surplus Flight Safety Aircraft Parts, Engines, and Propellers
AC 20-143	Installation, Inspection, and Maintenance of Controls for General Aviation Reciprocating Aircraft Engines
AC 20-154	Guide for Developing a Receiving Inspection System for Aircraft Parts and Material
AC 21-4B	Special Flight Permits for Operation of Overweight Aircraft
AC 21-9B	Manufacturers Reporting Failures, Malfunctions, or Defects
AC 21-12C	Application for U.S. Airworthiness Certificate, FAA Form 8130-6
AC 21-13	Standard Airworthiness Certification of Surplus Military Aircraft and Aircraft Built from Spare and Surplus Parts
AC 21-16G	RTCA, Inc. Document RTCA/DO-160E, Environmental Conditions and Test Procedures for Airborne Equipment

Circular ID	Advisory Circular Topic
AC 21-23B	Airworthiness Certification of Civil Aircraft, Engine, Propellers, and Related Products Imported to the United States
AC 21-25B	Approval of Modified Seats and Berths
AC 21-29D	Detecting and Reporting Suspected Unapproved Parts
AC 21-34	Shoulder Harness-Safety Belt Installations
AC 21-40A	Guide for Obtaining a Supplemental Type Certificate
AC 21-41A	Replacing MIL-S-8879C with SAE AS8879
AC 21.25-1	Issuance of Type Certificate: Restricted Category Agricultural Airplanes
AC 21.101-1	Establishing the Certification Basis of Changed Aeronautical Products
AC 23-2A	Flammability Tests
AC 23-10	Auxiliary Fuel Systems for Reciprocating and Turbine Powered Part 23 Airplanes
AC 23-13A	Fatigue, Fail-Safe, and Damage Tolerance Evaluation of Metallic Structure for Normal, Utility, Acrobatic, and Commuter Category Airplanes
AC 23-21	Airworthiness Compliance Checklists Used to Substantiate Major Alterations for Small Airplanes
AC 23-22	Guidance for Approved Model List (AML) Supplemental Type Certificated (STC) Approval of Part 23 Airplane Avionics Installations
AC 23-24	Airworthiness Compliance Checklists for Common Part 23 Supplemental Type Certificate (STC) Projects
AC 23.607-1	Self-Locking Nuts on Bolts Subject to Rotation
AC 23.1309-1E	Equipment, Systems, and Installations in Part 23 Airplanes
AC 25-7C	Flight Test Guide for Certification for Transport Category Airplanes
AC 25-8	Auxiliary Fuel Systems Installations
AC 25-16	Electrical Fault and Fire Prevention and Protection
AC 25-19A	Certification Maintenance Requirements
AC 25-21	Certification of Transport Airplane Structure
AC 25-22	Certification of Transport Airplane Mechanical Systems
AC 25.571-1D	Damage Tolerance and Fatigue Evaluation of Structure
AC 25.613-1	Material Strength Properties and Material Design Values
AC 25.775-1	Windows and Windshields
AC 25.783-1A	Fuselage Doors and Hatches
AC 25.853-1	Flammability Requirements for Aircraft Seat Cushions
AC 25.869-1A	Electrical System Fire and Smoke Protection
AC 25.905-1	Minimizing the Hazards from Propeller Blade and Hub Failures
AC 25.939-1	Evaluating Turbine Engine Operating Characteristics

Circular ID	Advisory Circular Topic
AC 25.963-1	Fuel Tank Access Covers
AC 25.1353-1A	Electrical Requirement and Installations
AC 25.1357-1A	Circuit Protective Device Accessibility
AC 25.1529-1A	Instructions for Continued Airworthiness of Structural Repairs on Transport Airplanes
AC 25.1581-1	Airplane Flight Manual
AC 27-1B	[Large AC] Certification of Normal Category Rotorcraft [All changes incorporated]
AC 29-2C	[Large AC] Certification of Transport Category Rotorcraft [All changes incorporated]
AC 33-2C	Aircraft Engine Type Certification Handbook
AC 33-6	Weld Repair of Aluminum Crankcases and Cylinders of Piston Engines
AC 33.63-1	Turbine Engine Vibration
AC 33.65-1	Surge and Stall Characteristics of Aircraft Turbine Engines
AC 33.83A	Turbine Engine Vibration Test
AC 33.90-1A	Initial Maintenance Inspection (IMI), 14 CFR §33.90, Test for Turbine Engines
AC 34-1B	Fuel Venting and Exhaust Emission Requirements for Turbine Engine Powered Airplanes
AC 35.4-1	Propeller Instructions for Continued Airworthiness
AC 39-1A	JIG Fixtures; Replacement of Wing Attach Angles and Doublers on Douglas DC-3 Series Aircraft, Airworthiness Directive 66-18-2
AC 39-7D	Airworthiness Directives
AC 39-8	Continued Airworthiness Assessments of Powerplant and Auxiliary Power Unit Installations of Transport Category Airplanes
AC 43-4A	[Large AC] Corrosion Control for Aircraft
AC 43-9C	Maintenance Records
AC 43-10B	United States - Canadian BASA/MIP Maintenance
AC 43-11	Reciprocating Engine Overhaul Terminology and Standards
AC 43-12A	Preventive Maintenance
AC 43-18	Fabrication of Aircraft parts by Maintenance Personnel
AC 43-204	Visual Inspection for Aircraft
AC 43-205	Guidance for Selecting Chemical Agents and Processes for De-painting and General Cleaning of Aircraft and Aviation Products
AC 43-210A	Standardized Procedures for Requesting Field Approval of Data, Major Alterations, and Repairs
AC 43-211A	Recommended Alternative Inspection Schedule for Socata TBM-700 Aircraft
AC 43.9-1F	Instructions for Completion of FAA Form 337
AC 43.13-1B	[Large AC. This includes Change 1.] Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair

