# **Instrument Regulations Overview: A Guide to 14 CFR Parts 61 and 91**

This document serves as a comprehensive summary of the critical section within 14 CFR Part 61 and 91, specifically focusing on its implication for instrument flying. It is designed to facilitate your understanding and study of this regulation, providing a foundation for further exploration and mastery of the subject. Flashcards can significantly enhance the retention of fundamental concepts and assist in the effective internalization of the material.

Should you encounter any uncertainty regarding the interpretation of this regulation or its application within the instrument flying context, I encourage you to seek clarification from your CFI.

## §61.3 Logbook Essentials

* **Certification Needed**: Must be certified to serve as flight crew.
* **Medical Requirement**: Must have a valid medical certificate.
* **ID Requirement**: Need a valid government-issued photo ID.

## §61.51 Pilot Logbooks

* **Training & Experience**: Log training time and flying experience for certificates.
* **Staying Current**: Record experience for keeping your flying currency.
* **Instrument Time**:
  + **Log If**: Only log instrument time when flying by instruments only, in real or simulated conditions.
  + **Details**: Include flight time, location, instrument approach type, and if with a safety pilot or instructor, their name (signature for training).
  + **Simulators**: Approved simulators can be used for training and currency logs.

Keep logs simple and accurate for safety and compliance.

## §61.57 Recent Flight Experience Requirements for Pilot in Command

* **General Currency:**
  + Must be current to act as Pilot in Command (PIC).
* **Passenger Currency:**
  + Need 3 takeoffs and landings within the last 90 days to carry passengers.
  + For night currency, 3 takeoffs and landings to a full stop at night.
* **Instrument Currency:**
  + Within the last 6 months, complete:
    - 6 instrument approaches,
    - Holding procedures and tasks,
    - Intercepting and tracking courses using navigational systems.
  + Certain simulators are acceptable for maintaining currency.
* **Instrument Proficiency Check:**
  + Required if not instrument current for over 6 months.
  + Must include at least 3 instrument approaches.
  + Conducted by an instructor, examiner, or FAA-approved person, following instrument Airman Certification Standards (ACS).
  + May require additional training for competency to ACS standards.

## §61.65 Instrument Rating Requirements

* **General Requirements**
  + Must have a private pilot license.
  + Must be proficient in reading, writing, and understanding English.
  + Required to complete and log specific ground training for the instrument rating.
  + Need an endorsement to take and then pass the instrument written exam.
  + Must receive and log flight training and get an endorsement for the practical test, which you also need to pass.
* **Aeronautical Experience for Instrument Airplane Rating**
  + 50 hours of cross-country flight as PIC, with at least 10 hours in airplanes.
  + 40 hours of actual or simulated instrument time, including 15 hours with an authorized instructor.
  + 3 hours of instrument training within the 2 months before the practical test.
* **Instrument Flight Training on Cross-Country Flight Procedures**
  + A cross-country flight of 250 nautical miles along airways or ATC-directed routing.
  + An instrument approach at each airport.
  + Three different types of approaches using navigation systems.

## §61.333 Commercial Pilot Privileges and Limitations

* **Without Instrument Rating**: Holding a commercial pilot certificate without an instrument rating restricts carrying passengers for hire on cross-country flights over 50 nautical miles or at night.

## §91.3 - PIC Responsibility and Authority

* The Pilot in Command (PIC) holds final authority and can deviate from Part 91 rules during an emergency. If requested by the FAA, the PIC must provide a written explanation of the deviation.

## §91.103 - Pre-flight Action

* The Pilot in Command (PIC) must know all available information about the flight before takeoff. This includes:
  + Runway lengths at airports of use
  + Required takeoff and landing distances
  + Weather reports and forecasts
  + Fuel requirements
  + Air Traffic Control (ATC) delays
  + Available alternate airports

A common way pilots remember this is by using the acronym NWKRAFT, which stands for NOTAMs (Notices to Air Missions), Weather, Known ATC delays, Runways lengths, Alternates available, Fuel requirements, and Takeoff and landing distances.

