V.A. Air Traffic Control Clearances

References: 14 CFR part 91, Instrument Flying Handbook (FAA-H-8083-15), Instrument Procedures Handbook (FAA-H-8083-16)

Objectives	The student should develop knowledge of the elements related to communications with ATC as well as copying and read back of an IFR clearance.
Key Elements	1. Pilot/Controller Responsibilities 2. C-R-A-F-T 3. Always clarify instructions if confused
Elements	1. Air Traffic Clearance 2. Pilot & Controller Responsibilities 3. Obtaining an IFR Clearance 4. Tower En Route Control 5. Setting Com and Nav Frequencies
Schedule	1. Discuss Objectives 2. Review material 3. Development 4. Conclusion
Equipment	1. White board and markers 2. References
IP's Actions	1. Discuss lesson objectives 2. Present Lecture 3. Ask and Answer Questions 4. Assign homework
SP's Actions	1. Participate in discussion 2. Take notes 3. Ask and respond to questions
Completion Standards	The student understands the ATC communication system, the format behind an IFR clearance, as well as how to obtain a clearance when necessary.

Instructors Notes:

Introduction:
   Attention
   Interesting fact or attention-grabbing story

   Overview
   Review Objectives and Elements/Key ideas

   What
   This lesson will examine the responsibilities of the controller and pilot in regards to communicating in the IFR world. You will also learn to the format of an IFR clearance, which is required for every IFR flight, and finally how to most efficiently set up your communication equipment for flight.

   Why
   Communication is a huge part of IFR flight. Due to potentially restricted visibility, communication with ATC becomes essential for safety. The understanding of that communication is therefore imperative.

How:

1. **Air Traffic Clearance**
   A. An authorization by ATC, for the purpose of preventing collision between known aircraft, for an aircraft to proceed under specified traffic conditions within controlled airspace
   B. Standard IFR Clearance
      i. Prior to any IFR flight, the pilot must obtain an IFR clearance (FAR 91.173)
      ii. Clearance Contents (CRAFT)
         a. **C**learance Limit: Usually the destination airport
            • Occasionally a short-range clearance to a fix within or just outside the terminal area and provides frequency on which the long-range clearance will be received
         b. **R**oute: Departure procedure, en route fixes
            • Often "as filed," but may be changed for established flow patterns or preferred routes
            • Pilot's responsibility to notify ATC if unable to comply with clearance
               a For example, radio equipment unable to receive necessary signals, or no RNAV
         c. **A**ltitude: Initial altitude
            • "Cruise" altitude (not common) assigns a block from min IFR altitude to the cruise altitude
               a Within this block climb, descent, and level-off are at pilot's discretion
               b Once the pilot begins descent and verbally reports leaving an altitude, he/she may not climb back to that altitude without further clearance
         d. **F**requency: Departure control
         e. **T**ransponder Code: Squawk
         f. Often you will know most of this information before copying
            • Have the CRAFT information pre-filled. Line out/update any information as required
   C. During preflight, when "Ready to copy" inform the controller and copy in the CRAFT format
   D. Clearance Read Back
      i. Promptly read back the clearance in the CRAFT order
      ii. Inform ATC of any items you missed; correct any errors and read back those items again to confirm
      iii. Note "read back correct" from the controller

      iv. Ensure appropriate phraseology is used
          a. AIM Pilot Controller Glossary
   E. Interpretation, Clarification, Change of an ATC clearance
      i. Interpretation
          a. Know what to expect from the controller
- CRAFT
- Pilot Controller Glossary
- En route locations of nav facilities, waypoints, etc., Departure Procedures

      ii. Clarification and Change
          a. Once the clearance is accepted, you are required to comply with ATC instructions
- You may request a clearance that is different from what was received

          b. Always request clarification/amendment anytime a clearance is not fully understood or is unsafe

