Flight Operations Manual

University of Central Missouri
Version 13.1

3/10/2021

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Section 1 – REVISIONS

Revision Instructions

1) Revisions will be consecutively numbered.
2) The revision notice will instruct you as to which pages are updated.
3) To ensure that the manual is always current, the person responsible for this manual must complete the revision on the effective date or immediately upon receiving the revision.

Revision Record

Revision Number	Revision Date	Section	Page
Original	10/20/04	All	All
2	08/22/07	All	All
3	05/22/08	9	All
4	08/13/08	4,5,6,7,8	All
5	07/01/09	All	All
6	08/01/10	All	All
7	08/01/12	All	All
8	02/14/2013	All	All
9	03/25/2013	4,5,6,7	23, 59, 114-115,119, 137, 142, 162, 195, 227, 255, 263, 271
10	4/17/2013	1, 3, 8	1, 12, 17, 18
10.1	5/10/2013	4,6,7	33, 68, 153, 154, 177, 188, 189, 212, 223, 224, 246, 256, 257
10.2	8/11/2013	3, 4, 5, 6, 7, 8	7, 9, 10, 13, 16, 17, 23, 24, 110, 112, 114, 133, 135, 137, 153, 212, 223, 246, 256, 285, 286, 288, 290, 293
10.3	8/19/2013	8, 9	294-297, 299, 300, 302-305, 307-310
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12	2/1/2018	All	All
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Section 2 – COURSES

This standardization manual is designed as a reference source for all flight training courses. Flight course information, UCM policies and procedures, and flight maneuvers are explained.

It is understood that there are acceptable variations to different maneuvers, some more so than others. UCM has developed the most effective and efficient training methods for our program. Remember this text was created for the students' benefit and should be the primary reference for all maneuvers done at UCM.

Each maneuver will include a list of references indicating where further information about the maneuver may be obtained. UCM strongly suggests the references be used to help develop a complete understanding of each maneuver prior to attempting them in flight.

Jeppesen Flight Syllabi

All of the courses listed below follow the Jeppesen Flight Syllabus. (If you are in the UCM Commercial Syllabus please see the Chief Flight Instructor or the SOF.) These are available for purchase at the airport terminal building. If further assistance is needed, please feel free to speak with the Chief Flight Instructor, Assistant Chief Flight Instructor; Supervisor of Flight, or one of the Check Instructors.

FLYA 1320 Private Flight A 1.0 SH Credit

The student will progress from Unit 1 through Unit 13. PVT 1 Oral/Flight (Unit 10 which comes after Unit 8) is the Stage 1 Check administered by the Chief Flight Instructor, Assistant Chief Flight Instructor, or Check Instructor. The student will complete the Private A written test in Blackboard prior to signing up for the Stage 1 Exam. The student will complete the FAA Aeronautical Knowledge Exam for Private Pilot Airplane prior to signing up for Private Flight A. In order to enroll in Private Flight A the student must meet the requirements of the Pre-Aviation semester, see training information in Section 3 for more information.

FLYA 1321 Private Flight B 1.0 SH Credit

_The student will progress from Unit 14 through Unit 26. PVT 2 Oral/Flight (Unit 20) is the Stage 2 Check. PVT Final Oral/Final (Unit 26) is the End of Course Check. All Checks are administered by the Chief Flight Instructor, Assistant Chief Flight Instructor, or Check Instructor. The student will complete the Private Flight B written test in Blackboard prior to signing up for the End of Course Check. At the completion of this course the student will have met the requirements for the Private Pilot Practical Test.

FLYA 3310 Commercial Flight A 1.0 SH Credit

_The student will progress from Unit 30 through Unit 36. For Jepp COM 141v3 COM 1 Oral/Flight is Unit 36 and is the Eval 1 Check. For Jepp COM 141v4.1 COM 1 Oral/Flight takes place in between Units 36 and 37 and is the Eval 1 Check. The COM 1 Oral/Flight will be administered by the Chief Flight Instructor, Assistant Chief Flight Instructor, or Check Instructor. The student will also complete the Commercial Flight A written test in Blackboard prior to signing up for the Eval 1 Check.

FLYA 3311 Commercial Flight B 1.0 SH Credit

The student will progress from Unit 37 through Unit 40. For Jepp COM 141v3 COM 2 Oral/Flight is Unit 40 and is the Eval 2 Check. For Jepp COM 141v4.1 COM 2 Oral/Flight is in between Units 40 and 41 and is the Eval 2 Check. The COM 2 Oral/Flight will be administered by the Chief Flight Instructor, Assistant Chief Flight Instructor, or Check Instructor. The student will also complete the Commercial Flight B written test in Blackboard prior to signing up for the Eval 2 Check.

FLYA 2313 Instrument Flight A 1.0 SH Credit

The student will progress from Unit 1 through Unit 13. INST 1 Oral/Flight (Unit 13) is the Stage 1 Check administered by the Chief Flight Instructor, Assistant Chief Flight Instructor, or Check Instructor. The student will also complete the Instrument Flight A written test in Blackboard prior to signing up for the Stage 1 Check.

FLYA 2314 Instrument Flight B 1.0 SH Credit

The student will progress from Unit 14 through Unit 29. INST 2 Oral/Flight (Unit 23) is the Stage 2 Check. INST Final Oral/Flight (Unit 29) is the End of Course Check. All Checks are administered by the Chief Flight Instructor, Assistant Chief Flight Instructor, or Check Instructor. The student will complete the Instrument B written test in Blackboard prior to signing up for the Stage 2 Check. The student will complete the FAA Aeronautical Knowledge Exam for Instrument Airplane prior to signing up for Instrument Flight B. At the completion of this course the student will have met the requirements for the Instrument Rating Practical Test.

FLYA 3312 Commercial Flight C 1.0 SH Credit

The student will progress from Unit 41 through Unit 51. COM C Oral/Flight (Unit 44) is the Stage 4 Check administered by the Chief Flight Instructor, Assistant Chief Flight Instructor, or Check Instructor. The student will also complete the Commercial Flight C written test in Blackboard prior to signing up for the Stage 4 Check.

FLYA 3315 Commercial Flight D 1.0 SH Credit

The student will progress from Unit 52 through Unit 67. COM D Oral/Flight (Unit 67) is the Stage 5 Check administered by the Chief Flight Instructor, Assistant Chief Flight Instructor, or Check Instructor. The student will also complete the Commercial Flight D written test in Blackboard prior to signing up for the Stage 5 Check. The student will complete the FAA Aeronautical Knowledge Exam for Commercial Pilot Airplane prior to signing up for Commercial Flight D.

FLYA 3316 Commercial Flight E 1.0 SH Credit

The student will progress from Unit 68 through Unit 76. COM E Oral/Flight (Unit 76) is the Eval 3 Check administered by the Chief Flight Instructor, Assistant Chief Flight Instructor, or Check Instructor. The student will also complete the Commercial Flight E written test in Blackboard prior to signing up for the Eval 3 Check.

FLYA 3317 Commercial Flight F 1.0 SH Credit

The student will progress from Unit 77 through Unit 87. COM Final Oral/Flight (Unit 87) is the End of Course Check administered by the Chief Flight Instructor, Assistant Chief Flight Instructor, or Check Instructor. The student will complete the Commercial F written exam in Blackboard prior to signing up for the End of Course Check. At the completion of this course the student will have met the requirements for the Commercial Pilot Practical Test.

Section 3 – GENERAL INFORMATION

Administrative

General

1) All operations will be conducted in accordance with current Federal Aviation Regulations and UCM policies.
2) All phases of training will be conducted in a professional manner. Individuals not adhering to professional standards of conduct and dress will not be allowed to conduct training and will be charged a NO SHOW.
3) Identification of airport personnel and flight students will be worn at all times.
    a. Students will display their university I.D. or have their photograph uploaded to their ETA profile.
    b. University employees will display their assigned I.D.

TSA Requirements

1) US Citizens are required to prove citizenship when receiving flight training toward a recreational pilot, sport pilot, private pilot, instrument rating or multiengine rating. Proof of citizenship includes:
    a. Valid, unexpired U.S. passport.
    b. Original birth certificate and government-issued picture ID.
    c. Original certification of birth abroad with raised seal and government-issued picture ID.
    d. Original certificate of U.S. citizenship with raised seal, or a Certificate of Repatriation, and government-issued picture ID.
    e. Original U.S. Naturalization Certificate with raised seal and government-issued picture ID.
2) A logbook endorsement will be given to the student upon proof of citizenship by their flight instructor.
3) Any non US citizen is required to receive TSA approval for flight training and must see the Chief Flight Instructor to begin the approval process.
4) Upon receiving the endorsement, the instructor will enter a currency into ETA.

Medical Certificates

Student pilots planning to pursue a Professional Pilot degree are recommended to obtain a first (1st) class medical prior to receiving flight training. All other aviation students are required to obtain a minimum of a second (2nd) class medical prior to receiving flight training.
Student pilots utilizing VA benefits for any flight training for a certificate or rating must obtain AND maintain a second class medical.

1) One introductory flight may be received while waiting for the medical.
2) A list of current Aviation Medical Examiners may be obtained from a flight instructor or the dispatcher.

Training

1) Each degree seeking student shall be enrolled in a flight course in order to conduct flight training at UCM.
    a. Class enrollment on campus meets this requirement.
    b. If a student has a "U" grade from previous semesters, that must be removed before a student will be allowed to enroll or train in any other flight course.
    c. Students training under Part 141 must complete an enrollment form and turn it into the Chief Flight Instructor, Assistant Chief Flight Instructor or a Check Instructor.
2) Incoming Professional Pilot students will be considered as "Pre-Aviation" students for the first semester and certain academic performance benchmarks must be met to be eligible to begin flight training:
    a. During the first semester, two courses will be required; AVIA 1310-FAA Private Pilot Requirements and AVIA 1903-Aviation History. These two courses will need to be completed with a final grade of "B" or better and the FAA Private Pilot Knowledge Test will need to be passed at the end of that semester. Students meeting this benchmark will be placed on the flight schedule and begin flight training the following semester.
    b. There is the possibility of beginning flight training during the first semester based on exemplary academic performance in AVIA 1310-FAA Private Pilot Requirements and AVIA 1903-Aviation History. At mid-term, the top academic performing students in these classes will be identified and the opportunity to begin flight training at that time may be offered to them, based upon resource availability.
3) Prior to scheduling a Practical Test the student must meet with the SOF and the following must be accomplished:
    a. Evidence of course completion
        i. Graduation Certificate. (Part 141 only)
        ii. Applicable aeronautical experience requirements met (Part 61 only)

iii. Proper logbook endorsements from their flight instructor.
iv. Original copy of written test results (if applicable).
v. Application for Airman Certificate/Rating (either on IACRA or FAA form 8710-1) **completed and signed** by the students' flight instructor.

Request for Advanced Placement in Flight Courses

Each student requesting advanced placement in flight courses or requesting credit for previous flight experience will

1) Present the request to the chief flight instructor.
2) Complete an oral and flight evaluation to determine the entry point in the UCM training course for the desired rating sought.
3) 14 CFR Part 141.77 requires that a student may be given credit towards the curriculum requirements of a course for previous pilot experience and knowledge, provided the following conditions are met:
   a. If the credit is based upon a part 141-approved training course, the credit given that student for the previous pilot experience and knowledge may be 50 percent of the curriculum requirements and must be based upon a proficiency test or knowledge test, or both, conducted by the receiving pilot school;
   b. Credit for training specified in paragraph (c) (1) or paragraph (c) (2) of 141.77 may be given only if the previous provider of the training has certified in writing, or other form acceptable to the Administrator as to the kind and amount of training provided, and the result of each stage check and end-of-course test, if applicable, given to the student.
   c. If the credit is not based upon a part 141-approved training course, the credit given that student for the previous pilot experience and knowledge shall not exceed more than 25 percent of the curriculum requirements and must be based upon a proficiency test or knowledge test, or both, conducted by the receiving pilot school;
   d. The receiving school determines the amount of course credit to be transferred.

Request for Credit for Certificates or Ratings Held

1) Each student that is requesting university credit based upon the possession of an FAA certificate or rating.
   a. Must complete an Application for Evaluation of Official Certifications, Licenses, Diplomas and Work Experience for College Credit form.
   b. Complete an end of course oral and flight evaluation for the certificate or rating.
2) Exceptions for those students seeking a degree in:
   a. Professional Pilot degree programs
      i. May not enter with any certificate higher than Private pilot with Instrument Rating.
      ii. Students entering with an Instrument Rating will not be eligible for the restricted ATP.
      iii. Commercial rated pilots must select another degree option.
   b. Flight Operations Management must complete one certificate or rating at UCM.

Flight Training Syllabus

1) All flight training will follow the approved Syllabus.
2) All students must have a printed syllabus appropriate to the training being received.
3) The student will have the syllabus at the airport for each flight lesson in order to prepare for the training activities of that day.
4) Each lesson in the syllabus will be completed unless approval for advanced placement has been granted.
5) All written tests, evaluation rides, and stage checks will be completed for each course regardless of whether the student is training under part 141 or part 61. No stage checks will be combined.

Training Records

1) The activity of each assigned flight activity will be recorded in ETA. There should be an entry for every day that the student is scheduled to attend.
2) After the student completes the End of Course stage check, if they want to review ground or procedures in an airplane or simulator, use the Refresher request.

Flight Scheduling

Flight training schedules will consist of weekly flight training periods.

1) Monday, Wednesday & Friday.
2) Tuesday & Thursday

The exact times will be determined based upon student and flight instructor availability. The scheduling of students to their flight slot will be conducted during the fall and spring semester finals weeks. The scheduling process is:

1) The student arrives and fills out their availability time sheet.

   a. The student must have their class schedule and work schedule (if practical).
   b. The student must be enrolled in the flight class they wish to complete the semester they are signing up for.
2) The student will present the availability sheet, class schedule and work schedule to the Scheduler.
3) Based on the availability sheet, instructor request, flight course the student is enrolled in, and resource availability, the Scheduler will determine which flight slot the student will be in and what instructor they will be with.
4) The scheduler will then assign the student a flight block.

If a student is unable to arrive in person during the scheduling time, the student must make arrangements by phone to ensure a scheduled flight block. The Scheduler will fill out the students' availability sheet for the student during the phone scheduling session. If no prior arrangements are made, the student will not be able to sign up for a flight slot until after all scheduling has occurred.

Ground Instruction

1) All ground instruction will be recorded in ETA and charged the ground instruction rate.
2) All ground instruction must take place at the airport or via zoom.
3) Each flight will have a minimum 12 minute preflight and 18 minute post flight briefing.
   a. The preflight should detail the lesson objectives, review procedures and maneuvers already introduced, and introduce new material.
   b. The post flight briefing should review the maneuvers performed during the flight, review the performance of these maneuvers, record the training in the appropriate records and logbooks and assign study materials for the next lesson.
   c. Additional time may be necessary.
4) When administering a pre-solo written exam, total time for test completion and corrections will be billed to student.

Flight Training Attendance

1) Upon arrival at the airport to receive any type of instruction, the student must check in with the dispatcher. If not checked in, the student's attendance may not be recorded and a no show may be incurred.
2) Students will attend all flight classes regularly until the course requirements are completed. Absence does not relieve the student of the responsibility for meeting all course requirements.
3) Approved absences are listed in the university student handbook and include;
   a. Illness which prevents flying or ground training.
   b. Death of an immediate family member.
   c. Weather prohibited flight training. (The student will be notified by their instructor. Otherwise plan to do ground instruction.)
   d. FAA Tests
      i. Practical tests
      ii. Written tests
   e. Approved University activities (Written excuse must be submitted.)
      i. Field trips
      ii. Campus Activities
      iii. Aviation Fraternity Activities.
   f. Instructor illness. (The student will be contacted ASAP)
   g. Examples of unexcused absences include, but are not limited to:
      i. Sports training times
      ii. Music/choir practice
      iii. Work
      iv. Homework
      v. Paper due or a class assignment.
4) Notification of an approved absence must be submitted to the Chief Flight Instructor, Assistant Chief Flight Instructor or the Supervisor of Flying (SOF) at least two hours in advance.
5) If time does not allow for the two hour minimum, the student will phone the airport and discuss the situation with the Chief Flight Instructor, Assistant Chief Flight Instructor, or the Supervisor of Flying (SOF).
6) Notify the assigned flight instructor as well, but they are not authorized to excuse any absence.
7) An unexcused absence or failure to adhere to this policy will result in a NO SHOW. (Refer to NO SHOW section of this manual to see ramifications).
8) The dispatcher will record NO SHOWS and any other absences in the student's training record.

No Shows

1) All un-excused NO SHOWS will deduct 2 hours' worth of ground instruction from the student's flight account.
2) Listed below are all the applicable reasons a student will receive a NO SHOW or UNPREPARED:
   a. If the student is 15 minutes late, the dispatcher will automatically NO SHOW the student.
      i. The student may do ground or flight if time is available.
   b. If the student is unprepared, the instructor has the discretion to mark the lesson as "UNPREPARED". .
   c. Use of alcohol or drugs which prevents a student from flying during their assigned flight slot will not excuse the student from class attendance and result in an UNPREPARED
   d. If the student is not adhering to professional standards of conduct and dress will not be allowed to conduct training and will be charged an UNPREPARED.
3) If the student believes the NO SHOW should be excused, the student must contest the NO SHOW, with proof, within five (5) business days.
4) After two (2) un-excused NO SHOWS, the student must meet with the Chief Flight Instructor, after three (3) un-excused NO SHOWS the student must meet with the Chair of the School of Aviation and will be removed from the schedule for at least 60 days. Six (6) NO SHOWS will result in failure of the course.

Students of Concern

1) Any student displaying inappropriate behavior, unprofessionalism or unsafe practices and processes will be considered a student of concern. These specifically include:
   a. Any student that receives two (2) NO SHOWS in the same course.
   b. Any student that displays unprofessionalism.
   c. Any student that demonstrates unsafe flying.
2) All students of concern will be referred to the Review Board for evaluation of possible termination from the program.

Student Training Evaluation Program (STEP)

1) Any student struggling with aspects of pilot training throughout their flight course, yet displays a consistent attitude of professionalism and hard-work ethics, will meet with the UCM Standardization and Training Officers for a detailed Training Plan to assist in their flight goals. This also includes:
   a. Any student that unsatisfactorily completes a lesson three times.
   b. Any student that does not progress to the next lesson in a timely manner.
   c. Any student that fails a stage check twice.
   d. Any student identified by a CFI as needing further assistance.
2) The student will receive a mentor to which they will report.
3) Any student not progressing within the training plan in a timely fashion will meet with a Review Board. This includes, but it is not limited to:
   a. Any student that fails the same stage or evaluation checks (either oral or flight) three (3) times will be removed from the flight schedule and considered for termination by a review board.
      i. The third attempt at a stage or evaluation check will be completed with the Chief Flight Instructor, Assistant Chief, or a designated check instructor.
      ii. The Review Board may allow exceptions on an individual basis.
   b. Time specified in training plan.
4) A student may at any time consult with the Chief Flight Instructor if they believe that flight training is not progressing as desired.

Flight Fees

1) Flight fees will be deposited by the Student Services Coordinator with enrollment in flight courses. Funds will be removed from the balance as expenses at the airport are incurred.
   a. Course fees are based on the average amount of hours required to complete a course. Additional funds may be required to complete the course.
   b. If a course is completed in less hours the remaining funds can be credited to the student.
2) A student is expected to fly a minimum of 20 flight hours for each one-semester hour in which they are enrolled and should plan for these expenses.
3) The costs per flight hour will vary based on which aircraft is flown. The cost of ground training is the same as flight training
   a. In addition to the basic aircraft rental cost, the student will pay for flight and ground instruction.
   b. The instructor giving the ground instruction will ensure a reservation is made in scheduling system, and the student is checked out and checked in by the dispatcher and the appropriate amount of ground time is recorded.

4) If the student fails to attend a scheduled session, they will be charged a NO SHOW fee of 2 hours of ground instruction.
5) The **student** is responsible for monitoring the flight account to ensure there is a positive balance to continue flight training on a daily basis. There must be plan for sufficient funds to fly for the entire semester.
6) Dispatchers will not allow a student to fly if there is a negative balance unless:
   a. The student has made prior arrangements with the airport accounting office and the student has been given permission for a negative bypass on the system.
   b. Renter pilots may pay by the flight as long as prior arrangements have been made with the office professional.
7) The rates for instruction and aircraft rental are posted next to the dispatch desk. This list is updated as necessary to cover any increased costs associated with operation of the aircraft. A request for a copy may be made at any time from the dispatcher.
8) All students will be responsible for paying the difference of fuel costs when leaving Skyhaven, if the fuel cost exceeds above $1.00 a gallon from Skyhaven's published fuel prices.

Rolling Enrollment

1) Any student that enrolls in a flight course after the last day to add a class, as published by the university, will be considered a rolling enrollment. Rolling enrollments will be issued a "U" grade at the end of the semester and will have 16 academic weeks (from the date of enrollment) to complete the requirements of the course.
2) Any student not meeting the FAA knowledge test requirement for the next course to be enrolled in will have 1 week to complete the FAA knowledge test for that course before being removed from the flight schedule.

Incomplete Grades

1) Receiving an incomplete grade is not a student option except for rolling enrollments. Incomplete grades are assigned at the discretion of the Chief Flight Instructor. DO NOT assume you will receive a "U"grade for incomplete work. If a student receives a "U" grade they have the next semester to complete the course requirements. If the requirements are not completed, the university will change the "U" to an "F" and you will be required to re-enroll in the course and complete the requirements.

Pre-Training Briefings

1) Pre training briefings will consist of flight training information pertinent to the course in which the student is enrolled and will include the course description, grading system, U grades, airport costs, flight fees and required written exams.
2) Pre-training briefings will be conducted anytime a new flight class is started
3) The student will meet with the Supervisor of Flight to cover the areas outlined on the Pre-Training Briefing checklist.

UCM Flight Information Files (FIF)

1) The FIF page of ETA contains important and timely information pertinent to flight operations at UCM.
2) Each person requesting to use a UCM aircraft or flight training device shall read all published FIFs prior to being dispatched and confirm on their ETA account they have read them.

Dress Code

1) Students will dress appropriately when receiving **any ground or flight** training.
2) Clothing should be appropriate to the day's weather conditions, i.e. coats, hats, and gloves during cold weather.
3) The following items are prohibited at all times:
   a. Shorts that are shorter than fingertip length.
   b. Offensive graphics on T-shirts or other clothing.
   c. Sleeveless shirts.
   d. Low cut shirts.
   e. Skirts or dresses.
   f. Tube tops.
   g. Ragged, poorly cut off or excessively worn shorts.
   h. Open toe shoes, sandals, heels, or flip flops.
   i. Clothing or jewelry that presents a safety issue.

Training vs. Rental

1) All training flights must be:
    a. Approved by a UCM flight instructor.
    b. Released through the UCM dispatcher.
    c. In compliance with the FARs and UCM policies.
2) Pilots desiring to carry passengers will do so as a rental operation:
    a. Rental policy rules will apply.
    b. Rental time will not be counted as training time towards any syllabus.
3) UCM flight students may be allowed as an observer when the student and instructor agree and they do not create a distraction to training.
    a. The observer must be observing training that is similar to their own, i.e. student pilots may observe other student pilots.

Food/Beverages

1) No food or beverages of any type, other than bottled water, are to be carried in any UCM aircraft or simulators.
2) The use of tobacco is prohibited in all UCM aircraft and simulators.

Aircraft Rental

1) Aircraft rental is any personal use of an aircraft in which the flight is not part of any UCM training syllabus.
    a. Any flight with passengers is considered a rental flight.
2) To rent an aircraft from UCM, the renter must:
    a. Hold a pilot certificate other than Student Pilot.
    b. Hold a current and appropriate medical certificate.
    c. Meet any currency requirements per the FARs.
    d. Receive a rental checkout from an authorized UCM flight instructor in each type of aircraft they intend to rent.
        i. The checkout content and length will depend upon the certificates, flight experience, and the type of aircraft in which a checkout is being received. Refer to Rental Checkout Qualifications Chart below.
        ii. All checkouts must be arranged through the Chief Flight Instructor, Assistant Chief Flight Instructor, or Check Instructor.
3) IFR rental privileges also require the following:
    a. Instrument currency per FARs.
    b. Instrument stand ride from the Chief Flight Instructor, Assistant Chief Flight Instructor, or Check Instructor.
    c. Weather limitations based on actual IFR experience as outlined in the IFR Privileges Chart.
4) Renter pilots are not authorized to use the aircraft to give or receive flight instruction.
5) No intentional single engine operations or repetitive takeoffs and landings are permitted in multi-engine aircraft during rental flights.
6) Aircraft that are rented for overnight trips require approval of Chief Flight Instructor, Assistant Chief Flight Instructor, or Check Instructor and may be charged a minimum of 3 hours aircraft rental time for each night out, unless prior arrangements have been made with the Chief Flight Instructor.
7) All rental flights not flown in the vicinity of Skyhaven must file a FAA flight plan and leave a copy with the dispatcher with a contact phone number.
8) Landings are to be made on paved runways **ONLY** unless prior authorization is given.

9)

Rental Checkout Qualifications

Aircraft Type	**Total Time**	**Time in Type/Class**	**And/or**	**Hours Dual Checkout**
Single engine, fixed gear	35	5	And/or	1-3
Baron	300	25 (Multi)	And	3-5

IFR Privileges Chart

Actual IFR Experience	Ceilings	Visibility
0-15	1,000' AGL	3 SM
16-25	600' AGL	2 SM
26 or more	Minimums	Minimums
Night IFR	1,000' AGL	3 SM

Aircraft Retrieval

If a stranded aircraft that a student or renter has been dispatched must be retrieved, the student or rental will be charged as follows:

1) Aircraft stranded for mechanical reasons will be retrieved at no cost.
2) Aircraft stranded for weather or any non-mechanical reason will be charged for flight time and pilot time as appropriate to retrieve it.

Dispatch Operations

Aircraft Priority List

Aircraft are dispatched to flight students and renters on a priority basis. Anytime there is an aircraft shortage due to maintenance on the aircraft, the following priorities are:

1) Check Rides
2) Stage/Evaluation Checks
3) Assigned Flight Slots
4) Arranged Flight Training
5) Reserved Rental Flights

Administrative flights are determined by the SOF as far as priority.

Preflight Action Sheets

1) Preflight action requirements per FAR 91.103 will be completed prior to any dispatch of UCM aircraft.
2) Conditions to be computed include but are not limited to the following:
   a. Weather conditions.
   b. Density altitude.
   c. Aircraft performance and limitations.
   d. Weight and Balance.
   e. NOTAMS & TFRs
   f. The only official briefing source authorized by UCM is (800)WXBRIEF OR WWW.1800WXBRIEF.COM
3) Completion of the UCM Preflight Action sheet will meet the above requirements.

Dispatch Procedures

Receiving an aircraft from the dispatcher requires the following:

1) A current and complete preflight sheet presented to the dispatcher and cross-country flight plan, if applicable.
2) PIC Authorization of the activity.
3) Adequate funds available in the student's flight account.
4) An inspection of logbooks and certificates for proper endorsements, checkouts, and ratings is required for student pilots or certain rental flights.

Inoperative Equipment and Discrepancies

1) Each pilot will review the aircraft discrepancy card and review inspection statuses in RMS at http://www.talon-systems.com/ucm/rms (username: student, password: student) to ensure airworthiness prior to each flight.
2) If inoperative equipment is discovered during preflight inspection refer to FAR 91.213 and the aircraft POH to determine whether regulations require the equipment and what action to take prior to flight.
3) If assistance is needed, speak to a flight instructor or check instructor for help in determining the status of the aircraft.
4) Any question of airworthiness, inoperative equipment, or reliability of equipment should be recorded in the aircraft discrepancy log.
5) Record all discrepancies on the discrepancy form on the aircraft record book.
   a. Fill information out as completely as possible.
   b. Only one discrepancy per line. If there multiple discrepancies use multiple lines.
      i. Use more than one line for a discrepancy if needed.
      ii. Notify the dispatcher of the discrepancy upon return.
      iii. Return to service authorization is indicated on the discrepancy card and will be signed off by an A&P or the person doing an operational status check (ops check).
6) If inoperative equipment or a discrepancy is encountered away from Skyhaven Airport and repair is needed, the Director of Maintenance, Chief Flight Instructor, or Assistant Chief Flight Instructor must give authorization for repair.

Ramp Operations

Preflight and Starting
1) Preflight and starting will be accomplished with the checklist provided for each airplane.
2) If the checklist is missing, notify dispatch and use the checklist in the aircraft POH.
3) **Hand Propping of aircraft is not allowed!**
   a. Contact maintenance for assistance.
   b. If maintenance is not available, aircraft will be grounded.

Taxiing and Run-Ups
1) Crosswind taxi techniques are expected during **all** taxi operations.
2) Use of mixture leaning techniques to prevent plug fowling is preferred.
3) Taxi at a speed and manner consistent with the surface, winds, and proximity of other aircraft or objects.
4) Turn on the taxi light as recommended in AC 91-73b.
5) Smooth application of power and brakes is expected, using only the minimum of either to move and control the aircraft.
6) Run-ups will be in areas well clear of the active runway, facing into the wind, with the propeller over a suitable surface.
7) Solo students are prohibited from pushing the aircraft back in the hangars. Park on the lower ramp.

Parking
1) All planes must be parked on the ramp.
2) The furthest South parking spot that does not have rope is not to be used as a parking spot.
3) Ideally, park at the furthest spot to the South and next to an airplane to make it easier for the next person to park their plane.
4) If Dispatch asks you to hangar the plane, park in front of the hangar and push the plane back (Note: this should include at least one employee).
5) All solo flights will be scheduled to return before line service leaves for the day.
   a. Due to seasonal changes in sunset if a solo flight must return after line service leaves it can be left on the ramp if good weather is expected the next day and low temperature is expected to be above 40F

Securing Of Aircraft
1) Aircraft will be parked in the designated areas and not in transient parking unless otherwise requested.
2) Aircraft will be tied down in the following manner:
   a. The rope will be run through the ring and pulled tight against the ring.
   b. A half-hitch will be tied tightly against the tie down ring.
   c. Any remaining rope will be tied off.
   d. Tie the wings first and then the tail.
   e. Aircraft control locks will be installed.
   f. Students at en route stops on cross-country flights are responsible for security of the aircraft.

Hangar Door Operations
Student Pilots may operate Hangar Doors if checked out by their instructor and successfully soloed. If a student damages a hangar door because of improper operation, they will be marked as 'Unprepared' and charged two (2) hours of ground;

1) WHEN OPERATING A HANGAR DOOR:
   a. Unlock the three hangar door locks, ensuring the locks are out of the door movement area.
   b. Ensure the locks are unlocked by visually confirming;
   c. Call out, "Clear door."
   d. Press 'Open' to open the door. Remain close to the operational controls to stop door movement during an emergency.
   e. Never walk under a door in motion.
2) When closing a hangar door:
   a. Visually confirm that there is nothing in the way of the door movement area;
   b. Call out, "Clear door";
   c. Press 'Close' to close the door. Remain close to the operational controls to stop door movement during an emergency;
   d. After door has closed, lock the three hangar door locks.
   e. Never walk under a door in motion.

Servicing Operations

1) Notify line service when fuel is needed.
2) Fuel sampling:
   a. If clean, fuel should be returned to the fuel tank.
   b. If contaminated and using GATS jar, filter fuel back into tank, otherwise fuel should be placed into red fuel cans positioned along the flight line.
   c. Under **NO** circumstances will fuel be dumped onto the ground.
3) Notify line service when oil is needed.
   a. Do not mix makes or grades of oil.
   b. The grade of oil currently in use can be found on the right side window of single engine aircraft and both sides on multi engine aircraft, or in the engine logbooks.
4) Students at en route stops on cross-country flights are responsible for supervision of aircraft servicing.

Starting Precautions

1) Follow any cold weather starting procedures as described in the POH.
2) Frosted spark plugs occur when the engine fires and then dies in below freezing conditions. Water has condensed and frozen on the tip of the spark plug. If this occurs, wait five minutes and try starting again.
3) Excessive cranking causes the starter to overheat and drains the battery. Avoid cranking for more than 10 seconds each start attempt. If after three 10 second periods there should be a two minute cooling period to avoid damage to the starter.
4) After engine start during cold weather operations, allow engine to idle between 800 - 1,000 RPM for 2 to 5 minutes to warm up.

Batteries

1) Report any low or dead batteries to dispatch or maintenance so that they may be charged or removed from the aircraft.
2) Frozen batteries may crack and allow corrosive chemicals to contact the aircraft structure.

Cold Weather Ramp Operations:

NOTE: All temperatures referred to below are reported “ground” temperatures.

1) Preheating:
   a. Use sump heater is recommended when air temperatures are below 40°F.
   b. Use of the sump heater or preheat is **required** when air temperatures are below 20°F, for the first flight of the day and thereafter if it’s been two hours since the last flight.
   c. Notify line service when preheat or electrical power source is needed.
2) Disconnecting Engine Sump Heater:
   a. Unplug the extension cord from the wall electrical outlet.
   b. Disconnect the aircraft engine sump heater plug from the extension cord.
   c. Coil the electrical extension cord neatly on the floor by the electrical outlet for subsequent use.
3) Connecting Engine Sump Heater:
   a. Confirm the extension cord is unplugged from the electrical outlet.
   b. Connect the aircraft engine sump heater plug to the extension cord first
   c. Connect the plug the extension cord into the wall electrical outlet.
4) Deicing:
   a. Absolutely no ice scrapers will be used on UCM aircraft.
   b. Use the soft bristle broom on metal surfaces only to remove snow.
   c. Rub windshield with soft rags only in a vertical motion.
5) Winter Kits - Install and remove winter kits according to the following:
   a. Above 20°F/-7°C – winter kits OFF
   b. At or below 20°F/-7°C – winter kits ON

Flight Operations

Stage and Evaluation Checks

1) To schedule a check, the flight instructor will submit the lesson request with no instructor named and no date. When the Scheduler posts the flight schedule, they will send a confirmation to the instructor and student.
2) Prior to scheduling a stage or evaluation check:
   a. The instructor must complete the Evaluation, Stage, or End of Course Checklist as appropriate.
   3) The Scheduler will schedule the stage and evaluation checks for the students during the students assigned flight time if possible.

Training Areas

1) All UCM training flights other than cross country flights will operate within one of the UCM training areas.
2) A training area will be selected and recorded by the dispatcher on the daily flight board.
3) Solo student pilots have priority to training areas 4 LOW and 5 LOW.
4) Each training area is limited to 4 aircraft. You may be contacted via radio by dispatch and asked to move out of areas 4 LOW or 5 LOW if needed for a solo student pilot.
5) Upon reaching 3,000' or beyond 3 n.m. from the airport, Whiteman Approach (127.45) will be used to provide flight following for the local areas as well as for cross countries.
6) Caution areas:
   a. The Victor airways north and southwest.
   b. The overlying Military Operations Area (MOA).
   c. The approach corridors for:
      i. GPS 19
      ii. GPS 01
      iii. VOR-A
7) Normal training areas are classified as low or high. A low training area is from 1,300 ft MSL to 4,000 ft MSL. A high training area is from 4,000 ft MSL to 8,000 ft MSL. Training areas are labeled 1 through 6. All aircraft training in high training areas will be in contact with Whiteman Approach for VFR flight following. The boundaries are described as follows and charted on a wall map near dispatch and in each training aircraft for reference purposes.
   a. Area 1 includes the East Kansas City Airport for landing practice. This area is **not** available for solo student pilots. The boundaries are:
      i. Northern – Missouri River and Highway 24.
      ii. Southern – I-70
      iii. Eastern – Highway 131
      iv. Western – Highway 7
   b. Area 2 includes the Higginsville and Lexington Airports for landing practice. This area is **not** available for solo student pilots. The boundaries are:
      i. Northern – Missouri River
      ii. Southern – I-70
      iii. Eastern – Highway 23
      iv. Western – Highway 131
   c. Area 3 includes the Marshall Airport for landing practice. This area is **not** available for student pilots. The boundaries are:
      i. Northern – Missouri River
      ii. Southern – I-70
      iii. Eastern – Highway 65 and 41
      iv. Western – Highway 23
   d. Area 4 includes Skyhaven Airport for landing practice. This area is available for student pilots. Area 4 is divided into two areas; a HIGH (above 4,000 MSL) and a LOW (Below 4,000 MSL).
      i. Northern – I-70
      ii. Southern – Highway 50
      iii. Eastern – Highway 13
      iv. Western – Highway 131
   e. Area 5 includes Skyhaven Airport for landing practice. This area is available for student pilots. Area 5 is divided into two areas; a HIGH (above 4,000 MSL) and a LOW (Below 4,000 MSL)
      i. Northern – Highway 50
      ii. Southern – Abandoned railroad

   iii. Eastern – Highway 13
   iv. Western – Highway 131
f. Area 6 includes Clinton Airport for landing practice. This area is **not** available for student pilots.
   i. Northern – Abandoned railroad
   ii. Southern – Highway 7
   iii. Eastern – Highway 13
   iv. Western – Highway 131 and a line from Holden to Urich

Minimum Training Altitudes

1) Altitudes selected will depend upon type of training and aircraft utilized.
2) Practice area altitudes are normally 2,500 ft to 4,000 ft MSL for single engine.
3) Multi engine practice area altitudes are 4,000 ft to 8,000 ft MSL
4) Ground reference maneuvers will be performed at approximately 1,000 ft AGL or 1800 ft MSL.
5) No flight over Warrensburg at less than 3,000 AGL is allowed.
6) Minimum altitudes of 500 ft AGL will be observed at all times, except during takeoff and landing at approved airports.

Non-Paved Airports/Runways

1) UCM aircraft operations on other than hard surface runways are allowed only on public use airports identified on FAA publications and approved by the Chief Flight Instructor. Operations on other than hard surface runways that are not for public use must receive prior permission from the Chief or Assistant Chief Flight Instructor. The following procedures will be used in order to land on a non-paved runway:
   a. Call the field operator to determine the status of the runway.
   b. Check applicable NOTAMs.
   c. Perform a low approach prior to landing on the field to inspect it for water/high grass/debris/etc.
   d. The instructor must have landed on that runway prior to using it for student instruction or been given authorization by the Chief Flight Instructor or Assistant Chief Flight Instructor.
      i. The following airports have been authorized by the Chief Flight Instructor to land at without having landed there:
         1) Marshal Missouri, KMHL
         2) Gastons, 3M0
         3) Miami County, K81 – If the instructor has never landed on the grass runway, first land on the pavement to inspect the grass runway from the ground.
         4) Lincoln Missouri (0R2)
         5) Kingsley Field, Miller. MO MO9

2) All other than hard surface landings will be made with an instructor on board. All rental flights are **PROHIBITED** from landing on any runway that is not paved. Unless prior authorization is given.

NOTE: UCM aircraft are not allowed to operate on gravel runways. Public use grass/turf runways are the only approved, other than hard surface runway for UCM aircraft to conduct operations.

Landings

1) Touch and Go Landings:
   a. Touch and go landings are not allowed on runways with a length of less than 3,500 ft (runway 14/32).
   b. Touch and go landings are not authorized unless the aircraft has touched down within the first 1/3rd of the runway used and on centerline.
   c. Once a student has at least their private pilot certificate and has been trained by a CFI on touch and go procedures, they may perform them during a solo flight in fixed gear airplanes only.
   d. Touch and go landings are approved in a complex plane as long it is a dual flight.

2) Stop and Go Landings:
   a. Stop and go landings are approved as long as it does not conflict with traffic in the pattern.
   b. Stop and go landings are not allowed on runways with a length of less than 3,500 ft (runway 14/32).
   c. Stop and go landings are not authorized unless the aircraft has touched down and stopped with at least 2000’ of runway distance remaining and on centerline.
   d. Once a student has at least their private pilot certificate and has been trained by a CFI on stop and go procedures, they may perform them during a solo flight.

Student pilot landing restrictions:

1) Dual:
    a. Touch and go and stop and go landings are authorized **only** when flying dual.
        i. Prior to students practicing touch and go and stop and go landings with an instructor, the flight instructor must demonstrate the procedure.
    b. Touch and go landings are **NOT** authorized at night.
    c. Non-paved airport/runway landings are authorized only when flying dual and must be to a full-stop.

2) Solo:
    a. Student pilots must complete full stop landings.
    b. Touch and go and stop and go landings are **NOT** authorized.
    c. Landings must be made on paved surfaces.

Private - Commercial pilot landing restrictions:

1) Touch and go and stop and go landings are authorized during daylight only for pilots holding private or commercial certificates as long as they have been given instruction on touch and go landings from a UCM instructor.
2) Non-paved airport/runway landings are allowed by private and commercial rated pilots in C-172Rs, C-172Ss, the C-172P, C-152 and PA-18 as long as the student has completed the required training to conduct other than hard surface landing operations.

Complex aircraft landing restrictions:

1) All landings in complex aircraft will be to a full stop during a solo flight.
2) Touch and go and stop and go landings are authorized during dual flights only.

Off Airport Landings

1) No off airport landings are authorized in any powered, fixed wing aircraft that is **not in distress**.
2) If an off airport landing occurs:
    a. Immediate notification of the Chief Flight Instructor, Assistant Chief Flight Instructor, Chief of Maintenance, or a Check Instructor is required.
    b. Aircraft will be cleared for flight by maintenance.

Collision Avoidance

1) All UCM aircraft with follow FAR 91.113 in regards to right of way rules.
2) No intentional maneuvering of a UCM aircraft to any other aircraft within 2,000’ horizontally and 500’ vertically.
3) No formation flying of UCM aircraft is allowed, planned or otherwise.
4) Clearing turns are **required** prior to performing each maneuver.
5) Aircraft conducting training outside of the traffic pattern will contact Whiteman Approach on 127.45 MHz for traffic advisories and VFR flight following.
6) All departing aircraft will climb at V_Y until reaching 3,000 ft MSL or 3 NM from Skyhaven, whichever occurs first.
7) All arriving aircraft will descend to traffic pattern altitude, slow down and complete Before Landing Checklist at least 3 NM from Skyhaven Airport.
8) Aircraft landing lights will be on while in the vicinity of an airport and anytime when operating in marginal VFR (3-5 SM visibility).

Maneuver Limitations

1) Repetitious practice of any one maneuver can lead to complacency.
2) No maneuver may be practiced more than 5 times in a row.
3) If additional practice for a maneuver is required, move on to another maneuver and return to original one later.
4) Any maneuver not previously practiced with and approved by a flight instructor will not be practiced during solo flight.

Fuel and Oil Requirements

1) All flight planning concerning fuel requirements will be in accordance with the POH of the training aircraft being used.
2) Local flights within the designated flight training areas will depart with no less than 2 hours of fuel.
3) Cross-country flights will refuel as necessary:
   a. VFR Day flights will depart with enough fuel to reach destination plus 1 hour fuel at cruise power.
   b. VFR night flight will depart with enough fuel to reach destination plus 1 ½ hours fuel at cruise power.
   c. All IFR flights will depart with enough fuel to reach destination, fly to alternate and have minimum reserve of 1 ½ hours minimum fuel after reaching the planned alternate airport at cruise power.
4) Student Pilots will refer to the Private pilot section 4 for fuel requirements.
5) Oil requirements allow for operation to terminate with no less than two quarts below full capacity.

Cold Weather Flight Operations

All temperatures listed below are surface temperatures for aircraft other than the Baron.

1) Operating at low power settings during cold temperatures is limited as follows:
   a. Taxi Operations:
      i. If the aircraft has been plugged in or preheated, taxi operations are conducted as normal.
      ii. If the aircraft has NOT been preheated, the oil temperature indicator may not be in the green band prior to takeoff if outside air temperatures are very cold. Allow for a suitable warm-up period after starting (2 to 5 minutes at 800 - 1,000 RPM). During taxi, do not exceed 1,300 RPM for a period of 10 minutes after engine start. After a suitable warm-up period, accelerate the engine several times to higher engine RPMs. The airplane is ready for takeoff if the engine accelerates smoothly and the oil pressure remains normal and steady.
   b. From 20°F/-6°C to 16°F/-8°C
      i. Monitor cylinder head temperatures (if equipped), exhaust gas temperatures, and oil temperatures for proper operational limits.
      ii. Maintain in-flight power settings at or above 1,500 RPM or 15” MAP.
   c. From 15°F/-9°C to 11°F/-11°C
      i. Cruise maneuvers only.
      ii. Solo flights are authorized for students that demonstrate satisfactory knowledge and skill regarding cold weather operations.
      iii. Monitor cylinder head temperatures (if equipped), exhaust gas temperatures, and oil temperatures for proper operational limits.
   d. From 10°F/-12°C to 1°F/-17°C
      i. Dual flights only.
      ii. Cruise maneuvers only.
      iii. Monitor cylinder head temperatures (if equipped), exhaust gas temperatures, and oil temperatures for proper operational limits.
   e. 0°F/-18°C or below
      i. Flight operations **cease**.
2) Due to the possibility of thermal shock
   a. All power changes at cold temperatures should be made smoothly.
   b. Abrupt power changes will not be made.
   c. Keep fuel air mixture leaned out during descent.
   d. Monitor and maintain the greatest possible engine heat for the power setting selected below 20°F/-7°C.
   e. Power off conditions can be simulated at full flaps and 1,500 – 1700 RPM during cold temperatures.
3) Operating the engines at low power settings in the Baron.
   a. No simulated or actual engine failures when the inflight air temperature is less than 20°F/-7°C
   b. No simulated emergency descents when the inflight air temperature is less than 20°F/-7°C
   c. During cool weather operations perform a maneuver at low power setting (ie slow flight) to allow the engines to cool down before performing a low power setting maneuver.

Cross Country Training

1) Flight plans will be filed with FSS and a copy will be left with the UCM Dispatcher.
2) Any overnight flights must be approved by the Chief Flight Instructor, Assistant Chief Flight Instructor, or Check Instructor and must leave contact phone number at destination.

3) Any flights requiring fuel en route should request the appropriate fuel card from the dispatcher. Student ID will be required to receive a fuel card. All receipts and fuel cards will be placed in the aircraft dispatch book (where tach & Hobbs times are recorded).
4) Failure to return card after the flight will result in the suspension of flight privileges until the card is returned.

Weather

Weather Briefings

All flights will receive an official FAA weather briefing from 1 (800) WXBRIEF or WWW.1800WXBRIEF.COM

Rain and Snow

All flight operations will cease when:

1) Snow depth is ¾ of an inch or greater on runway or ramp surfaces.
2) Braking action is reported as:
    a. Student pilots - Good
    b. Solo flights - Medium.
    c. Dual flights - Poor.
3) Standing water is ½ inch or greater on runway or ramp surfaces.
4) No flight operations in UCM aircraft may conducted:
    a. Within 20 NM of a thunderstorm.
    b. With known icing or icing forecast within 1 hour of departure or arrival time at Skyhaven or along route.
5) Simulator operations will cease and simulators will be shut down when thunderstorms are within 20NM.

Excessive Heat

When the heat index reaches 100°F, flight training is optional and may be rescheduled, suspended, or terminated.

VFR-On-Top

VFR-On-Top is not authorized unless:

1) The pilot is rated and current for IFR by FARs and UCM policies.
2) The aircraft is equipped and legal for IFR.
3) The weather does not exceed the IFR requirements for the pilot.

Traffic Pattern Ceiling

Due to the Class E airspace Transition Area a ceiling of not less than 1,500 AGL is required for VFR operation of UCM aircraft within the traffic pattern.

Wind

1) All operations will be suspended when
    a. 30 kts surface winds reported as either; sustained wind or peak gust.
    b. Gust factors reaching 15 kts regardless of sustained winds.
2) 25 kts sustained wind or peak gust - Dual flights ONLY.
3) Maximum tailwind component permitted for takeoff or landing is 5 kts.
4) Any time operations are suspended due to winds it will not resume for 30 minutes after excessive wind. This is a rolling time frame. If there is a gust that suspends training and another gust 10 minutes later, the 30 minute time starts over.
5) Crosswind taxi techniques will be used during taxi.
6) Tailwheel wind limitations are as follows:
    a. 25 kts total wind
    b. 10 kts crosswind
    c. 10 kts gust factor

IFR Privileges

1) Flight training in IMC will only be conducted with students who have completed Stage 1 of the Instrument Syllabus or are instrument rated and the instructor is current.
2) For students to qualify for IMC privileges in UCM aircraft
   a. If six calendar months has elapsed since completion of Instrument Practical Test
      i. You must complete an instrument proficiency check
      ii. To retain IFR privileges, an instrument proficiency check must be accomplished every six calendar months with an instructor designated by the Chief Flight Instructor, Assistant Chief Flight Instructor or a Check Instructor.
3) For instructors to qualify for IMC privileges in UCM aircraft you must have
   a. Instrument currency requirements of the FARs.
   b. Obtain an initial instrument standardization ride with the Chief Flight Instructor, Assistant Chief Flight Instructor or a Check Instructor.
   c. To retain IFR privileges, an instrument standardization ride is required every twelve calendar months with the Chief Flight Instructor, Assistant Chief Flight Instructor or a Check Instructor.
4) For flight in IMC the following weather criteria will be followed:

IFR Privileges Chart

Actual IFR Experience	Ceilings	Visibility
0-15	600' AGL	2 SM
16 or more	Minimums	Minimums
Night IFR	1,000' AGL	3 SM

5) These additional general weather conditions also apply:
   a. No known icing or forecast icing within 1 hour of proposed flight.
   b. No flight within 20 NM of thunderstorms.
   c. Weather en route and at the destination must be holding steady or improving.
   d. The weather at the time of departure must allow for the flight to return to Skyhaven in the event of an emergency.

Safety

Accident/Incident Procedures

Any pilot involved in any accident, incident, or abnormal flight activities shall:

1) Contact the Chief Flight Instructor, Assistant Chief Flight Instructor, or Chief of Maintenance.
2) Contact emergency services if necessary.
3) Never make a statement to the press.
4) If pressed for a statement by an official:
   a. As required by FARs, give a statement to the FAA, NTSB, and the UCM investigation team.
   b. This can be done at a convenient time and place.
5) Keep any passengers together and removed from other activities and do not let them move anything from the wreckage, except for medical reasons.
6) Never relinquish certificates to any investigator. A formal set of protocols must be followed before relinquishing a certificate, unless surrendered voluntarily.
7) The pilot is obligated to assist the FAA and the NTSB in the investigation; however,
   a. Do not give any information that could cause certificate action without legal assistance or representation.
   b. Let the Chief Flight Instructor determine if any one aboard the aircraft is capable to give an interview.
   c. If an interview is given, ask for and receive a written agreement from the FAA or NTSB investigator stating that anything said will not be used in certificate action or civil/criminal proceedings.
8) Fill out a NASA Report Form within 10 days. Make a copy for yourself and the UCM Investigation Team, and your legal representative.
9) Preserve all records:
   a. Aircraft logbook and inspection records.
   b. Airmen certificates including pilot certificate, flight instructor certificate, and medical certificate.
   c. Preflight planning including any weather notes, navigation logs, preflight action, flight plan forms, etc.
10) Fill out the Aviation Safety Incident/Hazard Report

Investigation Team

In the event of an accident or incident there will be an activation of the Investigation Team. The makeup of the team can be modified to suit the occasion; however, it should consist at a minimum of one person from of each of the following areas:

1) Accident investigation.
2) UCM Flight Operations.
3) Human Factors.
4) Aviation legal expertise.
5) Aircraft maintenance.

Alcohol and Drug Use

1) No person shall operate a UCM aircraft:
   a. Within 12 hours of alcohol consumption.
   b. While under the influence of alcohol.
   c. Having a blood alcohol content of 0.04% or greater.
   d. While using any drug that affects the person’s faculties in anyway contrary to safety.
2) Use of alcohol or drugs which prevents a student from flying during his assigned flight slot will not excuse the student from class attendance and will result in a “NO SHOW”.
3) Students that are taking prescribed medications must be cleared to fly by an Aviation Medical Examiner or receive an excused absence from flight training.
4) Drug and Alcohol testing can be required during an accident investigation or suspicion of use.

Fire Precautions and Procedures

1) Know and understand the systems of your aircraft. Following procedures as outlined by the aircraft manual is essential to safety!
2) Emergency Procedures can be found in Section 3 of your Pilot's Operating Handbook (POH) or Approved Flight Manual (AFM).
3) A charged five pound CO_2 extinguisher is available at all times at the following locations:
   a. Maintenance facility.
   b. Terminal building.
   c. Fuel trucks.
   d. Individual aircraft.
4) Electrical Fire (C-172):
   a. Master Switch – OFF
   b. Vents, cabin air, heat – CLOSED
   c. Fire Extinguisher – ACTIVATE
   d. Avionics Master – OFF
   e. All other switches – OFF
5) Engine Fire in Flight (C-172):
   a. Mixture – IDLE CUT OFF
   b. Fuel Shut Off – OFF
   c. Auxiliary Fuel Pump - OFF
   d. Master Switch - OFF
   e. Cabin Heat/Air - OFF
   f. Airspeed – 100 KTS or greater
   g. Forced Landing – EXECUTE
6) Induction fire during starting (C-172):
   a. Cranking – CONTINUE to get a start which would suck the flames and accumulated fuel into the engine.
      i. If engine starts:
   b. Power – 1700 RPM for a few minutes.
   c. Engine – SHUTDOWN and inspect for damage.
      i. If engine fails to start:
   d. Throttle – FULL OPEN
   e. Mixture – IDLE CUT OFF
   f. Cranking – CONTINUE
   g. Fuel Shutoff Valve- OFF
   h. Auxiliary Fuel Pump – OFF
   i. Fire Extinguisher – OBTAIN
   j. Engine – SECURE
      i. Master Switch – OFF
      ii. Ignition Switch – OFF
   k. Parking Brake – RELEASE
   l. Airplane – EVACUATE
   m. Fire – EXTINGUISH
   n. Fire Damage – INSPECT
7) The aircraft will not be flown after a known induction fire until maintenance personnel have inspected and released the aircraft to service.

Practice Instrument Approaches

1) Aircraft are not allowed to fly practice instrument approaches to runways at Skyhaven that are opposite direction to VFR traffic.

Section 4 – PRIVATE PILOT

The Private Pilot rating is divided into two flight courses and a ground school. All degree seeking students will conduct training under CFR 14 Part 141 unless approved by the Chief Flight Instructor.

This section contains references to both the C-172R and C-172S.

Student Pilots

Student pilots have restrictions to solo flight training.

1) All student pilot solo flights must be approved by the flight instructor and proper endorsements received prior to dispatch.
   a. Local flights will be released when dispatcher confirms:
      i. Weather limitations on endorsements are not exceeded.
      ii. Solo endorsement from instructor has been given for the type of flight and aircraft and has not expired.
      iii. Aircraft has at least 2 hours of fuel.
   b. Cross country flights will be released when dispatcher confirms:
      i. Weather limitations on endorsements are not exceeded.
      ii. Solo endorsement from instructor has been given for the type of flight and aircraft and has not expired.
      iii. Initial cross country endorsement from instructor has been issued for type of aircraft.
      iv. Cross country planning endorsed for current day and weather conditions.
      v. Aircraft has full fuel tanks upon departure and meets UCM fuel reserve requirements.
2) Student pilots may not operate aircraft solo if the following wind limitations are exceeded.
   a. Steady wind of 15 kts.
   b. Crosswind of 10 kts.
   c. Gust factor of 5 kts.
   d. Any condition that exceeds the students' solo endorsement limitations given by assigned flight instructor which may be more restrictive.
3) Solo student pilots are not authorized to fly above any cloud layers.
4) Solo student pilot visibility and cloud layer requirements:

Destination	Cloud Layer	Visibility
Traffic Pattern	2,000' AGL	3 SM
Local Training	2,500' AGL	5 SM
Cross Country	3,000' AGL	6 SM

5) Student pilot solo local training is restricted to areas 4 LOW and 5 LOW.
6) All solo local flights must be on the ground by sunset.
7) Supervised solos require the instructor to be present at the airfield for the entire duration of the flight and the student will be billed for that time.
8) Approval to deviate from the above listed cross countries must be obtained prior to departure from the Chief Flight Instructor, Assistant Chief Flight Instructor, or Check Instructor.
9) All solo cross country flights must be planned to return to Sky Haven at least one hour prior to official sunset.
10) All solo cross country flights WILL make a landing to a full stop at each destination.
11) Solo cross country students will be charged ground instruction for the time required for a CFI to check planning, give endorsements, and supervise student takeoff.

Re-Dispatch Procedures

1) **All student pilot solo flights must be** re-dispatched by the SOF after landing (scheduled or unscheduled) at any location other than Skyhaven if the aircraft is delayed by more than 30 minutes of ETA at Skyhaven.
2) Student Pilot cross country training flights must
   a. Close the flight plan.
   b. Call (660) 543-4334 for a re-dispatch of the aircraft (if delayed as mentioned above).
   c. Receive an updated weather briefing.
   d. Open next leg of flight plan.
   e. Depart with fuel levels in accordance with UCM policies.
3) Any delay in returning to Skyhaven requires notification to the UCM Dispatcher (if able) and Flight Service Station.

Restricted Maneuvers

1) Solo flights are restricted from performing:
   a. Simulated forced landings and emergency practice.
   b. Secondary stalls.
   c. Touch and goes and stop and goes
   d. The maneuvers listed above and maneuvers your flight instructor tells you not to practice.

C-172R

Passenger Briefing (C-172R)

Objective:

To provide a standard pre-flight briefing to passengers.

Description:

The pilot in command is required by the Federal Aviation Regulations to provide a passenger briefing.

Setup Procedure:

1) Before starting the engine the Pilot-in-Command will provide the passenger safety briefing to include, but not limited to:
   a. Designation of Pilot-in-Command.
   b. Procedures for positively exchanging flight controls.

      S
      - i. Seat belts and shoulder harnesses (location and operation).
      - ii. Seat belts & shoulder harnesses fastened for taxi, takeoff and landing.
      - iii. Seat position adjusted and locked in place (controls and operation).

      A
      - iv. Air vents (location and operation).
      - v. All environmental controls (discussed).
      - vi. Action in case of any passenger discomfort.

      F
      - vii. Fire extinguisher (location and operation).
      - viii. Smoking is prohibited.

      E
      - ix. Exit doors (how to secure; how to open).
      - x. Emergency evacuation plan.
      - xi. Emergency/survival kit (location and contents).
      - xii. Equipment (location & operation, i.e., ELT, flight controls).

      T
      - xiii. Traffic (scanning, spotting, notifying pilot).
      - xiv. Talking ("sterile cockpit" expectations).

      Y
      - xv. Your questions?

Flight Proficiency Standards:

- Briefs occupants on the use of safety belts, shoulder harnesses, doors, and emergency procedures.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance and regulatory requirement for providing a passenger briefing.

Common Errors:

- Failure to perform a passenger briefing.
- Incomplete passenger briefing.

References:

Airman Airman Certification Standards, Federal Aviation Regulations, AC 121-24, AOPA Passenger Safety Briefing Video

Taxiing (C-172R)

Objective:

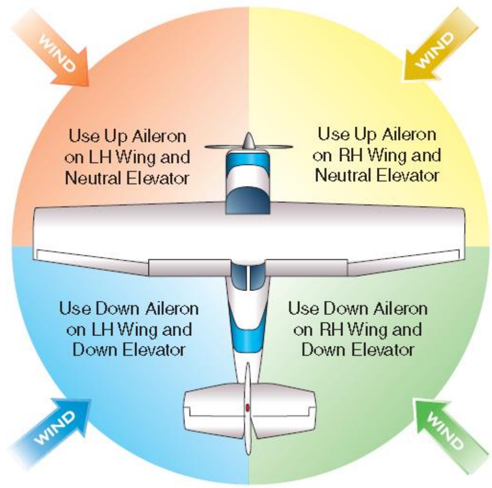
To safely maneuver the airplane on the surface of the airport.

Description:

Taxiing is the controlled movement of the airplane under its own power while on the ground.

Setup Procedure:

1) Complete before taxi checklist.
2) Set heading bug to the wind direction.
3) After engine start, check for traffic in both directions, increase power and allow the airplane to roll slight forward and apply brakes.
4) To turn right, use right rudder. To turn left, use left rudder. Differential braking can be used to make a sharper turn.
5) Taxi at a speed consistent with safety, but no faster than a brisk walk. Use power to control taxi speed before using brakes.
6) Apply proper crosswind taxi control deflections.
7) To come to a stop, reduce power to idle and smoothly apply brakes.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to safe taxi procedures.
- Performs a brake check immediately after the airplane begins moving.
- Positions the flight controls properly for the existing wind conditions.
- Controls direction and speed without excessive use of brakes.
- Complies with airport/taxiway markings, signals, ATC clearances, and instructions.
- Taxies so as to avoid other aircraft and hazards.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance of crosswind taxi techniques.
- Explain the importance of using minimal power and braking.

Safety Considerations:

- Maintain taxiway centerline.
- Use taxi lights.
- Use proper crosswind taxi techniques.
- Taxi at a speed consistent with safety.

Common Errors:

- Not performing a brake check.
- Improper crosswind taxi control deflections.
- Improper use of power and brakes.
- Taxiing at a speed not consistent with safety.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Normal & Crosswind Takeoff & Climb (C-172R)

Objective:

To move the airplane from its starting position on the runway, become airborne, and establish a positive climb to a safe maneuvering altitude.

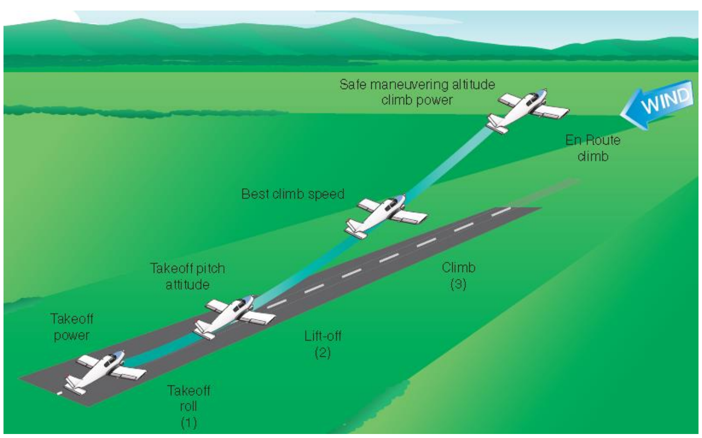
Description:

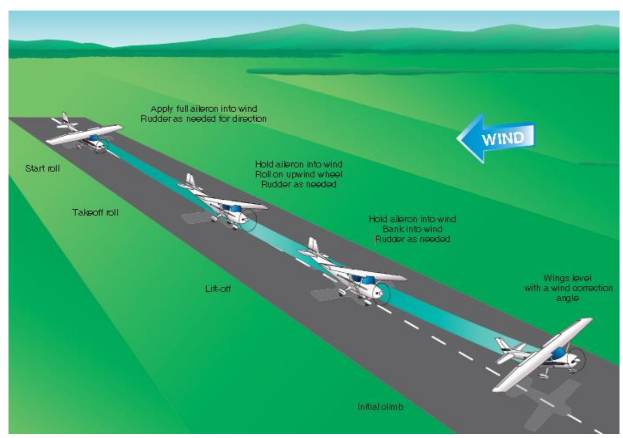
The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane is accelerated to an airspeed that provides sufficient lift to become airborne.
2) The rotation, when the pilot increases elevator back pressure, increasing the angle of attack to lift the nose wheel.
3) The initial climb when the airplane leaves the ground and establishes a pitch attitude to climb away from the runway.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete takeoff checklist and takeoff briefing.
3) Use aircraft lighting as recommended by the current version of AC 91-73.
4) Ensure runway is clear, align aircraft with runway centerline, confirm DG is aligned with runway, and ensure nose wheel is straight.
5) Position flight controls for wind for existing conditions.
6) Advance throttle smoothly to takeoff power ensuring toes are resting on rudder pedals, not on brakes.
7) Check engine instruments during takeoff roll for normal indications.
8) Maintain directional control with rudder pedals and crosswind control with appropriate aileron deflection
9) Maintain a slightly tail low attitude.
10) Upon reaching rotation speed, 55 kts (V_R), increase back elevator pressure to establish the lift-off attitude that is approximately that for V_Y and allow the aircraft to fly off the ground.
11) Apply adequate drift correction to maintain runway centerline.
12) Accelerate to 79 kts (V_Y).
13) At 500 ft., or as workload permits, complete climb checklist.





Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a normal and crosswind takeoff, climb operations, and rejected takeoff procedures.
- Positions the flight controls for the existing wind conditions.
- Clears the area; taxies into the takeoff position and aligns the airplane on the runway centerline.
- Lifts off at the recommended airspeed and accelerates to V_Y.
- Establishes a pitch attitude that will maintain V_Y +10/-5 kts.
- Retracts flaps at 200’ or a safe altitude.
- Maintains takeoff power and V_Y +10/-5 kts to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Complies with noise abatement procedures.
- Completes the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain runway selection criteria.
- Discuss how to maintain directional control during the ground roll.
- Discuss proper lift-off technique.
- Explain how to use ailerons during crosswind situations.
- Describe how to correct for wind-drift.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not force aircraft off runway too early, causing it to settle back on the runway.
- Do not allow upwind wing to rise during takeoff.
- Do not exceed maximum demonstrated crosswind.
- Consider the effect of density altitude on performance.

Common Errors:

- Improper runway incursion avoidance procedures.
- Improper use of controls during a normal/crosswind takeoff.
- Inappropriate lift-off procedures.
- Improper climb attitude, power setting, and airspeed.
- Improper use of checklist.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Short-Field Takeoff & Climb (C-172R)

Objective:

To move the airplane from its starting position on the runway, become airborne, and establish a positive climb to a safe maneuvering altitude when the takeoff area is short or restricted by obstructions.

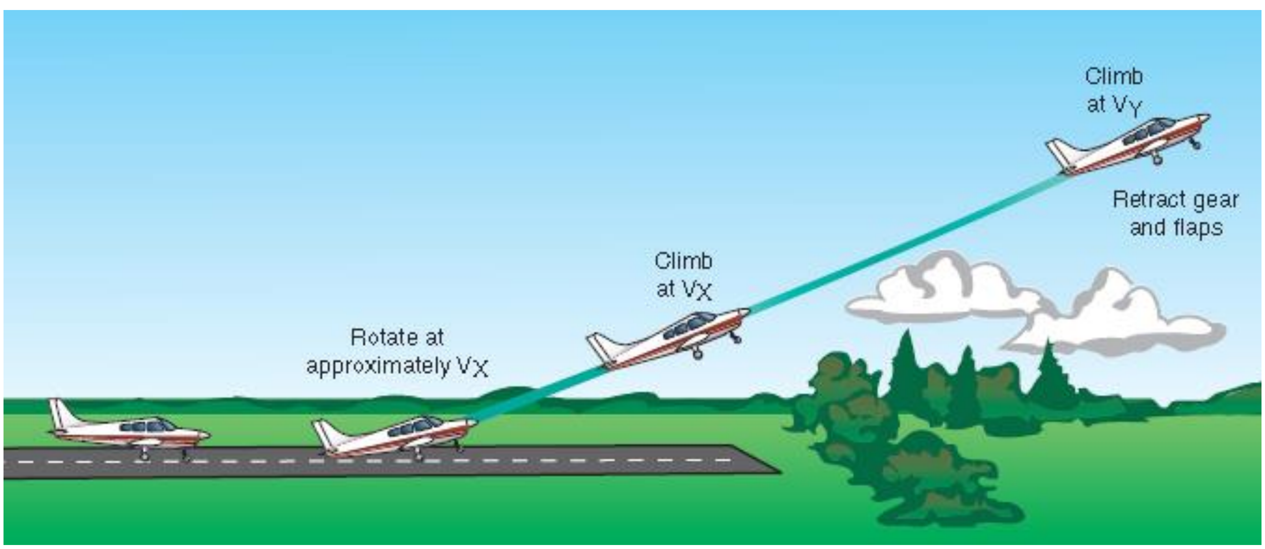
Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane is accelerated to an airspeed that provides sufficient lift to become airborne.
2) The rotation, when the pilot increases elevator back pressure, increasing the angle of attack to lift the nose wheel.
3) The initial climb when the airplane leaves the ground and a pitch attitude is established to climb away from the runway and clear a 50 foot obstacle.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete Short-Field takeoff checklist and takeoff briefing.
3) Set flaps to 10°.
4) Use aircraft lighting as recommended by the current version of AC 91-73.
5) Back taxi and align aircraft with runway centerline, confirm DG is aligned with runway, and ensure nose wheel is straight.
6) Ensure runway is clear, advance throttle smoothly to takeoff power while holding brakes; check engine instruments.
7) Release brakes and ensure toes are resting on rudder pedals, not brakes.
8) Maintain directional control with rudder pedals and appropriate aileron deflection.
9) Upon reaching rotation speed, 55 kts (V_R), increase back elevator pressure to establish lift-off attitude and allow aircraft to fly off ground.
10) Accelerate the aircraft to 57 kts (V_X) until obstacle is cleared or 50 feet above takeoff surface is attained and then accelerate to 79 kts (V_Y).
11) Retract flaps after a safe altitude of at least 200 ft. and an airspeed of 79 kts are attained.
12) At 500 ft., or as workload permits, complete climb checklist.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a short-field takeoff and maximum performance climb.
- Positions the flight controls for the existing wind conditions; set the flaps as recommended.
- Clears the area; taxies into takeoff position utilizing maximum available takeoff area and aligns the airplane on the runway center/takeoff path.
- Applies brakes (if appropriate), while advancing throttle smoothly to takeoff power.
- Lifts off at the recommended airspeed, and accelerates to the recommended obstacle clearance airspeed or V_X.
- Establishes a pitch attitude that will maintain the recommended obstacle clearance airspeed, or V_X, +10/-5 kts, until the obstacle is cleared, or until the airplane is 50 feet above the surface.
- After clearing the obstacle, establishes the pitch attitude for V_Y, accelerates to V_Y, and maintains V_Y, +10/-5 kts, during the climb.
- Retracts the landing gear, if appropriate, and flaps after a positive rate of climb is established.
- Retracts flaps at 200' or a safe altitude.
- Maintains takeoff power and V_Y +10/-5 to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Completes the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain runway selection criteria.
- Discuss how to maintain directional control during ground roll.
- Discuss proper lift-off technique.
- Explain the difference between V_X and V_Y.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not force aircraft off runway too early, causing it to settle back onto runway.
- Use of entire runway length.
- Retraction of flaps as recommended.
- Consider effect of density altitude on performance.

Common Errors:

- Improper runway incursion avoidance procedures.
- Improper use of controls during a short-field takeoff.
- Inappropriate lift-off procedures.
- Improper initial climb attitude, power setting and airspeed to clear obstacle.
- Improper use of checklist.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Soft-Field Takeoff & Climb (C-172R)

Objective:

To align the airplane with the takeoff path, become airborne as quickly as possible, and establish a positive climb to a safe maneuvering altitude.

Description:

The takeoff can be separated into 3 steps:
1) The takeoff roll, when the airplane enters the runways with full up elevator deflection and accelerates to an airspeed at which the airplane will lift off.
2) The acceleration to lift off speed while remaining in ground effect.
3) The initial climb when the airplane establishes a pitch attitude to climb away from the runway.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete Short-Field takeoff checklist and takeoff briefing.
3) Set flaps to 10°.
4) Use aircraft lighting as recommended by the current version of AC 91-73.
5) Ensure runway is clear, taxi onto runway with back elevator pressure and align nose with runway centerline without stopping or the use of brakes.
6) Smoothly advance throttle to takeoff power.
7) Ensure toes are resting on rudder pedals, not on brakes.
8) Check engine instruments during ground roll for normal indications.
9) Maintain directional control with rudder pedals and appropriate aileron deflection.
10) Use back elevator pressure to establish a positive pitch attitude and allow the aircraft to fly itself off the ground.
11) When the aircraft becomes airborne, reduce pitch to remain in ground effect while accelerating to 60 kts (V_X) then simultaneously climb and accelerate to 79 kts (V_Y).
12) Retract flaps after a safe altitude of at least 200 ft. and an airspeed of 79 kts are attained.
13) At 500 ft., or as workload permits, complete climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a soft-field takeoff and climb.
- Positions the flight controls for existing wind conditions and to maximize lift as quickly as possible.
- Clears the area; taxies on to the takeoff surface at a speed consistent with safety without stopping while advancing the throttle smoothly to takeoff power.
- Establishes and maintains a pitch attitude that will transfer the weight of the airplane from the wheels to the wings as rapidly as possible.
- Lifts off at the lowest possible airspeed and remains in ground effect while accelerating to V_X, while simultaneously accelerating to V_Y and climbing.
- Establishes a pitch attitude for V_Y, and maintains selected airspeed +10/-5 kts to a safest maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Completes the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss proper soft-field takeoff technique.
- Explain runway selection criteria.
- Predict the height of ground effect and discuss its relevance.
- Discuss how to maintain directional control during ground roll.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not allow the airplane to climb above ground effect too soon, causing it to settle back onto the runway.

Common Errors:

- Improper runway incursion avoidance procedures.
- Improper use of controls during a soft-field takeoff.
- Improper lift-off procedures.
- Improper climb attitude, power setting and airspeed.
- Improper use of checklist.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Traffic Pattern (C-172R)

Objective:

To assure that air traffic flows into and out of an airport in an orderly manner.

Description:

The airplane is flown on a rectangular course around a runway at an altitude specified in the current Airport/Facility Directory or as outlined in the FAR/AIM.

Setup Procedure:

Departures

1) All departures:
    a. Fly the departure leg straight out until reaching traffic pattern altitude.
    b. Once reaching traffic pattern altitude, continue climbing and turn on course.

Arrivals

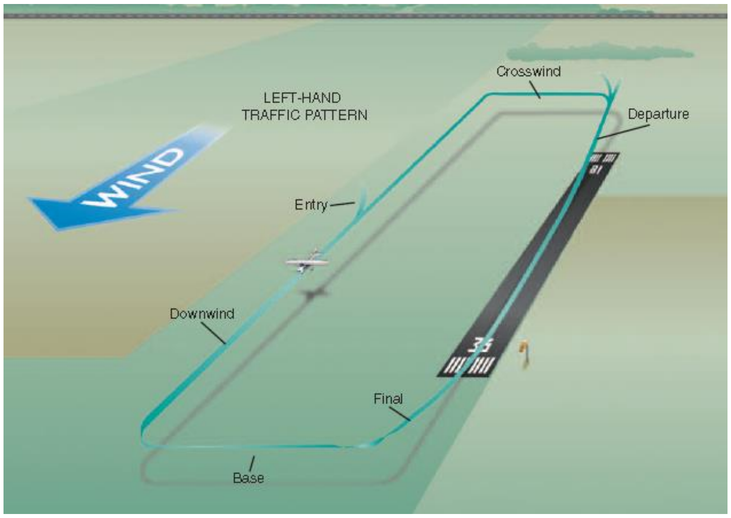
1) Prior to reaching 5 NM from the airfield, complete the following:
    a. Monitor local AWOS/ASOS/ATIS
    b. Ask "Is there any traffic between me and the airport?" and cancel flight following (if applicable)
    c. Complete the Before Landing checklist
2) Slow down below the approach flap airspeed prior to pattern entry.

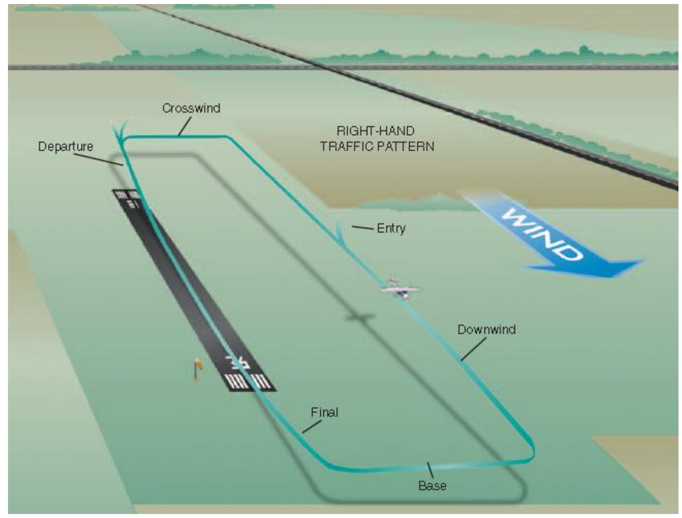
    If already established on the downwind side, skip to step 4.*

3) For a midfield entry:
    a. Cross midfield 500' above traffic pattern altitude, observing traffic flow and wind direction.
    b. Fly 2-3 miles beyond the downwind leg, then descend to pattern altitude.
    c. Complete a tear-drop shaped turn to the right or left as necessary to position the aircraft at a 45 degree angle to the downwind leg.

    If less than two aircraft are currently in the pattern, the alternate method (cross midfield at traffic pattern altitude, enter directly into downwind leg) may be used.

4) Enter the traffic pattern at the designated traffic pattern altitude (normally 1,000' AGL) at a 45 degree angle to the downwind leg at midfield.
5) Apply appropriate crosswind correction to allow for a parallel flight path approximately ½ mile from the runway
6) Allow for proper spacing from other aircraft in the pattern as to prevent runway incursions upon landing.
7) Maintain airspeed below the flap speed required for each configuration change.





Flight Proficiency Standards:

- Exhibits knowledge of the elements related to traffic patterns. This shall include procedures at airports with and without operating control towers, prevention of runway incursions, collision avoidance, wake turbulence avoidance, and wind shear.
- Complies with proper traffic pattern procedures.
- Maintains proper spacing from other aircraft.
- Corrects for wind drift to maintain the proper ground track.
- Maintains orientation with the runway/landing area in use.
- Maintains traffic pattern altitude, ±100 feet and the appropriate airspeed, ±10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss traffic patterns at controlled and uncontrolled airports.
- Explain traffic pattern procedures.
- Explain how to maintain the proper ground track.

Safety Considerations:

- Maintain proper traffic pattern altitude.
- Maintain a distance from the runway that is within power-off gliding distance.
- Preferred bank of 30 degrees while in pattern.
- Climb within 300 feet of traffic pattern altitude before turning crosswind.
- Maintain proper aircraft separation.
- Comply with standards traffic pattern procedures or ATC instructions.

Common Errors:

- Failure to comply with traffic pattern instructions, procedures, and rules.
- Improper correction for wind drift.
- Inadequate spacing from other traffic.
- Poor altitude or airspeed control.
- Flying too wide of a pattern.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Normal Approach & Landing (C-172R)

Objective:

To safely transition from flight to ground operations during normal conditions.

Description:

The aircraft is configured for a stabilized approach in the landing configuration and transitioned from the descent to touchdown.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
    a. Reduce power to approximately 1,300 RPM.
    b. Confirm flaps 10°.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 75 kts.
6) Turn on the base leg when 45° from the touchdown point:
    a. At key position, assess approach position.
    b. With wings level, set flaps to 20° as required.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 70 kts.
7) Turn on final as to align the aircraft with the extended runway center line:
    a. Set flaps to 30° as required.
    b. Adjust pitch and power as required to maintain a stabilized approach, at 65 kts, toward the selected aiming point until flare to land.
    c. Complete the GUMPS check.
8) During the flare to land simultaneously reduce power to idle and maintain aircraft approximately one foot above runway until it slows to stall speed and touches down on the runway centerline.
9) Maintain positive pitch attitude for aerodynamic braking.
10) Exit runway and complete after landing checklist.

***The above condition is based on a no wind condition.*
*Adjust configuration and airspeed to compensate for wind and gust factor.***

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a normal and crosswind approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects a suitable touchdown point
- Establishes the recommended approach and landing configuration and airspeed, and adjusts pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, or in its absence, not more than 1.3 V_{S0}, +10/-5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the flare and touchdown.
- Touches down smoothly at approximate stalling speed.
- Touches down at or within 400 feet beyond a specified point, with no drift, and with the airplane's longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Completes the appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain proper use of crosswind control inputs.

Safety Considerations:

- Observe flap extension speeds.
- Maintain proper airspeed at all times.
- Use proper crosswind correction to avoid drifting from runway centerline.

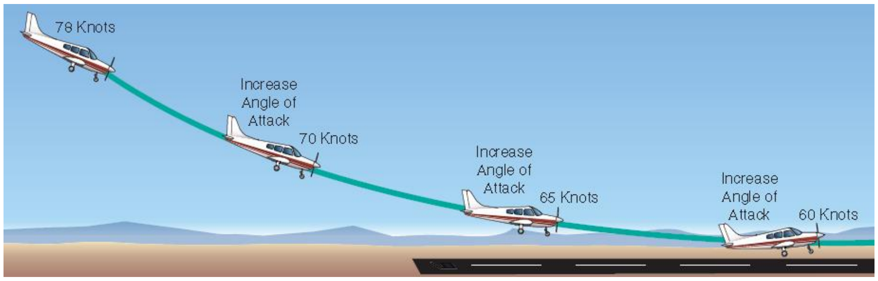
Common Errors:

- Improper use of landing performance data and limitations.
- Failure to establish proper crosswind correction.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Improper procedure during round out and touchdown.
- Improper use of brakes.
- Poor directional control after touchdown.

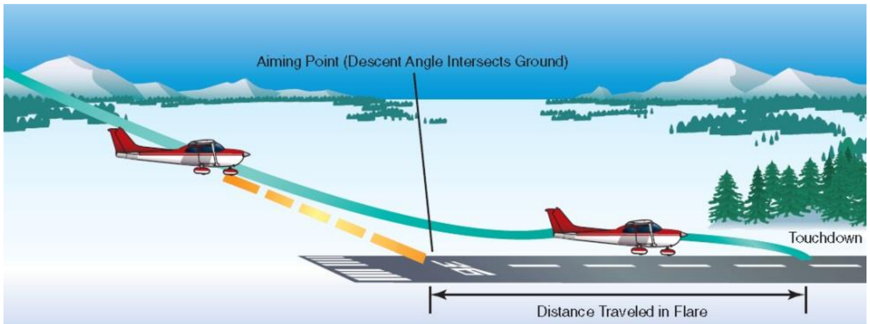
References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Changing angle of attack during round out



Aiming point of a stabilized approach



Example of a well-executed round out and proper landing attitude

Crosswind Approach & Landing (C-172R)

Objective:

To safely transition from flight to ground operations during crosswind conditions.

Description:

The aircraft is configured for a stabilized approach in the landing configuration and transitioned from the descent to touchdown.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
    a. Reduce power to approximately 1,300 RPM.
    b. Confirm flaps 10°.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 75 kts.
6) Turn on the base leg when 45° from the touchdown point:
    a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
    b. At key position, assess approach position.
    c. With wings level, set flaps to 20° as required.
    d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 70 kts.
7) Turn on final as to align the aircraft with the extended runway center line:
    a. Apply appropriate crosswind correction to maintain the extended runway centerline.
    b. Set flaps to 30° as required.
    c. Adjust pitch and power as required to maintain a stabilized approach, at 65 kts, toward the selected aiming point until flare to land.
    d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
    e. Complete the GUMPS check.
8) During the flare to land simultaneously reduce power to idle and maintain aircraft approximately one foot above runway until it slows to stall speed and touches down on the runway centerline.
9) Maintain positive pitch attitude for aerodynamic braking.
10) Exit runway and complete after landing checklist.

*** Adjust configuration and airspeed to compensate for strong crosswind and/or gust factor.***

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a normal and crosswind approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects a suitable touchdown point
- Establishes the recommended approach and landing configuration and airspeed, and adjusts pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the flare and touchdown.
- Touches down smoothly at approximate stalling speed.
- Touches down at or within 400 feet beyond a specified point, with no drift, and with the airplane's longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Completes the appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain proper use of crosswind control inputs.

Safety Considerations:

- Observe flap extension speeds.
- Maintain proper airspeed at all times.
- Use proper crosswind correction to avoid drifting from runway centerline.

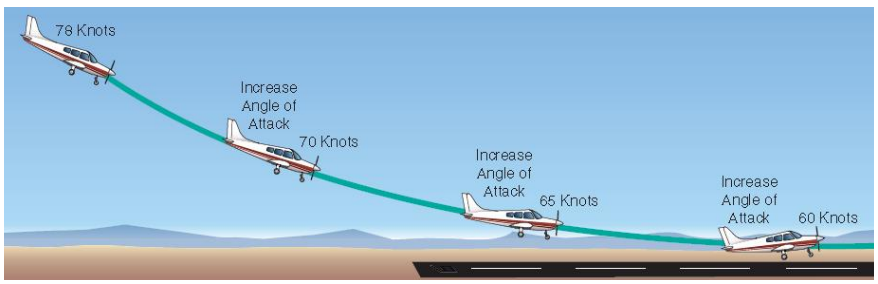
Common Errors:

- Improper use of landing performance data and limitations.
- Failure to establish proper crosswind correction.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Improper procedure during round out and touchdown.
- Improper use of brakes.
- Poor directional control after touchdown.