Circular ID	Advisory Circular Topic
AC 43.13-2B	[Large AC] Acceptable Methods, Techniques, and Practices - Aircraft Alterations
AC 45-2E	Identification and Registration Marking
AC 45-3A	Installation, Removal, or Change of Identification Data and Identification Plates on Aircraft
AC 60-6B	Airplane Flight manuals (AFM), Approved Manual Materials, Markings, and Placards Airplanes
AC 65-2D	Airframe and Powerplant Mechanics Certification Guide
AC 65-15A	[Large AC] Airframe and Powerplant Mechanics Airframe Handbook
AC 65-24	Certification of a Repairman (General)
AC 65-31B	Training, Qualification, and Certification of Nondestructive Inspection (NDI) Personnel
AC 90-75	Strobe Light System Inspection
AC 90-95	Unanticipated Right Yaw in Helicopters
AC 91-26	Maintenance and Handling of Air-driven Gyroscopic Instruments
AC 91-32B	Safety in and Around Helicopters
AC 91-59A	Inspection and Care of General Aviation Aircraft Exhaust Systems
AC 91-67	Minimum Equipment Requirements for General Aviation Operations Under 14 CFR Part 91
AC 120-16G	Air Carrier Maintenance Programs
AC 120-17A	Maintenance Control by Reliability Methods
AC 120-27E	Aircraft Weight and Balance Control
AC 120-49	Certification of Air Carriers
AC 120-72	Maintenance Resource Management Training
AC 120-73	Damage Tolerance Assessment of Repairs to Pressurized Fuselages
AC 120-77	Maintenance and Alteration Data
AC 120-79A	Developing and Implementing a Continuing Analysis and Surveillance System
AC 120-84	Aging Airplane Inspections and Records Reviews
AC 120-85A	Air Cargo Operations
AC 133-1A	Rotorcraft External-Load Operations in Accordance with Federal Aviation Regulations Part 133
AC 135-4A	Aviation Security: Air Taxi Commercial Operators (ATCO)
AC 135-7B	14 CFR 135: Additional Maintenance Requirements for Aircraft Type Certificated for Nine or Less Passenger Seats
AC 135-10B	Approved Aircraft Inspection Program
AC 137-1A	Agricultural Aircraft Operations
AC 145-4A	Inspection, Retread, Repair, and Alterations of Aircraft Tires
AC 145-5	Repair Station Internal Evaluation Programs
AC 145-9	Guide for Developing and Evaluating Repair Station and Quality Control Manuals

Circular ID	Advisory Circular Topic
AC 145-10	Repair Station Training Program

F-9 Technical Standard Orders

http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgTSO.nsf/MainFrame?OpenFrameset

Note: Check the website above for TSOs currently available for new approvals/production by number, revision, title, and date.

Figure 105: Technical Standard Orders

TSO No.	Title	Date
TSO-C109	Airborne Navigation Data Storage System	12/09/1985
TSO-C168	Aviation Visual Distress Signals	03/25/2004
	Communication Equipment	
TSO-C31d	High Frequency (HF) Radio Communications Transmitting Equipment Operating Within the Radio Frequency Range 1.5-30 Megahertz	04/30/1984
TSO-C32d	High Frequency (HF) Radio Communications Receiving Equipment Operating Within the Radio Frequency Range 1.5-30 Megahertz	04/30/1984
TSO-C37d	VHF Radio Communications Transmitting Equipment Operating Within the Radio Frequency Range 117.975 to 137.000 Megahertz	09/23/1992
TSO-C38d	VHF Radio Communications Receiving Equipment Operating Within the Radio Frequency Range 117.975 to 137.000 Megahertz	09/23/1992
TSO-C50c	Audio Selector Panels and Amplifiers	01/31/1983
TSO-C57a	Headsets and Speakers	01/31/1983
TSO-C58a	Aircraft Microphones (Except Carbon)	01/31/1983
TSO-C59a	Airborne Selective Calling (SELCAL) Equipment	07/14/2005
TSO-C121	Underwater Locating Devices (Acoustic) (Self-Powered)	03/01/1990
TSO-C122	Devices that Prevent Blocked Channels Used in Two-Way Radio Communications Due to Simultaneous Transmissions	04/11/1994
TSO-C126	406 MHz Emergency Locator Transmitter (ELT)	12/23/1992
TSO-C128	Devices that Prevent Blocked Channels Used in Two-Way Radio Communications Due to Unintentional Transmissions	07/20/1993
TSO-C162	Ground Based Augmentation System Very High Frequency Data Broadcast Equipment	05/30/2003
TSO-C163	VDL Mode 3 Communications Equipment Operating Within the Frequency Range 117.975-137.000 Megahertz	05/04/2004
TSO-C169	VHF Radio Communications Transceiver Equipment Operating Within the Radio Frequency Range 117.975	05/17/2004
TSO-C170	High Frequency (HF) Radio Communications Transceiver Equipment Operating Within the Radio Frequency	12/20/2004