## §91.109 Flight Instruction, Simulated Instrument Flight, and Certain Flight Tests

* **IFR Training with Throw-over Yoke**: For IFR training in aircraft equipped with a throw-over yoke, the instructor is required to have at least 25 hours of PIC time in the specific make and model of the aircraft.
* **Safety Pilot Requirements**: The safety pilot must be rated for the aircraft and must have adequate vision forward and to each side of the aircraft.

## §91.113 - Right of Way

* **See and Avoid**: Pilots are responsible for maintaining vigilance to "see and avoid" other aircraft under all weather conditions.
* **Distress Priority**: An aircraft in distress has the right-of-way over all other air traffic. It's important to review right-of-way rules as they are commonly tested in written exams.

## §91.121 - Altimeter Settings

* **Setting the Altimeter:**
  + Use a reported altimeter setting from within 100 nautical miles of the aircraft, or
  + Set to the elevation of the departure airport if no altimeter setting or radio is available.
* **Upon Establishing Communication with ATC:**
  + ATC will typically provide a new altimeter setting when two-way radio communication is established.
* **Above 18,000 Feet:**
  + Set the altimeter to 29.92 inches of mercury.

## §91.123 - Compliance with ATC Clearances and Instructions

* **When PIC Can Deviate:**
  + With a new clearance from ATC.
  + In an emergency situation that compromises safety.
  + Following a TCAS (Traffic Collision Avoidance System) resolution advisory, although such equipment may not be common in training aircraft.
* **Deviation from ATC Instructions:**
  + Pilots may only deviate from ATC instructions in the interest of safety during emergencies.
* **Reporting:**
  + If given priority by ATC due to an emergency, the pilot should report the incident to ATC within 48 hours if requested.
* **Important Note:**
  + Declaring an emergency incurs no fees or penalties. It's better to declare an emergency when in doubt. Reluctance to declare emergencies has led to accidents and fatalities. Always prioritize safety for both pilots and passengers.

## §91.129 - Operations in Class D Airspace

* **ATC Communications:**
  + Must be established before entering Class D airspace.
  + When departing from the primary airport within Class D airspace, maintain communications with ATC until instructed otherwise.
* **Runway and Taxiway Operations:**
  + No operation on runways or taxiways, including takeoffs and landings, is permitted without explicit clearance from ATC.

## §91.130 - Operations in Class C Airspace

* **Communication Requirements:**
  + Maintain communication with ATC when departing from the primary airport within Class C airspace until instructed otherwise by ATC.
* **Equipment Requirements:**
  + Aircraft must be equipped with a Mode C Transponder when operating in or over Class C airspace.
  + After January 1, 2020, aircraft are required to have ADS-B (Automatic Dependent Surveillance-Broadcast) equipment.

## §91.131 - Operations in Class B Airspace

* **Clearance for IFR Flights:**
  + IFR flights do not require a specific clearance from the ATC facility with jurisdiction over the Class B airspace.
* **Equipment Requirements:**
  + A Mode C transponder is mandatory for all operations within Class B airspace.
  + After the year 2020, aircraft must also be equipped with ADS-B (Automatic Dependent Surveillance-Broadcast).

## §91.135 - Operations in Class A Airspace

* **IFR Operations and Clearance:**
  + All aircraft operating in Class A airspace must do so under Instrument Flight Rules (IFR) and have an ATC clearance. Both the pilot and the aircraft must meet IFR requirements.
* **Equipment Requirements:**
  + A Mode C transponder is mandatory for operations in Class A airspace.
  + After the year 2020, aircraft must also be equipped with ADS-B (Automatic Dependent Surveillance-Broadcast).