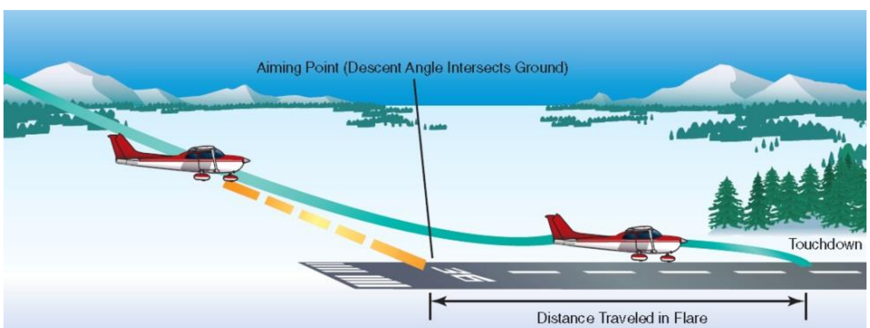
References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Changing angle of attack during round out

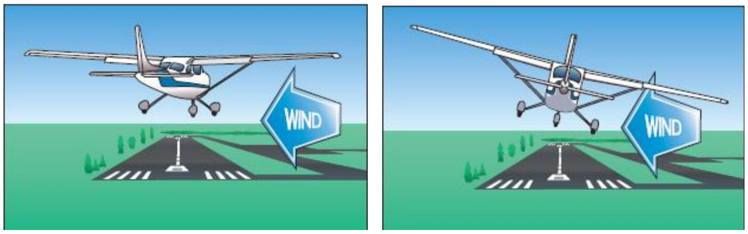


Aiming point of a stabilized approach

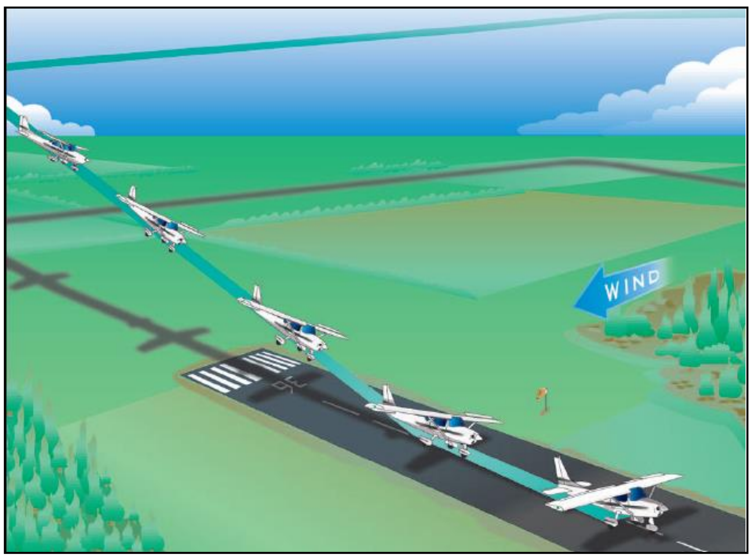


Example of a well-executed round out and proper landing attitude

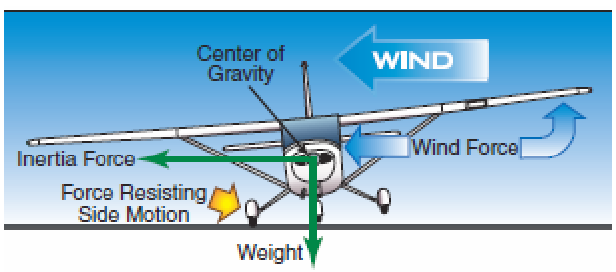
Crabbed Method (Left) / Wing-Low Method (Right)
(Recommended)



Crosswind Approach and Landing using wing low method



Drifting during touchdown (inappropriate crosswind correction)



Short-Field Approach & Landing (C-172R)

Objective:

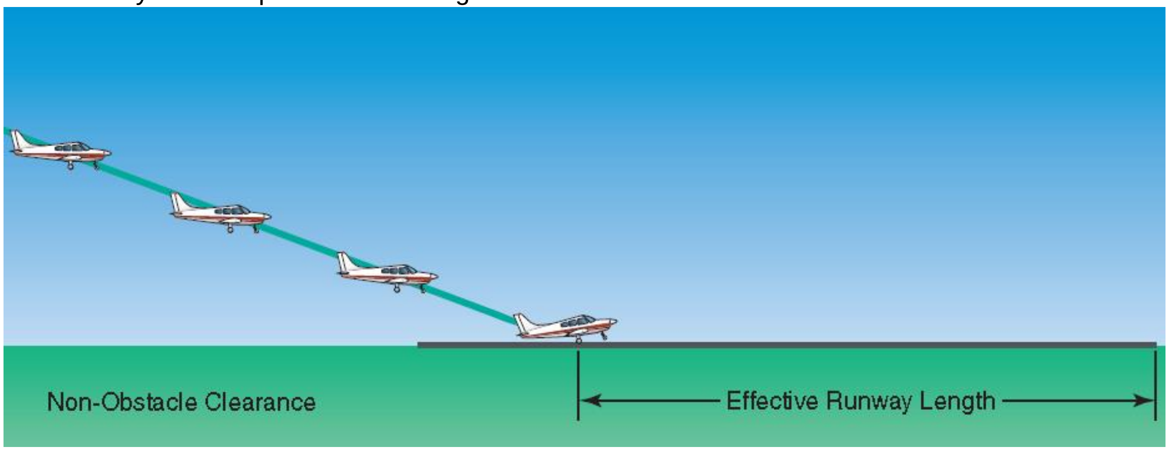
To safely transition from flight to ground operations at an airport with a relatively short runway or where an approach is made over obstacles.

Description:

The airplane is configured for a stabilized approach with or without a 50 foot obstacle. There will be little or no float during the round out, allowing the airplane to touch down at a specified point, and be stopped in a shorter than normal distance.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
   a. Reduce power to approximately 1,300 RPM.
   b. Confirm flaps 10°.
   c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 75 kts.
6) Turn on the base leg when 45° from the touchdown point:
   a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
   b. At key position, assess approach position.
   c. With wings level, set flaps to 20° as required.
   d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 70 kts.
7) Turn final on the extended runway center line:
   a. Apply appropriate crosswind correction to maintain the extended runway centerline.
   b. Set flaps to 30° as required.
   a. Adjust pitch and power as required to maintain a stabilized approach, at 62 kts, toward the selected aiming point until flare to land.
   c. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
   d. Maintain a stabilized descent above the 50 ft obstacle and land at the specified point.
   e. Complete the GUMPS check.
8) During the flare to land simultaneously reduce power to idle and maintain aircraft approximately one foot above runway until it slows to stall speed.
9) Touch down at approximate stall speed on the runway centerline.
10) Maintain positive pitch attitude for aerodynamic braking.
11) Apply maximum braking to a complete stop without skidding the tires.
12) Exit runway and complete after landing checklist.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a short-field approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects the most suitable touchdown point.
- Establishes the recommended approach and landing configuration and airspeed; adjusts pitch attitude and power as required.
- Maintains a stabilized approach and recommended approach airspeed, or in its absence not more than 1.3 V_{SO}, +10/-5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the round out and touchdown.
- Touches down smoothly at minimum control airspeed.
- Touches down at or within 200 feet beyond a specified point, with no side drift, minimum float and with the airplane's longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Applies brakes, as necessary, to stop in the shortest distance consistent with safety.
- Completes the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on an approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain how to compensate for obstacles and shortened runway lengths.

Safety Considerations:

- Maintain proper airspeed at all times.
- Compensate for crosswind.
- Do not skid tires.
- Use of aerodynamic braking as available.

Common Errors:

- Excessive airspeed on final approach.
- Slow airspeed prior to touchdown.
- Failure to establish proper crosswind correction.
- Improper use of landing performance data and limitations.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Improper procedure during round out and touchdown.
- Improper use of brakes.
- Poor directional control after touchdown.

References:

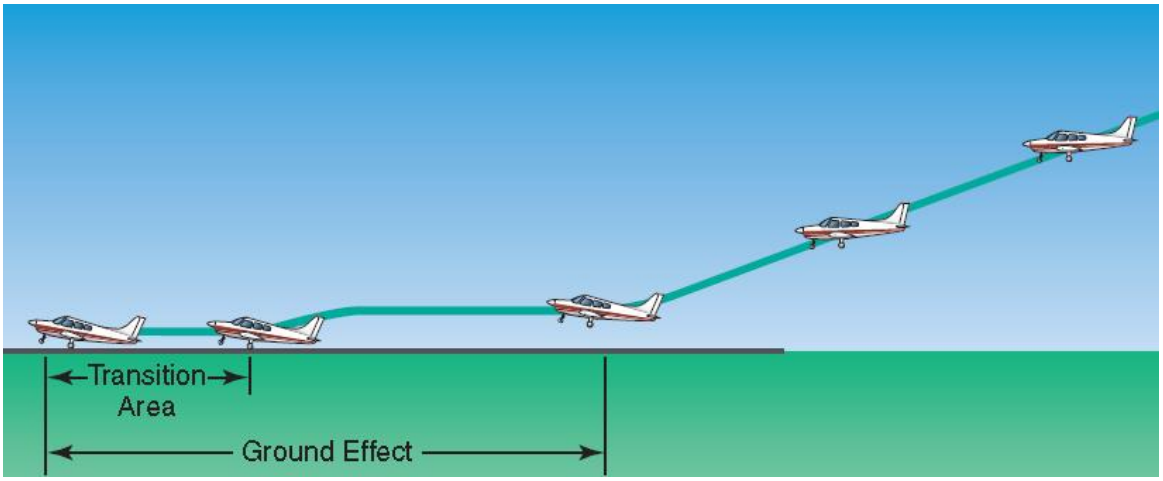
Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Soft-Field Approach & Landing (C-172R)

Objective:
To safely transition the airplane from flight to ground operations on a rough or soft surface.

Description:
The aircraft is configured for a stabilized approach in the landing configuration and transitioned from the descent to touchdown on a field that is unimproved.

Setup Procedure:
1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
    a. Reduce power to approximately 1,300 RPM.
    b. Confirm flaps 10°.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 75 kts.
6) Turn on the base leg when 45° from the touchdown point:
    a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
    b. At key position, assess approach position.
    c. With wings level, set flaps to 20° as required.
    d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 70 kts.
7) Turn final on the extended runway center line:
    a. Apply appropriate crosswind correction to maintain the extended runway centerline.
    b. Set flaps to 30° as required.
    c. Adjust pitch and power as required to maintain a stabilized approach, at 65 kts, toward the selected aiming point until flare to land.
    d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
    e. Adjust stabilized approach to clear obstacles and land at the specified point.
    f. Complete the GUMPS check.
8) During the flare to land, reduce power as required to maintain aircraft approximately one foot above runway until it slows to stall speed.
9) Touch down at approximate stall speed on the runway centerline as smoothly as possible.
10) Maintain back elevator pressure to keep nose wheel off the ground as long as possible.
11) Maintain directional control with rudder and aileron deflection.
12) Adjust power as necessary to maintain aircraft movement on soft surfaces.
13) Exit the runway with minimal braking and complete after landing checklist.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a soft-field approach and landing.
- Considers the wind conditions, landing surface and obstructions, and selects the most suitable touchdown area.
- Establishes the recommended approach and landing configurations, and airspeed; adjusts pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, or in its absence not more than 1.3 V_{SO}, +10/-5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the round out and touchdown.
- Touches down softly with no drift, and with the airplane's longitudinal axis aligned with the runway/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Maintains proper position of the flight controls and sufficient speed to taxi on the soft surface.
- Completes the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss effect of flaps on an approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain how to touchdown and maneuver the aircraft on soft of unimproved surfaces.

Safety Considerations:

- Do not land on fields that exceed the capabilities of the aircraft or pilot.
- Fly over and visually check the field prior to landing.
- Check field length and density altitude.
- Only land on public, published, unimproved runways with UCM aircraft.
- Use caution when landing on wet grass.

Common Errors:

- Failure to maintain elevator back-pressure after touchdown.
- Improper use of brakes.
- Failure to consider effect of wind and landing surface.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Touch and Go (C-172R)

Objective:

To transition from a landing rollout to a takeoff roll while remaining on the runway.

Description:

A touch and go is a landing which transitions into a takeoff while the aircraft remains rolling on the runway.

Setup Procedure:

1) Perform a normal landing.
2) Upon touchdown:
    a. Allow the aircraft to continue rolling.
    b. Maintain runway centerline.
    c. Apply proper crosswind correction.
3) Reconfigure the aircraft for takeoff.
    a. Retract flaps to desired value (10º or less).
    b. Set trim to the takeoff position.
4) Smoothly apply full-power.
5) Upon reaching rotation speed, 55 kts (V_R), increase back elevator pressure to establish the lift-off attitude that is approximately V_Y or V_X and allow the aircraft to fly off the ground.
6) Apply adequate drift correction to maintain runway centerline.
7) At 500 ft., or as workload permits, complete the climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to touch and go procedures.
- Maintains runway centerline upon touchdown.
- Applies proper crosswind controls upon touchdown, reconfiguration and climb out.
- Demonstrates proper aircraft reconfiguration.
- Lifts off at the recommended airspeed and accelerates to V_X or V_Y, as appropriate.
- Retracts flaps at 200' or a safe altitude, if appropriate.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Complies with noise abatement procedures.
- Completes the appropriate checklist.

Note: These are the UCM standards. The aforementioned standards are not found in the Airman Certification Standards.

Learning Outcomes:

- Explain the purpose(s) of touch and go's.
- Discuss how crosswind correction will change throughout the maneuver.
- Discuss the importance of maintaining runway centerline during aircraft reconfiguration.

Safety Considerations:

- Maintain runway centerline.
- Proper crosswind correction.
- Maintain situational awareness.
- Proper reconfiguration.

Common Errors:

- Failure to maintain runway centerline.
- Touchdown beyond the first 1/3rd of the runway and attempting a touch and go.
- Improper aircraft reconfiguration.
- Failure to maintain adequate crosswind correction.
- Attempting to lift-off prior to rotation speed.

Emergency Descent (C-172R)

Objective:

To descend the airplane as soon and as rapidly as possible, within the structural limitations of the airplane.

Description:

The emergency descent is a maneuver for descending as rapidly as possible to a lower altitude or to the ground for an emergency landing.

Setup Procedure:

1) Perform clearing turns.
2) If utilizing flight following, contact ATC for traffic advisories below.
3) Reduce power to idle.
4) Confirm flaps 0º
5) Set mixture to rich.
6) Roll into a 30º - 45º bank to the left and pitch down to achieve 120 kts (If in turbulent air, maintain an airspeed below V_A).
7) Initiate recovery to level flight at least 300' prior to assigned altitude by:
    a. Rolling out the bank.
    b. Pitching up.
8) Return to cruise flight and complete the cruise checklist to include leaning procedures

Flight Proficiency Standards:

- Exhibit knowledge of the elements related to emergency descent.
- Recognizes situations, such as depressurization, cockpit smoke, and/or fire that require an emergency descent.
- Establish the appropriate airspeed and configuration for the emergency descent.
- Exhibit orientation, division of attention, and proper planning.
- Maintains positive load factors during the descent.
- Follow the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the purpose(s) of an emergency descent.
- Discuss engine cooling characteristics during an emergency descent.
- Discuss the importance of proper planning as it pertains to emergencies.

Safety Considerations:

- Maintain positive aircraft control.
- Clear the engine periodically
- Clear below then GO.
- Steep spiral over airport.
- Continue on to emergency approach and landing.

Common Errors:

- Failure to recognize the urgency of the emergency descent.
- Failure to use emergency checklist for situation.
- Failure to maintain appropriate configuration and airspeed.
- Poor orientation, planning, and division of attention.

Emergency Approach & Landing (C-172R)

Objective:

To develop accuracy, judgment, planning, procedures, and confidence when little or no power is available.

Description:

An engine failure is simulated by the instructor after which the airplane is safely maneuvered to a landing.

Setup Procedure:

1) The instructor will reduce engine power to idle and announce “simulated emergency landing.”
2) Establish an airspeed of 65 kts ($V_{L/D}$) and trim to maintain airspeed.
3) Select a suitable landing location and spiral over it.
4) Complete an engine restart flow.
5) Complete the engine failure checklists as time permits.
6) Establish communication to report emergency situation.
7) Configure and maneuver the aircraft to fly a normal traffic pattern as applicable.
8) Initiate a go-around no lower than 500 feet AGL.

Flight Proficiency Standards:

- Exhibit knowledge of the elements related to emergency approach and landing procedures.
- Establish and maintain the recommended best-glide airspeed, ±10 kts.
- Select a suitable landing area.
- Plan and follow a flight pattern to the selected landing area considering altitude, wind, terrain, and obstructions.
- Prepare for landing or go-around as specified by the instructor.
- Follow the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the criteria for a good emergency landing field.
- Explain the steps to follow after an engine failure.
- Explain how to trouble shoot for problems after an engine failure.

Safety Considerations:

- Maintain positive aircraft control.
- Clear the engine periodically.
- Maintain awareness for towers and other obstacles.
- Maintain situational awareness.
- This is a **dual only** maneuver.

Common Errors:

- Improper airspeed control.
- Poor judgment in the selection of an emergency landing area.
- Failure to estimate the approximate wind speed and direction.
- Failure to fly the most suitable pattern for existing situation.
- Failure to accomplish the emergency checklists.
- Undershooting or overshooting selected landing area.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Forward Slip to a Landing (C-172R)

Objective:

To dissipate altitude without increasing airspeed.

Description:

The upwind wing is lowered and opposite rudder is used to maintain the ground track bringing the aircrafts longitudinal axis at an angle to its flight path. The pitch is adjusted to maintain the desired airspeed.

Setup Procedure:

1) Determine the wind direction.
2) Reduce power to idle.
3) Simultaneously bank into the wind and apply full opposite rudder.
4) Adjust pitch to maintain desired airspeed.
5) Adjust aileron input to maintain the ground track of the aircraft with the extended runway centerline.

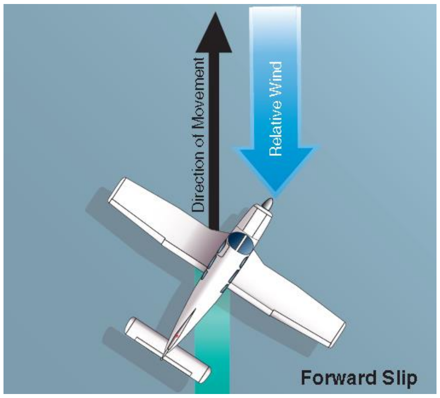
Flight Proficiency Standards:

- Exhibits knowledge of the elements related to forward slip to a landing.
- Considers the wind conditions, landing surface and obstructions, and selects the most suitable touchdown point.
- Establishes the slipping attitude at the point from which a landing can be made using the recommended approach and landing configuration and airspeed; adjusts pitch attitude and power as required.
- Maintains a ground track aligned with the runway center/landing path and an airspeed, which results in minimum float during the flare.
- Makes smooth, timely, and correct control application during the recovery from the slip, the flare, and the touchdown.
- Touchdown smoothly at the approximate stalling speed, at or within 400 feet beyond a specified point with no side drift and with the airplane's longitudinal axis aligned with and over the runway centerline.
- Maintain crosswind correction and directional control throughout the approach and landing sequence.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance of maintaining the proper attitude to avoid a stall.
- Predict the amount of control input required to maintain the desired ground track.
- Discuss the applications in which a forward slip might be used.
- Explain the proper control inputs to perform a forward slip.
- Explain flap configuration considerations applicable to forward slips.
- Explain aircraft limitations applicable to forward slips.



Safety Considerations:

- Maintain sufficient airspeed as to avoid a stall.
- Observe maximum forward slip duration limitations.
- Terminate the maneuver with sufficient altitude to complete a landing.

Common Errors:

- Improper aileron and/or rudder control inputs.
- Failure to maintain airspeed and a stabilized slip.
- Inappropriate removal of hand from throttle.
- Improper technique during transition from the slip to the touchdown.
- Failure to maintain runway centerline.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Go-Around (C-172R)

Objective:

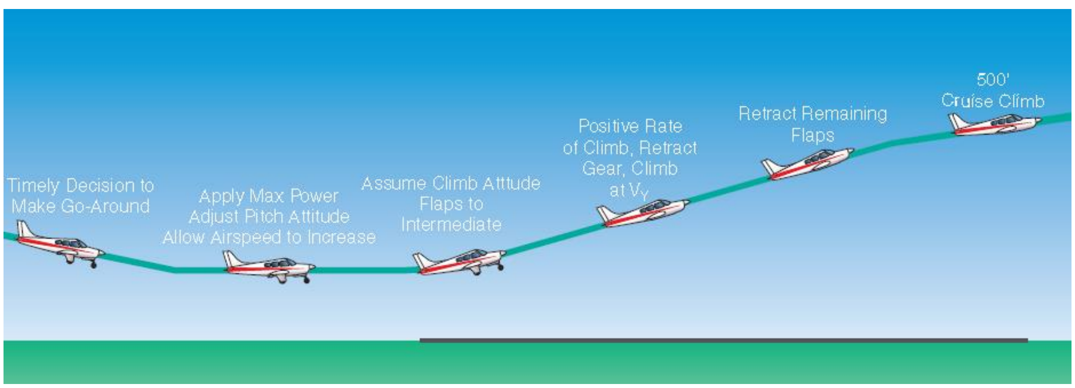
To safely discontinue the landing approach if unstable or other unsatisfactory conditions exist.

Description:

As full power is applied, the aircraft attitude is adjusted to accelerate to V_Y and climb. As a safe airspeed is attained, flaps are retracted 10° at a time allowing stabilization between each retraction.

Setup Procedure:

1) Simultaneously apply maximum power and establish a go-around pitch attitude.
2) Set flaps to 20°.
3) Establish a pitch attitude to accelerate to 55 kts.
4) Allow the airplane to accelerate to V_X or V_Y and climb.
5) If there is an aircraft on the runway, sidestep to clear the departure path of the airplane and allow the pilot to view the landing or departing traffic.
6) Set flaps to 10° and stabilize in between configuration changes then flaps to 0°.
7) Verify Go Around checklist is complete.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a go-around/rejected landing.
- Makes a timely decision to discontinue the approach to landing.
- Applies takeoff power immediately and transitions to climb pitch attitude for V_X, and maintains V_Y+10/-5 kts.
- Retracts the flaps as appropriate.
- Retracts the landing gear, if appropriate, after a positive rate of climb is established.
- Maneuvers to the side of the runway/landing area to clear and avoid conflicting traffic.
- Maintains takeoff power V_Y+10/-5 to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the climb.
- Completes the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss events that may require a go-around.
- Explain the importance of maintaining airspeed and coordination during the go-around procedure.
- Discuss the necessity for maneuvering to the side of the runway after making the decision to go-around.

Safety Considerations:

- Maneuver the airplane to the side of the runway.
- Do not establish a pitch up attitude too quickly.
- Maintain coordination.
- Timely decision making.
- Be watchful for situation which may require a go-around.

Common Errors:

- Delayed decision to make a go-around.
- Improper application of power.
- Failure to control pitch attitude.
- Improper trim technique.
- Failure to compensate for torque effect.
- Failure to maintain 79 kts (V_Y).
- Improper wing flap retraction.
- Failure to maintain well clear of obstructions and other traffic.
- Improper use of checklist.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Maneuvering During Slow Flight (C-172R)

Objective:

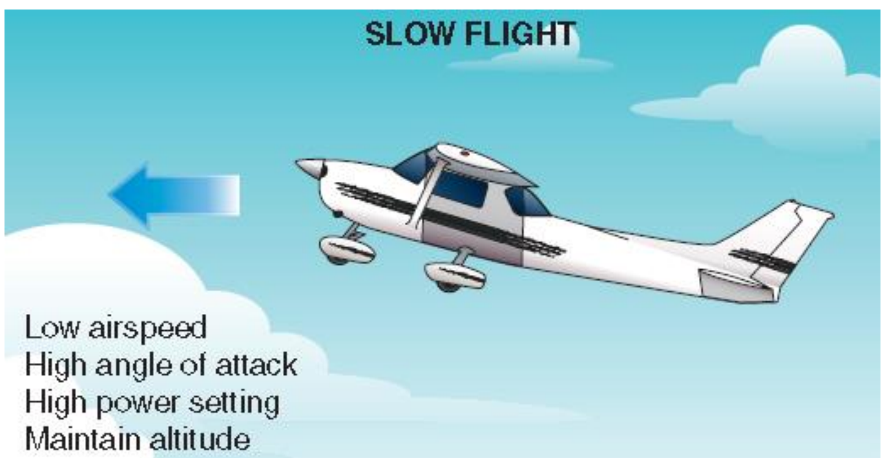
To demonstrate the flight characteristics and controllability of an airplane at speeds lower than normal cruise and develop proficiency in performing maneuvers that require slow airspeeds.

Description:

Slow flight consists of slowing the aircraft to a minimum controllable airspeed in the landing configuration and maneuvering the aircraft while maintaining altitude and airspeed.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
2) Perform clearing turns.
3) Set mixture to rich.
4) Reduce power to 1,500 RPM or less.
5) Below 110 kts, set flaps to 10°.
6) Adjust pitch and power as necessary to maintain altitude.
7) Below 85 kts, set flaps to 20° and 30° allowing the aircraft to stabilize between each setting.
8) Establish and maintain an airspeed at which any further increase in pitch or reduction of power would result in an immediate stall or a higher speed as specified by your instructor.
    a. Slow flight should be practiced at varying speeds and configurations above the 1G stall speed of the aircraft as specified by the instructor.
9) Maneuver as instructed.
10) Recover when instructed by:
    a. Adding full power
    b. Set flaps to 20° and allow the aircraft to stabilize.
    c. Then set flaps to 10° and 0° allowing the aircraft to stabilize between each setting.
11) Return to cruise flight and perform the cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to maneuvering during slow flight.
- Selects an entry altitude that will allow the task to be completed no lower than 1,500'AGL.
- Establish and maintain an airspeed at which any further increase in angle of attack, increase in load factor, or reduction in power, would result in a stall warning (e.g., airplane buffet, stall horn, etc.).
- Accomplishes coordinated straight and level flight, turns, climbs, and descents with landing gear and flap configurations specified by the instructor.
- Divides attention between airplane control and orientation.

- Maintains the specified altitude, ±100 feet; specified heading, ±10°; airspeed, +10/-0 kts; and specified angle of bank, ±10°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the relationship between pitch and power in maintaining airspeed and altitude during slow flight.
- Discuss how flight at minimum airspeeds develops the ability to estimate the margin of safety above the stalling speed.
- Compare the practice of slow flight to various phases of flight such as; takeoffs, climbs, descents, go-arounds, and approaches to landing.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified gear and flap configuration.
- Improper entry technique.
- Failure to establish and maintain the specified airspeed.
- Excessive variations of altitude and heading.
- Rough or uncoordinated control technique.
- Improper correction for left turning tendency.
- Improper trim technique.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Power – Off Stall (C-172R)

Objective:

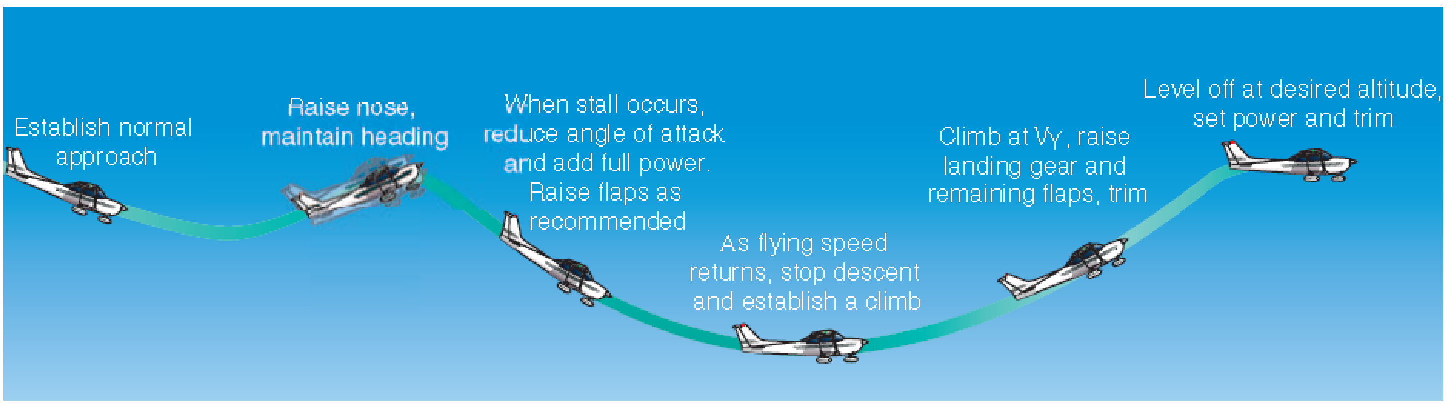
To familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop the skills to prevent and recover from stalls in the landing configuration.

Description:

The aircraft is slowed down and placed in the landing configuration after which a stall is induced and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
2) Perform clearing turns.
3) Set mixture to rich.
4) Reduce power to 1,500 RPM or less allowing the aircraft to slow to approach speed while maintaining altitude.
5) Below 110 kts, set flaps to 10°.
6) Below 85 kts, set flaps to 20° and 30° allowing the aircraft to stabilize between each setting.
7) Establish a stabilized descent at 65 kts.
8) Reduce power to idle.
9) Maintain coordinated flight and altitude until recognition of the stall. As the stall occurs, recover from the stall by simultaneously reducing the angle of attack, adding full power, and leveling the wings.
10) Set flaps to 20°.
11) Accelerate the aircraft to V_X (recommended) or V_Y and climb while retracting the remaining flaps in 10° increments.
12) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to power-off stalls.
- Selects an entry altitude that allows the task to be completed no lower than 1,500'AGL.
- Establishes a stabilized descent in the approach or landing configuration, as specified by the instructor.
- Transitions smoothly from the approach or landing attitude to a pitch attitude that will induce a stall.
- Maintains a specified heading, ±10°, in straight flight; maintains a specified angle of bank not to exceed 20°, ±10°; in turning flight, while inducing the stall.
- Recognizes and recovers promptly after the stall occurs by simultaneously reducing the angle of attack, increasing power to maximum allowable and leveling the wings to return to a straight and level flight attitude with minimum loss of altitude appropriate for the airplane.
- Retract the flaps to the recommended setting; retracts the landing gear, if retractable, after a positive rate of climb is established.
- Accelerates to V_X or V_Y speed before the final flap retraction; returns to the altitude, heading, and airspeed specified by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Power – On Stall (C-172R)

Objective:

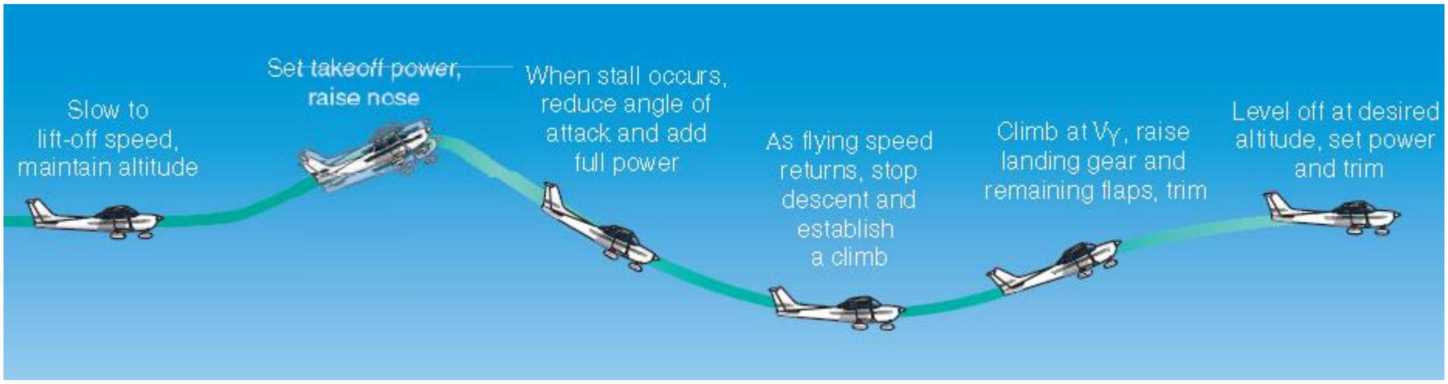
To familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in the takeoff configuration.

Description:

The aircraft is slowed down and placed in the takeoff configuration after which a stall is induced and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
2) Perform clearing turns.
3) Set mixture to rich.
4) Reduce power to 1200 RPM or less, allowing the aircraft to slow to takeoff speed while maintaining altitude.
5) Add full power at 55 kts (V_R).
6) Transition smoothly to the pitch attitude that will induce a stall.
7) Recognize and recover promptly after a fully developed stall occurs by simultaneously reducing the angle of attack, confirming full power, and leveling the wings.
8) Accelerate the aircraft to 79 kts (V_Y) and climb.
9) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to power-on stalls.
- Selects an entry altitude that allows the task to be completed no lower than 1,500' AGL.
- Establishes the takeoff or departure configuration. Sets power to no less than 65 percent available power.
- Transitions smoothly from the takeoff or departure attitude to the pitch attitude that will induce a stall.
- Maintains a specified heading, ±10°, in straight flight; maintains a specified angle of bank not to exceed 20°, ±10°, in turning flight, while inducing the stall.
- Recognizes and recovers promptly after the stall occurs by simultaneously reducing the angle of attack, increasing power as appropriate, and leveling the wings to return to a straight and level flight attitude with a minimum loss of altitude appropriate for the airplane.
- Retracts the flaps to the recommended setting; retracts the landing gear if retractable, after a positive rate of climb is established.
- Accelerates to V_X or V_Y speed before the final flap retraction; returns to the altitude, heading, and airspeed specified by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Recovery from Unusual Flight Attitudes (C-172R)

Objective:

To safely re-establish control of the airplane after recognition of an unusual attitude.

Description:

The aircraft is maneuvered with the proper use of pitch, power, and bank to safely recover from a nose-high or nose-low unusual attitude.

Setup Procedure:

1) The instructor will position the aircraft into a level or banked nose-high or nose-low unusual attitude while the student has his or her eyes closed.
2) The instructor will instruct the student to recover from the unusual attitude visually or by using a view limiting device.
3) For a nose-high attitude:
    a. Simultaneously add full power and lower the pitch.
    b. Level the wings.
4) For a nose-low attitude:
    a. Reduce power.
    b. Level the wings.
    c. Increase pitch.
5) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to attitude instrument flying during unusual attitudes.
- Recognizes unusual flight attitudes solely by reference to instruments; recovers promptly to a stabilized level flight attitude using proper instrument cross-check and interpretation and smooth, coordinated control application in the correct sequence.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the importance of quickly and accurately determining an unusual attitude.
- Explain proper control inputs to recover from an unusual attitude.

Safety Considerations:

- Maintain positive aircraft control.
- Observe aircraft limitations with respect to airspeed and load factors.

Common Errors:

- Incorrect interpretation of the flight instruments.
- Inappropriate application of controls.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Steep Turns (C-172R)

Objective:

To develop coordination, orientation, division of attention and smooth control techniques while executing high performance turns.

Description:

The maneuver consists of a 360° turn using a bank angle of approximately 45° while maintaining a constant airspeed and altitude.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
2) Perform clearing turns.
3) Adjust the mixture in accordance with the POH.
4) Reduce power to establish an airspeed of 95 kts.
5) Enter a coordinated 45° banking turn to the left or right.
6) Increase power and adjust trim and pitch as required to maintain altitude and airspeed.
7) Begin rollout at ½ the bank angle prior to rollout heading.
8) Reduce power and pitch on rollout as needed to remain at 95 kts.
9) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to steep turns.
- Establishes the manufacturer's recommended airspeed (95 kts) or if one is not stated, a safe airspeed not to exceed V_A.
- Rolls into a coordinated 360° turn; maintains a 45° bank.
- Perform the task in the opposite direction, as specified by the instructor.
- Divide attention between airplane control and orientation.
- Maintain the entry altitude, ±100 feet, airspeed, ±10 kts, bank, ±5°; and roll out on the entry heading, ±10°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain why load factor increases as bank angle increases.
- Discuss the relationship between load factor and stall speed.
- Discuss the principle of over-banking tendency.
- Explain how to maintain altitude and airspeed.
- Explain limit load factor and what happens if it's exceeded.

Safety Considerations:

- Do not exceed manufacturer's recommended airspeed or V_A.
- Always clear the area before initiating the maneuver.
- The maneuver is to be completed no lower than 1,500' AGL.
- Division of attention between maneuver and scanning for traffic.

Common Errors:

- Improper pitch, bank, and power coordination during entry and rollout.
- Uncoordinated use of flight controls.
- Improper procedure in correcting altitude deviations.
- Loss of orientation.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Tracking A Straight Line (C-172R)

Objective:

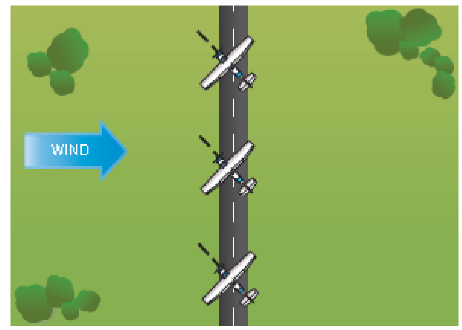
To maintain a uniform ground track along a selected straight line or road with a constant airspeed and altitude while controlling the effect of wind drift on the airplane and the proper correction using varying crosswind correction.

Description:

Tracking a straight line is a training maneuver, in which the ground track of the airplane is flown following a straight line on the ground correcting for wind drift.

Setup Procedure:

1) Select a straight line at least 1 mile in length with a crosswind in an area free of obstructions.
2) Perform clearing turns and establish 1,000' AGL.
3) Adjust the mixture in accordance with the POH.
4) Position the airplane to follow a path over or parallel to a straight line.
5) Maintain an equal distance from the straight line as you fly along it crabbing as necessary.
6) Return to cruise flight and perform the cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to tracking a straight line.
- Selects a suitable reference area.
- Plans the maneuver so as to track the straight line, 1,000' AGL at an appropriate distance from the selected reference area.
- Applies adequate wind-drift correction during straight and turning flight to maintain a constant ground track along the straight line reference area.
- Divides attention between airplane control and the ground track while maintaining coordinated flight.
- Maintains altitude, ±100 feet; maintains airspeed, ±10 kts.

Learning Outcomes:

- Describe proper division of attention.
- Explain the correlation between the maneuver and a traffic pattern at an airport.
- Predict amount of wind correction based on conditions.

Safety Considerations:

- Avoid tall obstacles and populated areas.
- Locate a landing area to use in the event of an emergency.
- Maintain separation from other aircraft.

Common Errors:

- Improper crab angle.
- Fixation on one aspect of the maneuver.
- Uncoordinated flight.

References:

Airplane Flying Handbook; POH/AFM;

Rectangular Course (C-172R)

Objective:

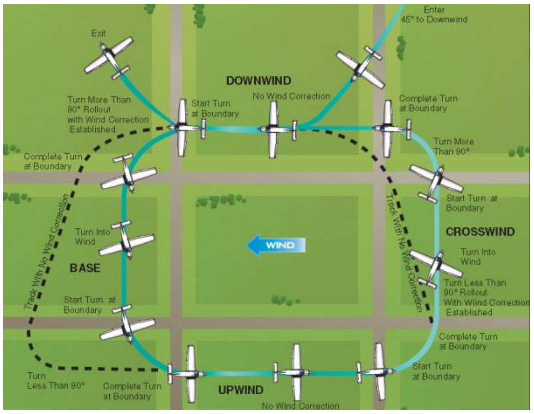
To maintain a uniform ground track around a selected rectangular ground reference with a constant airspeed and altitude while controlling the effect of wind drift on the airplane and the proper correction using varying crosswind correction.

Description:

The rectangular course is a training maneuver, in which the ground track of the airplane is equidistant from all sides of the selected rectangular area on the ground.

Setup Procedure:

1) Select a rectangular area approximately 1 mile in length in an area free of obstructions.
2) Perform clearing turns and establish 1,000’ AGL.
3) Adjust the mixture in accordance with the POH.
4) Maintain a safe airspeed (recommended 95 kts).
5) Enter the pattern at a 45° angle to midfield of the downwind approximately ½ mile from the field.
6) Maintain an equal distance from the field as you fly around it crabbing as necessary.
7) Exit the maneuver at a 45° angle to midfield of the downwind.
8) Return to cruise flight and perform the cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a rectangular course.
- Selects a suitable reference area.
- Plans the maneuver so as to enter a left or right pattern, 1,000’ AGL at an appropriate distance from the selected reference area, 45° to the downwind leg.
- Applies adequate wind-drift correction during straight and turning flight to maintain a constant ground track around the rectangular reference area.
- Divides attention between airplane control and the ground track while maintaining coordinated flight.
- Maintains altitude, ±100 feet; maintains airspeed, ±10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Describe proper division of attention.
- Explain the correlation between the maneuver and a traffic pattern at an airport.
- Predict amount of wind correction based on conditions.

Safety Considerations:

- Avoid tall obstacles and populated areas.
- Locate a landing area to use in the event of an emergency.
- Maintain separation from other aircraft.

Common Errors:

- Improper crab angle.
- Fixation on one aspect of the maneuver.
- Uncoordinated flight.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Turns Around a Point (C-172R)

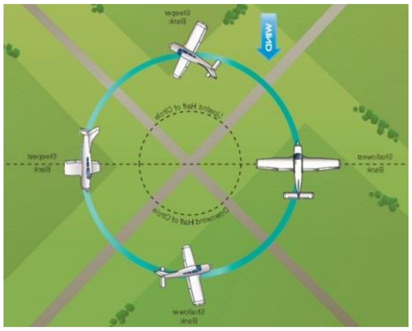
Objective:

To maintain a uniform ground track around a reference point with a constant airspeed and altitude while demonstrating the effect of wind drift on the airplane and the proper correction using varying bank angle.

Description:

The airplane's ground track makes two complete circles, with a constant radius, around a selected point on the ground.

Setup Procedure:



1) Select a prominent reference point on the ground.
2) Perform clearing turns and establish 1,000' AGL.
3) Adjust the mixture in accordance with the POH.
4) Maintain a safe airspeed (recommended 95 kts).
5) Enter the maneuver on the downwind.
6) Initiate the turn when abeam the point.
7) Apply wind correction, as necessary, to maintain a constant radius around the selected reference point.
8) Exit on the downwind.
9) Return to cruise flight and perform the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to turns around a point.
- Selects a suitable ground reference point.
- Plans the maneuver so as to enter left or right at 1,000' AGL, at an appropriate distance from the reference point.
- Applies adequate wind-drift correction to track a constant radius turn around the selected reference point.
- Divides attention between airplane control and the ground track while maintaining coordinated flight.
- Maintains altitude, ±100 feet; maintains airspeed, ±10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Student should demonstrate wind drift correction with varying bank angle and proper aircraft control to maintain the desired ground track.
- Plan maneuver radius by assessing wind speed and direction.

Safety Considerations:

- Always clear area before beginning a maneuver.
- Select area with an emergency landing field close.
- Avoid areas with towers or tall buildings/towns.

Common Errors:

- Faulty entry procedure.
- Poor planning or division of attention.
- Uncoordinated flight control application.
- Improper wind-drift correction.
- Failure to maintain selected altitude or airspeed.
- Failure to establish approximately 45° bank at the steepest point.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

S-Turns (C-172R)

Objective:

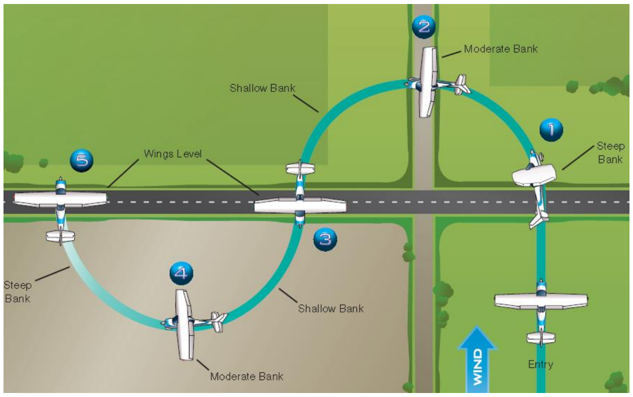
To maintain a uniform ground track of semicircles along a selected reference line with a constant airspeed and altitude while demonstrating the effect of wind drift on the airplane and the proper correction using varying bank angle.

Description:

The airplane's ground track describes semicircles of equal radii on each side of a selected straight line on the ground.

Setup Procedure:

1) Select a prominent line on the ground perpendicular to the wind.
2) Perform clearing turns and establish 1,000' AGL.
3) Adjust the mixture in accordance with the POH.
4) Maintain a safe airspeed (recommended 95 kts).
5) Enter the maneuver on the downwind.
6) Initiate the first turn upon reaching the reference line.
7) Apply wind correction, as necessary, to maintain a constant radius around a point on the reference line.
8) After a 180° turn, reverse the turn.
9) After two 180° turns are completed, exit on the downwind.
10) Return to cruise flight and perform the cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to S-turns.
- Selects a suitable ground reference line.
- Plans the maneuver so as to enter at 1,000' feet AGL, perpendicular to the selected reference line.
- Applies adequate wind-drift correction to track a constant radius turn on each side of the selected reference line.
- Reverses the direction of turn directly over the selected reference line.
- Divides attention between airplane control and the ground track while maintaining coordinated flight.
- Maintains altitude, ±100 feet; maintains airspeed, ±10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Demonstrate wind drift correction with varying bank angle and proper aircraft control to maintain the desired ground track.
- Plan maneuver radius by assessing wind speed and direction.

Safety Considerations:

- Always clear area before beginning a maneuver.
- Select an area with an emergency landing field nearby.
- Avoid areas with towers or tall buildings/towns.

Common Errors:

- Faulty entry procedure.
- Poor planning or division of attention.
- Uncoordinated flight control application.
- Improper wind-drift correction.
- Failure to maintain selected altitude or airspeed.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

C-172S

Passenger Briefing (C-172S)

Objective:
To provide a standard pre-flight briefing to passengers.

Description:
The pilot in command is required by the Federal Aviation Regulations to provide a passenger briefing.

Setup Procedure:
2) Before starting the engine the Pilot-in-Command will provide the passenger safety briefing to include, but not limited to:
   a. Designation of Pilot-in-Command.
   b. Procedures for positively exchanging flight controls.

      S
      i. Seat belts and shoulder harnesses (location and operation).
      ii. Seat belts & shoulder harnesses fastened for taxi, takeoff and landing.
      iii. Seat position adjusted and locked in place (controls and operation).

      A
      iv. Air vents (location and operation).
      v. All environmental controls (discussed).
      vi. Action in case of any passenger discomfort.

      F
      vii. Fire extinguisher (location and operation).
      viii. Smoking is prohibited.

      E
      ix. Exit doors (how to secure; how to open).
      x. Emergency evacuation plan.
      xi. Emergency/survival kit (location and contents).
      xii. Equipment (location & operation, i.e., ELT, flight controls).

      T
      xiii. Traffic (scanning, spotting, notifying pilot).
      xiv. Talking ("sterile cockpit" expectations).

      Y
      xv. Your questions?

Flight Proficiency Standards:
- Briefs occupants on the use of safety belts, shoulder harnesses, doors, and emergency procedures.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:
- Explain the importance and regulatory requirement for providing a passenger briefing.

Common Errors:
- Failure to perform a passenger briefing.
- Incomplete passenger briefing.

References:
Airman Airman Certification Standards, Federal Aviation Regulations, AC 121-24, AOPA Passenger Safety Briefing Video

Taxiing (C-172S)

Objective:

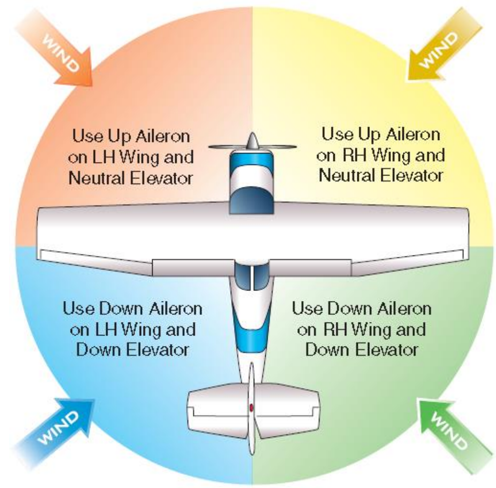
To safely maneuver the airplane on the surface of the airport.

Description:

Taxiing is the controlled movement of the airplane under its own power while on the ground.

Setup Procedure:

1) Complete before taxi checklist.
2) Set heading bug to the wind direction.
3) After engine start, check for traffic in both directions, increase power and allow the airplane to roll slight forward and apply brakes.
4) To turn right, use right rudder. To turn left, use left rudder. Differential braking can be used to make a sharper turn.
5) Taxi at a speed consistent with safety, but no faster than a brisk walk. Use power to control taxi speed before using brakes.
6) Apply proper crosswind taxi control deflections.
7) To come to a stop, reduce power to idle and smoothly apply brakes.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to safe taxi procedures.
- Performs a brake check immediately after the airplane begins moving.
- Positions the flight controls properly for the existing wind conditions.
- Controls direction and speed without excessive use of brakes.
- Complies with airport/taxiway markings, signals, ATC clearances, and instructions.
- Taxies so as to avoid other aircraft and hazards.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance of crosswind taxi techniques.
- Explain the importance of using minimal power and braking.

Safety Considerations:

- Maintain taxiway centerline.
- Use taxi lights.
- Use proper crosswind taxi techniques.
- Taxi at a speed consistent with safety.

Common Errors:

- Not performing a brake check.
- Improper crosswind taxi control deflections.
- Improper use of power and brakes.
- Taxiing at a speed not consistent with safety.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Normal & Crosswind Takeoff & Climb (C-172S)

Objective:

To move the airplane from its starting position on the runway, become airborne, and establish a positive climb to a safe maneuvering altitude.

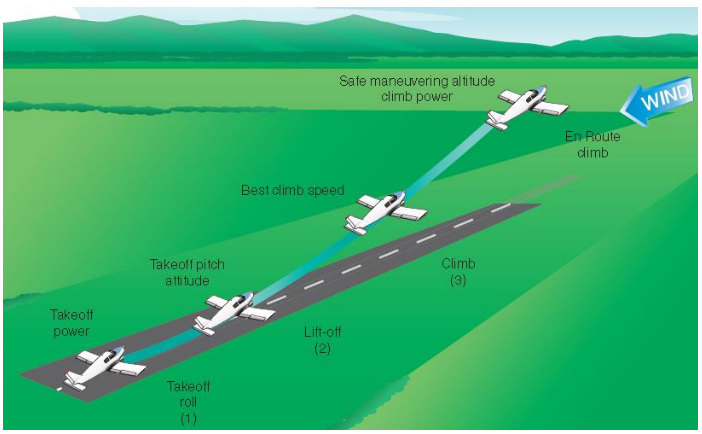
Description:

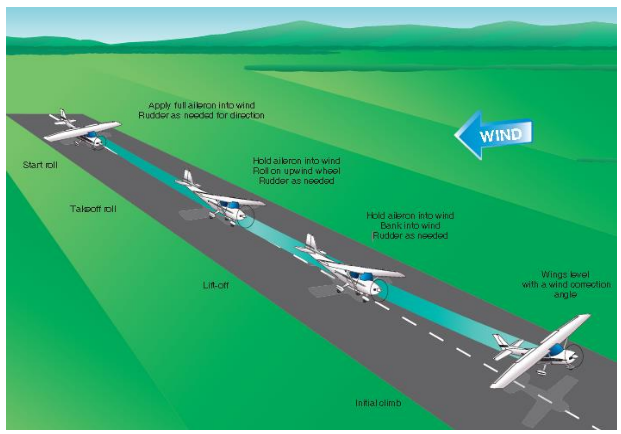
The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane is accelerated to an airspeed that provides sufficient lift to become airborne.
2) The rotation, when the pilot increases elevator back pressure, increasing the angle of attack to lift the nose wheel.
3) The initial climb when the airplane leaves the ground and establishes a pitch attitude to climb away from the runway.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete takeoff checklist and takeoff briefing.
3) Use aircraft lighting as recommended by the current version of AC 91-73.
4) Ensure runway is clear, align aircraft with runway centerline, confirm DG is aligned with runway, and ensure nose wheel is straight.
5) Position flight controls for wind for existing conditions.
6) Advance throttle smoothly to takeoff power ensuring toes are resting on rudder pedals, not on brakes.
7) Check engine instruments during takeoff roll for normal indications.
8) Maintain directional control with rudder pedals and crosswind control with appropriate aileron deflection
9) Maintain a slightly tail low attitude.
10) Upon reaching rotation speed, 55 kts (V_R), increase back elevator pressure to establish the lift-off attitude that is approximately that for V_Y and allow the aircraft to fly off the ground.
11) Apply adequate drift correction to maintain runway centerline.
12) Accelerate to 74 kts (V_Y).
13) At 500 ft., or as workload permits, complete climb checklist.





Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a normal and crosswind takeoff, climb operations, and rejected takeoff procedures.
- Positions the flight controls for the existing wind conditions.
- Clears the area; taxies into the takeoff position and aligns the airplane on the runway centerline.
- Lifts off at the recommended airspeed and accelerates to V_Y.
- Establishes a pitch attitude that will maintain V_Y +10/-5 kts.
- Retracts the landing gear, if appropriate, and flaps after a positive rate of climb is established.
- Retracts flaps at 200' or a safe altitude.
- Maintains takeoff power and V_Y +10/-5 kts to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Complies with noise abatement procedures.
- Completes the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain runway selection criteria.
- Discuss how to maintain directional control during the ground roll.
- Discuss proper lift-off technique.
- Explain how to use ailerons during crosswind situations.
- Describe how to correct for wind-drift.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not force aircraft off runway too early, causing it to settle back on the runway.
- Do not allow upwind wing to rise during takeoff.
- Do not exceed maximum demonstrated crosswind.
- Consider the effect of density altitude on performance.

Common Errors:

- Improper runway incursion avoidance procedures.
- Improper use of controls during a normal/crosswind takeoff.
- Inappropriate lift-off procedures.
- Improper climb attitude, power setting, and airspeed.
- Improper use of checklist.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Short-Field Takeoff & Climb (C-172S)

Objective:

To move the airplane from its starting position on the runway, become airborne, and establish a positive climb to a safe maneuvering altitude when the takeoff area is short or restricted by obstructions.

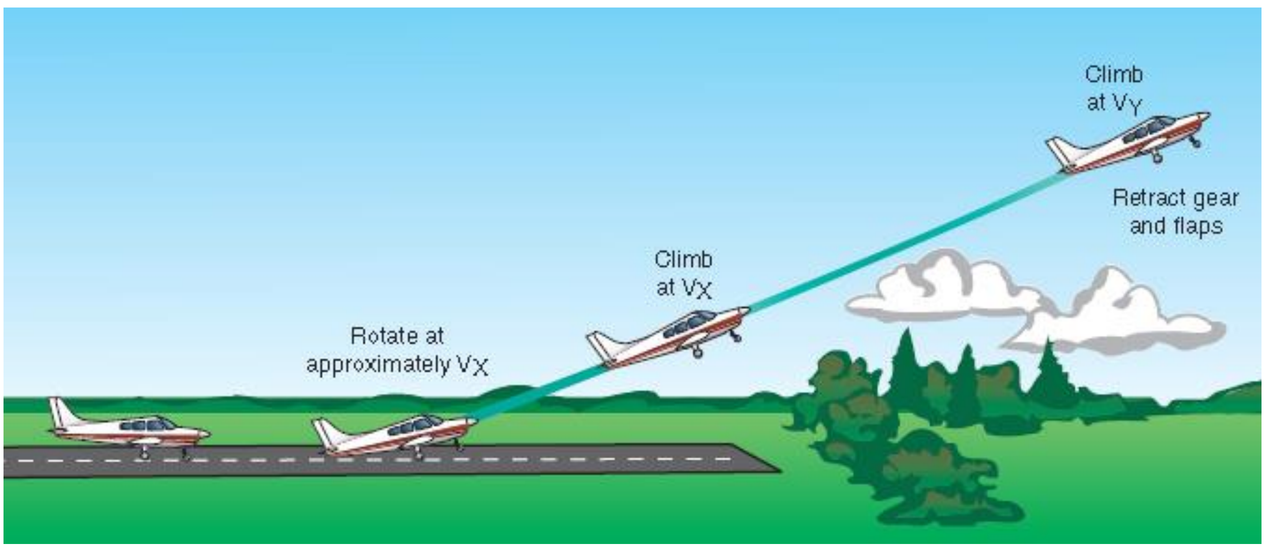
Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane is accelerated to an airspeed that provides sufficient lift to become airborne.
2) The rotation, when the pilot increases elevator back pressure, increasing the angle of attack to lift the nose wheel.
3) The initial climb when the airplane leaves the ground and a pitch attitude is established to climb away from the runway and clear a 50 foot obstacle.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete Short-Field takeoff checklist and takeoff briefing.
3) Set flaps to 10°.
4) Use aircraft lighting as recommended by the current version of AC 91-73.
5) Back taxi and align aircraft with runway centerline, confirm DG is aligned with runway, and ensure nose wheel is straight.
6) Ensure runway is clear, advance throttle smoothly to takeoff power while holding brakes; check engine instruments.
7) Release brakes and ensure toes are resting on rudder pedals, not brakes.
8) Maintain directional control with rudder pedals and appropriate aileron deflection.
9) Upon reaching rotation speed, 55 kts (V_R), increase back elevator pressure to establish lift-off attitude and allow aircraft to fly off ground.
10) Accelerate the aircraft to 56 kts until obstacle is cleared or 50 feet above takeoff surface is attained and then accelerate to 74 kts (V_Y).
11) Retract flaps after a safe altitude of at least 200 ft. and an airspeed of 74 kts are attained.
12) At 500 ft., or as workload permits, complete climb checklist.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a short-field takeoff and maximum performance climb.
- Positions the flight controls for the existing wind conditions; set the flaps as recommended.
- Clears the area; taxies into takeoff position utilizing maximum available takeoff area and aligns the airplane on the runway center/takeoff path.
- Applies brakes (if appropriate), while advancing throttle smoothly to takeoff power.
- Lifts off at the recommended airspeed, and accelerates to the recommended obstacle clearance airspeed or V_X.
- Establishes a pitch attitude that will maintain the recommended obstacle clearance airspeed, or V_X, +10/-5 kts, until the obstacle is cleared, or until the airplane is 50 feet above the surface.
- After clearing the obstacle, establishes the pitch attitude for V_Y, accelerates to V_Y, and maintains V_Y, +10/-5 kts, during the climb.
- Retracts the landing gear, if appropriate, and flaps after a positive rate of climb is established.
- Retracts flaps at 200’ or a safe altitude.
- Maintains takeoff power and V_Y +10/-5 to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Completes the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain runway selection criteria.
- Discuss how to maintain directional control during ground roll.
- Discuss proper lift-off technique.
- Explain the difference between V_X and V_Y.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not force aircraft off runway too early, causing it to settle back onto runway.
- Use of entire runway length.
- Retraction of flaps as recommended.
- Consider effect of density altitude on performance.

Common Errors:

- Improper runway incursion avoidance procedures.
- Improper use of controls during a short-field takeoff.
- Inappropriate lift-off procedures.
- Improper initial climb attitude, power setting and airspeed to clear obstacle.
- Improper use of checklist.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Soft-Field Takeoff & Climb (C-172S)

Objective:

To align the airplane with the takeoff path, become airborne as quickly as possible, and establish a positive climb to a safe maneuvering altitude.

Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane enters the runways with full up elevator deflection and accelerates to an airspeed at which the airplane will lift off.
2) The acceleration to lift off speed while remaining in ground effect.
3) The initial climb when the airplane establishes a pitch attitude to climb away from the runway.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete Short-Field takeoff checklist and takeoff briefing.
3) Set flaps to 10°.
4) Use aircraft lighting as recommended by the current version of AC 91-73.
5) Ensure runway is clear, taxi onto runway with back elevator pressure and align nose with runway centerline without stopping or the use of brakes.
6) Smoothly advance throttle to takeoff power.
7) Ensure toes are resting on rudder pedals, not on brakes.
8) Check engine instruments during ground roll for normal indications.
9) Maintain directional control with rudder pedals and appropriate aileron deflection.
10) Use back elevator pressure to establish a positive pitch attitude and allow the aircraft to fly itself off the ground.
11) When the aircraft becomes airborne, reduce pitch to remain in ground effect while accelerating to 62 kts (V_X) then simultaneously climb and accelerate to 74 kts (V_Y).
12) Retract flaps after a safe altitude of at least 200 ft. and an airspeed of 74 kts are attained.
13) At 500 ft., or as workload permits, complete climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a soft-field takeoff and climb.
- Positions the flight controls for existing wind conditions and to maximize lift as quickly as possible.
- Clears the area; taxies on to the takeoff surface at a speed consistent with safety without stopping while advancing the throttle smoothly to takeoff power.
- Establishes and maintains a pitch attitude that will transfer the weight of the airplane from the wheels to the wings as rapidly as possible.
- Lifts off at the lowest possible airspeed and remains in ground effect while accelerating to V_X, while simultaneously accelerating to V_Y and climbing.
- Establishes a pitch attitude for V_Y, and maintains selected airspeed +10/-5 kts to a safest maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Completes the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss proper soft-field takeoff technique.
- Explain runway selection criteria.
- Predict the height of ground effect and discuss its relevance.
- Discuss how to maintain directional control during ground roll.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not allow the airplane to climb above ground effect too soon, causing it to settle back onto the runway.

Common Errors:

- Improper runway incursion avoidance procedures.
- Improper use of controls during a soft-field takeoff.
- Improper lift-off procedures.
- Improper climb attitude, power setting and airspeed.
- Improper use of checklist.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Traffic Pattern (C-172S)

Objective:

To assure that air traffic flows into and out of an airport in an orderly manner.

Description:

The airplane is flown on a rectangular course around a runway at an altitude specified in the current Airport/Facility Directory.

Setup Procedure:

Departures

1) All departures:
   a. Fly the departure leg straight out until reaching traffic pattern altitude.
   b. Once reaching traffic pattern altitude, continue climbing and turn on course.

Arrivals

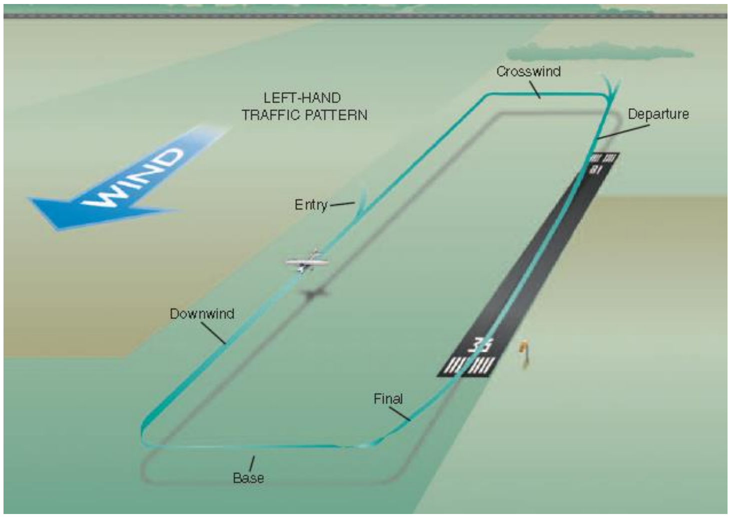
1) Prior to reaching 5 NM from the airfield, complete the following:
   a. Monitor local AWOS/ASOS/ATIS
   b. Ask "Is there any traffic between me and the airport?" and cancel flight following (if applicable)
   c. Complete the Before Landing checklist
2) Slow down below the approach flap airspeed prior to pattern entry.

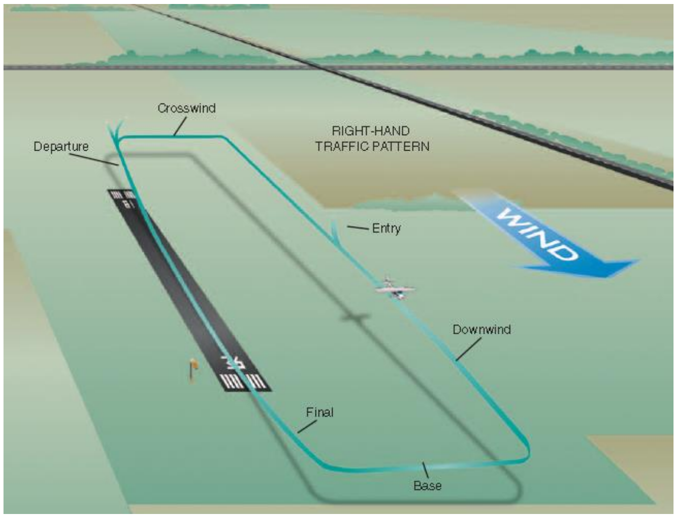
   If already established on the downwind side, skip to step 4.*

3) For a midfield entry:
   a. Cross midfield 500' above traffic pattern altitude, observing traffic flow and wind direction.
   b. Fly 2-3 miles beyond the downwind leg, then descend to pattern altitude.
   c. Complete a tear-drop shaped turn to the right or left as necessary to position the aircraft at a 45 degree angle to the downwind leg.

   If less than two aircraft are currently in the pattern, the alternate method (cross midfield at traffic pattern altitude, enter directly into downwind leg) may be used.

4) Enter the traffic pattern at the designated traffic pattern altitude (normally 1,000' AGL) at a 45 degree angle to the downwind leg at midfield.
5) Apply appropriate crosswind correction to allow for a parallel flight path approximately ½ mile from the runway
6) Allow for proper spacing from other aircraft in the pattern as to prevent runway incursions upon landing.
7) Maintain airspeed below the flap speed required for each configuration change.





Flight Proficiency Standards:

- Exhibits knowledge of the elements related to traffic patterns. This shall include procedures at airports with and without operating control towers, prevention of runway incursions, collision avoidance, wake turbulence avoidance, and wind shear.
- Complies with proper traffic pattern procedures.
- Maintains proper spacing from other aircraft.
- Corrects for wind drift to maintain the proper ground track.
- Maintains orientation with the runway/landing area in use.
- Maintains traffic pattern altitude, ±100 feet and the appropriate airspeed, ±10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss traffic patterns at controlled and uncontrolled airports.
- Explain traffic pattern procedures.
- Explain how to maintain the proper ground track.

Safety Considerations:

- Maintain proper traffic pattern altitude.
- Maintain a distance from the runway that is within power-off gliding distance.
- Preferred bank of 30 degrees while in pattern.
- Maneuver within 300 feet of traffic pattern altitude before turning crosswind to base.
- Maintain proper aircraft separation.
- Comply with standards traffic pattern procedures or ATC instructions.

Common Errors:

- Failure to comply with traffic pattern instructions, procedures, and rules.
- Improper correction for wind drift.
- Inadequate spacing from other traffic.
- Poor altitude or airspeed control.
- Flying too wide of a pattern.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Normal Approach & Landing (C-172S)

Objective:

To safely transition from flight to ground operations during normal conditions.

Description:

The aircraft is configured for a stabilized approach in the landing configuration and transitioned from the descent to touchdown.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
    a. Reduce power to approximately 1,300 RPM.
    b. Confirm flaps 10°.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 75 kts.
6) Turn on the base leg when 45° from the touchdown point:
    a. At key position, assess approach position.
    b. With wings level, set flaps to 20° as required.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 70 kts.
7) Turn on final as to align the aircraft with the extended runway center line:
    a. Set flaps to 30° as required.
    b. Adjust pitch and power as required to maintain a stabilized approach, at 65 kts, toward the selected aiming point until flare to land.
    c. Complete the GUMPS check.
8) During the flare to land simultaneously reduce power to idle and maintain aircraft approximately one foot above runway until it slows to stall speed and touches down on the runway centerline.
9) Maintain positive pitch attitude for aerodynamic braking.
10) Exit runway and complete after landing checklist.

***The above condition is based on a no wind condition.*
*Adjust configuration and airspeed to compensate for wind and gust factor.***

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a normal and crosswind approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects a suitable touchdown point
- Establishes the recommended approach and landing configuration and airspeed, and adjusts pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, or in its absence, not more than 1.3 V_{S0}, +10/-5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the flare and touchdown.
- Touches down smoothly at approximate stalling speed.
- Touches down at or within 400 feet beyond a specified point, with no drift, and with the airplane's longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Completes the appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain proper use of crosswind control inputs.

Safety Considerations:

- Observe flap extension speeds.
- Maintain proper airspeed at all times.
- Use proper crosswind correction to avoid drifting from runway centerline.

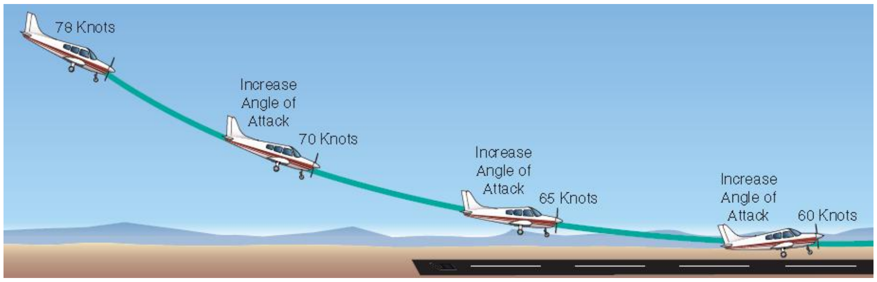
Common Errors:

- Improper use of landing performance data and limitations.
- Failure to establish proper crosswind correction.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Improper procedure during round out and touchdown.
- Improper use of brakes.
- Poor directional control after touchdown.

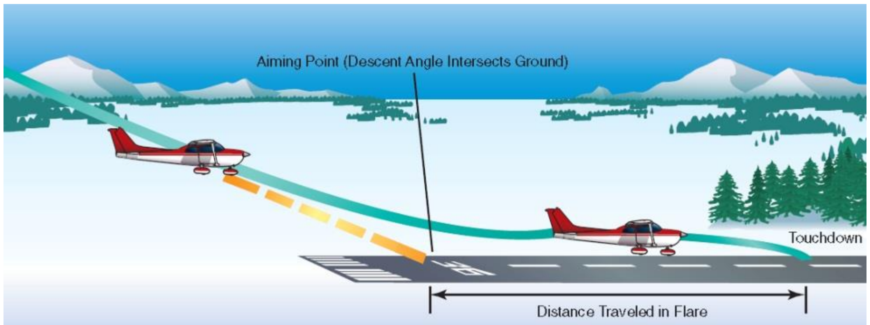
References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Changing angle of attack during round out



Aiming point of a stabilized approach



Example of a well-executed round out and proper landing attitude


Near-Zero Rate of Descent
15 Feet
2 to 3 Feet
1 Foot

Crosswind Approach & Landing (C-172S)

Objective:

To safely transition from flight to ground operations during crosswind conditions.

Description:

The aircraft is configured for a stabilized approach in the landing configuration and transitioned from the descent to touchdown.

Setup Procedure:

2) Complete the before landing and normal landing checklist at least 3 nm before the airport.
3) Enter and fly the appropriate pattern.
4) Select touchdown and aiming points.
5) Set flaps to 10° no later than abeam the touchdown point.
6) When abeam the intended touchdown point:
    a. Reduce power to approximately 1,300 RPM.
    b. Confirm flaps 10°.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 75 kts.
7) Turn on the base leg when 45° from the touchdown point:
    a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
    b. At key position, assess approach position.
    c. With wings level, set flaps to 20° as required.
    d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 70 kts.
8) Turn on final as to align the aircraft with the extended runway center line:
    a. Apply appropriate crosswind correction to maintain the extended runway centerline.
    b. Set flaps to 30° as required.
    c. Adjust pitch and power as required to maintain a stabilized approach, at 65 kts, toward the selected aiming point until flare to land.
    d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
    e. Complete the GUMPS check.
9) During the flare to land simultaneously reduce power to idle and maintain aircraft approximately one foot above runway until it slows to stall speed and touches down on the runway centerline.
10) Maintain positive pitch attitude for aerodynamic braking.
11) Exit runway and complete after landing checklist.

*** Adjust configuration and airspeed to compensate for strong crosswind and/or gust factor.***

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a normal and crosswind approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects a suitable touchdown point
- Establishes the recommended approach and landing configuration and airspeed, and adjusts pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, or in its absence, not more than 1.3 V_{S0}, +10/-5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the flare and touchdown.
- Touches down smoothly at approximate stalling speed.
- Touches down at or within 400 feet beyond a specified point, with no drift, and with the airplane's longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Completes the appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain proper use of crosswind control inputs.

Safety Considerations:

- Observe flap extension speeds.
- Maintain proper airspeed at all times.
- Use proper crosswind correction to avoid drifting from runway centerline.

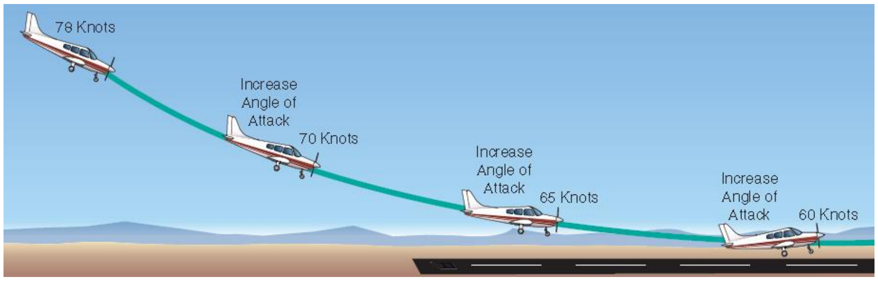
Common Errors:

- Improper use of landing performance data and limitations.
- Failure to establish proper crosswind correction.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Improper procedure during round out and touchdown.
- Improper use of brakes.
- Poor directional control after touchdown.

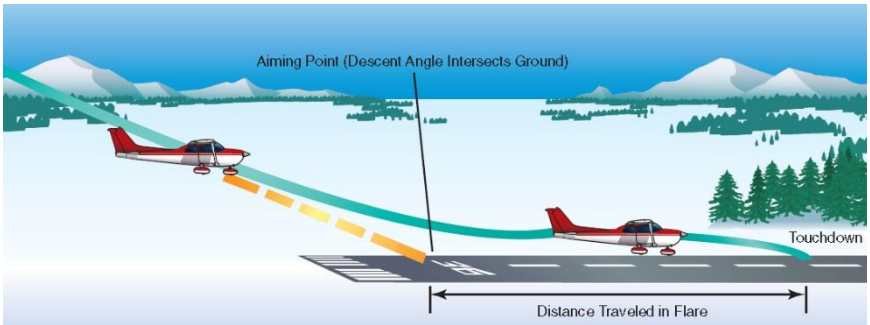
References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Changing angle of attack during round out

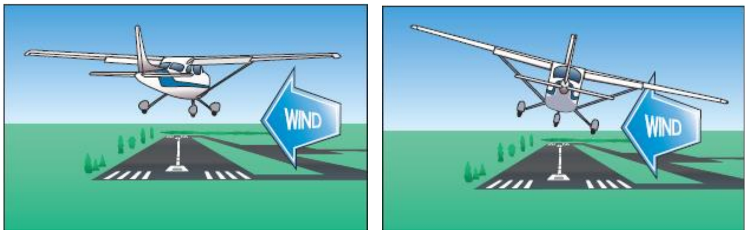


Aiming point of a stabilized approach

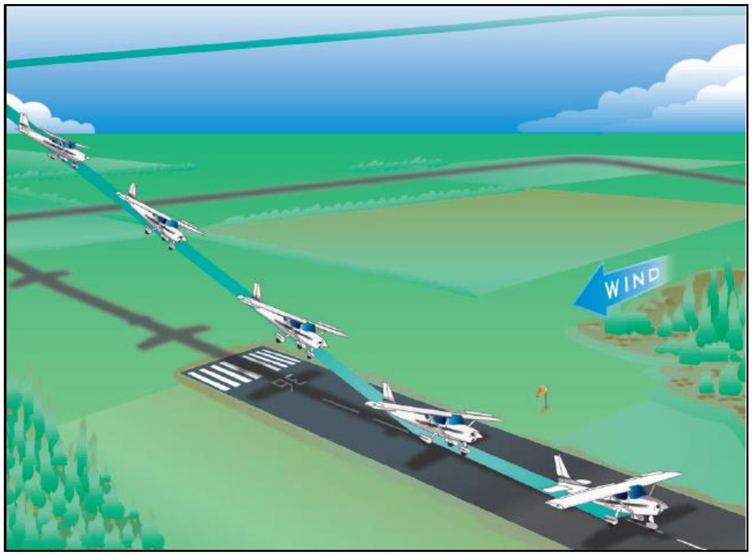


Example of a well-executed round out and proper landing attitude

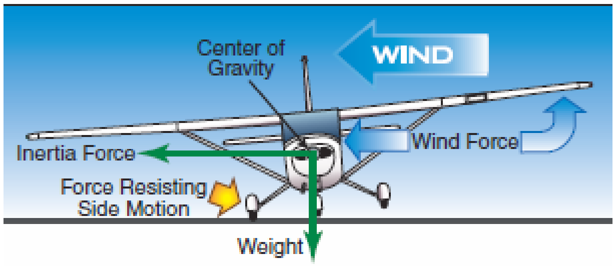
Crabbed Method (Left) / Wing-Low Method (Right)
(Recommended)



Crosswind Approach and Landing using wing low method



Drifting during touchdown (inappropriate crosswind correction)



Short-Field Approach & Landing (C-172S)

Objective:

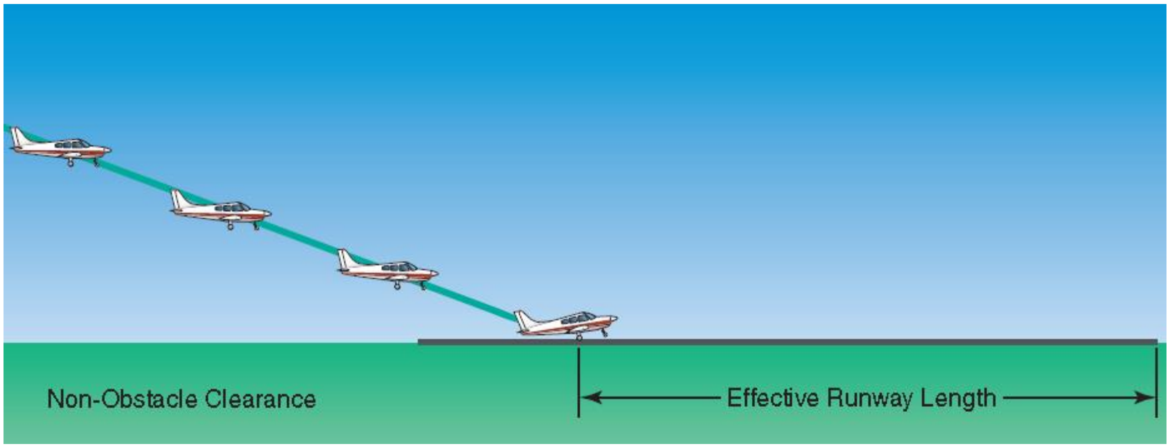
To safely transition from flight to ground operations at an airport with a relatively short runway or where an approach is made over obstacles.

Description:

The airplane is configured for a stabilized approach over a 50 foot obstacle. There will be little or no float during the round out, allowing the airplane to touch down at a specified point, and be stopped in a shorter than normal distance.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
    a. Reduce power to approximately 1,300 RPM.
    b. Confirm flaps 10°.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 75 kts.
6) Turn on the base leg when 45° from the touchdown point:
    a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
    b. At key position, assess approach position.
    c. With wings level, set flaps to 20° as required.
    d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 70 kts.
7) Turn on final as to align the aircraft with the extended runway center line:
    a. Apply appropriate crosswind correction to maintain the extended runway centerline.
    b. Set flaps to 30° as required.
    c. Adjust pitch and power as required to maintain a stabilized approach, at 61 kts, toward the selected aiming point until flare to land.
    d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
    e. Maintain a stabilized descent above the 50 ft obstacle and land at the specified point.
    f. Complete the GUMPS check.
8) During the flare to land simultaneously reduce power to idle and maintain aircraft approximately one foot above runway until it slows to stall speed.
9) Touch down at approximate stall speed on the runway centerline.
10) Maintain positive pitch attitude for aerodynamic braking.
11) Apply maximum braking (simulated) to a complete stop without skidding the tires.
12) Exit runway and complete after landing checklist.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a short-field approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects the most suitable touchdown point.
- Establishes the recommended approach and landing configuration and airspeed; adjusts pitch attitude and power as required.
- Maintains a stabilized approach and recommended approach airspeed, or in its absence not more than 1.3 V_{SO}, +10/-5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the round out and touchdown.
- Touches down smoothly at minimum control airspeed.
- Touches down at or within 200 feet beyond a specified point, with no side drift, minimum float and with the airplane's longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Applies brakes, as necessary, to stop in the shortest distance consistent with safety.
- Completes the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on an approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain how to compensate for obstacles and shortened runway lengths.

Safety Considerations:

- Maintain proper airspeed at all times.
- Compensate for crosswind.
- Do not skid tires.
- Use of aerodynamic braking as available.

Common Errors:

- Excessive airspeed on final approach.
- Slow airspeed prior to touchdown.
- Failure to establish proper crosswind correction.
- Improper use of landing performance data and limitations.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Improper procedure during round out and touchdown.
- Improper use of brakes.
- Poor directional control after touchdown.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Soft-Field Approach & Landing (C-172S)

Objective:

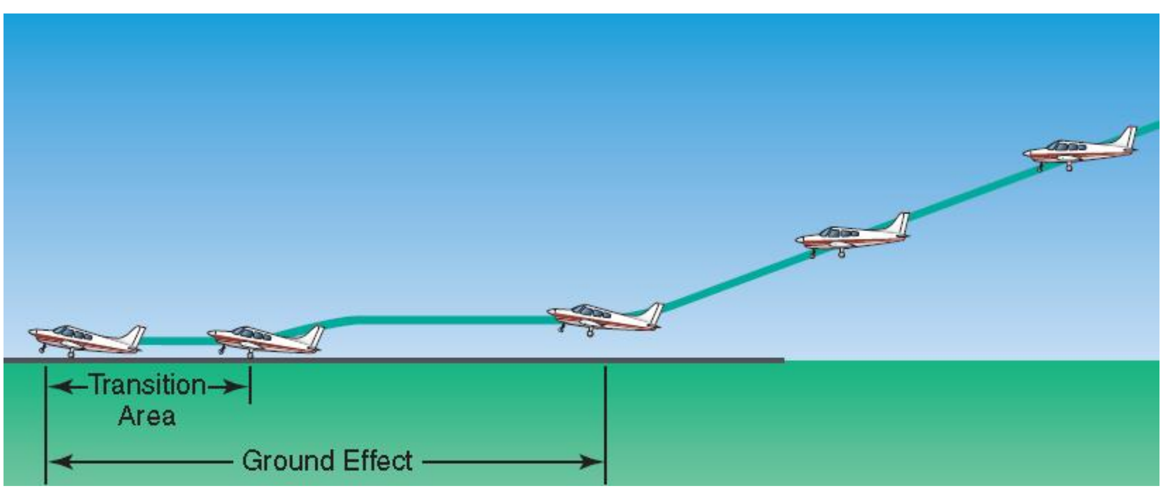
To safely transition the airplane from flight to ground operations on a rough or soft surface.

Description:

The aircraft is configured for a stabilized approach in the landing configuration and transitioned from the descent to touchdown on a field that is unimproved.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
    a. Reduce power to approximately 1,300 RPM.
    b. Confirm flaps 10°.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 75 kts.
6) Turn on the base leg when 45° from the touchdown point:
    a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
    b. At key position, assess approach position.
    c. With wings level, set flaps to 20° as required.
    d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 70 kts.
7) Turn on final as to align the aircraft with the extended runway center line:
    a. Apply appropriate crosswind correction to maintain the extended runway centerline.
    b. Set flaps to 30° as required.
    c. Adjust pitch and power as required to maintain a stabilized approach, at 65 kts, toward the selected aiming point until flare to land.
    d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
    e. Adjust stabilized approach to clear obstacles and land at the specified point.
    f. Complete the GUMPS check.
8) During the flare to land reduce power as required to maintain aircraft approximately one foot above runway until it slows to stall speed.
9) Touch down at approximate stall speed on the runway centerline as smoothly as possible.
10) Maintain back elevator pressure to keep nose wheel off the ground as long as possible.
11) Maintain directional control with rudder and aileron deflection.
12) Adjust power as necessary to maintain aircraft movement on soft surfaces.
13) Exit the runway with minimal braking and complete after landing checklist.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a soft-field approach and landing.
- Considers the wind conditions, landing surface and obstructions, and selects the most suitable touchdown area.
- Establishes the recommended approach and landing configurations, and airspeed; adjusts pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, or in its absence not more than 1.3 V_{SO}, +10/-5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the round out and touchdown.
- Touches down softly with no drift, and with the airplane's longitudinal axis aligned with the runway/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Maintains proper position of the flight controls and sufficient speed to taxi on the soft surface.
- Completes the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss effect of flaps on an approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain how to touchdown and maneuver the aircraft on soft of unimproved surfaces.

Safety Considerations:

- Do not land on fields that exceed the capabilities of the aircraft or pilot.
- Fly over and visually check the field prior to landing.
- Check field length and density altitude.
- Only land on public, published, unimproved runways with UCM aircraft.
- Use caution when landing on wet grass.

Common Errors:

- Failure to maintain elevator back-pressure after touchdown.
- Improper use of brakes.
- Failure to consider effect of wind and landing surface.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Touch and Go (C-172S)

Objective:

To transition from a landing rollout to a takeoff roll while remaining on the runway.

Description:

A touch and go is a landing which transitions into a takeoff while the aircraft remains rolling on the runway.

Setup Procedure:

1) Perform a normal landing.
2) Upon touchdown:
    a. Allow the aircraft to continue rolling.
    b. Maintain runway centerline.
    c. Apply proper crosswind correction.
3) Reconfigure the aircraft for takeoff.
    a. Retract flaps to 10º.
    b. Set trim to the takeoff position.
4) Smoothly apply full-power.
5) Upon reaching rotation speed, 55 kts (V_R), increase back elevator pressure to establish the lift-off attitude that is approximately V_Y or V_X and allow the aircraft to fly off the ground.
6) Apply adequate drift correction to maintain runway centerline.
7) At 500 ft., or as workload permits, complete the climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to touch and go procedures.
- Maintains runway centerline upon touchdown.
- Applies proper crosswind controls upon touchdown, reconfiguration and climb out.
- Demonstrates proper aircraft reconfiguration.
- Lifts off at the recommended airspeed and accelerates to V_X or V_Y, as appropriate.
- Retracts flaps at 200' or a safe altitude, if appropriate.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Complies with noise abatement procedures.
- Completes the appropriate checklist.

Note: These are the UCM standards. The aforementioned standards are not found in the Airman Certification Standards.

Learning Outcomes:

- Explain the purpose(s) of touch and go's.
- Discuss how crosswind correction will change throughout the maneuver.
- Discuss the importance of maintaining runway centerline during aircraft reconfiguration.

Safety Considerations:

- Maintain runway centerline.
- Proper crosswind correction.
- Maintain situational awareness.
- Proper reconfiguration.

Common Errors:

- Failure to maintain runway centerline.
- Touchdown beyond the first 1/3rd of the runway and attempting a touch and go.
- Improper aircraft reconfiguration.
- Failure to use checklist.
- Failure to maintain adequate crosswind correction.
- Attempting to lift-off prior to rotation speed.

Emergency Descent (C-172S)

Objective:

To descend the airplane as soon and as rapidly as possible, within the structural limitations of the airplane.

Description:

The emergency descent is a maneuver for descending as rapidly as possible to a lower altitude or to the ground for an emergency landing.

Setup Procedure:

9) Perform clearing turns.
10) If utilizing flight following, contact ATC for traffic advisories below.
11) Reduce power to idle.
12) Confirm flaps 0º
13) Set mixture to rich.
14) Roll into a 30º – 45º bank to the left and pitch down to achieve 120 kts (If in turbulent air, maintain an airspeed below V_A).
15) Initiate recovery to level flight at least 300' prior to assigned altitude by:
    c. Rolling out the bank.
    d. Pitching up.
16) Return to cruise flight and complete the cruise checklist to include leaning procedures

Flight Proficiency Standards:

- Exhibit knowledge of the elements related to emergency descent.
- Recognizes situations, such as depressurization, cockpit smoke, and/or fire that require an emergency descent.
- Establish the appropriate airspeed and configuration for the emergency descent.
- Exhibit orientation, division of attention, and proper planning.
- Maintains positive load factors during the descent.
- Follow the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the purpose(s) of an emergency descent.
- Discuss engine cooling characteristics during an emergency descent.
- Discuss the importance of proper planning as it pertains to emergencies.

Safety Considerations:

- Maintain positive aircraft control.
- Clear the engine periodically
- Clear below then GO.
- Steep spiral over airport.
- Continue on to emergency approach and landing.

Common Errors:

- Failure to recognize the urgency of the emergency descent.
- Failure to use emergency checklist for situation.
- Failure to maintain appropriate configuration and airspeed.
- Poor orientation, planning, and division of attention.

Emergency Approach & Landing (C-172S)

Objective:

To develop accuracy, judgment, planning, procedures, and confidence when little or no power is available.

Description:

An engine failure is simulated by the instructor after which the airplane is safely maneuvered to a landing.

Setup Procedure:

1) The instructor will reduce engine power to idle and announce “simulated emergency landing.”
2) Establish an airspeed of 68 kts ($V_{L/D}$) and trim to maintain airspeed.
3) Select a suitable landing location and spiral over it.
4) Complete an engine restart flow.
5) Complete the engine failure checklists as time permits.
6) Establish communication to report emergency situation.
7) Configure and maneuver the aircraft to fly a normal traffic pattern as applicable.
8) Initiate a go-around no lower than 500 feet AGL.

