
# USU Flight Operations Manual

April 2022

Welcome to the USU Aviation Technology-Professional Pilot Program. We hope you will find your experiences in this program to be exciting and motivating as you prepare for a career in aviation.

The flight training program at Utah State University must adhere not only to all university policies, but also to the Federal Aviation Regulations, aircraft, and airport policies.

This manual will help guide users through the complexities of both educational and federal training required to become a professional pilot.

USU has requirements set forth by the program for safe aircraft operation and pilot professionalism.

All pilots (Students, Instructors, Staff, and Examiners) of USU aircraft are subject to the following rules and may not violate these unless explicitly permitted by the Chief Flight Instructor in writing.

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# New Students

Welcome new Flying Aggies! We are excited to have you with us. Please read the Operations Manual in its entirety so that there will be no training or policy surprises. If at any time students find themselves left with additional questions, please contact us as soon as possible so that any issues can be resolved.

## Flying Prerequisites

Before any student can start flying, they must have these prerequisites completed by the first week of class. Additional directions are found later in this publication, please reference those for more details.

Please note before you start flying you will need ALL the following:

- Current FAA Class Medical
- Student Pilot license (Or applicable to rating sought)
- TSA Documents
- Challenge flight for any ratings greater than a Student Pilot
- Any previous flying course must be completed, which includes passing the checkride
- Funds secure in Talon

The items above must be in place by the end of the first week (Friday) of the semester. If the student does not, they will automatically be dropped from the flying and ground school courses. If funds are "on the way" or delayed, student *may* be dropped from the course. Students may re-enroll before the semester's last add/drop date once all items above are in place.

Students must also make a few purchases when starting their careers in aviation. A few of these items are listed below.

The following items will need to be purchased at the airport:

- USU Flight Uniform
- Checklist

These items are required as well but can be purchased at online retailers such as Amazon or Sporty's Pilot Shop. Some items may be downloaded digitally for free also.

- Flashlight with a red filter
- Pilot Operating Handbook (POH – available at the Airport)
- Headset (also available at the Airport)
- Logbook

# Student Conduct

# USU Safety and Just Culture

**Safety is paramount at USU.**

With the above statement we adhere to a culture of safety. The key element is to know what is allowable and what is not. Hence this entire Operations Manual (Ops Manual) is set up for your education and to help you succeed in this culture.

Safety is in jeopardy when pilots do the following. There is no leeway for the following actions:

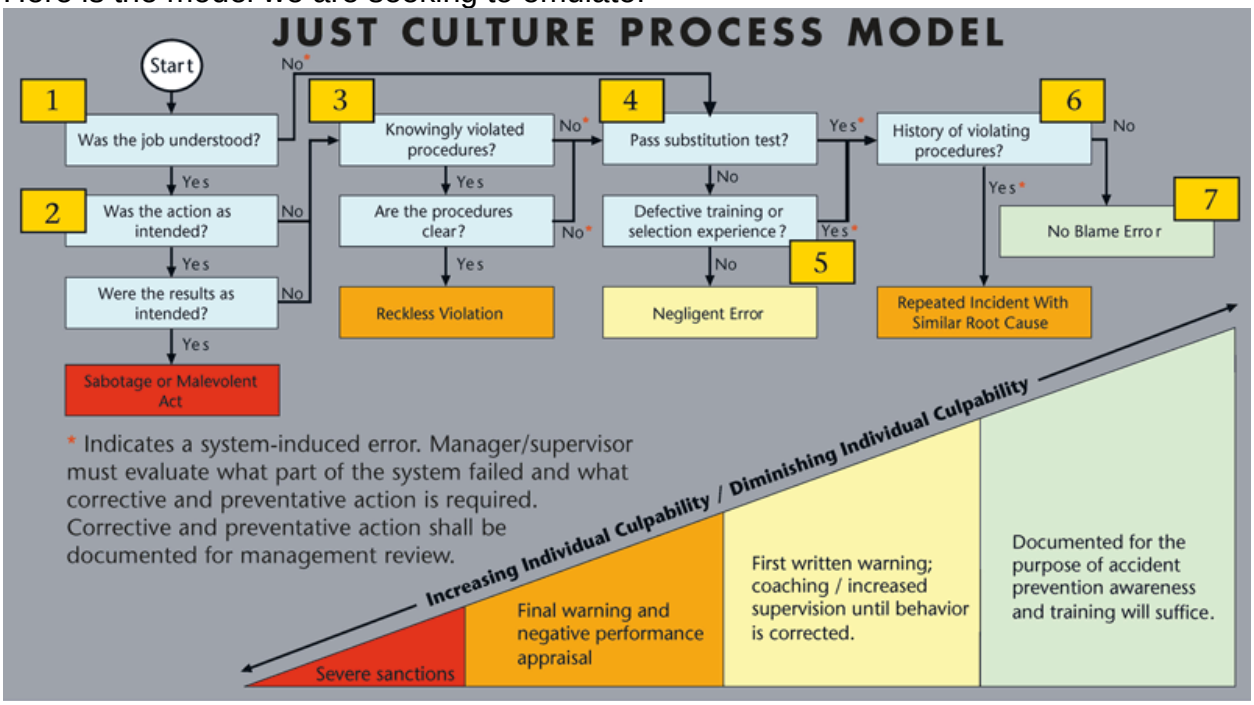
- Willful disregard for safety
- Omitting/Covering up any issue or report (failure to submit or altering actual facts of reports)
- Willfully not adhering to safety practices (failure to use Checklists, Ops Manual, handbooks, etc.)
- Endangering ANY life
- Refusing re-training