## §91.155 - Basic VFR Weather Minimums

* **Visibility and Cloud Clearance Requirements by Airspace Class:**
* **Class A**: Not applicable (N/A) since VFR flights are not allowed in Class A airspace.
* **Class B**:
  + Visibility: 3 statute miles (sm)
  + Cloud Clearance: Remain clear of clouds.
* **Class C & D:**
  + Visibility: 3sm
  + Cloud Clearance: 500 feet below, 1000 feet above, 2000 feet horizontal.
* **Class E:**
  + Below 10,000 feet MSL: 3sm visibility, 500 feet below, 1000 feet above, 2000 feet horizontal cloud clearance.
  + At or above 10,000 feet MSL: 5sm visibility, 1000 feet below, 1000 feet above, 1 statute mile horizontal cloud clearance.
* **Class G:**
  + Below 1,200 feet AGL: 1sm visibility and clear of clouds.
  + At or above 10,000 feet MSL: 5sm visibility, 1000 feet below, 1000 feet above, 1sm horizontal cloud clearance.
  + Otherwise:
    - Day: 1sm visibility and clear of clouds.
    - Night: 3sm visibility, 500 feet below, 1000 feet above, 2000 feet horizontal cloud clearance.
    - In Class G, you may operate at night with at least 1sm visibility and clear of clouds if within 1/2sm of the runway (not recommended).
* **Additional Regulations:**
  + **VFR Under Ceilings:** No VFR flights beneath a ceiling within controlled airspace to the surface unless the ceiling is at least 1,000 feet, except under special VFR conditions.
* **Visibility for Takeoff, Landing, and Entering Traffic Pattern:**
  + Within surface areas of Class B, C, D, or E airspace, ground visibility must be at least 3sm, or flight visibility must be at least 3sm for takeoff, landing, or entering the traffic pattern.
  + **Class E Airspace Base Operations:** Aircraft operating at the base of a Class E area are considered to be in the airspace directly below that airspace.

## §91.157 - Special VFR Weather Minimums

* Special VFR (SVFR) operations provide an exception to standard VFR weather minimums within the lateral boundaries of controlled airspace extending to the surface, under specific conditions:
* **Visibility Requirement**: SVFR allows operation with a minimum visibility of 1 statute mile (sm).
* **Day SVFR Conditions:**
  + Operations must be below 10,000 feet mean sea level (MSL).
  + An Air Traffic Control (ATC) clearance is required.
  + The aircraft must remain clear of clouds.
* **Night SVFR Conditions:**
  + All requirements for Day SVFR must be met.
  + The pilot and aircraft must be certified and equipped for Instrument Flight Rules (IFR) flight.
* (Note: If capable of IFR flight, it may be more practical to conduct operations under IFR rather than opting for Night SVFR.)

## §91.161 - Special Awareness Training Required

* Special Awareness Training is mandatory for any pilot flying under Visual Flight Rules (VFR)—even if they are receiving Instrument Flight Rules (IFR) training—within 60 nautical miles (nm) of the Washington, D.C. VOR/DME (Very High Frequency Omnidirectional Range/Distance Measuring Equipment). This requirement aims to enhance safety and awareness within this highly sensitive and restricted airspace area.

## §91.167 - Fuel Requirements for IFR Flights

Under Instrument Flight Rules (IFR), the fuel requirement stipulates that an aircraft must carry enough fuel to:

* Complete the flight to the intended airport.
* If an alternate airport is required, fly to this alternate airport.
* After reaching the alternate airport (if applicable), have enough fuel to fly for an additional 45 minutes at normal cruising speed.

## §91.169 - IFR Flight Plan: Information Required

When filing an IFR flight plan, include all the details you would for a VFR flight plan, plus additional information specific to IFR operations:

* **Basic Details**: Aircraft tail number, type of aircraft, pilot's full name, departure point, arrival point, proposed route, amount of fuel required, fuel on board, and number of people on board.
* **Alternate Airport Requirement**: You must list an alternate airport on your flight plan unless the weather conditions at your first intended landing airport meet the criteria set by the 1-2-3 Rule.

### 1-2-3 Rule Explained:

* **Weather Conditions**: For the period of 1 hour before to 1 hour after your Estimated Time of Arrival (ETA), the weather forecast must indicate:
  + A ceiling of at least 2,000 feet above the airport.
  + Visibility of more than 3 statute miles.
* If these conditions are met, filing an alternate airport is not necessary.