Flight Proficiency Standards:

- Exhibit knowledge of the elements related to emergency approach and landing procedures.
- Establish and maintain the recommended best-glide airspeed, ±10 kts.
- Select a suitable landing area.
- Plan and follow a flight pattern to the selected landing area considering altitude, wind, terrain, and obstructions.
- Prepare for landing or go-around as specified by the instructor.
- Follow the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the criteria for a good emergency landing field.
- Explain the steps to follow after an engine failure.
- Explain how to trouble shoot for problems after an engine failure.

Safety Considerations:

- Maintain positive aircraft control.
- Clear the engine periodically.
- Maintain awareness for towers and other obstacles.
- Maintain situational awareness.
- This is a **dual only** maneuver.

Common Errors:

- Improper airspeed control.
- Poor judgment in the selection of an emergency landing area.
- Failure to estimate the approximate wind speed and direction.
- Failure to fly the most suitable pattern for existing situation.
- Failure to accomplish the emergency checklists.
- Undershooting or overshooting selected landing area.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Forward Slip to a Landing (C-172S)

Objective:

To dissipate altitude without increasing airspeed.

Description:

The upwind wing is lowered and opposite rudder is used to maintain the ground track bringing the aircrafts longitudinal axis at an angle to its flight path. The pitch is adjusted to maintain the desired airspeed.

Setup Procedure:

1) Determine the wind direction.
2) Reduce power to idle.
3) Simultaneously bank into the wind and apply full opposite rudder.
4) Adjust pitch to maintain desired airspeed.
5) Adjust aileron input to maintain the ground track of the aircraft with the extended runway centerline.

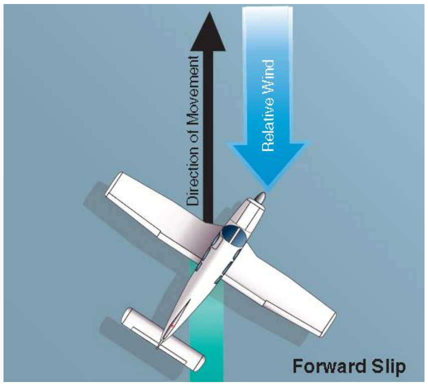
Flight Proficiency Standards:

- Exhibits knowledge of the elements related to forward slip to a landing.
- Considers the wind conditions, landing surface and obstructions, and selects the most suitable touchdown point.
- Establishes the slipping attitude at the point from which a landing can be made using the recommended approach and landing configuration and airspeed; adjusts pitch attitude and power as required.
- Maintains a ground track aligned with the runway center/landing path and an airspeed, which results in minimum float during the flare.
- Makes smooth, timely, and correct control application during the recovery from the slip, the flare, and the touchdown.
- Touchdown smoothly at the approximate stalling speed, at or within 400 feet beyond a specified point with no side drift and with the airplane's longitudinal axis aligned with and over the runway centerline.
- Maintain crosswind correction and directional control throughout the approach and landing sequence.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance of maintaining the proper attitude to avoid a stall.
- Predict the amount of control input required to maintain the desired ground track.
- Discuss the applications in which a forward slip might be used.
- Explain the proper control inputs to perform a forward slip.
- Explain flap configuration considerations applicable to forward slips.
- Explain aircraft limitations applicable to forward slips.



Safety Considerations:

- Maintain sufficient airspeed as to avoid a stall.
- Observe maximum forward slip duration limitations.
- Terminate the maneuver with sufficient altitude to complete a landing.

Common Errors:

- Improper aileron and/or rudder control inputs.
- Failure to maintain airspeed.
- Failure to maintain stabilized slip.
- Inappropriate removal of hand from throttle.
- Improper technique during transition from the slip to the touchdown.
- Failure to maintain runway centerline.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Go-Around (C-172S)

Objective:

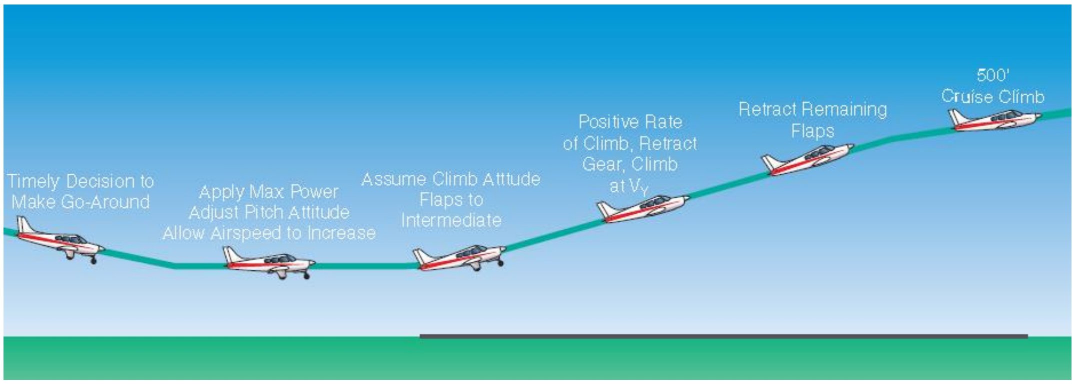
To safely discontinue the landing approach if unstable or other unsatisfactory conditions exist.

Description:

As full power is applied, the aircraft attitude is adjusted to accelerate to V_Y and climb. As a safe airspeed is attained, flaps are retracted 10° at a time allowing stabilization between each retraction.

Setup Procedure:

1) Simultaneously apply maximum power and establish a go-around pitch attitude.
2) Set flaps to 20°.
3) Establish a pitch attitude to accelerate to 55 kts.
4) Allow the airplane to accelerate to V_X or V_Y and climb.
5) If there is an aircraft on the runway, sidestep to clear the departure path of the airplane and allow the pilot to view the landing or departing traffic.
6) Set flaps to 10° and stabilize in between configuration changes then flaps to 0°.
7) Verify Go Around checklist is complete.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a go-around/rejected landing.
- Makes a timely decision to discontinue the approach to landing.
- Applies takeoff power immediately and transitions to climb pitch attitude for V_X, and maintains V_Y+10/-5 kts.
- Retracts the flaps as appropriate.
- Retracts the landing gear, if appropriate, after a positive rate of climb is established.
- Maneuvers to the side of the runway/landing area to clear and avoid conflicting traffic.
- Maintains takeoff power V_y+10/-5 to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the climb.
- Completes the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss events that may require a go-around.
- Explain the importance of maintaining airspeed and coordination during the go-around procedure.
- Discuss the necessity for maneuvering to the side of the runway after making the decision to go-around.

Safety Considerations:

- Maneuver the airplane to the side of the runway.
- Do not establish a pitch up attitude too quickly.
- Maintain coordination.
- Timely decision making.
- Be watchful for situation which may require a go-around.

Common Errors:

- Delayed decision to make a go-around.
- Improper application of power.
- Failure to control pitch attitude.
- Improper trim technique.
- Failure to compensate for torque effect.
- Failure to maintain 79 kts (V_Y).
- Improper wing flap retraction.
- Failure to maintain well clear of obstructions and other traffic.
- Improper use of checklist.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Maneuvering During Slow Flight (C-172S)

Objective:

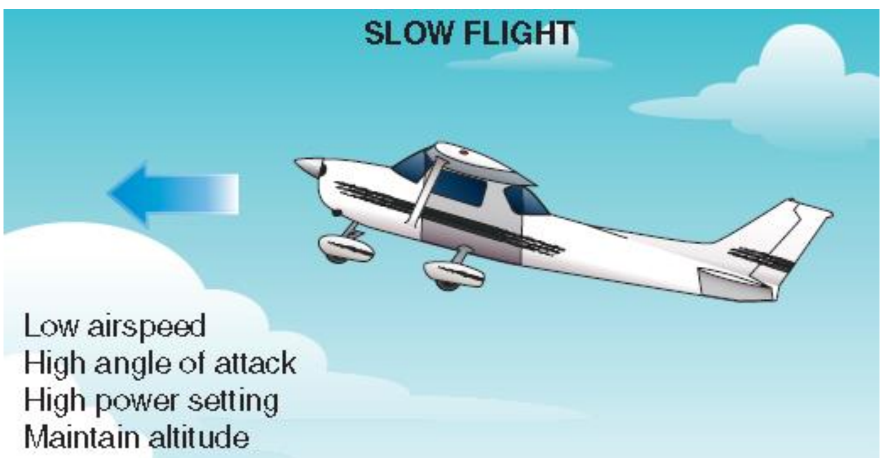
To demonstrate the flight characteristics and controllability of an airplane at speeds lower than normal cruise and develop proficiency in performing maneuvers that require slow airspeeds.

Description:

Slow flight consists of slowing the aircraft to a minimum controllable airspeed in the landing configuration and maneuvering the aircraft while maintaining altitude and airspeed.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
2) Perform clearing turns.
3) Set mixture to rich.
4) Reduce power to 1,500 RPM or less.
5) Below 110 kts, set flaps to 10°.
6) Adjust pitch and power as necessary to maintain altitude.
7) Below 85 kts, set flaps to 20° and 30° allowing the aircraft to stabilize between each setting.
8) Establish and maintain an airspeed at which any further increase in pitch or reduction of power would result in an immediate stall or a higher speed as specified by your instructor.
    a. Slow flight should be practiced at varying speeds and configurations above the 1G stall speed of the aircraft as specified by the instructor.
9) Maneuver as instructed.
10) Recover when instructed by:
    a. Adding full power
    b. Set flaps to 20° and allow the aircraft to stabilize.
    c. Then set flaps to 10° and 0° allowing the aircraft to stabilize between each setting.
11) Return to cruise flight and perform the cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to maneuvering during slow flight.
- Selects an entry altitude that will allow the task to be completed no lower than 1,500 feet AGL.
- Establish and maintain an airspeed at which any further increase in angle of attack, increase in load factor, or reduction in power, would result in a stall warning (e.g., airplane buffet, stall horn, etc.).
- Accomplishes coordinated straight and level flight, turns, climbs, and descents with landing gear and flap configurations specified by the instructor.
- Divides attention between airplane control and orientation.

- Maintains the specified altitude, ±100 feet; specified heading, ±10°; airspeed, +10/-0 kts; and specified angle of bank, ±10°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the relationship between pitch and power in maintaining airspeed and altitude during slow flight.
- Discuss how flight at minimum airspeeds develops the ability to estimate the margin of safety above the stalling speed.
- Compare the practice of slow flight to various phases of flight such as; takeoffs, climbs, descents, go-arounds, and approaches to landing.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified gear and flap configuration.
- Improper entry technique.
- Failure to establish and maintain the specified airspeed.
- Excessive variations of altitude and heading.
- Rough or uncoordinated control technique.
- Improper correction for left turning tendency.
- Improper trim technique.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Power – Off Stall (C-172S)

Objective:

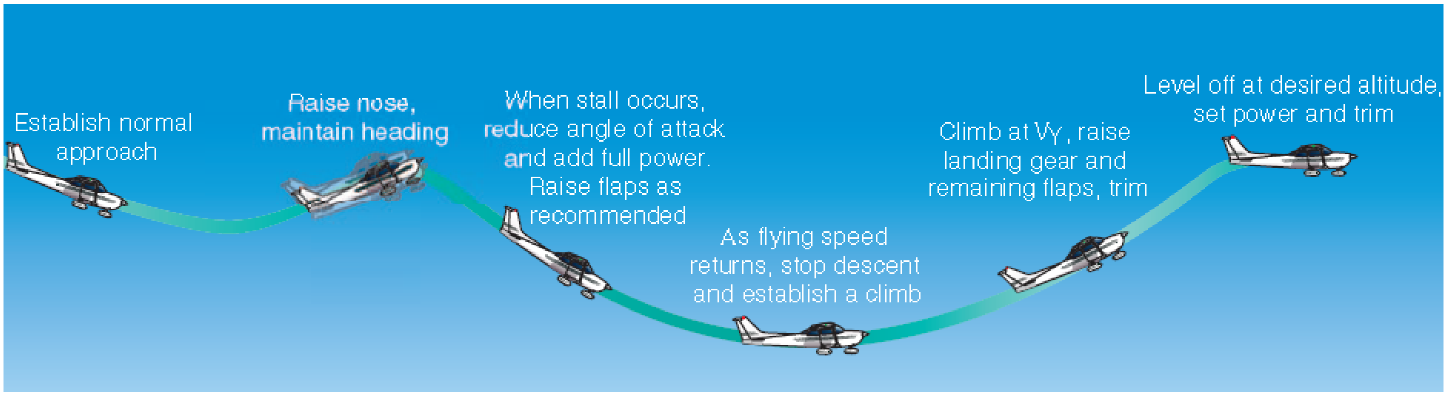
To familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop the skills to prevent and recover from stalls in the landing configuration.

Description:

The aircraft is slowed down and placed in the landing configuration after which a stall is induced and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 1,500’ AGL.
2) Perform clearing turns.
3) Set mixture to rich.
4) Reduce power to 1,500 RPM or less allowing the aircraft to slow to approach speed while maintaining altitude.
5) Below 110 kts, set flaps to 10°.
6) Below 85 kts, set flaps to 20° and 30° allowing the aircraft to stabilize between each setting.
7) Establish a stabilized descent at 65 kts.
8) Reduce power to idle.
9) Maintain coordinated flight and altitude until recognition of the stall. As the stall occurs, recover from the stall by simultaneously reducing the angle of attack, adding full power, and leveling the wings.
10) Set flaps to 20°.
11) Accelerate the aircraft to V_X (recommended) or V_Y and climb while retracting the remaining flaps in 10° increments.
12) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to power-off stalls.
- Selects an entry altitude that allows the task to be completed no lower than 1,500’ feet AGL.
- Establishes a stabilized descent in the approach or landing configuration, as specified by the instructor.
- Transitions smoothly from the approach or landing attitude to a pitch attitude that will induce a stall.
- Maintains a specified heading, ±10°, in straight flight; maintains a specified angle of bank not to exceed 20°, ±10°; in turning flight, while inducing the stall.
- Recognizes and recovers promptly after the stall occurs by simultaneously reducing the angle of attack, increasing power to maximum allowable and leveling the wings to return to a straight and level flight attitude with minimum loss of altitude appropriate for the airplane.
- Retract the flaps to the recommended setting; retracts the landing gear, if retractable, after a positive rate of climb is established.
- Accelerates to V_X or V_Y speed before the final flap retraction; returns to the altitude, heading, and airspeed specified by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Power – On Stall (C-172S)

Objective:

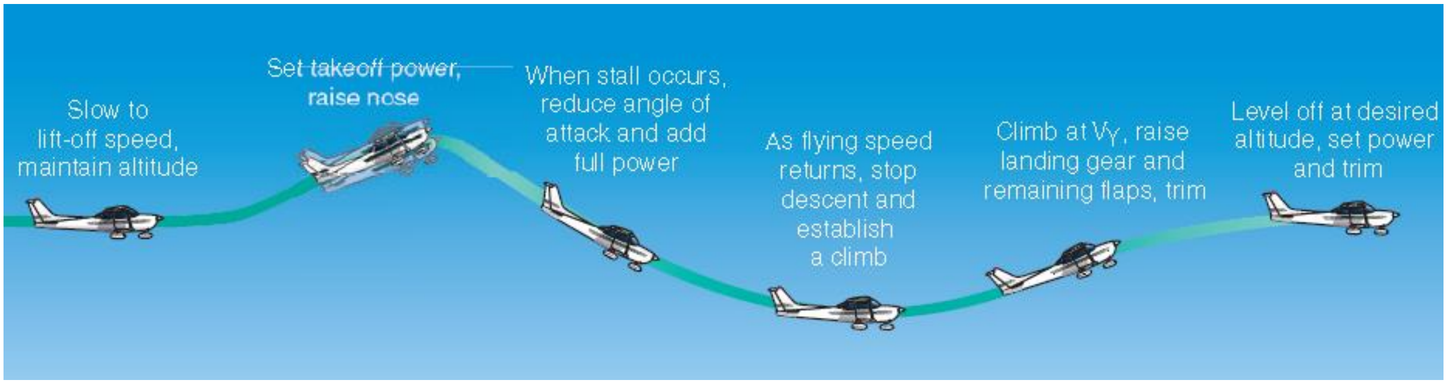
To familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in the takeoff configuration.

Description:

The aircraft is slowed down and placed in the takeoff configuration after which a stall is induced and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
2) Perform clearing turns.
3) Set mixture to rich.
4) Reduce power to 1200 RPM or less, allowing the aircraft to slow to takeoff speed while maintaining altitude.
5) Add full power at 55 kts (V_R).
6) Transition smoothly to the pitch attitude that will induce a stall.
7) Recognize and recover promptly after a fully developed stall occurs by simultaneously reducing the angle of attack, confirming full power, and leveling the wings.
8) Accelerate the aircraft to 74 kts (V_Y) and climb.
9) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to power-on stalls.
- Selects an entry altitude that allows the task to be completed no lower than 1,500' AGL.
- Establishes the takeoff or departure configuration. Sets power to no less than 65 percent available power.
- Transitions smoothly from the takeoff or departure attitude to the pitch attitude that will induce a stall.
- Maintains a specified heading, ±10°, in straight flight; maintains a specified angle of bank not to exceed 20°, ±10°, in turning flight, while inducing the stall.
- Recognizes and recovers promptly after the stall occurs by simultaneously reducing the angle of attack, increasing power as appropriate, and leveling the wings to return to a straight and level flight attitude with a minimum loss of altitude appropriate for the airplane.
- Retracts the flaps to the recommended setting; retracts the landing gear if retractable, after a positive rate of climb is established.
- Accelerates to V_X or V_Y speed before the final flap retraction; returns to the altitude, heading, and airspeed specified by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Recovery from Unusual Flight Attitudes (C-172S)

Objective:

To safely re-establish control of the airplane after recognition of an unusual attitude.

Description:

The aircraft is maneuvered with the proper use of pitch, power, and bank to safely recover from a nose-high or nose-low unusual attitude.

Setup Procedure:

1) The instructor will position the aircraft into a level or banked nose-high or nose-low unusual attitude while the student has his or her eyes closed.
2) The instructor will instruct the student to recover from the unusual attitude visually or by using a view limiting device.
3) For a nose-high attitude:
    a. Simultaneously add full power and lower the pitch.
    b. Level the wings.
4) For a nose-low attitude:
    a. Reduce power.
    b. Level the wings.
    c. Increase pitch.
5) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to attitude instrument flying during unusual attitudes.
- Recognizes unusual flight attitudes solely by reference to instruments; recovers promptly to a stabilized level flight attitude using proper instrument cross-check and interpretation and smooth, coordinated control application in the correct sequence.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the importance of quickly and accurately determining an unusual attitude.
- Explain proper control inputs to recover from an unusual attitude.

Safety Considerations:

- Maintain positive aircraft control.
- Observe aircraft limitations with respect to airspeed and load factors.

Common Errors:

- Incorrect interpretation of the flight instruments.
- Inappropriate application of controls.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Steep Turns (C-172S)

Objective:

To develop coordination, orientation, division of attention and smooth control techniques while executing high performance turns.

Description:

The maneuver consists of a 360° turn using a bank angle of approximately 45° while maintaining a constant airspeed and altitude.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
2) Perform clearing turns.
3) Adjust the mixture in accordance with the POH.
4) Reduce power to establish an airspeed of 95 kts.
5) Enter a coordinated 45° banking turn to the left or right.
6) Increase power and adjust trim and pitch as required to maintain altitude and airspeed.
7) Begin rollout at ½ the bank angle prior to rollout heading.
8) Reduce power and pitch on rollout as needed to remain at 95 kts.
9) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to steep turns.
- Establishes the manufacturer's recommended airspeed (95 kts) or if one is not stated, a safe airspeed not to exceed V_A.
- Rolls into a coordinated 360° turn; maintains a 45° bank.
- Perform the task in the opposite direction, as specified by the instructor.
- Divide attention between airplane control and orientation.
- Maintain the entry altitude, ±100 feet, airspeed, ±10 kts, bank, ±5°; and roll out on the entry heading, ±10°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain why load factor increases as bank angle increases.
- Discuss the relationship between load factor and stall speed.
- Discuss the principle of over-banking tendency.
- Explain how to maintain altitude and airspeed.
- Explain limit load factor and what happens if it's exceeded.

Safety Considerations:

- Do not exceed manufacturer's recommended airspeed or Va.
- Always clear the area before initiating the maneuver.
- The maneuver is to be completed no lower than 1,500' feet AGL.
- Division of attention between maneuver and scanning for traffic.

Common Errors:

- Improper pitch, bank, and power coordination during entry and rollout.
- Uncoordinated use of flight controls.
- Improper procedure in correcting altitude deviations.
- Loss of orientation.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Tracking A Straight Line (C-172S)

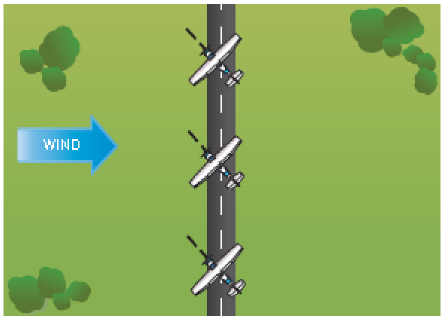
Objective:

To maintain a uniform ground track along a selected straight line or road with a constant airspeed and altitude while controlling the effect of wind drift on the airplane and the proper correction using varying crosswind correction.

Description:

Tracking a straight line is a training maneuver, in which the ground track of the airplane is flown following a straight line on the ground correcting for wind drift.

Setup Procedure:



1) Select a straight line at least 1 mile in length with a crosswind in an area free of obstructions.
2) Perform clearing turns and establish 1,000’ AGL.
3) Adjust the mixture in accordance with the POH.
4) Position the airplane to follow a path over or parallel to a straight line.
5) Maintain an equal distance from the straight line as you fly along it crabbing as necessary.
6) Return to cruise flight and perform the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to tracking a straight line.
- Selects a suitable reference area.
- Plans the maneuver so as to track the straight line, 1,000’ AGL at an appropriate distance from the selected reference area.
- Applies adequate wind-drift correction during straight and turning flight to maintain a constant ground track along the straight line reference area.
- Divides attention between airplane control and the ground track while maintaining coordinated flight.
- Maintains altitude, ±100 feet; maintains airspeed, ±10 kts.

Learning Outcomes:

- Describe proper division of attention.
- Explain the correlation between the maneuver and a traffic pattern at an airport.
- Predict amount of wind correction based on conditions.

Safety Considerations:

- Avoid tall obstacles and populated areas.
- Locate a landing area to use in the event of an emergency
- Maintain separation from other aircraft.

Common Errors:

- Improper crab angle.
- Fixation on one aspect of the maneuver.
- Uncoordinated flight.

References:

Airplane Flying Handbook; POH/AFM;

Rectangular Course (C-172S)

Objective:

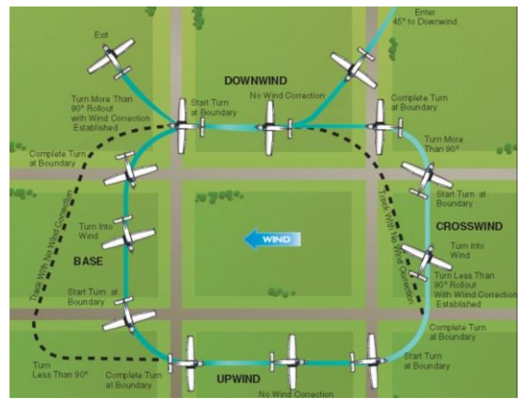
To maintain a uniform ground track around a selected rectangular ground reference with a constant airspeed and altitude while controlling the effect of wind drift on the airplane and the proper correction using varying crosswind correction.

Description:

The rectangular course is a training maneuver, in which the ground track of the airplane is equidistant from all sides of the selected rectangular area on the ground.

Setup Procedure:

1) Select a rectangular area approximately 1 mile in length in an area free of obstructions.
2) Perform clearing turns and establish 1,000’ AGL.
3) Adjust the mixture in accordance with the POH.
4) Maintain a safe airspeed (recommended 95 kts).
5) Enter the pattern at a 45° angle to midfield of the downwind approximately ½ mile from the field.
6) Maintain an equal distance from the field as you fly around it crabbing as necessary.
7) Exit the maneuver at a 45° angle to midfield of the downwind.
8) Return to cruise flight and perform the cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a rectangular course.
- Selects a suitable reference area.
- Plans the maneuver so as to enter a left or right pattern, 1,000’ AGL at an appropriate distance from the selected reference area, 45° to the downwind leg.
- Applies adequate wind-drift correction during straight and turning flight to maintain a constant ground track around the rectangular reference area.
- Divides attention between airplane control and the ground track while maintaining coordinated flight.
- Maintains altitude, ±100 feet; maintains airspeed, ±10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Describe proper division of attention.
- Explain the correlation between the maneuver and a traffic pattern at an airport.
- Predict amount of wind correction based on conditions.

Safety Considerations:

- Avoid tall obstacles and populated areas.
- Locate a landing area to use in the event of an emergency
- Maintain separation from other aircraft.

Common Errors:

- Improper crab angle.
- Fixation on one aspect of the maneuver.
- Uncoordinated flight.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Turns Around a Point (C-172S)

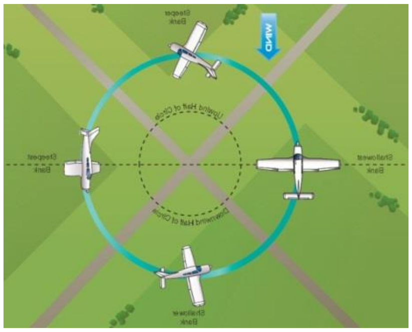
Objective:

To maintain a uniform ground track around a reference point with a constant airspeed and altitude while demonstrating the effect of wind drift on the airplane and the proper correction using varying bank angle.

Description:

The airplane's ground track makes two complete circles, with a constant radius, around a selected point on the ground.

Setup Procedure:



1) Select a prominent reference point on the ground.
2) Perform clearing turns and establish 1,000' AGL.
3) Adjust the mixture in accordance with the POH.
4) Maintain a safe airspeed (recommended 95 kts).
5) Enter the maneuver on the downwind.
6) Initiate the turn when abeam the point.
7) Apply wind correction, as necessary, to maintain a constant radius around the selected reference point.
8) Exit on the downwind.
9) Return to cruise flight and perform the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to turns around a point.
- Selects a suitable ground reference point.
- Plans the maneuver so as to enter left or right at 1,000' AGL, at an appropriate distance from the reference point.
- Applies adequate wind-drift correction to track a constant radius turn around the selected reference point.
- Divides attention between airplane control and the ground track while maintaining coordinated flight.
- Maintains altitude, ±100 feet; maintains airspeed, ±10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Student should demonstrate wind drift correction with varying bank angle and proper aircraft control to maintain the desired ground track.
- Plan maneuver radius by assessing wind speed and direction.

Safety Considerations:

- Always clear area before beginning a maneuver.
- Select area with an emergency landing field close.
- Avoid areas with towers or tall buildings/towns.

Common Errors:

- Faulty entry procedure.
- Poor planning or division of attention.
- Uncoordinated flight control application.
- Improper wind-drift correction.
- Failure to maintain selected altitude or airspeed.
- Failure to establish approximately 45° bank at the steepest point.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

S-Turns (C-172S)

Objective:

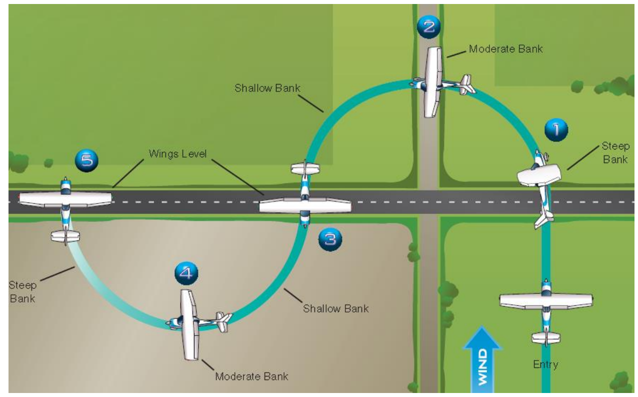
To maintain a uniform ground track of semicircles along a selected reference line with a constant airspeed and altitude while demonstrating the effect of wind drift on the airplane and the proper correction using varying bank angle.

Description:

The airplane's ground track describes semicircles of equal radii on each side of a selected straight line on the ground.

Setup Procedure:

1) Select a prominent line on the ground perpendicular to the wind.
2) Perform clearing turns and establish 1,000' AGL.
3) Adjust the mixture in accordance with the POH.
4) Maintain a safe airspeed (recommended 95 kts).
5) Enter the maneuver on the downwind.
6) Initiate the first turn upon reaching the reference line.
7) Apply wind correction, as necessary, to maintain a constant radius around a point on the reference line.
8) After a 180° turn, reverse the turn.
9) After two 180° turns are completed, exit on the downwind.
10) Return to cruise flight and perform the cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to S-turns.
- Selects a suitable ground reference line.
- Plans the maneuver so as to enter at 1,000' feet AGL, perpendicular to the selected reference line.
- Applies adequate wind-drift correction to track a constant radius turn on each side of the selected reference line.
- Reverses the direction of turn directly over the selected reference line.
- Divides attention between airplane control and the ground track while maintaining coordinated flight.
- Maintains altitude, ±100 feet; maintains airspeed, ±10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Demonstrate wind drift correction with varying bank angle and proper aircraft control to maintain the desired ground track.
- Plan maneuver radius by assessing wind speed and direction.

Safety Considerations:

- Always clear area before beginning a maneuver.
- Select an area with an emergency landing field nearby.
- Avoid areas with towers or tall buildings/towns.

Common Errors:

- Faulty entry procedure.
- Poor planning or division of attention.
- Uncoordinated flight control application.
- Improper wind-drift correction.
- Failure to maintain selected altitude or airspeed.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

C-152

Passenger Briefing (C-152)

Objective:

To provide a standard pre-flight briefing to passengers.

Description:

The pilot in command is required by the Federal Aviation Regulations to provide a passenger briefing.

Setup Procedure:

1) Before starting the engine the Pilot-in-Command will provide the passenger safety briefing to include, but not limited to:
   c. Designation of Pilot-in-Command.
   d. Procedures for positively exchanging flight controls.

S
- i. Seat belts and shoulder harnesses (location and operation).
- ii. Seat belts & shoulder harnesses fastened for taxi, takeoff and landing.
- iii. Seat position adjusted and locked in place (controls and operation).

A
- iv. Air vents (location and operation).
- v. All environmental controls (discussed).
- vi. Action in case of any passenger discomfort.

F
- vii. Fire extinguisher (location and operation).
- viii. Smoking is prohibited.

E
- ix. Exit doors (how to secure; how to open).
- x. Emergency evacuation plan.
- xi. Emergency/survival kit (location and contents).
- xii. Equipment (location & operation, i.e., ELT, flight controls).

T
- xiii. Traffic (scanning, spotting, notifying pilot).
- xiv. Talking ("sterile cockpit" expectations).

Y
- xv. Your questions?

Flight Proficiency Standards:

- Briefs occupants on the use of safety belts, shoulder harnesses, doors, and emergency procedures.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance and regulatory requirement for providing a passenger briefing.

Common Errors:

- Failure to perform a passenger briefing.
- Incomplete passenger briefing.

References:

Airman Airman Certification Standards, Federal Aviation Regulations, AC 121-24, AOPA Passenger Safety Briefing Video

Taxiing (C-152)

Objective:

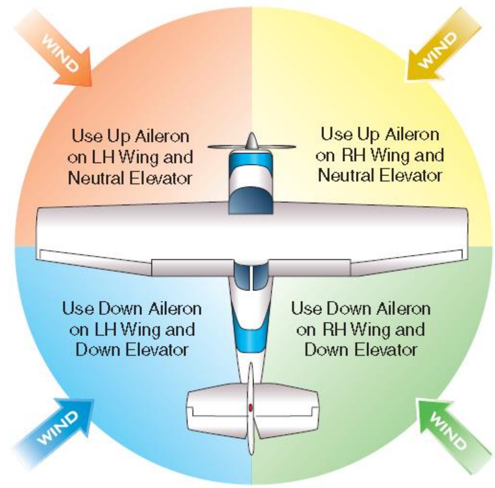
To safely maneuver the airplane on the surface of the airport.

Description:

Taxiing is the controlled movement of the airplane under its own power while on the ground.

Setup Procedure:

1) Complete before taxi checklist.
2) Set heading bug to the wind direction.
3) After engine start, check for traffic in both directions, increase power and allow the airplane to roll slight forward and apply brakes.
4) To turn right, use right rudder. To turn left, use left rudder. Differential braking can be used to make a sharper turn.
5) Taxi at a speed consistent with safety, but no faster than a brisk walk. Use power to control taxi speed before using brakes.
6) Apply proper crosswind taxi control deflections.
7) To come to a stop, reduce power to idle and smoothly apply brakes.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to safe taxi procedures.
- Performs a brake check immediately after the airplane begins moving.
- Positions the flight controls properly for the existing wind conditions.
- Controls direction and speed without excessive use of brakes.
- Complies with airport/taxiway markings, signals, ATC clearances, and instructions.
- Taxies so as to avoid other aircraft and hazards.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance of crosswind taxi techniques.
- Explain the importance of using minimal power and braking.

Safety Considerations:

- Maintain taxiway centerline.
- Use taxi lights.
- Use proper crosswind taxi techniques.
- Taxi at a speed consistent with safety.

Common Errors:

- Not performing a brake check.
- Improper crosswind taxi control deflections.
- Improper use of power and brakes.
- Taxiing at a speed not consistent with safety.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Normal & Crosswind Takeoff & Climb (C-152)

Objective:

To move the airplane from its starting position on the runway, become airborne, and establish a positive climb to a safe maneuvering altitude.

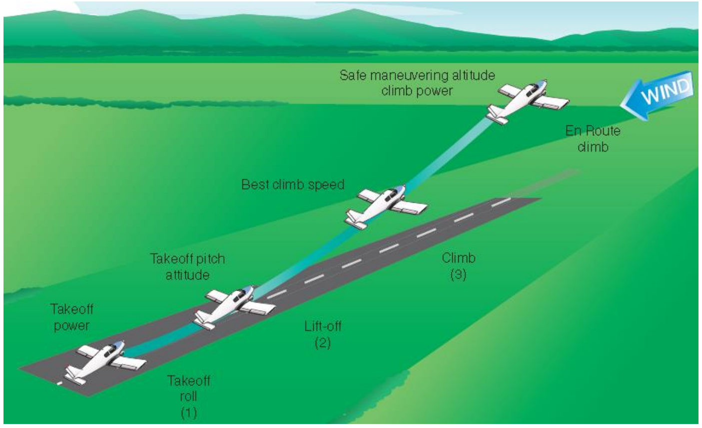
Description:

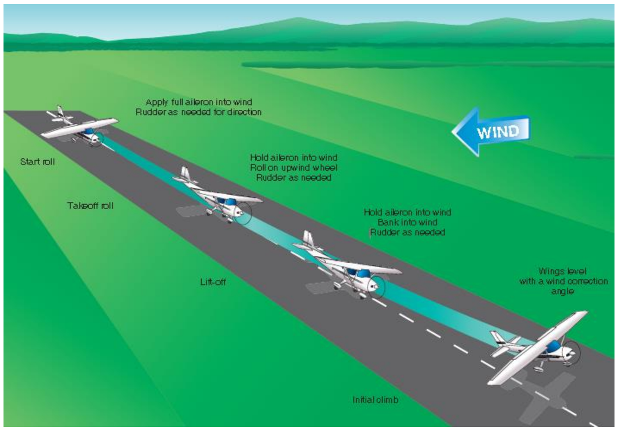
The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane is accelerated to an airspeed that provides sufficient lift to become airborne.
2) The rotation, when the pilot increases elevator back pressure, increasing the angle of attack to lift the nose wheel.
3) The initial climb when the airplane leaves the ground and establishes a pitch attitude to climb away from the runway.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete takeoff checklist and takeoff briefing.
3) Use aircraft lighting as recommended by the current version of AC 91-73.
4) Ensure runway is clear, align aircraft with runway centerline, confirm DG is aligned with runway, and ensure nose wheel is straight.
5) Position flight controls for wind for existing conditions.
6) Advance throttle smoothly to takeoff power ensuring toes are resting on rudder pedals, not on brakes.
7) Check engine instruments during takeoff roll for normal indications.
8) Maintain directional control with rudder pedals and crosswind control with appropriate aileron deflection
9) Maintain a slightly tail low attitude.
10) Upon reaching rotation speed, 50 kts (V_R), increase back elevator pressure to establish the lift-off attitude that is approximately that for V_Y and allow the aircraft to fly off the ground.
11) Apply adequate drift correction to maintain runway centerline.
12) Accelerate to 67 kts (V_Y).
13) At 500 ft., or as workload permits, complete climb checklist.





Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a normal and crosswind takeoff, climb operations, and rejected takeoff procedures.
- Positions the flight controls for the existing wind conditions.
- Clears the area; taxies into the takeoff position and aligns the airplane on the runway centerline.
- Lifts off at the recommended airspeed and accelerates to V_Y.
- Establishes a pitch attitude that will maintain V_Y +10/-5 kts.
- Retracts flaps at 200' or a safe altitude.
- Maintains takeoff power and V_Y +10/-5 kts to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Complies with noise abatement procedures.
- Completes the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain runway selection criteria.
- Discuss how to maintain directional control during the ground roll.
- Discuss proper lift-off technique.
- Explain how to use ailerons during crosswind situations.
- Describe how to correct for wind-drift.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not force aircraft off runway too early, causing it to settle back on the runway.
- Do not allow upwind wing to rise during takeoff.
- Do not exceed maximum demonstrated crosswind.
- Consider the effect of density altitude on performance.

Common Errors:

- Improper runway incursion avoidance procedures.
- Improper use of controls during a normal/crosswind takeoff.
- Inappropriate lift-off procedures.
- Improper climb attitude, power setting, and airspeed.
- Improper use of checklist.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Short-Field Takeoff & Climb (C-152)

Objective:

To move the airplane from its starting position on the runway, become airborne, and establish a positive climb to a safe maneuvering altitude when the takeoff area is short or restricted by obstructions.

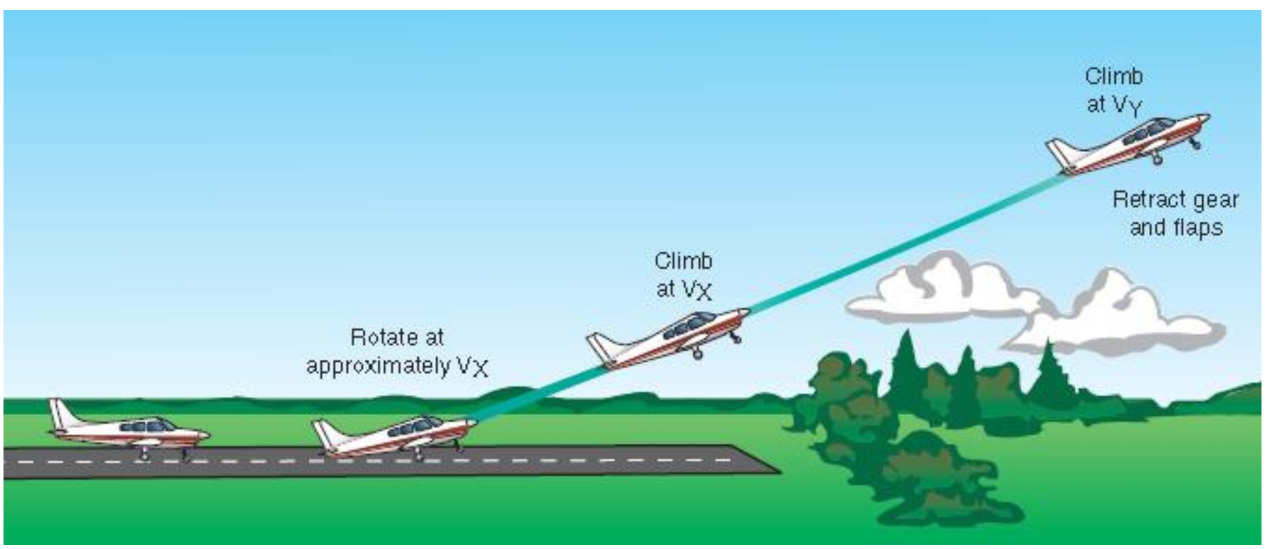
Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane is accelerated to an airspeed that provides sufficient lift to become airborne.
2) The rotation, when the pilot increases elevator back pressure, increasing the angle of attack to lift the nose wheel.
3) The initial climb when the airplane leaves the ground and a pitch attitude is established to climb away from the runway and clear a 50 foot obstacle.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete Short-Field takeoff checklist and takeoff briefing.
3) Set flaps to 10°.
4) Use aircraft lighting as recommended by the current version of AC 91-73.
5) Back taxi and align aircraft with runway centerline, confirm DG is aligned with runway, and ensure nose wheel is straight.
6) Ensure runway is clear, advance throttle smoothly to takeoff power while holding brakes; check engine instruments.
7) Release brakes and ensure toes are resting on rudder pedals, not brakes.
8) Maintain directional control with rudder pedals and appropriate aileron deflection.
9) Upon reaching rotation speed, 50 kts (V_R), increase back elevator pressure to establish lift-off attitude and allow aircraft to fly off ground.
10) Accelerate the aircraft to 55 kts (V_X) until obstacle is cleared or 50 feet above takeoff surface is attained and then accelerate to 67 kts (V_Y).
11) Retract flaps after a safe altitude of at least 200 ft. and an airspeed of 67 kts are attained.
12) At 500 ft., or as workload permits, complete climb checklist.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a short-field takeoff and maximum performance climb.
- Positions the flight controls for the existing wind conditions; set the flaps as recommended.
- Clears the area; taxies into takeoff position utilizing maximum available takeoff area and aligns the airplane on the runway center/takeoff path.
- Applies brakes (if appropriate), while advancing throttle smoothly to takeoff power.
- Lifts off at the recommended airspeed, and accelerates to the recommended obstacle clearance airspeed or V_X.
- Establishes a pitch attitude that will maintain the recommended obstacle clearance airspeed, or V_X, +10/-5 kts, until the obstacle is cleared, or until the airplane is 50 feet above the surface.
- After clearing the obstacle, establishes the pitch attitude for V_Y, accelerates to V_Y, and maintains V_Y, +10/-5 kts, during the climb.
- Retracts the landing gear, if appropriate, and flaps after a positive rate of climb is established.
- Retracts flaps at 200' or a safe altitude.
- Maintains takeoff power and V_Y +10/-5 to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Completes the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain runway selection criteria.
- Discuss how to maintain directional control during ground roll.
- Discuss proper lift-off technique.
- Explain the difference between V_X and V_Y.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not force aircraft off runway too early, causing it to settle back onto runway.
- Use of entire runway length.
- Retraction of flaps as recommended.
- Consider effect of density altitude on performance.

Common Errors:

- Improper runway incursion avoidance procedures.
- Improper use of controls during a short-field takeoff.
- Inappropriate lift-off procedures.
- Improper initial climb attitude, power setting and airspeed to clear obstacle.
- Improper use of checklist.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Soft-Field Takeoff & Climb (C-152)

Objective:

To align the airplane with the takeoff path, become airborne as quickly as possible, and establish a positive climb to a safe maneuvering altitude.

Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane enters the runways with full up elevator deflection and accelerates to an airspeed at which the airplane will lift off.
2) The acceleration to lift off speed while remaining in ground effect.
3) The initial climb when the airplane establishes a pitch attitude to climb away from the runway.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete Short-Field takeoff checklist and takeoff briefing.
3) Set flaps to 10°.
4) Use aircraft lighting as recommended by the current version of AC 91-73.
5) Ensure runway is clear, taxi onto runway with back elevator pressure and align nose with runway centerline without stopping or the use of brakes.
6) Smoothly advance throttle to takeoff power.
7) Ensure toes are resting on rudder pedals, not on brakes.
8) Check engine instruments during ground roll for normal indications.
9) Maintain directional control with rudder pedals and appropriate aileron deflection.
10) Use back elevator pressure to establish a positive pitch attitude and allow the aircraft to fly itself off the ground.
11) When the aircraft becomes airborne, reduce pitch to remain in ground effect while accelerating to 50 kts (V_X) then simultaneously climb and accelerate to 67 kts (V_Y).
12) Retract flaps after a safe altitude of at least 200 ft. and an airspeed of 67 kts are attained.
13) At 500 ft., or as workload permits, complete climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a soft-field takeoff and climb.
- Positions the flight controls for existing wind conditions and to maximize lift as quickly as possible.
- Clears the area; taxies on to the takeoff surface at a speed consistent with safety without stopping while advancing the throttle smoothly to takeoff power.
- Establishes and maintains a pitch attitude that will transfer the weight of the airplane from the wheels to the wings as rapidly as possible.
- Lifts off at the lowest possible airspeed and remains in ground effect while accelerating to V_X, while simultaneously accelerating to V_Y and climbing.
- Establishes a pitch attitude for V_Y, and maintains selected airspeed +10/-5 kts to a safest maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Completes the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss proper soft-field takeoff technique.
- Explain runway selection criteria.
- Predict the height of ground effect and discuss its relevance.
- Discuss how to maintain directional control during ground roll.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not allow the airplane to climb above ground effect too soon, causing it to settle back onto the runway.

Common Errors:

- Improper runway incursion avoidance procedures.
- Improper use of controls during a soft-field takeoff.
- Improper lift-off procedures.
- Improper climb attitude, power setting and airspeed.
- Improper use of checklist.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Traffic Pattern (C-152)

Objective:

To assure that air traffic flows into and out of an airport in an orderly manner.

Description:

The airplane is flown on a rectangular course around a runway at an altitude specified in the current Airport/Facility Directory or as outlined in the FAR/AIM.

Setup Procedure:

Departures

1) All departures:
   a. Fly the departure leg straight out until reaching traffic pattern altitude.
   b. Once reaching traffic pattern altitude, continue climbing and turn on course.

Arrivals

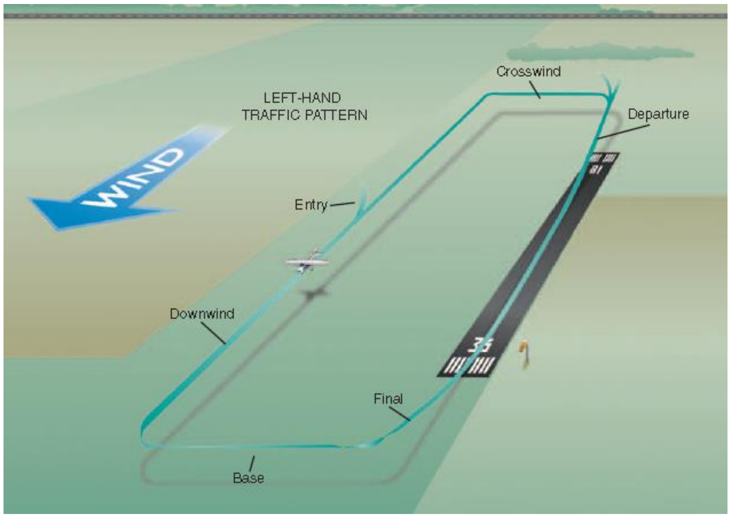
1) Prior to reaching 5 NM from the airfield, complete the following:
   a. Monitor local AWOS/ASOS/ATIS
   b. Ask "Is there any traffic between me and the airport?" and cancel flight following (if applicable)
   c. Complete the Before Landing checklist
2) Slow down below the approach flap airspeed prior to pattern entry.

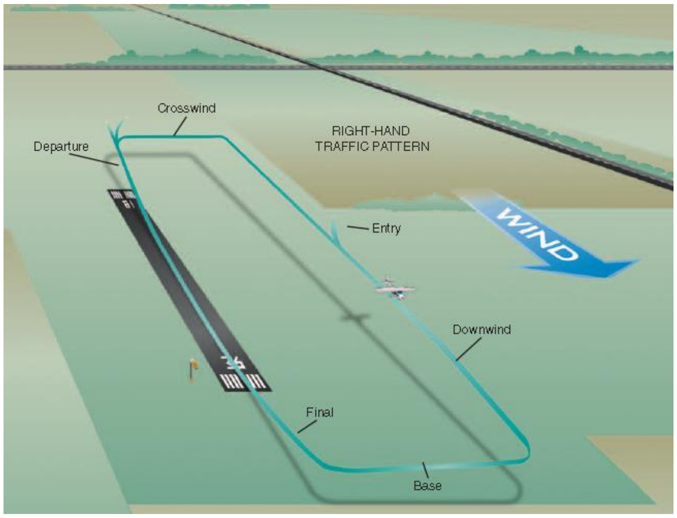
   If already established on the downwind side, skip to step 4.

3) For a midfield entry:
   a. Cross midfield 500' above traffic pattern altitude, observing traffic flow and wind direction.
   b. Fly 2-3 miles beyond the downwind leg, then descend to pattern altitude.
   c. Complete a tear-drop shaped turn to the right or left as necessary to position the aircraft at a 45 degree angle to the downwind leg.

   If less than two aircraft are currently in the pattern, the alternate method (cross midfield at traffic pattern altitude, enter directly into downwind leg) may be used.

4) Enter the traffic pattern at the designated traffic pattern altitude (normally 1,000' AGL) at a 45 degree angle to the downwind leg at midfield.
5) Apply appropriate crosswind correction to allow for a parallel flight path approximately ½ mile from the runway
6) Allow for proper spacing from other aircraft in the pattern as to prevent runway incursions upon landing.
7) Maintain airspeed below the flap speed required for each configuration change.





Flight Proficiency Standards:

- Exhibits knowledge of the elements related to traffic patterns. This shall include procedures at airports with and without operating control towers, prevention of runway incursions, collision avoidance, wake turbulence avoidance, and wind shear.
- Complies with proper traffic pattern procedures.
- Maintains proper spacing from other aircraft.
- Corrects for wind drift to maintain the proper ground track.
- Maintains orientation with the runway/landing area in use.
- Maintains traffic pattern altitude, ±100 feet and the appropriate airspeed, ±10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss traffic patterns at controlled and uncontrolled airports.
- Explain traffic pattern procedures.
- Explain how to maintain the proper ground track.

Safety Considerations:

- Maintain proper traffic pattern altitude.
- Maintain a distance from the runway that is within power-off gliding distance.
- Preferred bank of 30 degrees while in pattern.
- Maneuver within 300 feet of traffic pattern altitude before turning crosswind to base.
- Maintain proper aircraft separation.
- Comply with standards traffic pattern procedures or ATC instructions.

Common Errors:

- Failure to comply with traffic pattern instructions, procedures, and rules.
- Improper correction for wind drift.
- Inadequate spacing from other traffic.
- Poor altitude or airspeed control.
- Flying too wide of a pattern.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Normal Approach & Landing (C-152)

Objective:

To safely transition from flight to ground operations during normal conditions.

Description:

The aircraft is configured for a stabilized approach in the landing configuration and transitioned from the descent to touchdown.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
    a. Reduce power to approximately 1,300 RPM.
    b. Confirm flaps 10°.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 65 kts.
6) Turn on the base leg when 45° from the touchdown point:
    a. At key position, assess approach position.
    b. With wings level, set flaps to 20° as required.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 60 kts.
7) Turn on final as to align the aircraft with the extended runway center line:
    a. Set flaps to 30° as required.
    b. Adjust pitch and power as required to maintain a stabilized approach, at 55 kts, toward the selected aiming point until flare to land.
    c. Complete the GUMPS check.
8) During the flare to land simultaneously reduce power to idle and maintain aircraft approximately one foot above runway until it slows to stall speed and touches down on the runway centerline.
9) Maintain positive pitch attitude for aerodynamic braking.
10) Exit runway and complete after landing checklist.

***The above condition is based on a no wind condition.*
*Adjust configuration and airspeed to compensate for wind and gust factor.***

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a normal and crosswind approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects a suitable touchdown point
- Establishes the recommended approach and landing configuration and airspeed, and adjusts pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, or in its absence, not more than 1.3 V_{S0}, +10/-5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the flare and touchdown.
- Touches down smoothly at approximate stalling speed.
- Touches down at or within 400 feet beyond a specified point, with no drift, and with the airplane's longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Completes the appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain proper use of crosswind control inputs.

Safety Considerations:

- Observe flap extension speeds.
- Maintain proper airspeed at all times.
- Use proper crosswind correction to avoid drifting from runway centerline.

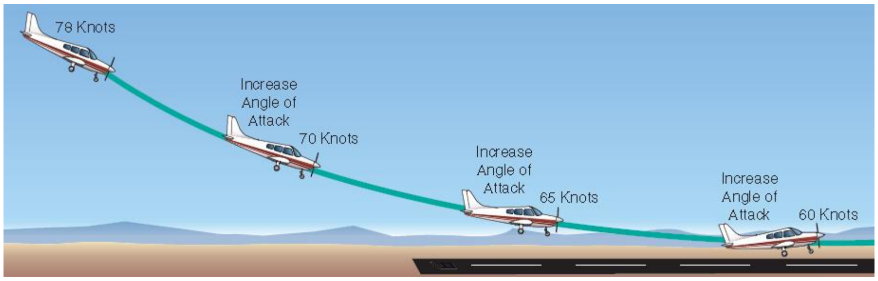
Common Errors:

- Improper use of landing performance data and limitations.
- Failure to establish proper crosswind correction.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Improper procedure during round out and touchdown.
- Improper use of brakes.
- Poor directional control after touchdown.

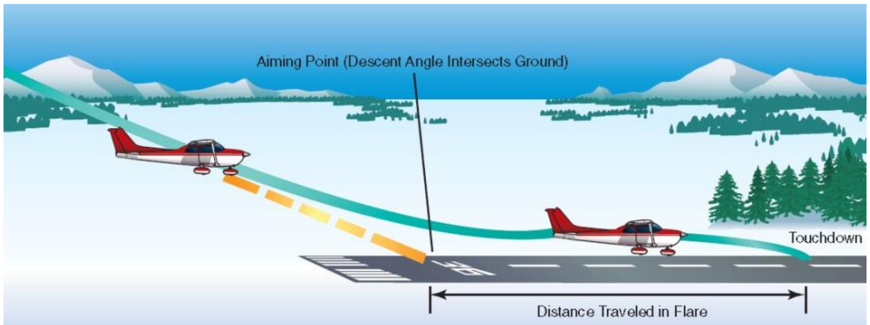
References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Changing angle of attack during round out



Aiming point of a stabilized approach



Example of a well-executed round out and proper landing attitude

Crosswind Approach & Landing (C-152)

Objective:

To safely transition from flight to ground operations during crosswind conditions.

Description:

The aircraft is configured for a stabilized approach in the landing configuration and transitioned from the descent to touchdown.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
    a. Reduce power to approximately 1,300 RPM.
    b. Confirm flaps 10°.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 65 kts.
6) Turn on the base leg when 45° from the touchdown point:
    a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
    b. At key position, assess approach position.
    c. With wings level, set flaps to 20° as required.
    d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 60 kts.
7) Turn final on the extended runway center line:
    a. Apply appropriate crosswind correction to maintain the extended runway centerline.
    b. Set flaps to 30° as required.
    c. Adjust pitch and power as required to maintain a stabilized approach, at 55 kts, toward the selected aiming point until flare to land.
    d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
    e. Complete the GUMPS check.
8) During the flare to land simultaneously reduce power to idle and maintain aircraft approximately one foot above runway until it slows to stall speed and touches down on the runway centerline.
9) Maintain positive pitch attitude for aerodynamic braking.
10) Exit runway and complete after landing checklist.

*** Adjust configuration and airspeed to compensate for strong crosswind and/or gust factor.***

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a normal and crosswind approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects a suitable touchdown point
- Establishes the recommended approach and landing configuration and airspeed, and adjusts pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, or in its absence, not more than 1.3 V_{S0}, +10/-5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the flare and touchdown.
- Touches down smoothly at approximate stalling speed.
- Touches down at or within 400 feet beyond a specified point, with no drift, and with the airplane's longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Completes the appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain proper use of crosswind control inputs.

Safety Considerations:

- Observe flap extension speeds.
- Maintain proper airspeed at all times.
- Use proper crosswind correction to avoid drifting from runway centerline.

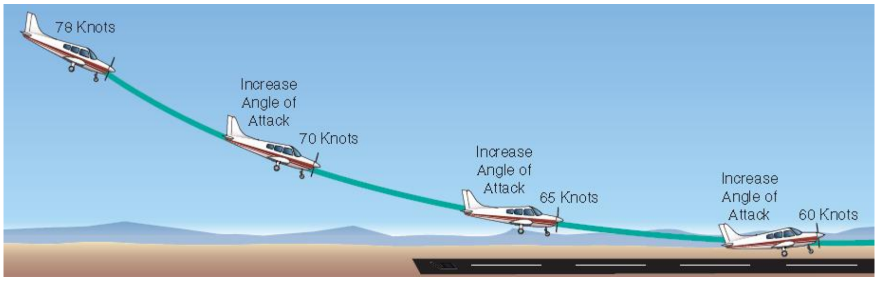
Common Errors:

- Improper use of landing performance data and limitations.
- Failure to establish proper crosswind correction.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Improper procedure during round out and touchdown.
- Improper use of brakes.
- Poor directional control after touchdown.

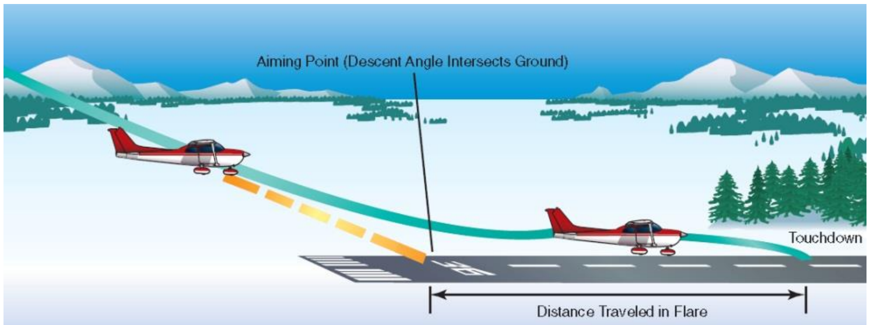
References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Changing angle of attack during round out

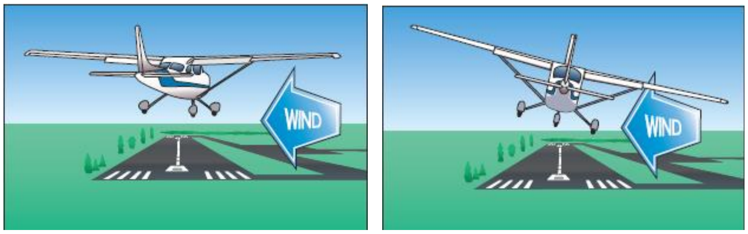


Aiming point of a stabilized approach

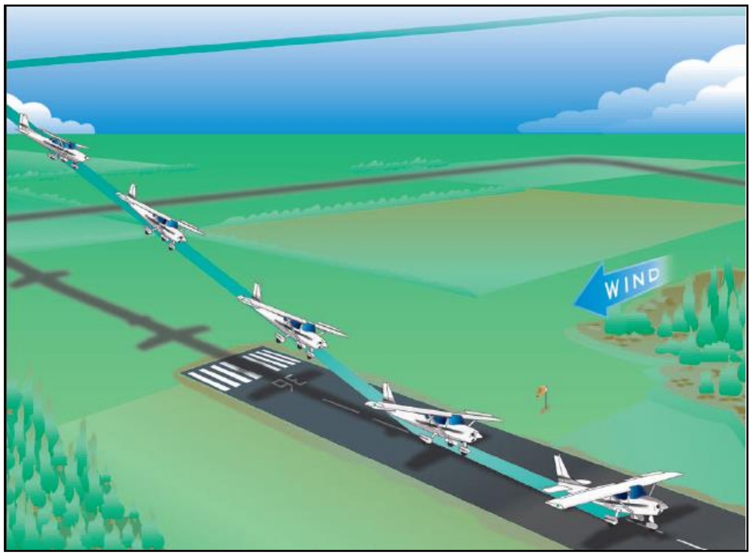


Example of a well-executed round out and proper landing attitude

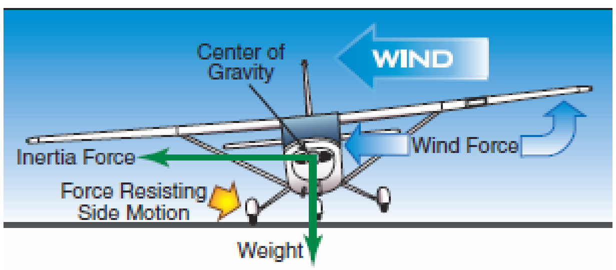
Crabbed Method (Left) / Wing-Low Method (Right)
(Recommended)



Crosswind Approach and Landing using wing low method



Drifting during touchdown (inappropriate crosswind correction)



Short-Field Approach & Landing (C-152)

Objective:

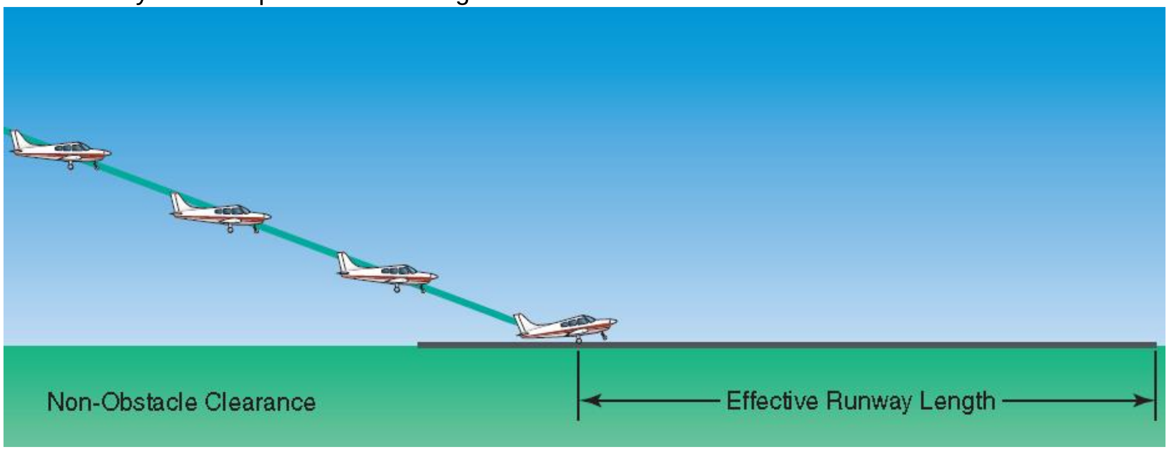
To safely transition from flight to ground operations at an airport with a relatively short runway or where an approach is made over obstacles.

Description:

The airplane is configured for a stabilized approach with or without a 50 foot obstacle. There will be little or no float during the round out, allowing the airplane to touch down at a specified point, and be stopped in a shorter than normal distance.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
   a. Reduce power to approximately 1,300 RPM.
   b. Confirm flaps 10°.
   c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 65 kts.
6) Turn on the base leg when 45° from the touchdown point:
   a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
   b. At key position, assess approach position.
   c. With wings level, set flaps to 20° as required.
   d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 60 kts.
7) Turn final on the extended runway center line:
   a. Apply appropriate crosswind correction to maintain the extended runway centerline.
   b. Set flaps to 30° as required.
   a. Adjust pitch and power as required to maintain a stabilized approach, at 54 kts, toward the selected aiming point until flare to land.
   c. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
   d. Maintain a stabilized descent above the 50 ft obstacle and land at the specified point.
   e. Complete the GUMPS check.
8) During the flare to land simultaneously reduce power to idle and maintain aircraft approximately one foot above runway until it slows to stall speed.
9) Touch down at approximate stall speed on the runway centerline.
10) Maintain positive pitch attitude for aerodynamic braking.
11) Apply maximum braking (simulated) to a complete stop without skidding the tires.
12) Exit runway and complete after landing checklist.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a short-field approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects the most suitable touchdown point.
- Establishes the recommended approach and landing configuration and airspeed; adjusts pitch attitude and power as required.
- Maintains a stabilized approach and recommended approach airspeed, or in its absence not more than 1.3 V_{SO}, +10/-5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the round out and touchdown.
- Touches down smoothly at minimum control airspeed.
- Touches down at or within 200 feet beyond a specified point, with no side drift, minimum float and with the airplane's longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Applies brakes, as necessary, to stop in the shortest distance consistent with safety.
- Completes the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on an approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain how to compensate for obstacles and shortened runway lengths.

Safety Considerations:

- Maintain proper airspeed at all times.
- Compensate for crosswind.
- Do not skid tires.
- Use of aerodynamic braking as available.

Common Errors:

- Excessive airspeed on final approach.
- Slow airspeed prior to touchdown.
- Failure to establish proper crosswind correction.
- Improper use of landing performance data and limitations.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Improper procedure during round out and touchdown.
- Improper use of brakes.
- Poor directional control after touchdown.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Soft-Field Approach & Landing (C-152)

Objective:

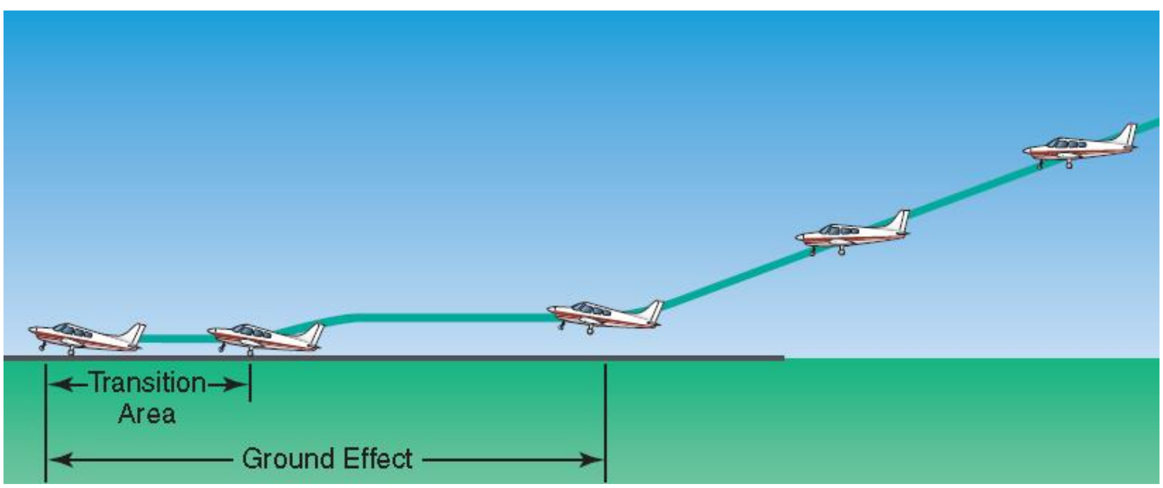
To safely transition the airplane from flight to ground operations on a rough or soft surface.

Description:

The aircraft is configured for a stabilized approach in the landing configuration and transitioned from the descent to touchdown on a field that is unimproved.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
    a. Reduce power to approximately 1,300 RPM.
    b. Confirm flaps 10°.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 65 kts.
6) Turn on the base leg when 45° from the touchdown point:
    a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
    b. At key position, assess approach position.
    c. With wings level, set flaps to 20° as required.
    d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 60 kts.
7) Turn final on the extended runway center line:
    a. Apply appropriate crosswind correction to maintain the extended runway centerline.
    b. Set flaps to 30° as required.
    c. Adjust pitch and power as required to maintain a stabilized approach, at 55 kts, toward the selected aiming point until flare to land.
    d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
    e. Adjust stabilized approach to clear obstacles and land at the specified point.
    f. Complete the GUMPS check.
8) During the flare to land reduce power as required to maintain aircraft approximately one foot above runway until it slows to stall speed.
9) Touch down at approximate stall speed on the runway centerline as smoothly as possible.
10) Maintain back elevator pressure to keep nose wheel off the ground as long as possible.
11) Maintain directional control with rudder and aileron deflection.
12) Adjust power as necessary to maintain aircraft movement on soft surfaces.
13) Exit the runway with minimal braking and complete after landing checklist.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a soft-field approach and landing.
- Considers the wind conditions, landing surface and obstructions, and selects the most suitable touchdown area.
- Establishes the recommended approach and landing configurations, and airspeed; adjusts pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, or in its absence not more than 1.3 V_{SO}, +10/-5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the round out and touchdown.
- Touches down softly with no drift, and with the airplane's longitudinal axis aligned with the runway/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Maintains proper position of the flight controls and sufficient speed to taxi on the soft surface.
- Completes the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss effect of flaps on an approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain how to touchdown and maneuver the aircraft on soft of unimproved surfaces.

Safety Considerations:

- Do not land on fields that exceed the capabilities of the aircraft or pilot.
- Fly over and visually check the field prior to landing.
- Check field length and density altitude.
- Only land on public, published, unimproved runways with UCM aircraft.
- Use caution when landing on wet grass.

Common Errors:

- Failure to maintain elevator back-pressure after touchdown.
- Improper use of brakes.
- Failure to consider effect of wind and landing surface.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Touch and Go (C-152)

Objective:

To transition from a landing rollout to a takeoff roll while remaining on the runway.

Description:

A touch and go is a landing which transitions into a takeoff while the aircraft remains rolling on the runway.

Setup Procedure:

1) Perform a normal landing.
2) Upon touchdown:
   a. Allow the aircraft to continue rolling.
   b. Maintain runway centerline.
   c. Apply proper crosswind correction.
3) Reconfigure the aircraft for takeoff.
   a. Retract flaps to desired value (10º or less).
   b. Set trim to the takeoff position.
4) Smoothly apply full-power.
5) Upon reaching rotation speed, 50 kts (V_R), increase back elevator pressure to establish the lift-off attitude that is approximately V_Y or V_X and allow the aircraft to fly off the ground.
6) Apply adequate drift correction to maintain runway centerline.
7) At 500 ft., or as workload permits, complete the climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to touch and go procedures.
- Maintains runway centerline upon touchdown.
- Applies proper crosswind controls upon touchdown, reconfiguration and climb out.
- Demonstrates proper aircraft reconfiguration.
- Lifts off at the recommended airspeed and accelerates to V_X or V_Y, as appropriate.
- Retracts flaps at 200’ or a safe altitude, if appropriate.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Complies with noise abatement procedures.
- Completes the appropriate checklist.

Note: These are the UCM standards. The aforementioned standards are not found in the Airman Certification Standards.

Learning Outcomes:

- Explain the purpose(s) of touch and go’s.
- Discuss how crosswind correction will change throughout the maneuver.
- Discuss the importance of maintaining runway centerline during aircraft reconfiguration.

Safety Considerations:

- Maintain runway centerline.
- Proper crosswind correction.
- Maintain situational awareness.
- Proper reconfiguration.

Common Errors:

- Failure to maintain runway centerline.
- Touchdown beyond the first 1/3rd of the runway and attempting a touch and go.
- Improper aircraft reconfiguration.
- Failure to maintain adequate crosswind correction.
- Attempting to lift-off prior to rotation speed.

Emergency Descent (C-152)

Objective:

To descend the airplane as soon and as rapidly as possible, within the structural limitations of the airplane.

Description:

The emergency descent is a maneuver for descending as rapidly as possible to a lower altitude or to the ground for an emergency landing.

Setup Procedure:

1) Perform clearing turns.
2) If utilizing flight following, contact ATC for traffic advisories below.
3) Reduce power to idle.
4) Confirm flaps 0º
5) Set mixture to rich.
6) Roll into a 30º - 45º bank to the left and pitch down to achieve 105 kts (If in turbulent air, maintain an airspeed below V_A).
7) Initiate recovery to level flight at least 300' prior to assigned altitude by:
    e. Rolling out the bank.
    f. Pitching up.
8) Return to cruise flight and complete the cruise checklist to include leaning procedures

Flight Proficiency Standards:

- Exhibit knowledge of the elements related to emergency descent.
- Recognizes situations, such as depressurization, cockpit smoke, and/or fire that require an emergency descent.
- Establish the appropriate airspeed and configuration for the emergency descent.
- Exhibit orientation, division of attention, and proper planning.
- Maintains positive load factors during the descent.
- Follow the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the purpose(s) of an emergency descent.
- Discuss engine cooling characteristics during an emergency descent.
- Discuss the importance of proper planning as it pertains to emergencies.

Safety Considerations:

- Maintain positive aircraft control.
- Clear the engine periodically
- Clear below then GO.
- Steep spiral over airport.
- Continue on to emergency approach and landing.

Common Errors:

- Failure to recognize the urgency of the emergency descent.
- Failure to use emergency checklist for situation.
- Failure to maintain appropriate configuration and airspeed.
- Poor orientation, planning, and division of attention.

Emergency Approach & Landing (C-152)

Objective:
To develop accuracy, judgment, planning, procedures, and confidence when little or no power is available.

Description:
An engine failure is simulated by the instructor after which the airplane is safely maneuvered to a landing.

Setup Procedure:
1) The instructor will reduce engine power to idle and announce “simulated emergency landing.”
2) Establish an airspeed of 60 kts ($V_{L/D}$) and trim to maintain airspeed.
3) Select a suitable landing location and spiral over it.
4) Complete an engine restart flow.
5) Complete the engine failure checklists as time permits.
6) Establish communication to report emergency situation.
7) Configure and maneuver the aircraft to fly a normal traffic pattern as applicable.
8) Initiate a go-around no lower than 500 feet AGL.

Flight Proficiency Standards:
- Exhibit knowledge of the elements related to emergency approach and landing procedures.
- Establish and maintain the recommended best-glide airspeed, ±10 kts.
- Select a suitable landing area.
- Plan and follow a flight pattern to the selected landing area considering altitude, wind, terrain, and obstructions.
- Prepare for landing or go-around as specified by the instructor.
- Follow the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:
- Discuss the criteria for a good emergency landing field.
- Explain the steps to follow after an engine failure.
- Explain how to trouble shoot for problems after an engine failure.

Safety Considerations:
- Maintain positive aircraft control.
- Clear the engine periodically.
- Maintain awareness for towers and other obstacles.
- Maintain situational awareness.
- This is a **dual only** maneuver.

Common Errors:
- Improper airspeed control.
- Poor judgment in the selection of an emergency landing area.
- Failure to estimate the approximate wind speed and direction.
- Failure to fly the most suitable pattern for existing situation.
- Failure to accomplish the emergency checklists.
- Undershooting or overshooting selected landing area.

References:
Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Forward Slip to a Landing (C-152)

Objective:

To dissipate altitude without increasing airspeed.

Description:

The upwind wing is lowered and opposite rudder is used to maintain the ground track bringing the aircrafts longitudinal axis at an angle to its flight path. The pitch is adjusted to maintain the desired airspeed.

Setup Procedure:

1) Determine the wind direction.
2) Reduce power to idle.
3) Simultaneously bank into the wind and apply full opposite rudder.
4) Adjust pitch to maintain desired airspeed.
5) Adjust aileron input to maintain the ground track of the aircraft with the extended runway centerline.

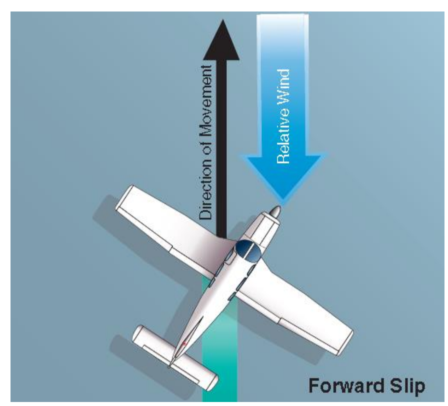
Flight Proficiency Standards:

- Exhibits knowledge of the elements related to forward slip to a landing.
- Considers the wind conditions, landing surface and obstructions, and selects the most suitable touchdown point.
- Establishes the slipping attitude at the point from which a landing can be made using the recommended approach and landing configuration and airspeed; adjusts pitch attitude and power as required.
- Maintains a ground track aligned with the runway center/landing path and an airspeed, which results in minimum float during the flare.
- Makes smooth, timely, and correct control application during the recovery from the slip, the flare, and the touchdown.
- Touchdown smoothly at the approximate stalling speed, at or within 400 feet beyond a specified point with no side drift and with the airplane's longitudinal axis aligned with and over the runway centerline.
- Maintain crosswind correction and directional control throughout the approach and landing sequence.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance of maintaining the proper attitude to avoid a stall.
- Predict the amount of control input required to maintain the desired ground track.
- Discuss the applications in which a forward slip might be used.
- Explain the proper control inputs to perform a forward slip.
- Explain flap configuration considerations applicable to forward slips.
- Explain aircraft limitations applicable to forward slips.



Safety Considerations:

- Maintain sufficient airspeed as to avoid a stall.
- Observe maximum forward slip duration limitations.
- Terminate the maneuver with sufficient altitude to complete a landing.

Common Errors:

- Improper aileron and/or rudder control inputs.
- Failure to maintain airspeed and a stabilized slip.
- Inappropriate removal of hand from throttle.
- Improper technique during transition from the slip to the touchdown.
- Failure to maintain runway centerline.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Go-Around (C-152)

Objective:

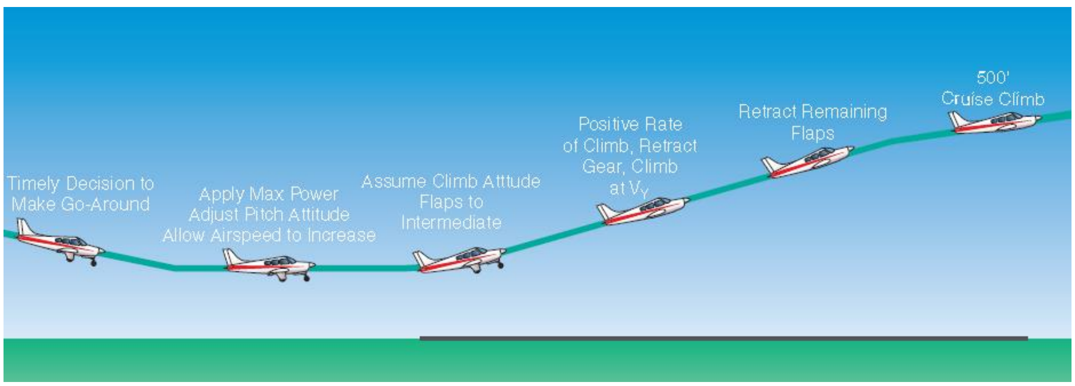
To safely discontinue the landing approach if unstable or other unsatisfactory conditions exist.

Description:

As full power is applied, the aircraft attitude is adjusted to accelerate to V_Y and climb. As a safe airspeed is attained, flaps are retracted 10° at a time allowing stabilization between each retraction.

Setup Procedure:

1) Simultaneously apply maximum power and establish a go-around pitch attitude.
2) Set flaps to 20°.
3) Establish a pitch attitude to accelerate to 55 kts.
4) Allow the airplane to accelerate to V_X or V_Y and climb.
5) If there is an aircraft on the runway, sidestep to clear the departure path of the airplane and allow the pilot to view the landing or departing traffic.
6) Set flaps to 10° and stabilize in between configuration changes then flaps to 0°.
7) Verify Go Around checklist is complete.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a go-around/rejected landing.
- Makes a timely decision to discontinue the approach to landing.
- Applies takeoff power immediately and transitions to climb pitch attitude for V_X, and maintains V_Y+10/-5 kts.
- Retracts the flaps as appropriate.
- Retracts the landing gear, if appropriate, after a positive rate of climb is established.
- Maneuvers to the side of the runway/landing area to clear and avoid conflicting traffic.
- Maintains takeoff power V_Y+10/-5 to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the climb.
- Completes the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss events that may require a go-around.
- Explain the importance of maintaining airspeed and coordination during the go-around procedure.
- Discuss the necessity for maneuvering to the side of the runway after making the decision to go-around.

Safety Considerations:

- Maneuver the airplane to the side of the runway.
- Do not establish a pitch up attitude too quickly.
- Maintain coordination.
- Timely decision making.
- Be watchful for situation which may require a go-around.

Common Errors:

- Delayed decision to make a go-around.
- Improper application of power.
- Failure to control pitch attitude.
- Improper trim technique.
- Failure to compensate for torque effect.
- Failure to maintain 79 kts (V_Y).
- Improper wing flap retraction.
- Failure to maintain well clear of obstructions and other traffic.
- Improper use of checklist.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Maneuvering During Slow Flight (C-152)

Objective:

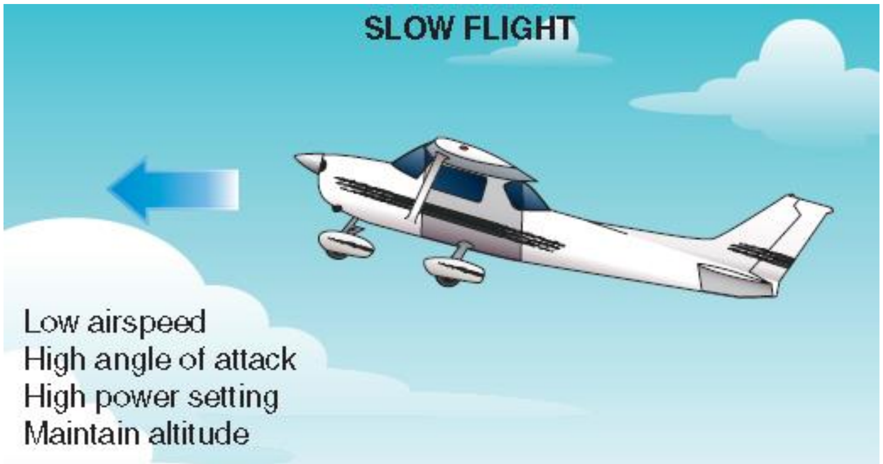
To demonstrate the flight characteristics and controllability of an airplane at speeds lower than normal cruise and develop proficiency in performing maneuvers that require slow airspeeds.

Description:

Slow flight consists of slowing the aircraft to a minimum controllable airspeed in the landing configuration and maneuvering the aircraft while maintaining altitude and airspeed.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
2) Perform clearing turns.
3) Set mixture to rich.
4) Reduce power to 1,500 RPM or less.
5) Below 85 kts, set flaps to 10°.
6) Adjust pitch and power as necessary to maintain altitude.
7) Set flaps to 20° and 30° allowing the aircraft to stabilize between each setting.
8) Establish and maintain an airspeed at which any further increase in pitch or reduction of power would result in an immediate stall or a higher speed as specified by your instructor.
    a. Slow flight should be practiced at varying speeds and configurations above the 1G stall speed of the aircraft as specified by the instructor.
9) Maneuver as instructed.
10) Recover when instructed by:
    a. Adding full power
    b. Set flaps to 20° and allow the aircraft to stabilize.
    c. Then set flaps to 10° and 0° allowing the aircraft to stabilize between each setting.
11) Return to cruise flight and perform the cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to maneuvering during slow flight.
- Selects an entry altitude that will allow the task to be completed no lower than 1,500'AGL.
- Establish and maintain an airspeed at which any further increase in angle of attack, increase in load factor, or reduction in power, would result in a stall warning (e.g., airplane buffet, stall horn, etc.).
- Accomplishes coordinated straight and level flight, turns, climbs, and descents with landing gear and flap configurations specified by the instructor.
- Divides attention between airplane control and orientation.

- Maintains the specified altitude, ±100 feet; specified heading, ±10°; airspeed, +10/-0 kts; and specified angle of bank, ±10°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the relationship between pitch and power in maintaining airspeed and altitude during slow flight.
- Discuss how flight at minimum airspeeds develops the ability to estimate the margin of safety above the stalling speed.
- Compare the practice of slow flight to various phases of flight such as; takeoffs, climbs, descents, go-arounds, and approaches to landing.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified gear and flap configuration.
- Improper entry technique.
- Failure to establish and maintain the specified airspeed.
- Excessive variations of altitude and heading.
- Rough or uncoordinated control technique.
- Improper correction for left turning tendency.
- Improper trim technique.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Power – Off Stall (C-152)

Objective:

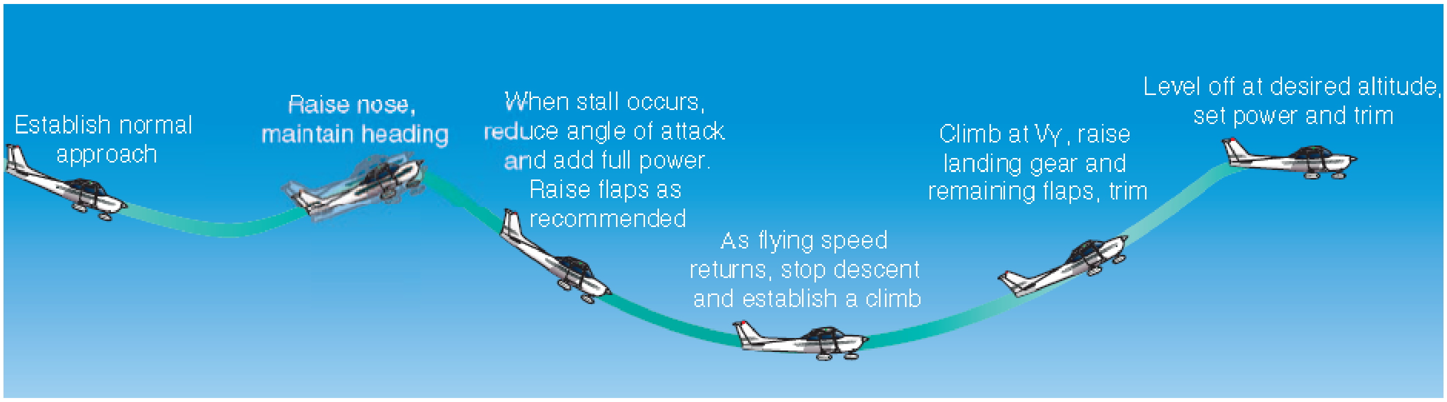
To familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop the skills to prevent and recover from stalls in the landing configuration.