Negligence is not an excuse that will be acceptable. We seek the following cultures here to assist with the safety we desire:

1. Informed Culture- USU will manage and operate a system having current knowledge about human, technical, organizational, and environmental factors that determine the safety. Its pilots will know how to act or will ask for assistance.
2. Reporting culture- At USU we will have a climate in which people are prepared to report their errors and near-misses.
3. Flexible Culture-USU will be open to running the program in a way which will benefit the students by keeping training relevant, and management focused on safety.
4. Learning Culture- USU will maintain a willingness to listen and correct. We will maintain the competence to draw the right conclusion from its safety information system and will implement major reforms if needed.
5. JUST CULTURE- at USU there will be an atmosphere of trust in which its students are encouraged to provide essential safety-related information, but in which they are also clear about where the line must be drawn between acceptable and unacceptable behavior.

Acceptable behavior, weather minimums, airports, aircraft care, etc. are outlined in this Ops Manual. Please read and understand what you are committing to by choosing Utah State University for your flight training.

Here is the model we are seeking to emulate:




https://deptmedicine.arizona.edu/patient-care/blog/quality-safety-%E2%80%98just-culture%E2%80%99-provides-process-review-correct-mistakes-optimal

## Ethical Conduct

In its programs and activities, Utah State University does not discriminate based on race, color, religion, sex, national origin, age, genetic information, sexual orientation or gender identity/expression, disability, status as a protected veteran, or any other status protected by University policy or local, state, or federal law.

> *Note that harassment is not limited to the areas above, and can be in any verbal, non-verbal, or electronic communication.*

Individuals from all races, genders, and ethnic backgrounds are represented among our students and are some of the best pilots and aviation professionals in the industry. Disrespect of this kind is considered a symptom of profound ignorance, and to create a hostile, non-collaborative environment that detracts from learning and from safety.
All students should review the USU Student code (link below) for information concerning student conduct, Academic Integrity, Student Code of Conduct, and additional assistance in other related areas. Any harassment is grounds for immediate and permanent dismissal from the program.

https://studentconduct.usu.edu

Students are expected to comply whole-heartedly with federal, state, and local laws, and with the regulations and policies of USU. Violations of traffic or criminal laws, Federal Aviation Administration (FAA) regulations, or ethical infractions can result in

disciplinary action within the program, separate from any University or Law Enforcement actions.

## Legal and Academic Policy

Due to the highly sensitive nature of flight training, USU flight operations will not allow flight training if the students are under any legal or academic investigations until they are sorted out with the appropriate entities.

You must notify flight operation management within 48 hours of any legal actions, citations, pending charges, academic investigations, or academic suspension.

All flight operations personnel will need to disclose any of the above issues. Failure to do so may result in termination from the flight program

## Alcohol and Illicit Drug Policy

Alcohol is not permitted on campus, or at the airport.
Legal and responsible drinking may take place off campus. No illegal drugs.

Students should be advised that known illegal use/arrest for alcohol and drug offenses will result in disciplinary action within the program, separate from any University or Law Enforcement actions.

Also note that while marijuana is legal for recreational use in many states and foreign countries, it is still illegal on a Federal Level. Therefore, it is still illegal to utilize marijuana at any time and any place for all pilots holding FAA Certificates. This includes all pilots currently enrolled and employed by the program and university.

**USU reserves the right to have any pilot perform random drug screening.**

## Honesty and Integrity

Utah State Aviation expects integrity and honesty from all pilots in both their personal and professional lives. Failure to acknowledge a breakdown or defect, failure to report an infringement, failure to abide by rules or required procedures, all have a damaging effect on safety.

## Cheating

Per Article VI Section VI-1 of the USU Student Code:

1. Cheating: (1) using or attempting to use or providing others with any unauthorized assistance in taking quizzes, tests, examinations, or in any other academic exercise or activity, including working in a group when the instructor has designated that the quiz, test, examination, or any other academic exercise or activity be done “individually”; (2) depending on the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; (3) substituting for another student,

or permitting another student to substitute for oneself, in taking an examination or preparing academic work; (4) acquiring tests or other academic material belonging to a faculty member, staff member, or another student without express permission; (5) continuing to write after time has been called on a quiz, test, examination, or any other academic exercise or activity; (6) submitting substantially the same work for credit in more than one class, except with prior approval of the instructor; or (7) engaging in any form of research fraud.

2. Falsification: altering or fabricating any information or citation in an academic exercise or activity.
3. Plagiarism: representing, by paraphrase or direct quotation, the published or unpublished work of another person as one's own in any academic exercise or activity without full and clear acknowledgment. It also includes using materials prepared by another person or by an agency engaged in the sale of term papers or other academic materials.

Any student found violating the rules stated above will be subject to discipline which can include independent investigations and actions from the FAA, University, and/or the aviation program.

## Disciplinary Actions

Any pilot that flies for USU, that is called out on a disciplinary issue WILL BE required to receive additional training, write a report, meet with counseling, retrain on weak areas, etc. prior to returning to flight status. This includes flight instructors.

All pilots that utilize USU aircraft will be under the same scrutiny. Any actions that result in failures to moral and academic standards will first be dealt with legally. Federal actions with the FAA and program level may also be required. Conviction by the judicial system or medical/certificate suspensions from the FAA may disqualify students from further participation in the Aviation Program at Utah State University. Since each case is different, the severity of the incident will be considered as verdicts are made.