## §91.171 - VOR Equipment Check for IFR

For IFR operations using VOR (VHF Omnidirectional Range) navigation, specific checks and standards must be met:

* **Check Frequency**: The VOR must be checked and found within acceptable standards within the last 30 days to be used for IFR.
* **Accuracy Standards**:
  + **Dual VOR Check**: The two VORs must agree within 4 degrees of each other.
  + **VOT (VOR Test Facility) and Ground Checks**: Must be within +/- 4 degrees.
  + **Airborne Check**: Must be within +/- 6 degrees.
* **Documentation**: After conducting a VOR check, documentation is required. It must include:
  + **Date** of the check.
  + **Place** where the check was performed.
  + **Bearing Error** observed.
  + **Signature** of the person signing off the check.
  + This ensures the reliability and accuracy of the VOR equipment for navigation under IFR conditions.

## §91.173 - ATC Clearances and Flight Plan Required

* **For IFR operations:**
* **Filing an IFR Flight Plan** is mandatory before departure.
* **Receiving an ATC Clearance** is required to legally operate under Instrument Flight Rules.

## §91.175 - Taking Off and Landing Under IFR

### Landing Requirements

* **Instrument Approach**: Must use a standard instrument approach procedure as prescribed in Part 97. Custom approaches are not allowed.
* **Minimum Descent Altitude (MDA) or Decision Altitude (DA)/Decision Height (DH):** Cannot operate below these unless:
  + Flight visibility meets or exceeds what's prescribed for the approach.
  + For Category II or III approaches, at least one visual reference for the intended runway must be distinctly visible to the pilot.
* **Visual References Required for Descent Below 100 Feet Above Touchdown Zone Elevation:**
  + Approach light system is visible; however, you cannot descend below 100 feet above the touchdown zone elevation unless the red terminating bars or the red side row bars are visible.
  + Visible items may include threshold markings and lights, runway end identifier lights, visual glide slope indicators, touchdown zone markings and lights, the runway itself, and runway markings and lights.
* **Landing Visibility:** Cannot land if visibility is less than what is prescribed for the approach.
* **Missed Approach Protocol:** Must execute a missed approach upon reaching the Missed Approach Point (MAP) without the required visual reference, or if visual reference is lost after descending below DA/DH or MDA.

### Taking Off Under IFR

* **Zero Visibility Takeoffs:** Under Part 91, takeoffs are permitted in zero visibility and ceiling conditions ("zero-zero").
* **Commercial Operation Visibility Requirements (for reference):**
  + Single-engine aircraft: Minimum of 1 statute mile (sm) visibility.
  + Multi-engine aircraft: Minimum of 1/2 statute mile visibility.

## §91.177 - Minimum Altitude for IFR Operations

For IFR flights, except during takeoff and landing, aircraft must adhere to minimum altitude requirements to ensure safety and compliance with FAA regulations:

* **Referenced Regulations**: Minimum altitudes are detailed in Parts 95 and 97 of the Federal Aviation Regulations (FARs).
* **Mountainous Areas**: If no specific altitude is prescribed, the minimum altitude is 2,000 feet above the highest obstacle within a 4 nautical mile (NM) radius of the course to be flown.
* **Non-Mountainous Areas**: In areas that are not mountainous, the minimum altitude is 1,000 feet above the highest obstacle within the vicinity of the flight path.

These minimum altitude requirements are designed to provide an adequate safety margin over terrain and obstacles during IFR flight operations.

## §91.179 - IFR Cruising Altitude Rules

For aircraft operating under IFR:

* **In Controlled Airspace**: Follow altitudes assigned by ATC.
* **Cruising Altitude Based on Magnetic Course**:
  + For courses between 0-179 degrees: Cruise at odd-thousand-foot altitudes (e.g., 3,000, 5,000 feet).
  + For courses between 180-359 degrees: Cruise at even-thousand-foot altitudes (e.g., 4,000, 6,000 feet).
* **Above Flight Level 180 (18,000 feet MSL)**:
  + Maintain the altitude assigned by ATC.
  + The general rule of even altitudes for westbound and odd altitudes for eastbound flights typically applies.
* **VFR on Top**:
  + If flying VFR on top (above a cloud layer under VFR conditions while on an IFR flight plan), adhere to VFR cruising altitude rules: even/odd thousand feet plus 500 feet (e.g., 3,500, 4,500 feet for odd and even courses, respectively).