Description:

The aircraft is slowed down and placed in the landing configuration after which a stall is induced and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
2) Perform clearing turns.
3) Set mixture to rich.
4) Reduce power to 1,500 RPM or less allowing the aircraft to slow to approach speed while maintaining altitude.
5) Below 85 kts, set flaps to 10°.
6) Set flaps to 20° and 30° allowing the aircraft to stabilize between each setting.
7) Establish a stabilized descent at 55 kts.
8) Reduce power to idle.
9) Maintain coordinated flight and altitude until recognition of the stall. As the stall occurs, recover from the stall by simultaneously reducing the angle of attack, adding full power, and leveling the wings.
10) Set flaps to 20°.
11) Accelerate the aircraft to V_X (recommended) or V_Y and climb while retracting the remaining flaps in 10° increments.
12) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to power-off stalls.
- Selects an entry altitude that allows the task to be completed no lower than 1,500'AGL.
- Establishes a stabilized descent in the approach or landing configuration, as specified by the instructor.
- Transitions smoothly from the approach or landing attitude to a pitch attitude that will induce a stall.
- Maintains a specified heading, ±10°, in straight flight; maintains a specified angle of bank not to exceed 20°, ±10°; in turning flight, while inducing the stall.
- Recognizes and recovers promptly after the stall occurs by simultaneously reducing the angle of attack, increasing power to maximum allowable and leveling the wings to return to a straight and level flight attitude with minimum loss of altitude appropriate for the airplane.
- Retract the flaps to the recommended setting; retracts the landing gear, if retractable, after a positive rate of climb is established.
- Accelerates to V_X or V_Y speed before the final flap retraction; returns to the altitude, heading, and airspeed specified by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Power – On Stall (C-152)

Objective:

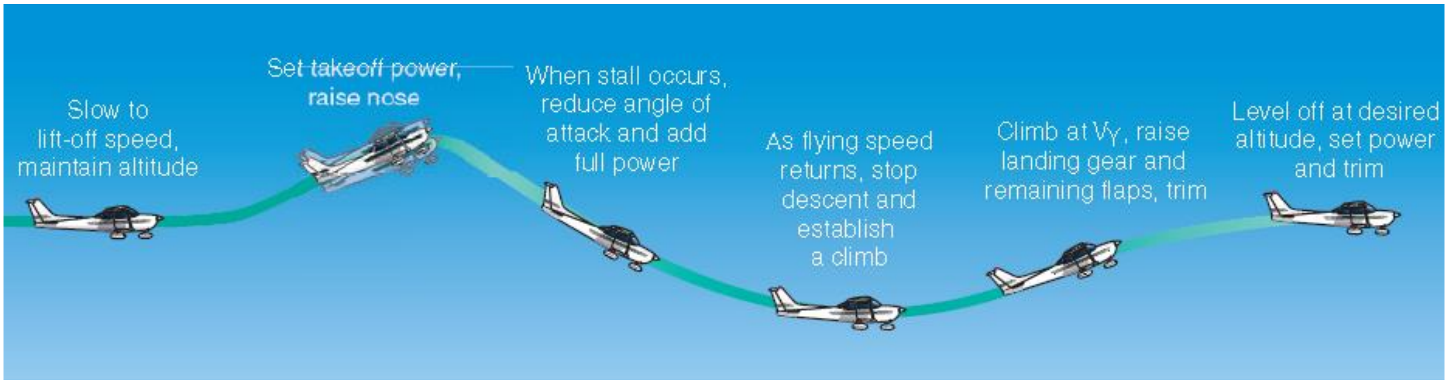
To familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in the takeoff configuration.

Description:

The aircraft is slowed down and placed in the takeoff configuration after which a stall is induced and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
2) Perform clearing turns.
3) Set mixture to rich.
4) Reduce power to 1200 RPM or less, allowing the aircraft to slow to takeoff speed while maintaining altitude.
5) Add full power at 50 kts (V_R).
6) Transition smoothly to the pitch attitude that will induce a stall.
7) Recognize and recover promptly after a fully developed stall occurs by simultaneously reducing the angle of attack, confirming full power, and leveling the wings.
8) Accelerate the aircraft to 67 kts (V_Y) and climb.
9) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to power-on stalls.
- Selects an entry altitude that allows the task to be completed no lower than 1,500' AGL.
- Establishes the takeoff or departure configuration. Sets power to no less than 65 percent available power.
- Transitions smoothly from the takeoff or departure attitude to the pitch attitude that will induce a stall.
- Maintains a specified heading, ±10°, in straight flight; maintains a specified angle of bank not to exceed 20°, ±10°, in turning flight, while inducing the stall.
- Recognizes and recovers promptly after the stall occurs by simultaneously reducing the angle of attack, increasing power as appropriate, and leveling the wings to return to a straight and level flight attitude with a minimum loss of altitude appropriate for the airplane.
- Retracts the flaps to the recommended setting; retracts the landing gear if retractable, after a positive rate of climb is established.
- Accelerates to V_X or V_Y speed before the final flap retraction; returns to the altitude, heading, and airspeed specified by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Recovery from Unusual Flight Attitudes (C-152)

Objective:

To safely re-establish control of the airplane after recognition of an unusual attitude.

Description:

The aircraft is maneuvered with the proper use of pitch, power, and bank to safely recover from a nose-high or nose-low unusual attitude.

Setup Procedure:

1) The instructor will position the aircraft into a level or banked nose-high or nose-low unusual attitude while the student has his or her eyes closed.
2) The instructor will instruct the student to recover from the unusual attitude visually or by using a view limiting device.
3) For a nose-high attitude:
    a. Simultaneously add full power and lower the pitch.
    b. Level the wings.
4) For a nose-low attitude:
    a. Reduce power.
    b. Level the wings.
    c. Increase pitch.
5) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to attitude instrument flying during unusual attitudes.
- Recognizes unusual flight attitudes solely by reference to instruments; recovers promptly to a stabilized level flight attitude using proper instrument cross-check and interpretation and smooth, coordinated control application in the correct sequence.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the importance of quickly and accurately determining an unusual attitude.
- Explain proper control inputs to recover from an unusual attitude.

Safety Considerations:

- Maintain positive aircraft control.
- Observe aircraft limitations with respect to airspeed and load factors.

Common Errors:

- Incorrect interpretation of the flight instruments.
- Inappropriate application of controls.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Steep Turns (C-152)

Objective:

To develop coordination, orientation, division of attention and smooth control techniques while executing high performance turns.

Description:

The maneuver consists of a 360° turn using a bank angle of approximately 45° while maintaining a constant airspeed and altitude.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
2) Perform clearing turns.
3) Adjust the mixture in accordance with the POH.
4) Reduce power to establish an airspeed of 95 kts.
5) Enter a coordinated 45° banking turn to the left or right.
6) Increase power and adjust trim and pitch as required to maintain altitude and airspeed.
7) Begin rollout at ½ the bank angle prior to rollout heading.
8) Reduce power and pitch on rollout as needed to remain at 95 kts.
9) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to steep turns.
- Establishes the manufacturer's recommended airspeed (95 kts) or if one is not stated, a safe airspeed not to exceed V_A.
- Rolls into a coordinated 360° turn; maintains a 45° bank.
- Perform the task in the opposite direction, as specified by the instructor.
- Divide attention between airplane control and orientation.
- Maintain the entry altitude, ±100 feet, airspeed, ±10 kts, bank, ±5°; and roll out on the entry heading, ±10°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain why load factor increases as bank angle increases.
- Discuss the relationship between load factor and stall speed.
- Discuss the principle of over-banking tendency.
- Explain how to maintain altitude and airspeed.
- Explain limit load factor and what happens if it's exceeded.

Safety Considerations:

- Do not exceed manufacturer's recommended airspeed or V_A.
- Always clear the area before initiating the maneuver.
- The maneuver is to be completed no lower than 1,500' AGL.
- Division of attention between maneuver and scanning for traffic.

Common Errors:

- Improper pitch, bank, and power coordination during entry and rollout.
- Uncoordinated use of flight controls.
- Improper procedure in correcting altitude deviations.
- Loss of orientation.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Tracking A Straight Line (C-152)

Objective:

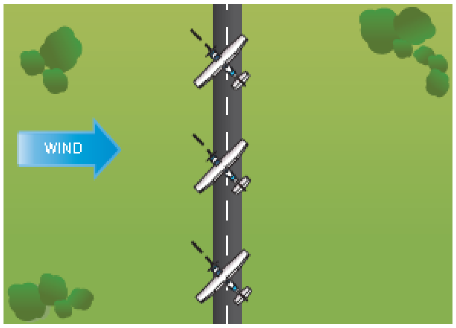
To maintain a uniform ground track along a selected straight line or road with a constant airspeed and altitude while controlling the effect of wind drift on the airplane and the proper correction using varying crosswind correction.

Description:

Tracking a straight line is a training maneuver, in which the ground track of the airplane is flown following a straight line on the ground correcting for wind drift.

Setup Procedure:

1) Select a straight line at least 1 mile in length with a crosswind in an area free of obstructions.
2) Perform clearing turns and establish 1,000' AGL.
3) Adjust the mixture in accordance with the POH.
4) Position the airplane to follow a path over or parallel to a straight line.
5) Maintain an equal distance from the straight line as you fly along it crabbing as necessary.
6) Return to cruise flight and perform the cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to tracking a straight line.
- Selects a suitable reference area.
- Plans the maneuver so as to track the straight line, 1,000' AGL at an appropriate distance from the selected reference area.
- Applies adequate wind-drift correction during straight and turning flight to maintain a constant ground track along the straight line reference area.
- Divides attention between airplane control and the ground track while maintaining coordinated flight.
- Maintains altitude, ±100 feet; maintains airspeed, ±10 kts.

Learning Outcomes:

- Describe proper division of attention.
- Explain the correlation between the maneuver and a traffic pattern at an airport.
- Predict amount of wind correction based on conditions.

Safety Considerations:

- Avoid tall obstacles and populated areas.
- Locate a landing area to use in the event of an emergency.
- Maintain separation from other aircraft.

Common Errors:

- Improper crab angle.
- Fixation on one aspect of the maneuver.
- Uncoordinated flight.

References:

Airplane Flying Handbook; POH/AFM;

Rectangular Course (C-152)

Objective:

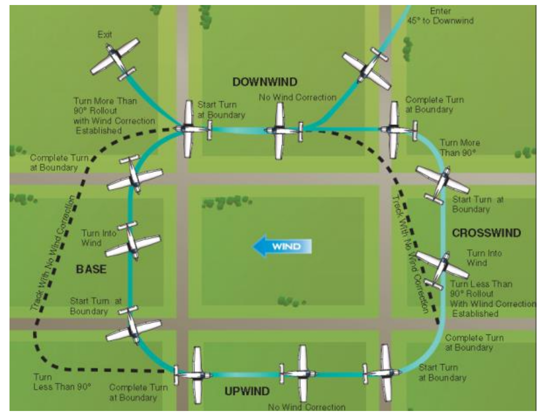
To maintain a uniform ground track around a selected rectangular ground reference with a constant airspeed and altitude while controlling the effect of wind drift on the airplane and the proper correction using varying crosswind correction.

Description:

The rectangular course is a training maneuver, in which the ground track of the airplane is equidistant from all sides of the selected rectangular area on the ground.

Setup Procedure:

1) Select a rectangular area approximately 1 mile in length in an area free of obstructions.
2) Perform clearing turns and establish 1,000' AGL.
3) Adjust the mixture in accordance with the POH.
4) Maintain a safe airspeed (recommended 95 kts).
5) Enter the pattern at a 45° angle to midfield of the downwind approximately ½ mile from the field.
6) Maintain an equal distance from the field as you fly around it crabbing as necessary.
7) Exit the maneuver at a 45° angle to midfield of the downwind.
8) Return to cruise flight and perform the cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a rectangular course.
- Selects a suitable reference area.
- Plans the maneuver so as to enter a left or right pattern, 1,000' AGL at an appropriate distance from the selected reference area, 45° to the downwind leg.
- Applies adequate wind-drift correction during straight and turning flight to maintain a constant ground track around the rectangular reference area.
- Divides attention between airplane control and the ground track while maintaining coordinated flight.
- Maintains altitude, ±100 feet; maintains airspeed, ±10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Describe proper division of attention.
- Explain the correlation between the maneuver and a traffic pattern at an airport.
- Predict amount of wind correction based on conditions.

Safety Considerations:

- Avoid tall obstacles and populated areas.
- Locate a landing area to use in the event of an emergency.
- Maintain separation from other aircraft.

Common Errors:

- Improper crab angle.
- Fixation on one aspect of the maneuver.
- Uncoordinated flight.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Turns Around a Point (C-152)

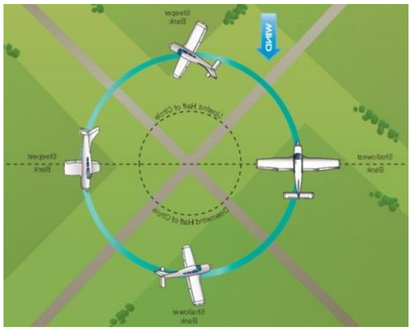
Objective:

To maintain a uniform ground track around a reference point with a constant airspeed and altitude while demonstrating the effect of wind drift on the airplane and the proper correction using varying bank angle.

Description:

The airplane's ground track makes two complete circles, with a constant radius, around a selected point on the ground.

Setup Procedure:



1) Select a prominent reference point on the ground.
2) Perform clearing turns and establish 1,000' AGL.
3) Adjust the mixture in accordance with the POH.
4) Maintain a safe airspeed (recommended 95 kts).
5) Enter the maneuver on the downwind.
6) Initiate the turn when abeam the point.
7) Apply wind correction, as necessary, to maintain a constant radius around the selected reference point.
8) Exit on the downwind.
9) Return to cruise flight and perform the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to turns around a point.
- Selects a suitable ground reference point.
- Plans the maneuver so as to enter left or right at 1,000' AGL, at an appropriate distance from the reference point.
- Applies adequate wind-drift correction to track a constant radius turn around the selected reference point.
- Divides attention between airplane control and the ground track while maintaining coordinated flight.
- Maintains altitude, ±100 feet; maintains airspeed, ±10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Student should demonstrate wind drift correction with varying bank angle and proper aircraft control to maintain the desired ground track.
- Plan maneuver radius by assessing wind speed and direction.

Safety Considerations:

- Always clear area before beginning a maneuver.
- Select area with an emergency landing field close.
- Avoid areas with towers or tall buildings/towns.

Common Errors:

- Faulty entry procedure.
- Poor planning or division of attention.
- Uncoordinated flight control application.
- Improper wind-drift correction.
- Failure to maintain selected altitude or airspeed.
- Failure to establish approximately 45° bank at the steepest point.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

S-Turns (C-152)

Objective:

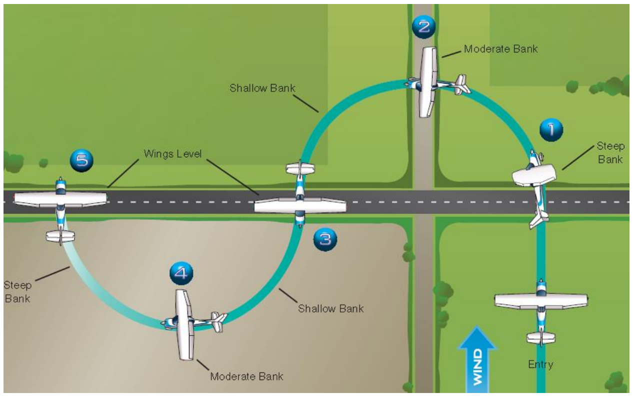
To maintain a uniform ground track of semicircles along a selected reference line with a constant airspeed and altitude while demonstrating the effect of wind drift on the airplane and the proper correction using varying bank angle.

Description:

The airplane's ground track describes semicircles of equal radii on each side of a selected straight line on the ground.

Setup Procedure:

1) Select a prominent line on the ground perpendicular to the wind.
2) Perform clearing turns and establish 1,000' AGL.
3) Adjust the mixture in accordance with the POH.
4) Maintain a safe airspeed (recommended 95 kts).
5) Enter the maneuver on the downwind.
6) Initiate the first turn upon reaching the reference line.
7) Apply wind correction, as necessary, to maintain a constant radius around a point on the reference line.
8) After a 180° turn, reverse the turn.
9) After two 180° turns are completed, exit on the downwind.
10) Return to cruise flight and perform the cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to S-turns.
- Selects a suitable ground reference line.
- Plans the maneuver so as to enter at 1,000' feet AGL, perpendicular to the selected reference line.
- Applies adequate wind-drift correction to track a constant radius turn on each side of the selected reference line.
- Reverses the direction of turn directly over the selected reference line.
- Divides attention between airplane control and the ground track while maintaining coordinated flight.
- Maintains altitude, ±100 feet; maintains airspeed, ±10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Demonstrate wind drift correction with varying bank angle and proper aircraft control to maintain the desired ground track.
- Plan maneuver radius by assessing wind speed and direction.

Safety Considerations:

- Always clear area before beginning a maneuver.
- Select an area with an emergency landing field nearby.
- Avoid areas with towers or tall buildings/towns.

Common Errors:

- Faulty entry procedure.
- Poor planning or division of attention.
- Uncoordinated flight control application.
- Improper wind-drift correction.
- Failure to maintain selected altitude or airspeed.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Section 5 – INSTRUMENT RATING

The Instrument Rating is divided into two flight courses and a ground school. All degree seeking students will conduct training under CFR 14 Part 141 unless approved by the Chief Flight Instructor.

This section contains references to both the C-172R and C-172S.

C-172R

Instrument Cockpit Check (C-172R)

Objective:

To develop good habits for checking the operation of flight instruments and their power source prior to takeoff in instrument meteorological conditions (IMC).

Description:

Each instrument relating to Instrument Flight Rules (IFR) is checked for proper indications during the taxi to the run up area or runway.

Setup Procedure:

1) Check the magnetic compass for freedom of movement; confirm that it is full of fluid and showing known headings.
2) Check clock for correct digital display.
3) The airspeed indicator should indicate zero.
4) Allow 5 minutes for the gyro of the attitude indicator to spin up and then it should remain erect to the horizontal position and not dip more than 5° while turning on the ground.
5) With the altimeter set to the current altimeter setting, note any variation between field elevation and the altimeter indication. Discrepancies of 75 feet or more indicate questionable reliability.
6) Check engine instruments for proper indications.
7) During taxi turns, check the turn coordinator for turns in direction of the turn and the ball should move opposite to the direction of turns.
8) Allow 5 minutes for the gyro of the heading indicator to spin up and set it according to the magnetic compass.
9) Note VSI needle position. The VSI should read zero. If it does not, the ground indication should be interpreted as the zero position.

Flight Proficiency Standards:

- Exhibit adequate knowledge of the elements related to the preflight check of instruments, avionics, and navigation equipment.
- Perform the preflight on instruments, avionics, and navigation equipment.
- Determine that the aircraft is in condition for safe instrument flight.
- Note any discrepancies and determine whether the aircraft is safe for instrument fight or requires maintenance.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance of performing an instrument cockpit check.
- Discuss how each instrument check determines the operational status of the instrument and power source.
- Demonstrate the instrument cockpit check.
- Determine if an unsafe condition exists based on the results of the instrument cockpit check.

Safety Considerations:

- Division of attention during the instrument taxi check.
- Proper interpretation of the instruments.

Common Errors:

- Failure to check all instruments.
- Improperly checking instruments.
- Failure to maintain control of the aircraft while performing the check.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Straight and Level Flight (C-172R)

Objective:

To fly by reference to instruments while maintaining a constant altitude and heading.

Description:

In straight and level flight you must keep the wings level with the horizon and a pitch attitude which allows no climb or descent.

Setup Procedure:

1) Begin your level off by approximately 10% of your climb rate before desired altitude.
2) Perform cruise checklist to include leaning procedures.
3) Set heading bug to desired heading.
4) Trim for level flight.
5) Maintain straight and level flight through instrument scan, interpretation, and aircraft control.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to attitude instrument flying during straight and level flight while conducting various instrument flight procedures.
- Maintains altitude within ±100 feet during level flight, headings within ±10°, airspeed within ±10 kts, and bank angles within ±5° during turns.
- Uses proper instrument crosscheck and interpretation, and apply the appropriate pitch, bank, power, and trim corrections when applicable.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss proper instrument scan techniques including both the primary and supporting method and the control and performance method.
- Explain instrument cross-check and interpretation.

Safety Considerations:

- Maintain positive aircraft control.
- Maintain orientation.

Common Errors:

- Slow or improper cross-check during straight and level flight.
- Improper power control.
- Failure to make smooth, precise corrections, as required.
- Uncoordinated use of controls.
- Improper trim control.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Turns (C-172R)

Objective:

To fly by reference to instruments while changing direction.

Description:

On the roll-in, use the attitude indicator to establish the approximate angle of bank, and then check the turn coordinator's miniature aircraft for a standard-rate turn indication.

Setup Procedure:

1) Set the heading bug before initiating a turn.
2) Apply coordinated aileron and rudder pressures in the desired direction of turn.
3) Establish the bank angle using the attitude indicator and verify standard rate with the turn coordinator and slip/skid indicator.
4) Maintain the standard rate of turn, using the turn coordinator as the primary bank reference.
5) Use the altimeter, VSI, and attitude indicator for necessary pitch adjustments.
6) To recover, roll out at ½ the bank angle prior to the desired heading.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to attitude instrument flying during turns while conducting various instrument flight procedures.
- Maintains altitude within ±100 feet during level flight, headings within ±10°, airspeed within ±10 kts, and bank angles within ±5° during turns.
- Uses proper instrument crosscheck and interpretation, and apply the appropriate pitch, bank, power, and trim corrections when applicable.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss proper instrument scan techniques including the primary and supporting method and the control and performance method.
- Explain instrument cross-check and interpretation.

Safety Considerations:

- Maintain positive aircraft control.
- Maintain orientation.

Common Errors:

- Improper cross-check procedures.
- Improper bank control during roll-in and roll-out.
- Failure to make smooth, precise corrections, as required.
- Uncoordinated use of controls.
- Improper trim technique.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Constant Airspeed Climbs and Descents (C-172R)

Objective:

To change the airplane's altitude while maintaining a constant airspeed.

Description:

Raise or lower the miniature aircraft to the approximate indication for the predetermined climb speed by applying light elevator pressure.

Setup Procedure:

1) Adjust power as required for a climb or descent configuration.
2) Apply elevator pressure to move the attitude indicator to the approximate indication.
3) Complete climb or descent checklist.
4) Cross check with airspeed indicator for proper airspeed making pitch adjustments if necessary.
5) Level off at desired altitude.
6) Complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to attitude instrument flying during climbs and descents while conducting various instrument flight procedures.
- Maintains altitude within ±100 feet during level flight, headings within ±10°, airspeed within ±10 kts, and bank angles within ±5° during turns.
- Uses proper instrument crosscheck and interpretation, and apply the appropriate pitch, bank, power, and trim corrections when applicable.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss proper instrument scan techniques including the primary and supporting method and the performance method.
- Explain instrument scan techniques including the primary and supporting method and the control and performance method.
- Explain instrument cross-check and interpretation.

Safety Considerations:

- Maintain positive aircraft control.
- Maintain orientation.

Common Errors:

- Improper cross-check procedures.
- Improper bank control during roll-in and roll-out.
- Failure to make smooth, precise corrections, as required.
- Uncoordinated use of controls.
- Improper trim technique.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Recovery from Unusual Flight Attitudes (C-172R)

Objective:
To safely re-establish control of the airplane after recognition of an unusual attitude.

Description:
The aircraft is maneuvered with the proper use of pitch, power, and bank to safely recover from a nose-high or nose-low unusual attitude.

Setup Procedure:
1) The instructor will position the aircraft into a level or banked nose-high or nose-low unusual attitude while the student has his or her eyes closed.
2) The instructor will instruct the student to recover from the unusual attitude using a view limiting device.
3) Check airspeed indicator and altimeter for indications and attitude interpretation.
4) For a nose-high attitude:
    a. Simultaneously add full power and lower the pitch.
    b. Level the wings.
5) For a nose-low attitude:
    a. Reduce power.
    b. Level the wings.
    c. Increase pitch.
6) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:
- Exhibit adequate knowledge of the elements relating to attitude instrument flying during recovery from unusual attitudes (both nose-high and nose-low).
- Use proper instrument cross-check and interpretation, and apply the appropriate pitch, bank, and power corrections in the correct sequence to return the aircraft to a stabilized level attitude.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:
- Discuss the importance of quickly and accurately determining an unusual attitude.
- Explain proper control inputs to recover from an unusual attitude.

Safety Considerations:
- Maintain positive aircraft control.
- Observe aircraft limitations with respect to airspeed and load factors.

Common Errors:
- Incorrect interpretation of the flight instruments.
- Inappropriate applications of controls.

References:
Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

VOR Navigation (C-172R)

Objective:

To develop the operational knowledge of how to use the VOR navigation equipment in instrument flight.

Description:

The location of the aircraft will be determined using VOR equipment and then maneuvered to most efficiently intercept the assigned radial. Tracking of the course will be maintained while adjusting for wind.

Setup Procedure:

1) Tune in the appropriate VOR frequency and positively identify the station using aural indications.
2) Determine where you are by rotating the OBS until the CDI centers with correct TO/FROM indication and visualize your position relative to the station.
3) Visualize where you want to go relative to the station and your location.
4) Determine what heading you need to intercept your desired course and track this heading.
5) Rotate the OBS until the desired course is indicated.
6) Interpreting CDI indications; turn as necessary to intercept and track course to include wind drift correction.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to intercepting and tracking VORs.
- Tunes and correctly identifies the navigation facility.
- Sets and correctly orients the course to be intercepted into the course selector or correctly identifies the course on the RMI.
- Intercepts the specified course at a predetermined angle, inbound or outbound from a navigational facility.
- Maintains the airspeed within ±10 kts, altitude within ±100 feet, and selected headings within ±5°.
- Applies proper correction to maintain a course, allowing no more than ¾ scale deflection of the CDI or within ±10° in case of an RMI.
- Determines the aircraft position relative to the navigational facility or from a waypoint in the case of GPS.
- Recognizes navigational receiver or facility failure, and when required, reports the failure to ATC.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss how to orient the aircraft to a particular station using airborne VOR equipment.
- Explain how to intercept, track, and correct for wind while navigating with a VOR facility.
- Discuss why visualization is important rather than blindly following CDI deviations left or right.
- Explain what reverse sensing is and how to avoid it.

Safety Considerations:

- Avoid special disorientation by relying on instrument reference.
- Do not navigate aircraft into airspace without clearance.

Common Errors:

- Incorrect orientation of aircraft to VOR facility.
- Turning aircraft wrong direction for intercept.
- Choosing an inappropriate intercept angle.
- Overshooting the on course turn.
- Not correcting for wind while tracking the radial.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

NDB Navigation (C-172R)

Objective:

To develop the operational knowledge of how to use the NDB navigation equipment in instrument flight.

Description:

The location of the aircraft will be determined using NDB equipment and then maneuvered to most efficiently intercept the assigned bearing. Tracking of the course will be maintained while adjusting for wind.

Setup Procedure:

1) Tune in the appropriate NDB frequency and positively identify the station (continually monitor during NDB approach).
2) Determine where you are by looking at the ADF needle (the head of the needle always points to the station) and visualize your position relative to the station.
3) Visualize where you want to go relative to the station and your location.
4) Determine what heading you need to intercept your desired course and track this heading.
5) Turn on course when the desired course is intercepted to include wind drift correction.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to intercepting and tracking NDBs.
- Tunes and correctly identifies the navigation facility.
- Intercepts the specified course at a predetermined angle, inbound or outbound from a navigational facility.
- Maintains the airspeed within ±10 kts, altitude within ±100 feet, and selected headings within ±5°.
- Applies proper correction to maintain a course, within ±10°.
- Determines the aircraft position relative to the navigational facility.
- Recognizes navigational receiver or facility failure, and when required, reports the failure to ATC.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss how to orient the aircraft to a particular station using airborne ADF equipment.
- Explain how to intercept, track, and correct for wind while navigating with a NDB facility.
- Discuss why visualization is important when navigating with a NDB station.
- Explain how to determine the aircraft's relative bearing and magnetic bearing TO and FROM the station.
- Explain which direction the needle will move when intercepting off the head of the needle and off the tail of the needle.

Safety Considerations:

- Avoid special disorientation by relying on instrument reference.
- Do not navigate aircraft into airspace without clearance.

Common Errors:

- Incorrect orientation of aircraft to NDB facility.
- Turning aircraft wrong direction for intercept.
- Choosing an inappropriate intercept angle.
- Overshooting the on course turn.
- Not correcting for wind while tracking the bearing.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

GPS Navigation (C-172R)

Objective:

To develop the operational knowledge of how to use the GPS navigation equipment in instrument flight.

Description:

The location of the aircraft will be determined using GPS equipment and then maneuvered to most efficiently intercept the assigned course. Tracking of the course will be maintained while adjusting for wind.

Setup Procedure:

1) During Start up
    a. Determine the operational status of the GPS unit by verifying that the self-test page gives correct indications.
    b. Verify that the date and time given during the startup is correct.
    c. Determine if the database is current. Based on operations, decide whether the database is acceptable.
    d. Decide how the GPS will be used, and program it appropriately, i.e. direct to navigation, flight plan.
    e. Verify RAIM is available, call out "GPS Active."
    f. Set OBS to the desired course and ensure in GPS mode.
2) Determine how you will intercept course if necessary.
3) Apply wind correction as necessary to track the course.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to intercepting and tracking the navigational system.
- Sets and correctly orients the course to be intercepted into the course selector.
- Intercepts the specified course at a predetermined angle, inbound or outbound from a navigational fix.
- Maintains the airspeed within ±10 kts, altitude within ±100 feet, and selected headings within ±5°.
- Applies proper correction to maintain a course, allowing no more than ¾ scale deflection of the CDI.
- Determines the aircraft position relative to a specified waypoint.
- Recognizes navigational receiver or facility failure, and when required, reports the failure to ATC.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the operation of the airborne equipment and the satellite constellation.
- Discuss how to preflight the equipment and determine whether its use is appropriate for the proposed flight.
- Properly set up the GPS for navigation and use of the functions.
- Explain how to intercept, track, and correct for wind while navigating with a GPS unit.
- Discuss why visualization is important instead of blindly following the GPS indications.

Safety Considerations:

- Avoid special disorientation by relying on instrument reference.
- Do not navigate aircraft into airspace without clearance

Common Errors:

- No pre-flight of the equipment prior to use.
- Lack of knowledge of GPS unit (only knows how to "direct to" a location).
- No RAIM check.
- Improper use of OBS function.
- Loss of situational awareness.
- GPS/NAV switch in wrong position.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Holding (C-172R)

Objective:

To maneuver the aircraft in a racetrack pattern at a specified location while waiting further instructions from ATC.

Description:

Determine and fly the appropriate entry procedure into the hold. Once established in the hold, the aircraft follows the specified course inbound to the holding fix, turns 180°, flies an outbound heading for a specified distance or a time that allows the inbound leg to be 1 minute or specified distance and turns another 180° to the inbound course returning to the fix.

Setup Procedure:

1) Receive your holding clearance and determine if you have all the necessary information. Read it back to the controller to verify.
2) Determine where the aircraft is relative to the holding fix.
3) Visualize your hold and determine the proper entry.
4) Navigate to the fix (5 T's) and execute the proper entry.
5) Establish the inbound course while applying wind drift correction.
6) Upon reaching the holding fix, make the outbound turn.
7) Start outbound timing when abeam the fix or wings level, whichever comes last. Triple your inbound wind correction for the outbound wind correction angle.
8) Report to ATC when established in the hold.
9) After a specified distance or a time that allows the inbound leg to be 1 minute, make the inbound turn.
10) When established inbound, start inbound timing and apply wind correction angle.
11) Cross fix again and adjust outbound timing to establish inbound legs of 1 minute if applicable.
12) Leave hold as instructed, report exiting the hold, and continue on course.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to holding procedures.
- Changes to the holding airspeed appropriate for the altitude or aircraft within 3 minutes of the holding fix.
- Explains and uses an entry procedure that ensures the aircraft remains within the protected airspace for the hold.
- Recognizes arrival at the holding fix and initiates prompt entry into the holding pattern.
- Complies with ATC reporting requirements.
- Uses the proper timing criteria, where applicable, as required by altitude or ATC instructions.
- Complies with pattern leg lengths when a DME distance is specified.
- Uses proper wind correction procedures to maintain the desired pattern and to arrive over the fix as close as possible to a specified time.
- Maintains the airspeed within ±10 kts; altitude within ±100 feet; headings within ±10°; and tracks a selected course, radial or bearing within ¾ scale deflection of the CDI.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Identifies the components of a hold.
- Properly interprets a holding clearance.
- Explain how to properly enter a hold using the 3 recommended entry techniques.
- Discusses use of timing and wind correction angle to establish the inbound and outbound legs.
- Explains how to identify the abeam point with VOR, NDB, and intersection holds.

Safety Considerations:

- Holding outside the protected airspace.
- Not receiving an Expect Further Clearance (EFC) time.

Common Errors:

- Failure to maintain orientation in relation to holding fix.
- Improper hold entry.
- Improper direction of turns.
- Not adjusting outbound timing to achieve a one minute inbound leg.
- Improperly using wind correction angle outbound.
- Not identifying the abeam point.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

VOR DME ARCS (C-172R)

Objective:

To intercept and track a circular path around a VOR.

Description:

The aircraft is maneuvered to intercept a circular path around a VOR at a specified distance from the VOR.

Setup Procedure:

1) Positively identify the VOR station and DME facility.
2) Visualize the aircraft's position relative to the VOR and track "TO" or "FROM" the VOR as required to the specified DME distance.
3) Lead the turn to intercept the arc by approximately a ½ mile.
4) Turn approximately 90° to the radial from the VOR in the proper direction.
5) Rotate OBS to center CDI with a "TO" or "FROM" indication ("TO" when final approach course is towards the VOR and "FROM" when the final approach course is away from the VOR). Turn OBS 10° toward final approach course heading.
6) When the CDI centers, turn the aircraft approximately 10° and rotate the OBS 10° more.
7) Repeat step 6) around the arc.
8) Apply wind correction as necessary to maintain the specified DME distance.
9) Exit the arc at the specified location and continue on course.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to intercepting and tracking navigational systems and DME arcs.
- Tunes and correctly identifies the navigation facility.
- Sets and correctly orients the course to be intercepted into the course selector or correctly identifies the course on the RMI.
- Intercepts the specified course at a predetermined angle, inbound or outbound from a navigational facility.
- Maintains the airspeed within ±10 kts, altitude within ±100 feet, and selected headings within ±5°.
- Applies proper correction to maintain a course, allowing no more than ¾ scale deflection of the CDI or within ±10° in case of an RMI.
- Determines the aircraft position relative to the navigational facility or from a waypoint in the case of GPS.
- Intercepts a DME arc and maintain that arc within ±1 nautical mile.
- Recognizes navigational receiver or facility failure, and when required, reports the failure to ATC.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss how to plan an intercept to a DME ARC using VOR, DME, and GPS equipment.
- Explain how to intercept, track, and correct for wind while tracking the arc.
- Discuss why visualization is important instead of blindly following CDI either left or right.

Safety Considerations:

- Avoid spatial disorientation by relying on instrument reference.
- Do not navigate aircraft into airspace without clearance.

Common Errors:

- Incorrect orientation of aircraft to VOR facility.
- Turning aircraft wrong direction for interception.
- Choosing an inappropriate intercept angle.
- Overshooting the on course turn.
- Not correcting for wind while tracking the arc.
- Not being able to intercept an arc from the inside of the arc.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Non-Precision Approach (C-172R)

Objective:

To safely navigate the aircraft from the enroute environment to align it with the final approach course while maintaining obstruction clearance.

Description:

The non-precision instrument approach allows you to navigate from the IAF to the MAP with lateral navigation and obstruction clearance.

Setup Procedure:

1) Complete the Before IAF checklist.
    a. NAV Source – Set & Check
    b. DG – Align With Compass
    c. Weather – Check
    d. Approach – Brief
2) Prior to the final approach fix (FAF):
    a. 3 Miles – Complete checklist.
        i. Seat Backs & Seat Belts – Upright Position, Fastened
        ii. Fuel Selector Valve – Both
        iii. Mixture – Rich
        iv. Landing Light & Taxi Light – On
    b. 2 Miles - Reduce power and slow aircraft to a speed of 90 kts.
        i. If GPS approach, verify correct approach is active.
    c. 1 Mile - Set approach flaps to 10°. Verify aircraft configured and stabilized for the approach.
3) At FAF, reduce power to approximately 1,400-1,600 RPM and start a descent maintaining approach airspeed of 80 kts.
4) Report position at 5nm, 3nm, and 1nm from MAP.
5) 500' above MDA complete the GUMPS check.
6) Maintain a stabilized approach at 700-1,000 FPM until reaching 100’ above the minimum descent altitude (MDA) and begin to add power (1,800-2,000 RPM).
7) Fly the aircraft at MDA until the missed approach point or until a normal descent to landing can be made.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to an instrument approach procedure.
- Selects and complies with the appropriate instrument approach procedure to be performed.
- Establishes two-way communications with ATC, as appropriate, to the phase of flight or approach segment and uses proper communication phraseology and technique.
- Selects, tunes, identifies, and confirms the operational status of the navigation equipment to be used for the approach procedure.
- Complies with all clearances issued by ATC or the instructor.
- Recognizes if any flight instrumentation is inaccurate or inoperative, and takes appropriate action.
- Advises ATC or instructor anytime that the aircraft is unable to comply with a clearance.
- Establishes the appropriate aircraft configuration and airspeed considering turbulence and wind shear, and completes the aircraft checklist items appropriate to the phase of flight.
- Maintains, prior to beginning the final approach segment, altitude within ±100 feet, heading within ±10° and allows less than a ¾ scale deflection of the CDI or within ±10° in the case of an RMI, and maintains airspeed within ±10 kts.
- Applies the necessary adjustments to the published MDA and visibility criteria for the aircraft approach category when required, such as –
    - NOTAMs
    - Inoperative aircraft and ground navigation equipment
    - Inoperative visual aids associated with the landing environment
    - NWS reporting factors and criteria

- Establishes a rate of descent and track that will ensure arrival at the MDA prior to reaching the MAP with the aircraft continuously in a position from which descent to a landing on the intended runway can be made at a normal rate using normal maneuvers.
- Allows, while on the final approach segment, no more than ¾ scale deflection of the CDI or within 10° of an RMI, and maintains airspeed within ±10 kts of that desired.
- Maintains the MDA, when reached, within +100/– 0 feet to the MAP.
- Executes the missed approach procedure at the MAP when the required visual references for the intended runway are not distinctly visible, the visibility minimums prescribed by the approach procedure are not met, or the aircraft is not in a position to make a landing using a normal descent rate and normal maneuvers.
- Execute a normal landing from a straight-in or circling approach when instructed by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain how to read the instrument approach charts.
- Discuss how to fly the approach.
- Identify symbols on the instrument approach chart.
- Discuss the importance of a stabilized approach.

Safety Considerations:

- Flying a stabilized approach.
- Avoid spatial disorientation by relying on instrument reference.
- Do not navigate aircraft into airspace without clearance.
- Do not descend below MDA prior to having required visual references.
- Do not attempt a landing from a point where such attempt should not be made.
- Identify the missed approach point and fly appropriate missed approach procedures.

Common Errors:

- Not properly identifying the navigation stations.
- Not performing required checklists.
- Not configuring the aircraft appropriately.
- Chasing the course.
- Descending at an inappropriate rate.
- Failure to start timing when appropriate.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Precision Approach (and LPV) (C-172R)

Objective:

To safely navigate the aircraft from the enroute environment to align it with the final approach course while maintaining obstruction clearance.

Description:

The precision instrument approach allows you to navigate from the IAF to the MAP with lateral and vertical navigation.

Setup Procedure:

1) Complete the Before IAF checklist.
    a. NAV Source – Set & Check
    b. DG – Align With Compass
    c. Weather – Check
    d. Approach – Brief
1) Prior to glide slope intercept:
    a. Glideslope becomes active - Complete 3 mile Before FAF checklist.
        i. Seat Backs & Seat Belts – Upright Position, Fastened
        ii. Fuel Selector Valve – Both
        iii. Mixture – Rich
        iv. Landing Light & Taxi Light – On
    b. 2 dots below glideslope interception - Reduce power and slow aircraft to approach speed of 90 kts.
        i. If GPS approach, verify correct approach is active.
    c. 1 dot below glideslope interception - Set approach flaps to 10°. Verify aircraft configured and stabilized for the approach.
2) At glide slope interception:
    a. Reduce power to between 1,600 to 1,800 RPM to maintain a descent at 80 kts.
    b. Maintain a stabilized approach on the glide slope until reaching DA/DH.
        i. Minor pitch changes to maintain glide slope.
        ii. Use power to control airspeed.
3) Report position at 5nm, 3nm, and 1nm from MAP.
4) 500' above DA/DH complete the GUMPS check.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the precision instrument approach procedures.
- Accomplishes the appropriate precision instrument approaches as selected by the instructor.
- Selects and complies with the appropriate instrument approach procedure to be performed.
- Establishes two-way communications with ATC using the proper communication phraseology and techniques, as required for the phase of flight or approach segment.
- Complies, in a timely manner with all clearances, instructions, and procedures.
- Advises ATC or instructor anytime that the aircraft is unable to comply with a clearance.
- Establishes the appropriate airplane configuration and airspeed/V-speed considering turbulence, wind shear, microburst conditions, or other meteorological and operating conditions.
- Completes the aircraft checklist items appropriate to the phase of flight or approach segment, including engine out approach and landing checklists, if appropriate.
- Prior to beginning the final approach segment, maintains the desired altitude ±100 feet, the desired airspeed within ±10 kts, the desired heading within ±10°; and accurately tracks radials, courses, and bearings.
- Selects, tunes, identifies, and monitors the operational status of ground and airplane navigation equipment used for the approach.

- Applies the necessary adjustments to the published DA/DH and visibility criteria for the aircraft approach category when required, such as –
  - NOTAMs
  - Inoperative aircraft and ground navigation equipment
  - Inoperative visual aids associated with the landing environment
  - NWS reporting factors and criteria
- Establishes a predetermined rate of descent at glide slope intercept which approximates that required for the aircraft to follow the glide slope.
- Maintains a stabilized final approach, from the FAF to DA/DH allowing no more than ¾ scale deflection of either the glide slope or localizer indications and maintains the desired airspeed within ±10 kts.
- A missed approach or transition to a landing shall be initiated at DA/DH.
- Immediately initiates the missed approach at DA/DH when the required visual references for the intended runway are not distinctly visible, the visibility minimums prescribed by the approach procedure are not met, or the aircraft is not in a position to make a landing using a normal descent rate and normal maneuvers.
- Transitions to a normal landing approach only when the aircraft is in a position from which a descent to a landing on the runway can be made at a normal rate of descent using normal maneuvering.
- Maintains localizer and glide slope within ¾ scale deflection of the indicators during the visual descent from DA/DH to a point over the runway where glide slop must be abandoned to accomplish a normal landing.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain how to read the instrument approach charts.
- Discuss how to fly the approach.
- Identify symbols on the instrument approach chart.
- Discuss the importance of a stabilized approach.
- Explain how to estimate the rate of descent required to follow the glide slope.

Safety Considerations:

- Fly a stabilized approach.
- Avoid spatial disorientation by relying on instrument reference.
- Do not navigate aircraft into airspace without clearance.
- Do not descend below DA/DH prior to having required visual references.
- Do not attempt a landing from a point where such attempt should not be made.
- Identify the missed approach point and fly appropriate missed approach procedures.

Common Errors:

- Not properly identifying the navigation stations.
- Not performing required checklists.
- Not configuring the aircraft appropriately.
- Chasing the course.
- Descending at an inappropriate rate.
- Failure to start timing when appropriate.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Non Precision Approach (Coupled) (C-172R)

Objective:

To safely navigate the aircraft from the enroute environment to align it with the final approach course while maintaining obstruction clearance.

Description:

The non-precision instrument approach allows you to navigate from the IAF to the MAP with lateral navigation and obstruction clearance.

Setup Procedure:

1) Engage autopilot (AP).
2) Engage autopilot mode (HDG, NAV).
3) Complete the Before IAF checklist.
   a. NAV Source – Set & Check
   b. DG – Align With Compass
   c. Weather – Check
   d. Approach – Brief
4) Prior to the final approach fix (FAF):
   a. 3 Miles – Complete checklist:
      i. Seat Backs & Seat Belts – Upright Position, Fastened
      ii. Fuel Selector Valve – Both
      iii. Mixture – Rich
      iv. Landing Light & Taxi Light – On
   b. 2 Miles - Reduce power and slow aircraft to a speed of 90 kts.
      i. If GPS approach, verify correct approach is active.
   c. 1 Mile - Set approach flaps to 10°. Verify aircraft configured and stabilized for the approach.
5) At FAF, reduce power to approximately 1,400-1,600 RPM and start a descent maintaining approach airspeed of 80 kts.
6) Report position at 5nm, 3nm, and 1nm from MAP.
7) 500' above MDA complete the GUMPS check.
8) Maintain a stabilized approach at 700-1,000 FPM until reaching 100’ above the minimum descent altitude (MDA) and begin to add power (1,800-2,000 RPM).
9) Disengage autopilot no lower than 200’ AGL.
10) Fly the aircraft at MDA until the missed approach point or until a normal descent to landing can be made.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to an instrument approach procedure.
- Selects and complies with the appropriate instrument approach procedure to be performed.
- Establishes two-way communications with ATC, as appropriate, to the phase of flight or approach segment and uses proper communication phraseology and technique.
- Selects, tunes, identifies, and confirms the operational status of the navigation equipment to be used for the approach procedure.
- Complies with all clearances issued by ATC or the instructor.
- Recognizes if any flight instrumentation is inaccurate or inoperative, and takes appropriate action.
- Advises ATC or instructor anytime that the aircraft is unable to comply with a clearance.
- Establishes the appropriate aircraft configuration and airspeed considering turbulence and wind shear, and completes the aircraft checklist items appropriate to the phase of flight.
- Maintains, prior to beginning the final approach segment, altitude within ±100 feet, heading within ±10° and allows less than a ¾ scale deflection of the CDI or within ±10° in the case of an RMI, and maintains airspeed within ±10 kts.
- Applies the necessary adjustments to the published MDA and visibility criteria for the aircraft approach category when required, such as –
   - NOTAMs

  - Inoperative aircraft and ground navigation equipment
  - Inoperative visual aids associated with the landing environment
  - NWS reporting factors and criteria
- Establishes a rate of descent and track that will ensure arrival at the MDA prior to reaching the MAP with the aircraft continuously in a position from which descent to a landing on the intended runway can be made at a normal rate using normal maneuvers.
- Allows, while on the final approach segment, no more than ¾ scale deflection of the CDI or within 10° of an RMI, and maintains airspeed within ±10 kts of that desired.
- Maintains the MDA, when reached, within +100/– 0 feet to the MAP.
- Executes the missed approach procedure at the MAP when the required visual references for the intended runway are not distinctly visible, the visibility minimums prescribed by the approach procedure are not met, or the aircraft is not in a position to make a landing using a normal descent rate and normal maneuvers.
- Execute a normal landing from a straight-in or circling approach when instructed by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain how to read the instrument approach charts.
- Discuss how to fly the approach.
- Identify symbols on the instrument approach chart.
- Discuss the importance of a stabilized approach.

Safety Considerations:

- Flying a stabilized approach.
- Avoid spatial disorientation by relying on instrument reference.
- Do not navigate aircraft into airspace without clearance.
- Do not descend below MDA prior to having required visual references.
- Do not attempt a landing from a point where such attempt should not be made.
- Identify the missed approach point and fly appropriate missed approach procedures.

Common Errors:

- Not properly identifying the navigation stations.
- Not performing required checklists.
- Not configuring the aircraft appropriately.
- Chasing the course.
- Descending at an inappropriate rate.
- Failure to start timing when appropriate.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Straight in Approach (C-172R)

Objective:

To transition the aircraft from MDA or DH to landing on a runway aligned with the final approach course.

Description:

The aircraft will transition from the approach configuration to the landing configuration while continuing from the DH or MDA to point of intended landing while maintaining a stabilized approach.

Setup Procedure:

1) Confirm that all requirements to descend below DA/DH, VDP, or MDA have been achieved.
2) Configure the aircraft for a normal landing.
3) Continue a stabilized approach.
4) Accomplish a normal landing and roll out.
5) Exit runway and complete after landing checklists.
6) Close IFR flight plan if necessary.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to the pilot's responsibilities, and the environmental, operational, and meteorological factors, which affect a landing from a straight-in approach.
- Transitions at the DA/DH, MDA, or VDP to a visual flight condition, allowing for safe visual maneuvering and a normal landing.
- Adheres to all ATC (or instructor) advisories, such as NOTAMs, wind shear, wake turbulence, runway surface, braking conditions, and other operational considerations.
- Completes appropriate checklist items for the pre-landing and landing phase.
- Maintains positive aircraft control throughout the complete landing maneuver.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Determine straight in approach categories and criteria.
- Explain the proper aircraft configuration.
- Discuss how to maintain a stabilized descent to landing.
- List the requirements for descending below DA/DH or MDA.
- Explain what to do if visual reference to the airport environment is lost.

Safety Considerations:

- Collision avoidance of VFR traffic.
- Situational awareness of position, airspeed, bank, and aircraft configuration.

Common Errors:

- Selecting incorrect approach category.
- Descends below DA/DH or MDA without having the airport environment in sight.
- Attempts a descent to landing that would be considered abnormal.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Circling Approach (C-172R)

Objective:

To transition the aircraft from MDA to landing on a runway not aligned with the final approach course.

Description:

The aircraft will transition from the approach configuration to the landing configuration while maneuvering to align the aircraft with the runway and continue to a point of intended landing while maintaining a stabilized approach.

Setup Procedure:

1) Prior to arriving at circling MDA or VDP, develop a plan to maneuver the aircraft to align with the active runway.
2) Remain within the required circling distances.
3) Maneuver the aircraft to align it with the runway, being cautious of other aircraft operating in the vicinity.
4) Confirm that all requirements to descend below MDA have been achieved.
5) Configure the aircraft for a stabilized normal approach to landing.
6) Accomplish a normal landing and roll out.
7) Exit runway and complete after landing checklists.
8) Close IFR flight plan if necessary.

*Note – If approach is in opposite direction of traffic flow, break off the approach 2 miles prior to the MAP.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to a circling approach procedure.
- Selects and complies with the appropriate circling approach procedure considering turbulence and wind shear and considering the maneuvering capabilities of the aircraft.
- Confirms the direction of traffic and adheres to all restrictions and instructions issued by ATC and the instructor.
- Does not exceed the visibility criteria or descend below the appropriate circling altitude until in a position from which a descent to a normal landing can be made.
- Maneuvers the aircraft, after reaching the authorized MDA and maintains that altitude within +100/-0 feet and a flight path that permits a normal landing on a runway. The runway selected must be such that it requires at least a 90° change of direction, from the final approach course, to align the aircraft for landing.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Determine circling approach categories and criteria.
- Explain the proper aircraft configuration.
- Discuss how to maintain a stabilized descent to landing.
- List the requirements for descending below MDA.
- Explain what to do if visual reference to the airport environment is lost.

Safety Considerations:

- Collision avoidance of VFR traffic.
- Situational awareness of position, airspeed, bank, and aircraft configuration.

Common Errors:

- Selecting incorrect approach category.
- Descends below DH or MDA without having the airport environment in sight.
- Attempting a descent to landing that would be considered abnormal.
- Losing visual reference to runway.
- Improper circling planning considering traffic flow.
- Circling to far from runway environment.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Missed Approach (C-172R)

Objective:

To determine when it is necessary to execute the missed approach procedures and safely execute the published missed approach procedures.

Description:

If the decision is made to execute a missed approach procedure, the aircraft will be reconfigured to the departure configuration. Precisely follow the missed approach procedure to ensure terrain and obstruction clearance and repositioning of the aircraft to attempt another approach or proceed to a new destination.

Setup Procedure:

1) Initiate the missed approach and configure the aircraft for a Go Around.
2) Advise ATC of the missed approach.
3) Follow the missed approach instructions on the instrument approach chart unless otherwise instructed by ATC.
4) Verify the Go-Around checklist and complete the climb checklist as workload permits.
5) Follow any clearance issued by ATC and advise them of any preferred course of action, i.e. attempt another approach at the same airport, depart the area.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to missed approach procedures associated with standard instrument approaches.
- Initiates the missed approach promptly by applying power, establishing a climb attitude, and reducing drag in accordance with the aircraft manufacturer's recommendations.
- Reports to ATC the missed approach procedure.
- Complies with the published or alternate missed approach procedure.
- Advise ATC or instructor anytime that the aircraft is unable to comply with a clearance, restriction, or climb gradient.
- Follows the recommended checklist items appropriate to the Go Around procedure.
- Requests, if appropriate, ATC clearance to the alternate airport, clearance limit, or as directed by the instructor.
- Maintains the recommended airspeed within ±10 kts; heading, course, or bearing within ±10°; and altitude(s) ±100 feet during the missed approach procedure.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the situations in which a missed approach is necessary.
- Discuss how to execute a missed approach prior to the missed approach point
- Discuss how to execute a missed approach while circling.

Safety Considerations:

- Establish a climbing attitude in the departure configuration.
- Remain coordinated and at a safe flying airspeed.
- Establish contact with ATC and advise them of the missed approach.

Common Errors:

- Turns prior to the missed approach point.
- Does not establish a climbing attitude.
- Allows the aircraft to get too slow.
- Flies past the missed approach point without executing the missed approach procedure.
- Is not familiar enough with the missed approach procedure to execute the first few steps without referring to the approach chart.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

C-172S

Instrument Cockpit Check (C-172S)

Objective:

To develop good habits for checking the operation of flight instruments and their power source prior to takeoff in instrument meteorological conditions (IMC).

Description:

Each instrument relating to Instrument Flight Rules (IFR) is checked for proper indications during the taxi to the run up area or runway.

Setup Procedure:

1) Check the magnetic compass for freedom of movement; confirm that it is full of fluid and showing known headings.
2) The airspeed indicator should indicate zero.
3) The attitude indicator should remain erect to the horizontal position and not dip more than 5° while turning on the ground.
4) With the altimeter set to the current altimeter setting, note any variation between field elevation and the altimeter indication. Discrepancies of 75 feet or more indicate questionable reliability.
5) The VSI should read zero. If it does not, the ground indication should be interpreted as the zero position.
6) During taxi turns, check the turn coordinator for turns in direction of the turn and the ball should move opposite to the direction of turns.
7) Verify the heading indicator matches the magnetic compass.
8) Check clock for correct digital display
9) The standby airspeed indicator should indicate zero.
10) Allow 5 minutes for the stand-by gyro of the attitude indicator to spin up and then it should remain erect to the horizontal position and not dip more than 5° while turning on the ground.
11) With the stand by altimeter set to the current altimeter setting, note any variation between field elevation and the altimeter indication. Discrepancies of 75 feet or more indicate questionable reliability.
12) Check engine instruments for proper indications.

Flight Proficiency Standards:

- Exhibit adequate knowledge of the elements related to the preflight check of instruments, avionics, and navigation equipment.
- Perform the preflight on instruments, avionics, and navigation equipment.
- Determine that the aircraft is in condition for safe instrument flight.
- Note any discrepancies and determine whether the aircraft is safe for instrument fight or requires maintenance.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance of performing an instrument cockpit check.
- Discuss how each instrument check determines the operational status of the instrument and power source.
- Demonstrate the instrument cockpit check.
- Determine if an unsafe condition exists based on the results of the instrument cockpit check.

Safety Considerations:

- Division of attention during the instrument taxi check.
- Proper interpretation of the instruments.

Common Errors:

- Failure to check all instruments.
- Improperly checking instruments.
- Failure to maintain control of the aircraft while performing the check.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Straight and Level Flight (C-172S)

Objective:

To fly by reference to instruments while maintaining a constant altitude and heading.

Description:

In straight and level flight you must keep the wings level with the horizon and a pitch attitude which allows no climb or descent.

Setup Procedure:

1) Begin your level off by approximately 10% of your climb rate before desired altitude.
2) Perform cruise checklist to include leaning procedures.
3) Set heading bug to desired heading.
4) Trim for level flight.
5) Maintain straight and level flight through instrument scan, interpretation, and aircraft control.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to attitude instrument flying during straight and level flight while conducting various instrument flight procedures.
- Maintains altitude within ±100 feet during level flight, headings within ±10°, airspeed within ±10 kts, and bank angles within ±5° during turns.
- Uses proper instrument crosscheck and interpretation, and apply the appropriate pitch, bank, power, and trim corrections when applicable.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss proper instrument scan techniques including both the primary and supporting method and the control and performance method.
- Explain instrument cross-check and interpretation.

Safety Considerations:

- Maintain positive aircraft control.
- Maintain orientation.

Common Errors:

- Slow or improper cross-check during straight and level flight.
- Improper power control.
- Failure to make smooth, precise corrections, as required.
- Uncoordinated use of controls.
- Improper trim control.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Turns (C-172S)

Objective:

To fly by reference to instruments while changing direction.

Description:

On the roll-in, use the attitude indicator to establish the approximate angle of bank, and then check the turn coordinator's miniature aircraft for a standard-rate turn indication.

Setup Procedure:

1) Set the heading bug before initiating a turn.
2) Apply coordinated aileron and rudder pressures in the desired direction of turn.
3) Establish the bank angle using the attitude indicator and verify standard rate with the turn coordinator and slip/skid indicator.
4) Maintain the standard rate of turn, using the turn coordinator as the primary bank reference.
5) Use the altimeter, VSI, and attitude indicator for necessary pitch adjustments.
6) To recover, roll out at ½ the bank angle prior to the desired heading.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to attitude instrument flying during turns while conducting various instrument flight procedures.
- Maintains altitude within ±100 feet during level flight, headings within ±10°, airspeed within ±10 kts, and bank angles within ±5° during turns.
- Uses proper instrument crosscheck and interpretation, and apply the appropriate pitch, bank, power, and trim corrections when applicable.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss proper instrument scan techniques including the primary and supporting method and the control and performance method.
- Explain instrument cross-check and interpretation.

Safety Considerations:

- Maintain positive aircraft control.
- Maintain orientation.

Common Errors:

- Improper cross-check procedures.
- Improper bank control during roll-in and roll-out.
- Failure to make smooth, precise corrections, as required.
- Uncoordinated use of controls.
- Improper trim technique.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Constant Airspeed Climbs and Descents (C-172S)

Objective:

To change the airplane's altitude while maintaining a constant airspeed.

Description:

Raise or lower the miniature aircraft to the approximate indication for the predetermined climb speed by applying light elevator pressure.

Setup Procedure:

1) Set target altitude.
2) Set climb or descent configuration.
3) Adjust power as required.
4) Apply elevator pressure to move the attitude indicator to the approximate indication.
5) Complete climb or descent checklist.
6) Cross check with airspeed indicator for proper airspeed making pitch adjustments if necessary.
7) Level off at desired altitude.
8) Complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to attitude instrument flying during climbs and descents while conducting various instrument flight procedures.
- Maintains altitude within ±100 feet during level flight, headings within ±10°, airspeed within ±10 kts, and bank angles within ±5° during turns.
- Uses proper instrument crosscheck and interpretation, and apply the appropriate pitch, bank, power, and trim corrections when applicable.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss proper instrument scan techniques including the primary and supporting method and the performance method.
- Explain instrument scan techniques including the primary and supporting method and the control and performance method.
- Explain instrument cross-check and interpretation.

Safety Considerations:

- Maintain positive aircraft control.
- Maintain orientation.

Common Errors:

- Improper cross-check procedures.
- Improper bank control during roll-in and roll-out.
- Failure to make smooth, precise corrections, as required.
- Uncoordinated use of controls.
- Improper trim technique.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Recovery from Unusual Flight Attitudes (C-172S)

Objective:

To safely re-establish control of the airplane after recognition of an unusual attitude.

Description:

The aircraft is maneuvered with the proper use of pitch, power, and bank to safely recover from a nose-high or nose-low unusual attitude.

Setup Procedure:

1) The instructor will position the aircraft into a level or banked nose-high or nose-low unusual attitude while the student has his or her eyes closed.
2) The instructor will instruct the student to recover from the unusual attitude using a view limiting device.
3) Check airspeed indicator and altimeter for indications and attitude interpretation.
4) For a nose-high attitude:
    c. Simultaneously add full power and lower the pitch.
    d. Level the wings.
5) For a nose-low attitude:
    d. Reduce power.
    e. Level the wings.
    f. Increase pitch.
6) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibit adequate knowledge of the elements relating to attitude instrument flying during recovery from unusual attitudes (both nose-high and nose-low).
- Use proper instrument cross-check and interpretation, and apply the appropriate pitch, bank, and power corrections in the correct sequence to return the aircraft to a stabilized level attitude.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the importance of quickly and accurately determining an unusual attitude.
- Explain proper control inputs to recover from an unusual attitude.

Safety Considerations:

- Maintain positive aircraft control.
- Observe aircraft limitations with respect to airspeed and load factors.

Common Errors:

- Incorrect interpretation of the flight instruments.
- Inappropriate applications of controls.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

VOR Navigation (C-172S)

Objective:

To develop the operational knowledge of how to use the VOR navigation equipment in instrument flight.

Description:

The location of the aircraft will be determined using VOR equipment and then maneuvered to most efficiently intercept the assigned radial. Tracking of the course will be maintained while adjusting for wind.

Setup Procedure:

1) Tune in the appropriate VOR frequency and positively identify the station using aural indications.
2) Determine where you are by rotating the OBS until the CDI centers with correct TO/FROM indication and visualize your position relative to the station.
3) Visualize where you want to go relative to the station and your location.
4) Determine what heading you need to intercept your desired course and track this heading.
5) Rotate the OBS until the desired course is indicated.
6) Interpreting CDI indications; turn as necessary to intercept and track course to include wind drift correction.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to intercepting and tracking VORs.
- Tunes and correctly identifies the navigation facility.
- Sets and correctly orients the course to be intercepted into the course selector or correctly identifies the course on the RMI.
- Intercepts the specified course at a predetermined angle, inbound or outbound from a navigational facility.
- Maintains the airspeed within ±10 kts, altitude within ±100 feet, and selected headings within ±5°.
- Applies proper correction to maintain a course, allowing no more than ¾ scale deflection of the CDI or within ±10° in case of an RMI.
- Determines the aircraft position relative to the navigational facility or from a waypoint in the case of GPS.
- Recognizes navigational receiver or facility failure, and when required, reports the failure to ATC.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss how to orient the aircraft to a particular station using airborne VOR equipment.
- Explain how to intercept, track, and correct for wind while navigating with a VOR facility.
- Discuss why visualization is important rather than blindly following CDI deviations left or right.
- Explain what reverse sensing is and how to avoid it.

Safety Considerations:

- Avoid special disorientation by relying on instrument reference.
- Do not navigate aircraft into airspace without clearance.

Common Errors:

- Incorrect orientation of aircraft to VOR facility.
- Turning aircraft wrong direction for intercept.
- Choosing an inappropriate intercept angle.
- Overshooting the on course turn.
- Not correcting for wind while tracking the radial.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

GPS Navigation (C-172S)

Objective:

To develop the operational knowledge of how to use the GPS navigation equipment in instrument flight.

Description:

The location of the aircraft will be determined using GPS equipment and then maneuvered to most efficiently intercept the assigned course. Tracking of the course will be maintained while adjusting for wind.

Setup Procedure:

1) During Start up
    a. Determine the operational status of the GPS unit by verifying that the self-test page gives correct indications.
    b. Verify that the date and time given during the startup is correct.
    c. Determine if the database is current. Based on operations, decide whether the database is acceptable.
    d. Decide how the GPS will be used, and program it appropriately, i.e. direct to navigation, flight plan.
    e. Verify RAIM is available, call out "GPS Active."
    f. Set OBS to the desired course and ensure in GPS mode.
2) Determine how you will intercept course if necessary.
3) Apply wind correction as necessary to track the course.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to intercepting and tracking the navigational system.
- Sets and correctly orients the course to be intercepted into the course selector.
- Intercepts the specified course at a predetermined angle, inbound or outbound from a navigational fix.
- Maintains the airspeed within ±10 kts, altitude within ±100 feet, and selected headings within ±5°.
- Applies proper correction to maintain a course, allowing no more than ¾ scale deflection of the CDI.
- Determines the aircraft position relative to a specified waypoint.
- Recognizes navigational receiver or facility failure, and when required, reports the failure to ATC.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the operation of the airborne equipment and the satellite constellation.
- Discuss how to preflight the equipment and determine whether its use is appropriate for the proposed flight.
- Properly set up the GPS for navigation and use of the functions.
- Explain how to intercept, track, and correct for wind while navigating with a GPS unit.
- Discuss why visualization is important instead of blindly following the GPS indications.

Safety Considerations:

- Avoid special disorientation by relying on instrument reference.
- Do not navigate aircraft into airspace without clearance

Common Errors:

- No pre-flight of the equipment prior to use.
- Lack of knowledge of GPS unit (only knows how to "direct to" a location).
- No RAIM check.
- Improper use of OBS function.
- Loss of situational awareness.
- GPS/NAV switch in wrong position.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Holding (C-172S)

Objective:

To maneuver the aircraft in the racetrack pattern at a specified location while waiting further instructions from ATC.

Description:

Determine and fly the appropriate entry procedure into the hold. Once established in the hold, the aircraft follows the specified course inbound to the holding fix, turns 180°, flies an outbound heading for a specified distance or a time that allows the inbound leg to be 1 minute or specified distance and turns another 180° to the inbound course returning to the fix.

Setup Procedure:

1) Receive your holding clearance and determine if you have all the necessary information. Read it back to the controller to verify.
2) Determine where the aircraft is relative to the holding fix.
3) Visualize your hold and determine the proper entry.
4) Navigate to the fix (5 T's) and execute the proper entry.
5) Establish the inbound course while applying wind drift correction.
6) Upon reaching the holding fix, make the outbound turn.
7) Start outbound timing when abeam the fix or wings level, whichever comes last. Triple your inbound wind correction for the outbound wind correction angle.
8) Report to ATC when established in the hold.
9) After a specified distance or a time that allows the inbound leg to be 1 minute, make the inbound turn.
10) When established inbound, start inbound timing and apply wind correction angle.
11) Cross fix again and adjust outbound timing to establish inbound legs of 1 minute if applicable.
12) Leave hold as instructed, report exiting the hold, and continue on course.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to holding procedures.
- Changes to the holding airspeed appropriate for the altitude or aircraft within 3 minutes of the holding fix.
- Explains and uses an entry procedure that ensures the aircraft remains within the protected airspace for the hold.
- Recognizes arrival at the holding fix and initiates prompt entry into the holding pattern.
- Complies with ATC reporting requirements.
- Uses the proper timing criteria, where applicable, as required by altitude or ATC instructions.
- Complies with pattern leg lengths when a DME distance is specified.
- Uses proper wind correction procedures to maintain the desired pattern and to arrive over the fix as close as possible to a specified time.
- Maintains the airspeed within ±10 kts; altitude within ±100 feet; headings within ±10°; and tracks a selected course, radial or bearing within ¾ scale deflection of the CDI.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Identifies the components of a hold.
- Properly interprets a holding clearance.
- Explain how to properly enter a hold using the 3 recommended entry techniques.
- Discusses use of timing and wind correction angle to establish the inbound and outbound legs.
- Explains how to identify the abeam point with VOR, NDB, and intersection holds.

Safety Considerations:

- Holding outside the protected airspace.
- Not receiving an Expect Further Clearance (EFC) time.

Common Errors:

- Failure to maintain orientation in relation to holding fix.
- Improper hold entry.
- Improper direction of turns.
- Not adjusting outbound timing to achieve a one minute inbound leg.
- Improperly using wind correction angle outbound.
- Not identifying the abeam point.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

VOR DME ARCS (C-172S)

Objective:

To intercept and track a circular path around a VOR.

Description:

The aircraft is maneuvered to intercept a circular path around a VOR at a specified distance from the VOR.

Setup Procedure:

1) Positively identify the VOR station and DME facility.
2) Visualize the aircraft's position relative to the VOR and track "TO" or "FROM" the VOR as required to the specified DME distance.
3) Lead the turn to intercept the arc by approximately a ½ mile.
4) Turn approximately 90° to the radial from the VOR in the proper direction.
5) Rotate OBS to center CDI with a "TO" or "FROM" indication ("TO" when final approach course is towards the VOR and "FROM" when the final approach course is away from the VOR). Turn OBS 10° toward final approach course heading.
6) When the CDI centers, turn the aircraft approximately 10° and rotate the OBS 10° more.
7) Repeat step 6) around the arc.
8) Apply wind correction as necessary to maintain the specified DME distance.
9) Exit the arc at the specified location and continue on course.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to intercepting and tracking navigational systems and DME arcs.
- Tunes and correctly identifies the navigation facility.
- Sets and correctly orients the course to be intercepted into the course selector or correctly identifies the course on the RMI.
- Intercepts the specified course at a predetermined angle, inbound or outbound from a navigational facility.
- Maintains the airspeed within ±10 kts, altitude within ±100 feet, and selected headings within ±5°.
- Applies proper correction to maintain a course, allowing no more than ¾ scale deflection of the CDI or within ±10° in case of an RMI.
- Determines the aircraft position relative to the navigational facility or from a waypoint in the case of GPS.
- Intercepts a DME arc and maintain that arc within ±1 nautical mile.
- Recognizes navigational receiver or facility failure, and when required, reports the failure to ATC.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss how to plan an intercept to a DME ARC using VOR, DME, and GPS equipment.
- Explain how to intercept, track, and correct for wind while tracking the arc.
- Discuss why visualization is important instead of blindly following CDI either left or right.

Safety Considerations:

- Avoid spatial disorientation by relying on instrument reference.
- Do not navigate aircraft into airspace without clearance.

Common Errors:

- Incorrect orientation of aircraft to VOR facility.
- Turning aircraft wrong direction for interception.
- Choosing an inappropriate intercept angle.
- Overshooting the on course turn.
- Not correcting for wind while tracking the arc.
- Not being able to intercept an arc from the inside of the arc.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Non Precision Approach (C-172S)

Objective:

To safely navigate the aircraft from the enroute environment to align it with the final approach course while maintaining obstruction clearance.

Description:

The non-precision instrument approach allows you to navigate from the IAF to the MAP with lateral navigation and obstruction clearance.

Setup Procedure:

1) Complete the Before IAF checklist.
    a. NAV Source – Set & Check
    b. HSI – Check Against Compass
    c. Weather – Check
    d. Approach – Brief
2) Prior to the final approach fix (FAF):
    a. 3 Miles – Complete checklist.
        i. Seat Backs & Seat Belts – Upright Position, Fastened
        ii. Fuel Selector Valve – Both
        iii. Mixture – Rich
        iv. Landing Light & Taxi Light – On
    b. 2 Miles - Reduce power and slow aircraft to a speed of 90 kts.
        i. If GPS approach, verify correct approach is active.
    c. 1 Mile - Set approach flaps to 10°. Verify aircraft configured and stabilized for the approach.
3) At FAF, reduce power to approximately 1,400-1,600 RPM and start a descent maintaining approach airspeed of 80 kts.
4) Report position at 5nm, 3nm, and 1nm from MAP.
5) 500' above MDA complete the GUMPS check.
6) Maintain a stabilized approach at 700-1,000 FPM until reaching 100' above the minimum descent altitude (MDA) and begin to add power (1,800-2,000 RPM).
7) Fly the aircraft at MDA until the missed approach point or until a normal descent to landing can be made.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to an instrument approach procedure.
- Selects and complies with the appropriate instrument approach procedure to be performed.
- Establishes two-way communications with ATC, as appropriate, to the phase of flight or approach segment and uses proper communication phraseology and technique.
- Selects, tunes, identifies, and confirms the operational status of the navigation equipment to be used for the approach procedure.
- Complies with all clearances issued by ATC or the instructor.
- Recognizes if any flight instrumentation is inaccurate or inoperative, and takes appropriate action.
- Advises ATC or instructor anytime that the aircraft is unable to comply with a clearance.
- Establishes the appropriate aircraft configuration and airspeed considering turbulence and wind shear, and completes the aircraft checklist items appropriate to the phase of flight.
- Maintains, prior to beginning the final approach segment, altitude within ±100 feet, heading within ±10° and allows less than a ¾ scale deflection of the CDI or within ±10° in the case of an RMI, and maintains airspeed within ±10 kts.
- Applies the necessary adjustments to the published MDA and visibility criteria for the aircraft approach category when required, such as –
    - NOTAMs
    - Inoperative aircraft and ground navigation equipment
    - Inoperative visual aids associated with the landing environment
    - NWS reporting factors and criteria

- Establishes a rate of descent and track that will ensure arrival at the MDA prior to reaching the MAP with the aircraft continuously in a position from which descent to a landing on the intended runway can be made at a normal rate using normal maneuvers.
- Allows, while on the final approach segment, no more than ¾ scale deflection of the CDI or within 10° of an RMI, and maintains airspeed within ±10 kts of that desired.
- Maintains the MDA, when reached, within +100/– 0 feet to the MAP.
- Executes the missed approach procedure at the MAP when the required visual references for the intended runway are not distinctly visible, the visibility minimums prescribed by the approach procedure are not met, or the aircraft is not in a position to make a landing using a normal descent rate and normal maneuvers.
- Execute a normal landing from a straight-in or circling approach when instructed by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain how to read the instrument approach charts.
- Discuss how to fly the approach.
- Identify symbols on the instrument approach chart.
- Discuss the importance of a stabilized approach.

Safety Considerations:

- Flying a stabilized approach.
- Avoid spatial disorientation by relying on instrument reference.
- Do not navigate aircraft into airspace without clearance.
- Do not descend below MDA prior to having required visual references.
- Do not attempt a landing from a point where such attempt should not be made.
- Identify the missed approach point and fly appropriate missed approach procedures.

Common Errors:

- Not properly identifying the navigation stations.
- Not performing required checklists.
- Not configuring the aircraft appropriately.
- Chasing the course.
- Descending at an inappropriate rate.
- Failure to start timing when appropriate.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Precision Approach (and LPV) (C-172S)

Objective:

To safely navigate the aircraft from the enroute environment aligning it with the final approach course while maintaining obstruction clearance.

Description:

The precision instrument approach allows you to navigate from the IAF to the MAP with lateral navigation and vertical navigation.

Setup Procedure:

1) Complete the Before IAF checklist.
    a. NAV Source – Set & Check (If LPV approach, verify WAAS is enabled)
    b. HSI – Check Against Compass
    c. Weather – Check
    d. Approach – Brief
2) Prior to glide slope intercept:
    a. Glideslope becomes active - Complete 3 mile Before FAF checklist.
        i. Seat Backs & Seat Belts – Upright Position, Fastened
        ii. Fuel Selector Valve – Both
        iii. Mixture – Rich
        iv. Landing Light & Taxi Light – On
    b. 2 dots below glideslope interception - Reduce power and slow aircraft to approach speed of 90 kts.
        i. If GPS approach, verify correct approach is active.
    c. 1 dot below glideslope interception - Set approach flaps to 10°. Verify aircraft configured and stabilized for the approach.
3) At glide slope interception:
    a. Reduce power to between 1,600 to 1,800 RPM to maintain a descent at 80 kts.
    b. Maintain a stabilized approach on the glide slope until reaching DA/DH.
        i. Minor pitch changes to maintain glide slope.
        ii. Use power to control airspeed.
4) Report position at 5nm, 3nm, and 1nm from MAP.
5) 500' above DA/DH complete the GUMPS check.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the precision instrument approach procedures.
- Accomplishes the appropriate precision instrument approaches as selected by the instructor.
- Selects and complies with the appropriate instrument approach procedure to be performed.
- Establishes two-way communications with ATC using the proper communication phraseology and techniques, as required for the phase of flight or approach segment.
- Complies, in a timely manner with all clearances, instructions, and procedures.
- Advises ATC or instructor anytime that the aircraft is unable to comply with a clearance.
- Establishes the appropriate airplane configuration and airspeed/V-speed considering turbulence, wind shear, microburst conditions, or other meteorological and operating conditions.
- Completes the aircraft checklist items appropriate to the phase of flight or approach segment, including engine out approach and landing checklists, if appropriate.
- Prior to beginning the final approach segment, maintains the desired altitude ±100 feet, the desired airspeed within ±10 kts, the desired heading within ±10°; and accurately tracks radials, courses, and bearings.
- Selects, tunes, identifies, and monitors the operational status of ground and airplane navigation equipment used for the approach.

- Applies the necessary adjustments to the published DA/DH and visibility criteria for the aircraft approach category when required, such as –
  - NOTAMs
  - Inoperative aircraft and ground navigation equipment
  - Inoperative visual aids associated with the landing environment
  - NWS reporting factors and criteria
- Establishes a predetermined rate of descent at glide slope intercept which approximates that required for the aircraft to follow the glide slope.
- Maintains a stabilized final approach, from the FAF to DA/DH allowing no more than ¾ scale deflection of either the glide slope or localizer indications and maintains the desired airspeed within ±10 kts.
- A missed approach or transition to a landing shall be initiated at DA/DH.
- Immediately initiates the missed approach at DA/DH when the required visual references for the intended runway are not distinctly visible, the visibility minimums prescribed by the approach procedure are not met, or the aircraft is not in a position to make a landing using a normal descent rate and normal maneuvers.
- Transitions to a normal landing approach only when the aircraft is in a position from which a descent to a landing on the runway can be made at a normal rate of descent using normal maneuvering.
- Maintains localizer and glide slope within ¾ scale deflection of the indicators during the visual descent from DA/DH to a point over the runway where glide slop must be abandoned to accomplish a normal landing.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain how to read the instrument approach charts.
- Discuss how to fly the approach.
- Identify symbols on the instrument approach chart.
- Discuss the importance of a stabilized approach.
- Explain how to estimate the rate of descent required to follow the glide slope.

Safety Considerations:

- Fly a stabilized approach.
- Avoid spatial disorientation by relying on instrument reference.
- Do not navigate aircraft into airspace without clearance.
- Do not descend below DA/DH prior to having required visual references.
- Do not attempt a landing from a point where such attempt should not be made.
- Identify the missed approach point and fly appropriate missed approach procedures.

Common Errors:

- Not properly identifying the navigation stations.
- Not performing required checklists.
- Not configuring the aircraft appropriately.
- Chasing the course.
- Descending at an inappropriate rate.
- Failure to start timing when appropriate.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Non Precision Approach (Coupled) (C-172S)

Objective:

To safely navigate the aircraft from the enroute environment to align it with the final approach course while maintaining obstruction clearance.

Description:

The non-precision instrument approach allows you to navigate from the IAF to the MAP with lateral navigation and obstruction clearance.

Setup Procedure:

1) Engage autopilot mode (HDG, NAV, ROL).
2) Set target altitude. Select Flight Level Change (FLC) and UP or DN to capture target airspeed. Set power as required.
3) Verify correct (AP) modes.
4) Engage autopilot (AP).
5) Complete the Before IAF checklist.
    a. NAV Source – Set & Check
    b. HSI – Check Against Compass
    c. Weather – Check
    d. Approach – Brief
6) Prior to the final approach fix (FAF):
    a. 3 Miles – Complete checklist:
        i. Seat Backs & Seat Belts – Upright Position, Fastened
        ii. Fuel Selector Valve – Both
        iii. Mixture – Rich
        iv. Landing Light & Taxi Light – On
    b. 2 Miles - Reduce power and slow aircraft to a speed of 90 kts.
        i. If GPS approach, verify correct approach is active.
    c. 1 Mile - Set approach flaps to 10°. Set target altitude in Altitude Box. Verify aircraft configured and stabilized for the approach.
7) At FAF, reduce power to approximately 1,500-1,700 RPM and slow aircraft down to 80 kts.
8) Engage the Flight Level Change (FLC) function of the autopilot. Set power as required to maintain a stabilized approach at 700-1,000 FPM until reaching 100’ above the minimum descent altitude (MDA) and begin to add power (1,800-2,000 RPM).
9) 500' above MDA complete the GUMPS check.
10) Disengage autopilot no lower than 200’ AGL.
11) Fly the aircraft at MDA until the missed approach point or until a normal descent to landing can be made.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to an instrument approach procedure.
- Selects and complies with the appropriate instrument approach procedure to be performed.
- Establishes two-way communications with ATC, as appropriate, to the phase of flight or approach segment and uses proper communication phraseology and technique.
- Selects, tunes, identifies, and confirms the operational status of the navigation equipment to be used for the approach procedure.
- Complies with all clearances issued by ATC or the instructor.
- Recognizes if any flight instrumentation is inaccurate or inoperative, and takes appropriate action.
- Advises ATC or instructor anytime that the aircraft is unable to comply with a clearance.
- Establishes the appropriate aircraft configuration and airspeed considering turbulence and wind shear, and completes the aircraft checklist items appropriate to the phase of flight.
- Maintains, prior to beginning the final approach segment, altitude within ±100 feet, heading within ±10° and allows less than a ¾ scale deflection of the CDI or within ±10° in the case of an RMI, and maintains airspeed within ±10 kts.

- Applies the necessary adjustments to the published MDA and visibility criteria for the aircraft approach category when required, such as –
  - NOTAMs
  - Inoperative aircraft and ground navigation equipment
  - Inoperative visual aids associated with the landing environment
  - NWS reporting factors and criteria
- Establishes a rate of descent and track that will ensure arrival at the MDA prior to reaching the MAP with the aircraft continuously in a position from which descent to a landing on the intended runway can be made at a normal rate using normal maneuvers.
- Allows, while on the final approach segment, no more than ¾ scale deflection of the CDI or within 10° of an RMI, and maintains airspeed within ±10 kts of that desired.
- Maintains the MDA, when reached, within +100/– 0 feet to the MAP.
- Executes the missed approach procedure at the MAP when the required visual references for the intended runway are not distinctly visible, the visibility minimums prescribed by the approach procedure are not met, or the aircraft is not in a position to make a landing using a normal descent rate and normal maneuvers.
- Execute a normal landing from a straight-in or circling approach when instructed by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain how to read the instrument approach charts.
- Discuss how to fly the approach.
- Identify symbols on the instrument approach chart.
- Discuss the importance of a stabilized approach.

Safety Considerations:

- Flying a stabilized approach.
- Avoid spatial disorientation by relying on instrument reference.
- Do not navigate aircraft into airspace without clearance.
- Do not descend below MDA prior to having required visual references.
- Do not attempt a landing from a point where such attempt should not be made.
- Identify the missed approach point and fly appropriate missed approach procedures.

Common Errors:

- Not properly identifying the navigation stations.
- Not performing required checklists.
- Not configuring the aircraft appropriately.
- Chasing the course.
- Descending at an inappropriate rate.
- Failure to start timing when appropriate.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Precision and LPV Approach (Coupled) (C-172S)

Objective:

To safely navigate the aircraft from the enroute environment to align it with the final approach course while maintaining obstruction clearance.

Description:

The precision instrument approach allows you to navigate from the IAF to the MAP with lateral navigation and vertical navigation.

Setup Procedure:

1) Engage autopilot mode (HDG, NAV, ROL).
2) Set target altitude in Altitude Box. Select Flight Level Change (FLC) and UP or DN to capture target airspeed. Set power as required.
3) Verify correct (AP) modes.
4) Engage autopilot (AP).
5) Complete the Before IAF checklist.
    a. NAV Source – Set & Check (If LPV approach, verify WAAS is enabled)
    b. HSI – Check Against Compass
    c. Weather – Check
    d. Approach – Brief
6) Prior to glide slope intercept: Engage Approach mode (APR) on the autopilot.
    a. Glideslope becomes active - Complete 3 mile Before FAF checklist.
        i. Seat Backs & Seat Belts – Upright Position, Fastened
        ii. Fuel Selector Valve – Both
        iii. Mixture – Rich
        iv. Landing Light & Taxi Light – On
    b. 2 dots below glideslope interception - Reduce power and slow aircraft to approach speed of 90 kts.
        i. If GPS approach, verify correct approach is active.
    c. 1 dot below glideslope interception - Set approach flaps to 10°. Verify aircraft configured and stabilized for the approach.
7) At glide slope interception:
    a. Reduce power to between 1,600 to 1,800 RPM to maintain a descent at 80 kts.
    b. Maintain a stabilized approach on the glide slope until reaching DA/DH.
        i. Use power to control airspeed.
8) Report position at 5nm, 3nm, and 1nm from MAP.
9) 500' above DA/DH complete the GUMPS check.
10) Disengage autopilot no lower than 200’ AGL. OR Engage the Go Around function (GA) next to the throttle quadrant. This will cycle the approach to the missed approach segment and disengage the autopilot.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the precision instrument approach procedures.
- Accomplishes the appropriate precision instrument approaches as selected by the instructor.
- Selects and complies with the appropriate instrument approach procedure to be performed.
- Establishes two-way communications with ATC using the proper communication phraseology and techniques, as required for the phase of flight or approach segment.
- Complies, in a timely manner with all clearances, instructions, and procedures.
- Advises ATC or instructor anytime that the aircraft is unable to comply with a clearance.
- Establishes the appropriate airplane configuration and airspeed/V-speed considering turbulence, wind shear, microburst conditions, or other meteorological and operating conditions.
- Completes the aircraft checklist items appropriate to the phase of flight or approach segment, including engine out approach and landing checklists, if appropriate.

- Prior to beginning the final approach segment, maintains the desired altitude ±100 feet, the desired airspeed within ±10 kts, the desired heading within ±10°; and accurately tracks radials, courses, and bearings.
- Selects, tunes, identifies, and monitors the operational status of ground and airplane navigation equipment used for the approach.
- Applies the necessary adjustments to the published DA/DH and visibility criteria for the aircraft approach category when required, such as –
  - NOTAMs
  - Inoperative aircraft and ground navigation equipment
  - Inoperative visual aids associated with the landing environment
  - NWS reporting factors and criteria
- Establishes a predetermined rate of descent at glide slope intercept which approximates that required for the aircraft to follow the glide slope.
- Maintains a stabilized final approach, from the FAF to DA/DH allowing no more than ¾ scale deflection of either the glide slope or localizer indications and maintains the desired airspeed within ±10 kts.
- A missed approach or transition to a landing shall be initiated at DA/DH.
- Immediately initiates the missed approach at DA/DH when the required visual references for the intended runway are not distinctly visible, the visibility minimums prescribed by the approach procedure are not met, or the aircraft is not in a position to make a landing using a normal descent rate and normal maneuvers.
- Transitions to a normal landing approach only when the aircraft is in a position from which a descent to a landing on the runway can be made at a normal rate of descent using normal maneuvering.
- Maintains localizer and glide slope within ¾ scale deflection of the indicators during the visual descent from DA/DH to a point over the runway where glide slop must be abandoned to accomplish a normal landing.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain how to read the instrument approach charts.
- Discuss how to fly the approach.
- Identify symbols on the instrument approach chart.
- Discuss the importance of a stabilized approach.
- Explain how to estimate the rate of descent required to follow the glide slope.

Safety Considerations:

- Fly a stabilized approach.
- Avoid spatial disorientation by relying on instrument reference.
- Do not navigate aircraft into airspace without clearance.
- Do not descend below DA/DH prior to having required visual references.
- Do not attempt a landing from a point where such attempt should not be made.
- Identify the missed approach point and fly appropriate missed approach procedures.

Common Errors:

- Not properly identifying the navigation stations.
- Not performing required checklists.
- Not configuring the aircraft appropriately.
- Chasing the course.
- Descending at an inappropriate rate.
- Failure to start timing when appropriate.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Straight in Approach (C-172S)

Objective:

To transition the aircraft from MDA or DH to landing on a runway aligned with the final approach course.

Description:

The aircraft will transition from the approach configuration to the landing configuration while continuing from the DH or MDA to point of intended landing while maintaining a stabilized approach.

Setup Procedure:

1) Confirm that all requirements to descend below DA/DH, VDP, or MDA have been achieved.
2) Configure the aircraft for a normal landing.
3) Continue a stabilized approach.
4) Accomplish a normal landing and roll out.
5) Exit runway and complete after landing checklists.
6) Close IFR flight plan if necessary.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to the pilot's responsibilities, and the environmental, operational, and meteorological factors, which effect a landing from a straight-in approach.
- Transitions at the DA/DH, MDA, or VDP to a visual flight condition, allowing for safe visual maneuvering and a normal landing.
- Adheres to all ATC (or instructor) advisories, such as NOTAMs, wind shear, wake turbulence, runway surface, braking conditions, and other operational considerations.
- Completes appropriate checklist items for the pre-landing and landing phase.
- Maintains positive aircraft control throughout the complete landing maneuver.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Determine straight in approach categories and criteria.
- Explain the proper aircraft configuration.
- Discuss how to maintain a stabilized descent to landing.
- List the requirements for descending below DA/DH or MDA.
- Explain what to do if visual reference to the airport environment is lost.

Safety Considerations:

- Collision avoidance of VFR traffic.
- Situational awareness of position, airspeed, bank, and aircraft configuration.

Common Errors:

- Selecting incorrect approach category.
- Descends below DA/DH or MDA without having the airport environment in sight.
- Attempts a descent to landing that would be considered abnormal.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Circling Approach (C-172S)

Objective:

To transition the aircraft from MDA to landing on a runway not aligned with the final approach course.