This is a list of items we would prefer never to deal with:

- Cheating on an FAA written test
- Cheating in any class
- Minor in possession of alcohol or illegal drugs
- DUI/DWI
- Falsification of pilot logbook, etc.

Poor choices such as these should be self-reported and that will be taken into consideration if disciplinary actions are taken. Any violation of the Student Code of Conduct will result in notification of the flight department. These infractions are taken very seriously. Poor decision-making skills, anti-authority attitudes, and impulsivity are traits not in line with professionalism nor the aviation industry.

Order of reprimand is as follows:

1. Verbal Warning and re-training
2. Letter of reprimand in record and re-training.
3. First letter goes permanent and the second item is added to it.
4. Suspension from flying
5. Dismissal from the program or termination of employment.

In some severe instances, especially ones resulting in unsafe flying, steps can and will be skipped.

## Notification and Communication

USU Aviation students are expected to reach out and contact their instructor, dispatch, or management any time things are not going as planned. We want you to succeed, and if we are not aware, we cannot help.

Similarly, it is a USU Pilot's responsibility to notify management any time there has been any deviation or violation of the Federal Aviation Regulations.

If at any point a USU Pilot receives an FAA, Tower, or Controller phone number to call while in a USU aircraft, the pilot is required to notify USU management immediately. In the event of a deviation, keeping program Instructors and Faculty members informed better prepares everyone for the resulting FAA meetings. Failure to notify management could lead to unwanted consequences.

## Flight Uniforms and Dress Code

All USU Flight Students are required to purchase and wear uniforms. Uniforms are to be worn anytime flight, ground, or simulator instruction is given at the USU airport locations and must be kept neat and clean in order to maintain a professional image. There are 4 seasons in Cache Valley please dress accordingly. Uniforms are available at any time -- see Dispatch at the airport to purchase.

Uniforms are as follows:

Pants: Semi-formal pants. Clean and in good condition with no rips or tears.
**No leggings, yoga pants, or jeans (blue, black, gray, etc.).**

- Students preferably brown/khaki in color
- CFI's any solid conservative color

Shorts: Approved Semi-formal shorts must end slightly (within 2 inches) above or past the knee. Clean and in good condition with no rips or tears.
**No blue jean shorts.**

- Students preferably brown/khaki in color

- CFI's any solid conservative color
  Approved colors in single or mixed use:
  Black, Grey, White, Blue, Brown, Tan

Shirts: Approved uniform shirts only, in clean condition.

Students:

- Blue oxford with approved USU Aviation insignia, tucked in!
- Blue knit shirt with approved USU Aviation insignia, tucked in!

CFI's:

- White or Gray Aviator shirt with approved USU Aviation insignia, tucked in!
- White or Gray Polo Shirt with approved USU Aviation insignia, tucked in!

Shoes: Closed toe and closed heel and low heel. Good grip since you will be climbing in and out of aircraft.

Flight ID Badge: All USU Pilots are required to display their flight ID Badge on the **exterior** of their person so that it is always clearly visible while at the airport. The ID badge is considered part of the mandatory uniform.

Optional: Hats: Must contain USU Colors (blue, grey, white) or logos
Jackets: Flight Jackets with approved USU Aviation insignia are available but must be individually ordered.

- **We place a group order once each semester after the third week of school**
- Order jackets online by the third week of school on our Aviation website at https://aste.usu.edu/aviation/students/uniforms.
- Payment for the flight jackets will be made when they are picked up. We only accept debit/credit cards.

Students will NOT be checked-in for any training activity nor dispatched an aircraft without the appropriate uniform on. If you are denied an operational check-in due to inappropriate uniform standards, you will be assessed a "NO-SHOW" fee.

Appearance: Student:

- Personal appearance is up to the student.
- There are no rules against hair length/color, piercings, tattoos, or any other accessory if they are not crude or offensive in nature.

- The only expectation is that regular hygiene schedules are adhered to.

CFI:

- Due to the professional nature of this position, we expect that the instructors will maintain standards set forth by the industry.
- This includes but is not limited to dress, grooming, and hygiene. Please be aware that you are near another person so body odor and breath should be taken care of appropriately.
- While at the airport, all instructors will wear the approved instructor apparel listed. They will maintain appropriate hairstyling and grooming. Facial hair is acceptable so long as it is kept tidy.
- Please be the consummate professional while selecting attire appropriate for the weather. The uniform is expected any time that you are at the airport, they are not to be worn in conjunction with extracurricular activities such as bars, parties, etc. You can purchase additional shirts if you desire.

## Pilot Supplies:

Uniforms, Checklists, Pilot Operating Handbooks, Badge Holders, Lanyards, Hats, and Headsets are available anytime – see Dispatch at the airport to purchase.

## Required items that all students will need to purchase and/or own:

- Flight Uniform(s)
- Checklist
- Pilot Operating Handbook (POH - available free online)
- Appropriate FAA charts and publications
- Navigation Plotter and E6B
- Logbook
- Headset

## Electronic Student Records:

At Utah State University we utilize training and tracking software called Talon to ensure compliance with policies and regulations. It will not only have your personal information (address, phone number, email, etc.), it will track your finances, lessons, comments about performance and more. To receive credit for a flight, pay for the aircraft usage, and complete activities, you will be required to utilize your own secure pin. This pin is not to be shared and should be changed regularly. You will learn more about the safety protocols in the electronic record keeping section.