TSO No.	Title	Date
	Electrical Equipment	
TSO-C56a	Engine-Driven Direct Current Generators/Starter-Generators	04/12/1984
TSO-C71	Airborne Static ("DC to DC") Electrical Power Converter (for Air Carrier Aircraft)	06/15/1961
TSO-C73	Static Electrical Power Inverter	12/18/1963
TSO-C97	Lithium Sulfur Dioxide Batteries	09/26/1979
TSO-C142	Lithium Batteries	04/04/2000
TSO-C155	Recorder Independent Power Supply	02/03/2005
TSO-C173	Nickel-Cadmium and Lead-Acid Batteries	05/02/2005
TSO-C174	Battery-Based Emergency Power Unit (BEPU)	07/25/2005
TSO-C179A TSO-C179	Rechargeable Lithium Cells and Lithium Batteries	08/22/2006
	Emergency Equipment	
TSO-C13f	Life Preservers	09/24/1992
TSO-C22g	Safety Belts	03/05/1993
TSO-C23d	Personnel Parachute Assemblies	06/01/1994
TSO-C64a	Oxygen Mask Assembly, Continuous Flow, Passenger	08/25/1989
TSO-C69c	Emergency Evacuation Slides, Ramps, Ramp/Slides, and Slide/Rafts	08/18/1999
TSO-C70a	Life Rafts (Reversible and Nonreversible)	04/13/1984
TSO-C72c	Individual Flotation Devices	09/07/1990
TSO-C78	Crewmember Demand Oxygen Masks	02/10/1967
TSO-C89	Oxygen Regulators, Demand	02/10/1967
TSO-C99	Protective Breathing Equipment	06/27/1983
TSO-C103	Continuous Flow Oxygen Mask Assembly (for Non-Transport Category Aircraft)	04/12/1984
TSO-C116	Crewmember Protective Breathing Equipment	03/01/1990
	Fabric	
TSO-C14b	Aircraft Fabric, Intermediate Grade	02/15/1990
TSO-C15d	Aircraft Fabric, Grade A	02/26/1990
	Fire Protection Equipment	
TSO-C19b	Portable Water-Solution Type Fire Extinguishers	05/01/1958
TSO-C79	Fire Detectors (Radiation Sensing Type)	11/12/1963
	Furnishings / Safety Equipment	
TSO-C25a	Aircraft Seats and Berths (Type I Transport, 6g Forward Load)	01/15/1957
TSO-C39b	Aircraft Seats and Berths	04/17/1987
TSO-C39c	9g Transport Airplane Seats Certified by Static Testing	02/13/2004
TSO-C100b	Child Restraint System (CRS)	07/16/2002

TSO No.	Title	Date
TSO-C114	Torso Restraint Systems	03/27/1987
TSO-C127a	Rotorcraft, Transport Airplane, and Normal and Utility Airplane Seating Systems	08/21/1998
TSO-C127	Rotorcraft, Transport Airplane, and Normal and Utility Airplane Seating Systems	03/30/1992
TSO-C167	Personnel Carrying Device Systems (PCDS), also known as Human Harnesses	06/09/2004
TSO-C175	Galley Cart, Containers and Associated Components	11/04/2005
	Hardware/ Hoses	
TSO-C21b	Aircraft Turnbuckle Assemblies and/or Turnbuckle Safetying Devices	03/16/1989
TSO-C42	Propeller Feathering Hose Assemblies	03/01/1957
TSO-C53a	Fuel and Engine Oil System Hose Assemblies	02/16/1961
TSO-C75	Hydraulic Hose Assemblies	09/04/1963
TSO-C76	Fuel Drain Valves	03/01/1963
TSO-C80	Flexible and Oil Cell Material	05/26/1964
TSO-C140	Aerospace Fuel, Engine Oil, and Hydraulic Fluid Hose Assemblies	07/17/2002
TSO-C148	Aircraft Mechanical Fasteners	09/26/1997
TSO-C149	Aircraft Bearings	04/24/1998
TSO-C150	Aircraft Seals	04/24/1998
TSO-C171	Aircraft Clamps	05/02/2005
TSO-C178A TSO-C178	Single Phase 115 VAC, 400 Hz Arc Fault Circuit Breakers	03/03/2006
	Instruments	
TSO-C1D	Cargo Compartment Fire Detection Instruments	08/19/2004
TSO-C2d	Airspeed Instruments	06/14/1989
TSO-C3d	Turn and Slip Instrument	06/14/1989
TSO-C4c	Bank and Pitch Instruments	04/01/1959
TSO-C5e	Direction Instrument, Non-Magnetic (Gyroscopically Stabilized)	06/14/1989
TSO-C6d	Direction Instrument, Magnetic (Gyroscopically Stabilized)	06/14/1989
TSO-C7d	Direction Instrument, Magnetic Non-Stabilized Type (Magnetic Compass)	06/14/1989
TSO-C8d	Vertical Velocity Instruments (Rate-of-Climb)	08/08/1991
TSO-C10	Altimeter, Pressure Actuated, Sensitive Type	01/02/2005
TSO-C10b	Altimeter, Pressure-Actuated, Sensitive Type	09/01/1959
TSO-C11e	Powerplant Fire Detection Instruments (Thermal and Flame Contact Types)	10/17/1991
TSO-C43c	Temperature Instruments	05/30/1995
TSO-C44b	Fuel Flowmeters	05/10/1995