Description:

The aircraft will transition from the approach configuration to the landing configuration while maneuvering to align the aircraft with the runway and continue to a point of intended landing while maintaining a stabilized approach.

Setup Procedure:

1) Prior to arriving at circling MDA or VDP, develop a plan to maneuver the aircraft to align with the active runway.
2) Remain within the required circling distances.
3) Maneuver the aircraft to align it with the runway, being cautious of other aircraft operating in the vicinity.
4) Confirm that all requirements to descend below MDA have been achieved.
5) Configure the aircraft for a stabilized normal approach to landing.
6) Accomplish a normal landing and roll out.
7) Exit runway and complete after landing checklists.
8) Close IFR flight plan if necessary.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to a circling approach procedure.
- Selects and complies with the appropriate circling approach procedure considering turbulence and wind shear and considering the maneuvering capabilities of the aircraft.
- Confirms the direction of traffic and adheres to all restrictions and instructions issued by ATC and the instructor.
- Does not exceed the visibility criteria or descend below the appropriate circling altitude until in a position from which a descent to a normal landing can be made.
- Maneuvers the aircraft, after reaching the authorized MDA and maintains that altitude within +100/-0 feet and a flight path that permits a normal landing on a runway. The runway selected must be such that it requires at least a 90° change of direction, from the final approach course, to align the aircraft for landing.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Determine circling approach categories and criteria.
- Explain the proper aircraft configuration.
- Discuss how to maintain a stabilized descent to landing.
- List the requirements for descending below MDA.
- Explain what to do if visual reference to the airport environment is lost.

Safety Considerations:

- Collision avoidance of VFR traffic.
- Situational awareness of position, airspeed, bank, and aircraft configuration.

Common Errors:

- Selecting incorrect approach category.
- Descends below DH or MDA without having the airport environment in sight.
- Attempting a descent to landing that would be considered abnormal.
- Losing visual reference to runway.
- Improper circling planning considering traffic flow.
- Circling to far from runway environment.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Missed Approach (C-172S)

Objective:

To determine when it is necessary to execute the missed approach procedures and safely execute the published missed approach procedures.

Description:

If the decision is made to execute a missed approach procedure, the aircraft will be reconfigured to the departure configuration. Precisely follow the missed approach procedure to ensure terrain and obstruction clearance and repositioning of the aircraft to attempt another approach or proceed to a new destination.

Setup Procedure:

1) Simultaneously advance the throttle and press the Go Around (GA) button, initiate the missed approach, and configure the aircraft for a Go Around.
2) Advise ATC of the missed approach.
3) Follow the missed approach instructions on the instrument approach chart unless otherwise instructed by ATC.
4) Verify the Go-Around checklist and complete the climb checklist as workload permits.
5) Follow any clearance issued by ATC and advise them of any preferred course of action, i.e. attempt another approach at the same airport, depart the area.
6) Once established in the Missed Approach climb, engage the Control Wheel Steering (CWS) button to adjust the Flight Director to maintain a 74 kt climb.

Flight Proficiency Standards:

- Exhibits adequate knowledge of the elements related to missed approach procedures associated with standard instrument approaches.
- Initiates the missed approach promptly by applying power, establishing a climb attitude, and reducing drag in accordance with the aircraft manufacturer's recommendations.
- Reports to ATC the missed approach procedure.
- Complies with the published or alternate missed approach procedure.
- Advise ATC or instructor anytime that the aircraft is unable to comply with a clearance, restriction, or climb gradient.
- Follows the recommended checklist items appropriate to the Go Around procedure.
- Requests, if appropriate, ATC clearance to the alternate airport, clearance limit, or as directed by the instructor.
- Maintains the recommended airspeed within ±10 kts; heading, course, or bearing within ±10°; and altitude(s) ±100 feet during the missed approach procedure.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the situations in which a missed approach is necessary.
- Discuss how to execute a missed approach prior to the missed approach point
- Discuss how to execute a missed approach while circling.

Safety Considerations:

- Establish a climbing attitude in the departure configuration.
- Remain coordinated and at a safe flying airspeed.
- Establish contact with ATC and advise them of the missed approach.

Common Errors:

- Turns prior to the missed approach point.
- Does not establish a climbing attitude.
- Allows the aircraft to get too slow.
- Flies past the missed approach point without executing the missed approach procedure.
- Is not familiar enough with the missed approach procedure to execute the first few steps without referring to the approach chart.

References:

Instrument Flying Handbook; POH/AFM; Instrument Pilot ACS; CFII PTS

Section 6 – COMMERCIAL PILOT

The Commercial Pilot rating is divided into six flight courses and a ground school. All degree seeking students will conduct training under CFR 14 Part 141 unless approved by the Chief Flight Instructor.

This section contains references to the C-172R, C-172S, and the C-172RG.

C-172R

Passenger Briefing (C-172R)

Objective:

To provide a standard pre-flight briefing to passengers.

Description:

The pilot in command is required by the Federal Aviation Regulations to provide a passenger briefing.

Setup Procedure:

1) Before starting the engine the Pilot-in-Command will provide the passenger safety briefing to include, but not limited to:
   a. Designation of Pilot-in-Command.
   b. Procedures for positively exchanging flight controls.

      S
      i. Seat belts and shoulder harnesses (location and operation).
      ii. Seat belts & shoulder harnesses fastened for taxi, takeoff and landing.
      iii. Seat position adjusted and locked in place (controls and operation).

      A
      iv. Air vents (location and operation).
      v. All environmental controls (discussed).
      vi. Action in case of any passenger discomfort.

      F
      vii. Fire extinguisher (location and operation).
      viii. Smoking is prohibited.

      E
      ix. Exit doors (how to secure; how to open).
      x. Emergency evacuation plan.
      xi. Emergency/survival kit (location and contents).
      xii. Equipment (location & operation, i.e., ELT, flight controls).

      T
      xiii. Traffic (scanning, spotting, notifying pilot).
      xiv. Talking ("sterile cockpit" expectations).

      Y
      xv. Your questions?

Flight Proficiency Standards:

- Briefs occupants on the use of safety belts, shoulder harnesses, doors, and emergency procedures.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance and regulatory requirement for providing a passenger briefing.

Common Errors:

- Failure to perform a passenger briefing.
- Incomplete passenger briefing.

References:

Airman Airman Certification Standards, Federal Aviation Regulations, AC 121-24, AOPA Passenger Safety Briefing Video

Normal & Crosswind Takeoff & Climb (C-172R)

Objective:

To move the airplane from its starting position on the runway, become airborne, and establish a positive climb to a safe maneuvering altitude.

Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane is accelerated to an airspeed that provides sufficient lift to become airborne.
2) The rotation, when the pilot increases elevator back pressure, increasing the angle of attack to lift the nose wheel.
3) The initial climb when the airplane leaves the ground and establishes a pitch attitude to climb away from the runway.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete takeoff checklist and takeoff briefing.
3) Use aircraft lighting as recommended by the current version of AC 91-73.
4) Ensure runway is clear, align aircraft with runway centerline, confirm DG is aligned with runway, and ensure nose wheel is straight.
5) Position flight controls for wind for existing conditions.
6) Advance throttle smoothly to takeoff power ensuring toes are resting on rudder pedals, not on brakes.
7) Check engine instruments during takeoff roll for normal indications.
8) Maintain directional control with rudder pedals and crosswind control with appropriate aileron deflection
9) Maintain a slightly tail low attitude.
10) Upon reaching rotation speed, 55 kts (V_R), increase back elevator pressure to establish the lift-off attitude that is approximately that for V_Y and allow the aircraft to fly off the ground.
11) Apply adequate drift correction to maintain runway centerline.
12) Accelerate to 79 kts (V_Y).
13) At 500 ft., or as workload permits, complete climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to normal and crosswind takeoff, climb operations and rejected takeoff procedures.
- Positions the flight controls for the existing wind conditions.
- Clears the area, taxies onto the takeoff surface and aligns the airplane on the runway center/takeoff path.
- Lifts off at the recommended airspeed and accelerates to V_Y.
- Establishes a pitch attitude that will maintain V_Y ±5 kts.
- Retracts the landing gear if appropriate, and flaps after a positive rate of climb is established.
- Maintains takeoff power and V_Y ±5 kts.
- Maintains directional control, proper wind-drift correction throughout the takeoff and climb.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain runway selection criteria.
- Discuss how to maintain directional control during the ground roll.
- Discuss proper lift-off technique.
- Explain how to use ailerons during crosswind situations.
- Describe how to correct for wind-drift.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not force aircraft off runway too early, causing it to settle back on the runway.
- Consider the effect of density altitude on performance.
- Do not retract landing gear too soon.
- Do not allow upwind wing to rise during takeoff.
- Do not exceed maximum demonstrated crosswind velocity.

Common Errors:

- Improper runway incursion avoidance procedures.
- Inappropriate lift-off procedures.
- Improper climb attitude, power setting, and airspeed.
- Improper use of checklists.
- Improper positioning of the flight controls and wing flaps.
- Drift during climb.
- Failure to establish and maintain proper climb configuration and airspeeds.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Short-Field Takeoff & Climb (C-172R)

Objective:

To move the airplane from its starting position on the runway, become airborne, and establish a positive climb to a safe maneuvering altitude when the takeoff area is short or restricted by obstructions.

Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane is accelerated to an airspeed that provides sufficient lift to become airborne.
2) The rotation, when the pilot increases elevator back pressure, increasing the angle of attack to lift the nose wheel.
3) The initial climb when the airplane leaves the ground and a pitch attitude is established to climb away from the runway and clear a 50 foot obstacle.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete Short-Field takeoff checklist and takeoff briefing.
3) Set flaps to 10°.
4) Use aircraft lighting as recommended by the current version of AC 91-73.
5) Back taxi and align aircraft with runway centerline, confirm DG is aligned with runway, and ensure nose wheel is straight.
6) Ensure runway is clear, advance throttle smoothly to takeoff power while holding brakes; check engine instruments.
7) Release brakes and ensure toes are resting on rudder pedals, not brakes.
8) Maintain directional control with rudder pedals and appropriate aileron deflection.
9) Upon reaching rotation speed, 55 kts (V_R), increase back elevator pressure to establish lift-off attitude and allow aircraft to fly off ground.
10) Accelerate the aircraft to 57 kts (V_X) until obstacle is cleared or 50 feet above takeoff surface is attained and then accelerate to 79 kts (V_Y).
11) Retract flaps after a safe altitude of at least 200 ft. and an airspeed of 79 kts are attained.
12) At 500 ft., or as workload permits, complete climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a short-field takeoff and maximum performance climb.
- Positions the flight controls for the existing wind conditions, sets flaps as recommended.
- Clears the area; taxies into takeoff position utilizing maximum available takeoff area and aligns the airplane on the runway center/takeoff path.
- Applies brakes (if appropriate) while advancing the throttle smoothly to takeoff power.
- Lifts off at the recommended airspeed, and accelerates to recommended obstacle clearance airspeed, or V_X.
- Establishes a pitch attitude that will maintain the recommended obstacle clearance airspeed, or V_X +5/-0 kts, until the obstacle is cleared, or until the airplane is 50 feet above the surface.
- After clearing the obstacle, establishes the pitch attitude for V_Y, accelerates to V_Y, and maintains V_Y ±5 kts, during the climb.
- Retracts the landing gear, if appropriate and flaps after clear of any obstacles or as recommended by manufacturer.
- Maintains takeoff power and V_Y ±5 kts to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Completes appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain runway selection criteria.
- Discuss how to maintain directional control during ground roll.
- Discuss proper lift-off technique.
- Explain the difference between V_X and V_Y.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not force aircraft off runway too early, causing it to settle back onto runway.
- Do not force aircraft to stay on the ground when it is ready to lift off, wheelbarrow.
- Back taxi to ensure use of entire runway length.
- Retraction of gear and flaps as recommended.

Common Errors:

- Failure to position the airplane for maximum utilization of available runway.
- Improper runway incursion avoidance procedures.
- Improper use of controls during a short-field takeoff.
- Inappropriate lift-off procedures.
- Improper initial climb attitude, power setting and airspeed to clear obstacle.
- Improper use of checklists.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Soft-Field Takeoff & Climb (C-172R)

Objective:

To align the airplane with the takeoff path, become airborne as quickly as possible, and establish a positive climb to a safe maneuvering altitude.

Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane enters the runways with full up elevator deflection and accelerates to an airspeed at which the airplane will lift off.
2) The acceleration to lift off speed while remaining in ground effect.
3) The initial climb when the airplane establishes a pitch attitude to climb away from the runway.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete Short-Field takeoff checklist and takeoff briefing.
3) Set flaps to 10°.
4) Use aircraft lighting as recommended by the current version of AC 91-73.
5) Ensure runway is clear, taxi onto runway with back elevator pressure and align nose with runway centerline, confirm DG is aligned with runway, without stopping or the use of brakes.
6) Smoothly advance throttle to takeoff power.
7) Ensure toes are resting on rudder pedals, not on brakes.
8) Check engine instruments during ground roll for normal indications.
9) Maintain directional control with rudder pedals and appropriate aileron deflection.
10) Use back elevator pressure to establish a positive pitch attitude and allow the aircraft to fly itself off the ground.
11) When the aircraft becomes airborne, reduce pitch to remain in ground effect while accelerating to 60 kts (V_X) then simultaneously climb and accelerate to 79 kts (V_Y).
12) Retract flaps after a safe altitude of at least 200 ft. and an airspeed of 79 kts are attained.
13) At 500 ft., or as workload permits, complete climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a soft-field takeoff and climb.
- Positions the flight controls for existing conditions and to maximize lift as quickly as possible.
- Clears the area; taxies onto takeoff surface at a speed consistent with safety without stopping while advancing the throttle smoothly to takeoff power.
- Establishes and maintains a pitch attitude that will transfer the weight of the airplane from the wheels to the wings as rapidly as possible.
- Lifts off at the lowest possible airspeed and remains in ground effect while accelerating to V_X.
- Establishes a pitch attitude for V_X or V_Y, as appropriate, and maintains selected airspeed ±5 kts, during the climb.
- Retracts the landing gear, if appropriate and flaps after clear of any obstacles or as recommended by the manufacturer.
- Maintains takeoff power and V_X or V_Y ±5 kts to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss proper soft-field takeoff technique.
- Explain runway selection criteria.
- Predict the height of ground effect and discuss its relevance.
- Discuss how to maintain directional control during ground roll.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not force the aircraft off runway too quickly.
- Do not retract landing gear too soon.
- Do not allow the airplane to climb above ground effect too soon, causing it to settle back onto the runway.

Common Errors:

- Improper runway incursion avoidance procedures.
- Improper use of controls during a soft-field takeoff.
- Improper lift-off procedures.
- Improper climb attitude, power setting and airspeed.
- Improper use of checklist.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Traffic Pattern (C-172R)

Objective:
To assure that air traffic flows into and out of an airport in an orderly manner.

Description:
The airplane is flown on a rectangular course around a runway at an altitude specified in the current Airport/Facility Directory or as outlined in the FAR/AIM.

Setup Procedure:
Departures

1) All departures:
   a. Fly the departure leg straight out until reaching traffic pattern altitude.
   b. Once reaching traffic pattern altitude, continue climbing and turn on course.

Arrivals

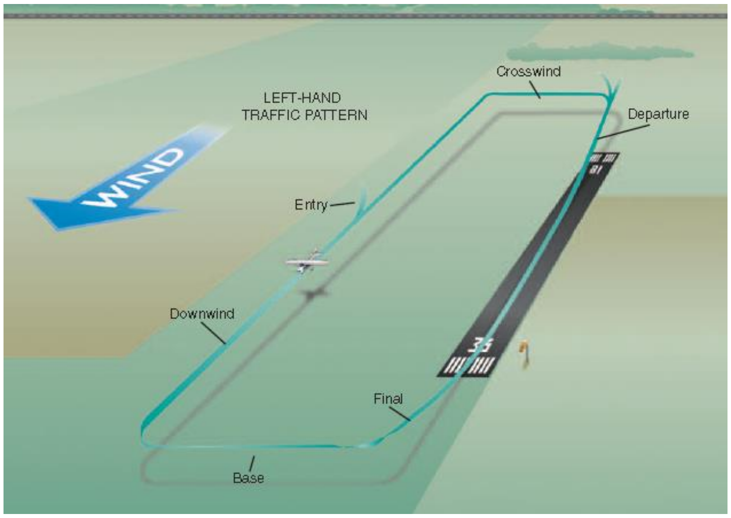
1) Prior to reaching 5 NM from the airfield, complete the following:
   a. Monitor local AWOS/ASOS/ATIS
   b. Ask "Is there any traffic between me and the airport?" and cancel flight following (if applicable)
   c. Complete the Before Landing checklist
2) Slow down below the approach flap airspeed prior to pattern entry.

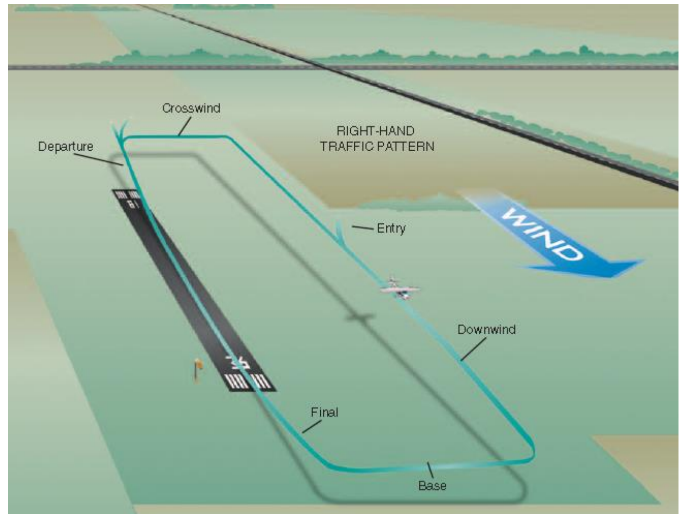
   If already established on the downwind side, skip to step 4.*

3) For a midfield entry:
   a. Cross midfield 500' above traffic pattern altitude, observing traffic flow and wind direction.
   b. Fly 2-3 miles beyond the downwind leg, then descend to pattern altitude.
   c. Complete a tear-drop shaped turn to the right or left as necessary to position the aircraft at a 45 degree angle to the downwind leg.

   If less than two aircraft are currently in the pattern, the alternate method (cross midfield at traffic pattern altitude, enter directly into downwind leg) may be used.

4) Enter the traffic pattern at the designated traffic pattern altitude (normally 1,000' AGL) at a 45 degree angle to the downwind leg at midfield.
5) Apply appropriate crosswind correction to allow for a parallel flight path approximately ½ mile from the runway
6) Allow for proper spacing from other aircraft in the pattern as to prevent runway incursions upon landing.
7) Maintain airspeed below the flap speed required for each configuration change.





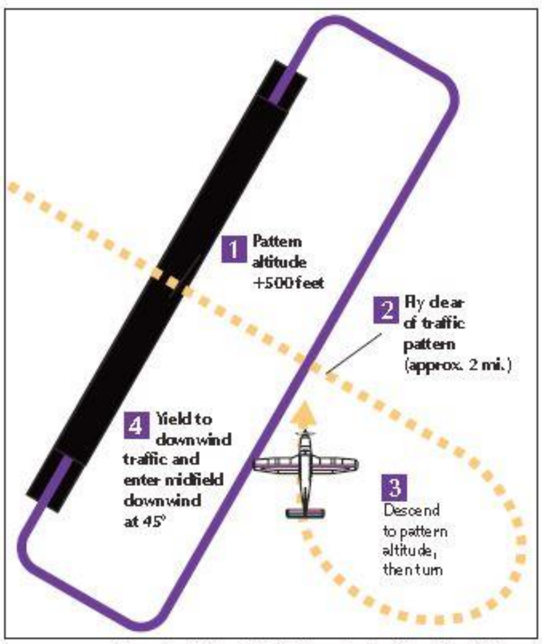


Figure 9. Preferred Entry from Upwind Leg Side of Airport

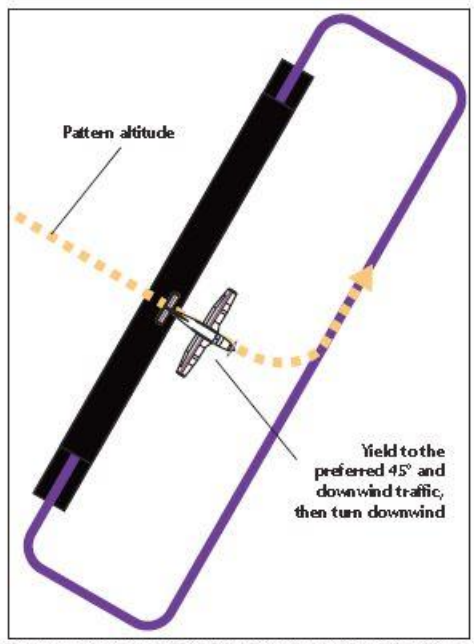


Figure 10. Alternate Midfield Entry from Upwind Leg Side of Airport

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to traffic patterns. This shall include procedures at airports with and without operating control towers, prevention of runway incursions, collision avoidance, wake turbulence avoidance, and wind shear.
- Complies with proper traffic pattern procedures.
- Maintains proper spacing from other aircraft.
- Corrects for wind drift to maintain the proper ground track.
- Maintains orientation with the runway/landing area in use.
- Maintains traffic pattern altitude, ±100 feet and the appropriate airspeed, ±10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss traffic patterns at controlled and uncontrolled airports.
- Explain traffic pattern procedures.
- Explain how to maintain the proper ground track.

Safety Considerations:

- Maintain proper traffic pattern altitude.
- Maintain a distance from the runway that is within power-off gliding distance.
- Preferred bank of approximately 30 degrees (and not to exceed 30) while in pattern.
- Maneuver within 300 feet of traffic pattern altitude before turning crosswind to base.
- Maintain proper aircraft separation.
- Comply with standards traffic pattern procedures or ATC instructions.

Common Errors:

- Failure to comply with traffic pattern instructions, procedures, and rules.
- Improper correction for wind drift.
- Inadequate spacing from other traffic.
- Poor altitude or airspeed control.
- Flying too wide of a pattern.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Normal & Crosswind Approach & Landing (C-172R)

Objective:

To safely transition the aircraft from flight to ground operations during normal conditions.

Description:

The aircraft is configured for a stabilized approach in the landing configuration and transitioned from the descent to touchdown.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
    a. Reduce power to approximately 1,300 RPM.
    b. Confirm flaps 10°.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 75 kts.
6) Turn on the base leg when 45° from the touchdown point:
    a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
    b. At key position, assess approach position.
    c. With wings level, set flaps to 20° as required.
    d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 70 kts.
7) Turn on final as to align the aircraft with the extended runway center line:
    a. Apply appropriate crosswind correction to maintain the extended runway centerline.
    b. Set flaps to 30° as required.
    c. Adjust pitch and power as required to maintain a stabilized approach, at 65 kts, toward the selected aiming point until flare to land.
    d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
8) During the flare to land simultaneously reduce power to idle and maintain aircraft approximately one foot above runway until it slows to stall speed and touches down on the runway centerline.
9) Maintain positive pitch attitude for aerodynamic braking.
10) Exit runway and complete after landing checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to normal and crosswind approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects a suitable touchdown point.
- Establishes the recommended approach and landing configuration and airspeed and adjust pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, or in its absence, nor more than 1.3 V_{S0} ±5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the round out and touchdown.
- Touches down smoothly at approximate stall speed.
- Touches down at or within 200 feet beyond a specified point, with no drift, and with the airplane's longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control through the approach and landing sequence.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain proper use of crosswind control inputs.

Safety Considerations:

- Observe flap extension speeds.
- Maintain proper airspeed at all times.
- Use proper crosswind correction to avoid drifting from runway centerline.
- Ensure landing gear is extended and locked.

Common Errors:

- Failure to establish proper crosswind correction.
- Improper use of landing performance data and limitations.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Failure to establish and maintain a stabilized approach.
- Improper technique during round out and touchdown.
- Improper use of brakes.
- Poor directional control after touchdown.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Short-Field Approach & Landing (C-172R)

Objective:

To safely transition from flight to ground operations at an airport with a relatively short runway or where an approach is made over obstacles.

Description:

The airplane is configured for a stabilized approach over a 50 foot obstacle. There will be little or no float during the round out, allowing the airplane to touch down at a specified point, and be stopped in a shorter than normal distance.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
    a. Reduce power to approximately 1,300 RPM.
    b. Confirm flaps 10°.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 75 kts.
6) Turn on the base leg when 45° from the touchdown point:
    a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
    b. At key position, assess approach position.
    c. With wings level, set flaps to 20° as required.
    d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 70 kts.
7) Turn on final as to align the aircraft with the extended runway center line:
    a. Apply appropriate crosswind correction to maintain the extended runway centerline.
    b. Set flaps to 30° as required.
    c. Adjust pitch and power as required to maintain a stabilized approach, at 62 kts, to clear obstacles, toward the selected aiming point until flare to land.
    d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
8) During the flare to land simultaneously reduce power as required and maintain aircraft approximately one foot above runway until it slows to stall speed and touches down on the runway centerline.
9) Maintain positive pitch attitude for aerodynamic braking.
10) Apply maximum braking to a complete stop without skidding the tires.
11) Exit runway and complete after landing checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a short-field approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects the most suitable touchdown point.
- Establishes the recommended approach and landing configuration and airspeed; adjusts pitch attitude and power.
- Maintains a stabilized approach and recommended approach airspeed, or in its absence, not more than 1.3 V_{SO} ±5 kts with wind gust factor applied.
- Makes smooth, timely, and correct control application during the round out and touchdown.
- Touches down smoothly at minimum control airspeed.
- Touches down at or within 100 feet beyond a specified point, with no side drift, minimum float and with the airplane's longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Applies brakes, as necessary, to stop in the shortest distance consistent with safety.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on an approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain how to compensate for obstacles and shortened runway lengths.

Safety Considerations:

- Maintain proper airspeed at all times.
- Compensate for crosswind.
- Do not skid tires.
- Use of aerodynamic braking as available.
- Ensure landing gear is extended and locked.

Common Errors:

- Failure to establish and maintain a stabilized approach.
- Improper technique in use of power, wing flaps, and trim.
- Excessive airspeed on final approach.
- Failure to establish proper crosswind correction.
- Improper use of landing performance data and limitations.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Improper use of brakes.
- Poor directional control after touchdown.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Soft-Field Approach & Landing (C-172R)

Objective:

To safely transition the airplane from flight to ground operations on a rough or soft surface.

Description:

The aircraft is configured for a stabilized approach in the landing configuration and transitioned from the descent to touchdown on a field that is unimproved.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
    a. Reduce power to approximately 1,300 RPM.
    b. Confirm flaps 10°.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 75 kts.
6) Turn on the base leg when 45° from the touchdown point:
    a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
    b. At key position, assess approach position.
    c. With wings level, set flaps to 20° as required.
    d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 70 kts.
7) Turn on final as to align the aircraft with the extended runway center line:
    a. Apply appropriate crosswind correction to maintain the extended runway centerline.
    b. Set flaps to 30° as required.
    c. Adjust pitch and power as required to maintain a stabilized approach, at 65 kts toward the selected aiming point until flare to land.
    d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
8) During the flare to land simultaneously reduce power as required to maintain aircraft approximately one foot above runway until it slows to stall speed.
9) Touch down at approximate stall speed on the runway centerline as smoothly as possible.
10) Maintain back elevator pressure to keep nose wheel off the ground as long as possible.
11) Maintain directional control with rudder and aileron deflection.
12) Adjust power as necessary to maintain aircraft movement on soft surfaces.
13) Exit the runway with minimal braking and complete after landing checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a soft-field approach and landing.
- Considers the wind conditions, landing surface, and obstructions, and selects the most suitable touchdown area.
- Establishes the recommended approach and landing configuration and airspeed; adjusts pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, or in its absence, not more than 1.3 V_{S0} ±5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the round out and touchdown.
- Touches down softly, with no drift, and with the airplane's longitudinal axis aligned with the runway/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Maintains proper position of the flight controls and sufficient speed to taxi on the soft surface.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss effect of flaps on an approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain how to touchdown and maneuver the aircraft on soft of unimproved surfaces.

Safety Considerations:

- Do not land on fields that exceed the capabilities of the aircraft or pilot.
- Fly over and visually check the field prior to landing.
- Check field length and density altitude.
- UCM retractable gear aircraft can only land on paved, public, published runways.
- Ensure landing gear is extended and locked.

Common Errors:

- Failure to maintain elevator back-pressure after touchdown.
- Improper use of brakes.
- Failure to consider effect of wind and landing surface.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Power-Off 180° Accuracy Landing (C-172R)

Objective:

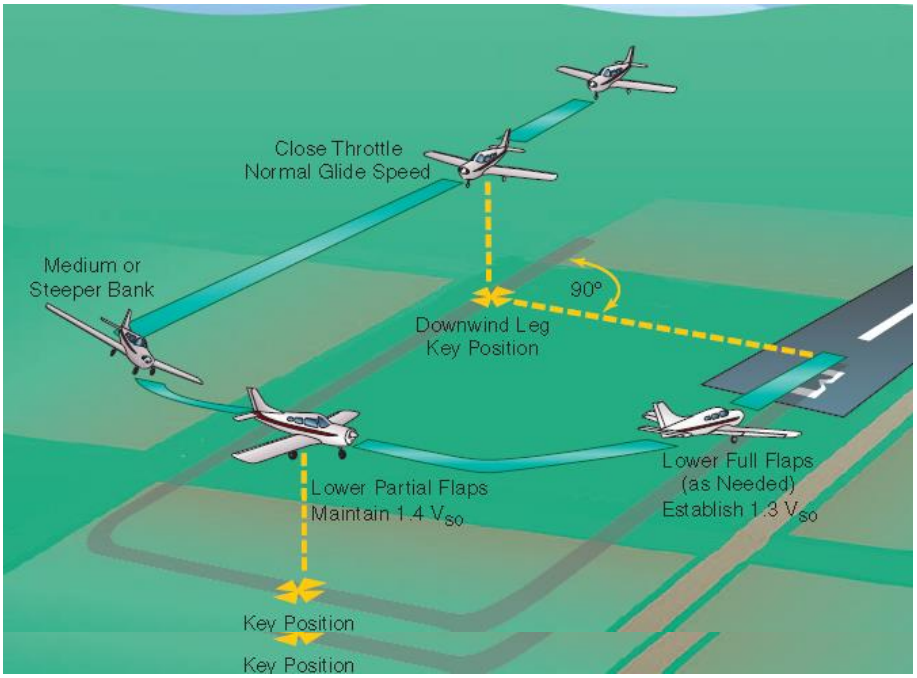
To instill in the pilot the judgment and procedures necessary for accurately flying the airplane, without power, to a safe landing.

Description:

Power-off accuracy approaches are approaches and landings made by gliding with the engine idling, through a specific pattern to a touchdown within 200 feet of a designated line or mark on the runway.

Setup Procedure:

1) Complete the before landing checklist.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming point.
4) When abeam the intended touchdown point:
   a. Close throttle.
   b. Set flaps 10°.
5) Maintain altitude while decelerating to the recommended glide speed 65 kts.
6) Base leg turn will be determined by the glide angle of the airplane, weight, and velocity of the wind.
7) Extend flaps as required.
8) Turn to final approach and extend flaps, as necessary.
9) Adjust trim and make slight adjustments in pitch attitude of flap setting to control glide angle and airspeed.
10) Touch down at approximate stalling speed on the runway centerline at the designated point.
11) Exit the runway and complete after landing checklist.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a power-off 180° accuracy approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects an appropriate touchdown point.
- Positions airplane on downwind leg, parallel to landing runway, and not more than 1,000 feet AGL.
- Abeam the specified touchdown point closes throttle and establishes appropriate glide speed.
- Completes final airplane configuration.
- Touches down in a normal landing attitude, at or within 200 feet beyond the specified touchdown point.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the effect of wind velocity on required altitude and bank angle.
- Discuss the importance of controlling glide angle and airspeed on final approach.

Safety Consideration:

- Maintain coordinated flight throughout the maneuver.
- Be aware of the position of other traffic in the pattern.
- Maintain appropriate airspeed throughout the maneuver.

Common Errors:

- Failure to touchdown within 200 feet of the intended touchdown point.
- Failure to maintain constant airspeed and glide angle.
- Failure to accurately determine the wind direction and velocity.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Touch and Go/Stop and Go (C-172R)

Objective:

To transition from a landing rollout to a takeoff roll while remaining on the runway.

Description:

A touch and go is a landing which transitions into a takeoff while the aircraft remains rolling on the runway.

Setup Procedure:

1) Perform a normal landing.
2) Upon touchdown:
    a. Allow the aircraft to continue rolling.
    b. Maintain runway centerline.
    c. Apply proper crosswind correction.
3) Reconfigure the aircraft for takeoff.
    a. Retract flaps to (10º or less).
    b. Set trim to the takeoff position.
4) Smoothly apply full-power.
5) Upon reaching rotation speed, 55 kts, increase back elevator pressure to establish the lift-off attitude that is approximately V_Y or V_X and allow the aircraft to fly off the ground.
6) Apply adequate drift correction to maintain runway centerline.
7) At a safe altitude, of at least 200 ft., retract flaps to 0º.
8) At 500 ft., or as workload permits, complete the climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to touch and go procedures.
- Maintains runway centerline upon touchdown.
- Applies proper crosswind controls upon touchdown, reconfiguration and climb out.
- Demonstrates proper aircraft reconfiguration.
- Lifts off at the recommended airspeed and accelerates to V_X or V_Y, as appropriate.
- Retracts flaps at 200' or a safe altitude, if appropriate.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Complies with noise abatement procedures.
- Completes the appropriate checklist.

Note: These are the UCM standards. The aforementioned standards are not found in the Airman Certification Standards.

Learning Outcomes:

- Explain the purpose(s) of touch and go's.
- Discuss how crosswind correction will change throughout the maneuver.
- Discuss the importance of maintaining runway centerline during aircraft reconfiguration.

Safety Considerations:

- Maintain runway centerline.
- Proper crosswind correction.
- Maintain situational awareness.
- Proper reconfiguration.

Common Errors:

- Failure to maintain runway centerline.
- Touchdown beyond the first 1/3rd of the runway and attempting a touch and go.
- Improper aircraft reconfiguration.
- Failure to use checklist.
- Failure to maintain adequate crosswind correction.

- Attempting to lift-off prior to rotation speed.

Go-Around (C-172R)

Objective:

To safely discontinue the landing approach when unsatisfactory conditions exist.

Description:

As full power is applied, the aircraft attitude is adjusted to accelerate to V_Y and climb. As a safe airspeed is attained, flaps are retracted 10° at a time allowing stabilization between each retraction.

Setup Procedure:

1) Simultaneously apply maximum power and establish a go-around pitch attitude.
2) Set flaps to 20°.
3) Establish a pitch attitude to accelerate to 55 kts.
4) Allow the airplane to accelerate to V_X or V_Y and climb.
5) If there is an aircraft on the runway, sidestep to clear the departure path of the airplane and allow the pilot to view the landing or departing traffic.
6) Set flaps to 10° and stabilize in between configuration changes then flaps to 0°.
7) Verify Go Around checklist is complete.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a go-around/rejected landing.
- Makes a timely decision to discontinue the approach to landing.
- Applies takeoff power immediately and transitions to climb pitch attitude for V_X, and maintains V_Y+10/-5 kts.
- Retracts the flaps as appropriate.
- Retracts the landing gear, if appropriate, after a positive rate of climb is established.
- Maneuvers to the side of the runway/landing area to clear and avoid conflicting traffic.
- Maintains takeoff power V_y+10/-5 to a safe maneuvering altitude.
- Maintains takeoff power V_Y ±5 kts to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the climb.
- Completes the appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss events that may require a go-around.
- Explain the importance of maintaining airspeed and coordination during the go-around procedure.
- Discuss the necessity for maneuvering to the side of the runway after making the decision to go-around.

Safety Considerations:

- Maneuver the airplane to the side of the runway.
- Do not establish a pitch up attitude too quickly.
- Maintain coordination.
- Timely decision making.
- Be watchful for situation which may require a go-around.

Common Errors:

- Delayed decision to make a go-around.
- Improper application of power.
- Failure to control pitch attitude.
- Improper trim technique.
- Failure to compensate for torque effect.
- Failure to maintain V_Y as appropriate.
- Improper wing flap retraction.
- Improper gear retraction.
- Failure to maintain well clear of obstructions and other traffic.
- Improper use of checklists.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Emergency Descent (C-172R)

Objective:
To descend the airplane as soon and as rapidly as possible, within the structural limitations of the airplane.

Description:
The emergency descent is a maneuver for descending as rapidly as possible to a lower altitude or to the ground for an emergency landing.

Setup Procedure:
1) Perform clearing turns.
2) If utilizing flight following, contact ATC for traffic advisories below.
3) Reduce power to idle.
4) Confirm flaps 0º
5) Set mixture to rich.
6) Roll into a 30º bank to the left and pitch down to achieve 120 kts (If in turbulent air, maintain an airspeed below V_A).
7) Initiate recovery to level flight at least 300’ prior to assigned altitude by:
    a. Rolling out the bank.
    b. Pitching up.
8) Return to cruise flight and complete the cruise checklist to include leaning procedures

Flight Proficiency Standards:
- Exhibit knowledge of the elements related to emergency descent.
- Recognizes situations, such as depressurization, cockpit smoke, and/or fire that require an emergency descent.
- Establish the appropriate airspeed and configuration for the emergency descent.
- Exhibit orientation, division of attention, and proper planning.
- Maintains positive load factors during the descent.
- Follow the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:
- Explain the purpose(s) of an emergency descent.
- Discuss engine cooling characteristics during an emergency descent.
- Discuss the importance of proper planning as it pertains to emergencies.

Safety Considerations:
- Maintain positive aircraft control.
- Clear the engine periodically
- Clear below then GO.
- Steep spiral over airport.
- Continue on to emergency approach and landing.

Common Errors:
- Failure to recognize the urgency of the emergency descent.
- Failure to use emergency checklist for situation.
- Failure to maintain appropriate configuration and airspeed.
- Poor orientation, planning, and division of attention.

Maneuvering During Slow Flight (C-172R)

Objective:

To demonstrate the flight characteristics and controllability of an airplane at speeds lower than normal cruise and develop proficiency in performing maneuvers that require slow airspeeds.

Description:

Slow flight consists of slowing the aircraft to a minimum controllable airspeed in the landing configuration and maneuvering the aircraft while maintaining altitude and airspeed.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
2) Perform clearing turns.
3) Set mixture to rich.
4) Reduce power to 1,500 RPM or less.
5) Below 110 kts, set flaps to 10°.
6) Adjust pitch and power as necessary to maintain altitude.
7) Below 85 kts, set flaps to 20° and 30° allowing the aircraft to stabilize between each setting.
8) Establish and maintain an airspeed at which any further increase in pitch or reduction of power would result in an immediate stall or a higher speed as specified by your instructor.
    a. Slow flight should be practiced at varying speeds and configurations above the 1G stall speed of the aircraft as specified by the instructor.
9) Establish Maneuver as instructed.
10) Recover when instructed by:
    a. Adding full power
    b. Set flaps to 20° and allow the aircraft to stabilize.
11) Then set flaps to 10° and 0° allowing the aircraft to stabilize between each setting.
12) Return to cruise flight and perform the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to maneuvering during slow flight.
- Selects an entry altitude that will allow the task to be completed no lower than 1,500' AGL.
- Establish and maintain an airspeed at which any further increase in angle of attack, increase in load factor, or reduction in power, would result in a stall warning (e.g., airplane buffet, stall horn, etc.).
- Accomplishes coordinated straight and level flight, turns, climbs, and descents with landing gear and flap configurations specified by the instructor.
- Divides attention between airplane control and orientation.
- Maintains the specified altitude, ±50 feet; specified headings, ±10°; airspeed +5/-0 kts, and specified angle of bank, ±5°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the relationship between pitch and power in maintaining airspeed and altitude during slow flight.
- Discuss how flight at minimum airspeeds develops the ability to estimate the margin of safety above the stalling speed.
- Compare the practice of slow flight to various phases of flight such as; takeoffs, climbs, descents, go-around, and approaches to landing.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified flap configuration.
- Improper entry technique.
- Failure to establish and maintain the specified airspeed.
- Excessive variations of altitude and heading when a constant altitude and heading are specified.
- Rough or uncoordinated control technique.
- Improper correction for left turning tendency.
- Improper trim technique.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Power – Off Stall (C-172R)

Objective:

To familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop the skills to prevent and recover from stalls in the landing configuration.

Description:

The aircraft is slowed down and placed in the landing configuration after which a stall is induced and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery by at least 1,500' AGL.
2) Perform clearing turns.
3) Set mixture to rich.
4) Reduce power to 1,500 RPM or less allowing the aircraft to slow to approach speed while maintaining altitude.
5) Below 110 kts, set flaps to 10°.
6) Below 85 kts, set flaps to 20° and 30° allowing the aircraft to stabilize between each setting.
7) Establish a stabilized descent at 65 kts.
8) Reduce power to idle.
9) Maintain coordinated flight and altitude until recognition of the stall.
10) Recognize and recover from the impending stall (aerodynamic buffeting) by simultaneously reducing the angle of attack, leveling the wings, and adding full power.
11) Set flaps to 20°.
12) Accelerate the aircraft to V_X (recommended) or V_Y and climb while retracting the remaining flaps in 10° increments.
13) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to power-off stalls.
- Selects an entry altitude that allows the task to be completed no lower than 1,500' AGL.
- Establishes a stabilized descent in the approach or landing configuration, as specified by the instructor.
- Transitions smoothly from the approach or landing attitude to a pitch attitude that will induce a stall.
- Maintains a specified heading, ±10° in straight flight; maintains a specified angle of bank, not to exceed 20°, ±5°, in turning flight while inducing the stall.
- Recognizes and recovers promptly as the "on set" of the stall occurs by simultaneously reducing the angle of attack, increasing power to maximum allowable and leveling the wings to return to a straight and level flight attitude with a minimum loss of altitude appropriate for the airplane.
- Retracts the flaps to the recommended setting, retracts the landing gear if retractable after a positive rate of climb is established.
- Accelerates to V_X or V_Y speed before the final flap retraction.
- Returns to the altitude, heading, and airspeed specified by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.

- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Power – On Stall (C-172R)

Objective:

To familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in the takeoff configuration.

Description:

The aircraft is slowed down and placed in the takeoff configuration after which a stall is induced and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
2) Perform clearing turns.
3) Set mixture to rich.
4) Reduce power to 1200 RPM or less, allowing the aircraft to slow to takeoff speed while maintaining altitude.
5) Add full power at 55 kts (V_R).
6) Transition smoothly to the pitch attitude that will induce a stall.
7) Recognize and recover from the impending stall (aerodynamic buffeting) by simultaneously reducing the angle of attack, leveling the wings, and adding full power.
8) Accelerate the aircraft to 74 kts (V_Y) and climb.
9) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to power-on stalls.
- Selects an entry altitude that allows the task to be completed no lower than 1,500' AGL.
- Establishes the takeoff or departure configuration. Sets power to no less than 65 percent available power.
- Transitions smoothly from the takeoff or departure attitude to a pitch attitude that will induce a stall.
- Maintains a specified heading ±5°, in straight flight; maintains a specified angle of bank, not to exceed a 20°, ±10°, turning flight, while inducing the stall.
- Recognizes and recovers promptly as the stall occurs by simultaneously reducing the angle of attack, increasing power to maximum allowable and leveling the wings to return to a straight and level flight attitude, with a minimum loss of altitude appropriate for the airplane.
- Retracts flaps to the recommended setting and retracts the landing gear if retractable after a positive rate of climb is established.
- Accelerates to V_X or V_Y speed before the final flaps retraction; returns to the altitude, heading, and airspeed specified by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Accelerated Stall (C-172R)

Objective:

To familiarize the pilot with the conditions that produce accelerated stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in an accelerated configuration.

Description:

The aircraft is slowed down and placed in the clean configuration. After which a steep turn is applied with excessive back elevator pressure and therefore a stall is induced at a higher than normal stalling speed and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery by at least 3,000’ AGL.
2) Perform clearing turns.
3) Reduce power to 1500 RPM allowing the aircraft to slow below maneuvering speed while maintaining altitude.
4) Set mixture to rich.
5) Verify flaps up.
6) Upon reaching 75 kts, transition smoothly to an approximate 45 degree bank and apply back pressure to induce an accelerated stall.
7) Recognize and recover from the stall (aerodynamic buffeting) as the stall occurs by simultaneously leveling the wings, reducing the angle of attack, and increasing power.
8) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to accelerated stalls.
- Selects an entry altitude that allows the task to be completed no lower than 3,000’ AGL.
- Establishes the configuration as specified by the instructor.
- Establish and maintain a coordinated turn in a 45° bank, increasing elevator back pressure smoothly and firmly until an impending stall is reached.
- Recognizes and recovers promptly at the first indication of an impending stall.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Cross-Control Stall (C-172R)

Objective:

To familiarize the pilot with the conditions that produce cross-control stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in a cross-control configuration.

Description:

The aircraft is left in a clean configuration while power is reduced to simulate landing conditions after which a stall is initiated by using excessive rudder in the direction of the base-to-final turn and back elevator pressure is applied to keep the nose from lowering. Recovery procedures should be initiated at first indication of stall by applying full power and removing opposite aileron and rudder inputs simultaneously.

Setup Procedure:

1) Select an altitude which allows recovery by 3000' AGL.
2) Perform clearing turns.
3) Reduce power to 1300 RPM allowing the aircraft to slow to 65 kts while maintaining altitude.
4) Set mixture to rich.
5) Verify flaps up.
6) Select a point on the ground to act as a runway and position aircraft on a base leg.
7) Upon reaching 65 kts begin a "base-to-final" turn that overshoots final approach and simultaneously:
    a. Correct for final approach path by smoothly applying excessive rudder in the direction of turn.
    b. Use opposite aileron to hold constant bank.
    c. Increase elevator back pressure to keep the nose from dropping below horizon.
8) Recognize and recover from the impending stall (aerodynamic buffeting) by simultaneously reducing the angle of attack, removing opposite rudder and aileron inputs, and adding full power.
9) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards

- Exhibits knowledge of the elements of the elements of cross-controlled stalls, with the landing gear extended.
- Exhibits instructional knowledge of common errors related to cross-control stalls, with the landing gear extended.
- Demonstrates and simultaneously explains a cross-control stall, with landing gear extended, from an instructional standpoint.
- Analyzes and corrects simulated common errors related to a cross-control stall with the landing gear extended.

Note: These are the PTS standards for the CFI certificate as these maneuvers are only to be demonstrated to commercial pilot students and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a cross-control stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a cross-control stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.

- Failure to recognize indications of a stall.
- Spin entry due to stalling aircraft in uncoordinated condition.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; CFI PTS

Elevator Trim Stall (C-172R)

Objective:

To familiarize the pilot with the conditions that produce elevator trim stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls with excessive elevator trim.

Description:

The aircraft is left in a clean configuration while power is reduced to simulate landing conditions and elevator trim is added to maintain a stable descent. After which a go-around is simulated with the excessive trim and therefore a stall attitude is reached rapidly and recovery is initiated returning the aircraft to normal cruise.

Setup Procedure:

1) Select an altitude which allows recovery by 3000' AGL.
2) Perform clearing turns.
3) Reduce power to 1,500 RPM or less allowing the aircraft to slow to approach speed while maintaining altitude.
4) Below 110 kts, set flaps to 10°.
5) Below 85 kts, set flaps to 20° and 30° allowing the aircraft to stabilize between each setting.
6) Apply nose up elevator trim to establish a descent at 65kts.
7) Once a 65 kt descent has been established simulate a go-around by applying full power.
8) Recognize and recover once an attitude has been reached that would result in an impending stall by:
    a. Reducing angle of attack.
    b. Hold forward elevator pressure while reducing nose up elevator trim.
    c. Set flaps to 20°
9) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits instructional knowledge of the elements of elevator trim stalls, in selected landing gear and flap configurations.
- Exhibits instructional knowledge of common errors related to elevator trim stalls, in selected landing gear and flap configurations.
- Demonstrates and simultaneously explains elevator trim stalls, in selected landing gear and flap configurations, from an instructional standpoint.
- Analyzes and corrects simulated common errors related to elevator trim stalls in selected configurations.

Note: These are the PTS standards for the CFI certificate as these maneuvers are only to be demonstrated to commercial pilot students and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of an elevator trim stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from an elevator trim stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.
- Forward elevator pressure required in recovery.

Common Errors:

- Failure to establish specified configuration.

- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Spin entry due to stalling aircraft in uncoordinated condition.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; CFI PTS

Secondary Stall (C-172R)

Objective:

To familiarize the pilot with the conditions that produce secondary stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls that could occur due to improper recovery techniques.

Description:

The aircraft configured for and placed into a power off stall. During recovery a secondary stall is induced by abrupt control inputs, attempting to return to normal cruise to early, or by not adequately reducing angle of attack during initial stall recovery.

Setup Procedure:

1) Select an altitude which allows recovery by at least 3,000' AGL.
2) Reduce power to 1,500 RPM or less allowing the aircraft to slow to approach speed while maintaining altitude.
3) Below 110 kts, set flaps to 10°.
4) Below 85 kts, set flaps to 20° and 30° allowing the aircraft to stabilize between each setting.
5) Establish a stabilized descent at 65 kts.
6) Reduce power to idle.
7) Maintain coordinated flight and altitude until recognition of the stall.
8) Induce secondary stall by:
    a. Allowing nose to pitch down, but immediately pitch the nose up excessively to maintain desired altitude. or
    b. Hold aircraft in stall by not reducing angle of attack.
9) Recover from the secondary stall (aerodynamic buffeting) by simultaneously reducing the angle of attack, leveling the wings, and adding full power.
10) Set flaps to 20°.
11) Accelerate the aircraft to V_X (recommended) or V_Y and climb while retracting the remaining flaps in 10° increments.
12) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits instructional knowledge of the elements of secondary stalls, in selected configurations.
- Exhibits instructional knowledge of common errors related to secondary stalls, in selected configurations.
- Demonstrates and simultaneously explains secondary stalls, in selected landing gear and flap configurations, form an instructional standpoint.
- Analyzes and corrects simulated common errors related to secondary stalls in selected configurations.

Note: These are the PTS standards for the CFI certificate as these maneuvers are only to be demonstrated to commercial pilot students and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a secondary stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a secondary stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Spin entry due to stalling aircraft in uncoordinated condition.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.

References:

Airplane Flying Handbook; POH/AFM; CFI PTS

Steep Turns (C-172R)

Objective:

To develop coordination, orientation, division of attention and smooth control techniques while executing high performance turns.

Description:

The maneuver consists of two 360° turns in opposite directions, using a bank angle of 50° while maintaining a constant airspeed and altitude.

Setup Procedure:

1) Select an altitude which allows performance of maneuver no lower than 1,500' AGL.
2) Perform clearing turns.
3) Adjust the mixture in accordance with the POH.
4) Reduce power to establish an airspeed of 95 kts.
5) Enter a coordinated 50° banking turn to the left or right.
6) Increase power and adjust trim and pitch as required to maintain altitude and airspeed.
7) Begin rollout at ½ the bank angle prior to rollout heading.
8) Reduce power and pitch on rollout as needed to remain at 95 kts.
9) Continue the maneuver in the opposite direction.
10) Reduce power and pitch on rollout as needed to remain at 95 kts.
11) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to steep turns.
- Establishes the manufacturer's recommended airspeed or if one is not stated, a safe airspeed not to exceed Va.
- Rolls into a coordinated 360° steep turn with at least a 50° bank, followed by a 360° turn in the opposite direction.
- Divides attention between airplane control and orientation.
- Maintains the entry altitude, ±100 feet, airspeed, 10 kts, bank, ±5°, and rolls out on the entry heading, ±10°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain why load factor increases as bank angle increases.
- Discuss the relationship between load factor and stall speed.
- Discuss the principle of over-banking tendency.
- Explain how to maintain altitude and airspeed.
- Explain limit load factor and what happens if it's exceeded.

Safety Considerations:

- Do not exceed manufacturer's recommended airspeed or Va.
- Always clear the area before initiating the maneuver.
- The maneuver is to be completed no lower than 1,500' feet AGL.
- Division of attention between maneuver and scanning for traffic.

Common Errors:

- Improper pitch, bank, and power coordination during entry and rollout.
- Uncoordinated use of flight controls.
- Improper procedure in correcting altitude deviations.
- Loss of orientation.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Chandelle (C-172R)

Objective:

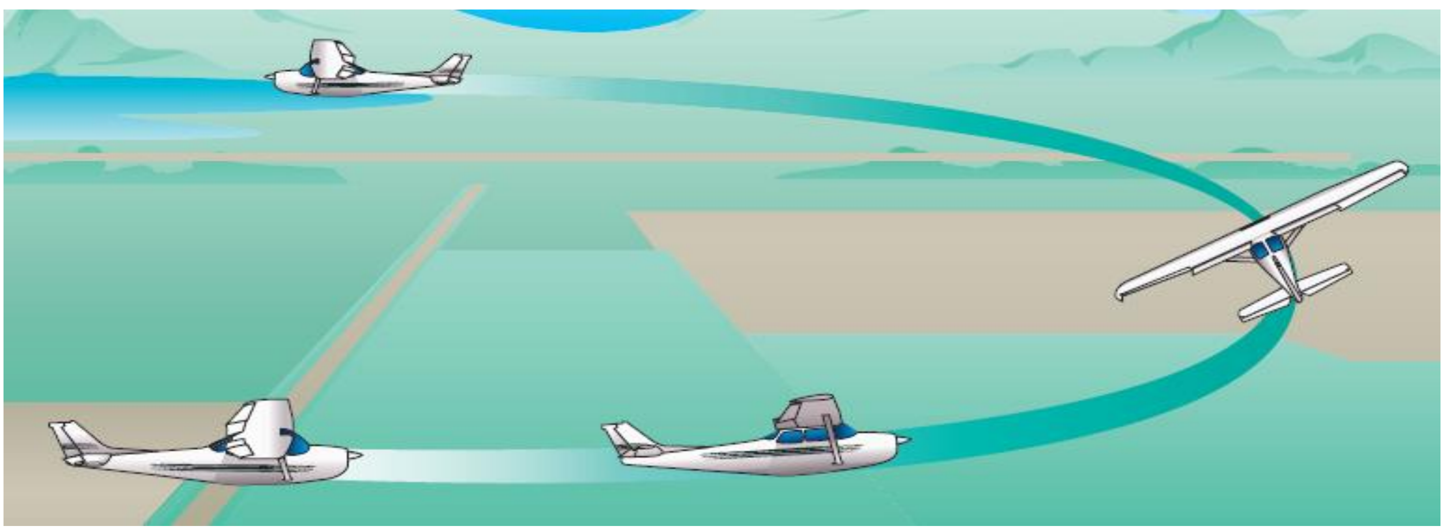
To develop the pilot's coordination, orientation, planning and accuracy of control during maximum performance flight.

Description:

A chandelle is a maximum performance climbing turn beginning from approximately straight and level flight, and ending at the completion of a 180° turn in a wings level, nose high attitude at the minimum controllable airspeed.

Setup Procedure:

1) Select an altitude to perform the maneuver no lower than 1,500' AGL.
2) Perform clearing turns.
3) Orient the airplane so that the turn is into the wind.
4) Maintain an airspeed of 105 kts.
5) Establish a 30° bank turn.
6) Simultaneously apply full power and pitch to maintain a smooth coordinated climbing turn to the 90° degree point with a constant bank.
7) At the 90° point, gradually increase back pressure to maintain pitch attitude and begin a coordinated roll out to reach wings level at the 180° point, just above the stall speed.
8) At the 180° point, establish level flight within 50 feet of final altitude.
9) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to chandelles.
- Selects an altitude that will allow the maneuver to be performed no lower than 1,500' AGL.
- Establishes the recommended entry configuration, power and airspeed.
- Establishes the angle of bank at approximately 30°.
- Simultaneously applies power and pitch to maintain a smooth, coordinated climbing turn to the 90° point, with a constant bank.
- Begins a coordinated constant rate rollout from the 90° point to the 180° point maintaining power and a constant pitch attitude.
- Completes rollout at the 180° point, ±10° just above stall airspeed, and maintains that airspeed momentarily avoiding a stall.
- Resumes straight and level flight with minimum loss of altitude.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Coordination during high power settings and high angles of attack.
- Maneuvering the aircraft at high performance levels.

Safety Considerations:

- This maneuver should be performed no lower than 1,500’ AGL.
- Divide attention between flying the airplane and scanning for traffic.
- Maintain coordinated flight.

Common Errors:

- Improper pitch, bank, and power coordination during entry or completion.
- Uncoordinated use of flight controls.
- Improper planning and timing of pitch and bank attitude changes.
- Factors related to failure in achieving maximum performance.
- A stall during the maneuver.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Lazy Eights (C-172R)

Objective:

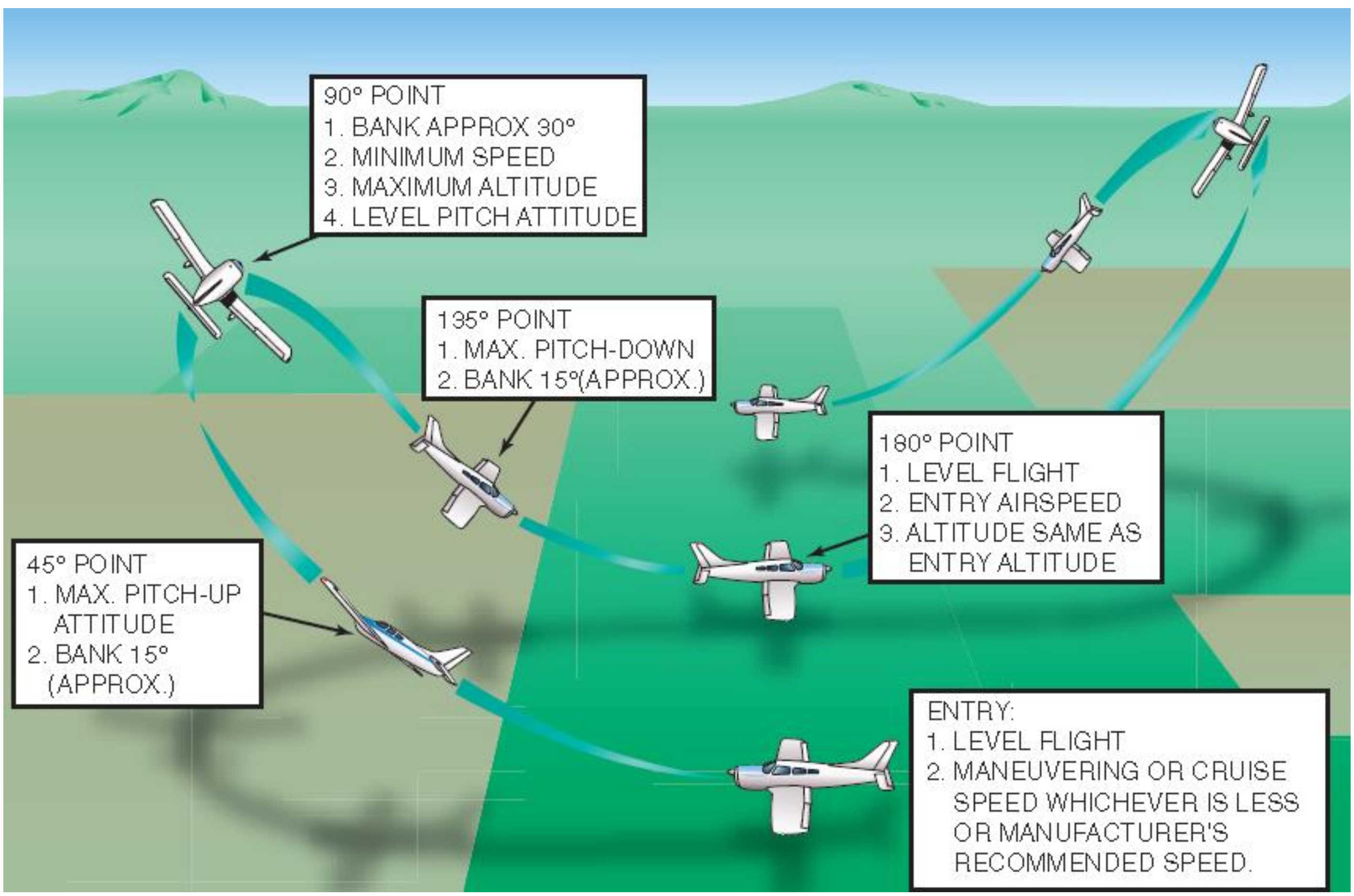
To develop coordination of controls through a wide range of airspeeds and altitudes so that certain accuracy points are reached with planned attitude and bank.

Description:

Two 180° turns, in opposite direction, while making a climb and a descent in a symmetrical pattern during each of the turns. At no time is the airplane flown straight and level.

Setup Procedure:

1) Select an altitude to perform the maneuver no lower than 1,500' AGL.
2) Perform clearing turns.
3) Orient the airplane so that the first turn is to the left and into the wind.
4) Maintain an airspeed of 105 kts.
5) Begin the maneuver by constantly changing pitch and bank to achieve the following:
   a. 45° point – 15° of bank and max pitch up.
   b. 90° point – 30° of bank, level pitch attitude, minimum controllable airspeed.
   c. 135° point – 15° of bank and max pitch down.
   d. 180° point – back to starting airspeed, altitude, and reciprocal heading.
6) Repeat in opposite direction.
7) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to lazy eights.
- Selects an altitude that will allow the maneuver to be performed no lower than 1,500' AGL.
- Establishes the recommended entry configuration, power, and airspeed.
- Maintains coordinated flight throughout the maneuver.
- Achieves the following throughout the maneuver
    - Approximately 30° bank at the steepest point.
    - Constant change of pitch and roll rate.
    - Altitude tolerance at 180° points, ±100 feet from entry altitude.
    - Airspeed tolerance at the 180° point, ±10 kts from entry airspeed.
    - Heading tolerance at the 180° point ±10°.
- Continues the maneuver through the number of symmetrical loops specified and resumes straight and level flight.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance of proper power setting.
- Explain the need for differing amounts of rudder pressure between the left and right turn.
- Discuss the effects of torque at the top of the eight in both the right and left turns.

Safety Considerations:

- Always clear the area before beginning a maneuver.
- Maintain coordination at all times during the maneuver.
- Use proper division of attention to see and avoid traffic.

Common Errors:

- Uncoordinated use of flight controls.
- Inconsistent airspeed and altitude at key points in the maneuver.
- Loss of orientation.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Steep Spiral (C-172R)

Objective:

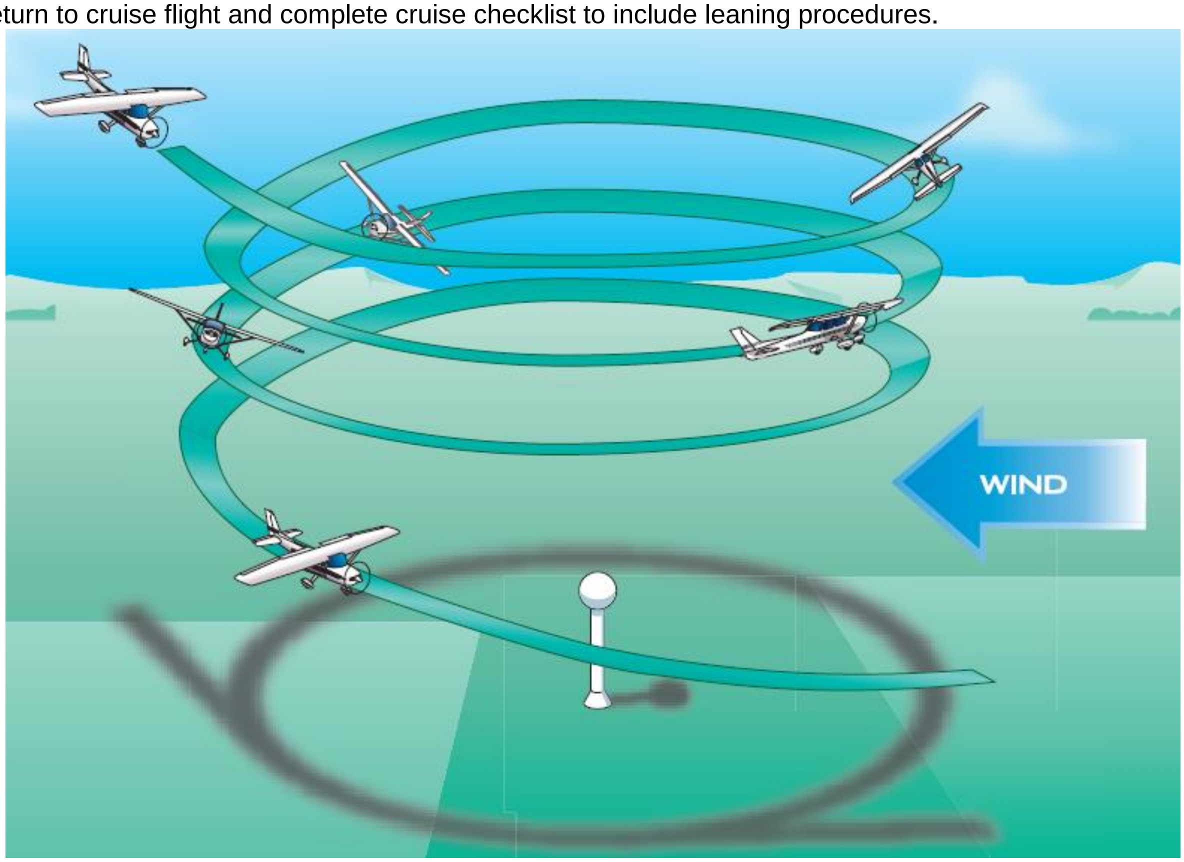
To improve pilot techniques for airspeed control, wind drift control, planning, orientation, and division of attention.

Description:

A steep spiral is a constant gliding turn, during which a constant radius around a point on the ground is maintained.

Setup Procedure:

1) Begin the maneuver with sufficient altitude to allow for three 360° degree turns without descending below 1,500' feet AGL.
2) Perform clearing turns.
3) Select a point to perform the maneuver around.
4) Enter on a downwind heading.
5) Reduce power and slow to 75 kts.
6) Reduce the power to idle when abeam the point.
7) Maintain 75 kts ($V_{L/D}$ +10 kts).
8) Change bank angle as necessary to maintain an equal distance from the reference point 45-55° of bank at the steepest point in the turn, not to exceed 60°.
9) Clear the engine, momentarily advancing power to normal cruise power, on each upwind leg.
10) Roll out on a downwind heading.
11) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a steep spiral.
- Selects an altitude sufficient to continue through a series of at least three 360° turns.
- Selects a suitable ground reference point.
- Applies wind-drift correction to track a constant radius circle around the selected reference point with bank not to exceed 60° at steepest point in turn.
- Divides attention between airplane control and ground track, while maintaining coordinated flight.
- Maintains the specified airspeed, ±10 kts, rolls out toward specified heading, ±10°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the effect of bank angle on ground track.
- Discuss the effect of ground speed on the radius of the turn.
- Recognize the importance of clearing the engine during extended periods of engine operations at low power settings.

Safety Considerations:

- Clear the area.
- Divide attention between aircraft control and orientation.
- Choose a reference point with emergency landing field within gliding distance.

Common Errors:

- Failure to maintain constant radius around reference point.
- Failure to maintain constant airspeed.
- Uncoordinated use of flight controls.
- Loss of orientation.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Eights On Pylons (C-172R)

Objective:

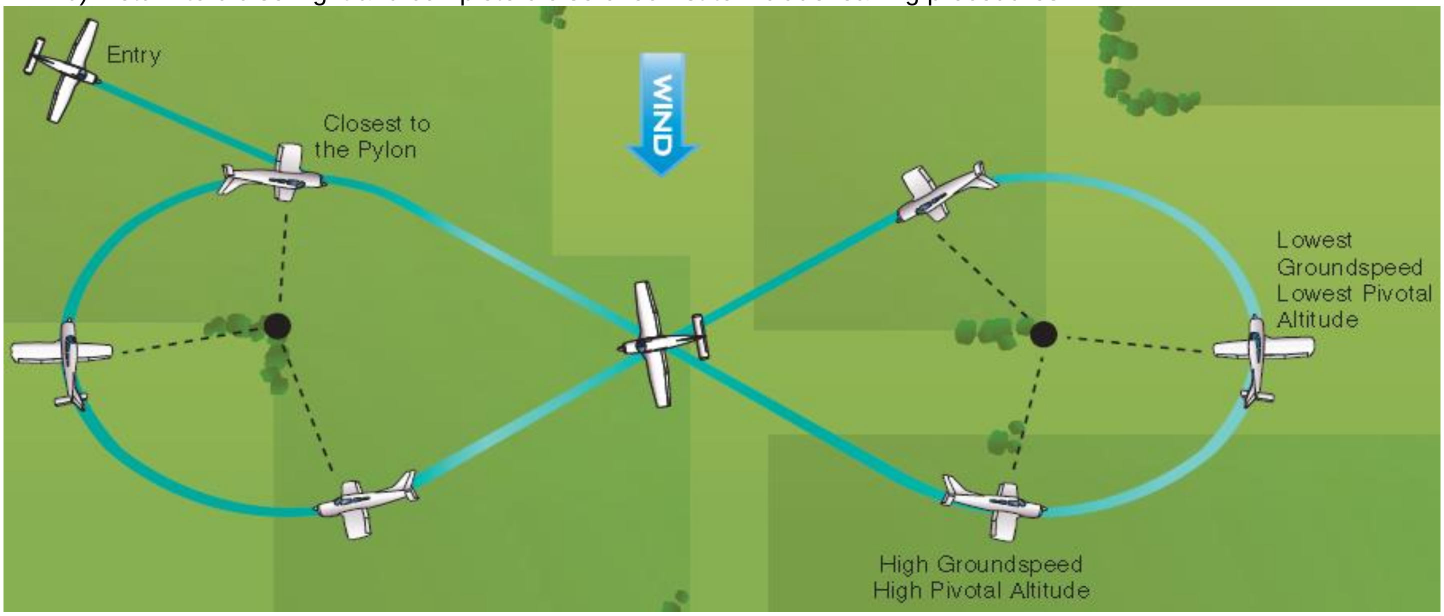
To develop a fine control touch, coordination, and the division of attention necessary for accurate and safe maneuvering of the airplane.

Description:

The airplane is flown in circular paths, alternately left and right, in the form of a figure 8 around two selected points on the ground at such a precise altitude and airspeed that a line parallel to the airplane's lateral axis appears to pivot on each of the pylons.

Setup Procedure:

1) Select two pylons perpendicular to the wind with suitable emergency landing area within gliding distance and a distant apart to obtain a 3 to 5 second straight and level flight segement.
2) Perform clearing turns.
3) Select appropriate emergency landing field.
4) Establish the appropriate pivotal altitude.
5) Establish airspeed below V_A.
6) Enter the maneuver at a 45° to the downwind with the first turn to the left.
7) When abeam the pylon, begin your turn.
8) Maintain the point on your reference line by climbing or descending as the pivotal altitude changes.
9) Fly straight and level between pylons and repeat around the other pylon.
10) Return to cruise flight and complete cruise checklist to include leaning procedures.



Completion Standards:

- Exhibits knowledge of the elements related to eights on pylons.
- Determines the approximate pivotal altitude.
- Selects suitable pylons that will permit straight and level flight between the pylons.
- Enters the maneuver at the appropriate altitude and airspeed and at a bank angle of approximately 30° or 40° at the steepest point.
- Applies the necessary corrections so that the line of sight reference line remains on the pylon.
- Divides attention between accurate coordinated airplane control and outside visual references.
- Holds pylon using appropriate pivotal altitude avoiding slips and skids.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain how pivotal altitude is affected with changes in groundspeed.
- Compute pivotal altitude.
- Explain the relationship between pivotal altitude and angle of bank.

Safety Considerations:

- Clear the area of traffic and obstacles.
- Look for an emergency landing field nearby.
- Division of attention between maneuver and scanning for traffic.
- Maintain coordinated flight.

Common Errors:

- Faulty entry technique.
- Poor planning, orientation, and division of attention.
- Uncoordinated flight.
- Use of improper line of sight reference.
- Improper timing of turn entries and rollouts.
- Improper wind-drift correction between pylons.
- Selection of pylons where there is no suitable emergency landing area within gliding distance.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

C-172S

Passenger Briefing (C-172S)

Objective:

To provide a standard pre-flight briefing to passengers.

Description:

The pilot in command is required by the Federal Aviation Regulations to provide a passenger briefing.

Setup Procedure:

2) Before starting the engine the Pilot-in-Command will provide the passenger safety briefing to include, but not limited to:
   a. Designation of Pilot-in-Command.
   b. Procedures for positively exchanging flight controls.

      S
      i. Seat belts and shoulder harnesses (location and operation).
      ii. Seat belts & shoulder harnesses fastened for taxi, takeoff and landing.
      iii. Seat position adjusted and locked in place (controls and operation).

      A
      iv. Air vents (location and operation).
      v. All environmental controls (discussed).
      vi. Action in case of any passenger discomfort.

      F
      vii. Fire extinguisher (location and operation).
      viii. Smoking is prohibited.

      E
      ix. Exit doors (how to secure; how to open).
      x. Emergency evacuation plan.
      xi. Emergency/survival kit (location and contents).
      xii. Equipment (location & operation, i.e., ELT, flight controls).

      T
      xiii. Traffic (scanning, spotting, notifying pilot).
      xiv. Talking ("sterile cockpit" expectations).

      Y
      xv. Your questions?

Flight Proficiency Standards:

- Briefs occupants on the use of safety belts, shoulder harnesses, doors, and emergency procedures.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance and regulatory requirement for providing a passenger briefing.

Common Errors:

- Failure to perform a passenger briefing.
- Incomplete passenger briefing.

References:

Airman Airman Certification Standards, Federal Aviation Regulations, AC 121-24, AOPA Passenger Safety Briefing Video

Normal & Crosswind Takeoff & Climb (C-172S)

Objective:

To move the airplane from its starting position on the runway, become airborne, and establish a positive climb to a safe maneuvering altitude.

Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane is accelerated to an airspeed that provides sufficient lift to become airborne.
2) The rotation, when the pilot increases elevator back pressure, increasing the angle of attack to lift the nose wheel.
3) The initial climb when the airplane leaves the ground and establishes a pitch attitude to climb away from the runway.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete takeoff checklist and takeoff briefing.
3) Use aircraft lighting as recommended by the current version of AC 91-73.
4) Ensure runway is clear, align aircraft with runway centerline, confirm HSI is aligned with runway, and ensure nose wheel is straight.
5) Position flight controls for wind for existing conditions.
6) Advance throttle smoothly to takeoff power ensuring toes are resting on rudder pedals, not on brakes.
7) Check engine instruments during takeoff roll for normal indications.
8) Maintain directional control with rudder pedals and crosswind control with appropriate aileron deflection
9) Maintain a slightly tail low attitude.
10) Upon reaching rotation speed, 55 kts (V_R), increase back elevator pressure to establish the lift-off attitude that is approximately that for V_Y and allow the aircraft to fly off the ground.
11) Apply adequate drift correction to maintain runway centerline.
12) Accelerate to 74 kts (V_Y).
13) At 500 ft., or as workload permits, complete climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to normal and crosswind takeoff, climb operations and rejected takeoff procedures.
- Positions the flight controls for the existing wind conditions.
- Clears the area, taxies onto the takeoff surface and aligns the airplane on the runway center/takeoff path.
- Lifts off at the recommended airspeed and accelerates to V_Y.
- Establishes a pitch attitude that will maintain V_Y ±5 kts.
- Retracts the landing gear if appropriate, and flaps after a positive rate of climb is established.
- Maintains takeoff power and V_Y ±5 kts.
- Maintains directional control, proper wind-drift correction throughout the takeoff and climb.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain runway selection criteria.
- Discuss how to maintain directional control during the ground roll.
- Discuss proper lift-off technique.
- Explain how to use ailerons during crosswind situations.
- Describe how to correct for wind-drift.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not force aircraft off runway too early, causing it to settle back on the runway.
- Consider the effect of density altitude on performance.
- Do not retract landing gear too soon.
- Do not allow upwind wing to rise during takeoff.
- Do not exceed maximum demonstrated crosswind velocity.

Common Errors:

- Improper runway incursion avoidance procedures.
- Inappropriate lift-off procedures.
- Improper climb attitude, power setting, and airspeed.
- Improper use of checklists.
- Improper positioning of the flight controls and wing flaps.
- Drift during climb.
- Failure to establish and maintain proper climb configuration and airspeeds.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Short-Field Takeoff & Climb (C-172S)

Objective:

To move the airplane from its starting position on the runway, become airborne, and establish a positive climb to a safe maneuvering altitude when the takeoff area is short or restricted by obstructions.

Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane is accelerated to an airspeed that provides sufficient lift to become airborne.
2) The rotation, when the pilot increases elevator back pressure, increasing the angle of attack to lift the nose wheel.
3) The initial climb when the airplane leaves the ground and a pitch attitude is established to climb away from the runway and clear a 50 foot obstacle.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete Short-Field takeoff checklist and takeoff briefing.
3) Set flaps to 10°.
4) Use aircraft lighting as recommended by the current version of AC 91-73.
5) Back taxi and align aircraft with runway centerline, confirm HSI is aligned with runway, and ensure nose wheel is straight.
6) Ensure runway is clear, advance throttle smoothly to takeoff power while holding brakes; check engine instruments.
7) Release brakes and ensure toes are resting on rudder pedals, not brakes.
8) Maintain directional control with rudder pedals and appropriate aileron deflection.
9) Upon reaching rotation speed, 55 kts (V_R), increase back elevator pressure to establish lift-off attitude and allow aircraft to fly off ground.
10) Accelerate the aircraft to 56 kts until obstacle is cleared or 50 feet above takeoff surface is attained and then accelerate to 74 kts (V_Y).
11) Retract flaps after a safe altitude of at least 200 ft. and an airspeed of 74 kts are attained.
12) At 500 ft., or as workload permits, complete climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a short-field takeoff and maximum performance climb.
- Positions the flight controls for the existing wind conditions, sets flaps as recommended.
- Clears the area; taxies into takeoff position utilizing maximum available takeoff area and aligns the airplane on the runway center/takeoff path.
- Applies brakes (if appropriate) while advancing the throttle smoothly to takeoff power.
- Lifts off at the recommended airspeed, and accelerates to recommended obstacle clearance airspeed, or V_X.
- Establishes a pitch attitude that will maintain the recommended obstacle clearance airspeed, or V_X +5/-0 kts, until the obstacle is cleared, or until the airplane is 50 feet above the surface.
- After clearing the obstacle, establishes the pitch attitude for V_Y, accelerates to V_Y, and maintains V_Y ±5 kts, during the climb.
- Retracts the landing gear, if appropriate and flaps after clear of any obstacles or as recommended by manufacturer.
- Maintains takeoff power and V_Y ±5 kts to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Completes appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain runway selection criteria.
- Discuss how to maintain directional control during ground roll.
- Discuss proper lift-off technique.
- Explain the difference between V_X and V_Y.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not force aircraft off runway too early, causing it to settle back onto runway.
- Do not force aircraft to stay on the ground when it is ready to lift off, wheelbarrow.
- Back taxi to ensure use of entire runway length.
- Retraction of gear and flaps as recommended.

Common Errors:

- Failure to position the airplane for maximum utilization of available runway.
- Improper runway incursion avoidance procedures.
- Improper use of controls during a short-field takeoff.
- Inappropriate lift-off procedures.
- Improper initial climb attitude, power setting and airspeed to clear obstacle.
- Improper use of checklists.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Soft-Field Takeoff & Climb (C-172S)

Objective:

To align the airplane with the takeoff path, become airborne as quickly as possible, and establish a positive climb to a safe maneuvering altitude.

Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane enters the runways with full up elevator deflection and accelerates to an airspeed at which the airplane will lift off.
2) The acceleration to lift off speed while remaining in ground effect.
3) The initial climb when the airplane establishes a pitch attitude to climb away from the runway.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete Short-Field takeoff checklist and takeoff briefing.
3) Set flaps to 10°.
4) Use aircraft lighting as recommended by the current version of AC 91-73.
5) Ensure runway is clear, taxi onto runway with back elevator pressure and align nose with runway centerline, confirm HSI is aligned with runway, without stopping or the use of brakes.
6) Smoothly advance throttle to takeoff power.
7) Ensure toes are resting on rudder pedals, not on brakes.
8) Check engine instruments during ground roll for normal indications.
9) Maintain directional control with rudder pedals and appropriate aileron deflection.
10) Use back elevator pressure to establish a positive pitch attitude and allow the aircraft to fly itself off the ground.
11) When the aircraft becomes airborne, reduce pitch to remain in ground effect while accelerating to 62 kts (V_X) then simultaneously climb and accelerate to 74 kts (V_Y).
12) Retract flaps after a safe altitude of at least 200 ft. and an airspeed of 74 kts are attained.
13) At 500 ft., or as workload permits, complete climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a soft-field takeoff and climb.
- Positions the flight controls for existing conditions and to maximize lift as quickly as possible.
- Clears the area; taxies onto takeoff surface at a speed consistent with safety without stopping while advancing the throttle smoothly to takeoff power.
- Establishes and maintains a pitch attitude that will transfer the weight of the airplane from the wheels to the wings as rapidly as possible.
- Lifts off at the lowest possible airspeed and remains in ground effect while accelerating to V_X.
- Establishes a pitch attitude for V_X or V_Y, as appropriate, and maintains selected airspeed ±5 kts, during the climb.
- Retracts the landing gear, if appropriate and flaps after clear of any obstacles or as recommended by the manufacturer.
- Maintains takeoff power and V_X or V_Y ±5 kts to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss proper soft-field takeoff technique.
- Explain runway selection criteria.
- Predict the height of ground effect and discuss its relevance.
- Discuss how to maintain directional control during ground roll.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not force the aircraft off runway too quickly.
- Do not retract landing gear too soon.
- Do not allow the airplane to climb above ground effect too soon, causing it to settle back onto the runway.

Common Errors:

- Improper runway incursion avoidance procedures.
- Improper use of controls during a soft-field takeoff.
- Improper lift-off procedures.
- Improper climb attitude, power setting and airspeed.
- Improper use of checklist.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Traffic Pattern (C-172S)

Objective:

To assure that air traffic flows into and out of an airport in an orderly manner.

Description:

The airplane is flown on a rectangular course around a runway at an altitude specified in the current Airport/Facility Directory or as outlined in the FAR/AIM.

Setup Procedure:

Departures

1) All departures:
    a. Fly the departure leg straight out until reaching traffic pattern altitude.
    b. Once reaching traffic pattern altitude, continue climbing and turn on course.

Arrivals

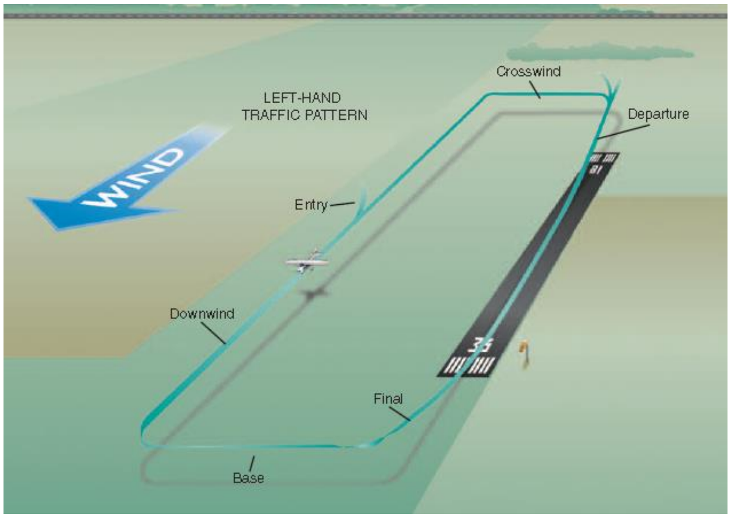
1) Prior to reaching 5 NM from the airfield, complete the following:
    a. Monitor local AWOS/ASOS/ATIS
    b. Ask "Is there any traffic between me and the airport?" and cancel flight following (if applicable)
    c. Complete the Before Landing checklist
2) Slow down below the approach flap airspeed prior to pattern entry.

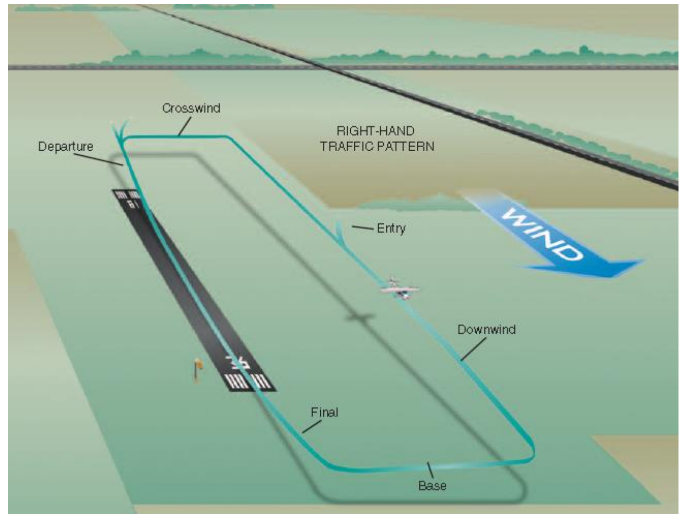
    If already established on the downwind side, skip to step 4.

3) For a midfield entry:
    a. Cross midfield 500' above traffic pattern altitude, observing traffic flow and wind direction.
    b. Fly 2-3 miles beyond the downwind leg, then descend to pattern altitude.
    c. Complete a tear-drop shaped turn to the right or left as necessary to position the aircraft at a 45 degree angle to the downwind leg.

    If less than two aircraft are currently in the pattern, the alternate method (cross midfield at traffic pattern altitude, enter directly into downwind leg) may be used.

4) Enter the traffic pattern at the designated traffic pattern altitude (normally 1,000' AGL) at a 45 degree angle to the downwind leg at midfield.
5) Apply appropriate crosswind correction to allow for a parallel flight path approximately ½ mile from the runway
6) Allow for proper spacing from other aircraft in the pattern as to prevent runway incursions upon landing.
7) Maintain airspeed below the flap speed required for each configuration change.