## Challenge Flights:

USU will allow students to enter the program who have training/ratings other than a student pilot certificate. The maximum credit allowed to be granted will be the private pilot ground school and certificate. This aligns with the Restricted ATP guidelines and is for the safety of the program and the benefit of the student. Any courses that are started after the Private rating will need to be repeated or an exemption given from flight operations (Chief or Assistant Chief Flight instructor). The challenge flight will consist of a flight paid for by the student to prove skill level of a private pilot to the ACS. This will include a one-hour flight and ground lessons to prove the requisite skills and knowledge of the pilot equal to that necessary to continue with the next stage of flight.

If a pilot is found deficient in the airframe, maneuvers, decision making process, or safety, they will not be progressed forward until such skills are demonstrated, which could include taking a USU flight course. This is to meet our insurance guidelines.

# Required Documentation

Students will be instructed during the first week of school when to bring the following required documents (originals only-photocopies are not accepted) to Airport Student Services, as they must be in place before students can begin their flight training. These items will be scanned and uploaded into the student's flight account and the original documents will be returned to the student.

## Student Pilot Certificate

All student pilot certificates will be issued by the Civil Aviation Registry (AFS-700) on high quality plastic card stock containing tamper and counterfeit-resistant features. Once a student pilot certificate has been issued, the pilot must hold a current medical certificate while exercising solo privileges in any USU or FAA Registered Aircraft in specific reference to FAR § 61.23(b)(3).

**To obtain a student pilot certificate**, fill out an IACRA form on the FAA's website:
https://iacra.faa.gov/IACRA/Default.aspx

Create an account and begin the student pilot application by *filling out all the information possible.* Make sure to write down the assigned **FTN number** -- this is what the authorized individual will use to pull up and complete the application.

The following authorized individuals can assist in completing the application:

- Certified Flight Instructor
- Designated Pilot Examiner
- Through an FAA ASI
- AST
- Airman Certification Representative (ACR) associated with a 14 CFR part 141 pilot school.

Any students planning to attend Utah State University can complete the student pilot application with a USU Certified Flight Instructor during the first week of school. Or, an appointment can be made with a Flight Instructor ahead of time by calling USU Dispatch at 435-797-7897. If an appointment with a Utah State University representative is not feasible the student must seek out one of the individuals above.

**NOTE**: An email will be sent to the student when the Temporary Airman Certificate is available. Log into IACRA, look for the Temporary Certificate, and print it. This Temporary Airman Certificate must be signed and brought to Airport Student Services to be scanned and uploaded into the student's Talon flight account.

This temporary certificate will be issued for use while waiting for the permanent certificate to be received. Per USU Policy, the permanent certificate must be in the pilot's possession to exercise solo privileges. For further information please contact us at 435-797-7897

## Pilot Certificates

Any other pilot certificates held/obtained by the student need to be updated and stored in our tracking program to retain compliance with the TSA, FAA, and to retain flight status at USU.

## Medical Certificate

In accordance with the Code of Federal Regulations Title 14, Part 61.3(c), all Professional Student Pilots are required to obtain an FAA Medical Certificate. There are three classes of medicals: First Class, Second Class, and Third Class. Although only a Third-Class medical is required for student pilot operations at USU Aviation, it is highly recommended that a student obtain a First-Class certificate to ensure no medical conditions exist which would disqualify him/her from obtaining certificates/licenses at a later date. Many pilot jobs require a current First Class Medical.

A Medical **must** be on record at the airport before the end of the first week of the semester enrolled, or student will be dropped from both the ground and flight course.

A medical certificate may be obtained from a certified Aviation Medical Examiner (AME). Cost varies depending on the examiner and type of physical sought, average costs typically range from $80-$130.

To locate an AME, please visit https://www.faa.gov/pilots/amelocator/
Details of each medical class requirements and durations are explained in CFR Title 14, Part 67. If there are still questions that need to be answered please contact the program.

## TSA Documentation

Per TSA guidelines, these documents will remain on file for a period of five years upon completion or withdrawal of training. The required documentation for Domestic and International Students are listed below:

## U.S. Citizen Students:

Acceptable documents to verify U.S. citizenship include:

- A Current U.S. Passport*
  OR
- A Current Driver's License* **AND**:
  - An official Birth Certificate (photocopies not accepted)

    **-OR-**
  - An original "raised Seal" Certificate of Naturalization (photocopies not accepted)

*If any submitted documents will expire before the completion of training or if a newer document supersedes the old, it is the student's responsibility to provide the new/required documents to satisfy TSA requirements.

## Permanent Resident Students:

Required Documents:

- Passport*
- Permanent Resident Card* (green card)
- TSA Approval through AFSP (see below)

*If any submitted documents will expire before the completion of training or if a newer document supersedes the old, it is the student's responsibility to provide the new/required documents to satisfy TSA requirements.

## International Students:

Students will be required to show a passport*, F Type VISA* and an I-20 form from their country to USU Flight Operations. Airport Student Services will upload these documents to the student's digital and physical files. Per TSA guidelines, these documents will remain on file for a period of five years upon completion or withdrawal of training.

* If a passport or F Type VISA submitted expires before the completion of training, it is the student's responsibility to provide new ones.