TSO No.	Title	Date
TSO-C45a	Manifold Pressure Instruments	02/28/1995
TSO-C46a	Maximum Allowable Airspeed Indicator Systems	04/23/1968
TSO-C47	Pressure Instruments – Fuel, Oil, and Hydraulic	10/15/1997
TSO-C48	Carbon Monoxide Detector Instruments	10/15/1957
TSO-C49b	Electric Tachometer: Magnetic Drag (Indicator and Generator)	05/30/1995
TSO-C54	Stall Warning Instruments	10/15/1961
TSO-C55	Fuel and Oil Quantity Instruments (Reciprocating Engine Aircraft)	04/01/1959
TSO-C95	Mach Meters	08/18/1983
TSO-C101	Over Speed Warning Instruments	02/19/1987
	Landing Gear / Skis / Floats	
TSO-C26c	Aircraft Wheels and Wheel-Brake Assemblies, with Addendum	05/18/1984
TSO-C26d	Aircraft Wheels, Brakes and Wheel/Brake Assemblies for Parts 23, 27 and 29 Aircraft	10/14/2004
TSO-C27	Twin Seaplane Floats	03/15/1952
TSO-C28	Aircraft Skis	03/15/1952
TSO-C62d	Tires	09/07/1990
TSO-C135	Transport Airplane Wheels and Wheel and Brake Assemblies	05/02/2002
	Lights	
TSO-C30c	Aircraft Position Lights	05/12/1989
TSO-C85a	Survivor Locator Lights	03/07/1996
TSO-C96a	Anticollision Light Systems	04/07/1989
TSO-C141	Aircraft Fluorescent Lighting Ballast/Fixture Equipment	08/17/1999
	Miscellaneous Equipment	
TSO-C77b	Gas Turbine Auxiliary Power Units	12/20/2000
TSO-C90c	Cargo Pallets, Nets, and Containers	04/03/1992
TSO-C137	Aircraft Portable Megaphones	07/20/1998
TSO-C164	Night Vision Goggles	09/30/2004
	Miscellaneous Avionics Equipment	
TSO-C9c	Automatic Pilots	09/16/1960
TSO-C16A-1	Amendment-1, Airspeed Tubes (Electrically Heated)	04/16/1951
TSO-C16	Airspeed Tubes (Electrically Heated)	09/01/1948
TSO-C63c	Airborne Water and Ground Mapping Pulsed Radars	08/18/1983
TSO-C123a	Cockpit Voice Recorder Systems	08/02/1996
TSO-C153	Integrated Modular Avionics Hardware Elements	05/06/2002
TSO-C157	Aircraft Flight Information Services-Broadcast (FIS-B) Data Link Systems and Equipment	09/20/2004
TSO-C158	Aeronautical Mobile High Frequency Data Link (HFDL) Equipment	08/19/2004

TSO No.	Title	Date
TSO-C159	Avionics Supporting Next Generation Satellite Systems (NGSS)	09/20/2004
TSO-C165	Electronic Map Display Equipment for Graphical Depiction of Aircraft Position	09/30/2003
TSO-C166	Extended Squitter Automatic Dependent Surveillance - Broadcast (TIS-B) Equipment Operating on the	09/20/2004
TSO-C176	Aircraft Cockpit Image Recorder Systems	07/28/2006
TSO-C177A TSO-C177	Data Link Recorder Systems	07/28/2006
	Navigation Equipment	
TSO-C34e	ILS Glide Slope Receiving Equipment Operating Within the Radio Frequency Range of 328.6-335.4	01/15/1988
TSO-C35d	Airborne Radio Marker Receiving Equipment	05/05/1971
TSO-C36e	Airborne ILS Localizer Receiving Equipment Operating Within the Radio Frequency Range of 108-112	01/25/1988
TSO-C40c	VOR Receiving Equipment Operating Within the Radio Frequency Range Of 108-117.95 Megahertz (MHz)	01/25/1988
TSO-C41d	Airborne Automatic Direction Finding (ADF) Equipment	05/06/1985
TSO-C52b	Flight Director Equipment	05/30/1995
TSO-C66c	Distance Measuring Equipment (DME) Operating Within the Radio Frequency Range of 960-1215 Megahertz	01/18/1991
TSO-C74c	Airborne ATC Transponder Equipment	02/20/1973
TSO-C87	Airborne Low-Range Radio Altimeter	02/01/1966
TSO-C88a	Automatic Pressure Altitude Reporting Code Generating Equipment	08/18/1983
TSO-C92c	Airborne Ground Proximity Warning Equipment	03/19/1996
TSO-C93	Airborne Interim Standard Microwave Landing System Converter Equipment	11/26/1976
TSO-C102	Airborne Radar Approach and Beacon Systems for Helicopters	04/02/1984
TSO-C104	Microwave Landing System (MLS) Airborne Receiving Equipment	06/22/1982
TSO-C105	Optional Display Equipment for Weather and Ground Mapping Radar Indicators	06/13/1984
TSO-C106	Air Data Computer	01/15/1988
TSO-C110a	Airborne Passive Thunderstorm Detection Equipment	10/26/1988
TSO-C112	Air Traffic Control Radar Beacon System/Mode Select (ATCRBS/Mode S) Airborne Equipment	02/05/1986
TSO-C113	Airborne Multipurpose Electronic Displays	10/27/1986
TSO-C115b	Airborne Area Navigation Equipment Using Multi-Sensor Inputs	09/30/1994
TSO-C117a	Airborne Windshear Warning and Escape Guidance Systems for Transport Airplanes	08/01/1996
TSO-C118	Traffic Alert and Collision Avoidance System (TCAS) Airborne Equipment, TCAS I	08/05/1988

TSO No.	Title	Date
TSO-C119b	Traffic Alert and Collision Avoidance System (TCAS) Airborne Equipment, TCAS II	12/19/1998
TSO-C132	Geosynchronous Orbit Aeronautical Mobile Satellite Services Aircraft Earth Station Equipment	03/25/2004
TSO-C144	Airborne Global Positioning System Antenna	03/12/1998
TSO-C145a	Airborne Navigation Sensors Using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)	09/19/2002
TSO-C146a	Stand-Alone Airborne Navigation Equipment Using the Global Positioning System (GPS) Augmented by the Wide Area Augmentation System (WAAS)	09/19/2002
TSO-C147	Traffic Advisory System (TAS) Airborne Equipment	04/16/1998
TSO-C151b	Terrain Awareness and Warning System	12/17/2002
TSO-C154a	Universal Access Transceiver (UAT) Automatic Dependent Surveillance-Broadcast (ADS-B) Equipment	06/17/2005
TSO-C161	Ground Based Augmentation System Positioning and Navigation Equipment	05/30/2003
TSO-C190	Active Airborne Global Navigation Satellite System (GNSS) Antenna	03/20/2007
	Utility Systems Equipment	
TSO-C20A-1	Amendment-1, Combustion Heaters	04/16/1951
TSO-C20	Combustion Heaters	06/15/1949

Notes

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Appendix G – Special Missions

This appendix provides a brief summary of special missions within the Forest Service.