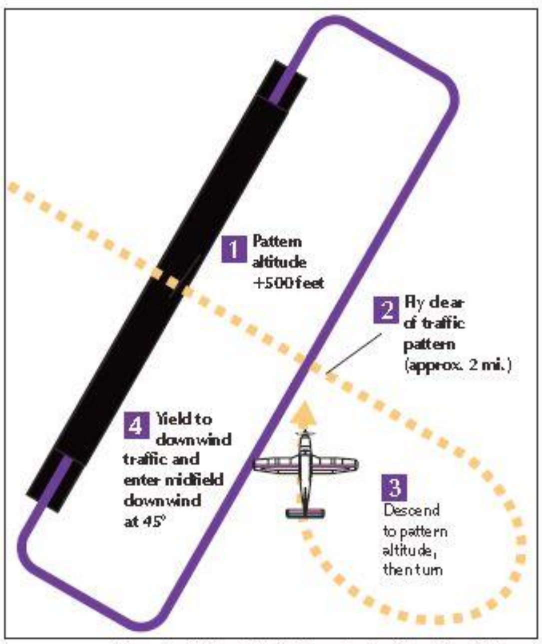


Figure 9. Preferred Entry from Upwind Leg Side of Airport

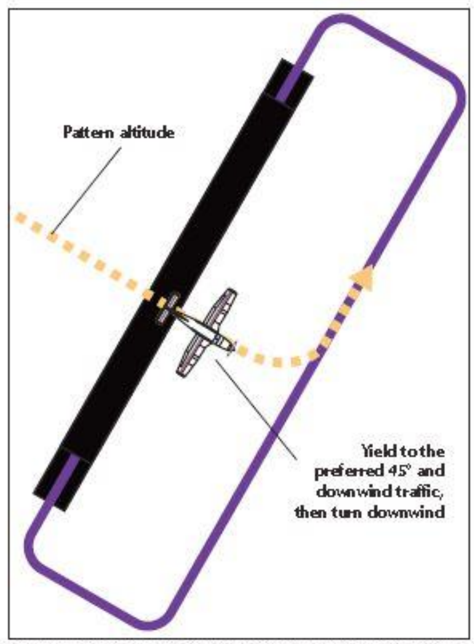


Figure 10. Alternate Midfield Entry from Upwind Leg Side of Airport

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to traffic patterns. This shall include procedures at airports with and without operating control towers, prevention of runway incursions, collision avoidance, wake turbulence avoidance, and wind shear.
- Complies with proper traffic pattern procedures.
- Maintains proper spacing from other aircraft.
- Corrects for wind drift to maintain the proper ground track.
- Maintains orientation with the runway/landing area in use.
- Maintains traffic pattern altitude, ±100 feet and the appropriate airspeed, ±10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss traffic patterns at controlled and uncontrolled airports.
- Explain traffic pattern procedures.
- Explain how to maintain the proper ground track.

Safety Considerations:

- Maintain proper traffic pattern altitude.
- Maintain a distance from the runway that is within power-off gliding distance.
- Preferred bank of 30 degrees while in pattern (and not to exceed 30) while in pattern.
- Maneuver within 300 feet of traffic pattern altitude before turning crosswind to base.
- Maintain proper aircraft separation.
- Comply with standards traffic pattern procedures or ATC instructions.

Common Errors:

- Failure to comply with traffic pattern instructions, procedures, and rules.
- Improper correction for wind drift.
- Inadequate spacing from other traffic.
- Poor altitude or airspeed control.
- Flying too wide of a pattern.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Normal & Crosswind Approach & Landing (C-172S)

Objective:

To safely transition the aircraft from flight to ground operations during normal conditions.

Description:

The aircraft is configured for a stabilized approach in the landing configuration and transitioned from the descent to touchdown.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
    a. Reduce power to approximately 1,300 RPM.
    b. Confirm flaps 10°.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 75 kts.
6) Turn on the base leg when 45° from the touchdown point:
    a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
    b. At key position, assess approach position.
    c. With wings level, set flaps to 20° as required.
    d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 70 kts.
7) Turn on final as to align the aircraft with the extended runway center line:
    a. Apply appropriate crosswind correction to maintain the extended runway centerline.
    b. Set flaps to 30° as required.
    c. Adjust pitch and power as required to maintain a stabilized approach, at 65 kts, toward the selected aiming point until flare to land.
    d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
8) During the flare to land simultaneously reduce power to idle and maintain aircraft approximately one foot above runway until it slows to stall speed and touches down on the runway centerline.
9) Maintain positive pitch attitude for aerodynamic braking.
10) Exit runway and complete after landing checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to normal and crosswind approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects a suitable touchdown point.
- Establishes the recommended approach and landing configuration and airspeed and adjust pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, or in its absence, nor more than 1.3 V_{S0} ±5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the round out and touchdown.
- Touches down smoothly at approximate stall speed.
- Touches down at or within 200 feet beyond a specified point, with no drift, and with the airplane's longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control through the approach and landing sequence.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain proper use of crosswind control inputs.

Safety Considerations:

- Observe flap extension speeds.
- Maintain proper airspeed at all times.
- Use proper crosswind correction to avoid drifting from runway centerline.
- Ensure landing gear is extended and locked.

Common Errors:

- Failure to establish proper crosswind correction.
- Improper use of landing performance data and limitations.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Failure to establish and maintain a stabilized approach.
- Improper technique during round out and touchdown.
- Improper use of brakes.
- Poor directional control after touchdown.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Short-Field Approach & Landing (C-172S)

Objective:

To safely transition from flight to ground operations at an airport with a relatively short runway or where an approach is made over obstacles.

Description:

The airplane is configured for a stabilized approach over a 50 foot obstacle. There will be little or no float during the round out, allowing the airplane to touch down at a specified point, and be stopped in a shorter than normal distance.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
   a. Reduce power to approximately 1,300 RPM.
   b. Confirm flaps 10°.
   c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 75 kts.
6) Turn on the base leg when 45° from the touchdown point:
   a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
   b. At key position, assess approach position.
   c. With wings level, set flaps to 20° as required.
   d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 70 kts.
7) Turn on final as to align the aircraft with the extended runway center line:
   a. Apply appropriate crosswind correction to maintain the extended runway centerline.
   b. Set flaps to 30° as required.
   c. Adjust pitch and power as required to maintain a stabilized approach, at 61 kts, to clear obstacles, toward the selected aiming point until flare to land.
   d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
   e. Complete the GUMPS check.
8) During the flare to land simultaneously reduce power as required and maintain aircraft approximately one foot above runway until it slows to stall speed and touches down on the runway centerline.
9) Maintain positive pitch attitude for aerodynamic braking.
10) Apply maximum braking to a complete stop without skidding the tires.
11) Exit runway and complete after landing checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a short-field approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects the most suitable touchdown point.
- Establishes the recommended approach and landing configuration and airspeed; adjusts pitch attitude and power.
- Maintains a stabilized approach and recommended approach airspeed, or in its absence, not more than 1.3 V_{SO} ±5 kts with wind gust factor applied.
- Makes smooth, timely, and correct control application during the round out and touchdown.
- Touches down smoothly at minimum control airspeed.
- Touches down at or within 100 feet beyond a specified point, with no side drift, minimum float and with the airplane's longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Applies brakes, as necessary, to stop in the shortest distance consistent with safety.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on an approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain how to compensate for obstacles and shortened runway lengths.

Safety Considerations:

- Maintain proper airspeed at all times.
- Compensate for crosswind.
- Do not skid tires.
- Use of aerodynamic braking as available.
- Ensure landing gear is extended and locked.

Common Errors:

- Failure to establish and maintain a stabilized approach.
- Improper technique in use of power, wing flaps, and trim.
- Excessive airspeed on final approach.
- Failure to establish proper crosswind correction.
- Improper use of landing performance data and limitations.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Improper use of brakes.
- Poor directional control after touchdown.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Soft-Field Approach & Landing (C-172S)

Objective:

To safely transition the airplane from flight to ground operations on a rough or soft surface.

Description:

The aircraft is configured for a stabilized approach in the landing configuration and transitioned from the descent to touchdown on a field that is unimproved.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
   a. Reduce power to approximately 1,300 RPM.
   b. Confirm flaps 10°.
   c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 75 kts.
6) Turn on the base leg when 45° from the touchdown point:
   a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
   b. At key position, assess approach position.
   c. With wings level, set flaps to 20° as required.
   d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 70 kts.
7) Turn on final as to align the aircraft with the extended runway center line:
   a. Apply appropriate crosswind correction to maintain the extended runway centerline.
   b. Set flaps to 30° as required.
   c. Adjust pitch and power as required to maintain a stabilized approach, at 65 kts toward the selected aiming point until flare to land.
   d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
   e. Complete the GUMPS check.
8) During the flare to land simultaneously reduce power as required to maintain aircraft approximately one foot above runway until it slows to stall speed.
9) Touch down at approximate stall speed on the runway centerline as smoothly as possible.
10) Maintain back elevator pressure to keep nose wheel off the ground as long as possible.
11) Maintain directional control with rudder and aileron deflection.
12) Adjust power as necessary to maintain aircraft movement on soft surfaces.
13) Exit the runway with minimal braking and complete after landing checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a soft-field approach and landing.
- Considers the wind conditions, landing surface, and obstructions, and selects the most suitable touchdown area.
- Establishes the recommended approach and landing configuration and airspeed; adjusts pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, or in its absence, not more than 1.3 V_{S0} ±5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the round out and touchdown.
- Touches down softly, with no drift, and with the airplane’s longitudinal axis aligned with the runway/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Maintains proper position of the flight controls and sufficient speed to taxi on the soft surface.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss effect of flaps on an approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain how to touchdown and maneuver the aircraft on soft of unimproved surfaces.

Safety Considerations:

- Do not land on fields that exceed the capabilities of the aircraft or pilot.
- Fly over and visually check the field prior to landing.
- Check field length and density altitude.
- UCM retractable gear aircraft can only land on paved, public, published runways.
- Ensure landing gear is extended and locked.

Common Errors:

- Failure to maintain elevator back-pressure after touchdown.
- Improper use of brakes.
- Failure to consider effect of wind and landing surface.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Power-Off 180° Accuracy Landing (C-172S)

Objective:

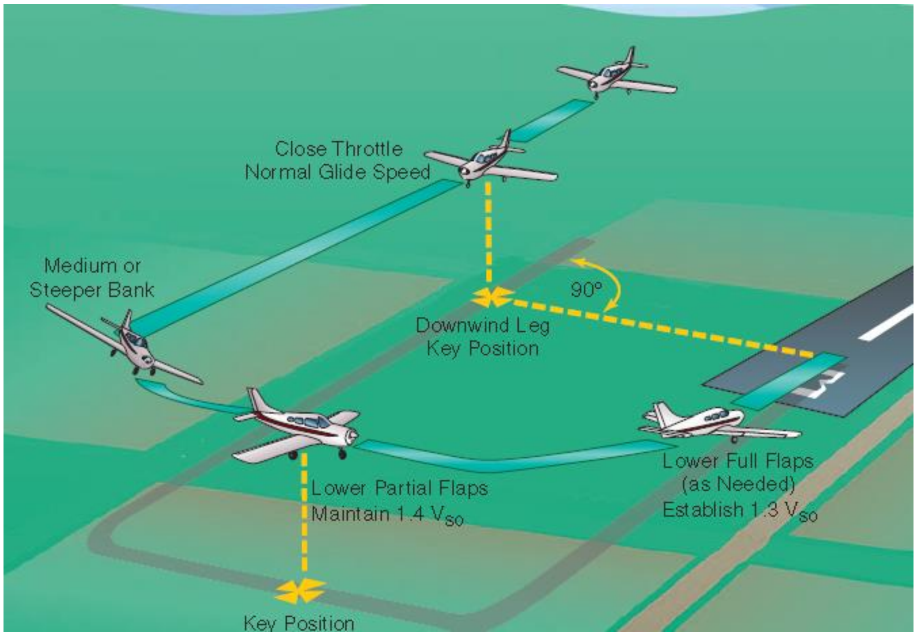
To instill in the pilot the judgment and procedures necessary for accurately flying the airplane, without power, to a safe landing.

Description:

Power-off accuracy approaches are approaches and landings made by gliding with the engine idling, through a specific pattern to a touchdown within 200 feet of a designated line or mark on the runway.

Setup Procedure:

1) Complete the before landing checklist.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming point.
4) When abeam the intended touchdown point:
    a. Close throttle.
    b. Set flaps 10°.
5) Maintain altitude while decelerating to the recommended glide speed 68 kts.
6) Base leg turn will be determined by the glide angle of the airplane, weight, and velocity of the wind.
7) Extend flaps as required.
8) Turn to final approach and extend flaps, as necessary.
9) Adjust trim and make slight adjustments in pitch attitude of flap setting to control glide angle and airspeed.
10) Touch down at approximate stalling speed on the runway centerline at the designated point.
11) Exit the runway and complete after landing checklist.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a power-off 180° accuracy approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects an appropriate touchdown point.
- Positions airplane on downwind leg, parallel to landing runway, and not more than 1,000 feet AGL.
- Abeam the specified touchdown point closes throttle and establishes appropriate glide speed.
- Completes final airplane configuration.
- Touches down in a normal landing attitude, at or within 200 feet beyond the specified touchdown point.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the effect of wind velocity on required altitude and bank angle.
- Discuss the importance of controlling glide angle and airspeed on final approach.

Safety Consideration:

- Maintain coordinated flight throughout the maneuver.
- Be aware of the position of other traffic in the pattern.
- Maintain appropriate airspeed throughout the maneuver.

Common Errors:

- Failure to touchdown within 200 feet of the intended touchdown point.
- Failure to maintain constant airspeed and glide angle.
- Failure to accurately determine the wind direction and velocity.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Touch and Go/Stop and Go (C-172S)

Objective:

To transition from a landing rollout to a takeoff roll while remaining on the runway.

Description:

A touch and go is a landing which transitions into a takeoff while the aircraft remains rolling on the runway.

Setup Procedure:

1) Perform a normal landing.
2) Upon touchdown:
    a. Allow the aircraft to continue rolling.
    b. Maintain runway centerline.
    c. Apply proper crosswind correction.
3) Reconfigure the aircraft for takeoff.
    a. Retract flaps to 10º.
    b. Set trim to the takeoff position.
4) Smoothly apply full-power.
5) Upon reaching rotation speed, 55 kts, increase back elevator pressure to establish the lift-off attitude that is approximately V_Y or V_X and allow the aircraft to fly off the ground.
6) Apply adequate drift correction to maintain runway centerline.
7) At a safe altitude, of at least 200 ft., retract flaps to 0º.
8) At 500 ft., or as workload permits, complete the climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to touch and go procedures.
- Maintains runway centerline upon touchdown.
- Applies proper crosswind controls upon touchdown, reconfiguration and climb out.
- Demonstrates proper aircraft reconfiguration.
- Lifts off at the recommended airspeed and accelerates to V_X or V_Y, as appropriate.
- Retracts flaps at 200' or a safe altitude, if appropriate.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Complies with noise abatement procedures.
- Completes the appropriate checklist.

Note: These are the UCM standards. The aforementioned standards are not found in the Airman Certification Standards.

Learning Outcomes:

- Explain the purpose(s) of touch and go's.
- Discuss how crosswind correction will change throughout the maneuver.
- Discuss the importance of maintaining runway centerline during aircraft reconfiguration.

Safety Considerations:

- Maintain runway centerline.
- Proper crosswind correction.
- Maintain situational awareness.
- Proper reconfiguration.

Common Errors:

- Failure to maintain runway centerline.
- Touchdown beyond the first 1/3rd of the runway and attempting a touch and go.
- Improper aircraft reconfiguration.
- Failure to use checklist.
- Failure to maintain adequate crosswind correction.

- Attempting to lift-off prior to rotation speed.

Go-Around (C-172S)

Objective:

To safely discontinue the landing approach when unsatisfactory conditions exist.

Description:

As full power is applied, the aircraft attitude is adjusted to accelerate to V_Y and climb. As a safe airspeed is attained, flaps are retracted 10° at a time allowing stabilization between each retraction.

Setup Procedure:

1) Simultaneously apply maximum power and establish a go-around pitch attitude.
2) Set flaps to 20°.
3) Establish a pitch attitude to accelerate to 55 kts.
4) Allow the airplane to accelerate to V_X or V_Y and climb.
5) If there is an aircraft on the runway, sidestep to clear the departure path of the airplane and allow the pilot to view the landing or departing traffic.
6) Set flaps to 10° and stabilize in between configuration changes then flaps to 0°.
7) Verify Go Around checklist is complete.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a go-around/rejected landing.
- Makes a timely decision to discontinue the approach to landing.
- Applies takeoff power immediately and transitions to climb pitch attitude for V_X, and maintains V_y+10/-5 kts.
- Retracts the flaps as appropriate.
- Retracts the landing gear, if appropriate, after a positive rate of climb is established.
- Maneuvers to the side of the runway/landing area to clear and avoid conflicting traffic.
- Maintains takeoff power V_y+10/-5 to a safe maneuvering altitude.
- Maintains takeoff power V_Y ±5 kts to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the climb.
- Completes the appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss events that may require a go-around.
- Explain the importance of maintaining airspeed and coordination during the go-around procedure.
- Discuss the necessity for maneuvering to the side of the runway after making the decision to go-around.

Safety Considerations:

- Maneuver the airplane to the side of the runway.
- Do not establish a pitch up attitude too quickly.
- Maintain coordination.
- Timely decision making.
- Be watchful for situation which may require a go-around.

Common Errors:

- Delayed decision to make a go-around.
- Improper application of power.
- Failure to control pitch attitude.
- Improper trim technique.
- Failure to compensate for torque effect.
- Failure to maintain V_Y as appropriate.
- Improper wing flap retraction.
- Improper gear retraction.
- Failure to maintain well clear of obstructions and other traffic.
- Improper use of checklists.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Emergency Descent (C-172S)

Objective:

To descend the airplane as soon and as rapidly as possible, within the structural limitations of the airplane.

Description:

The emergency descent is a maneuver for descending as rapidly as possible to a lower altitude or to the ground for an emergency landing.

Setup Procedure:

1) Perform clearing turns.
2) If utilizing flight following, contact ATC for traffic advisories below.
3) Reduce power to idle.
4) Confirm flaps 0º
5) Set mixture to rich.
6) Roll into a 30º - 45º bank to the left and pitch down to achieve 120 kts (If in turbulent air, maintain an airspeed below V_A).
7) Initiate recovery to level flight at least 300' prior to assigned altitude by:
   a. Rolling out the bank.
   b. Pitching up.
8) Return to cruise flight and complete the cruise checklist to include leaning procedures

Flight Proficiency Standards:

- Exhibit knowledge of the elements related to emergency descent.
- Recognizes situations, such as depressurization, cockpit smoke, and/or fire that require an emergency descent.
- Establish the appropriate airspeed and configuration for the emergency descent.
- Exhibit orientation, division of attention, and proper planning.
- Maintains positive load factors during the descent.
- Follow the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the purpose(s) of an emergency descent.
- Discuss engine cooling characteristics during an emergency descent.
- Discuss the importance of proper planning as it pertains to emergencies.

Safety Considerations:

- Maintain positive aircraft control.
- Clear the engine periodically
- Clear below then GO.
- Steep spiral over airport.
- Continue on to emergency approach and landing.

Common Errors:

- Failure to recognize the urgency of the emergency descent.
- Failure to use emergency checklist for situation.
- Failure to maintain appropriate configuration and airspeed.
- Poor orientation, planning, and division of attention.

Maneuvering During Slow Flight (C-172S)

Objective:

To demonstrate the flight characteristics and controllability of an airplane at speeds lower than normal cruise and develop proficiency in performing maneuvers that require slow airspeeds.

Description:

Slow flight consists of slowing the aircraft to a minimum controllable airspeed in the landing configuration and maneuvering the aircraft while maintaining altitude and airspeed.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
2) Perform clearing turns.
3) Set mixture to rich.
4) Reduce power to 1,500 RPM or less.
5) Below 110 kts, set flaps to 10°.
6) Adjust pitch and power as necessary to maintain altitude.
7) Below 85 kts, set flaps to 20° and 30° allowing the aircraft to stabilize between each setting.
8) Establish and maintain an airspeed at which any further increase in pitch or reduction of power would result in an immediate stall or a higher speed as specified by your instructor.
    a. Slow flight should be practiced at varying speeds and configurations above the 1G stall speed of the aircraft as specified by the instructor.
9) Maneuver as instructed.
10) Recover when instructed by:
    a. Adding full power
    b. Set flaps to 20° and allow the aircraft to stabilize.
11) Then set flaps to 10° and 0° allowing the aircraft to stabilize between each setting.
12) Return to cruise flight and perform the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to maneuvering during slow flight.
- Selects an entry altitude that will allow the task to be completed no lower than 1,500' AGL.
- Establish and maintain an airspeed at which any further increase in angle of attack, increase in load factor, or reduction in power, would result in a stall warning (e.g., airplane buffet, stall horn, etc.).
- Accomplishes coordinated straight and level flight, turns, climbs, and descents with landing gear and flap configurations specified by the instructor.
- Divides attention between airplane control and orientation.
- Maintains the specified altitude, ±50 feet; specified headings, ±10°; airspeed +5/-0 kts, and specified angle of bank, ±5°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the relationship between pitch and power in maintaining airspeed and altitude during slow flight.
- Discuss how flight at minimum airspeeds develops the ability to estimate the margin of safety above the stalling speed.
- Compare the practice of slow flight to various phases of flight such as; takeoffs, climbs, descents, go-around, and approaches to landing.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified flap configuration.
- Improper entry technique.
- Failure to establish and maintain the specified airspeed.
- Excessive variations of altitude and heading when a constant altitude and heading are specified.
- Rough or uncoordinated control technique.
- Improper correction for left turning tendency.
- Improper trim technique.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Power – Off Stall (C-172S)

Objective:

To familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop the skills to prevent and recover from stalls in the landing configuration.

Description:

The aircraft is slowed down and placed in the landing configuration after which a stall is induced and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery by at least 1,500' AGL.
2) Perform clearing turns.
3) Set mixture to rich.
4) Reduce power to 1,500 RPM or less allowing the aircraft to slow to approach speed while maintaining altitude.
5) Below 110 kts, set flaps to 10°.
6) Below 85 kts, set flaps to 20° and 30° allowing the aircraft to stabilize between each setting.
7) Establish a stabilized descent at 65 kts.
8) Reduce power to idle.
9) Maintain coordinated flight and altitude until recognition of the stall.
10) Recognize and recover from the impending stall (aerodynamic buffeting) by simultaneously reducing the angle of attack, leveling the wings, and adding full power.
11) Set flaps to 20°.
12) Accelerate the aircraft to V_X (recommended) or V_Y and climb while retracting the remaining flaps in 10° increments.
13) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to power-off stalls.
- Selects an entry altitude that allows the task to be completed no lower than 1,500' AGL.
- Establishes a stabilized descent in the approach or landing configuration, as specified by the instructor.
- Transitions smoothly from the approach or landing attitude to a pitch attitude that will induce a stall.
- Maintains a specified heading, ±10° in straight flight; maintains a specified angle of bank, not to exceed 20°, ±5°, in turning flight while inducing the stall.
- Recognizes and recovers promptly as the stall occurs by simultaneously reducing the angle of attack, increasing power to maximum allowable and leveling the wings to return to a straight and level flight attitude with a minimum loss of altitude appropriate for the airplane.
- Retracts the flaps to the recommended setting, retracts the landing gear if retractable after a positive rate of climb is established.
- Accelerates to V_X or V_Y speed before the final flap retraction.
- Returns to the altitude, heading, and airspeed specified by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.

- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Power – On Stall (C-172S)

Objective:

To familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in the takeoff configuration.

Description:

The aircraft is slowed down and placed in the takeoff configuration after which a stall is induced and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
2) Perform clearing turns.
3) Set mixture to rich.
4) Reduce power to 1200 RPM or less, allowing the aircraft to slow to takeoff speed while maintaining altitude.
5) Add full power at 55 kts (V_R).
6) Transition smoothly to the pitch attitude that will induce a stall.
7) Recognize and recover from the impending stall (aerodynamic buffeting) by simultaneously reducing the angle of attack, leveling the wings, and adding full power.
8) Accelerate the aircraft to 74 kts (V_Y) and climb.
9) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to power-on stalls.
- Selects an entry altitude that allows the task to be completed no lower than 1,500' AGL.
- Establishes the takeoff or departure configuration. Sets power to no less than 65 percent available power.
- Transitions smoothly from the takeoff or departure attitude to a pitch attitude that will induce a stall.
- Maintains a specified heading ±5°, in straight flight; maintains a specified angle of bank, not to exceed a 20°, ±10°, turning flight, while inducing the stall.
- Recognizes and recovers promptly as the stall occurs by simultaneously reducing the angle of attack, increasing power to maximum allowable and leveling the wings to return to a straight and level flight attitude, with a minimum loss of altitude appropriate for the airplane.
- Retracts flaps to the recommended setting and retracts the landing gear if retractable after a positive rate of climb is established.
- Accelerates to V_X or V_Y speed before the final flaps retraction; returns to the altitude, heading, and airspeed specified by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Accelerated Stall (C-172S)

Objective:

To familiarize the pilot with the conditions that produce accelerated stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in an accelerated configuration.

Description:

The aircraft is slowed down and placed in the clean configuration. After which a steep turn is applied with excessive back elevator pressure and therefore a stall is induced at a higher than normal stalling speed and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery by at least 3,000' AGL.
2) Perform clearing turns.
3) Reduce power to 1500 RPM allowing the aircraft to slow below maneuvering speed while maintaining altitude.
4) Set mixture to rich.
5) Verify flaps up.
6) Upon reaching 75 kts, transition smoothly to an approximate 45 degree bank and apply back pressure to induce an accelerated stall.
7) Recognize and recover from the stall (aerodynamic buffeting) as the stall occurs by simultaneously leveling the wings, reducing the angle of attack, and increasing power.
8) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to accelerated stalls.
- Selects an entry altitude that allows the task to be completed no lower than 3,000' AGL.
- Establishes the configuration as specified by the instructor.
- Establish and maintain a coordinated turn in a 45° bank, increasing elevator back pressure smoothly and firmly until an impending stall is reached.
- Recognizes and recovers promptly at the first indication of an impending stall.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.

- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Cross-Control Stall (C-172S)

Objective:

To familiarize the pilot with the conditions that produce cross-control stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in a cross-control configuration.

Description:

The aircraft is left in a clean configuration while power is reduced to simulate landing conditions after which a stall is initiated by using excessive rudder in the direction of the base-to-final turn and back elevator pressure is applied to keep the nose from lowering. Recovery procedures should be initiated at first indication of stall by applying full power and removing opposite aileron and rudder inputs simultaneously.

Setup Procedure:

1) Select an altitude which allows recovery by 3000' AGL.
2) Perform clearing turns.
3) Reduce power to 1300 RPM allowing the aircraft to slow to 65 kts while maintaining altitude.
4) Set mixture to rich.
5) Verify flaps up.
6) Select a point on the ground to act as a runway and position aircraft on a base leg.
7) Upon reaching 65 kts begin a "base-to-final" turn that overshoots final approach and simultaneously:
    a. Correct for final approach path by smoothly applying excessive rudder in the direction of turn.
    b. Use opposite aileron to hold constant bank.
    c. Increase elevator back pressure to keep the nose from dropping below horizon.
8) Recognize and recover from the impending stall (aerodynamic buffeting) by simultaneously reducing the angle of attack, removing opposite rudder and aileron inputs, and adding full power.
9) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards

- Exhibits knowledge of the elements of the elements of cross-controlled stalls, with the landing gear extended.
- Exhibits instructional knowledge of common errors related to cross-control stalls, with the landing gear extended.
- Demonstrates and simultaneously explains a cross-control stall, with landing gear extended, from an instructional standpoint.
- Analyzes and corrects simulated common errors related to a cross-control stall with the landing gear extended.

Note: These are the PTS standards for the CFI certificate as these maneuvers are only to be demonstrated to commercial pilot students and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a cross-control stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a cross-control stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.

- Failure to recognize indications of a stall.
- Spin entry due to stalling aircraft in uncoordinated condition.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; CFI PTS

Elevator Trim Stall (C-172S)

Objective:

To familiarize the pilot with the conditions that produce elevator trim stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls with excessive elevator trim.

Description:

The aircraft is left in a clean configuration while power is reduced to simulate landing conditions and elevator trim is added to maintain a stable descent. After which a go-around is simulated with the excessive trim and therefore a stall attitude is reached rapidly and recovery is initiated returning the aircraft to normal cruise.

Setup Procedure:

1) Select an altitude which allows recovery by 3000' AGL.
2) Perform clearing turns.
3) Reduce power to 1,500 RPM or less allowing the aircraft to slow to approach speed while maintaining altitude.
4) Below 110 kts, set flaps to 10°.
5) Below 85 kts, set flaps to 20° and 30° allowing the aircraft to stabilize between each setting.
6) Apply nose up elevator trim to establish a descent at 65kts.
7) Once a 65 kt descent has been established simulate a go-around by applying full power.
8) Recognize and recover once an attitude has been reached that would result in an impending stall by:
   d. Reducing angle of attack.
   e. Hold forward elevator pressure while reducing nose up elevator trim.
   f. Set flaps to 20°
9) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits instructional knowledge of the elements of elevator trim stalls, in selected landing gear and flap configurations.
- Exhibits instructional knowledge of common errors related to elevator trim stalls, in selected landing gear and flap configurations.
- Demonstrates and simultaneously explains elevator trim stalls, in selected landing gear and flap configurations, from an instructional standpoint.
- Analyzes and corrects simulated common errors related to elevator trim stalls in selected configurations.

Note: These are the PTS standards for the CFI certificate as these maneuvers are only to be demonstrated to commercial pilot students and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of an elevator trim stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from an elevator trim stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.
- Forward elevator pressure required in recovery.

Common Errors:

- Failure to establish specified configuration.

- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Spin entry due to stalling aircraft in uncoordinated condition.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; CFI PTS

Secondary Stall (C-172S)

Objective:

To familiarize the pilot with the conditions that produce secondary stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls that could occur due to improper recovery techniques.

Description:

The aircraft configured for and placed into a power off stall. During recovery a secondary stall is induced by abrupt control inputs, attempting to return to normal cruise to early, or by not adequately reducing angle of attack during initial stall recovery.

Setup Procedure:

1) Select an altitude which allows recovery by at least 3,000' AGL.
2) Reduce power to 1,500 RPM or less allowing the aircraft to slow to approach speed while maintaining altitude.
3) Below 110 kts, set flaps to 10°.
4) Below 85 kts, set flaps to 20° and 30° allowing the aircraft to stabilize between each setting.
5) Establish a stabilized descent at 65 kts.
6) Reduce power to idle.
7) Maintain coordinated flight and altitude until recognition of the stall.
8) Induce secondary stall by:
    a. Allowing nose to pitch down, but immediately pitch the nose up excessively to maintain desired altitude. or
    b. Hold aircraft in stall by not reducing angle of attack.
9) Recover from the secondary stall (aerodynamic buffeting) by simultaneously reducing the angle of attack, leveling the wings, and adding full power.
10) Set flaps to 20°.
11) Accelerate the aircraft to V_X (recommended) or V_Y and climb while retracting the remaining flaps in 10° increments.
12) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits instructional knowledge of the elements of secondary stalls, in selected configurations.
- Exhibits instructional knowledge of common errors related to secondary stalls, in selected configurations.
- Demonstrates and simultaneously explains secondary stalls, in selected landing gear and flap configurations, form an instructional standpoint.
- Analyzes and corrects simulated common errors related to secondary stalls in selected configurations.

Note: These are the PTS standards for the CFI certificate as these maneuvers are only to be demonstrated to commercial pilot students and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a secondary stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a secondary stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Spin entry due to stalling aircraft in uncoordinated condition.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.

References:

Airplane Flying Handbook; POH/AFM; CFI PTS

Steep Turns (C-172S)

Objective:

To develop coordination, orientation, division of attention and smooth control techniques while executing high performance turns.

Description:

The maneuver consists of two 360° turns in opposite directions, using a bank angle of 50° while maintaining a constant airspeed and altitude.

Setup Procedure:

1) Select an altitude which allows performance of maneuver no lower than 1,500' AGL.
2) Perform clearing turns.
3) Adjust the mixture in accordance with the POH.
4) Reduce power to establish an airspeed of 95 kts.
5) Enter a coordinated 50° banking turn to the left or right.
6) Increase power and adjust trim and pitch as required to maintain altitude and airspeed.
7) Begin rollout at ½ the bank angle prior to rollout heading.
8) Reduce power and pitch on rollout as needed to remain at 95 kts.
9) Continue the maneuver in the opposite direction.
10) Reduce power and pitch on rollout as needed to remain at 95 kts.
11) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to steep turns.
- Establishes the manufacturer's recommended airspeed or if one is not stated, a safe airspeed not to exceed Va.
- Rolls into a coordinated 360° steep turn with at least a 50° bank, followed by a 360° turn in the opposite direction.
- Divides attention between airplane control and orientation.
- Maintains the entry altitude, ±100 feet, airspeed, ±10 kts, bank, ±5°, and rolls out on the entry heading, ±10°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain why load factor increases as bank angle increases.
- Discuss the relationship between load factor and stall speed.
- Discuss the principle of over-banking tendency.
- Explain how to maintain altitude and airspeed.
- Explain limit load factor and what happens if it's exceeded.

Safety Considerations:

- Do not exceed manufacturer's recommended airspeed or Va.
- Always clear the area before initiating the maneuver.
- The maneuver is to be completed no lower than 1,500' feet AGL.
- Division of attention between maneuver and scanning for traffic.

Common Errors:

- Improper pitch, bank, and power coordination during entry and rollout.
- Uncoordinated use of flight controls.
- Improper procedure in correcting altitude deviations.
- Loss of orientation.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Chandelle (C-172S)

Objective:

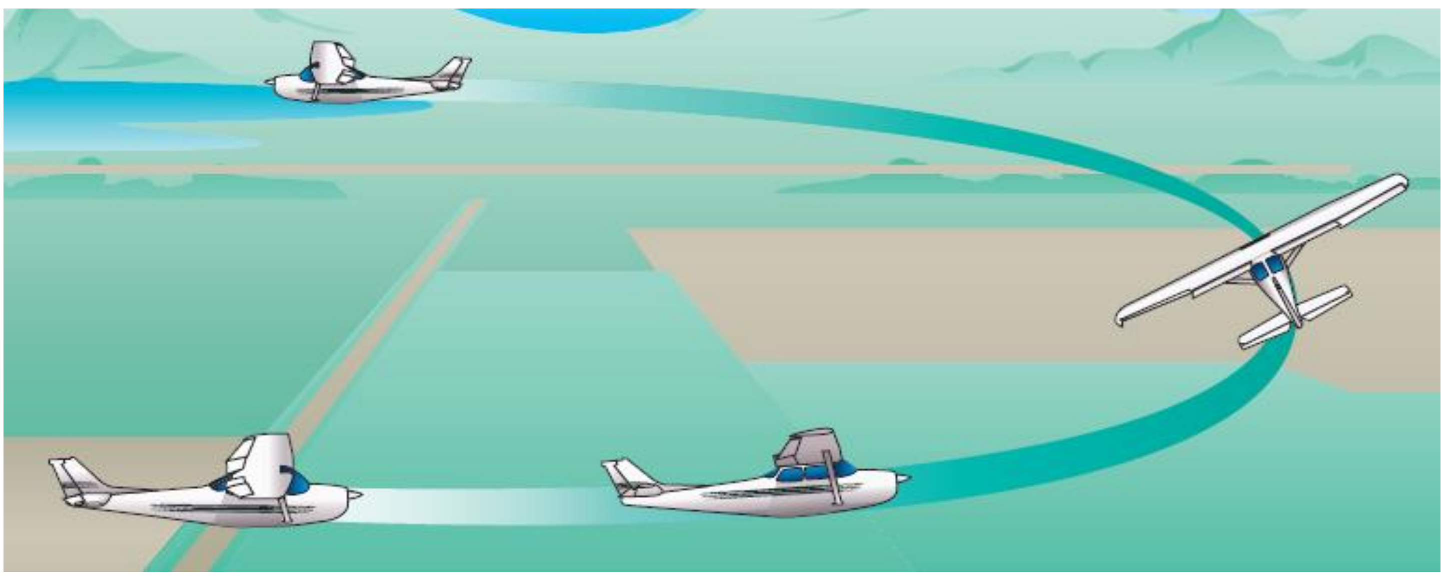
To develop the pilot's coordination, orientation, planning and accuracy of control during maximum performance flight.

Description:

A chandelle is a maximum performance climbing turn beginning from approximately straight and level flight, and ending at the completion of a 180° turn in a wings level, nose high attitude at the minimum controllable airspeed.

Setup Procedure:

1) Select an altitude to perform the maneuver no lower than 1,500' AGL.
2) Perform clearing turns.
3) Orient the airplane so that the turn is into the wind.
4) Maintain an airspeed of 105 kts.
5) Establish a 30° bank turn.
6) Simultaneously apply full power and pitch to maintain a smooth coordinated climbing turn to the 90° degree point with a constant bank.
7) At the 90° point, gradually increase back pressure to maintain pitch attitude and begin a coordinated roll out to reach wings level at the 180° point, just above the stall speed.
8) At the 180° point, establish level flight within 50 feet of final altitude.
9) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to chandelles.
- Selects an altitude that will allow the maneuver to be performed no lower than 1,500' AGL.
- Establishes the recommended entry configuration, power and airspeed.
- Establishes the angle of bank at approximately 30°.
- Simultaneously applies power and pitch to maintain a smooth, coordinated climbing turn to the 90° point, with a constant bank.
- Begins a coordinated constant rate rollout from the 90° point to the 180° point maintaining power and a constant pitch attitude.
- Completes rollout at the 180° point, ±10° just above stall airspeed, and maintains that airspeed momentarily avoiding a stall.
- Resumes straight and level flight with minimum loss of altitude.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Coordination during high power settings and high angles of attack.
- Maneuvering the aircraft at high performance levels.

Safety Considerations:

- This maneuver should be performed no lower than 1,500' AGL.
- Divide attention between flying the airplane and scanning for traffic.
- Maintain coordinated flight.

Common Errors:

- Improper pitch, bank, and power coordination during entry or completion.
- Uncoordinated use of flight controls.
- Improper planning and timing of pitch and bank attitude changes.
- Factors related to failure in achieving maximum performance.
- A stall during the maneuver.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Lazy Eights (C-172S)

Objective:

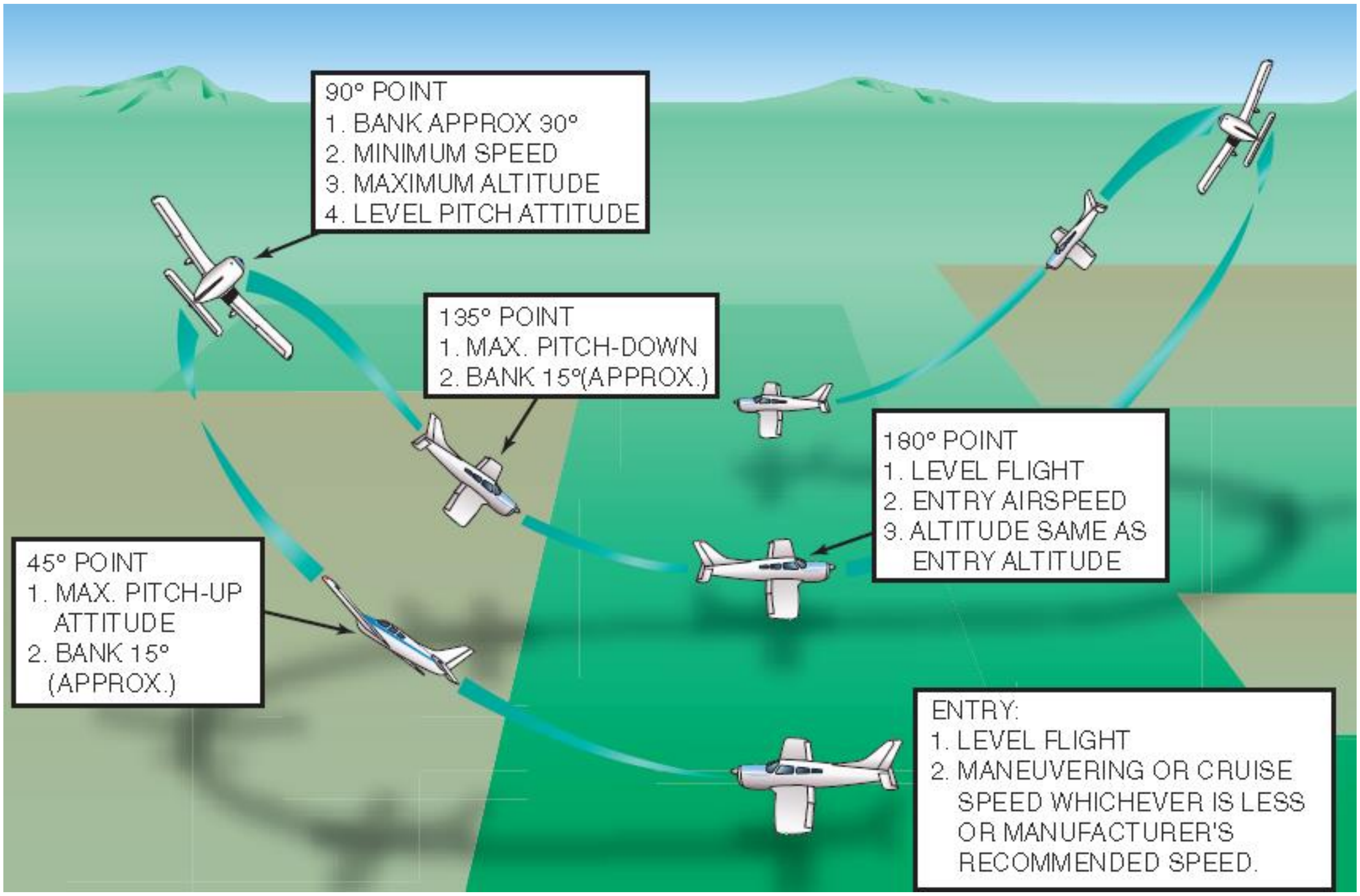
To develop coordination of controls through a wide range of airspeeds and altitudes so that certain accuracy points are reached with planned attitude and bank.

Description:

Two 180° turns, in opposite direction, while making a climb and a descent in a symmetrical pattern during each of the turns. At no time is the airplane flown straight and level.

Setup Procedure:

1) Select an altitude to perform the maneuver no lower than 1,500' AGL.
2) Perform clearing turns.
3) Orient the airplane so that the first turn is to the left and into the wind.
4) Maintain an airspeed of 105 kts.
5) Begin the maneuver by constantly changing pitch and bank to achieve the following:
    a. 45° point – 15° of bank and max pitch up.
    b. 90° point – 30° of bank, level pitch attitude, minimum controllable airspeed.
    c. 135° point – 15° of bank and max pitch down.
    d. 180° point – back to starting airspeed, altitude, and reciprocal heading.
6) Repeat in opposite direction.
7) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to lazy eights.
- Selects an altitude that will allow the maneuver to be performed no lower than 1,500' AGL.
- Establishes the recommended entry configuration, power, and airspeed.
- Maintains coordinated flight throughout the maneuver.
- Achieves the following throughout the maneuver
  - Approximately 30° bank at the steepest point.
  - Constant change of pitch and roll rate.
  - Altitude tolerance at 180° points, ±100 feet from entry altitude.
  - Airspeed tolerance at the 180° point, ±10 kts from entry airspeed.
  - Heading tolerance at the 180° point ±10°.
- Continues the maneuver through the number of symmetrical loops specified and resumes straight and level flight.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance of proper power setting.
- Explain the need for differing amounts of rudder pressure between the left and right turn.
- Discuss the effects of torque at the top of the eight in both the right and left turns.

Safety Considerations:

- Always clear the area before beginning a maneuver.
- Maintain coordination at all times during the maneuver.
- Use proper division of attention to see and avoid traffic.

Common Errors:

- Uncoordinated use of flight controls.
- Inconsistent airspeed and altitude at key points in the maneuver.
- Loss of orientation.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Steep Spiral (C-172S)

Objective:

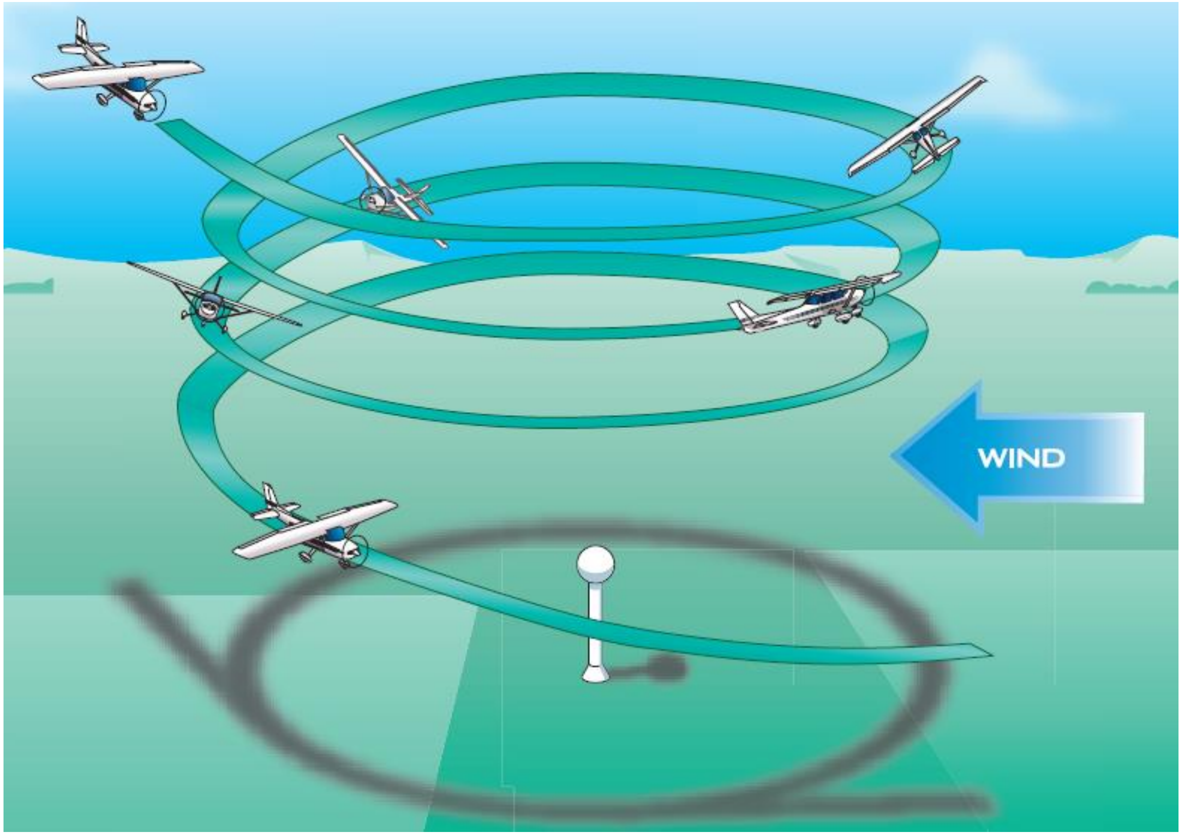
To improve pilot techniques for airspeed control, wind drift control, planning, orientation, and division of attention.

Description:

A steep spiral is a constant gliding turn, during which a constant radius around a point on the ground is maintained.

Setup Procedure:

1) Begin the maneuver with sufficient altitude to allow for three 360° degree turns without descending below 1,500' feet AGL.
2) Perform clearing turns.
3) Select a point to perform the maneuver around.
4) Enter on a downwind heading.
5) Reduce power and slow to 78 kts.
6) Reduce the power to idle when abeam the point.
7) Maintain 78 kts ($V_{L/D}$ +10 kts).
8) Change bank angle as necessary to maintain an equal distance from the reference point 45-55° of bank at the steepest point in the turn, not to exceed 60°.
9) Clear the engine, momentarily advancing power to normal cruise power, on each upwind leg.
10) Roll out on a downwind heading.
11) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a steep spiral.
- Selects an altitude sufficient to continue through a series of at least three 360° turns.
- Selects a suitable ground reference point.
- Applies wind-drift correction to track a constant radius circle around the selected reference point with bank not to exceed 60° at steepest point in turn.
- Divides attention between airplane control and ground track, while maintaining coordinated flight.
- Maintains the specified airspeed, ±10 kts, rolls out toward specified heading, ±10°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the effect of bank angle on ground track.
- Discuss the effect of ground speed on the radius of the turn.
- Recognize the importance of clearing the engine during extended periods of engine operations at low power settings.

Safety Considerations:

- Clear the area.
- Divide attention between aircraft control and orientation.
- Choose a reference point with emergency landing field within gliding distance.

Common Errors:

- Failure to maintain constant radius around reference point.
- Failure to maintain constant airspeed.
- Uncoordinated use of flight controls.
- Loss of orientation.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Eights On Pylons (C-172S)

Objective:

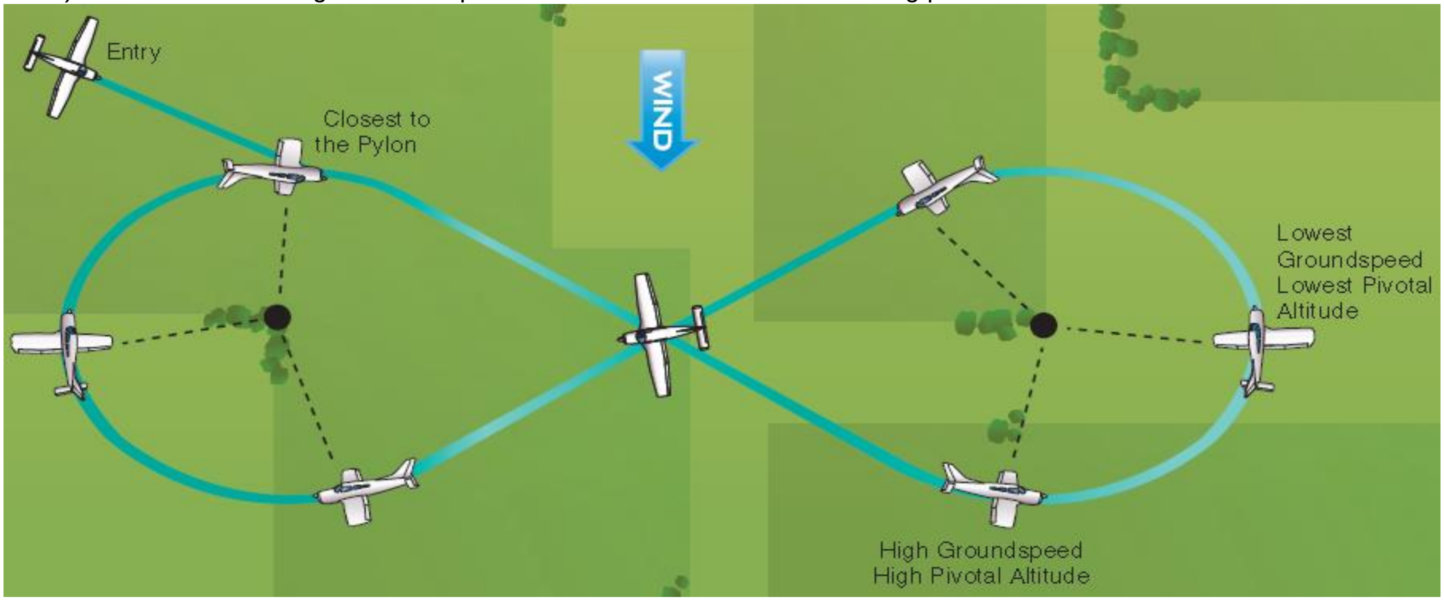
To develop a fine control touch, coordination, and the division of attention necessary for accurate and safe maneuvering of the airplane.

Description:

The airplane is flown in circular paths, alternately left and right, in the form of a figure 8 around two selected points on the ground at such a precise altitude and airspeed that a line parallel to the airplane's lateral axis appears to pivot on each of the pylons.

Setup Procedure:

1) Select two pylons perpendicular to the wind with suitable emergency landing area within gliding distance and a distant apart to obtain a 3 to 5 second straight and level flight segments.
1) Perform clearing turns.
2) Select appropriate emergency landing field.
3) Establish the appropriate pivotal altitude.
4) Establish airspeed below Va.
5) Enter the maneuver at a 45° to the downwind with the first turn to the left.
6) When abeam the pylon, begin your turn.
7) Maintain the point on your reference line by climbing or descending as the pivotal altitude changes.
8) Fly straight and level between pylons and repeat around the other pylon.
9) Return to cruise flight and complete cruise checklist to include leaning procedures.



Completion Standards:

- Exhibits knowledge of the elements related to eights on pylons.
- Determines the approximate pivotal altitude.
- Selects suitable pylons that will permit straight and level flight between the pylons.
- Enters the maneuver at the appropriate altitude and airspeed and at a bank angle of approximately 30° or 40° at the steepest point.
- Applies the necessary corrections so that the line of sight reference line remains on the pylon.
- Divides attention between accurate coordinated airplane control and outside visual references.
- Holds pylon using appropriate pivotal altitude avoiding slips and skids.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain how pivotal altitude is affected with changes in groundspeed.
- Compute pivotal altitude.
- Explain the relationship between pivotal altitude and angle of bank.

Safety Considerations:

- Clear the area of traffic and obstacles.
- Look for an emergency landing field nearby.
- Division of attention between maneuver and scanning for traffic.
- Maintain coordinated flight.

Common Errors:

- Faulty entry technique.
- Poor planning, orientation, and division of attention.
- Uncoordinated flight.
- Use of improper line of sight reference.
- Improper timing of turn entries and rollouts.
- Improper wind-drift correction between pylons.
- Selection of pylons where there is no suitable emergency landing area within gliding distance.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

C-152

Passenger Briefing (C-152)

Objective:

To provide a standard pre-flight briefing to passengers.

Description:

The pilot in command is required by the Federal Aviation Regulations to provide a passenger briefing.

Setup Procedure:

1) Before starting the engine the Pilot-in-Command will provide the passenger safety briefing to include, but not limited to:
   a. Designation of Pilot-in-Command.
   b. Procedures for positively exchanging flight controls.

      S
      i. Seat belts and shoulder harnesses (location and operation).
      ii. Seat belts & shoulder harnesses fastened for taxi, takeoff and landing.
      iii. Seat position adjusted and locked in place (controls and operation).

      A
      iv. Air vents (location and operation).
      v. All environmental controls (discussed).
      vi. Action in case of any passenger discomfort.

      F
      vii. Fire extinguisher (location and operation).
      viii. Smoking is prohibited.

      E
      ix. Exit doors (how to secure; how to open).
      x. Emergency evacuation plan.
      xi. Emergency/survival kit (location and contents).
      xii. Equipment (location & operation, i.e., ELT, flight controls).

      T
      xiii. Traffic (scanning, spotting, notifying pilot).
      xiv. Talking ("sterile cockpit" expectations).

      Y
      xv. Your questions?

Flight Proficiency Standards:

- Briefs occupants on the use of safety belts, shoulder harnesses, doors, and emergency procedures.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance and regulatory requirement for providing a passenger briefing.

Common Errors:

- Failure to perform a passenger briefing.
- Incomplete passenger briefing.

References:

Airman Airman Certification Standards, Federal Aviation Regulations, AC 121-24, AOPA Passenger Safety Briefing Video

Normal & Crosswind Takeoff & Climb (C-152)

Objective:

To move the airplane from its starting position on the runway, become airborne, and establish a positive climb to a safe maneuvering altitude.

Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane is accelerated to an airspeed that provides sufficient lift to become airborne.
2) The rotation, when the pilot increases elevator back pressure, increasing the angle of attack to lift the nose wheel.
3) The initial climb when the airplane leaves the ground and establishes a pitch attitude to climb away from the runway.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete takeoff checklist and takeoff briefing.
3) Use aircraft lighting as recommended by the current version of AC 91-73.
4) Ensure runway is clear, align aircraft with runway centerline, confirm DG is aligned with runway, and ensure nose wheel is straight.
5) Position flight controls for wind for existing conditions.
6) Advance throttle smoothly to takeoff power ensuring toes are resting on rudder pedals, not on brakes.
7) Check engine instruments during takeoff roll for normal indications.
8) Maintain directional control with rudder pedals and crosswind control with appropriate aileron deflection
9) Maintain a slightly tail low attitude.
10) Upon reaching rotation speed, 50 kts (V_R), increase back elevator pressure to establish the lift-off attitude that is approximately that for V_Y and allow the aircraft to fly off the ground.
11) Apply adequate drift correction to maintain runway centerline.
12) Accelerate to 67 kts (V_Y).
13) At 500 ft., or as workload permits, complete climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to normal and crosswind takeoff, climb operations and rejected takeoff procedures.
- Positions the flight controls for the existing wind conditions.
- Clears the area, taxies onto the takeoff surface and aligns the airplane on the runway center/takeoff path.
- Lifts off at the recommended airspeed and accelerates to V_Y.
- Establishes a pitch attitude that will maintain V_Y ±5 kts.
- Retracts the landing gear if appropriate, and flaps after a positive rate of climb is established.
- Maintains takeoff power and V_Y ±5 kts.
- Maintains directional control, proper wind-drift correction throughout the takeoff and climb.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain runway selection criteria.
- Discuss how to maintain directional control during the ground roll.
- Discuss proper lift-off technique.
- Explain how to use ailerons during crosswind situations.
- Describe how to correct for wind-drift.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not force aircraft off runway too early, causing it to settle back on the runway.
- Consider the effect of density altitude on performance.
- Do not retract landing gear too soon.
- Do not allow upwind wing to rise during takeoff.
- Do not exceed maximum demonstrated crosswind velocity.

Common Errors:

- Improper runway incursion avoidance procedures.
- Inappropriate lift-off procedures.
- Improper climb attitude, power setting, and airspeed.
- Improper use of checklists.
- Improper positioning of the flight controls and wing flaps.
- Drift during climb.
- Failure to establish and maintain proper climb configuration and airspeeds.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Short-Field Takeoff & Climb (C-152)

Objective:

To move the airplane from its starting position on the runway, become airborne, and establish a positive climb to a safe maneuvering altitude when the takeoff area is short or restricted by obstructions.

Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane is accelerated to an airspeed that provides sufficient lift to become airborne.
2) The rotation, when the pilot increases elevator back pressure, increasing the angle of attack to lift the nose wheel.
3) The initial climb when the airplane leaves the ground and a pitch attitude is established to climb away from the runway and clear a 50 foot obstacle.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete Short-Field takeoff checklist and takeoff briefing.
3) Set flaps to 10°.
4) Use aircraft lighting as recommended by the current version of AC 91-73.
5) Back taxi and align aircraft with runway centerline, confirm DG is aligned with runway, and ensure nose wheel is straight.
6) Ensure runway is clear, advance throttle smoothly to takeoff power while holding brakes; check engine instruments.
7) Release brakes and ensure toes are resting on rudder pedals, not brakes.
8) Maintain directional control with rudder pedals and appropriate aileron deflection.
9) Upon reaching rotation speed, 50 kts (V_R), increase back elevator pressure to establish lift-off attitude and allow aircraft to fly off ground.
10) Accelerate the aircraft to 54 kts (V_X) until obstacle is cleared or 50 feet above takeoff surface is attained and then accelerate to 67 kts (V_Y).
11) Retract flaps after a safe altitude of at least 200 ft. and an airspeed of 67 kts are attained.
12) At 500 ft., or as workload permits, complete climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a short-field takeoff and maximum performance climb.
- Positions the flight controls for the existing wind conditions, sets flaps as recommended.
- Clears the area; taxies into takeoff position utilizing maximum available takeoff area and aligns the airplane on the runway center/takeoff path.
- Applies brakes (if appropriate) while advancing the throttle smoothly to takeoff power.
- Lifts off at the recommended airspeed, and accelerates to recommended obstacle clearance airspeed, or V_X.
- Establishes a pitch attitude that will maintain the recommended obstacle clearance airspeed, or V_X +5/-0 kts, until the obstacle is cleared, or until the airplane is 50 feet above the surface.
- After clearing the obstacle, establishes the pitch attitude for V_Y, accelerates to V_Y, and maintains V_Y ±5 kts, during the climb.
- Retracts the landing gear, if appropriate and flaps after clear of any obstacles or as recommended by manufacturer.
- Maintains takeoff power and V_Y ±5 kts to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Completes appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain runway selection criteria.
- Discuss how to maintain directional control during ground roll.
- Discuss proper lift-off technique.
- Explain the difference between V_X and V_Y.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not force aircraft off runway too early, causing it to settle back onto runway.
- Do not force aircraft to stay on the ground when it is ready to lift off, wheelbarrow.
- Back taxi to ensure use of entire runway length.
- Retraction of gear and flaps as recommended.

Common Errors:

- Failure to position the airplane for maximum utilization of available runway.
- Improper runway incursion avoidance procedures.
- Improper use of controls during a short-field takeoff.
- Inappropriate lift-off procedures.
- Improper initial climb attitude, power setting and airspeed to clear obstacle.
- Improper use of checklists.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Soft-Field Takeoff & Climb (C-152)

Objective:

To align the airplane with the takeoff path, become airborne as quickly as possible, and establish a positive climb to a safe maneuvering altitude.

Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane enters the runways with full up elevator deflection and accelerates to an airspeed at which the airplane will lift off.
2) The acceleration to lift off speed while remaining in ground effect.
3) The initial climb when the airplane establishes a pitch attitude to climb away from the runway.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete Short-Field takeoff checklist and takeoff briefing.
3) Set flaps to 10°.
4) Use aircraft lighting as recommended by the current version of AC 91-73.
5) Ensure runway is clear, taxi onto runway with back elevator pressure and align nose with runway centerline, confirm DG is aligned with runway, without stopping or the use of brakes.
6) Smoothly advance throttle to takeoff power.
7) Ensure toes are resting on rudder pedals, not on brakes.
8) Check engine instruments during ground roll for normal indications.
9) Maintain directional control with rudder pedals and appropriate aileron deflection.
10) Use back elevator pressure to establish a positive pitch attitude and allow the aircraft to fly itself off the ground.
11) When the aircraft becomes airborne, reduce pitch to remain in ground effect while accelerating to 55 kts (V_X) then simultaneously climb and accelerate to 67 kts (V_Y).
12) Retract flaps after a safe altitude of at least 200 ft. and an airspeed of 67 kts are attained.
13) At 500 ft., or as workload permits, complete climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a soft-field takeoff and climb.
- Positions the flight controls for existing conditions and to maximize lift as quickly as possible.
- Clears the area; taxies onto takeoff surface at a speed consistent with safety without stopping while advancing the throttle smoothly to takeoff power.
- Establishes and maintains a pitch attitude that will transfer the weight of the airplane from the wheels to the wings as rapidly as possible.
- Lifts off at the lowest possible airspeed and remains in ground effect while accelerating to V_X.
- Establishes a pitch attitude for V_X or V_Y, as appropriate, and maintains selected airspeed ±5 kts, during the climb.
- Retracts the landing gear, if appropriate and flaps after clear of any obstacles or as recommended by the manufacturer.
- Maintains takeoff power and V_X or V_Y ±5 kts to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss proper soft-field takeoff technique.
- Explain runway selection criteria.
- Predict the height of ground effect and discuss its relevance.
- Discuss how to maintain directional control during ground roll.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not force the aircraft off runway too quickly.
- Do not retract landing gear too soon.
- Do not allow the airplane to climb above ground effect too soon, causing it to settle back onto the runway.

Common Errors:

- Improper runway incursion avoidance procedures.
- Improper use of controls during a soft-field takeoff.
- Improper lift-off procedures.
- Improper climb attitude, power setting and airspeed.
- Improper use of checklist.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Traffic Pattern (C-152)

Objective:

To assure that air traffic flows into and out of an airport in an orderly manner.

Description:

The airplane is flown on a rectangular course around a runway at an altitude specified in the current Airport/Facility Directory or as outlined in the FAR/AIM.

Setup Procedure:

Departures

1) All departures:
    a. Fly the departure leg straight out until reaching traffic pattern altitude.
    b. Once reaching traffic pattern altitude, continue climbing and turn on course.

Arrivals

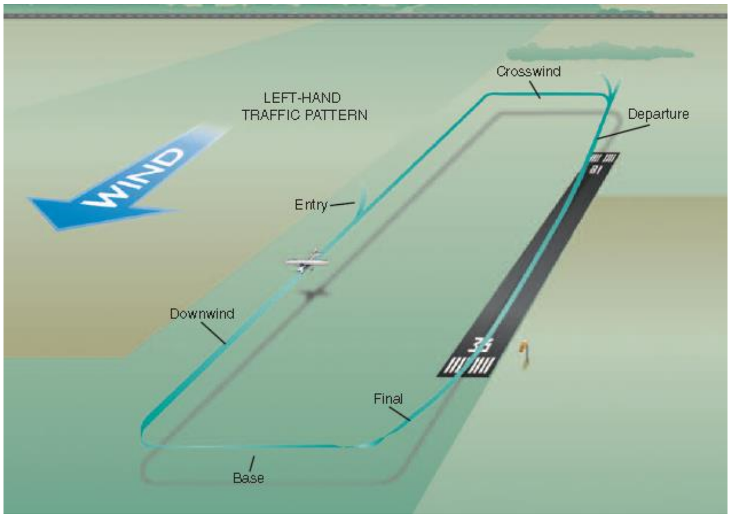
1) Prior to reaching 5 NM from the airfield, complete the following:
    a. Monitor local AWOS/ASOS/ATIS
    b. Ask "Is there any traffic between me and the airport?" and cancel flight following (if applicable)
    c. Complete the Before Landing checklist
2) Slow down below the approach flap airspeed prior to pattern entry.

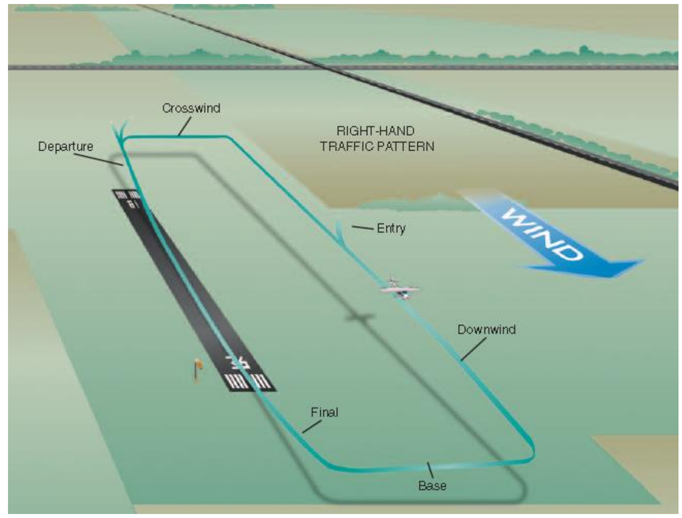
    If already established on the downwind side, skip to step 4.*

3) For a midfield entry:
    a. Cross midfield 500' above traffic pattern altitude, observing traffic flow and wind direction.
    b. Fly 2-3 miles beyond the downwind leg, then descend to pattern altitude.
    c. Complete a tear-drop shaped turn to the right or left as necessary to position the aircraft at a 45 degree angle to the downwind leg.

    If less than two aircraft are currently in the pattern, the alternate method may (cross midfield at traffic pattern altitude, enter directly into downwind leg) may be used.

4) Enter the traffic pattern at the designated traffic pattern altitude (normally 1,000' AGL) at a 45 degree angle to the downwind leg at midfield.
5) Apply appropriate crosswind correction to allow for a parallel flight path approximately ½ mile from the runway
6) Allow for proper spacing from other aircraft in the pattern as to prevent runway incursions upon landing.
7) Maintain airspeed below the flap speed required for each configuration change.





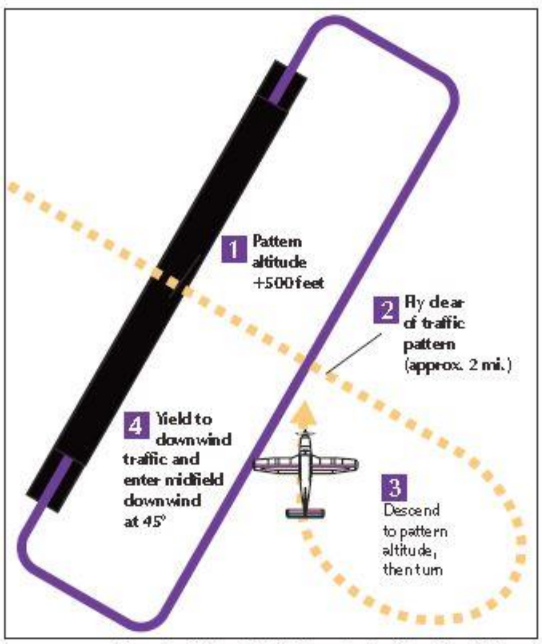


Figure 9. Preferred Entry from Upwind Leg Side of Airport

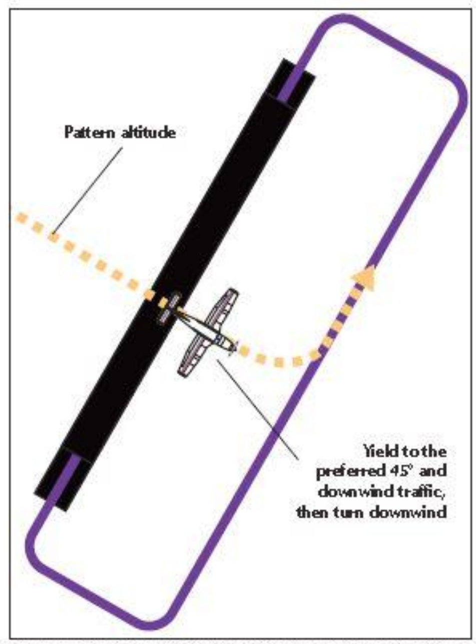


Figure 10. Alternate Midfield Entry from Upwind Leg Side of Airport

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to traffic patterns. This shall include procedures at airports with and without operating control towers, prevention of runway incursions, collision avoidance, wake turbulence avoidance, and wind shear.
- Complies with proper traffic pattern procedures.
- Maintains proper spacing from other aircraft.
- Corrects for wind drift to maintain the proper ground track.
- Maintains orientation with the runway/landing area in use.
- Maintains traffic pattern altitude, ±100 feet and the appropriate airspeed, ±10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss traffic patterns at controlled and uncontrolled airports.
- Explain traffic pattern procedures.
- Explain how to maintain the proper ground track.

Safety Considerations:

- Maintain proper traffic pattern altitude.
- Maintain a distance from the runway that is within power-off gliding distance.
- Preferred bank of approximately 30 degrees (and not to exceed 30) while in pattern.
- Maneuver within 300 feet of traffic pattern altitude before turning crosswind to base.
- Maintain proper aircraft separation.
- Comply with standards traffic pattern procedures or ATC instructions.

Common Errors:

- Failure to comply with traffic pattern instructions, procedures, and rules.
- Improper correction for wind drift.
- Inadequate spacing from other traffic.
- Poor altitude or airspeed control.
- Flying too wide of a pattern.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Normal & Crosswind Approach & Landing (C-152)

Objective:

To safely transition the aircraft from flight to ground operations during normal conditions.

Description:

The aircraft is configured for a stabilized approach in the landing configuration and transitioned from the descent to touchdown.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
    a. Reduce power to approximately 1,300 RPM.
    b. Confirm flaps 10°.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 65 kts.
6) Turn on the base leg when 45° from the touchdown point:
    a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
    b. At key position, assess approach position.
    c. With wings level, set flaps to 20° as required.
    d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 60 kts.
7) Turn on final as to align the aircraft with the extended runway center line:
    a. Apply appropriate crosswind correction to maintain the extended runway centerline.
    b. Set flaps to 30° as required.
    c. Adjust pitch and power as required to maintain a stabilized approach, at 55 kts, toward the selected aiming point until flare to land.
    d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
    e. Complete the GUMPS check.
8) During the flare to land simultaneously reduce power to idle and maintain aircraft approximately one foot above runway until it slows to stall speed and touches down on the runway centerline.
9) Maintain positive pitch attitude for aerodynamic braking.
10) Exit runway and complete after landing checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to normal and crosswind approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects a suitable touchdown point.
- Establishes the recommended approach and landing configuration and airspeed and adjust pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, or in its absence, nor more than 1.3 V_{S0} ±5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the round out and touchdown.
- Touches down smoothly at approximate stall speed.
- Touches down at or within 200 feet beyond a specified point, with no drift, and with the airplane’s longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control through the approach and landing sequence.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain proper use of crosswind control inputs.

Safety Considerations:

- Observe flap extension speeds.
- Maintain proper airspeed at all times.
- Use proper crosswind correction to avoid drifting from runway centerline.
- Ensure landing gear is extended and locked.

Common Errors:

- Failure to establish proper crosswind correction.
- Improper use of landing performance data and limitations.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Failure to establish and maintain a stabilized approach.
- Improper technique during round out and touchdown.
- Improper use of brakes.
- Poor directional control after touchdown.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Short-Field Approach & Landing (C-152)

Objective:

To safely transition from flight to ground operations at an airport with a relatively short runway or where an approach is made over obstacles.

Description:

The airplane is configured for a stabilized approach over a 50 foot obstacle. There will be little or no float during the round out, allowing the airplane to touch down at a specified point, and be stopped in a shorter than normal distance.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
    a. Reduce power to approximately 1,300 RPM.
    b. Confirm flaps 10°.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 70 kts.
6) Turn on the base leg when 45° from the touchdown point:
    a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
    b. At key position, assess approach position.
    c. With wings level, set flaps to 20° as required.
    d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 65 kts.
7) Turn on final as to align the aircraft with the extended runway center line:
    a. Apply appropriate crosswind correction to maintain the extended runway centerline.
    b. Set flaps to 30° as required.
    c. Adjust pitch and power as required to maintain a stabilized approach, at 54 kts, to clear obstacles, toward the selected aiming point until flare to land.
    d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
    e. Complete the GUMPS check.
8) During the flare to land simultaneously reduce power as required and maintain aircraft approximately one foot above runway until it slows to stall speed and touches down on the runway centerline.
9) Maintain positive pitch attitude for aerodynamic braking.
10) Apply maximum braking to a complete stop without skidding the tires.
11) Exit runway and complete after landing checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a short-field approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects the most suitable touchdown point.
- Establishes the recommended approach and landing configuration and airspeed; adjusts pitch attitude and power.
- Maintains a stabilized approach and recommended approach airspeed, or in its absence, not more than 1.3 V_{SO} ±5 kts with wind gust factor applied.
- Makes smooth, timely, and correct control application during the round out and touchdown.
- Touches down smoothly at minimum control airspeed.
- Touches down at or within 100 feet beyond a specified point, with no side drift, minimum float and with the airplane’s longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Applies brakes, as necessary, to stop in the shortest distance consistent with safety.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on an approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain how to compensate for obstacles and shortened runway lengths.

Safety Considerations:

- Maintain proper airspeed at all times.
- Compensate for crosswind.
- Do not skid tires.
- Use of aerodynamic braking as available.
- Ensure landing gear is extended and locked.

Common Errors:

- Failure to establish and maintain a stabilized approach.
- Improper technique in use of power, wing flaps, and trim.
- Excessive airspeed on final approach.
- Failure to establish proper crosswind correction.
- Improper use of landing performance data and limitations.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Improper use of brakes.
- Poor directional control after touchdown.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Soft-Field Approach & Landing (C-152)

Objective:

To safely transition the airplane from flight to ground operations on a rough or soft surface.

Description:

The aircraft is configured for a stabilized approach in the landing configuration and transitioned from the descent to touchdown on a field that is unimproved.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) Set flaps to 10° no later than abeam the touchdown point.
5) When abeam the intended touchdown point:
    a. Reduce power to approximately 1,300 RPM.
    b. Confirm flaps 10°.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 65 kts.
6) Turn on the base leg when 45° from the touchdown point:
    a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
    b. At key position, assess approach position.
    c. With wings level, set flaps to 20° as required.
    d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 60 kts.
7) Turn on final as to align the aircraft with the extended runway center line:
    a. Apply appropriate crosswind correction to maintain the extended runway centerline.
    b. Set flaps to 30° as required.
    c. Adjust pitch and power as required to maintain a stabilized approach, at 55 kts toward the selected aiming point until flare to land.
    d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
    e. Complete the GUMPS check.
8) During the flare to land simultaneously reduce power as required and maintain aircraft approximately one foot above runway until it slows to stall speed and touches down on the runway centerline as smoothly as possible.
9) Maintain back elevator pressure to keep nose wheel off the ground as long as possible.
10) Maintain directional control with rudder and aileron deflection.
11) Adjust power as necessary to maintain aircraft movement on soft surfaces.
12) Exit the runway with minimal braking and complete after landing checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a soft-field approach and landing.
- Considers the wind conditions, landing surface, and obstructions, and selects the most suitable touchdown area.
- Establishes the recommended approach and landing configuration and airspeed; adjusts pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, or in its absence, not more than 1.3 V_{S0} ±5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the round out and touchdown.
- Touches down softly, with no drift, and with the airplane's longitudinal axis aligned with the runway/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Maintains proper position of the flight controls and sufficient speed to taxi on the soft surface.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss effect of flaps on an approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain how to touchdown and maneuver the aircraft on soft of unimproved surfaces.

Safety Considerations:

- Do not land on fields that exceed the capabilities of the aircraft or pilot.
- Fly over and visually check the field prior to landing.
- Check field length and density altitude.
- UCM retractable gear aircraft can only land on paved, public, published runways.
- Ensure landing gear is extended and locked.

Common Errors:

- Failure to maintain elevator back-pressure after touchdown.
- Improper use of brakes.
- Failure to consider effect of wind and landing surface.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Power-Off 180° Accuracy Landing (C-152)

Objective:

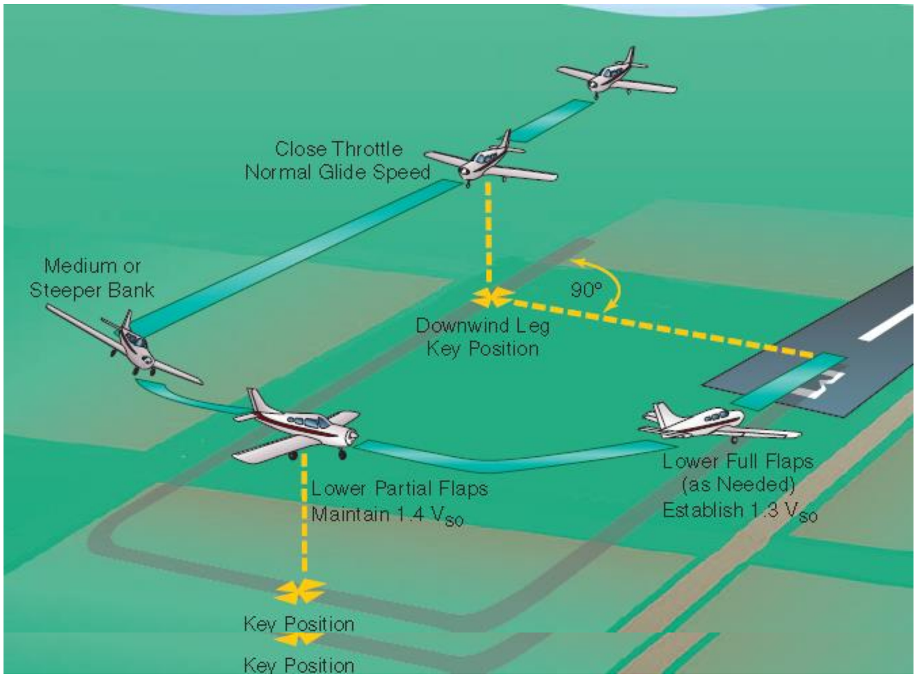
To instill in the pilot the judgment and procedures necessary for accurately flying the airplane, without power, to a safe landing.

Description:

Power-off accuracy approaches are approaches and landings made by gliding with the engine idling, through a specific pattern to a touchdown within 200 feet of a designated line or mark on the runway.

Setup Procedure:

1) Complete the before landing checklist.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming point.
4) When abeam the intended touchdown point:
    a. Close throttle.
    b. Set flaps 10°.
5) Maintain altitude while decelerating to the recommended glide speed 60 kts.
6) Base leg turn will be determined by the glide angle of the airplane, weight, and velocity of the wind.
7) Extend flaps as required.
8) Turn to final approach and extend flaps, as necessary.
9) Adjust trim and make slight adjustments in pitch attitude of flap setting to control glide angle and airspeed.
10) Complete the GUMPS check.
11) Touch down at approximate stalling speed on the runway centerline at the designated point.
12) Exit the runway and complete after landing checklist.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a power-off 180° accuracy approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects an appropriate touchdown point.
- Positions airplane on downwind leg, parallel to landing runway, and not more than 1,000 feet AGL.
- Abeam the specified touchdown point closes throttle and establishes appropriate glide speed.
- Completes final airplane configuration.
- Touches down in a normal landing attitude, at or within 200 feet beyond the specified touchdown point.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the effect of wind velocity on required altitude and bank angle.
- Discuss the importance of controlling glide angle and airspeed on final approach.

Safety Consideration:

- Maintain coordinated flight throughout the maneuver.
- Be aware of the position of other traffic in the pattern.
- Maintain appropriate airspeed throughout the maneuver.

Common Errors:

- Failure to touchdown within 200 feet of the intended touchdown point.
- Failure to maintain constant airspeed and glide angle.
- Failure to accurately determine the wind direction and velocity.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Touch and Go/Stop and Go (C-152)

Objective:
To transition from a landing rollout to a takeoff roll while remaining on the runway.

Description:
A touch and go is a landing which transitions into a takeoff while the aircraft remains rolling on the runway.

Setup Procedure:
1) Perform a normal landing.
2) Upon touchdown:
    a. Allow the aircraft to continue rolling.
    b. Maintain runway centerline.
    c. Apply proper crosswind correction.
3) Reconfigure the aircraft for takeoff.
    a. Retract flaps to (10º or less).
    b. Set trim to the takeoff position.
4) Smoothly apply full-power.
5) Upon reaching rotation speed, 50 kts, increase back elevator pressure to establish the lift-off attitude that is approximately V_Y or V_X and allow the aircraft to fly off the ground.
6) Apply adequate drift correction to maintain runway centerline.
7) At a safe altitude, of at least 200 ft., retract flaps to 0º.
8) At 500 ft., or as workload permits, complete the climb checklist.

Flight Proficiency Standards:
- Exhibits knowledge of the elements related to touch and go procedures.
- Maintains runway centerline upon touchdown.
- Applies proper crosswind controls upon touchdown, reconfiguration and climb out.
- Demonstrates proper aircraft reconfiguration.
- Lifts off at the recommended airspeed and accelerates to V_X or V_Y, as appropriate.
- Retracts flaps at 200' or a safe altitude, if appropriate.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Complies with noise abatement procedures.
- Completes the appropriate checklist.

Note: These are the UCM standards. The aforementioned standards are not found in the Airman Certification Standards.

Learning Outcomes:
- Explain the purpose(s) of touch and go's.
- Discuss how crosswind correction will change throughout the maneuver.
- Discuss the importance of maintaining runway centerline during aircraft reconfiguration.

Safety Considerations:
- Maintain runway centerline.
- Proper crosswind correction.
- Maintain situational awareness.
- Proper reconfiguration.

Common Errors:
- Failure to maintain runway centerline.
- Touchdown beyond the first 1/3rd of the runway and attempting a touch and go.
- Improper aircraft reconfiguration.
- Failure to use checklist.
- Failure to maintain adequate crosswind correction.

- Attempting to lift-off prior to rotation speed.

Go-Around (C-152)

Objective:

To safely discontinue the landing approach when unsatisfactory conditions exist.

Description:

As full power is applied, the aircraft attitude is adjusted to accelerate to V_Y and climb. As a safe airspeed is attained, flaps are retracted 10° at a time allowing stabilization between each retraction.

Setup Procedure:

1) Simultaneously apply maximum power and establish a go-around pitch attitude.
2) Set flaps to 20°.
3) Establish a pitch attitude to accelerate to 55 kts.
4) Allow the airplane to accelerate to V_X or V_Y and climb.
5) If there is an aircraft on the runway, sidestep to clear the departure path of the airplane and allow the pilot to view the landing or departing traffic.
6) Set flaps to 10° and stabilize in between configuration changes then flaps to 0°.
7) Verify Go Around checklist is complete.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a go-around/rejected landing.
- Makes a timely decision to discontinue the approach to landing.
- Applies takeoff power immediately and transitions to climb pitch attitude for V_X, and maintains V_Y+10/-5 kts.
- Retracts the flaps as appropriate.
- Retracts the landing gear, if appropriate, after a positive rate of climb is established.
- Maneuvers to the side of the runway/landing area to clear and avoid conflicting traffic.
- Maintains takeoff power V_y+10/-5 to a safe maneuvering altitude.
- Maintains takeoff power V_Y ±5 kts to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the climb.
- Completes the appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss events that may require a go-around.
- Explain the importance of maintaining airspeed and coordination during the go-around procedure.
- Discuss the necessity for maneuvering to the side of the runway after making the decision to go-around.

Safety Considerations:

- Maneuver the airplane to the side of the runway.
- Do not establish a pitch up attitude too quickly.
- Maintain coordination.
- Timely decision making.
- Be watchful for situation which may require a go-around.

Common Errors:

- Delayed decision to make a go-around.
- Improper application of power.
- Failure to control pitch attitude.
- Improper trim technique.
- Failure to compensate for torque effect.
- Failure to maintain V_Y as appropriate.
- Improper wing flap retraction.
- Improper gear retraction.
- Failure to maintain well clear of obstructions and other traffic.
- Improper use of checklists.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Emergency Descent (C-152)

Objective:

To descend the airplane as soon and as rapidly as possible, within the structural limitations of the airplane.

Description:

The emergency descent is a maneuver for descending as rapidly as possible to a lower altitude or to the ground for an emergency landing.

Setup Procedure:

1) Perform clearing turns.
2) If utilizing flight following, contact ATC for traffic advisories below.
3) Reduce power to idle.
4) Roll into a 30º bank to the left and pitch down to achieve 105 kts (If in turbulent air, maintain an airspeed below V_A).
5) Set mixture to rich.
6) Confirm flaps 0º
7) Initiate recovery to level flight at least 300' prior to assigned altitude by:
    a. Rolling out the bank.
    b. Pitching up.
8) Return to cruise flight and complete the cruise checklist to include leaning procedures

Flight Proficiency Standards:

- Exhibit knowledge of the elements related to emergency descent.
- Recognizes situations, such as depressurization, cockpit smoke, and/or fire that require an emergency descent.
- Establish the appropriate airspeed and configuration for the emergency descent.
- Exhibit orientation, division of attention, and proper planning.
- Maintains positive load factors during the descent.
- Follow the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the purpose(s) of an emergency descent.
- Discuss engine cooling characteristics during an emergency descent.
- Discuss the importance of proper planning as it pertains to emergencies.

Safety Considerations:

- Maintain positive aircraft control.
- Clear the engine periodically
- Clear below then GO.
- Steep spiral over airport.
- Continue on to emergency approach and landing.

Common Errors:

- Failure to recognize the urgency of the emergency descent.
- Failure to use emergency checklist for situation.
- Failure to maintain appropriate configuration and airspeed.
- Poor orientation, planning, and division of attention.

Maneuvering During Slow Flight (C-152)

Objective:

To demonstrate the flight characteristics and controllability of an airplane at speeds lower than normal cruise and develop proficiency in performing maneuvers that require slow airspeeds.