**The Flight Training Security Program (FTSP)** is a mandatory process for foreign students who are seeking training at a flight school regulated by the FAA, (Public Law 108-176, Dec 12, 2003). Federal Law prohibits flight schools from providing flight training to a foreign student unless the Secretary of Homeland Security first determines that the student does not pose a threat to aviation or national security. On September 20, 2004, the TSA issued an interim final rule establishing the FTSP.

All students who cannot provide appropriate proof of U.S. citizenship must complete the FTSP process for all flight training where this approval is required, including those who have a Permanent Resident Card (green card).

By legal mandate, USU may not provide certain flight training to any individual who cannot provide appropriate proof of U.S. citizenship until receiving TSA clearance.

## TSA Approval for International Students:

Follow the steps below:

1. Go online to https://www.fts.tsa.dhs.gov/home
   a. Scroll to FAQ on top of the homepage and read entire section.
   b. Create a Valid User ID and Password- Click the CREATE NEW STUDENT ACCOUNT link near the top of the login page. Enter the appropriate information to create a new account. Once the account is created, the student will then receive an email with their assigned USER ID and PASSWORD. If a problem arises go to FAQ's again and scroll to applicable question.
2. The student will receive an email requesting a fee to be submitted via FTSP website--Instructions are found in the FAQ's.
3. Fingerprints: Once payment is received, the student will receive email instructions for obtaining fingerprints.
   a. DO NOT GET FINGERPRINTED PRIOR TO RECEIVING THESE INSTRUCTIONS AS THEY WILL NOT BE ACCEPTED.
   b. Students MUST be fingerprinted at USU campus police ONLY.
   c. Students MUST schedule an appointment - schedule TWO fingerprinting sessions at: https://dps.usu.edu/police/fingerprinting-services
   d. Print out the email received that gave permission to obtain fingerprints.
   e. Bring a prepaid, addressed envelope with a tracking number.
4. Passport: When requested, the student must provide a copy which is:
   - Not grainy
   - Shows both eyes clearly
   - Not too light or dark when copied
   - All information on the passport copy must be legible and visible.
5. The Chief Flight Instructor will be informed of the student's request and its progress. He will be notified by TSA when their initial clearance has been awarded.

***Extremely Important***

TSA Clearance for International Students takes SEVERAL WEEKS (over 6) and must be completed before **ANY** flying is permitted.

**If TSA Clearance is not given before the end of the first week of the semester, students will be dropped from both the flight and ground courses.**

# Program Fees

## Flight Course Fees

It is highly recommended that the entire flight fee is paid before beginning flight training. This will ensure the student will have the funds available in their Talon flight account to keep up with the pace of training. Flight lessons will be scheduled on a regular basis, we recommend at least 2-3 flights per week. Be aware that insufficient funds in your Talon flight account could result in a No-Show also.

- Due to insurance requirements, a student MUST BE REGISTERED in an active Flight Course to proceed or continue with flight training.

- Flight course fees are automatically assessed to the student's Banner account when they register for the corresponding AV course.

- All Financial Aid, Loans, 3rd Party and Veteran's payments will be applied to any unpaid flight course fees by the Registrar's Office.

- Flight course fee payments are not accepted at the airport. Payments are taken at the Registrar's Office, or online using the TouchNet system. Acceptable forms of payment are cash, check, or credit card (USU does NOT accept all credit cards).

If a student is unable to pay the entire flight course fee at one time, there are two different installment plans available. The student can only have one installment plan set up per semester. Setting up an installment plan only keeps the student from being dropped from their classes for non-payment. The installment plan is NOT A LINE OF CREDIT. Until payments are made on the installment plan, the student will not have funds in their Talon flight account and will not be able to fly.

Making monthly payments on an installment plan does NOT EXEMPT you from having to complete the flight course for the semester. The plan is ONLY to keep you in good standing with the university for unpaid course fees and give you the ability to spread out the cost of the course over a few months.

- **Aviation Installment Plan**. This installment plan ONLY COVERS FLIGHT COURSE FEES. There is no fee to set up the plan, and the flight course fee will be divided out equally over 3 payments. Regular monthly payments are required. There are no late fees for non-payment, but USU Student ID cards will stop working on campus if a payment is missed.

- **Tuition Installment Plan (TIP)**. This installment plan COVERS TUITION, OTHER UNIVERSITY FEES, and FLIGHT COURSE FEES. There is a fee to set it up, there are late fees for non-payment, and it must be paid in full before the end of the semester. Payments will be applied first to tuition and other fees, with flight course fees being paid last.

Flight course fees are considered a fixed course fee. Meaning, the course fee pays for a specific number of ground and flight training hours for the "average" student to complete the course. The current fee schedule is available online at **UPDATE LINK** or from the academic advisor. The fixed course fee does not guarantee that the student's individual progress will allow them to complete their training with the course fee. Students must meet the certification standards established by the FAA, so any overages due to unsatisfactory performance during flight or ground training will require additional funds to be paid by the student.

Flight course fees are reviewed regularly and may be increased once or twice a year at the beginning of a new term. Students who did not complete their flight course within the semester they registered for it in, but who received an incomplete grade and given additional time to finish a flight course, will be subject to the new hourly rate associated with the fee increase. This may require the student to pay additional fees to finish their course.

To pay for additional funding to complete a course, the student needs to contact Student Services at the airport. The amount needed to continue in the course will be posted to the student's Banner account as Additional Funds for a specific flight course. Once that charge is paid at the Registrar's Office, or on TouchNet, the funds will be posted to the student's Talon flight account.

- After a flight course is completed, any remaining additional funds ARE REFUNDABLE, as they are not considered course fees.