2. **Pilot & Controller Responsibilities** (AIM 5-5-2, Chapter 1 of Instrument Procedures Handbook)
   A. Pilot
      i. FAR 91.173 – To operate under IFR in controlled airspace, a pilot must:
          a. File an IFR flight plan and obtain an ATC clearance
      ii. Acknowledge receipt and understanding of the ATC clearance
      iii. Request clarification or amendment, as appropriate, any time clearance is not fully understood
          a. Or considered unacceptable from a safety standpoint
          b. Required to contact ATC if unable to meet required climb gradients/rates
- If unable to maintain departure procedure climb gradient you must depart under VMC

      iv. Readback any part of a clearance containing hold short instructions
      v. Promptly comply with the ATC clearance except as necessary to cope with an emergency
          a. Advise ATC as soon as possible and obtain an amended clearance if deviation is necessary
      vi. Pilot is always responsible to see and avoid traffic when operating in VMC
      vii. PIC is directly responsible for and the final authority as to the operation of the aircraft (FAR 91.3)
          a. In emergencies, PIC may deviate to the extent necessary to maintain safety
   B. Controller
      i. Issuing appropriate clearances for the operation to be conducted
      ii. Assigning altitudes above the minimum IFR altitudes in controlled airspace
      iii. Ensuring pilot acknowledgement/read back of clearances
          a. If incorrect, distorted, or incomplete, makes corrections as appropriate
      iv. Departure Procedures
          a. Including departure procedures as part of the ATC clearance when necessary
          b. Specifying direction of takeoff, obtaining pilot concurrence that the procedure complies with local traffic patterns, terrain, and obstruction clearance

3. **Obtaining an IFR Clearance**
   A. Towered Airport
      i. Clearance is received from Clearance Delivery, if available, otherwise Ground
   B. Non-Towered Airport
      i. Determine how to obtain a clearance from the airport (Chart Supplement), options include:
          a. Contact the FSS on the ground by phone, and they will request the clearance from ATC
          b. Contact ATC by radio or by phone (if published in the Chart Supplement) while on the ground
          c. Depart VFR and pickup your IFR clearance from ATC while airborne
          d. Use a Remote Communications Outlet (RCO) to contact a FSS
          e. UNICOM may be able to contact ATC
      ii. Clearance Void Time

        a. Typically, when a clearance is given to a pilot on the ground at an uncontrolled field, a clearance void time, or a time by which the pilot must depart, is issued
- Clearance is automatically canceled if takeoff is not made prior to the specified time
- This departure time "reserves" your space within the IFR system

        b. If the void time has passed without departing, you must contact ATC and advise your intentions
- Obtain a new clearance or cancel the IFR flight plan
- Failure to contact ATC within 30 min after the void time will result in search and rescue
- Other IFR traffic for the airport is suspended until contacting ATC or 30 min after void time
- Pilots departing at/after their void time are not afforded IFR separation and may be in violation of FAR 91.173 requiring an appropriate clearance

4. **Tower En Route Control (TEC)**
   A. Control of IFR en route traffic in delegated airspace between two or more adjacent approach facilities
      i. An ATC program that uses overlapping approach control radar services to provide IFR clearances
      ii. You are routed by airport control towers, and departure/approach controllers
      iii. Allows flight beneath the en route structure
      iv. Usually for aircraft operating below 10,000' and flights less than 2 hours
   B. Advantages
      i. Designed to expedite traffic and reduce control and pilot communication requirements
      ii. Abbreviated filing procedures, fewer delays and reduced traffic separation requirements
   C. There are many locations where instrument flight can be conducted entirely in terminal airspace
      i. TEC routes can be found in the Chart Supplement

5. ***Setting Com and Nav Frequencies**
   A. Setup of all com/nav info according to the clearance received creates a much smoother flight
      i. Com Setup:
         a. Com 1: Departure Frequencies (Tower in the active frequency and Departure in standby)
         b. Com 2: Arrival Frequencies
   B. Set Heading Indicator bug on initial assigned departure heading
   C. Bug the initial altitude
   D. Enter/check assigned route in the GPS and activate flight plan
   E. Using primary navigation system (GPS): Enter and check the frequency and ID of first station
      i. Set OBS to initial course
   F. Set secondary NAV radio to the frequency of the approach facility (e.g., ILS) that would be used in case of emergency return to the departure airport in IMC
   G. Check transponder set to assigned code and on standby until ready for T/O, then switch to ALT mode

Conclusion:
Brief review of the main points

PTS Requirements:
  To determine that the applicant exhibits instructional knowledge of air traffic control clearances by describing:
1. Pilot and controller responsibilities to include tower, en route control, and clearance void times.
2. Correct and timely copying of an ATC clearance.
3. Ability to comply with the clearance.
4. Correct and timely read-back of an ATC clearance, using standard phraseology.
5. Correct interpretation of an ATC clearance and, when necessary, request for clarification, verification, or change.
6. Setting of communication and navigation frequencies in compliance with an ATC clearance.