Description:

Slow flight consists of slowing the aircraft to a minimum controllable airspeed in the landing configuration and maneuvering the aircraft while maintaining altitude and airspeed.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
2) Perform clearing turns.
3) Set mixture to rich.
4) Reduce power to 1,500 RPM or less.
5) Below 85 kts, set flaps to 10°.
6) Adjust pitch and power as necessary to maintain altitude.
7) Set flaps to 20° and 30° allowing the aircraft to stabilize between each setting.
8) Establish and maintain an airspeed at which any further increase in pitch or reduction of power would result in an immediate stall or a higher speed as specified by your instructor.
    a. Slow flight should be practiced at varying speeds and configurations above the 1G stall speed of the aircraft as specified by the instructor.
9) Maneuver as instructed.
10) Recover when instructed by:
    a. Adding full power
    b. Set flaps to 20° and allow the aircraft to stabilize.
11) Then set flaps to 10° and 0° allowing the aircraft to stabilize between each setting.
12) Return to cruise flight and perform the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to maneuvering during slow flight.
- Selects an entry altitude that will allow the task to be completed no lower than 1,500' AGL.
- Establish and maintain an airspeed at which any further increase in angle of attack, increase in load factor, or reduction in power, would result in a stall warning (e.g., airplane buffet, stall horn, etc.).
- Accomplishes coordinated straight and level flight, turns, climbs, and descents with landing gear and flap configurations specified by the instructor.
- Divides attention between airplane control and orientation.
- Maintains the specified altitude, ±50 feet; specified headings, ±10°; airspeed +5/-0 kts, and specified angle of bank, ±5°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the relationship between pitch and power in maintaining airspeed and altitude during slow flight.
- Discuss how flight at minimum airspeeds develops the ability to estimate the margin of safety above the stalling speed.
- Compare the practice of slow flight to various phases of flight such as; takeoffs, climbs, descents, go-around, and approaches to landing.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified flap configuration.
- Improper entry technique.
- Failure to establish and maintain the specified airspeed.
- Excessive variations of altitude and heading when a constant altitude and heading are specified.
- Rough or uncoordinated control technique.
- Improper correction for left turning tendency.
- Improper trim technique.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Power – Off Stall (C-152)

Objective:

To familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop the skills to prevent and recover from stalls in the landing configuration.

Description:

The aircraft is slowed down and placed in the landing configuration after which a stall is induced and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery by at least 1,500’ AGL.
2) Perform clearing turns.
3) Set mixture to rich.
4) Reduce power to 1,500 RPM or less allowing the aircraft to slow to approach speed while maintaining altitude.
5) Below 85 kts, set flaps to 10°.
6) Set flaps to 20° and 30° allowing the aircraft to stabilize between each setting.
7) Establish a stabilized descent at 55 kts.
8) Reduce power to idle.
9) Maintain coordinated flight and altitude until recognition of the stall.
10) Recognize and recover from the impending stall (aerodynamic buffeting) by simultaneously reducing the angle of attack, leveling the wings, and adding full power.
11) Set flaps to 20°.
12) Accelerate the aircraft to V_X (recommended) or V_Y and climb while retracting the remaining flaps in 10° increments.
13) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to power-off stalls.
- Selects an entry altitude that allows the task to be completed no lower than 1,500’ AGL.
- Establishes a stabilized descent in the approach or landing configuration, as specified by the instructor.
- Transitions smoothly from the approach or landing attitude to a pitch attitude that will induce a stall.
- Maintains a specified heading, ±10° in straight flight; maintains a specified angle of bank, not to exceed 20°, ±5°, in turning flight while inducing the stall.
- Recognizes and recovers promptly as the “on set” of the stall occurs by simultaneously reducing the angle of attack, increasing power to maximum allowable and leveling the wings to return to a straight and level flight attitude with a minimum loss of altitude appropriate for the airplane.
- Retracts the flaps to the recommended setting, retracts the landing gear if retractable after a positive rate of climb is established.
- Accelerates to V_X or V_Y speed before the final flap retraction.
- Returns to the altitude, heading, and airspeed specified by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.

- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Power – On Stall (C-152)

Objective:

To familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in the takeoff configuration.

Description:

The aircraft is slowed down and placed in the takeoff configuration after which a stall is induced and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
2) Perform clearing turns.
3) Set mixture to rich.
4) Reduce power to 1200 RPM or less, allowing the aircraft to slow to takeoff speed while maintaining altitude.
5) Add full power at 50 kts (V_R).
6) Transition smoothly to the pitch attitude that will induce a stall.
7) Recognize and recover from the impending stall (aerodynamic buffeting) by simultaneously reducing the angle of attack, leveling the wings, and adding full power.
8) Accelerate the aircraft to 67 kts (V_Y) and climb.
9) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to power-on stalls.
- Selects an entry altitude that allows the task to be completed no lower than 1,500' AGL.
- Establishes the takeoff or departure configuration. Sets power to no less than 65 percent available power.
- Transitions smoothly from the takeoff or departure attitude to a pitch attitude that will induce a stall.
- Maintains a specified heading ±5°, in straight flight; maintains a specified angle of bank, not to exceed a 20°, ±10°, turning flight, while inducing the stall.
- Recognizes and recovers promptly as the stall occurs by simultaneously reducing the angle of attack, increasing power to maximum allowable and leveling the wings to return to a straight and level flight attitude, with a minimum loss of altitude appropriate for the airplane.
- Retracts flaps to the recommended setting and retracts the landing gear if retractable after a positive rate of climb is established.
- Accelerates to V_X or V_Y speed before the final flaps retraction; returns to the altitude, heading, and airspeed specified by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Accelerated Stall (C-152)

Objective:

To familiarize the pilot with the conditions that produce accelerated stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in an accelerated configuration.

Description:

The aircraft is slowed down and placed in the clean configuration. After which a steep turn is applied with excessive back elevator pressure and therefore a stall is induced at a higher than normal stalling speed and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery by at least 3,000' AGL.
2) Perform clearing turns.
3) Reduce power to 1500 RPM allowing the aircraft to slow below maneuvering speed while maintaining altitude.
4) Set mixture to rich.
5) Verify flaps up.
6) Upon reaching 75 kts, transition smoothly to an approximate 45 degree bank and apply back pressure to induce an accelerated stall.
7) Recognize and recover from the stall (aerodynamic buffeting) as the stall occurs by simultaneously leveling the wings, reducing the angle of attack, and increasing power.
8) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to accelerated stalls.
- Selects an entry altitude that allows the task to be completed no lower than 3,000' AGL.
- Establishes the configuration as specified by the instructor.
- Establish and maintain a coordinated turn in a 45° bank, increasing elevator back pressure smoothly and firmly until an impending stall is reached.
- Recognizes and recovers promptly at the first indication of an impending stall.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Cross-Control Stall (C-152)

Objective:

To familiarize the pilot with the conditions that produce cross-control stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in a cross-control configuration.

Description:

The aircraft is left in a clean configuration while power is reduced to simulate landing conditions after which a stall is initiated by using excessive rudder in the direction of the base-to-final turn and back elevator pressure is applied to keep the nose from lowering. Recovery procedures should be initiated at first indication of stall by applying full power and removing opposite aileron and rudder inputs simultaneously.

Setup Procedure:

1) Select an altitude which allows recovery by 3000' AGL.
2) Perform clearing turns.
3) Reduce power to 1300 RPM allowing the aircraft to slow to 55 kts while maintaining altitude.
4) Set mixture to rich.
5) Verify flaps up.
6) Select a point on the ground to act as a runway and position aircraft on a base leg.
7) Upon reaching 55 kts begin a "base-to-final" turn that overshoots final approach and simultaneously:
   a. Correct for final approach path by smoothly applying excessive rudder in the direction of turn.
   b. Use opposite aileron to hold constant bank.
   c. Increase elevator back pressure to keep the nose from dropping below horizon.
8) Recognize and recover from the impending stall (aerodynamic buffeting) by simultaneously reducing the angle of attack, removing opposite rudder and aileron inputs, and adding full power.
9) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards

- Exhibits knowledge of the elements of the elements of cross-controlled stalls, with the landing gear extended.
- Exhibits instructional knowledge of common errors related to cross-control stalls, with the landing gear extended.
- Demonstrates and simultaneously explains a cross-control stall, with landing gear extended, from an instructional standpoint.
- Analyzes and corrects simulated common errors related to a cross-control stall with the landing gear extended.

Note: These are the PTS standards for the CFI certificate as these maneuvers are only to be demonstrated to commercial pilot students and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a cross-control stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a cross-control stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.

- Failure to recognize indications of a stall.
- Spin entry due to stalling aircraft in uncoordinated condition.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; CFI PTS

Elevator Trim Stall (C-152)

Objective:

To familiarize the pilot with the conditions that produce elevator trim stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls with excessive elevator trim.

Description:

The aircraft is left in a clean configuration while power is reduced to simulate landing conditions and elevator trim is added to maintain a stable descent. After which a go-around is simulated with the excessive trim and therefore a stall attitude is reached rapidly and recovery is initiated returning the aircraft to normal cruise.

Setup Procedure:

1) Select an altitude which allows recovery by 3000' AGL.
2) Perform clearing turns.
3) Reduce power to 1,500 RPM or less allowing the aircraft to slow to approach speed while maintaining altitude.
4) Below 85 kts, set flaps to 10°.
5) Set flaps to 20° and 30° allowing the aircraft to stabilize between each setting.
6) Apply nose up elevator trim to establish a descent at 55kts.
7) Once a 55 kt descent has been established simulate a go-around by applying full power.
8) Recognize and recover once an attitude has been reached that would result in an impending stall by:
    a. Reducing angle of attack.
    b. Hold forward elevator pressure while reducing nose up elevator trim.
    c. Set flaps to 20°
9) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits instructional knowledge of the elements of elevator trim stalls, in selected landing gear and flap configurations.
- Exhibits instructional knowledge of common errors related to elevator trim stalls, in selected landing gear and flap configurations.
- Demonstrates and simultaneously explains elevator trim stalls, in selected landing gear and flap configurations, from an instructional standpoint.
- Analyzes and corrects simulated common errors related to elevator trim stalls in selected configurations.

Note: These are the PTS standards for the CFI certificate as these maneuvers are only to be demonstrated to commercial pilot students and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of an elevator trim stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from an elevator trim stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.
- Forward elevator pressure required in recovery.

Common Errors:

- Failure to establish specified configuration.

- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Spin entry due to stalling aircraft in uncoordinated condition.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; CFI PTS

Secondary Stall (C-152)

Objective:

To familiarize the pilot with the conditions that produce secondary stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls that could occur due to improper recovery techniques.

Description:

The aircraft configured for and placed into a power off stall. During recovery a secondary stall is induced by abrupt control inputs, attempting to return to normal cruise to early, or by not adequately reducing angle of attack during initial stall recovery.

Setup Procedure:

1) Select an altitude which allows recovery by at least 3,000' AGL.
2) Reduce power to 1,500 RPM or less allowing the aircraft to slow to approach speed while maintaining altitude.
3) Below 85 kts, set flaps to 10°.
4) Set flaps to 20° and 30° allowing the aircraft to stabilize between each setting.
5) Establish a stabilized descent at 55 kts.
6) Reduce power to idle.
7) Maintain coordinated flight and altitude until recognition of the stall.
8) Induce secondary stall by:
    a. Allowing nose to pitch down, but immediately pitch the nose up excessively to maintain desired altitude.
    or
    b. Hold aircraft in stall by not reducing angle of attack.
9) Recover from the secondary stall (aerodynamic buffeting) by simultaneously reducing the angle of attack, leveling the wings, and adding full power.
10) Set flaps to 20°.
11) Accelerate the aircraft to V_X (recommended) or V_Y and climb while retracting the remaining flaps in 10° increments.
12) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits instructional knowledge of the elements of secondary stalls, in selected configurations.
- Exhibits instructional knowledge of common errors related to secondary stalls, in selected configurations.
- Demonstrates and simultaneously explains secondary stalls, in selected landing gear and flap configurations, form an instructional standpoint.
- Analyzes and corrects simulated common errors related to secondary stalls in selected configurations.

Note: These are the PTS standards for the CFI certificate as these maneuvers are only to be demonstrated to commercial pilot students and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a secondary stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a secondary stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Spin entry due to stalling aircraft in uncoordinated condition.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.

References:

Airplane Flying Handbook; POH/AFM; CFI PTS

Steep Turns (C-152)

Objective:

To develop coordination, orientation, division of attention and smooth control techniques while executing high performance turns.

Description:

The maneuver consists of two 360° turns in opposite directions, using a bank angle of 50° while maintaining a constant airspeed and altitude.

Setup Procedure:

1) Select an altitude which allows performance of maneuver no lower than 1,500’ AGL.
2) Perform clearing turns.
3) Adjust the mixture in accordance with the POH.
4) Reduce power to establish an airspeed of 95 kts.
5) Enter a coordinated 50° banking turn to the left or right.
6) Increase power and adjust trim and pitch as required to maintain altitude and airspeed.
7) Begin rollout at ½ the bank angle prior to rollout heading.
8) Reduce power and pitch on rollout as needed to remain at 95 kts.
9) Continue the maneuver in the opposite direction.
10) Reduce power and pitch on rollout as needed to remain at 95 kts.
11) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to steep turns.
- Establishes the manufacturer’s recommended airspeed or if one is not stated, a safe airspeed not to exceed Va.
- Rolls into a coordinated 360° steep turn with at least a 50° bank, followed by a 360° turn in the opposite direction.
- Divides attention between airplane control and orientation.
- Maintains the entry altitude, ±100 feet, airspeed, 10 kts, bank, ±5°, and rolls out on the entry heading, ±10°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain why load factor increases as bank angle increases.
- Discuss the relationship between load factor and stall speed.
- Discuss the principle of over-banking tendency.
- Explain how to maintain altitude and airspeed.
- Explain limit load factor and what happens if it’s exceeded.

Safety Considerations:

- Do not exceed manufacturer’s recommended airspeed or Va.
- Always clear the area before initiating the maneuver.
- The maneuver is to be completed no lower than 1,500’ feet AGL.
- Division of attention between maneuver and scanning for traffic.

Common Errors:

- Improper pitch, bank, and power coordination during entry and rollout.
- Uncoordinated use of flight controls.
- Improper procedure in correcting altitude deviations.
- Loss of orientation.

References:

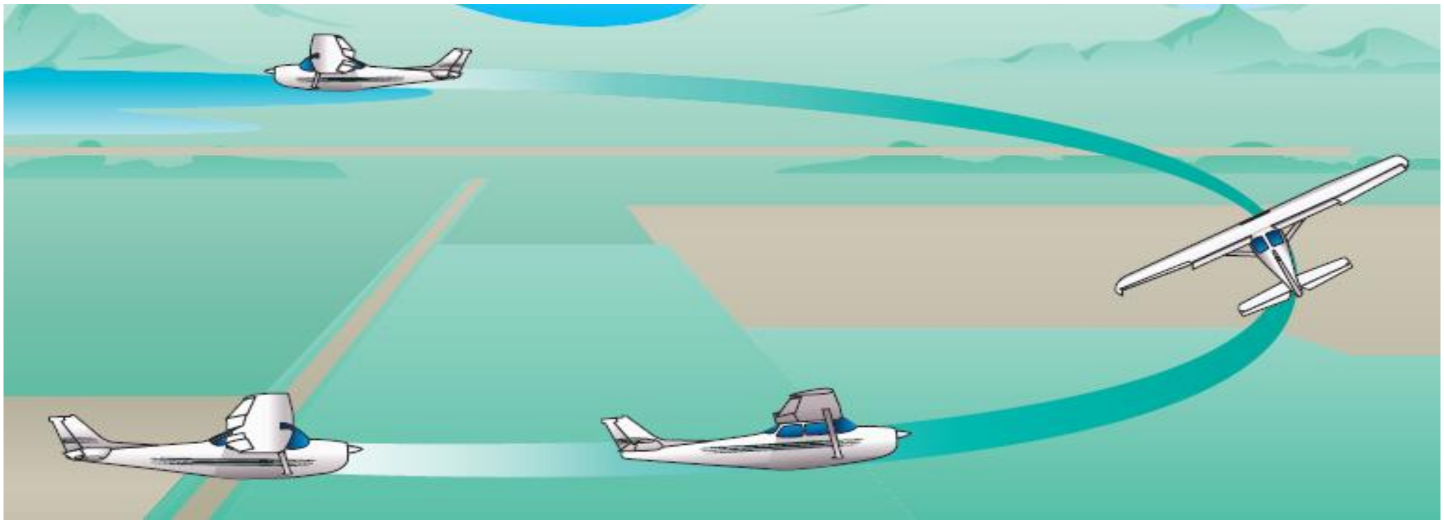
Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Chandelle (C-152)

Objective:
To develop the pilot's coordination, orientation, planning and accuracy of control during maximum performance flight.

Description:
A chandelle is a maximum performance climbing turn beginning from approximately straight and level flight, and ending at the completion of a 180° turn in a wings level, nose high attitude at the minimum controllable airspeed.

Setup Procedure:
1) Select an altitude to perform the maneuver no lower than 1,500' AGL.
2) Perform clearing turns.
3) Orient the airplane so that the turn is into the wind.
4) Maintain an airspeed of 95 kts.
5) Establish a 30° bank turn.
6) Simultaneously apply full power and pitch to maintain a smooth coordinated climbing turn to the 90° degree point with a constant bank.
7) At the 90° point, gradually increase back pressure to maintain pitch attitude and begin a coordinated roll out to reach wings level at the 180° point, just above the stall speed.
8) At the 180° point, establish level flight within 50 feet of final altitude.
9) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:
- Exhibits knowledge of the elements related to chandelles.
- Selects an altitude that will allow the maneuver to be performed no lower than 1,500' AGL.
- Establishes the recommended entry configuration, power and airspeed.
- Establishes the angle of bank at approximately 30°.
- Simultaneously applies power and pitch to maintain a smooth, coordinated climbing turn to the 90° point, with a constant bank.
- Begins a coordinated constant rate rollout from the 90° point to the 180° point maintaining power and a constant pitch attitude.
- Completes rollout at the 180° point, ±10° just above stall airspeed, and maintains that airspeed momentarily avoiding a stall.
- Resumes straight and level flight with minimum loss of altitude.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Coordination during high power settings and high angles of attack.
- Maneuvering the aircraft at high performance levels.

Safety Considerations:

- This maneuver should be performed no lower than 1,500’ AGL.
- Divide attention between flying the airplane and scanning for traffic.
- Maintain coordinated flight.

Common Errors:

- Improper pitch, bank, and power coordination during entry or completion.
- Uncoordinated use of flight controls.
- Improper planning and timing of pitch and bank attitude changes.
- Factors related to failure in achieving maximum performance.
- A stall during the maneuver.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Lazy Eights (C-152)

Objective:

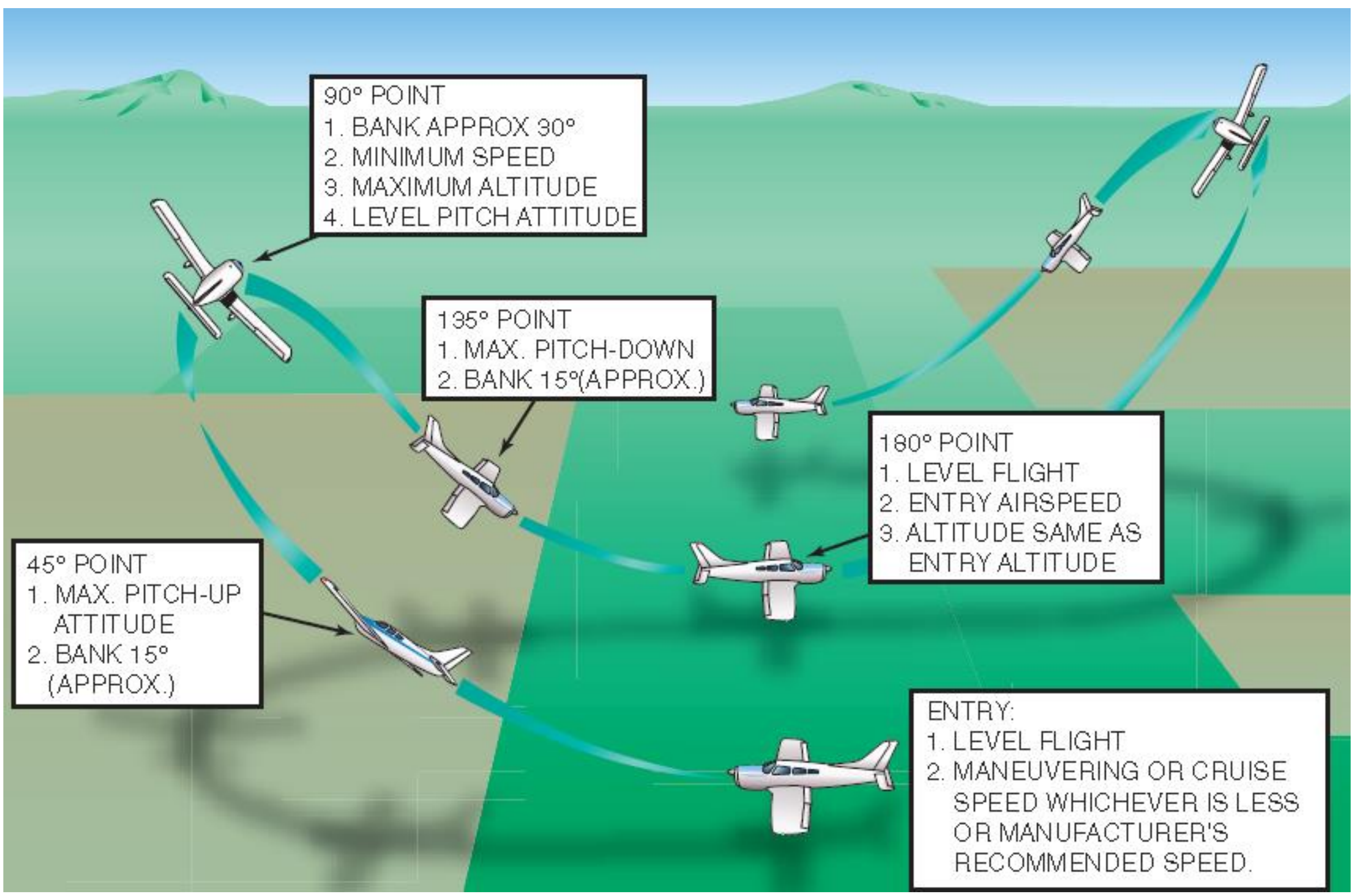
To develop coordination of controls through a wide range of airspeeds and altitudes so that certain accuracy points are reached with planned attitude and bank.

Description:

Two 180° turns, in opposite direction, while making a climb and a descent in a symmetrical pattern during each of the turns. At no time is the airplane flown straight and level.

Setup Procedure:

1) Select an altitude to perform the maneuver no lower than 1,500' AGL.
2) Perform clearing turns.
3) Orient the airplane so that the first turn is to the left and into the wind.
4) Maintain an airspeed of 95 kts.
5) Begin the maneuver by constantly changing pitch and bank to achieve the following:
    a. 45° point – 15° of bank and max pitch up.
    b. 90° point – 30° of bank, level pitch attitude, minimum controllable airspeed.
    c. 135° point – 15° of bank and max pitch down.
    d. 180° point – back to starting airspeed, altitude, and reciprocal heading.
6) Repeat in opposite direction.
7) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to lazy eights.
- Selects an altitude that will allow the maneuver to be performed no lower than 1,500' AGL.
- Establishes the recommended entry configuration, power, and airspeed.
- Maintains coordinated flight throughout the maneuver.
- Achieves the following throughout the maneuver
  - Approximately 30° bank at the steepest point.
  - Constant change of pitch and roll rate.
  - Altitude tolerance at 180° points, ±100 feet from entry altitude.
  - Airspeed tolerance at the 180° point, ±10 kts from entry airspeed.
  - Heading tolerance at the 180° point ±10°.
- Continues the maneuver through the number of symmetrical loops specified and resumes straight and level flight.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance of proper power setting.
- Explain the need for differing amounts of rudder pressure between the left and right turn.
- Discuss the effects of torque at the top of the eight in both the right and left turns.

Safety Considerations:

- Always clear the area before beginning a maneuver.
- Maintain coordination at all times during the maneuver.
- Use proper division of attention to see and avoid traffic.

Common Errors:

- Uncoordinated use of flight controls.
- Inconsistent airspeed and altitude at key points in the maneuver.
- Loss of orientation.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Steep Spiral (C-152)

Objective:

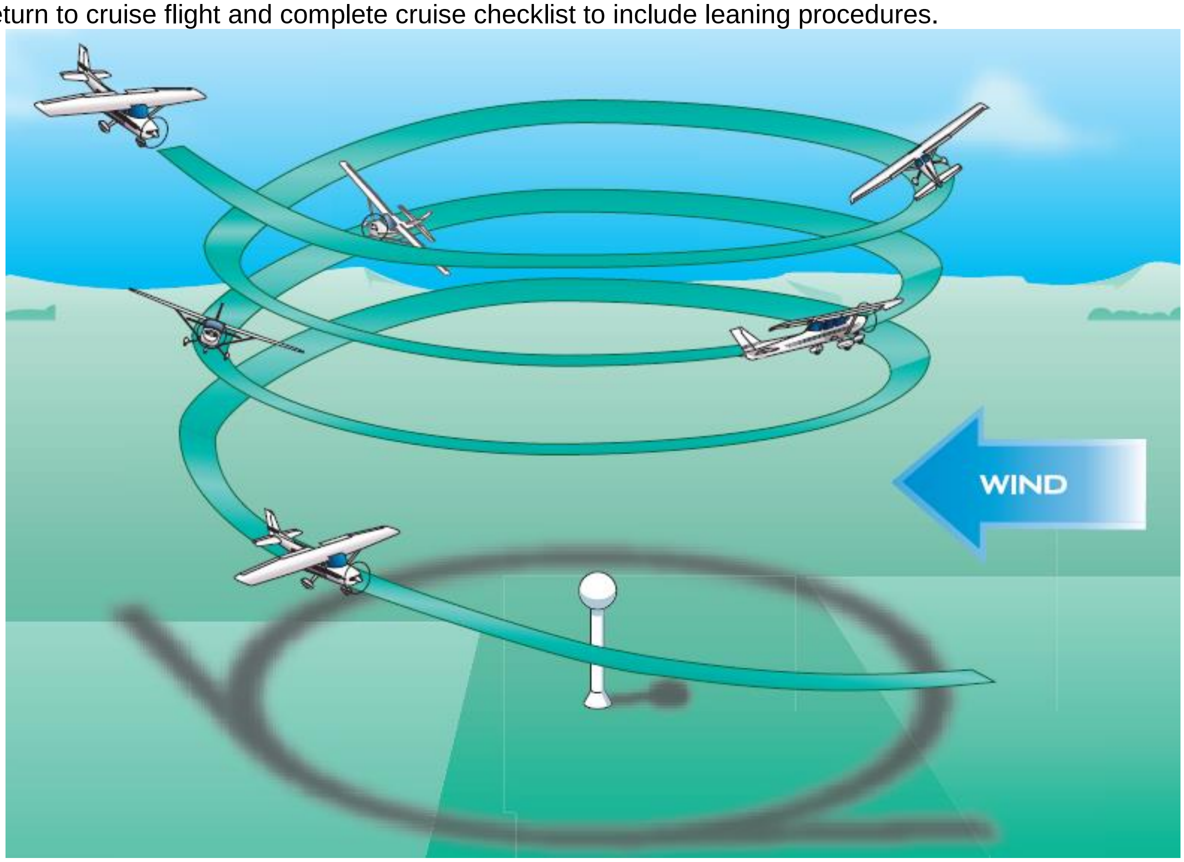
To improve pilot techniques for airspeed control, wind drift control, planning, orientation, and division of attention.

Description:

A steep spiral is a constant gliding turn, during which a constant radius around a point on the ground is maintained.

Setup Procedure:

1) Begin the maneuver with sufficient altitude to allow for three 360° degree turns without descending below 1,500' feet AGL.
2) Perform clearing turns.
3) Select a point to perform the maneuver around.
4) Enter on a downwind heading.
5) Reduce power and slow to 65 kts.
6) Reduce the power to idle when abeam the point.
7) Maintain 65 kts ($V_{L/D}$ +10 kts).
8) Change bank angle as necessary to maintain an equal distance from the reference point 45-55° of bank at the steepest point in the turn, not to exceed 60°.
9) Clear the engine, momentarily advancing power to normal cruise power, on each upwind leg.
10) Roll out on a downwind heading.
11) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a steep spiral.
- Selects an altitude sufficient to continue through a series of at least three 360° turns.
- Selects a suitable ground reference point.
- Applies wind-drift correction to track a constant radius circle around the selected reference point with bank not to exceed 60° at steepest point in turn.
- Divides attention between airplane control and ground track, while maintaining coordinated flight.
- Maintains the specified airspeed, ±10 kts, rolls out toward specified heading, ±10°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the effect of bank angle on ground track.
- Discuss the effect of ground speed on the radius of the turn.
- Recognize the importance of clearing the engine during extended periods of engine operations at low power settings.

Safety Considerations:

- Clear the area.
- Divide attention between aircraft control and orientation.
- Choose a reference point with emergency landing field within gliding distance.

Common Errors:

- Failure to maintain constant radius around reference point.
- Failure to maintain constant airspeed.
- Uncoordinated use of flight controls.
- Loss of orientation.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Eights On Pylons (C-152)

Objective:

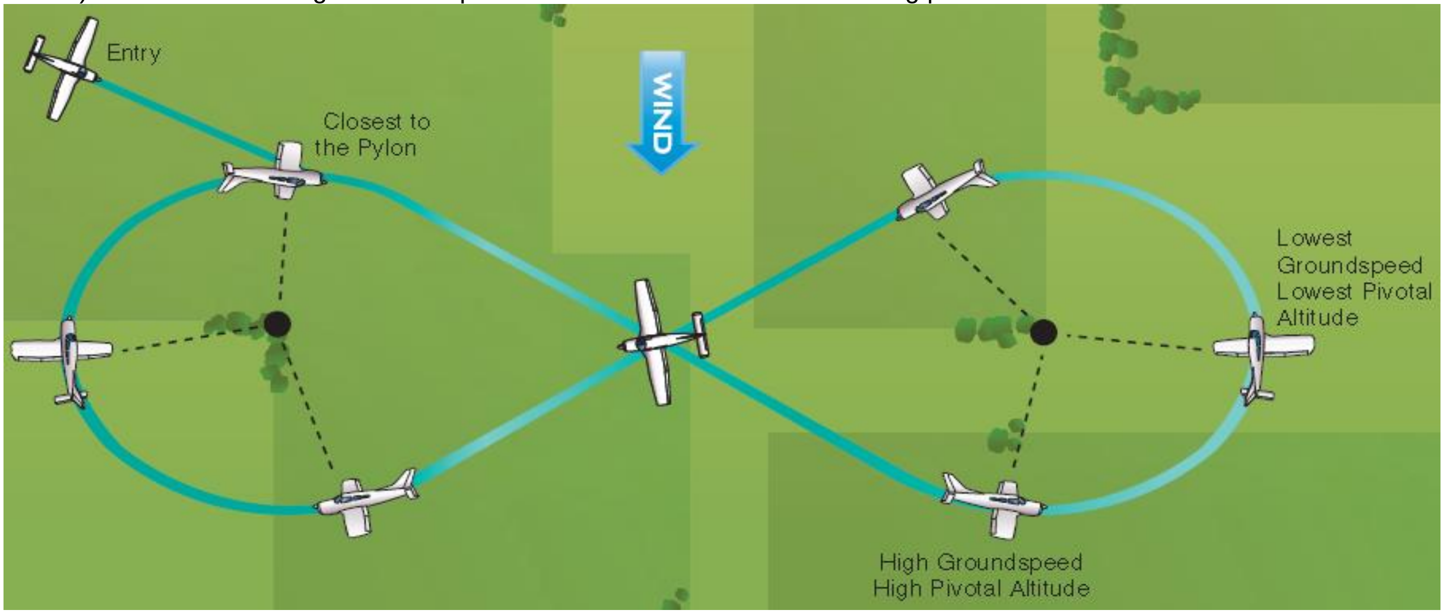
To develop a fine control touch, coordination, and the division of attention necessary for accurate and safe maneuvering of the airplane.

Description:

The airplane is flown in circular paths, alternately left and right, in the form of a figure 8 around two selected points on the ground at such a precise altitude and airspeed that a line parallel to the airplane's lateral axis appears to pivot on each of the pylons.

Setup Procedure:

1) Select two pylons perpendicular to the wind with suitable emergency landing area within gliding distance and a distant apart to obtain a 3 to 5 second straight and level segment.
2) Perform clearing turns.
3) Select appropriate emergency landing field.
4) Establish the appropriate pivotal altitude.
5) Establish airspeed below V_A.
6) Enter the maneuver at a 45° to the downwind with the first turn to the left.
7) When abeam the pylon, begin your turn.
8) Maintain the point on your reference line by climbing or descending as the pivotal altitude changes.
9) Fly straight and level between pylons and repeat around the other pylon.
10) Return to cruise flight and complete cruise checklist to include leaning procedures.



Completion Standards:

- Exhibits knowledge of the elements related to eights on pylons.
- Determines the approximate pivotal altitude.
- Selects suitable pylons that will permit straight and level flight between the pylons.
- Enters the maneuver at the appropriate altitude and airspeed and at a bank angle of approximately 30° or 40° at the steepest point.
- Applies the necessary corrections so that the line of sight reference line remains on the pylon.
- Divides attention between accurate coordinated airplane control and outside visual references.
- Holds pylon using appropriate pivotal altitude avoiding slips and skids.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain how pivotal altitude is affected with changes in groundspeed.
- Compute pivotal altitude.
- Explain the relationship between pivotal altitude and angle of bank.

Safety Considerations:

- Clear the area of traffic and obstacles.
- Look for an emergency landing field nearby.
- Division of attention between maneuver and scanning for traffic.
- Maintain coordinated flight.

Common Errors:

- Faulty entry technique.
- Poor planning, orientation, and division of attention.
- Uncoordinated flight.
- Use of improper line of sight reference.
- Improper timing of turn entries and rollouts.
- Improper wind-drift correction between pylons.
- Selection of pylons where there is no suitable emergency landing area within gliding distance.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

C-172RG

Passenger Briefing (C-172RG)

Objective:

To provide a standard pre-flight briefing to passengers.

Description:

The pilot in command is required by the Federal Aviation Regulations to provide a passenger briefing.

Setup Procedure:

2) Before starting the engine the Pilot-in-Command will provide the passenger safety briefing to include, but not limited to:
    a. Designation of Pilot-in-Command.
    b. Procedures for positively exchanging flight controls.

S

i. Seat belts and shoulder harnesses (location and operation).
ii. Seat belts & shoulder harnesses fastened for taxi, takeoff and landing.
iii. Seat position adjusted and locked in place (controls and operation).

A

iv. Air vents (location and operation).
v. All environmental controls (discussed).
vi. Action in case of any passenger discomfort.

F

vii. Fire extinguisher (location and operation).
viii. Smoking is prohibited.

E

ix. Exit doors (how to secure; how to open).
x. Emergency evacuation plan.
xi. Emergency/survival kit (location and contents).
xii. Equipment (location & operation, i.e., ELT, flight controls).

T

xiii. Traffic (scanning, spotting, notifying pilot).
xiv. Talking ("sterile cockpit" expectations).

Y

xv. Your questions?

Flight Proficiency Standards:

- Briefs occupants on the use of safety belts, shoulder harnesses, doors, and emergency procedures.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance and regulatory requirement for providing a passenger briefing.

Common Errors:

- Failure to perform a passenger briefing.
- Incomplete passenger briefing.

References:

Airman Airman Certification Standards, Federal Aviation Regulations, AC 121-24, AOPA Passenger Safety Briefing Video

Normal & Crosswind Takeoff & Climb (C-172RG)

Objective:

To move the airplane from its starting position on the runway, become airborne, and establish a positive climb to a safe maneuvering altitude.

Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane is accelerated to an airspeed that provides sufficient lift to become airborne.
2) The rotation, when the pilot increases elevator back pressure, increasing the angle of attack to lift the nose wheel.
3) The initial climb when the airplane leaves the ground and establishes a pitch attitude to climb away from the runway.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete takeoff checklist and takeoff briefing.
3) Use aircraft lighting as recommended by the current version of AC 91-73.
4) Ensure runway is clear, align aircraft with runway centerline, confirm DG is aligned with runway, and ensure nose wheel is straight.
5) Position flight controls for wind for existing conditions.
6) Advance throttle smoothly to takeoff power ensuring toes are resting on rudder pedals, not on brakes.
7) Check engine instruments during takeoff roll for normal indications.
8) Maintain directional control with rudder pedals and crosswind control with appropriate aileron deflection
9) Maintain a slightly tail low attitude.
10) Upon reaching rotation speed, 55 kts (V_R), increase back elevator pressure to establish the lift-off attitude that is approximately that for V_Y and allow the aircraft to fly off the ground.
11) Apply adequate drift correction to maintain runway centerline.
12) Accelerate to 84 kts (V_Y).
13) Tap the brakes and retract the landing gear when no more useable runway exists and a positive rate of climb is established.
14) At 500 ft. or as workload permits:
    a. Set climb power, 25” manifold pressure and 2500 RPM
    b. Complete climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to normal and crosswind takeoff, climb operations and rejected takeoff procedures.
- Positions the flight controls for the existing wind conditions.
- Clears the area, taxies onto the takeoff surface and aligns the airplane on the runway center/takeoff path.
- Lifts off at the recommended airspeed and accelerates to V_Y.
- Establishes a pitch attitude that will maintain V_Y ±5 kts.
- Retracts the landing gear if appropriate, and flaps after a positive rate of climb is established.
- Maintains takeoff power and V_Y ±5 kts.
- Maintains directional control, proper wind-drift correction throughout the takeoff and climb.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain runway selection criteria.
- Discuss how to maintain directional control during the ground roll.
- Discuss proper lift-off technique.
- Explain how to use ailerons during crosswind situations.
- Describe how to correct for wind-drift.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not force aircraft off runway too early, causing it to settle back on the runway.
- Consider the effect of density altitude on performance.
- Do not retract landing gear too soon.
- Do not allow upwind wing to rise during takeoff.
- Do not exceed maximum demonstrated crosswind velocity.

Common Errors:

- Improper runway incursion avoidance procedures.
- Inappropriate lift-off procedures.
- Improper climb attitude, power setting, and airspeed.
- Improper use of checklists.
- Improper positioning of the flight controls and wing flaps.
- Drift during climb.
- Failure to establish and maintain proper climb configuration and airspeeds.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Short – Field Takeoff & Climb (C-172RG)

Objective:

To move the airplane from its starting position on the runway, become airborne, and establish a positive climb to a safe maneuvering altitude when the takeoff area is short or restricted by obstructions.

Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane is accelerated to an airspeed that provides sufficient lift to become airborne.
2) The rotation, when the pilot increases elevator back pressure, increasing the angle of attack to lift the nose wheel.
3) The initial climb when the airplane leaves the ground and a pitch attitude is established to climb away from the runway and clear a 50 foot obstacle.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete Short-Field takeoff checklist and takeoff briefing.
3) If no obstacle exists, set flaps to 10° if takeoff weight is 2550 lbs or less.
4) Use aircraft lighting as recommended by the current version of AC 91-73.
5) Back taxi and align aircraft with runway centerline, confirm HSI is aligned with runway, and ensure nose wheel is straight.
6) Ensure runway is clear, advance throttle smoothly to takeoff power while holding brakes; check engine instruments.
7) Release brakes and ensure toes are resting on rudder pedals, not brakes.
8) Maintain directional control with rudder pedals and appropriate aileron deflection.
9) Upon reaching rotation speed, 55 kts (V_R), increase back elevator pressure to establish lift-off attitude and allow aircraft to fly off ground.
10) Accelerate the aircraft to 63 kts until obstacle is cleared or 50 feet above takeoff surface is attained then accelerate to 84 kts (V_Y).
11) Tap the brakes and retract landing gear when no more useable runway is available and a positive rate of climb is established.
13) Retract flaps after a safe altitude of at least 200 ft. and an airspeed of 84 kts are attained.
12) At 500 ft. or as workload permits:
    a. Set climb power, 25” manifold pressure and 2500 RPM
    b. Complete climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a short-field takeoff and maximum performance climb.
- Positions the flight controls for the existing wind conditions, sets flaps as recommended.
- Clears the area; taxies into takeoff position utilizing maximum available takeoff area and aligns the airplane on the runway center/takeoff path.
- Applies brakes (if appropriate) while advancing the throttle smoothly to takeoff power.
- Lifts off at the recommended airspeed, and accelerates to recommended obstacle clearance airspeed, or V_X.
- Establishes a pitch attitude that will maintain the recommended obstacle clearance airspeed, or V_X +5/-0 kts, until the obstacle is cleared, or until the airplane is 50 feet above the surface.
- After clearing the obstacle, establishes the pitch attitude for V_Y, accelerates to V_Y, and maintains V_Y ±5 kts, during the climb.
- Retracts the landing gear, if appropriate and flaps after clear of any obstacles or as recommended by manufacturer.
- Maintains takeoff power and V_Y ±5 kts to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Completes appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain runway selection criteria.
- Discuss how to maintain directional control during ground roll.
- Discuss proper lift-off technique.
- Explain the difference between V_X and V_Y.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not force aircraft off runway too early, causing it to settle back onto runway.
- Do not force aircraft to stay on the ground when it is ready to lift off, wheelbarrow.
- Back taxi to ensure use of entire runway length.
- Retraction of gear and flaps as recommended.

Common Errors:

- Failure to position the airplane for maximum utilization of available runway.
- Improper runway incursion avoidance procedures.
- Improper use of controls during a short-field takeoff.
- Inappropriate lift-off procedures.
- Improper initial climb attitude, power setting and airspeed to clear obstacle.
- Improper use of checklists.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Soft – Field Takeoff & Climb (C-172RG)

Objective:

To align the airplane with the takeoff path, become airborne as quickly as possible, and establish a positive climb to a safe maneuvering altitude.

Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll, when the airplane enters the runways with full up elevator deflection and accelerates to an airspeed at which the airplane will lift off.
2) The acceleration to 63 kts while remaining in ground effect.
3) The initial climb when the airplane establishes a pitch attitude is established to climb away from the runway.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete Short-Field takeoff checklist and takeoff briefing.
3) If no obstacle exists, set flaps to 10° if takeoff weight is 2550 lbs or less.
4) Use aircraft lighting as recommended by the current version of AC 91-73.
5) Ensure runway is clear, taxi onto runway with back elevator pressure and align nose with runway centerline, confirm DG is aligned with runway, without stopping or the use of brakes.
6) Smoothly advance throttle to takeoff power.
7) Ensure toes are resting on rudder pedals, not on brakes.
8) Check engine instruments during ground roll for normal indications.
9) Maintain directional control with rudder pedals and appropriate aileron deflection.
10) Use back elevator pressure to establish a positive pitch attitude and allow the aircraft to fly itself off the ground.
11) When the aircraft becomes airborne, reduce pitch slightly to maintain ground effect while accelerating to 63 kts then simultaneously climb and accelerate to 84 kts (V_Y).
12) Tap the brakes and retract landing gear when no more useable runway exists and a positive rate of climb is established.
13) Retract flaps after a safe altitude of at least 200 ft. and an airspeed of 84 kts are attained.
14) At 500 ft. or as workload permits:
    a. Set climb power, 25” manifold pressure and 2500 RPM
    b. Complete climb checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a soft-field takeoff and climb.
- Positions the flight controls for existing conditions and to maximize lift as quickly as possible.
- Clears the area; taxies onto takeoff surface at a speed consistent with safety without stopping while advancing the throttle smoothly to takeoff power.
- Establishes and maintains a pitch attitude that will transfer the weight of the airplane from the wheels to the wings as rapidly as possible.
- Lifts off at the lowest possible airspeed and remains in ground effect while accelerating to V_X.
- Establishes a pitch attitude for V_X or V_Y, as appropriate, and maintains selected airspeed ±5 kts, during the climb.
- Retracts the landing gear, if appropriate and flaps after clear of any obstacles or as recommended by the manufacturer.
- Maintains takeoff power and V_X or V_Y ±5 kts to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss proper soft-field takeoff technique.
- Explain runway selection criteria.
- Predict the height of ground effect and discuss its relevance.

- Discuss how to maintain directional control during ground roll.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- Do not force the aircraft off runway too quickly.
- Do not retract landing gear too soon.
- Do not allow the airplane to climb above ground effect too soon, causing it to settle back onto the runway.

Common Errors:

- Improper runway incursion avoidance procedures.
- Improper use of controls during a soft-field takeoff.
- Improper lift-off procedures.
- Improper climb attitude, power setting and airspeed.
- Improper use of checklist.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Traffic Pattern (C-172RG)

Objective:

To assure that air traffic flows into and out of an airport in an orderly manner.

Description:

The airplane is flown on a rectangular course around a runway at an altitude specified in the current Airport/Facility Directory or as outlined in the FAR/AIM.

Setup Procedure:

Departures

1) All departures:
   a. Fly the departure leg straight out until reaching traffic pattern altitude.
   b. Once reaching traffic pattern altitude, continue climbing and turn on course.

Arrivals

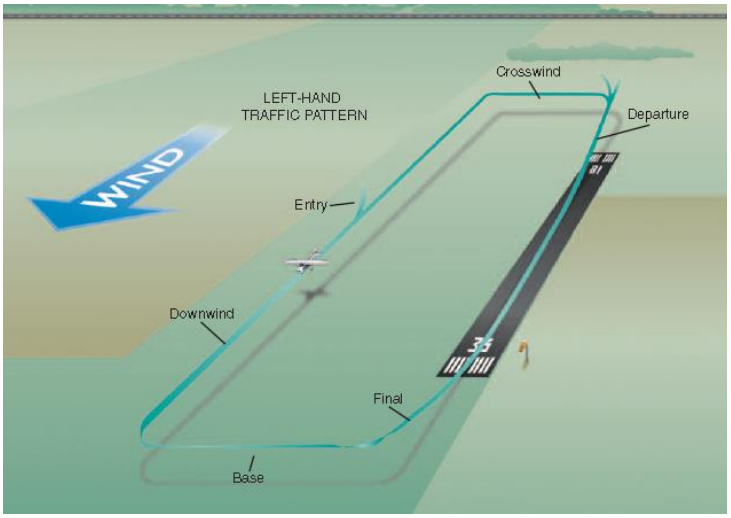
1) Prior to reaching 5 NM from the airfield, complete the following:
   a. Monitor local AWOS/ASOS/ATIS
   b. Ask "Is there any traffic between me and the airport?" and cancel flight following (if applicable)
   c. Complete the Before Landing checklist
2) Slow down below the approach flap airspeed prior to pattern entry.

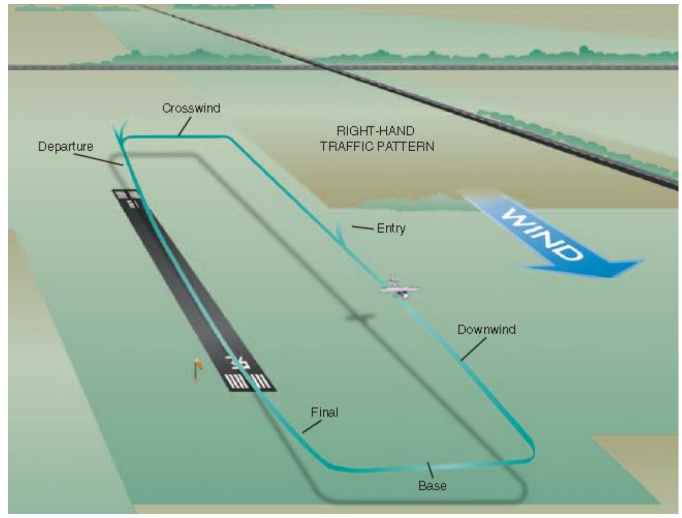
   If already established on the downwind side, skip to step 4.*

3) For a midfield entry:
   a. Cross midfield 500' above traffic pattern altitude, observing traffic flow and wind direction.
   b. Fly 2-3 miles beyond the downwind leg, then descend to pattern altitude.
   c. Complete a tear-drop shaped turn to the right or left as necessary to position the aircraft at a 45 degree angle to the downwind leg.

   If less than two aircraft are currently in the pattern, the alternate method (cross midfield at traffic pattern altitude, enter directly into downwind leg) may be used.

4) Enter the traffic pattern at the designated traffic pattern altitude (normally 1,000' AGL) at a 45 degree angle to the downwind leg at midfield.
5) Apply appropriate crosswind correction to allow for a parallel flight path approximately ½ mile from the runway
6) Allow for proper spacing from other aircraft in the pattern as to prevent runway incursions upon landing.
7) Maintain airspeed below the flap speed required for each configuration change.





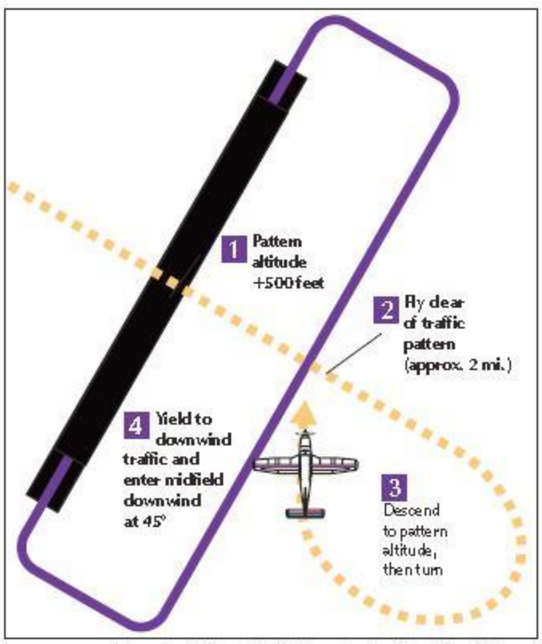


Figure 9. Preferred Entry from Upwind Leg Side of Airport

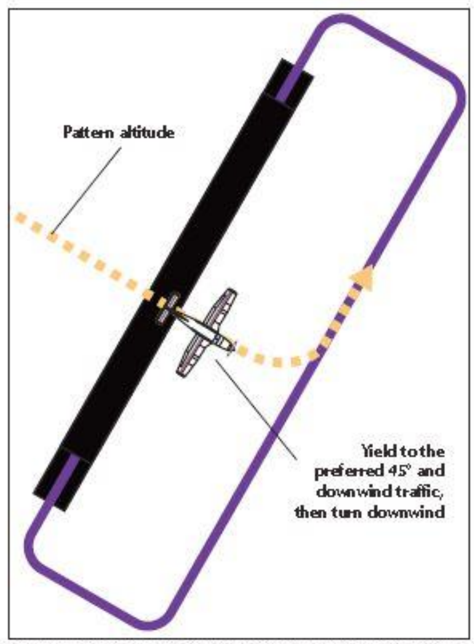


Figure 10. Alternate Midfield Entry from Upwind Leg Side of Airport

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to traffic patterns. This shall include procedures at airports with and without operating control towers, prevention of runway incursions, collision avoidance, wake turbulence avoidance, and wind shear.
- Complies with proper traffic pattern procedures.
- Maintains proper spacing from other aircraft.
- Corrects for wind drift to maintain the proper ground track.
- Maintains orientation with the runway/landing area in use.
- Maintains traffic pattern altitude, ±100 feet and the appropriate airspeed, ±10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss traffic patterns at controlled and uncontrolled airports.
- Explain traffic pattern procedures.
- Explain how to maintain the proper ground track.

Safety Considerations:

- Maintain proper traffic pattern altitude.
- Maintain a distance from the runway that is within power-off gliding distance.
- Preferred bank of approximately 30 degrees (and not to exceed 30) while in pattern..
- Maneuver within 300 feet of traffic pattern altitude before turning crosswind to base.
- Maintain proper aircraft separation.
- Comply with standards traffic pattern procedures or ATC instructions.

Common Errors:

- Failure to comply with traffic pattern instructions, procedures, and rules.
- Improper correction for wind drift.
- Inadequate spacing from other traffic.
- Poor altitude or airspeed control.
- Flying too wide of a pattern.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Normal & Crosswind Approach & Landing (C-172RG)

Objective:

To safely transition the aircraft from flight to ground operations during normal conditions.

Description:

The aircraft is configured for a stabilized approach in the landing configuration and transitioned from the descent to touchdown.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) When abeam midfield, apply carburetor heat and extend landing gear below 140 kts.
5) When abeam the intended touchdown point:
   a. Reduce power to approximately 15”.
   b. Set flaps to 10° below 130 kts.
   c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 75 kts.
6) Turn on the base leg when 45° from the touchdown point:
   a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
   b. At key position, assess approach position.
   a. With wings level, set flaps to 20° as requried.
   c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 70 kts.
7) Turn on final as to align the aircraft with the extended runway center line:
   a. Apply appropriate crosswind correction to maintain the extended runway centerline.
   b. Set flaps to 30° as required.
   c. Adjust pitch and power as required to maintain a stabilized approach, at 65 kts, toward the selected aiming point until flare to land.
   d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
   e. Complete the GUMPS check.
   f. **Ensure 3 down and locked.**
8) During the flare to land simultaneously reduce power to idle and maintain aircraft approximately one foot above runway until it slows to stall speed and touches down on the runway centerline.
9) Maintain positive pitch attitude for aerodynamic braking.
10) Exit runway and complete after landing checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to normal and crosswind approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects a suitable touchdown point.
- Establishes the recommended approach and landing configuration and airspeed and adjust pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, or in its absence, nor more than 1.3 V_{S0} ±5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the round out and touchdown.
- Touches down smoothly at approximate stall speed.
- Touches down at or within 200 feet beyond a specified point, with no drift, and with the airplane’s longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control through the approach and landing sequence.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain proper use of crosswind control inputs.

Safety Considerations:

- Observe flap extension speeds.
- Maintain proper airspeed at all times.
- Use proper crosswind correction to avoid drifting from runway centerline.
- Ensure landing gear is extended and locked.

Common Errors:

- Failure to establish proper crosswind correction.
- Improper use of landing performance data and limitations.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Failure to establish and maintain a stabilized approach.
- Improper technique during round out and touchdown.
- Improper use of brakes.
- Poor directional control after touchdown.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Short – Field Approach & Landing (C-172RG)

Objective:

To safely transition the aircraft from flight to ground operations at an airport with a relatively short runway and/or where an approach is made over obstacles.

Description:

The airplane is configured for a stabilized approach over a 50 foot obstacle. There will be little or no float during the round out, allowing the airplane to touch down at a specified point, and be stopped in a shorter than normal distance.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) When abeam midfield, apply carburetor heat and extend landing gear below 140 kts.
5) When abeam the intended touchdown point:
    a. Reduce power to approximately 15”.
    b. Set flaps to 10° below 130 kts.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 75 kts.
6) Turn on the base leg when 45° from the touchdown point:
    a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
    b. At key position, assess approach position.
    b. With wings level, set flaps to 20° as required.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 70 kts.
7) Turn on final as to align the aircraft with the extended runway center line:
    a. Apply appropriate crosswind correction to maintain the extended runway centerline.
    b. Set flaps to 30° as required.
    c. Adjust pitch and power as required to maintain a stabilized approach, at 63 kts, to clear obstacles, toward the selected aiming point until flare to land.
    d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
    e. Complete the GUMPS check.
    f. **Ensure 3 down and locked.**
8) During the flare to land simultaneously reduce power as required and maintain aircraft approximately one foot above runway until it slows to stall speed and touches down on the runway centerline.
9) Apply maximum braking to a complete stop without skidding the tires.
10) Maintain positive pitch attitude for aerodynamic braking.
11) Exit runway and complete after landing checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a short-field approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects the most suitable touchdown point.
- Establishes the recommended approach and landing configuration and airspeed; adjusts pitch attitude and power.
- Maintains a stabilized approach and recommended approach airspeed, or in its absence, not more than 1.3 V_{SO} ±5 kts with wind gust factor applied.
- Makes smooth, timely, and correct control application during the round out and touchdown.
- Touches down smoothly at minimum control airspeed.
- Touches down at or within 100 feet beyond a specified point, with no side drift, minimum float and with the airplane’s longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Applies brakes, as necessary, to stop in the shortest distance consistent with safety.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on an approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain how to compensate for obstacles and shortened runway lengths.

Safety Considerations:

- Maintain proper airspeed at all times.
- Compensate for crosswind.
- Do not skid tires.
- Use of aerodynamic braking as available.
- Ensure landing gear is extended and locked.

Common Errors:

- Failure to establish and maintain a stabilized approach.
- Improper technique in use of power, wing flaps, and trim.
- Excessive airspeed on final approach.
- Failure to establish proper crosswind correction.
- Improper use of landing performance data and limitations.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Improper use of brakes.
- Poor directional control after touchdown.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Soft – Field Approach & Landing (C-172RG)

Objective:

To safely transition the aircraft from flight to ground operations rough or soft surface.

Description:

The aircraft is configured for a stabilized approach in the landing configuration and transitioned from the descent to touchdown on a field that is unimproved.

Setup Procedure:

1) Complete the before landing and normal landing checklist at least 3 nm before the airport.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) When abeam midfield, apply carburetor heat and extend landing gear below 140 kts.
5) When abeam the intended touchdown point:
    a. Reduce power to approximately 15”.
    b. Set flaps to 10° below 130 kts.
    c. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 75 kts.
6) Turn on the base leg when 45° from the touchdown point:
    a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
    b. At key position, assess approach position.
    c. With wings level, set flaps to 20° as required.
    d. Adjust pitch and power to establish a descent of 400-500 fpm and an airspeed of 70 kts.
7) Turn on final as to align the aircraft with the extended runway center line:
    a. Apply appropriate crosswind correction to maintain the extended runway centerline.
    b. Set flaps to 30° as required.
    c. Adjust pitch and power as required to maintain a stabilized approach, at 65 kts, toward the selected aiming point until flare to land.
    d. Add crosswind control by lowering the upwind wing and applying opposite rudder as appropriate to maintain longitudinal axis of aircraft with extended centerline of runway.
    e. Complete the GUMPS check.
    f. **Ensure 3 down and locked.**
8) During the flare to land simultaneously reduce power as required and maintain aircraft approximately one foot above runway until it slows to stall speed and touches down on the runway centerline as smoothly as possible.
9) Maintain back elevator pressure to keep nose wheel off the ground as long as possible.
10) Maintain directional control with rudder and aileron deflection.
11) Adjust power as necessary to maintain aircraft movement on soft surfaces.
12) Exit the runway with minimal braking and complete after landing checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a soft-field approach and landing.
- Considers the wind conditions, landing surface, and obstructions, and selects the most suitable touchdown area.
- Establishes the recommended approach and landing configuration and airspeed; adjusts pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, or in its absence, not more than 1.3 V_{S0} ±5 kts, with wind gust factor applied.
- Makes smooth, timely, and correct control applications during the round out and touchdown.
- Touches down softly, with no drift, and with the airplane’s longitudinal axis aligned with the runway/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Maintains proper position of the flight controls and sufficient speed to taxi on the soft surface.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss effect of flaps on an approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain how to touchdown and maneuver the aircraft on soft of unimproved surfaces.

Safety Considerations:

- Do not land on fields that exceed the capabilities of the aircraft or pilot.
- Fly over and visually check the field prior to landing.
- Check field length and density altitude.
- UCM retractable gear aircraft can only land on paved, public, published runways.
- Ensure landing gear is extended and locked.

Common Errors:

- Failure to maintain elevator back-pressure after touchdown.
- Improper use of brakes.
- Failure to consider effect of wind and landing surface.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Power – Off 180° Accuracy Landing (C-172RG)

Objective:

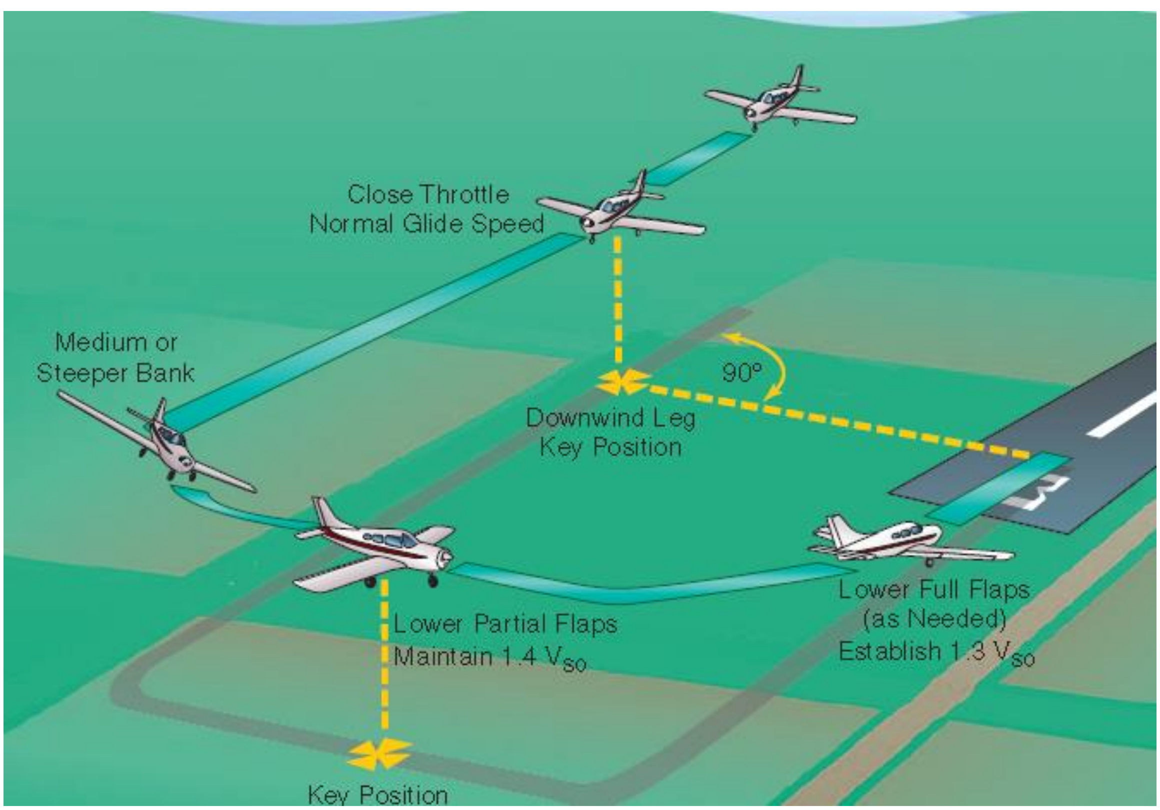
To instill in the pilot the judgment and procedures necessary for accurately flying the airplane, without power, to a safe landing.

Description:

Power-off accuracy approaches are approaches and landings made by gliding with the engine idling, through a specific pattern to a touchdown within 200 feet of a designated line or mark on the runway.

Setup Procedure:

1) Complete the before landing checklist.
2) Enter and fly the appropriate pattern.
3) Select touchdown and aiming points.
4) When abeam midfield apply carburetor heat.
5) When abeam the intended touchdown point:
    a. Extend landing gear.
    b. Close throttle.
    c. Set flaps 10°.
6) Maintain altitude while decelerating to the recommended glide speed 73 kts.
7) Base leg turn will be determined by the glide angle of the airplane, weight, and velocity of the wind.
8) Extend flaps as required.
9) Turn to final approach and extend flaps, as necessary.
10) Adjust trim and make slight adjustments in pitch attitude of flap setting to control glide angle and airspeed.
11) Complete the GUMPS check.
12) **Ensure 3 down and locked**.
13) Touch down at approximate stalling speed on the runway centerline at the designated point.
14) Exit the runway and complete after landing checklist.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a power-off 180° accuracy approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects an appropriate touchdown point.
- Positions airplane on downwind leg, parallel to landing runway, and not more than 1,000 feet AGL.
- Abeam the specified touchdown point closes throttle and establishes appropriate glide speed.
- Completes final airplane configuration.
- Touches down in a normal landing attitude, at or within 200 feet beyond the specified touchdown point.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the effect of wind velocity on required altitude and bank angle.
- Discuss the importance of controlling glide angle and airspeed on final approach.

Safety Consideration:

- Maintain coordinated flight throughout the maneuver.
- Be aware of the position of other traffic in the pattern.
- Maintain appropriate airspeed throughout the maneuver.

Common Errors:

- Failure to touchdown within 200 feet of the intended touchdown point.
- Failure to maintain constant airspeed and glide angle.
- Failure to accurately determine the wind direction and velocity.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Go-Around (C-172RG)

Objective:

To safely discontinue the landing approach when unsatisfactory conditions exist.

Description:

As full power is applied, the aircraft attitude is adjusted to accelerate to V_Y and climb. As a safe airspeed is attained, flaps are retracted 10° at a time allowing stabilization between each retraction. Landing gear is retracted after a positive rate of climb is attained and clear of any obstacles.

Setup Procedure:

1) Smoothly apply maximum allowable power.
2) Turn off carburetor heat.
3) Establish an attitude to accelerate to 55 kts.
4) Set flaps to 20° and stabilize in between configuration changes.
5) Allow the airplane to accelerate to V_X and climb.
6) Retract landing gear after a positive rate of climb is established and clear of any obstacles.
7) Set flaps to 10° and stabilize in between configuration changes.
8) Allow the aircraft to accelerate to V_Y.
9) Set flaps to 0° at a safe altitude above 200' AGL.
10) Open cowl flaps as required.
11) Verify the Go Around checklist is complete.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a go-around/rejected landing.
- Makes a timely decision to discontinue the approach to landing.
- Applies takeoff power immediately and transitions to climb pitch attitude for V_Y, and maintains V_Y ±5 kts.
- Retracts the flaps as appropriate.
- Retracts the landing gear, if appropriate, after a positive rate of climb is established and clear any obstacles.
- Maneuvers to the side of the runway/landing area to clear and avoid conflicting traffic.
- Maintains takeoff power V_Y ±5 kts to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the climb.
- Completes the appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss events that may require a go-around.
- Explain the importance of maintaining airspeed and coordination during the go-around procedure.
- Discuss the necessity for maneuvering to the side of the runway after making the decision to go-around.

Safety Considerations:

- Maneuver the airplane to the side of the runway.
- Do not establish a pitch up attitude too quickly.
- Maintain coordination.
- Timely decision making.
- Be watchful for situation which may require a go-around.

Common Errors:

- Delayed decision to make a go-around.
- Improper application of power.
- Failure to control pitch attitude.
- Improper trim technique.
- Failure to compensate for torque effect.
- Failure to maintain V_Y as appropriate.
- Improper wing flap retraction.
- Improper gear retraction.
- Failure to maintain well clear of obstructions and other traffic.
- Improper use of checklists.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Emergency Descent (C-172RG)

Objective:

To descend the airplane as soon and as rapidly as possible, within the structural limitations of the airplane.

Description:

The emergency descent is a maneuver for descending as rapidly as possible to a lower altitude or to the ground for an emergency landing.

Setup Procedure:

1) Perform clearing turns.
2) If utilizing flight following, contact ATC for traffic advisories below.
3) Apply carburetor heat.
4) Reduce power to idle.
5) Confirm flaps 0^{o}.
6) Set mixture to rich.
7) Advance prop to high RPM.
8) Extend landing gear.
9) Roll into a 30^{o} - 45^{o} bank to the left and pitch down to achieve 130 kts (If in turbulent air, maintain an airspeed below V_A)
10) Close cowl flaps as required.
11) Continue descent until instructed to recover or at assigned altitude.
12) Initiate recovery to level flight at least 300' prior to assigned altitude by:
    a. Rolling out the bank.
    b. Pitching up.
13) Return to cruise flight and complete the cruise checklist to include leaning procedures

Flight Proficiency Standards:

- Exhibit knowledge of the elements related to emergency descent.
- Recognizes situations, such as depressurization, cockpit smoke, and/or fire that require an emergency descent.
- Establish the appropriate airspeed and configuration for the emergency descent.
- Exhibit orientation, division of attention, and proper planning.
- Maintains positive load factors during the descent.
- Follow the appropriate checklist.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the purpose(s) of an emergency descent.
- Discuss engine cooling characteristics during an emergency descent.
- Discuss the importance of proper planning as it pertains to emergencies.

Safety Considerations:

- Maintain positive aircraft control.
- Clear the engine periodically
- Clear below then GO.
- Steep spiral over airport.
- Continue on to emergency approach and landing.

Common Errors:

- Failure to recognize the urgency of the emergency descent.
- Failure to use emergency checklist for situation.
- Failure to maintain appropriate configuration and airspeed.

- Poor orientation, planning, and division of attention.

Maneuvering During Slow Flight (C-172RG)

Objective:

To demonstrate the flight characteristics and controllability of an airplane at speeds lower than normal cruise and develop proficiency in performing maneuvers that require slow airspeeds.

Description:

Slow flight consists of slowing the aircraft to a minimum controllable airspeed in the landing configuration and maneuvering the aircraft while maintaining altitude and airspeed.

Setup Procedure:

1) Select an altitude which allows recovery by at least 1,500' AGL.
2) Perform clearing turns.
3) Open cowl flaps as required.
4) Extend landing gear.
5) Apply carburetor heat.
6) Reduce manifold pressure to 15" or less.
7) Advance propeller to high RPM once in white arc.
8) Set mixture rich.
9) Set 10° flaps below 130 kts.
10) Set 20° and 30° flaps below 100 kts allowing the aircraft to stabilize between each.
11) Adjust pitch and power as necessary to maintain altitude and airspeed.
12) Establish and maintain an airspeed at which any further increase in pitch or reduction of power would result in an immediate stall or a higher speed as specified by your instructor.
    a. Slow flight should be practiced at varying speeds and configurations above the 1G stall speed of the aircraft as specified by the instructor.
13) Maneuver as instructed.
14) Recover when instructed by adding full power.
15) Turn carburetor heat off.
16) Set flaps to 20° and allow the aircraft to stabilize.
17) Retract landing gear.
18) Then set flaps to 10° and 0° allowing the aircraft to stabilize between each setting.
19) Return to cruise flight and perform the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to maneuvering during slow flight.
- Selects an entry altitude that will allow the task to be completed no lower than 1,500' AGL.
- Establish and maintain an airspeed at which any further increase in angle of attack, increase in load factor, or reduction in power, would result in a stall warning (e.g., airplane buffet, stall horn, etc.).
- Accomplishes coordinated straight and level flight, turns, climbs, and descents with landing gear and flap configurations specified by the instructor.
- Divides attention between airplane control and orientation.
- Maintains the specified altitude, ±50 feet; specified headings, ±10°; airspeed +5/-0 kts, and specified angle of bank, ±5°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the relationship between pitch and power in maintaining airspeed and altitude during slow flight.
- Discuss how flight at minimum airspeeds develops the ability to estimate the margin of safety above the stalling speed.
- Compare the practice of slow flight to various phases of flight such as; takeoffs, climbs, descents, go-around, and approaches to landing.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified gear and flap configuration.
- Improper entry technique.
- Failure to establish and maintain the specified airspeed.
- Excessive variations of altitude and heading when a constant altitude and heading are specified.
- Rough or uncoordinated control technique.
- Improper correction for left turning tendency.
- Improper trim technique.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Power – Off Stall (C-172RG)

Objective:

To familiarize the pilot with the conditions that produce stalls, assist in recognizing an approaching stall, and develop skills to prevent and recover from stalls in the landing configuration.

Description:

The aircraft is slowed down and placed in the landing configuration after which a stall is induced and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery by at least 1,500' AGL.
2) Perform clearing turns.
3) Close cowl flaps as required.
4) Extend landing gear.
5) Apply carburetor heat.
6) Reduce manifold pressure to 15" or less.
7) Advance propeller to high RPM once in white arc.
8) Set mixture rich.
9) Set 10° flaps below 130 kts.
10) Set 20° and 30° flaps below 100 kts allowing the aircraft to stabilize between each.
11) Establish a stabilized descent at 65 kts.
12) Increase angle of attack while maintaining altitude.
13) Reduce power to idle.
14) Recognize and recover from the impending stall (aerodynamic buffeting) by simultaneously reducing the angle of attack, leveling the wings and adding full power.
15) Turn off carburetor heat.
16) Set flaps to 20° and stabilize in between configuration changes.
17) Retract landing gear after a positive rate of climb is established.
18) Set flaps to 10° and stabilize in between configuration changes.
19) Allow the aircraft to accelerate to V_Y.
20) Open cowl flaps as required.
21) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to power-off stalls.
- Selects an entry altitude that allows the task to be completed no lower than 1,500' AGL.
- Establishes a stabilized descent in the approach or landing configuration, as specified by the instructor.
- Transitions smoothly from the approach or landing attitude to a pitch attitude that will induce a stall.
- Maintains a specified heading, ±10° in straight flight; maintains a specified angle of bank, not to exceed 20°, ±5°, in turning flight while inducing the stall.
- Recognizes and recovers promptly as the stall occurs by simultaneously reducing the angle of attack, increasing power to maximum allowable and leveling the wings to return to a straight and level flight attitude with a minimum loss of altitude appropriate for the airplane.
- Retracts the flaps to the recommended setting, retracts the landing gear if retractable after a positive rate of climb is established.
- Accelerates to V_X or V_Y speed before the final flap retraction.
- Returns to the altitude, heading, and airspeed specified by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Power – On Stall (C-172RG)

Objective:

To familiarize the pilot with the conditions that produce stalls, assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in the takeoff configuration.

Description:

The aircraft is slowed down and placed in the takeoff configuration after which a stall is induced and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery by at least 1,500' AGL.
2) Perform clearing turns.
3) Open cowl flaps as required.
4) Verify landing gear UP
5) Apply carburetor heat.
6) Reduce manifold pressure to 15" or less.
7) Advance propeller to high RPM once in white arc.
8) Set mixture rich.
9) Verify flaps 0°.
10) Increase power to 20" at 55 kts (V_R) or stall warning horn.
11) Turn carburetor heat off.
12) Transition smoothly to the pitch attitude that will induce a stall.
13) Recognize and recover from the impending stall (aerodynamic buffeting) by simultaneously reducing the angle of attack, increasing power, and leveling the wings.
14) Accelerate the airplane to V_Y and climb.
15) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to power-on stalls.
- Selects an entry altitude that allows the task to be completed no lower than 1,500' AGL.
- Establishes the takeoff or departure configuration. Sets power to no less than 65 percent available power.
- Transitions smoothly from the takeoff or departure attitude to a pitch attitude that will induce a stall.
- Maintains a specified heading ±5°, in straight flight; maintains a specified angle of bank, not to exceed a 20°, ±10°, turning flight, while inducing the stall.
- Recognizes and recovers promptly as the stall occurs by simultaneously reducing the angle of attack, increasing power to maximum allowable and leveling the wings to return to a straight and level flight attitude, with a minimum loss of altitude appropriate for the airplane.
- Retracts flaps to the recommended setting and retracts the landing gear if retractable after a positive rate of climb is established.
- Accelerates to V_X or V_Y speed before the final flaps retraction; returns to the altitude, heading, and airspeed specified by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Accelerated Stall (C-172RG)

Objective:

To familiarize the pilot with the conditions that produce accelerated stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in an accelerated configuration.

Description:

The aircraft is slowed down and placed in the clean configuration. After which a steep turn is applied with excessive back elevator pressure and therefore a stall is induced at a higher than normal stalling speed and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery by at least 3,000' AGL.
2) Perform clearing turns.
3) Reduce power to 15" and 2,300 RPM allowing the aircraft to slow below maneuvering speed while maintaining altitude.
4) Set mixture to rich.
5) Verify flaps up.
6) Upon reaching 75 kts, transition smoothly to an approximate 45 degree bank and apply back pressure to induce an accelerated stall.
7) Recognize and recover from the stall (aerodynamic buffeting) as the stall occurs by simultaneously leveling the wings, reducing the angle of attack, and increasing power.
8) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to accelerated stalls.
- Selects an entry altitude that allows the task to be completed no lower than 3,000' AGL.
- Establishes the configuration as specified by the instructor.
- Establish and maintain a coordinated turn in a 45° bank, increasing elevator back pressure smoothly and firmly until an impending stall is reached.
- Recognizes and recovers promptly at the first indication of an impending stall.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Cross-Control Stall (C-172RG)

Objective:

To familiarize the pilot with the conditions that produce cross-control stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in a cross-control configuration.

Description:

The aircraft is left in a clean configuration while power is reduced to simulate landing conditions after which a stall is initiated by using excessive rudder in the direction of the base-to-final turn and back elevator pressure is applied to keep the nose from lowering. Recovery procedures should be initiated at first indication of stall by applying full power and removing opposite aileron and rudder inputs simultaneously.

Setup Procedure:

1) Select an altitude which allows recovery by 3000' AGL.
2) Perform clearing turns.
3) Close cowl flaps as required.
4) Extend landing gear.
5) Apply carburetor heat.
6) Reduce manifold pressure to 15" or less.
7) Advance propeller to high RPM in white arc.
8) Set mixture to rich.
9) Verify flaps up.
10) Select a point on the ground to act as a runway and position aircraft on a base leg.
11) Upon reaching 65 kts begin a "base-to-final" turn that overshoots final approach and simultaneously:
    a. Correct for final approach path by smoothly applying excessive rudder in the direction of turn.
    b. Use opposite aileron to hold constant bank.
    c. Increase elevator back pressure to keep the nose from dropping below horizon.
12) Recognize and recover from the impending stall (aerodynamic buffeting) by simultaneously reducing the angle of attack, removing opposite rudder and aileron inputs, and adding full power.
13) Turn off carburetor heat.
14) Retract landing gear after a positive rate of climb is established.
15) Open cowl flaps as required.
16) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards

- Exhibits knowledge of the elements of the elements of cross-controlled stalls, with the landing gear extended.
- Exhibits instructional knowledge of common errors related to cross-control stalls, with the landing gear extended.
- Demonstrates and simultaneously explains a cross-control stall, with landing gear extended, from an instructional standpoint.
- Analyzes and corrects simulated common errors related to a cross-control stall with the landing gear extended.

Note: These are the PTS standards for the CFI certificate as these maneuvers are only to be demonstrated to commercial pilot students and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a cross-control stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a cross-control stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.

- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Spin entry due to stalling aircraft in uncoordinated condition.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; CFI PTS

Elevator Trim Stall (C-172RG)

Objective:

To familiarize the pilot with the conditions that produce elevator trim stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls with excessive elevator trim.

Description:

The aircraft is left in a clean configuration while power is reduced to simulate landing conditions and elevator trim is added to maintain a stable descent. After which a go-around is simulated with the excessive trim and therefore a stall attitude is reached rapidly and recovery is initiated returning the aircraft to normal cruise.

Setup Procedure:

1) Select an altitude which allows recovery by 3000' AGL.
2) Perform clearing turns.
3) Open cowl flaps as required.
4) Extend landing gear.
5) Apply carburetor heat.
6) Reduce manifold pressure to 15" or less.
7) Advance propeller to high RPM in white arc.
8) Set mixture to rich.
9) Below 130 kts, set flaps to 10°.
10) Set flaps to 20° and 30° below 100 kts allowing the aircraft to stabilize between each setting.
11) Apply nose up elevator trim to establish a descent at 65kts.
12) Once a 65 kt descent has been established simulate a go-around by applying full power.
13) Turn carburetor heat off.
14) Recognize and recover once an attitude has been reached that would result in an impending stall by:
    a. Reducing angle of attack.
    b. Hold forward elevator pressure while reducing nose up elevator trim.
    c. Set flaps to 20°.
15) Retract landing gear.
16) Set flaps to 10°.
17) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits instructional knowledge of the elements of elevator trim stalls, in selected landing gear and flap configurations.
- Exhibits instructional knowledge of common errors related to elevator trim stalls, in selected landing gear and flap configurations.
- Demonstrates and simultaneously explains elevator trim stalls, in selected landing gear and flap configurations, from an instructional standpoint.
- Analyzes and corrects simulated common errors related to elevator trim stalls in selected configurations.

Note: These are the PTS standards for the CFI certificate as these maneuvers are only to be demonstrated to commercial pilot students and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of an elevator trim stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from an elevator trim stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.

- Uncoordinated flight.
- Not clearing the area.
- Division of attention.
- Forward elevator pressure required in recovery.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Spin entry due to stalling aircraft in uncoordinated condition.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying Handbook; POH/AFM; CFI PTS

Secondary Stall (C-172RG)

Objective:

To familiarize the pilot with the conditions that produce secondary stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls that could occur due to improper recovery techniques.

Description:

The aircraft configured for and placed into a power off stall. During recovery a secondary stall is induced by abrupt control inputs, attempting to return to normal cruise to early, or by not adequately reducing angle of attack during initial stall recovery.

Setup Procedure:

1) Select an altitude which allows recovery by at least 3,000' AGL.
2) Perform clearing turns.
3) Close cowl flaps as required.
4) Extend landing gear.
5) Apply carburetor heat.
6) Reduce manifold pressure to 15" or less.
7) Advance propeller to high RPM once in white arc.
8) Set mixture rich.
9) Set 10° flaps below 130 kts.
10) Set 20° and 30° flaps below 100 kts allowing the aircraft to stabilize between each.
11) Establish a stabilized descent at 65 kts.
12) Reduce power to idle.
13) Maintain coordinated flight and altitude until recognition of the stall.
14) Induce secondary stall by:
    a. Allowing nose to pitch down, but immediately pitch the nose up excessively to maintain desired altitude. or
    b. Hold aircraft in stall by not reducing angle of attack.
15) Recover from the secondary stall (aerodynamic buffeting) by simultaneously reducing the angle of attack, leveling the wings, and adding full power.
16) Set flaps to 20°.
17) Retract landing gear after a positive rate of climb is established.
18) Set flaps to 10°.
19) Allow the aircraft to accelerate to V_Y.
20) Open cowl flaps as required.
21) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits instructional knowledge of the elements of secondary stalls, in selected configurations.
- Exhibits instructional knowledge of common errors related to secondary stalls, in selected configurations.
- Demonstrates and simultaneously explains secondary stalls, in selected landing gear and flap configurations, form an instructional standpoint.
- Analyzes and corrects simulated common errors related to secondary stalls in selected configurations.

Note: These are the PTS standards for the CFI certificate as these maneuvers are only to be demonstrated to commercial pilot students and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a secondary stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a secondary stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Spin entry due to stalling aircraft in uncoordinated condition.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.

References:

Airplane Flying Handbook; POH/AFM; CFI PTS

Steep Turns (C-172RG)

Objective:

To develop coordination, orientation, division of attention and smooth control techniques while executing high performance turns.

Description:

The maneuver consists of two 360° turns in opposite directions, using a bank angle of 50° while maintaining a constant airspeed and altitude.

Setup Procedure:

1) Select an altitude which allows performance of maneuver no lower than 1,500' AGL.
2) Perform clearing turns.
3) Reduce manifold pressure to establish airspeed below Va.
4) Enter a coordinated 50° banking turn to the left.
5) Increase power and adjust trim and pitch as required to maintain altitude and airspeed.
6) Begin rollout at ½ the bank angle prior to rollout heading.
7) Continue the maneuver to the other direction.
8) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to steep turns.
- Establishes the manufacturer's recommended airspeed or if one is not stated, a safe airspeed not to exceed Va.
- Rolls into a coordinated 360° steep turn with at least a 50° bank, followed by a 360° turn in the opposite direction.
- Divides attention between airplane control and orientation.
- Maintains the entry altitude, ±100 feet, airspeed, 10 kts, bank, ±5°, and rolls out on the entry heading, ±10°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain why load factor increases as bank angle increases.
- Discuss the relationship between load factor and stall speed.
- Discuss the principle of over-banking tendency.
- Explain how to maintain altitude and airspeed.
- Explain limit load factor and what happens if it's exceeded.

Safety Considerations:

- Do not exceed manufacturer's recommended airspeed or Va.
- Always clear the area before initiating the maneuver.
- The maneuver is to be completed no lower than 1,500' feet AGL.
- Division of attention between maneuver and scanning for traffic.

Common Errors:

- Improper pitch, bank, and power coordination during entry and rollout.
- Uncoordinated use of flight controls.
- Improper procedure in correcting altitude deviations.
- Loss of orientation.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Chandelle (C-172RG)

Objective:

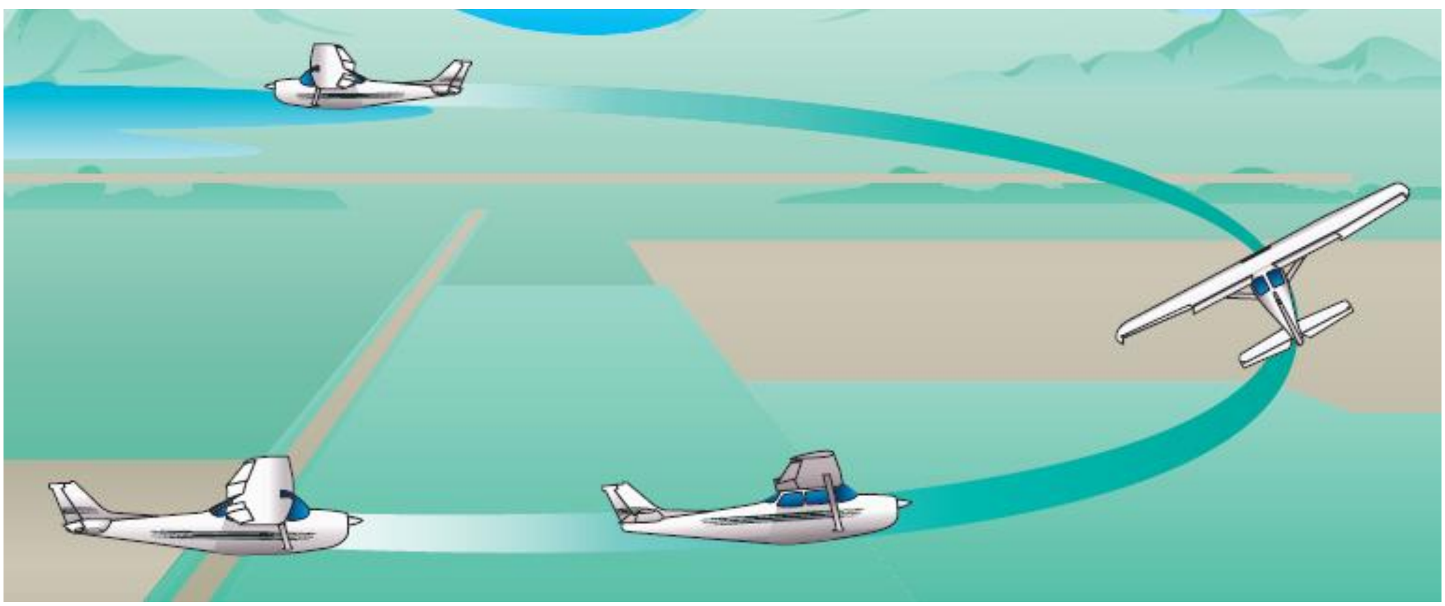
To develop the pilot's coordination, orientation, planning and accuracy of control during maximum performance flight.

Description:

A chandelle is a maximum performance climbing turn beginning from approximately straight and level flight, and ending at the completion of a 180° turn in a wings level, nose high attitude at the minimum controllable airspeed.

Setup Procedure:

1) Select an altitude to perform the maneuver no lower than 1,500' AGL.
2) Perform clearing turns.
3) Orient the airplane so that the turn is into the wind.
4) Establish an airspeed below Va.
5) Open cowl flaps as required.
6) Set propeller to high RPM.
7) Establish a 30° bank turn.
8) Apply full power
9) Increase pitch to reach maximum at the 90° point.
10) At the 90° point, gradually increase back pressure to maintain pitch attitude and begin a coordinated roll out to reach wings level at the 180° point.
11) At the 180° point, establish level flight within 50 feet of final altitude.
12) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to chandelles.
- Selects an altitude that will allow the maneuver to be performed no lower than 1,500' AGL.
- Establishes the recommended entry configuration, power and airspeed.
- Establishes the angle of bank at approximately 30°.
- Simultaneously applies power and pitch to maintain a smooth, coordinated climbing turn to the 90° point, with a constant bank.
- Begins a coordinated constant rate rollout from the 90° point to the 180° point maintaining power and a constant pitch attitude.
- Completes rollout at the 180° point, ±10° just above a stall airspeed, and maintains that airspeed momentarily avoiding a stall.
- Resumes straight and level flight with minimum loss of altitude.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Coordination during high power settings and high angles of attack.
- Maneuvering the aircraft at high performance levels.