On the other hand, if the student completes a flight course and did not spend all the flight course fee originally paid, THERE WILL BE NO REFUND of REMAINING FEES and they CANNOT BE USED for a FUTURE FLIGHT COURSE. If the excess funds are more than $100 for fixed wing, or $150 for rotorcraft, the student will have the opportunity to use remaining funds to gain additional flight experience and accumulate overall flight time. The student will have approximately 3 weeks to use these funds. When the additional flying is done, THE STUDENT MUST CONTACT STUDENT SERVICES at the AIRPORT. A grade will then be given, the course will be completed, and any remaining funds will be removed from the student's Talon flight account.

# Training Guidelines

## Flying Policy

Once you start flight training at USU, all training flights towards a rating need to be done in USU aircraft. Exemptions would be for ratings not offered by USU, such as tail wheel endorsement, glider flights, aerobatic flights, etc. You are responsible for the safe and working return of USU aircraft. If you happen to cause a flat tire, propeller strike, etc. You may be assessed the fees to return the aircraft to working status.

## FAA notification

Be aware that while choosing to fly with USU, we hold ourselves responsible to report any deviations (no matter if solo or dual flights) to the FAA. We have always been present when corrections are imposed and (we) are often the ones providing the corrective training. We require you tell us of any deviations first, so we can provide remedial training, and if needed, we notify the FAA of the corrective actions taken. We do not want to be informed of any deviations from the FAA, with no idea what they are talking about because you never told anyone about the deviation, that looks bad for the program and could lead to further inspections.

YOU ARE REQUIRED to inform management of any phone number, botched up clearance, etc. You are flying University aircraft and need to notify the university when mistakes are made.

## Attendance

Private, instrument, commercial, and flight instructor ground school classes are conducted under FAR Part 141. 100% attendance is mandatory,
and attendance will be taken each class period. Missed classes MUST be made up with the student's flight instructor at current flight instructor rates. Each flight instructor will be provided with class syllabi and attendance records for each ground school course. If a student misses a ground school session, they must contact their instructor and he/she will cover the information missed.

## Availability

Each credit hour of flight is equal to 4 hours of prep or flight time per week. An example is a 3-credit hour course is 12 hours per week of preparation, flights, and homework. We require at least 4 hours of flight time per week. That is usually preceded by 4 hours of preflight, weight and balance, and weather preparation. With the remaining 4 hours we expect you to prepare yourself for the flight by reading what is assigned. If in doubt of what to study, study the FAR's, ACS, checklists, coursebooks, and this ops manual.

## Course Sequence

The course of study for the students is set up in such a manner that flights are expected to follow the prescribed outline in each of the flight syllabi. There are no overnight flights required, nor any flights beyond 250 N.M. from Logan Cache Airport. If a student chooses to do a flight outside of these two conditions, it will require management

approval and the student is responsible for the aircraft and additional costs such as hotels, airport fees, fuel costs, damage to aircraft, popped tires etc.

## Course Completion

Students should be able to complete their flying course within the semester enrolled if they fly a minimum of 2 days a week (approximately 4+ hours at the airport). However, it is possible that the student may need extra time to complete a flight course.

**Refer to current USU General Catalog for Incomplete grade information**

At the end of the semester, all Chief Flight Instructors will review their students' progress and will issue a grade for those who have completed their course. For those who have not completed their training, they will determine whether or not the student has qualified for an incomplete grade. If the student has completed a significant portion of their training, they will be given an incomplete grade (IF) and additional time to finish the course. The additional time given will be determined by the Chief Flight Instructor.

Most flight courses end with a Checkride – see Flight Course Grading below. For flight courses that require a stage check to complete the course, the Stage Check Completion Form must be completed and turned into Student Services at the airport. Be sure all forms are filled out completely and have the certified flight instructor's signature. This process must be done prior to beginning the next flight training course.

**The following certificates and ratings are required for graduation:**

Fixed Wing:

- Private Pilot Certificate
- Instrument Rating
- Multi Engine Commercial Certificate
- Certified Flight Instructor

Rotorcraft:

- Private Pilot Certificate
- Instrument Rating
- Commercial Pilot
- Certified Flight Instructor
- Certified Flight Instructor, Instrument

## Flight Course Grading

Grades are issued in the semester in which they are enrolled. All grades reflect the earned grade at the end of the associated semester. For example, if the checkride is scheduled, but not completed, the student will receive an Incomplete Fail, identified by an "IF" in the transcript until the checkride is completed. The Incomplete grade does not affect the student's transcript. Once the checkride is passed, a final grade will be calculated and updated on the student's transcript.

Check rides are 3rd party tests given by Designated Pilot Examiners (DPE's). These DPE's are selected and maintained by the FAA and USU has no authority or power over them. We will do what we can to assist with scheduling but USU is not responsible for the checkride if it gets cancelled, delayed, or rescheduled due to unforeseen circumstances. Rescheduling a failed checkride is up to the DPE and the student.

## Grading Rubric

Flight Course grading follows the same grading scale implemented at Utah State University which can be found at this link:

https://catalog.usu.edu/content.php?catoid=12&navoid=3803

Note that A+ or D- grades are omitted from the university scale.

All students begin the course with an "A" grade. Grades are assessed in the order of grading tables listed below.

It is expected that the student does all that he/she can during the semester to accomplish the flight hours required by the FAA for each stage of training. This includes but is not limited to flying on nights (when appropriate), flying on the weekends, and flying on holidays.