G-1 Fixed-Wing Aircraft Missions

1. **Large Airtanker Mission (Type 1)**. The aircraft is used to deliver 3000 to 5000 gallons of fire retardant (a chemical mixture that helps to suppress fire) to a wildfire from an airtanker base by means of a fixed tank that is attached to or built into the aircraft. The retardant is usually dropped from a height of 200 feet above the fire.

2. **Aerial Supervision Module (ASM) Mission**. An Aerial Supervision Module consists of an Air Tactical Pilot (ATP) and an Air Tactical Supervisor (ATS), both trained specifically for the ASM mission.

    a. **Leadplane**. The leadplane mission directly supervises firefighting aircraft, usually airtankers dropping fire retardant. This is done to increase safety and efficiency over an incident. The leadplane mission consists of low-level runs to assess the terrain, entry and exit routes, visibility, turbulence, and location of ground firefighters. Ideally, this can be worked out in advance, and the arriving airtankers can drop their loads in a timely manner, reducing exposure to the low-level environment. The leadplane mission can also assume the functions of an Air Tactical Group Supervisor in their absence.

    b. **Aerial Supervision**. As part of the ASM, the ATS supervises all other aircraft over a wildfire. This individual is in constant contact with ground firefighters and is also responsible for communicating with the local dispatch. The ATS is always an experienced firefighter and assists the Incident Commander and other personnel on the fire in formulating strategy and tactics in accordance with incident objectives.

3. **Air Tactical Mission**. A contract or Agency pilot qualified for aerial supervision and an Air Tactical Group Supervisor (ATGS) compose this mission. An ATGS supervises all other aircraft over a wildfire. This individual is in constant contact with ground firefighters and is also responsible for communicating with the local dispatch. The ATGS is always an experienced firefighter and assists the Incident Commander and other personnel on the fire in formulating strategy and tactics in accordance with incident objectives.

4. **Infrared (IR) Mission** (higher altitude, above 3000 feet). IR fixed-wing aircraft conduct survey flights over wildfire incidents in order to accurately assess and map the fire's perimeter and to locate areas containing the most heat. These aircraft fly IR missions at night, and the information collected is available to the Incident Commander after the data is processed by interpreters on the ground and posted to

a File Transfer Protocol (FTP) site. This information is especially useful for fires located in rugged and remote areas.

5. **Smokejumper Mission Mix.** The aircraft launches at or near maximum takeoff weight, climbs to altitude and flies to the fire. Once the fire is located, the aircraft descends to approximately 1500 feet AGL. Once there, several orbits at shallow angle of bank may be done to locate smoke and jump spots.

    a. **Firefighter Delivery (Smokejumper)**. Once a fire is located and a jump spot is selected, descend for a low pass, (500 feet AGL) so jumpers get a close look at fire and jump spots. Climb back to 1500 feet AGL and complete several orbits to drop streamers to determine the wind line. After winds are determined, complete several more patterns at the same altitude to deliver smokejumpers. Usually they exit two at a time, so gross weight changes by roughly 500 lbs. for each pass.

    b. **Paracargo**. After all the jumpers are safely on the ground, cargo is dropped. These passes are done normally at 200 to 300 feet AGL. Each pass will deliver between 50 and 250 lbs. of cargo, depending on the airplane. After each pass, a climb will commence normally between 500 and 1500 feet AGL to set up for the next pass, with a descent on the final approach. After the last cargo drop, climb back to 1500 feet AGL and circle the fire to determine that jumper needs are met and communications have been established. Climb back up to altitude and fly back to base for normal approach and landing.

6. **Reconnaissance/Patrol/Survey**. These flights are conducted to attempt to locate fires over large and remote areas. Aircraft can usually survey an entire forest or other area of responsibility in several hours, and fires are often discovered when they are small and can be easily attacked by ground and/or aerial resources. Other flights might include Forest Health Protection missions such as insect and disease surveys, aerial photography, and aerial application for disease or pest eradication.

G-2 Rotor-Wing Aircraft Missions

1. **Water/Retardant Delivery (Fixed Tank).** The helicopter is used to deliver water or fire retardant (a chemical mixture that helps suppress fire) to a fire from a nearby water/retardant source by means of a tank that is attached to or built into the aircraft. The water or retardant is usually dropped from a height above the fire that minimizes the downwash from the aircraft.

2. **Water/Retardant Delivery (Bucket).** The helicopter delivers water or retardant to a fire with a bucket (a container, usually cylinder shaped, which can take-on and release water or retardant by mechanical means). The bucket is suspended below the aircraft with cables attached to a quick release mechanism. The bucket can also

be suspended on a longer cable (50 feet or more) to minimize the effect of downwash from the aircraft.