## §91.181 - Course to be Flown

When flying under IFR:

* **Adhere to Cleared Route**: Pilots are required to fly along the centerline of the airway or direct route as cleared by ATC.
* **Traffic Avoidance**: Despite following the cleared route, pilots must still maneuver as necessary to remain well clear of other traffic.
* **Flexibility with ATC**: Remember, you can request heading or course changes from ATC during the flight for safety, weather avoidance, or other operational needs.

## §91.183 - IFR Communications

During IFR operations:

* **Maintain ATC Contact**:
  + Pilots are required to keep in continuous contact with the appropriate air traffic control (ATC) facility.
* **Mandatory Reporting**:
  + Report the time and altitude of passing each designated reporting point, or any other points specifically requested by ATC.
* **Reporting Conditions**:
  + Any un-forecasted weather conditions encountered.
  + Any other information that could affect the safety of flight must be reported to ATC.

## §91.185 - Procedure for Loss of Two-Way Radio Communications

### VFR Conditions:

* If radio communication is lost while flying in Visual Flight Rules (VFR) conditions, continue under VFR and land as soon as it is practical to do so. Once landed, establish contact with ATC to explain the situation.

### IFR Conditions:

* In the event of losing communication under Instrument Flight Rules (IFR), continue the flight adhering to specific guidelines for **route** and **altitude** to ensure safety.

### Route (AVE F Mnemonic):

Follow in this order depending on what is applicable:

* **A**ssigned: The last route ATC assigned to you.
* **V**ectored: If being vectored, revert to the route that ATC last vectored you to follow.
* **E**xpected: A route that ATC advised you to expect in a further clearance.
* **F**iled: The route filed in your flight plan.

### Altitude (Highest of MEA):

Choose the highest altitude from the following:

* **M**inimum: The minimum altitude for IFR operations.
* **E**xpected: An altitude ATC expected you to climb/descend to.
* **A**ssigned: The last altitude ATC assigned to you.

## §91.187 - Malfunction Reports

* **Reporting Requirement**: The Pilot in Command (PIC) is required to report any malfunctions in navigational, approach, or communication equipment encountered during flight.
* **Information to Provide**:
  + **Affected Equipment**: Specify which equipment is malfunctioning.
  + **Impact**: Describe how the malfunction affects the operation of the aircraft.
  + **Assistance Needed**: Indicate the type of assistance or accommodation needed from Air Traffic Control (ATC).

## §91.203 - Aircraft Certification and Registration Requirements

Under this regulation:

* **Operating Certificate**: Aircraft must have a valid and current airworthiness certificate.
* **Registration Certificate**: A valid registration certificate must be on board. If the registration is being processed, an application for registration can temporarily suffice.

## §91.205 - Required Equipment for Aircraft

This regulation specifies the essential equipment needed for different types of flight:

### For VFR (Visual Flight Rules) Day Flights:

* **ATOMATOFLAMES Acronym**:
  + Altimeter
  + Tachometer for each engine
  + Oil pressure gauge for each engine using pressure system
  + Manifold pressure gauge for each altitude engine
  + Temperature gauge for each liquid-cooled engine
  + Oil temperature gauge for each air-cooled engine
  + Fuel gauge indicating the quantity in each tank
  + Landing gear position indicator (if the aircraft has retractable landing gear)
  + Anti-collision light system
  + Magnetic direction indicator
  + ELT (Emergency Locator Transmitter)
  + Safety belts

### For VFR Night Flights (additional to ATOMATOFLAMES):

* **FLAPS Acronym**:
  + Fuses (spare set) or circuit breakers
  + Landing lights (if the aircraft is operated for hire)
  + Anti-collision lights
  + Position lights
  + Source of electricity (battery)