If a rigorous flight schedule cannot be maintained, then it is expected that the student drops the class. Please reach out to airport administration if after the add/drop day, to prioritize flight courses due to the credits and hours associated with the course.

There are events beyond the students control such as weather, aircraft status (downed for repairs), etc. that prevent flights from occurring. The number of times that the student cancels flights for those reasons will be noted when grades are being assessed even if they were unable to complete the flights.

Here is a list of items being used to grade the students:

- Calendar Time
- No-Shows
- Stage Checks
- FAA Checkride (if applicable)

Grading examples- using a B grade as a baseline:

- +1 Partial = is now a B+ grade
- - 1 Partial = is now a B- grade
- +/- Full = (+full) is now an A grade
-

## Calendar Time

| Calendar Time Required | Grade Conversion |
|---|---|
| **Within the semester of course enrollment up to 6 months after** | **No grade conversion** |
| **6-12 months after end of semester** | **-2 Partial** |
| **If students have not completed the course within 12 months of the end of the semester in which they registered for the course they will receive a failing "F" grade and will be required to take the course again.** | |

## No-Shows

| Number of No-Show Events | Grade Conversion |
|---|---|
| **1or less No-Show** | **No grade conversion** |
| **Each No-Show after 1st** | **-1 Partial** |

## Stage Check

| Attempts | Grade Conversion |
|---|---|
| **Pass** | **No grade conversion** |
| **Each Failure** | **-1 Partial** |

## FAA Checkride

| Attempts | Grade Conversion |
|---|---|
| First attempt pass | +1 Full |
| Each Failure | -2 Full |

## Example #1

| Student 1 Private Pilot Cert | Initial "A" Grade | Grade |
|---|---|---|
| 6 additional months after end of semester | No Conversion | B+ |
| 0 No-Shows | No Conversion | B+ |
| Failed one stage check | -1 Partial | B |
| Passed FAA Checkride first attempt | +1 Full | A |
| Grade received after Passing FAA Checkride → | A | |

## Example #2

| Student 2 Private Pilot Cert | Initial "A" Grade | Grade |
|---|---|---|
| Finish within semester enrolled | +1 Partial* | A |
| 0 No-Shows | No Conversion | A |
| Failed two stage checks *note time within semester | -2 Partial | A-* |
| Passed FAA Checkride second attempt | -2 Full | C- |
| Grade received after Passing FAA Checkride → | C- | |

## Expected Standards

Students are obligated to keep in weekly contact with their Certified Flight Instructor (CFI). Because USU offers a degree, we have hard beginning and completion dates. These dates are used to grade the students. For each credit earned in the flight program there are associated requirements, such as 1 credit hour equals 4 hours of "class" work per week. We expect that to translate into Pre-flight preparation, cross-country flight planning, post flight review, along with the hours of flying. For a 3-credit hour course that is 12 hours per week that should be dedicated to flight.

Below are the progress standards expected in the aviation program:

- Every student must fly a minimum of 4 hours a week
- Students are expected to fly the entire block time scheduled. For example- a 2-hour flight block should be flown between 1.8 to 2 hours. Obviously, any weather, sickness, etc. supersede the expectation
- Students must be able to fly and be available for the minimum 2-hour blocks 3 times per week
- Private Pilot and Instrument candidates are expected to complete at least one stage every 45 days
- Commercial Pilot and CFI candidates are expected to complete at least one stage every 120 days
- Written stage exams must be taken and passed in compliance with the course syllabus and Training Course Outline as delineated in the syllabus

**See your academic advisor and/or the chief flight instructor if you might have a problem with the pace of training the moment it becomes an issue- DO NOT WAIT.**

Failure to maintain the minimum pace above may result in being suspended from flight training, delays in assigning new instructors, and reduced ability to fly.

## Ground Courses Prerequisites

All ground school courses must be taken during the same semester as their appropriate flight courses. For example, Private Ground is paired with Private Pilot Certification. If students are not able to fly that semester, they will be dropped from ground school as well.

## Flight Course Prerequisites

In order to begin flying, students must have all documents applicable as stated in this op manual and have funding secured before the first week of the semester. Additionally, students must have passed all portions of the previous flying course, including stage checks and checkrides if applicable, as well as complete a Challenge Flight prior to the end of the first week.

**The student must not register for any flight courses if they have not completed the pre-requisite flight course, or if they know they will not be able to start it in that semester.**

## Transfer Students

Any student that is transferring into the USU flight program must declare their major as Aviation. They will be required to learn the necessary items such as checklists, this Ops manual, aircraft specifics, etc.

- The FAA will only allow 50% credit to USU courses of any 141 training- this includes ground. If you are not a rated pilot but took the ground elsewhere you are still required to do 50% of the training (including both flight and ground) here at USU.
- The FAA will only allow 25% credit for any part 61 courses.
- Transfer students MUST COMPLETE A CHALLENGE FLIGHT PRIOR TO FLYING USU AIRCRAFT -Maximum credit will equal the Private Pilot Certificate only.

We encourage students to transfer after completing a rating or certificate. We anticipate all who do the Challenge Flight to pass on the first time. Please study and come prepared for the requisite ground and flight. Failure to pass this will require you to take our Time Building class with a 141 USU CFI. They will train you in the weak areas. Upon successful completion of the Time Building course you will be allowed to continue at USU with our training courses as outlined.