3. **Helitack Mission.** Helitack crewmembers are firefighters that are trained in operations with the helicopter. This training includes loading and unloading people and cargo, preparing and attaching external loads, and operational safety around helicopters.

    a. **Rappel**. The delivery of firefighters to a fire area by helicopter when there is no suitable location to land the aircraft close to the fire. The firefighters descend on a rope that is attached to the aircraft and with a device that attaches to the rope and controls the rate of descent. Additional firefighting equipment is lowered from the helicopter to the firefighters on the ground.

    b. **Fire Crew Transport**. The helicopter is used to transport firefighters to fires when access is limited by lack of roads or adverse terrain. To keep wildland fires small and suppression costs low, it is important to get firefighters to the scene as quickly as possible. Use of helicopters to transport personnel and equipment saves time and conserves energy of the firefighters for actual firefighting.

4. **Cargo Delivery Mission**.

    a. **Internal Cargo.** When there are areas near the fire that are large enough and clear of obstacles for the helicopter to land, the helicopter is internally loaded with food, water, tools and other firefighting equipment. This allows transportation of cargo at a higher airspeed while eliminating the hazard associated with external loads.

    b. **External Cargo.** When firefighters are on the fire line or located in an area that is not open and clear of obstructions, the helicopter can deliver supplies by means of a cargo net and a cable attached to the helicopter (i.e., 50 feet or longer longline). This allows lowering of supplies to personnel while maintaining the helicopter's clearance from obstacles.

5. **Helicopter Coordinator/Air Attack.** The Helicopter Coordinator function is to provide mission direction to helicopters on a large fire with complex air operations and to provide separation between the helicopters as an added safety.

Notes

Glossary

Aerial Supervision Module (ASM) – Aircraft with an Air Tactical Pilot (ATP) and an Air Tactical Supervisor (ATS). These aircraft are operated in the dual role of tanker leadplane and Air Attack.

Air Attack – Aircraft used to control airspace over a fire, usually staffed by a pilot and Air Tactical Group Supervisor (ATGS). These are normally contract fixed-wing aircraft piloted by a vendor pilot with an Agency Air Tactical Group Supervisor (ATGS) on board to coordinate airspace use. There are four categories of Air Attack aircraft: Type I, II, III, IV. The category is determined by the avionics configuration of the aircraft. Refer to AIG, Chapter 8, Avionics Requirements for the differences between the four types.

Airworthiness (**Airworthy)** – When an aircraft or one of its component parts meets its type design, or properly altered condition, and is in a condition for safe flight.

Airworthiness Branch (AWB) – Works in conjunction with the Operations Branch, Pilot Standardization Branch, Business Operations Branch, and Strategic Planner to provide National leadership for airworthiness issues of Agency and contract aircraft. The Airworthiness Branch conducts National oversight and continuing evaluation of the aviation programs.

Aviation Management Directorate (AMD) – Former title of the Office of Aviation Services.

Card – Forest Service approval document for contract aircraft.

End-Product Contract – A means of procuring a service for a site and time specific event, (such as the use of spray, dusting, application of fertilizers, prescribed burning, and so forth), where the contractor is self-sufficient to perform the full extent of the specified service by whatever means the contractor deems most appropriate. To determine if a contract should be an end-product or flight services contract, see the End-Product Contract Matrix in Chapter 6-6.

Fixed Operating Rate (FOR) – A Forest Service term for indirect costs associated with aircraft operations.

Flight Services Contract – An aircraft use contract in which the Forest Service maintains operational control (reference FSM 5711.22).

Helicopter External Load Operations – These operations are conducted under the authority of 14 CFR Part 133. The following definitions can also be found in 14 CFR Part 1- Definitions and Abbreviations:

> **Class A rotorcraft-load combination** – in which the external load cannot move freely, cannot be jettisoned, and does not extend below the landing gear.
>
> **Class B rotorcraft-load combination** – in which the external load is jettisonable, and is lifted free of land or water during the rotorcraft operations.

Class C rotorcraft-load combination – in which the external load is jettisonable, and remains in contact with land or water during the rotorcraft operations.

Class D rotorcraft-load combination – in which the external load is other than a Class A, B, or C and has been specifically approved by the Administrator for that operation. *This is the load class for rappel operations.*

Leadplane – These are normally Forest Service owned and/or operated aircraft used to lead Airtankers.

Limited Use Helicopter – *This is an interagency designation, not to be confused with the FAA designations for categories of Type/Airworthiness Certificates.* A helicopter certificated in the restricted category or a helicopter certificated in transport or normal category utilizing a reciprocating engine and any other helicopter not operated and maintained in accordance with 14 CFR 135. These helicopters may be used for limited operations such as tank and bucket operations and cargo.

Line Officer – a Forest Service official who serves in a direct line of command from the Chief and who has the delegated authority to make and execute decisions subject to this part.

New Limits – These are the FAA-approved fits and clearances manufacturers adhere to with new component/unit. This may be accomplished using standard or approved undersized and oversized dimensioned parts.

Office of Aviation Services (OAS) – Formerly the Aviation Management Directorate (AMD) and the Office of Aircraft Services. Responsible for Department of Interior (DOI) aviation services.

Ops Manual – A Part 135 and 137 operator's operations manual, which tells the FAA how they will operate.

Ops Specs – FAA Operations Specifications for Part 135 and 137 operators.

Overhaul – Assembled with or to **Serviceable Limits**.

Payload – The difference between the maximum certificated normal (internal) gross weight and the equipped weight of the aircraft.

Pin out – A description of the purpose of each pin in a power source connector.

Public Aircraft – See 14 CFR 1, Definitions and Abbreviations.

Public Use Aircraft – See FAA Advisory Circular 00-1.1 Government Aircraft Operations.

Rebuilt – Assembled with, or to New Limits.