## For IFR (Instrument Flight Rules) Flights:

* **GRABCARD Acronym**:
  + Generator or alternator
  + Radio navigation equipment suitable for the route
  + Altimeter (sensitive)
  + Ball (slip-skid indicator)
  + Clock (with second hand or digital presentation)
  + Attitude indicator
  + Rate of turn indicator
  + Directional gyro (heading indicator)
  + **Additional Requirements:**
  + **Anti-Collision Light System**: Required for small civil airplanes certified after March 11, 1996. For those certified before this date, it is required only at night.
  + **Flotation Gear**: If operating for hire beyond power-off gliding distance from shore, approved flotation gear is required for each occupant.
  + **Restraint System**: An approved restraint system is required for all occupants aged 2 years and older.
  + **Shoulder Harnesses**:
    - For each front seat, if the airplane was manufactured after July 18, 1978.
    - For all seats, if the airplane was manufactured after December 12, 1986.

## §91.207 - Emergency Locator Transmitters (ELTs) Requirements

### ELT Battery Maintenance:

* **Replacement or Recharge:** ELT batteries must be replaced or recharged if:
  + The battery has been used for more than one cumulative hour.
  + The battery has reached 50% of its useful life (the useful life must be clearly marked on the transmitter).

### ELT Inspection:

* **Annual Inspection:** ELTs must undergo an inspection every 12 calendar months to ensure proper operation and compliance with safety regulations.

### Exceptions for ELT Requirement:

* **Ferry Flights:** Aircraft can be operated without an ELT if it is being ferried for the purpose of ELT repair or installation. Only required crew members may be carried during these flights.

### ELT Exemptions:

* **Training Operations:** Aircraft conducting training flights entirely within a 50 nautical mile (nm) radius from the departure airport.
* **Design and Testing:** Flights necessary for aircraft design and testing purposes.
* **Crop Dusting:** Aircraft engaged in crop dusting operations.
* **Single-Person Aircraft:** Aircraft equipped to carry only one person.

### Temporary Operation without an ELT:

* An aircraft may operate without an ELT for up to 90 days if the ELT is removed for inspection, repair, modification, or replacement, provided that:
  + The aircraft records include a specific entry detailing the removal.
  + Specific placards are placed in view of the pilot indicating the absence of the ELT.

## §91.211 - Supplemental Oxygen Requirements

This regulation outlines when supplemental oxygen is required during flight:

* **Above 12,500 feet to 14,000 feet Pressure Altitude**:
  + If operating at these altitudes for more than 30 minutes, supplemental oxygen is required for the flight crew.
* **Above 14,000 feet Pressure Altitude**:
  + The minimum flight crew must use supplemental oxygen at all times while operating at or above this altitude.
* **Above 15,000 feet Pressure Altitude**:
  + Oxygen must be available for each occupant in the aircraft.

## §91.213 - Flying with Inoperative Equipment

This section outlines the protocol for determining whether an aircraft can be flown with inoperative equipment, focusing on the use of a Minimum Equipment List (MEL) and other considerations.

### MEL Consideration:

* If there's an approved MEL for the aircraft and the inoperative item is listed, you may fly as per the MEL's provisions.
* Without an MEL, further assessment is needed.

### Assessment Steps Without an MEL:

1. **Type Certification Requirements**: Is the equipment required by the aircraft's type certification?
2. **Aircraft's Equipment List or POH**: Is it listed as required in the aircraft's operating handbook or equipment list?
3. **Regulatory Requirements for IFR/VFR**:
   1. For IFR: Does it meet the equipment requirements outlined in §91.205 (GRABCRAD for IFR, ATOMATOFLAMES and FLAPS for VFR night)?
4. **Airworthiness Directives (ADs)**: Is the equipment subject to any AD that mandates its operation?
5. **Navigational Needs**: Is the equipment necessary for the type of navigation required for your flight plan?

### If All Answers Are "No":

* The aircraft can potentially be flown, but the inoperative equipment must either be removed or deactivated, appropriately placarded as inoperative, and the inoperative status logged in the aircraft's maintenance records.