Safety Considerations:

- This maneuver should be performed no lower than 1,500' AGL.
- Divide attention between flying the airplane and scanning for traffic.
- Maintain coordinated flight.

Common Errors:

- Improper pitch, bank, and power coordination during entry or completion.
- Uncoordinated use of flight controls.
- Improper planning and timing of pitch and bank attitude changes.
- Factors related to failure in achieving maximum performance.
- A stall during the maneuver.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Lazy Eights (C-172RG)

Objective:

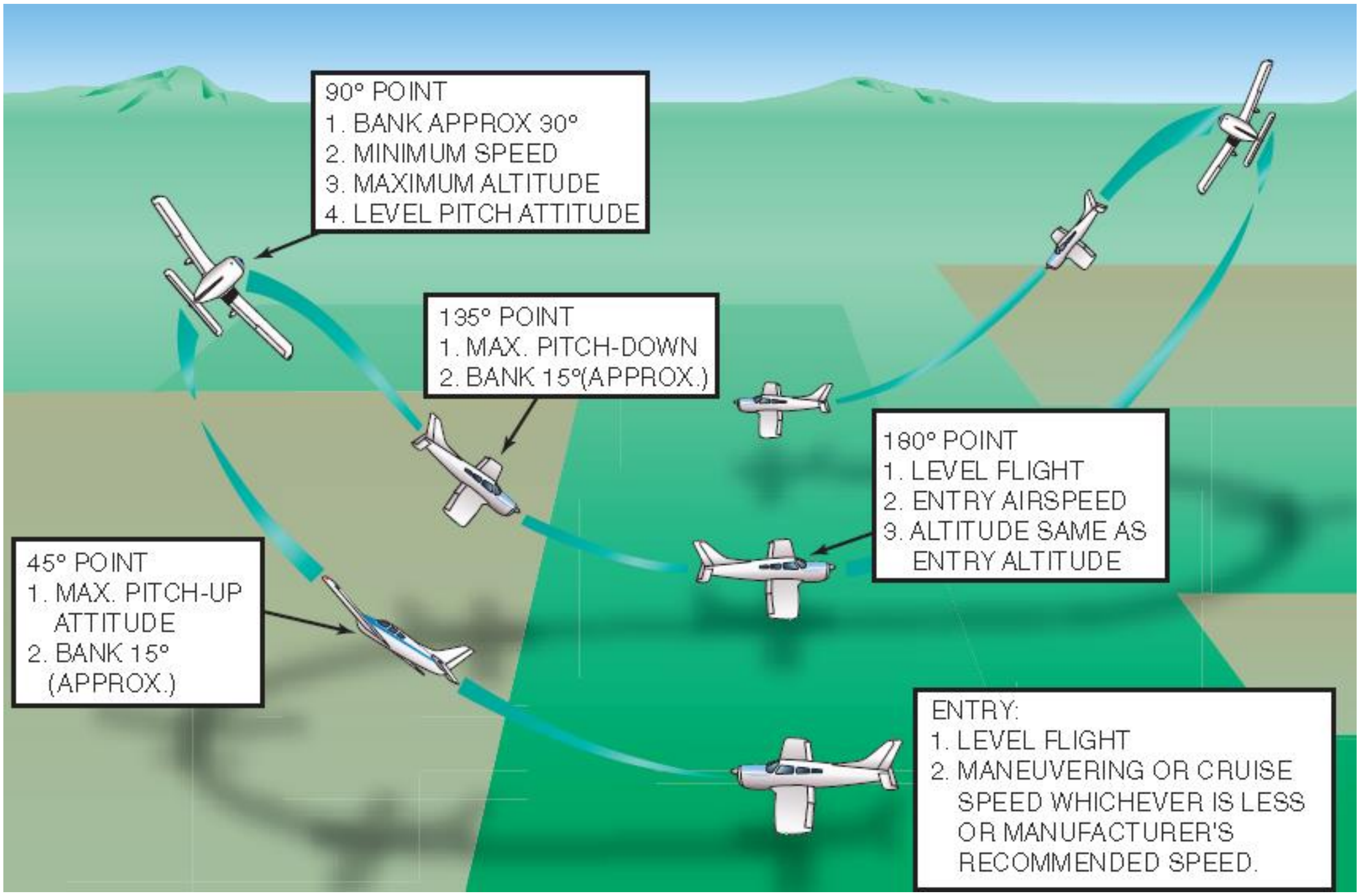
To develop coordination of controls through a wide range of airspeeds and altitudes so that certain accuracy points are reached with planned attitude and bank.

Description:

Two 180° turns, in opposite direction, while making a climb and a descent in a symmetrical pattern during each of the turns. At no time is the airplane flown straight and level.

Setup Procedure:

1) Select an altitude to perform the maneuver no lower than 1,500' AGL.
2) Perform clearing turns.
3) Orient the airplane so that the first turn is to the left and into the wind.
4) Maintain airspeed below Va.
5) Adjust cowl flaps as required.
6) Begin the maneuver by constantly changing pitch and bank maneuver:
    a. 45° point – 15° of bank and max pitch up.
    b. 90° point – 30° of bank, level pitch attitude, minimum controllable airspeed.
    c. 135° point – 15° of bank and max pitch down.
    d. 180° point – back to starting airspeed, altitude, and heading.
7) Repeat in opposite direction.
8) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to lazy eights.
- Selects an altitude that will allow the maneuver to be performed no lower than 1,500' AGL.
- Establishes the recommended entry configuration, power, and airspeed.
- Maintains coordinated flight throughout the maneuver.
- Achieves the following throughout the maneuver
  - Approximately 30° bank at the steepest point.
  - Constant change of pitch and roll rate.
  - Altitude tolerance at 180° points, ±100 feet from entry altitude.
  - Airspeed tolerance at the 180° point, ±10 kts from entry airspeed.
  - Heading tolerance at the 180° point ±10°.
- Continues the maneuver through the number of symmetrical loops specified and resumes straight and level flight.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance of proper power setting.
- Explain the need for differing amounts of rudder pressure between the left and right turn.
- Discuss the effects of torque at the top of the eight in both the right and left turns.

Safety Considerations:

- Always clear the area before beginning a maneuver.
- Maintain coordination at all times during the maneuver.
- Use proper division of attention to see and avoid traffic.

Common Errors:

- Uncoordinated use of flight controls.
- Inconsistent airspeed and altitude at key points in the maneuver.
- Loss of orientation.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Steep Spiral (C-172RG)

Objective:

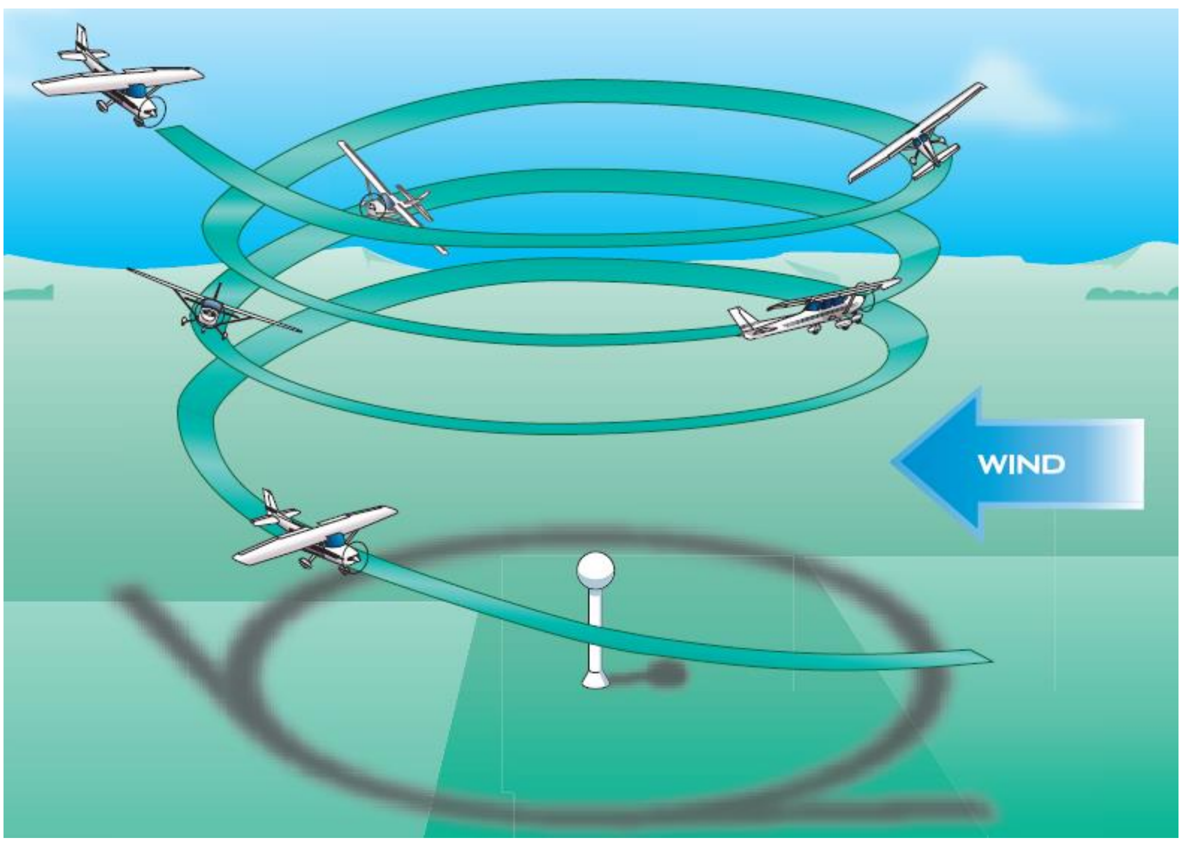
To improve pilot techniques for airspeed control, wind drift control, planning, orientation, and division of attention.

Description:

A steep spiral is a constant gliding turn, during which a constant radius around a point on the ground is maintained.

Setup Procedure:

1) Begin the maneuver with sufficient altitude to allow for three 360° degree turns without descending below 1,500' feet AGL.
2) Select a point to perform the maneuver.
3) Perform clearing turns and maneuver to enter on the downwind.
4) Close cowl flaps as required.
5) Extend the landing gear.
6) Apply carburetor heat.
7) Reduce power and slow to 83 kts.
8) Set prop to high RPM.
9) Set mixture rich.
10) Reduce the power to idle when abeam the point.
11) Maintain 83 kts ($V_{L/D}$ +10 kts).
12) Change bank angle as necessary to maintain an equal distance from the reference point 45-55° of bank, not to exceed 60°.
13) Clear the engine on each upwind leg.
14) Roll out on a specified heading.
15) Increase power to maintain level flight.



16) Turn carburetor heat off.

17) Retract landing gear below 140 kts.
18) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to a steep spiral.
- Selects an altitude sufficient to continue through a series of at least three 360° turns.
- Selects a suitable ground reference point.
- Applies wind-drift correction to track a constant radius circle around the selected reference point with bank not to exceed 60° at steepest point in turn.
- Divides attention between airplane control and ground track, while maintaining coordinated flight.
- Maintains the specified airspeed, ±10 kts, rolls out toward specified heading, ±10°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the effect of bank angle on ground track.
- Discuss the effect of ground speed on the radius of the turn.
- Recognize the importance of clearing the engine during extended periods of engine operations at low power settings.

Safety Considerations:

- Clear the area.
- Divide attention between aircraft control and orientation.
- Choose a reference point with emergency landing field within gliding distance.

Common Errors:

- Failure to maintain constant radius around reference point.
- Failure to maintain constant airspeed.
- Uncoordinated use of flight controls.
- Loss of orientation.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Eights On Pylons (C-172RG)

Objective:

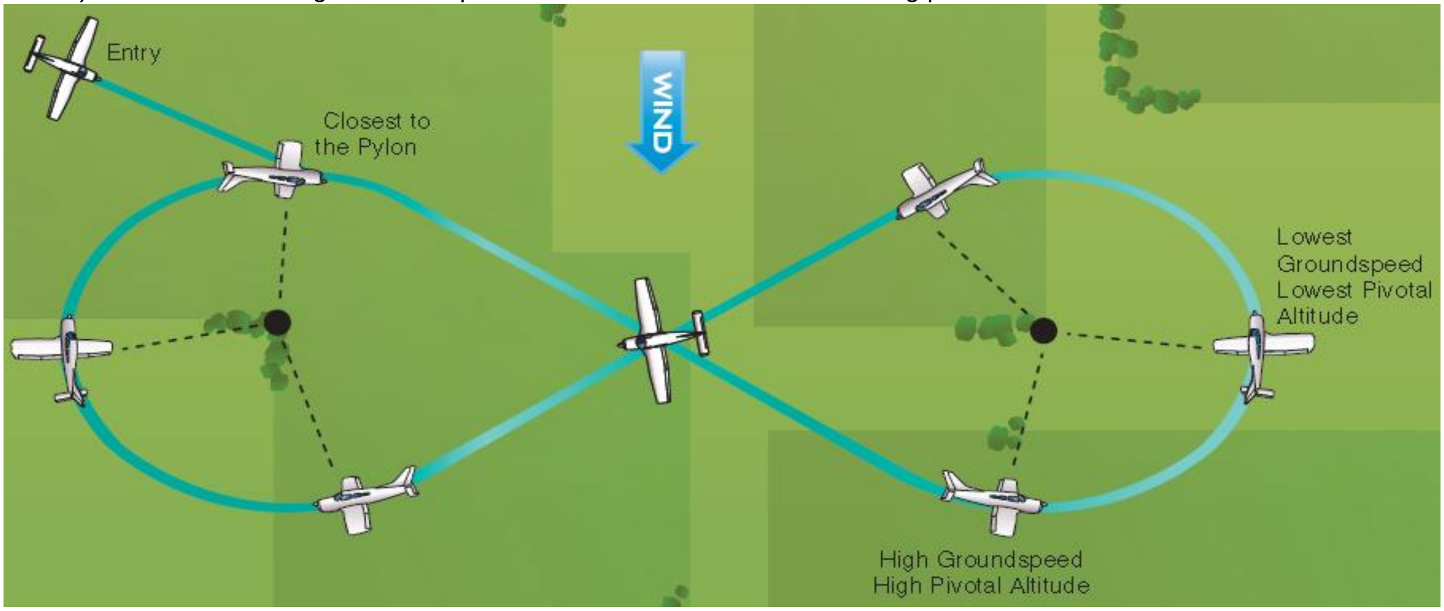
To develop a fine control touch, coordination, and the division of attention necessary for accurate and safe maneuvering of the airplane.

Description:

The airplane is flown in circular paths, alternately left and right, in the form of a figure 8 around two selected points on the ground at such a precise altitude and airspeed that a line parallel to the airplane's lateral axis appears to pivot on each of the pylons.

Setup Procedure:

1) Perform clearing turns.
2) Select two pylons perpendicular to the wind with suitable emergency landing area within gliding distance.
3) Select appropriate emergency landing field
4) Establish the appropriate pivotal altitude.
5) Establish airspeed below Va.
6) Enter the maneuver at a 45° to the downwind with the first turn to the left.
7) When abeam the pylon, begin your turn.
8) Maintain the point on your reference line by climbing or descending as the pivotal altitude changes.
9) Fly straight and level between pylons and repeat around the other pylon.
10) Return to cruise flight and complete cruise checklist to include leaning procedures.



Completion Standards:

- Exhibits knowledge of the elements related to eights on pylons.
- Determines the approximate pivotal altitude.
- Selects suitable pylons that will permit straight and level flight between the pylons.
- Enters the maneuver at the appropriate altitude and airspeed and at a bank angle of approximately 30° or 40° at the steepest point.
- Applies the necessary corrections so that the line of sight reference line remains on the pylon.
- Divides attention between accurate coordinated airplane control and outside visual references.
- Holds pylon using appropriate pivotal altitude avoiding slips and skids.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain how pivotal altitude is affected with changes in groundspeed.
- Compute pivotal altitude.
- Explain the relationship between pivotal altitude and angle of bank.

Safety Considerations:

- Clear the area of traffic and obstacles.
- Look for an emergency landing field nearby.
- Division of attention between maneuver and scanning for traffic.
- Maintain coordinated flight.

Common Errors:

- Faulty entry technique.
- Poor planning, orientation, and division of attention.
- Uncoordinated flight.
- Use of improper line of sight reference.
- Improper timing of turn entries and rollouts.
- Improper wind-drift correction between pylons.
- Selection of pylons where there is no suitable emergency landing area within gliding distance.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Section 7 – MULTI ENGINE RATING

The Multi-Engine Pilot rating is a flight course and an individualized ground school study. All degree seeking students will conduct training under CFR 14 Part 141 unless approved by the Chief Flight Instructor.

This section contains references to the BE-58.

BE-58

Taxiing (BE-58)

Objective:

To safely maneuver the airplane on the airport surface.

Description:

Taxiing is the controlled movement of the airplane under its own power while on the ground.

Setup Procedure:

1) After engine start, check for traffic in both directions, increase power and allow the airplane to roll slightly forward and apply brakes.
2) To turn right, use right rudder. To turn left, use left rudder. Differential power and braking can be used to make a sharper turn.
3) Taxi at a speed consistent with safety, but no faster than a brisk walk. Use power to control taxi speed before using brakes.
4) Apply proper crosswind taxi control deflections. Use upwind engine for additional crosswind taxi control during strong crosswinds.
5) To come to a stop, reduce power to idle and smoothly apply brakes.
6) Use aircraft lighting as recommended by AC 91-73.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to safe taxi procedures.
- Performs a brake check immediately after the airplane begins moving.
- Positions flight controls properly for the existing wind conditions.
- Controls direction and speed without excessive use of brakes.
- Complies with airport/taxiway markings, signals, ATC clearances, and instructions.
- Taxies so as to avoid other aircraft and hazards.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the importance of crosswind taxi techniques.
- Explain how to use differential power while taxiing.
- Explain the importance of using minimal power and braking.

Safety Considerations:

- Maintain taxiway centerline.
- Use aircraft lighting as recommended by AC 91-73.
- Use proper crosswind taxi techniques.
- Taxi at a speed consistent with safety.

Common Errors:

- Not performing a brake check.
- Improper crosswind taxi control deflections.
- Improper use of power and brakes.
- Taxiing at a speed not consistent with safety.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Normal & Crosswind Takeoff & Climb (BE-58)

Objective:

To move the airplane from its starting position on the runway, become airborne and establish a positive climb to a safe maneuvering altitude.

Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll: The airplane is accelerated to an airspeed of 85 kts that provides sufficient lift to become airborne.
2) The rotation, when the pilot increases elevator back pressure, increasing the angle of attack to lift the nose wheel.
3) The initial climb when the airplane leaves the ground and establishes a pitch attitude to climb away from the runway.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete Short-Field takeoff checklist and takeoff briefing.
3) Use aircraft lighting as recommended by the current version of AC 91-73.
4) Ensure runway is clear, align aircraft with runway centerline, confirm DG is aligned with runway, and ensure nose wheel is straight.
5) Apply brakes.
6) Advance throttles smoothly to 1700 RPM.
7) Check engine instruments for normal indications.
8) Release brakes.
9) Smoothly apply full power.
10) Maintain directional control with rudder pedals and crosswind control with appropriate aileron deflection.
11) Upon reaching rotation speed, 85 kts (V_R), increase back elevator pressure to establish the lift-off attitude and allow the aircraft to fly off the ground.
12) Accelerate to 105 knots (V_Y).
13) Apply brakes. Retract the landing gear when no more useable runway exists and a positive rate of climb is established.
14) At 500 ft. or as workload permits:
    a. Set climb power, full throttle and 2500 RPM.
    b. Complete cruise climb checklist.
    c. Accelerate to a cruise climb airspeed of 136 kts.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to normal and crosswind takeoff, climb operations, and rejected takeoff procedures.
- Positions the flight controls for the existing wind conditions.
- Clears the area, taxies onto the takeoff surface and aligns the airplane on the runway center/takeoff path.
- Establishes a pitch attitude that will maintain V_Y ±5 kts to a safe maneuvering altitude.
- Maintains directional control, proper wind-drift correction throughout the takeoff and climb.
- Complies with noise abatement procedures.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain runway selection criteria including performance charts.
- Discuss how to maintain directional control during the ground roll.
- Discuss proper lift-off technique.
- Explain the need for and how to correct for crosswinds.
- Discuss accelerate-stop distance and accelerate-go distance.
- Discuss the importance of and use of takeoff performance charts.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- If the airplane becomes airborne prior to V_{MC} +5 kts do not apply forward elevator pressure which results in wheel barrowing. Allow the airplane to become airborne, but only a few inches above the runway.
- Consider the effect of density altitude on performance.
- Do not retract landing gear too soon.
- Do not allow upwind wing to rise during takeoff.
- Do not exceed maximum demonstrated crosswind.

Common Errors:

- Improper runway incursion avoidance procedures.
- Inappropriate lift-off procedures.
- Improper climb attitude, power setting, and airspeed.
- Improper use of checklists.
- Improper positioning of the flight controls and wing flaps.
- Drift during climb.
- Failure to establish and maintain proper climb configuration and airspeeds.

References:

Airplane Flying handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Short-field & Crosswind Takeoff & Climb (BE-58)

Objective:

To move the airplane from its starting position on the runway, become airborne, and establish a positive climb to a safe maneuvering altitude in order to clear an obstacle on the departure end of the runway or to depart a short runway.

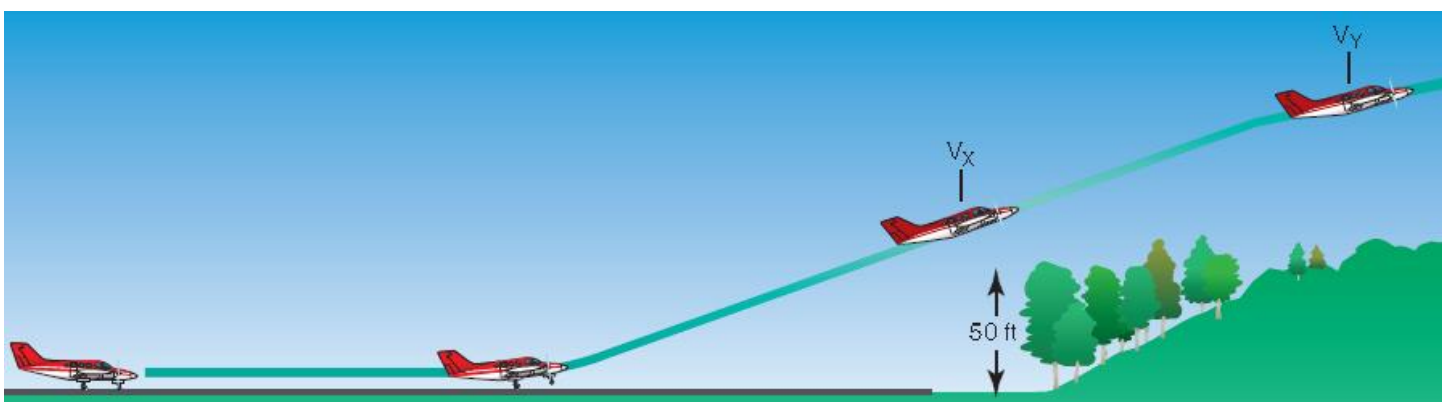
Description:

The takeoff can be separated into 3 steps:

1) The takeoff roll: The airplane is accelerated to an airspeed of 85 kts that provides sufficient lift to become airborne.
2) The rotation: When the pilot increases elevator back pressure, increasing the angle of attack to lift the nose wheel.
3) The initial climb: When the airplane leaves the ground and establishes a pitch attitude to climb away from the runway and clear an obstacle.

Setup Procedure:

1) Position aircraft to view traffic.
2) Complete Short-Field takeoff checklist and takeoff briefing.
3) Use aircraft lighting as recommended by AC 91-73.
4) Back taxi and align aircraft with runway centerline and ensure nose wheel is straight.
5) Apply brakes.
6) Advance throttles smoothly to full power.
7) Check engine instruments for normal indications.
8) Release brakes.
9) Maintain directional control with rudder pedals and crosswind control with appropriate aileron deflection.
10) Upon reaching rotation speed, 85 kts(V_R), increase back elevator pressure to establish the lift-off attitude and allow the aircraft to fly off the ground.
11) Apply brakes. Retract the landing gear when a positive rate of climb is established.
12) Accelerate the aircraft to cross the 50ft obstacle at 100 kts.
13) Accelerate to 105 knots (V_Y).
14) At 500 ft. or as workload permits:
    a. Set climb power, full throttle and 2500 RPM.
    b. Complete cruise climb checklist.
    c. Accelerate to a cruise climb airspeed of 136 kts.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to normal and crosswind takeoff, climb operations, and rejected takeoff procedures.
- Positions the flight controls for the existing wind conditions.
- Clears the area, taxies onto the takeoff surface, and aligns the airplane on the runway center/takeoff path.

- Establishes a pitch attitude that will maintain V_Y ±5 kts to a safe maneuvering altitude.
- Maintains directional control, proper wind-drift correction throughout the takeoff and climb.
- Complies with noise abatement procedures.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain runway selection criteria including performance charts.
- Discuss how to maintain directional control during the ground roll.
- Discuss proper lift-off technique.
- Explain the need for and how to correct for crosswinds.
- Discuss accelerate-stop distance and accelerate-go distance.
- Discuss the importance of and use of takeoff performance charts.

Safety Considerations:

- Maintain runway centerline.
- Select appropriate runway based on conditions.
- Clear final approach path prior to entering runway.
- If the airplane becomes airborne prior to V_{MC} +5 kts do not apply forward elevator pressure which results in wheel barrowing. Allow the airplane to become airborne, but only a few inches above the runway.
- Consider the effect of density altitude on performance.
- Do not retract landing gear too soon.
- Do not allow upwind wing to rise during takeoff.
- Do not exceed maximum demonstrated crosswind.

Common Errors:

- Improper runway incursion avoidance procedures.
- Inappropriate lift-off procedures.
- Improper climb attitude, power setting, and airspeed.
- Improper use of checklists.
- Improper positioning of the flight controls and wing flaps.
- Drift during climb.
- Failure to establish and maintain proper climb configuration and airspeeds.

References:

Airplane Flying handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Traffic Pattern (BE-58)

Objective:

To ensure that air traffic flows into and out of an airport in an orderly manner.

Description:

The airplane is flown on a rectangular course around a runway at an altitude specified in the current Airport/Facility Directory or as outlined in the FAR/AIM.

Setup Procedure:

Departures

1) All departures:
   a. Fly the departure leg straight out until reaching traffic pattern altitude.
   b. Once reaching traffic pattern altitude, continue climbing and turn on course.

Arrivals

1) Prior to reaching 5 NM from the airfield, complete the following:
   a. Monitor local AWOS/ASOS/ATIS
   b. Ask "Is there any traffic between me and the airport?" and cancel flight following (if applicable)
   c. Complete the Before Landing checklist
2) Slow down below the approach flap airspeed prior to pattern entry.

   If already established on the downwind side, skip to step 4.

3) For a midfield entry:
   a. Cross midfield 500' above traffic pattern altitude, observing traffic flow and wind direction.
   b. Fly 3-5 miles beyond the downwind leg, then descend to traffic pattern altitude.
   c. Complete a tear-drop shaped turn to the right or left as necessary to position the aircraft at a 45 degree angle to the downwind leg.

   If less than two aircraft are currently in the pattern, the alternate method (cross midfield at traffic pattern altitude, enter directly into downwind leg) may be used.

4) Enter the traffic pattern at the designated traffic pattern altitude (normally 1,000' AGL) at a 45 degree angle to the downwind leg at midfield.
5) Apply appropriate crab to ensure a parallel flight path approximately ½ to ¾ mile from the runway.
6) Allow for proper spacing from other aircraft in the pattern as to prevent runway incursions upon landing.
7) Maintain airspeed below the flap speed required for each configuration change.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to traffic patterns. This shall include procedures at airports with and without operating control towers, prevention of runway incursions, collision avoidance, wake turbulence avoidance, and wind shear.
- Complies with proper traffic pattern procedures.
- Maintains proper spacing from other aircraft.
- Corrects for wind drift to maintain the proper ground track.
- Maintains orientation with the runway/landing area in use.
- Maintains traffic pattern altitude, ±100 feet and the appropriate airspeed, ±10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss traffic patterns at controlled and uncontrolled airports.
- Explain traffic pattern procedures.

- Explain how to maintain the proper ground track.

Safety Considerations:

- Maintain proper traffic pattern altitude.
- Maintain a distance from the runway that is within power-off gliding distance.
- Preferred bank of 30 degrees while in pattern.
- Maneuver within 300 feet of traffic pattern altitude before turning crosswind to base.
- Maintain proper aircraft separation.
- Comply with standard traffic pattern procedures or ATC instructions.

Common Errors:

- Failure to comply with traffic pattern instructions, procedures, and rules.
- Improper correction for wind drift.
- Inadequate spacing from other traffic.
- Poor altitude or airspeed control.
- Flying too wide of a pattern.

References:

Airplane Flying handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

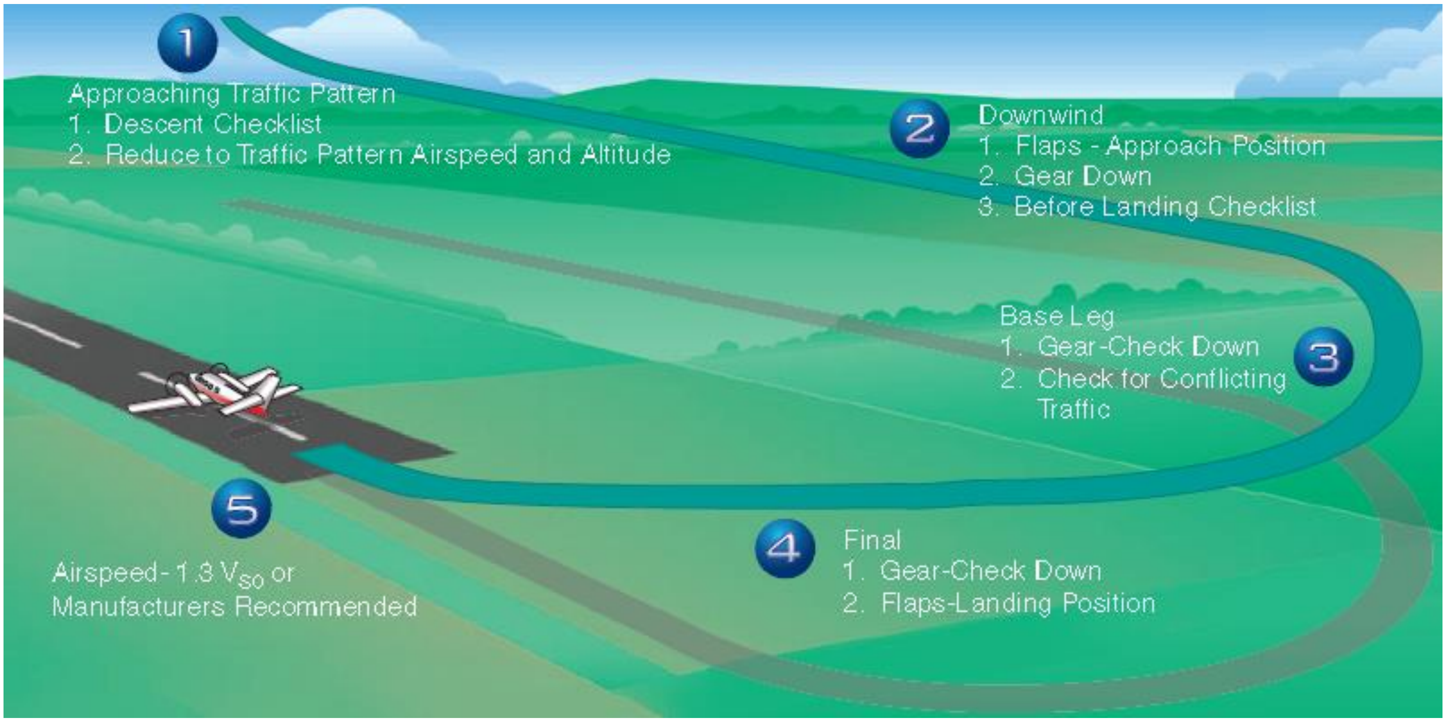
Normal & Crosswind Approach & Landing (BE-58)

Objective:
To safely transition from flight to ground operations during normal conditions.

Description:
The aircraft is configured for a stabilized approach in the landing configuration and transitioned from the descent to touchdown.

Setup Procedure:
1) Complete before landing checklist.
2) Confirm approach flaps (15º) below 152 kts.
3) Enter and fly the appropriate pattern at or below 130 kts.
4) Select touchdown and aiming points.
5) When abeam midfield, confirm below Vle and extend landing gear.
6) When abeam the intended touchdown point:
   a. Reduce power to approximately 15” manifold pressure.
   b. Adjust pitch and power to establish a descent of 400-700 fpm and an airspeed of 110 kts.
7) Turn on the base leg when 45° from the touchdown point:
   a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
   b. At key position, assess approach position.
   c. Adjust pitch and power to establish a descent of 400-700 fpm and an airspeed of 110 kts.
8) Turn final on the extended runway center line:
   a. Apply appropriate crosswind correction to maintain the extended runway centerline.
   b. Set flaps to DN (30º) below 122 kts.
   c. Adjust pitch and power to establish a stabilized descent of 400-700 fpm and an airspeed of 100 kts.
   d. Perform GUMPS check.
9) On short final:
   a. Ensure 3 down and locked.
   b. Establish a pitch attitude and power setting for 95 kts.
   c. Maintain a stabilized descent to the selected aiming point.
   d. Round out and establish the landing attitude.
   e. Smoothly reduce power to idle while maintaining the landing attitude until touchdown.

10) Exit the runway, complete after landing flow, and confirm with the checklist.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to normal and crosswind approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects a suitable touchdown point.
- Establishes the recommended approach and landing configuration and airspeed and adjusts pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, or in its absence, not more than 1.3 V_{S0}, ±5 kts with wind gust factor applied.
- Makes smooth, timely, and correct control application during the round out and touchdown.
- Touches down smoothly at approximate stalling speed.
- Touches down at or within 200 feet beyond a specified point, with no drift, and with the airplane's longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain proper use of crosswind control inputs.
- Discuss the importance of and use of landing performance charts.

Safety Considerations:

- Observe flap and gear extension speeds.
- On final approach and within 500 feet AGL, the airplane should be on speed, in trim, configured for landing, and tracking extended centerline in a constant descent angle towards an aiming point in the touchdown zone.
- Use proper crosswind correction to avoid drifting from runway centerline.
- Ensure landing gear is extended and locked.

Common Errors:

- Improper use of landing performance data and limitations.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Failure to establish and maintain a stabilized approach.
- Improper technique during round out and touchdown.
- Improper use of brakes.
- Poor directional control after touchdown.

References:

Airplane Flying handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Short-field & Crosswind Approach & Landing (BE-58)

Objective:

To safely transition from flight to ground operations while landing on a short runway with a 50ft obstacle and/or land on a specified touchdown spot.

Description:

The aircraft is configured for a stabilized approach in the landing configuration to clear a 50ft obstacle and transitioned from the descent to touchdown to a specified touchdown point.

Setup Procedure:

1) Complete before landing checklist.
2) Confirm approach flaps (15º) below 152 kts.
3) Enter and fly the appropriate pattern at or below 130 kts.
4) Select touchdown and aiming points.
5) When abeam midfield, confirm below Vle and extend landing gear.
6) When abeam the intended touchdown point:
    a. Reduce power to approximately 15" manifold pressure.
    b. Adjust pitch and power to establish a descent of 400-700 fpm and an airspeed of 110 kts.
7) Turn on the base leg when 45° from the touchdown point:
    a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
    b. At key position, assess approach position.
    c. Adjust pitch and power to establish a descent of 400-700 fpm and an airspeed of 110 kts.
8) Turn final on the extended runway center line:
    a. Apply appropriate crosswind correction to maintain the extended runway centerline.
    b. Set flaps to DN (30º) below 122 kts.
    c. Adjust pitch and power to establish a stabilized descent of 400-700 fpm and an airspeed of 100 kts.
    d. Perform GUMPS check.
9) On short final:
    a. Ensure 3 down and locked.
    b. Establish a pitch attitude and power setting for recommended approach speed based on weight.
        i. 5400 lbs 95 kts
        ii. 5000 lbs 91 kts
        iii. 4600 lbs 87 kts
        iv. 4000 lbs 81 kts
    c. Maintain a stabilized descent above the 50 ft obstacle to the selected aiming point.
    d. Round out and establish the landing attitude.
    e. Smoothly reduce power as required while maintaining the landing attitude until touchdown.
10) Apply maximum braking to a complete stop without skidding the tires.
11) Exit the runway, complete after landing flow, and confirm with the checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to normal and crosswind approach and landing.
- Considers the wind conditions, landing surface, obstructions, and selects a suitable touchdown point.
- Establishes the recommended approach and landing configuration and airspeed and adjusts pitch attitude and power as required.
- Maintains a stabilized approach and recommended airspeed, or in its absence, not more than 1.3 V_{S0}, ±5 kts with wind gust factor applied.
- Clears the 50ft obstacle (if applicable).
- Makes smooth, timely, and correct control application during the round out and touchdown.
- Touches down smoothly at approximate stalling speed.
- Touches down at or within 100 feet beyond a specified point, with no drift, and with the airplane's longitudinal axis aligned with and over the runway center/landing path.

- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain importance of airspeed management.
- Discuss effect of flaps on approach to landing.
- Describe effect of descent angle on a stabilized approach.
- Discuss proper selection and use of aiming point.
- Explain proper use of crosswind control inputs.
- Discuss the importance of and use of landing performance charts.

Safety Considerations:

- Observe flap and gear extension speeds.
- On final approach and within 500 feet AGL, the airplane should be on speed, in trim, configured for landing and tracking extended centerline in a constant descent angle towards an aiming point in the touchdown zone.
- Use proper crosswind correction to avoid drifting from runway centerline.
- Ensure landing gear is extended and locked.

Common Errors:

- Improper use of landing performance data and limitations.
- Failure to establish approach and landing configuration at appropriate time or in proper sequence.
- Failure to establish and maintain a stabilized approach.
- Improper technique during round out and touchdown.
- Improper use of brakes.
- Poor directional control after touchdown.
- Failure to clear an obstacle.
- Failure to touch down within the specified touchdown point parameters.

References:

Airplane Flying handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Go-Around (BE-58)

Objective:

To safely discontinue the landing approach when unsatisfactory conditions exist.

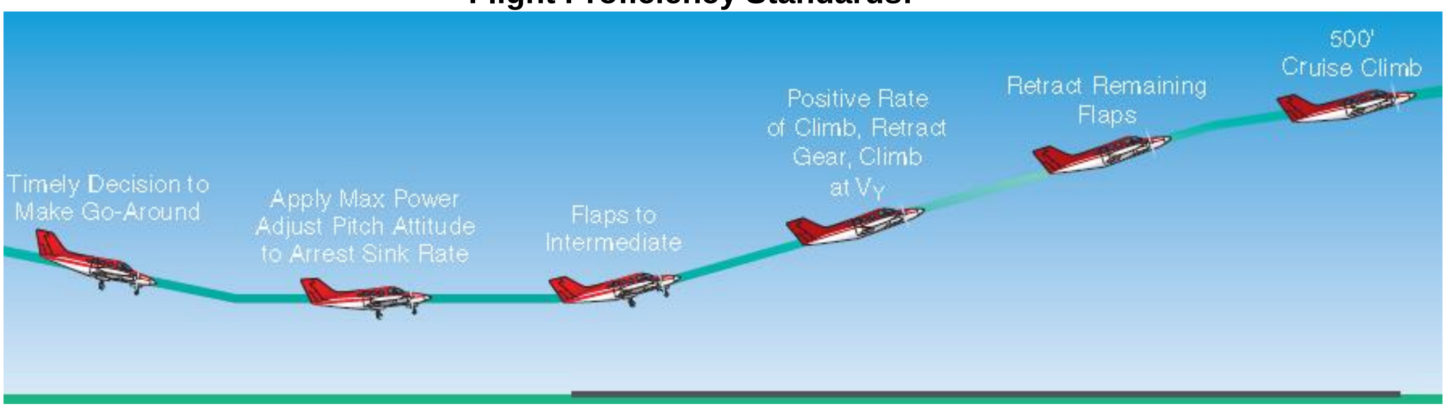
Description:

As full power is applied, the aircraft attitude is adjusted to accelerate to V_Y and climb. As a safe airspeed is attained, flaps are retracted incrementally, allowing stabilization between each retraction. Landing gear is retracted after a positive rate of climb is attained.

Setup Procedure:

8) Simultaneously apply maximum power, establish a go-around pitch attitude, and press the GA button.
9) Retract flaps to APH (15º).
10) Accelerate to 95 kts and simultaneously climb.
11) Retract landing gear after a positive rate of climb is established.
12) Retract flaps to 0º.
13) Open cowl flaps, as necessary, as workload permits.
14) Verify Go Around checklist is complete.

Flight Proficiency Standards:



- Exhibits knowledge of the elements related to a go-around/rejected landing.
- Makes a timely decision to discontinue the approach to landing.
- Applies takeoff power immediately and transitions to climb pitch attitude for V_Y, and maintains V_Y ±5 kts.
- Retracts the flaps as appropriate.
- Retracts the landing gear, if appropriate, after a positive rate of climb is established.
- Maneuvers to the side of the runway/landing area to clear and avoid conflicting traffic.
- Maintains takeoff power V_Y ±5 kts to a safe maneuvering altitude.
- Maintains directional control and proper wind-drift correction throughout the climb.
- Completes the appropriate checklists.

Note: These are the ACS standards and the CFI will refer Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss events that may require a go-around.
- Explain the importance of maintaining airspeed and coordination during the go-around procedure.
- Discuss the necessity for maneuvering to the side of the runway after making the decision to go-around.

Safety Considerations:

- Maneuver the airplane to the side of the runway.
- Do not establish a pitch up attitude too quickly.
- Maintain coordination.

- Timely decision making.
- Be watchful for situations which may require a go-around.

Common Errors:

- Delayed decision to make a go-around.
- Improper application of power.
- Failure to control pitch attitude.
- Improper trim technique.
- Failure to compensate for torque effect.
- Failure to maintain V_Y as appropriate.
- Improper wing flap retraction.
- Improper gear retraction.
- Failure to maintain well clear of obstructions and other traffic.
- Improper use of checklists.

References:

Airplane Flying handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Maneuvering During Slow Flight (BE-58)

Objective:

To demonstrate the flight characteristics and controllability of an airplane at speeds lower than normal cruise and develop proficiency in performing maneuvers that require slow airspeeds.

Description:

Slow flight consists of slowing the aircraft to a minimum controllable airspeed in the landing configuration and maneuvering the aircraft while maintaining altitude and airspeed.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 3,000' AGL.
2) Perform clearing turns.
3) Reduce manifold pressure to 15" or less.
4) Extend flaps to APH (15º) below 152 kts.
5) Extend landing gear below 152 kts.
6) Advance propeller to high RPM once airspeed is in the white arc.
7) Set mixture to rich.
8) Extend flaps to DN (30º) below 122 kts.
9) Open cowl flaps as required.
10) Adjust pitch and power as necessary to maintain altitude.
11) Establish and maintain an airspeed at which any further increase in pitch or reduction of power would result in an immediate stall or a higher speed as specified by your instructor.
12) Maneuver as instructed.
13) Recover when instructed by:
    a. Adding full power.
    b. Retract flaps to APH (15º).
    c. Retract landing gear.
    d. Retract flaps to 0º.
14) Return to cruise flight and perform the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to maneuvering during slow flight.
- Selects an entry altitude that will allow the task to be completed no lower than 3,000' AGL.
- Establish and maintain an airspeed at which any further increase in angle of attack, increase in load factor, or reduction in power, would result in a stall warning (e.g., airplane buffet, stall horn, etc.).
- Accomplishes coordinated straight and level flight, turns, climbs, and descents with landing gear and flap configurations specified by the instructor.
- Divides attention between airplane control and orientation.
- Maintains the specified altitude, ±50 feet; specified headings, ±10°; airspeed +5/-0 kts, and specified angle of bank, ±5°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the relationship between pitch and power in maintaining airspeed and altitude during slow flight.
- Discuss how flight at minimum airspeeds develops the ability to estimate the margin of safety above the stalling speed.
- Compare the practice of slow flight to various phases of flight such as takeoffs, climbs, descents, go-arounds, and approaches to landing.
- Discuss stall speed vs. bank angle.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.

- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified gear and flap configuration.
- Improper entry technique.
- Failure to establish and maintain the specified airspeed.
- Excessive variations of altitude and heading when a constant altitude and heading are specified.
- Rough or uncoordinated control technique.
- Improper trim technique.
- Bank angle too high during turns.

References:

Airplane Flying handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Power-Off Stall (BE-58)

Objective:

To familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in the landing configuration.

Description:

The aircraft is slowed down and placed in the landing configuration; after which, a stall is induced and recovery initiated, returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 3,000' AGL.
2) Perform clearing turns.
3) Reduce manifold pressure to 15" or less.
4) Extend flaps to APR (15º) below 152 kts.
5) Extend landing gear below 152 kts.
6) Establish and maintain a pitch attitude to maintain altitude.
7) Advance propeller to high RPM once airspeed is in the white arc.
8) Set mixture to rich.
9) Extend flaps to DN (30º) below 122 kts.
10) Close cowl flaps as required.
11) Establish a stabilized descent at 95 kts.
12) Reduce power to idle.
13) Maintain coordinated flight and altitude until recognition of the stall. As the stall occurs, recover from the stall by simultaneously reducing the angle of attack, adding full power, and leveling the wings.
14) Retract flaps to APH (15º).
15) Retract the landing gear after positive rate of climb.
16) Retract flaps to 0º.
17) Open the cowl flaps as required.
18) Accelerate the airplane to 105 kts (V_Y) and climb.
19) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to power-off stalls.
- Selects an entry altitude that allows the task to be completed no lower than 3,000' AGL.
- Establishes a stabilized descent in the approach or landing configuration, as specified by the instructor.
- Transitions smoothly from the approach or landing attitude to a pitch attitude that will induce a stall.
- Maintains a specified heading, ±10° in straight flight; maintains a specified angle of bank, not to exceed 20°, ±5°, in turning flight while inducing the stall.
- Recognizes and recovers promptly as the stall occurs by simultaneously reducing the angle of attack, increasing power to maximum allowable, and leveling the wings to return to a straight and level flight attitude with a minimum loss of altitude appropriate for the airplane.
- Retracts the flaps to the recommended setting, retracts the landing gear, if retractable, after a positive rate of climb is established.
- Accelerates to V_X or V_Y speed before the final flap retraction.
- Returns to the altitude, heading, and airspeed specified by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.

- Discuss stall speeds vs. bank angles.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Power-On Stall (BE-58)

Objective:

To familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in the takeoff configuration.

Description:

The aircraft is slowed down and placed in the takeoff configuration; after which, a stall is induced and recovery initiated, returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 3,000’ AGL.
2) Perform clearing turns.
3) Verify gear retracted.
4) Reduce power to 12” manifold, allowing the aircraft to slow to takeoff speed while maintaining altitude.
5) Advance propeller to high RPM when airspeed is in the white arc.
6) Set mixture to rich.
7) Verify flaps retracted.
8) Open cowl flaps as required.
9) Increase power to 17-20” at 85 kts (V_R).
10) Transition smoothly to the pitch attitude that will induce a stall.
11) Recognize and recover from the stall as the stall occurs by simultaneously reducing the angle of attack, adding full power, and leveling the wings.
12) Accelerate the airplane to 105 kts (V_Y) and climb.
13) Verify clean configuration.
14) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to power-on stalls.
- Selects an entry altitude that allows the task to be completed no lower than 3,000' AGL.
- Establishes the takeoff or departure configuration.
- Sets power to no less than 65 percent available power (except where permitted in PTS).
- Transitions smoothly from the takeoff or departure attitude to a pitch attitude that will induce a stall.
- Maintains a specified heading ±5°, in straight flight; maintains a specified angle of bank, not to exceed a 20°, ±10°, in turning flight, while inducing the stall.
- Recognizes and recovers promptly as the stall occurs by simultaneously reducing the angle of attack, increasing power to maximum allowable, and leveling the wings to return to a straight and level flight attitude, with a minimum loss of altitude appropriate for the airplane.
- Retracts flaps to the recommended setting, retracts the landing gear, if retractable, after a positive rate of climb is established.
- Accelerates to V_X or V_Y speed before the final flaps retraction and returns to the altitude, heading, and airspeed specified by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.
- Discuss stall speeds vs. bank angles.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration.
- Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery.
- Secondary stall during recovery.

References:

Airplane Flying handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Accelerated Stall (BE-58)

Objective:

To familiarize the pilot with the conditions that produce accelerated stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in an accelerated configuration.

Description:

The aircraft is slowed down and placed in the clean configuration. After which a steep turn is applied with excessive back elevator pressure and therefore a stall is induced at a higher than normal stalling speed and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

1) Select an altitude which allows recovery by at least 3,000' AGL.
2) Perform clearing turns.
3) Verify gear up.
4) Reduce power to 15" allowing the aircraft to slow below maneuvering speed while maintaining altitude.
5) Advance propeller to high RPM smoothly.
6) Set mixture to rich.
7) Verify flaps up.
8) At 110-120kts transition smoothly to a 45 degree bank and apply back pressure to induce an accelerated stall.
9) Recognize and recover from the stall as the stall occurs by simultaneously leveling the wings, reducing the angle of attack, and increasing power.
10) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to accelerated stalls.
- Selects an entry altitude that allows the task to be completed no lower than 3,000' AGL.
- Establishes a clean configuration.
- Transitions smoothly from straight and level flight to a steep turn configuration and applies enough back pressure that will induce an accelerated stall.
- Recognizes and recovers promptly as the stall occurs by simultaneously reducing the bank angle of the wings to return to a straight and level flight attitude, decreasing the angle of attack, and increasing power to maximum allowable, with a minimum loss of altitude appropriate for the airplane.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring.
- Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane.
- Explain how to avoid a spin.
- Discuss stall speed vs. bank angle.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.
- Adding back pressure to induce an accelerated stall at an airspeed more than 20 kts over 83 kts (V_{S1}).

Common Errors:

- Failure to establish specified configuration.
- Improper pitch and bank control.

- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Poor stall recognition and delayed recovery.
- Excessive airspeed during recovery.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Steep Turns (BE-58)

Objective:

To develop coordination, orientation, division of attention, and smooth control techniques while executing high performance turns.

Description:

The maneuver consists of two 360° turns in opposite directions, using a bank angle of 50° while maintaining a constant airspeed and altitude.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 3,000’ AGL.
2) Perform clearing turns.
3) Adjust the mixture in accordance with the POH.
4) Verify gear and flaps retracted.
5) Reduce manifold pressure to establish airspeed below V_A (recommended 135kts).
6) Close cowl flaps as required.
7) Enter a coordinated 50° banking turn to the left.
8) Increase power and adjust pitch and trim as required to maintain altitude and airspeed.
9) Begin rollout at ½ the bank angle prior to rollout heading.
10) Continue the maneuver in the opposite direction.
11) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to steep turns.
- Establishes the manufacturer’s recommended airspeed or if one is not stated, a safe airspeed not to exceed V_A.
- Rolls into a coordinated 360° steep turn with at least a 50° bank, followed by a 360° turn in the opposite direction.
- Divides attention between airplane control and orientation.
- Maintains the entry altitude, ±100 feet; airspeed, ±10 kts; bank, ±5°; and rolls out on the entry heading, ±10°.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain why load factor increases as bank angle increases.
- Discuss the relationship between load factor and stall speed.
- Discuss the principle of over banking tendency.
- Explain how to maintain altitude and airspeed.
- Explain limit load factor and what happens if it’s exceeded.
- Calculating V_A: $VA = VA\ Max\ *\ \sqrt{Actual Weight}\ \div Max\ Gross\ Weight$

Safety Considerations:

- Do not exceed manufacturer’s recommended airspeed or V_A.
- Always clear the area before initiating the maneuver.
- The maneuver is to be completed no lower than 3,000' AGL.
- Division of attention between maneuvering and scanning for traffic.

Common Errors:

- Improper pitch, bank, and power coordination during entry and rollout.
- Uncoordinated use of flight controls.
- Improper procedure in correcting altitude deviations.
- Loss of orientation.
- Wrong speed used for V_A.

References:

Airplane Flying handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Emergency Descent (BE-58)

Objective:

To descend the airplane as rapidly as possible, within the structural limitations of the airplane.

Description:

The emergency descent is a maneuver for descending as rapidly as possible to a lower altitude or to the ground for an emergency landing.

Setup Procedure:

1) Perform clearing turns.
2) If utilizing flight following, contact ATC for traffic advisories below.
3) Reduce power to idle.
4) Advance props to high RPM.
5) Set mixture to rich.
6) Roll into a 30º bank to the left and pitch down to achieve 142 kts (*Note*: this is a 10 knot buffer to prevent exceeding V_{LE}; in a real emergency use 152 kts).
7) Extend flaps to APH (15º) below 152 kts.
8) Extend landing gear below 152 kts.
9) Confirm cowl flaps closed as required.
10) Initiate recovery to level flight at least 300' prior to assigned altitude by:
    a. Rolling out the bank.
    b. Pitching up.
11) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to an emergency descent.
- Recognizes situations, such as depressurization, cockpit smoke and/or fire that require an emergency descent.
- Establishes the appropriate airspeed and configuration for the emergency descent.
- Exhibits orientation, division of attention, and proper planning.
- Maintains positive load factors during the descent.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the situations in which an emergency descent would be used.
- Explain the airplane configuration of an emergency descent.
- Discuss gear extension and retraction speeds.

Safety Considerations:

- Clear the area, including below, before initiating the maneuver.
- Divide attention between aircraft control and outside reference.
- Maintain positive aircraft control.

Common Errors:

- Slow response to the emergency.
- Failure to establish the specified configuration.
- Failure to establish and maintain the prescribed airspeed for the configuration.
- Incorrect engine settings.
- Failure to maintain positive load factor in the descent.
- Uncoordinated use of controls.

References:

Airplane Flying handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Engine Failure During Takeoff Before V_{MC} (BE-58)

Objective:

To maintain control of the aircraft and bring it to a stop after engine failure prior to V_{MC}.

Description:

Once the decision to reject a takeoff is made, the pilot should promptly close both throttles and maintain directional control with the rudder, nose wheel steering, and brakes.

Setup Procedure:

1) Taxi onto the runway and align the aircraft on the centerline.
2) Perform a normal or short field takeoff as specified.
3) The instructor or examiner will fail an engine before ½ V_{MC}.
4) When the engine fails, an unexpected yaw will occur, immediately reduce power on both engines to idle and maintain directional control.
5) Apply brakes as necessary.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to the procedure used for engine failure during takeoff prior to reaching V_{MC}.
- Closes the throttles smoothly and promptly when simulated engine failure occurs.
- Maintains directional control and applies brakes, as necessary.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Describe how to recognize an engine failure during takeoff.
- Explain the procedures for an engine failure during takeoff.

Safety Considerations:

- Prompt reaction of student and instructor to prevent inadvertent runway exit.
- Maintain positive aircraft control.
- Failure of the engine prior to 50% of 74 kts (V_{MC}).

Common Errors:

- Failure to follow the prescribed emergency procedure.
- Failure to promptly recognize an engine failure.
- Failure to promptly close throttles of both engines following engine failure.
- Faulty directional control and use of brakes.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Engine Failure After Takeoff (BE-58)

Objective:

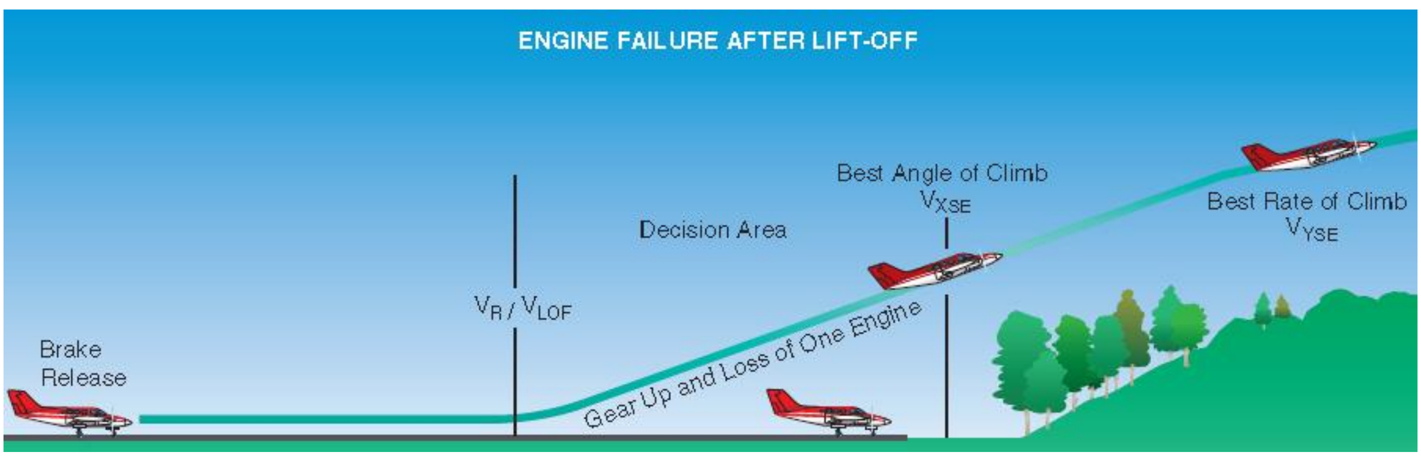
To maintain control of the aircraft after a simulated engine failure following takeoff and return to the airport for a safe landing.

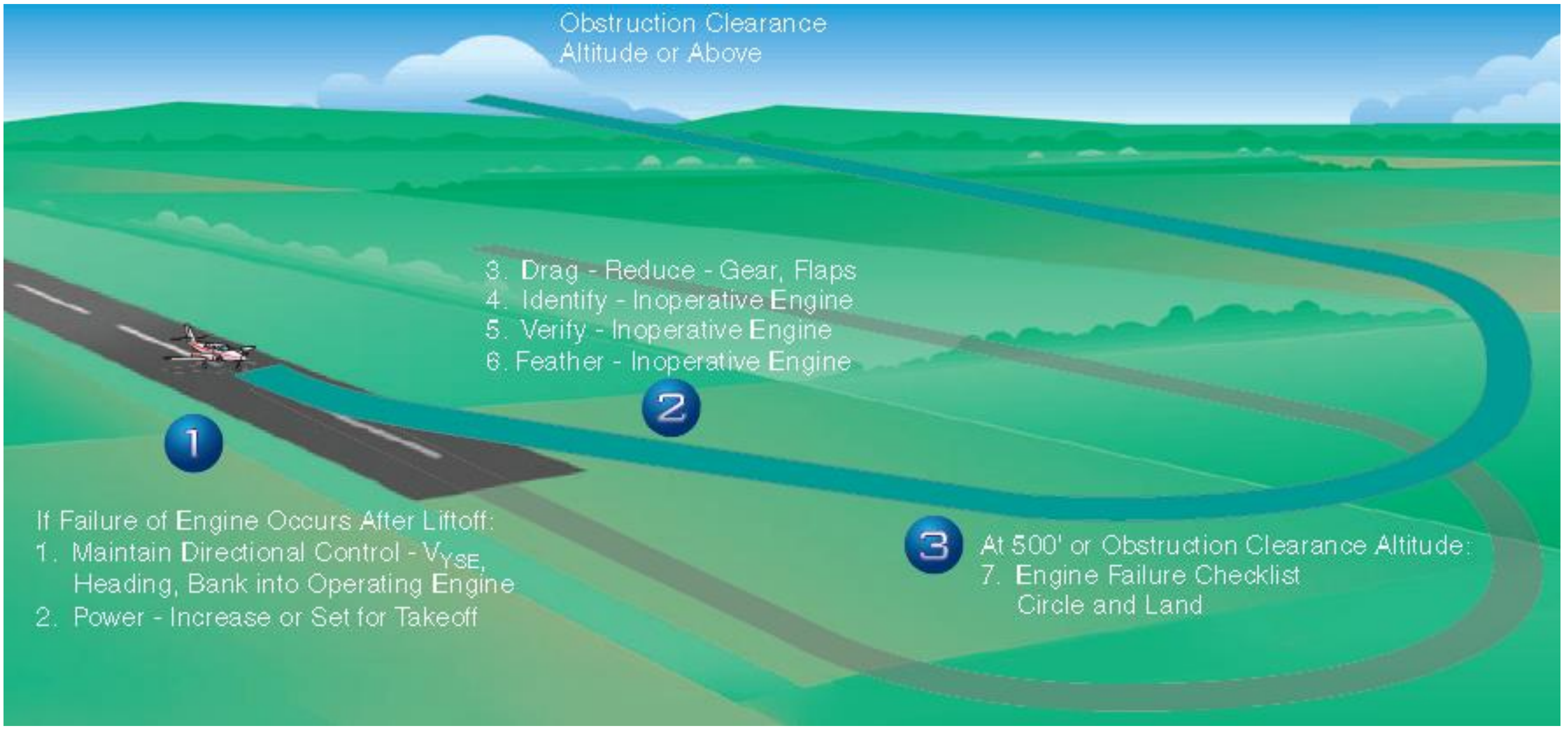
Description:

A simulated engine failure is given no lower than 500' AGL. Maintain directional control and comply with the manufacturer's recommended emergency procedures while returning to the airport for a landing.

Setup Procedure:

1) Maintain positive aircraft control and pitch for 100 (V_{YSE}); blue line.
2) Power up:
    a. Mixture full rich
    b. Propellers full forward
    c. Throttles full power
3) Clean up:
    a. Retract flaps
    b. Retract landing gear
4) Identify: Dead foot, dead engine.
5) Verify: Reduce power on suspected inoperative engine. If there are no changes then continue to reduce power to idle.
6) Feather the propeller of the inoperative engine.
7) Climb at 100 kts (V_{YSE}) and zero sideslip (bank angle approximately 2-5° and ⅓ to ½ ball deflection toward the operative engine).
8) Climb straight ahead, or with shallow turns to avoid obstacles.
9) Complete the Engine Failure After Lift-Off Checklist. Aircraft control should never be sacrificed to execute a checklist.
10) Return for landing. If not able to maintain altitude, land straight ahead.





Flight Proficiency Standards:

- Exhibits knowledge of the elements related to the procedure used for engine failure after lift-off.
- Recognizes a simulated engine failure promptly, maintains control, and utilizes appropriate emergency procedures.
- Reduces drag, identifies and verifies the inoperative engine after simulated engine failure.
- Simulates feathering the propeller on the inoperative engine. Instructor shall then establish zero-thrust on the inoperative engine.
- Establishes V_{YSE}; if obstructions are present, establishes V_{XSE} or V_{MC} +5 kts, whichever is greater, until obstructions are cleared. Then transitions to V_{YSE}.
- Banks toward the operating engine as required for best performance.
- Monitors operating engine and makes adjustments, as necessary.
- Recognizes the airplane's performance capabilities. If a climb is not possible at V_{YSE}, maintain V_{YSE} and return to the departure airport for landing, or initiates an approach to the most suitable landing area available.
- Secures the (simulated) inoperative engine.
- Maintains heading, ±10°, and airspeed, ±5 kts.
- Completes appropriate emergency checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the procedures and aircraft configuration during an engine failure after takeoff.
- Discuss the aircraft's handling characteristics during an engine failure after takeoff.
- Discuss zero sideslip.
- Discuss the three major accident factors: Loss of directional control, loss of performance, and loss of flying speed.

Safety Considerations:

- Divide attention between aircraft control and outside reference.
- Maintain positive aircraft control.
- Simulate the engine failure above 88 kts (V_{SSE}) after reaching a safe altitude (at least 500' AGL).

Common Errors:

- Failure to follow prescribed emergency checklists.
- Failure to properly identify and verify the inoperative engine.
- Failure to properly adjust engine controls and reduce drag.
- Failure to maintain directional control.
- Failure to establish and maintain a pitch attitude that will result in best engine inoperative airspeed, considering the height of obstructions.
- Failure to establish and maintain proper bank for best performance.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Approach & Landing Engine Inoperative (BE-58)

Objective:

To maintain aircraft control during approach and landing with one engine simulated inoperative.

Description:

The approach and landing with one engine inoperative is essentially the same as a two engine approach and landing. The traffic pattern should be flown at similar altitudes, airspeeds, and key positions as a two engine approach. The differences will be the power available and that the thrust is asymmetrical. A higher than normal power setting will be necessary to maintain airspeed.

Setup Procedure:

1) Complete before landing and one engine inoperative landing checklists (if time and safety permit).
2) Set flaps, as required, to APH (15°).
3) Enter and fly the appropriate pattern.
4) Select touchdown and aiming points.
5) When abeam midfield, confirm below V_{LE} and extend landing gear.
6) When abeam the intended touchdown point:
   a. Reduce power to approximately 17" manifold pressure (as required).
   b. Adjust pitch and power to establish a descent of 400-700 fpm and an airspeed at 100 kts (V_{YSE}).
7) Turn on the base leg when 45° from the touchdown point:
   a. Apply appropriate crosswind correction to fly perpendicular to the extended runway centerline.
   b. At key position, assess approach position.
   c. Maintain stabilized descent at 100 kts (V_{YSE}).
8) Turn final on the extended runway center line:
   a. Apply appropriate crosswind correction to maintain the extended runway centerline.
   b. Adjust pitch and power to establish a stabilized descent of 400-700 fpm and an airspeed of 100 kts(V_{YSE}).
   c. Perform GUMPS check.
9) On short final:
   a. Ensure 3 down and locked.
   b. Establish a pitch attitude and power setting for 95 kts.
   c. Maintain a stabilized descent to the selected aiming point.
   d. Round out and establish the landing attitude.
   e. Smoothly reduce power to idle while maintaining the landing attitude until touchdown.
10) Exit the runway, complete after landing flow, and confirm with the checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to an approach and landing with an engine inoperative to include engine failure on final approach.
- Recognizes engine failure and takes appropriate action, maintains control, and utilizes recommended emergency procedures.
- Banks toward the operating engine, as required, for best performance.
- Monitors the operating engine and makes adjustments as necessary.
- Maintains the recommended approach airspeed ±5 kts, and landing configuration with a stabilized approach, until landing is assured.
- Makes smooth, timely and correct control applications during round out and touchdown.
- Touches down on the first one third of available runway, with no drift and the airplane's longitudinal axis aligned with and over the runway center/landing path.
- Maintains crosswind correction and directional control throughout the approach and landing sequence.
- Completes appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss how to perform an engine out simulated landing.
- Explain why the pattern is fairly similar to a normal landing.
- Discuss why a single engine go around is not desired.

Safety Considerations:

- Divide attention between aircraft control and outside reference.
- Maintain positive aircraft control.
- Use of rudder trim.

Common Errors:

- Slow response to the emergency situation.
- Failure to establish the prescribed configuration.
- Failure to establish and maintain the desired airspeed.
- Incorrect engine control settings.
- Flying an unusually large traffic pattern.
- Over adjusting the traffic pattern for the loss of an engine.
- Uncoordinated use of controls.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

V_{MC} Demonstration (BE-58)

Objective:

To familiarize the student with the flight characteristics of an impending V_{MC} situation and how to recover from such if it should occur.

Description:

With the critical engine simulate inoperative, airspeed will be reduced until the first indication of either a stall, or a loss of directional control.

Setup Procedure:

1) Select an altitude which allows recovery to be completed no lower than 5,000' AGL.
2) Perform clearing turns.
3) Ensure the landing gear is retracted.
4) Reduce manifold pressure to 12".
5) Advance propellers full forward once airspeed is in the white arc.
6) Set mixtures rich.
7) Confirm flaps are retracted.
8) Open cowl flaps as required.
9) Adjust pitch to maintain altitude as the airplane slows to an airspeed of 100 kts.
10) Reduce power to idle on left engine.
11) Increase power to the takeoff (full throttle) setting on right engine.
12) Maintain entry heading.
13) Establish a zero side slip by banking toward the operative engine.
14) Slowly increase pitch attitude to achieve a deceleration rate of 1 knot per second. Apply rudder and aileron to maintain directional control.
15) Recover at loss of directional control or first indication of a stall (stall horn or aerodynamic buffeting) by simultaneously reducing power on the operative engine to idle and decreasing the angle of attack to regain airspeed and directional control.
16) At 74 kts (V_{MC}) confirm mixture rich, propellers high RPM and then advance power smoothly on the operative engine and accelerate to and maintain 100 kts (V_{YSE}).
17) Recover when instructed.
18) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to V_{MC} by explaining the causes of loss of directional control at airspeeds less than V_{MC}, the factors affecting V_{MC}, and safe recovery procedures.
- Configures the airplane at V_{SSE}/V_{YSE}, as appropriate –
  - Landing gear retracted.
  - Flaps set for takeoff.
  - Cowl flaps set for takeoff.
  - Trim set for takeoff.
  - Propellers set for high RPM.
  - Power of critical engine reduced to idle.
  - Power on operating engine set to takeoff or maximum available power.
- Establishes a single engine climb attitude with the airspeed at approximately 10 kts above V_{SSE} or V_{YSE}, as appropriate.
- Establishes a bank toward the operating engine, as required for best performance and controllability.
- Increases the pitch attitude slowly to reduce the airspeed at approximately 1 knot per second while applying rudder pressure to maintain directional control until full rudder is applied.
- Recognizes indications of loss of directional control, stall warning, or aerodynamic buffet.
- Recover promptly by simultaneously reducing power sufficiently on the operating engine while decreasing the angle of attack as necessary to regain airspeed and directional control. Recovery SHOULD NOT be attempted by increasing the power on the simulated failed engine.

- Recovers within 20° of the entry heading.
- Advances power smoothly on operating engine and accelerates to V_{XSE}/V_{YSE}, as appropriate, ±5 kts, during the recovery.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain recovery procedures for a V_{MC} demonstration.
- Explain the factors which affect V_{MC}.
- Explain how the aircraft manufacturer calculates V_{MC}.

Safety Considerations:

- Divide attention between aircraft control and outside reference.
- Maintain positive aircraft control.
- Complete the maneuver no lower than 5,000' AGL.
- Recovery from V_{MC} will be initiated at the first indications of a stall or loss of directional control.
- A stalled condition should never be allowed to develop. Stalls should never be performed with asymmetrical thrust.
- V_{MC} demonstrations should never be performed from a high pitch attitude with both engines operating and then reducing power on one engine.

Common Errors:

- Inadequate knowledge of the causes of loss of directional control at speeds less than V_{MC}, factors affecting V_{MC}, and safe recovery procedures.
- Improper entry procedures, including pitch attitude, bank angle, and airspeed.
- Failure to recognize imminent loss of directional control.
- Failure to use proper recovery technique.
- Rough and/or uncoordinated control technique.

References:

Airplane Flying handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Maneuvering With One Engine Inoperative (BE-58)

Objective:

To familiarize the student with the flight characteristics of maneuvering with one engine inoperative and the actual shut down, feathering, and restart of an engine.

Description:

The instructor will fail one engine. The student will maintain directional control & determine which engine is affected. The student will then follow the appropriate checklists for a shutdown, feathering, and restart of affected engine while maneuvering as instructed.

Setup Procedure:

1) Maintain positive aircraft control and pitch for 100 (V_{YSE}); blue line.
2) Power up:
    a. Mixture full rich
    b. Propellers full forward
    c. Throttles full power
3) Clean up:
    a. Retract flaps
    b. Retract landing gear
4) Identify: Dead foot, dead engine.
5) Verify: Reduce power on suspected inoperative engine. If there are no changes then continue to reduce power to idle.
6) If altitude allows attempt to identify and fix the problem.
7) If altitude does not allow to identity and fix the problem or if attempts to do so were unsuccessful feather the propeller of the inoperative engine.
8) Maintain 100 kts (V_{YSE}), altitude, and zero sideslip (bank angle approximately 2-5° and ⅓ to ½ ball deflection toward the operative engine).
9) Monitor electrical load – max of 100% on good engine.
10) Save the good engine – reduce operating power on the good engine if possible to maintain 100 (V_{YSE}).
11) Secure inoperative engine.
12) Complete the Engine Failure After Lift-Off Checklist. Aircraft control should never be sacrificed to execute a checklist.
13) Maneuver as directed.
14) Air start (with unfeathering accumulators & airspeed above 100 kts).
    a. If the aircraft is not equipped with unfeathering accumulators follow the Air Start Checklist to start the engine with use of the starter.
15) Return to cruise flight and complete the cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to maneuvering with one engine inoperative.
- Recognizes engine failure and maintains control.
- Set engine controls, reduces drag, identifies and verifies the inoperative engine, and feathers appropriate propeller.
- Establishes and maintains a bank toward the operating engine as required for best performance in straight and level flight.
- Follows the prescribed checklists to verify procedures for securing the inoperative engine.
- Monitors the operating engine and makes necessary adjustments.
- Demonstrates coordinated flight with one engine inoperative (propeller feathered).
- Restarts the inoperative engine using appropriate restart procedures.
- Maintains altitude ±100 feet or minimum sink as appropriate and heading ±10°.
- Completes the appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the procedures and aircraft configurations during an engine failure after takeoff.
- Discuss the aircraft's maneuvering characteristics with an engine shut down.

Safety Considerations:

- Divide attention between aircraft control and outside reference.
- Maintain positive aircraft control.
- Fail the engine above 82 kts (V_{SSE}) after reaching a safe altitude.

Common Errors:

- Failure to follow prescribed emergency checklists.
- Failure to properly identify and verify the inoperative engine.
- Failure to properly adjust engine controls and reduce drag.
- Failure to maintain positive control while maneuvering.
- Failure to establish and maintain the best engine inoperative speed.
- Improper trim technique.
- Failure to establish and maintain proper bank for best performance.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Non-Precision Approach (BE-58)

Objective:

To fly a published instrument approach by reference to instruments.

Description:

The student will learn how to manage a high performance multi-engine aircraft while flying an instrument approach.

Setup Procedure:

1) Monitor local AWOS/ASOS/ATIS.
2) Tune and identify NAVAIDS required for the approach.
3) Brief the instrument approach plate.
4) Check HSI against magnetic compass.
5) Prior to reaching the IAF, complete the Before Initial Approach Fix (IAF) checklist.
6) Prior to reaching the FAF, complete the Final Approach Fix (FAF) checklist.
7) At FAF:
    a. Extend landing gear below 152 kts.
    b. Adjust pitch and power to maintain a stabilized approach at 700-1,000 FPM and 110 kts (approximately 13" manifold pressure).
8) Prior to MDA, complete the GUMPS check.
9) Fly the aircraft at MDA until the missed approach point or until the runway is in sight,
    a. If the required visibility is ensured and the runway is in sight, a normal descent to a landing can be made.
        i. Set flaps to DN (30°) below 122 kts.
        ii. Maneuver to land.
    b. If not, execute a missed approach and complete the missed approach checklist.

Flight Proficiency Standards:

- Exhibits knowledge of the elements by explaining the procedures used during a published instrument approach.
- Requests and receives an actual or a simulated ATC clearance for an instrument approach.
- Follow the actual or simulated ATC clearance for an instrument approach.
- Establishes a rate of descent that will ensure arrival at the MDA or DH, with the airplane in a position from which a descent to a landing, on the intended runway can be made, either straight in or circling as appropriate.
- On the final approach segment, no more than ¾ scale deflection of the CDI/glide slope indicator. For RMI or ADF indicators, within 10° of the course.
- Complies with the published criteria for the aircraft approach category when circling.
- Completes landing and appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the aircraft's approach configuration.
- Explain how to safely perform a missed approach.

Safety Considerations:

- Divide attention between aircraft control and instrument reference.
- Maintain positive aircraft control.
- Follow the published instrument approach procedures.

Common Errors:

- Lack of instrument procedure skills.
- Failure to use proper communication procedures.
- Noncompliance with ATC clearances.
- Incorrect use of navigation equipment.
- Inappropriate descent below the MDA or DH.

References:

Airplane Flying handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Precision Approach (and LPV) (BE-58)

Objective:
To fly a published instrument approach by reference to instruments.

Description:
The student will learn how to manage a high performance multi-engine aircraft while flying an instrument approach

Setup Procedure:
1) Monitor local AWOS/ASOS/ATIS.
2) Tune and identify NAVAIDS required for the approach.
3) Brief the instrument approach plate.
4) Check HSI against magnetic compass.
5) Prior to reaching the IAF, complete the Before Initial Approach Fix (IAF) checklist.
6) Stay high to intercept the glideslope.
7) Prior to glideslope intercept, complete the Final Approach Fix (FAF) checklist.
8) At glideslope interception:
    a. Extend landing gear below 152 kts.
    b. Adjust pitch and power to establish a stabilized approach on the glideslope/path at 110 kts (approximately 14" – 16" manifold pressure).
9) 500' above DA/DH, complete the GUMPS check.
10) Fly the aircraft on the glideslope/path until the DA/DH:
    a. If the required visibility is ensured and the runway is in sight, a normal descent to a landing can be made.
        i. Set flaps to DN (30º) below 122 kts.
        ii. Maneuver to land.
    b. If not, execute a missed approach and complete the missed approach checklist.

Flight Proficiency Standards:
- Exhibits knowledge of the elements by explaining the procedures used during a published instrument approach.
- Requests and receives an actual or a simulated ATC clearance for an instrument approach.
- Follow the actual or a simulated ATC clearance for an instrument approach.
- Establishes a rate of descent that will ensure arrival at the MDA or DH, with the airplane in a position from which a descent to a landing, on the intended runway can be made, either straight in or circling as appropriate.
- On final approach segment, no more than ¾ scale deflection of the CDI/glide slope indicator. For RMI or ADF indicators, within 10° of the course.
- Complies with the published criteria for the aircraft approach category when circling.
- Completes landing and appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:
- Explain the aircraft's approach configuration.
- Explain how to safely perform a missed approach.

Safety Considerations:
- Divide attention between aircraft control and instrument reference.
- Maintain positive aircraft control.
- Follow the published instrument approach procedures.

Common Errors:

- Lack of instrument procedure skills.
- Failure to use proper communication procedures.
- Noncompliance with ATC clearances.
- Incorrect use of navigation equipment.
- Inappropriate descent below the MDA of DH.

References:

Airplane Flying handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Non-Precision Approach – One Engine Inoperative (BE-58)

Objective:

To fly a published instrument approach, by reference to instruments, with one engine inoperative.

Description:

Prior to the final approach fix (FAF), the instructor will simulate a failed engine. The student will maintain directional control, secure the engine, and continue the approach.

Setup Procedure:

1) Monitor local AWOS/ASOS/ATIS.
2) Tune and identify NAVAIDS required for the approach.
3) Brief the instrument approach plate.
4) Check HSI against magnetic compass.
5) Prior to reaching the IAF, complete the Before Initial Approach Fix (IAF) checklist.
6) When engine failure occurs, perform the engine failure procedures (power up, clean up, identify, verify, feather, secure) and continue with the approach as appropriate.
7) If workload permits, advise ATC of engine failure.
8) Prior to reaching the FAF, complete the Final Approach Fix (FAF) checklist.
9) At FAF
   a. Extend landing gear below 152 kts (V_{LE}).
   b. Adjust pitch and power to maintain a stabilized approach at 700-1000 FPM and 100 kts (approximately 18" manifold pressure and 2,500 RPM).
10) At FAF lower landing gear, reduce power as appropriate, and start descent at approximately 600-1,000 FPM while maintaining approach airspeed of 100 kts (V_{YSE}).
11) Prior to MDA complete the GUMPS check.
12) Perform "Level Off Check":
    a. At MDA + 100 feet determine if altitude can be maintained with gear and flaps extended.
       i. If yes, leave gear and flaps extended and continue descent to MDA.
       ii. If no, retract gear and flaps as necessary.
13) Fly the aircraft at MDA until the missed approach point or until the runway is in sight,
    a. If the required visibility is ensured and the runway is in sight, a normal descent to a landing can be made.
       i. If gear was retracted during "Level Off Check" and landing is assured, extend gear abeam touchdown point when circling or on final on a straight in landing.
       ii. Set flaps to DN (30º), as required, below 122 kts (V_{FE}).
       iii. Maneuver to land.
    b. If not, execute a missed approach and complete the missed approach checklist.
       i. Do not attempt a missed approach if flaps have been fully extended.

Flight Proficiency Standards:

- Exhibits knowledge of the elements by explaining the procedures used during a published instrument approach with one engine inoperative.
- Recognizes engine failure, sets the engine controls, reduces drag, identifies and verifies the inoperative engine, and simulates feathering appropriate engine propeller.
- Establishes and maintains a bank toward the operating engine, as required, for best performance in straight and level flight.
- Follows the prescribed checklists to verify procedures for securing the inoperative engine.
- Monitors the operating engine and makes necessary adjustments.
- Requests and receives an actual or a simulated ATC clearance for an instrument approach.
- Follows the actual or a simulated ATC clearance for an instrument approach.
- Maintains altitude within 100 feet, the airspeed within ±10 kts if within the aircraft's capability, and heading ±10°.
- Establishes a rate of descent that will ensure arrival at the MDA or DH, with the airplane in a position from which a descent to a landing, on the intended runway can be made, either straight in or circling as appropriate.

- On final approach segment, no more than ¾ scale deflection of the CDI/glide slop indicator. For RMI or ADF indicators, within 10° of the course.
- Avoids loss of aircraft control, or attempted flight contrary to the engine inoperative operating limitations of the aircraft.
- Complies with the published criteria for the aircraft approach category when circling.
- Completes landing and appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the changes in the aircraft's approach configuration when flying a single engine instrument approach.
- Explain the importance of avoiding a single engine missed approach.
- Explain how to identify the inoperative engine with reference to instruments.

Safety Considerations:

- Divide attention between aircraft control and instrument reference.
- Maintain positive aircraft control.
- Follow the published instrument approach procedures.

Common Errors:

- Lack of instrument procedure skills.
- Failure to use proper communications procedures.
- Noncompliance with ATC clearances.
- Incorrect use of navigation equipment.
- Failure to identify and verify the inoperative engine and to follow the emergency checklists.
- Inappropriate procedure in the adjustment of engine controls and reduction of drag.
- Inappropriate procedure in the establishment and maintenance of the best engine inoperative airspeed.
- Failure to establish and maintain proper flight attitude for best performance.
- Failure to maintain positive aircraft control.
- Inappropriate descent below the MDA of DH.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

Precision Approach (and LPV) – One Engine Inoperative (BE-58)

Objective:

To fly a published instrument approach, by reference to instruments, with one engine inoperative.

Description:

Prior to the final approach fix (FAF), the instructor will simulate a failed engine. The student will maintain directional control, secure the engine, and continue the approach.

Setup Procedure:

1) Monitor local AWOS/ASOS/ATIS.
2) Tune and identify NAVAIDS required for the approach.
3) Brief the instrument approach plate.
4) Check HSI against magnetic compass.
5) Prior to reaching the IAF, complete the Before Initial Approach Fix (IAF) checklist.
6) When engine failure occurs, perform the engine failure procedures (power up, clean up, identify, verify, feather, secure) and continue with the approach as appropriate.
7) If workload permits, advise ATC of engine failure.
8) Stay high to intercept the glideslope.
9) Prior to intercepting the glideslope, complete the Final Approach Fix (FAF) checklist.
10) At glideslope interception:
    a. Extend landing gear below 152 kts(V_{LE}).
    b. Adjust pitch and power to maintain a stabilized approach on the glideslope and 100 kts (approximately 20" manifold pressure and 2,500 RPM).
11) 500' above DA/DH, complete the GUMPS check.
12) Fly the aircraft on the glideslope/path until the DA/DH:
    a. If the required visibility is ensured and the runway is in sight, a normal descent to a landing can be made.
        i. Set flaps to DN (30º), as required, below 122 kts (V_{FE}).
        ii. Maneuver to land.
    b. If not, execute a missed approach and complete the missed approach checklist.
        i. Do not attempt a missed approach if flaps have been fully extended.

Flight Proficiency Standards:

- Exhibits knowledge of the elements by explaining the procedures used during a published instrument approach with one engine inoperative.
- Recognizes engine failure, sets the engine controls, reduces drag, identifies and verifies the inoperative engine, and simulates feathering appropriate engine propeller.
- Establishes and maintains a bank toward the operating engine, as required, for best performance in straight and level flight.
- Follows the prescribed checklists to verify procedures for securing the inoperative engine.
- Monitors the operating engine and makes necessary adjustments.
- Requests and receives an actual or a simulated ATC clearance for an instrument approach.
- Follows the actual or a simulated ATC clearance for an instrument approach.
- Maintains altitude within 100 feet, the airspeed within ±10 kts if within the aircraft's capability, and heading ±10°.
- Establishes a rate of descent that will ensure arrival at the MDA or DH, with the airplane in a position from which a descent to a landing, on the intended runway can be made, either straight in or circling as appropriate.
- On final approach segment, no more than ¾ scale deflection of the CDI/glide slop indicator. For RMI or ADF indicators, within 10° of the course.
- Avoids loss of aircraft control, or attempted flight contrary to the engine inoperative operating limitations of the aircraft.
- Complies with the published criteria for the aircraft approach category when circling.
- Completes landing and appropriate checklists.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Explain the changes in the aircraft's approach configuration when flying a single engine instrument approach.
- Explain the importance of avoiding a single engine missed approach.
- Explain how to identify the inoperative engine with reference to instruments.

Safety Considerations:

- Divide attention between aircraft control and instrument reference.
- Maintain positive aircraft control.
- Follow the published instrument approach procedures.

Common Errors:

- Lack of instrument procedure skills.
- Failure to use proper communications procedures.
- Noncompliance with ATC clearances.
- Incorrect use of navigation equipment.
- Failure to identify and verify the inoperative engine and to follow the emergency checklists.
- Inappropriate procedure in the adjustment of engine controls and reduction of drag.
- Inappropriate procedure in the establishment and maintenance of the best engine inoperative airspeed.
- Failure to establish and maintain proper flight attitude for best performance.
- Failure to maintain positive aircraft control.
- Inappropriate descent below the MDA of DH.

References:

Airplane Flying Handbook; POH/AFM; Commercial Pilot ACS; CFI PTS

BE-58 Configurations

1" = 5 kts or 100 fpm	Gear	Flaps	Power	Airspeed	VSI
Cruise Climb	Up	0°	Full"/2,500	136	1000
Cruise	Up	0°	20"/2,300	150	0
Cruise Descent	Up	0°	20"/2,300	165	500
Pre-Approach Level	Up	15°	17"/2,300	135	0
ILS Approach	Down	15°	15"/2,300	110	500
Non-Precision	Down	15°	13"/2,300	110	700
Missed Approach	Up	0°	Full/2700	105	1,200
Single-Engine Pre-Approach Level	Up	15°	25"/2,500	100	0
Single-Engine ILS	Down	15°	20"/2,500	100	500
Single Engine Non-Precision	Down	15°	18"/2,500	100	750
Single-Engine Missed Approach	Up	0°	Full/2700	100	Depends on density altitude

Note: These are approximate settings and are for reference only. Adjust your power settings and configurations as required to achieve the level of performance needed.