Reconnaissance – Normally a fixed-wing aircraft used for forest health, surveillance, or for new starts and reconnaissance of ongoing fires. These are usually contract aircraft and pilots with an Agency employee acting as observer. Refer to AIG, Chapter 8, Avionics Requirements to

determine the difference between Reconnaissance and Fire Reconnaissance avionics requirements.

SAFECOM – Interagency method to report incidents, hazards, maintenance, and airspace intrusions**.**

Service Bulletin (S/B) – An FAA-approved document issued by manufacturers to address aircraft problems.

Serviceable Limits – Unit not expected to fail prior to next scheduled **TBO**. The service limits are the FAA-approved allowable wear fits and tolerances to which a new limit part may deteriorate and still be a useable component. This may also be accomplished using standard and approved undersized and oversized dimensions.

Special Mission – Fixed-wing aircraft special missions in the Forest Service include airtanker, leadplane/aerial supervision module, air tactical, infrared, smokejumper (including firefighter delivery and paracargo), reconnaissance, patrol, survey, forest health, and other various missions. Rotor-wing aircraft special missions include water/retardant delivery, helitack (including rappel and fire crew transport), internal and external cargo delivery, helicopter coordinator/air attack, and other various missions. See Appendix G for a brief summary of aircraft special missions within the Forest Service.

Standard Use Helicopter – *This is an interagency designation, not to be confused with FAA designations for categories of Type/Airworthiness Certificates.* A turbine powered helicopter which is certificated in the normal or transport category, operated and maintained in accordance with 14 CFR 135 by an operator holding an Air Carrier Certificate. These helicopters may be used for all types of operations such as passengers, reconnaissance, tank or bucket operation, and cargo, for which they are certified. For ICS Type Specifications for Helicopters, see Appendix A-11.

Terrain Awareness and Warning System (TAWS) – For a breakdown of the various TAWS requirements and modes, see Appendix D.

Type I, II, III, IV Air Attack – Classification of light fixed-wing aircraft by avionics capabilities.

Type I, II, III, IV Helicopters – Classification of helicopters by passenger and payload capacity. Note: Type IV Helicopters have reciprocating engines and are not used by the Forest Service.

Use Rate – Forest Service term for hourly rate.

Notes

Acronyms and Abbreviations (A-F)

A/C – Aircraft.
A&P – Airframe and Powerplant.
AAIP – Approved Aircraft Inspection Program.
ABC – Airworthiness Branch Chief.
AC – Advisory Circular.
ACE – Aviation Conference and Education.
AD – Airworthiness Directive.
ADF – Automatic Direction Finding.
ADS-B – Automatic Dependent Surveillance-Broadcast.
AFF – Automated Flight Following.
AFM – Aircraft Flight Manual.
AGL – Above Ground Level.
AIG – Aircraft Inspector Guide.
AKO – Army Knowledge Online.
AM – Amplitude modulation transceiver.
AMD – Aviation Management Directorate.
AML – Approved Model List.
ANSI – American National Standards Institute.
ARA – Aircraft Rental Agreement.
ASAM – Aviation Safety Action Message.
ASI – Aviation Safety Inspector.
ASM – Aerial Supervision Module.
ATA – Air Transportation Association.
ATC – Air Traffic Control.
ATCO – Air Taxi Commercial Operators.
ATCRBS – Air Traffic Control Radar Beacon System.
ATGS – Air Tactical Group Supervisor.
ATP – Air Tactical Pilot.
ATU – Additional Telemetry Unit.
AV1 – Avionics Endorsement, Basic.
AV2 – Avionics Endorsement, Intermediate.
AV3 – Avionics Endorsement, Technical.
AV4 – Avionics Endorsement, Return to Contract.
AWB – Airworthiness Branch.
BAER – Burned Area Emergency Rehabilitation.
BEPU – Battery-Based Emergency Power Unit.
BLM – Bureau of Land Management.
BOA – Basic Ordering Agreement.
BPA – Blanket Purchase Agreement.
CAM – Civil Aeronautics Manual.
CAR – Civil Aviation Regulations.
CFR – Code of Federal Regulations.
CMMS – Computerized Maintenance Management System.
CO – Contracting Officer.
COR – Contracting Officer's Representative.
COTR – Contracting Officer's Technical Representative.
CRS – Certified Repair Station; Child Restraint System.
CTCSS – Continuous Tone Controlled Squelch System.
CWN – Call-When-Needed.
CY – Calendar Year.
DME – Distance Measuring Equipment.
DOD – Department of Defense.
DOI – Department of Interior.
DOT – Department of Transportation.
EDRS – Electronic Document Retrieval System.
EFB – Electronic Flight Bag.
ELAM – External Load Attach Mechanism.
ELT – Emergency Locator Transmitter.
EU – Exclusive Use.
EWIS – Electrical Wiring Interconnect System.
FAA – Federal Aviation Administration.
FACT – Foreign Affairs Counter Threat.
FAHD – Fire Applications Help Desk.
FAITAS – Federal Acquisition Institute Training Application System.
FAM – Fire and Aviation Management.
FAO – Forest Aviation Officer.
FCF – Functional Check Flight.
FEPP – Federal Excess Personal Property.
FLTA – Forward Looking Terrain Alert.
FM – Frequency modulated transceiver; VHF-FM radio.
FMO – Fire Management Officer.
FMR – Federal Management Regulation.
FOR – Fixed Operating Rate.
FSCAP – Flight Safety Critical Aircraft Parts.
FSDO – Flight Standards District Office.
FSH – Forest Service Handbook.
FSIMS – Flight Standards Information Management System.
FSM – Forest Service Manual.
FTP – File Transfer Protocol.