### Key Considerations:

* **Safety and Compliance**: Ensure the inoperative equipment does not compromise the safety of the flight or violate any regulatory requirements.
* **Transparency**: It's crucial to document and communicate the status of any inoperative equipment clearly for the safety and awareness of others who may operate or fly in the aircraft after you.

This approach ensures that even in the absence of an MEL, pilots and aircraft operators can make informed decisions about the airworthiness and safety of their aircraft in relation to inoperative equipment.

## §91.215 - Transponder and ADS-B Requirements

Mode C Transponders with ADS-B (Automatic Dependent Surveillance-Broadcast) are mandated in the following airspaces and situations:

* **Class A, B, and C Airspaces**: Essential for operation within these controlled airspaces.
* **Above Class B and C Airspaces**: Required for flights above the ceiling of these airspaces.
* **Within Mode C Veils**: Necessary for all aircraft within the Mode C Veil areas surrounding certain airports.
* **At and Above 10,000 Feet MSL**: Applies to flights at or above this altitude, except when flying at or below 2,500 feet above ground level (AGL).
* **Crossing the ADIZ (Air Defense Identification Zone) Line**: Required for all aircraft entering or operating within the ADIZ.

## §91.409 - Annual and 100-Hour Inspections

### Inspection Requirements:

* **Annual Inspection:** Must be performed every 12 calendar months, with sign-off required by an Inspection Authorization (IA) holder.
* **100-Hour Inspection:** Required for aircraft used for hire, based on every 100 hours of tachometer time. This can be performed by an Airframe and Powerplant mechanic (A&P) or an IA.
* **Exceptions:** Aircraft operating under a special flight permit are exempt from the annual and 100-hour inspection requirements.
* Inspection Acronyms:
* **A1TAPE or AVIATE:** Mnemonics used to remember required inspections, which are critical for both the written test and oral exams:
  + **Annual** and **100-Hour** inspections as detailed above.
  + **Transponder** inspection every 24 calendar months.
  + **Airworthiness Directives (ADs)** compliance.
  + **Pitot-Static** system inspection every 24 calendar months (required for IFR-rated aircraft operating in controlled airspace).
  + **ELT (Emergency Locator Transmitter)** inspection criteria: after 1 hour of cumulative use, if 50% of the battery's useful life has elapsed, or every 12 calendar months.

## §91.411 - Pitot-Static Test

* **Frequency**: The pitot-static system must be tested and inspected at least every 24 calendar months.
* **Documentation**: Logbook entries must reference §91.411 to document compliance with this requirement, ensuring the accuracy of airspeed, altitude, and vertical speed indicators for IFR operations.

## §91.413 - Transponder Test

* **Requirement**: Transponders must be tested and inspected at least every 24 calendar months to ensure they are functioning correctly and comply with regulations.
* **Documentation**: Logbook entries documenting the completion of transponder tests must reference §91.413.

## §91.417 - Maintenance Records

* **Record Keeping**: Maintenance records for each aircraft, including the airframe, engine(s), and propeller(s), must be meticulously maintained.
* **Contents of Records**: Records should include the date of work completion, description of the work performed, and the signature of the person approving the aircraft's return to service.
* **Annual Inspection Authority**: For annual inspections, the signature must be accompanied by an "I.A." (Inspection Authority), indicating that the mechanic is authorized to conduct and sign off on annual inspections.

## §97.3 - Approach Category Speeds

* **Categories Defined by Approach Speed:**
  + **Category A:** Speed less than 91 knots.
  + **Category B:** Speed 91 to 120 knots.
  + **Category C:** Speed 121 to 140 knots.
  + **Category D:** Speed 141 to 165 knots.
  + **Category E:** Speed greater than 165 knots.

This guide is provided for informational purposes only and is not intended to be used in isolation as a legal document. For any legal purposes or detailed understanding of aviation regulations, it is essential to refer directly to the relevant sections of the Federal Aviation Regulations (FARs). The information contained within this guide aims to assist in the study and comprehension of instrument flying regulations but must be supplemented with official sources and guidance from aviation authorities and professionals.