Acronyms and Abbreviations (G-P)

GNSS – Global Navigation Satellite System.
GPM – Gallons Per Minute.
GPS – Global Positioning Systems.
GPWS – Ground Proximity Warning System.
GSA – General Services Administration.
GSE – Ground Support Equipment.
HAI – Helicopter Association International.
HAZMAT – Hazardous Materials.
HFDL – High Frequency Data Link.
HIGE – Hover In-Ground Effect.
HIT – Health Indicator Test.
HMPE – High Molecular Polyethylene Equipment.
HMWPE – High Molecular Weight Polyethylene Equipment.
HOGE – Hover Out-of-Ground Effect.
HTSOS – High Threat Security Overseas Seminar.
IA – Initial Attack; Inspection Authorization.
IAT – Interagency Aviation Training.
IBAC – International Business Aviation Council.
ICA – Instructions for Continued Airworthiness.
ICAP – International Committee for Aviation Policy.
ICS – Incident Command System.
IDS – Instant Deployment System.
IEP – Internal Evaluation Program.
IFR – Instrument Flight Rules.
IHOG – Interagency Helicopter Operations Guide.
ILS – Instrument Landing System.
IMI – Initial Maintenance Inspection.
IR – Infrared.
IS-BAO – International Standard for Business Aviation.
JASC – Joint Aircraft System/Component.
LB – Low Band.
LFS – Large Fire Support.
LFW – Light Fixed-Wing Aircraft.
LOA – Letter of Authorization.
MAFFS – Modular Airborne Firefighting System.
MAP – Mandatory Availability Period.
MC – Management Code.
MEL - Minimum Equipment List.
MLS – Microwave Landing System.
MMEL – Master Minimum Equipment List.
M/M/S – Make/Model/Series.
MPG – Maintenance Procedures Guide.
MOU – Memorandum of Understanding.
MSDS – Material Safety Data Sheet.
Mx – Maintenance.
NAS – National Avionic Standards.
NASF – National Association of State Foresters.
NDI – Nondestructive Inspection.
NFES – National Fire Equipment System.
NFPA – National Fire Protection Association.
NGSS – Next Generation Satellite Systems.
NIFC – National Interagency Fire Center (Boise).
NIICD – National Interagency Incident Communications Division (i.e., National Radio Cache).
NIMS – National Incident Management System.
NIST – National Institute of Standards and Technology.
NTDP – National Technology and Development Program.
NTIA – National Telecommunications and Information Administration.
NTSB – National Transportation Safety Board.
OAS – Office of Aviation Services.
OAT – Outside Air Temperature.
OEM – Original Equipment Manufacturer.
OJT – On-The-Job Training.
Ops Specs – Operations Specifications.
PA - Pressure Altitude.
PASP – Project Aviation Safety Plan.
Pax – Passenger.
PCDS – Personnel Carrying Device Systems.
PDA – Premature Descent After.
PFC – Passenger Facility Charge.
PI – Project Inspector.
PMA – Parts Manufacturer Approval.
PPE – Personal Protective Equipment.
PSD – Plastic Sphere Dispenser.
PTT – Push to Talk.

Acronyms and Abbreviations (Q-Z)

QA – Quality Assurance.
QAS – Quality Assurance Specialist.
QCM – Quality Control Manual.
QEC - Quick Engine Change (Kit).
QTI – Qualified Technical Investigator.
RAO – Regional Aviation Officer.
RASM – Regional Aviation Safety Manager.
RF – Regional Forester.
RGL – Regulatory and Guidance Library (FAA).
RII – Required Inspection Items.
RMMS – Rotorcraft Maintenance Manual Supplement.
RO – Regional Office.
RSM – Repair Station Manual.
RTCA – Return to Contract Availability.
RTCA – Radio Technical Commission for Aeronautics.
RVSM – Reduced Vertical Separation Minimum.
S/B – Service Bulletin.
SAFECOM – Safety Communiqué.
SAP – Simplified Acquisition Procedures.
SEAT – Single-Engine Airtanker.
SELCAL – Selective Calling.
SHP – Shaft Horsepower.
SIP – Structural Integrity Program.
SMAAG – Special Mission Airworthiness Assurance Guide.
SMS – Safety Management Systems.
SOF – Safety of Flights.
STC – Supplemental Type Certificate.
SUP – Suspected Unapproved Parts.
TAWS – Terrain Awareness and Warning System.
TAS – Terrain Analysis System.
TBD – To Be Determined.
TBO – Time Between Overhaul.
TC – Type Certificate.
TCAS – Traffic Collision Avoidance System.
TCAD – Traffic and Collision Alert Device.
TCDS – Type Certificate Data Sheet.
TCTO – Time Compliance Technical Order.
TEAC – Turbine Engine Analysis Check.
THSP – Technical Specialist.
TICC – Technical Information and Communications Committee (ATA).
TOT – Turbine Outlet Temperature.
TSO – Technical Standing Order.
UAS – Unmanned Aircraft System.
UAT – Universal Access Transceiver.
USAF – United States Air Force.
USB – Universal Serial Bus.
USDA – United States Department of Agriculture.
USFS – United States Forest Service.
VDC – Volts Direct Current.
VFR – Visual Flight Rules.
VHF-AM – Amplitude modulated transceiver.
VHF-FM – Frequency modulated transceiver.
VLAT – Very Large Airtanker.
VOR – VHF Omnidirectional Range.
VSWR – Voltage Standing Wave Ratio.
WAAS – Wide Area Augmentation System.
WAT – Weather, Altitude, and Temperature.
WCF – Working Capital Fund.
WO – Washington Office (East or West).

Notes