## R-ATP (Restricted ATP)

USU qualifies for the Restricted ATP minimums. This allows students who have been through USU's 141 flight and ground training, along with all the classes required for the degree (60 credit hours) to apply for airlines at a reduced 1,000 hours instead of the 1,500 hours mandated by the Federal Aviation Regulations.
This is also why we are precise in our training, where we can fly, what we fly, the maintenance done on the aircraft, and the courses of study that our advisors suggest. You may not qualify if you do not adhere to both the FAA and USU policies. If in doubt, ask management.

## University Drop Policy

Students may drop courses for a limited period of time during the semester. Below is a brief summary of the university's drop policy – to see the complete Drop and Refund Policy, refer to the USU General Catalog. The times below are approximate.

- **During the first 20% (approximately the first three weeks)** of the semester, the student may drop a flight course without notation on their transcript and receive a full refund, minus the cost of any flights taken.
- **Between 20% and 60% (approximately the next six weeks)** of the semester, the student may drop a flight course, but will receive a "W" (withdrawal) on their

transcript. A refund MAY be possible but is subject to special approval by the Registrar's Office.
    - The student may submit a petition online to the Registrar's Office to request a refund of any remaining flight course fees. Go to: https://www.usu.edu/registrar/records/ara. The request must be accompanied by documentation proving extenuating circumstances out of the student's control. The Registrar's Office will determine the request on an individual basis, for such reasons as medical, military, death, relocation, etc. If the flight course refund is granted, the amount refunded will be for a portion of the original course fee. Each flight course has a non-refundable portion that covers the general operating costs of the program at the airport.
- **After 60% of the semester**, withdrawing from courses is not permitted.
    - However, the student may submit a petition online to the Registrar's Office to request a grade change from an "F" to a "W," as well as a partial refund of fight course fees. The petition process is the same as the previous bullet point.
    - If a grade request is made, a $20 fee will apply.

A student may not drop all his/her classes without an official withdrawal from the University.

Useful Links:

- https://www.usu.edu/registrar/index
- https://www.usu.edu/registrar/registration/dates
- https://www.usu.edu/registrar/registration/after/add-drop

## Failure to Progress

There are many possible issues that can delay or influence a student's training. Some of the aspects include a new language, first time living on your own, first time at college, first time learning a physical skill, etc.

The Aviation program has defined failure to progress as the following:

- No scheduled flights in the preceding 4 consecutive weeks.
    - Includes summer semester if student has not completed a course.
    - Excluding the holiday weeks between the end of fall and the start of spring semesters.
- Repeating a lesson more than 5 times.
- More than 3 No-Shows during that training course.
- Failing to respond to CFI/administrative phone calls, texts, or emails within a period of 1-2 week maximum.
- Failing a check 3 consecutive times (stage or FAA checkride).
- Not providing required documentation in a timely manner, such as Medicals, stage checks, Make and Model checkouts, etc.

- Scheduling and cancelling a lesson (non-weather-related cancel) more than 3 times.
- Failing to complete online ground lessons required for flight lessons
- Failing to complete any assignments from your CFI
- Any additional issues that lead the student's assigned CFI or Administration to believe that the student in question is purposefully avoiding completing the course.

If any students are in violation of the rules above, they will be considered as "on hold" and must meet with Administration in order to figure out the best way to resolve the outstanding issue. Serious or repeated offenses could result in suspension or dismissal from the program.

These rules are put in place so that students may finish their training within the semester by having access to aircraft and instructors. Any student that is having adverse issues in life but are actively in discussion and communication about those issues with their CFI or Administration will be handled on a case-by-case basis.

## Stage and End of Course Written Exams

Although Stage Exams and End of Course Exams are available through Online media such as Jeppesen Online Courses, the Stage Exams and End of Course Exams will only be accepted when they are proctored under supervision of a current USU Flight Instructor, Teacher, or Admin at the airport.

Proof of successful completion is a printed copy of the test that is signed by the proctor. The exam needs to be uploaded into the persons Talon account documents.

CFI's must review any wrong answers on written stage exams before the applicable stage check.

Stage Exams and End of Course Exams are closed book. Students may use an E6B, Map Plotter, and one piece of scratch paper.

## Stage and End of Course Check

Stage checks are designed to test students of their knowledge and flying ability. Failure results in additional training and a retest. Stage checks are scheduled by, and at the discretion of, the student's assigned flight instructor.

**Students do not dictate nor determine when they are ready for a stage check. Students cannot schedule their own stage checks.**

Please verify all the following with the stage check CFI before answering any questions concerning the stage check itself. If any mistakes are found, attempt to correct the mistake. If the mistake or missing document cannot be corrected or entered-the stage check is stopped. Reschedule the stage check. All these items should be clarified with

the recommending CFI prior to the stage check. Any questions that remain, please seek out any Chief or Assistant Chief.

## Talon Check

- Verify all ground lessons have been completed and entered in Talon. (Missing lessons should have been uploaded by the recommending CFI.) Failure at this point will terminate the stage check. Any exam must be at 80% or better for our 141 training.
- Verify all flight and ground lessons have been completed. These must all be completed prior to the stage check or EOC. The stage check or EOC will be terminated if any flight lesson is not completed.
- Verify all grade change sheets have been completed (this is done with your recommending CFI). These are often missed. To complete these changes, the student and their CFI will need to input their PIN's to complete.
- Verify all course minimums are met in Talon. Be aware that you should not be requesting a stage check with 1 or more hours of time remaining. Make sure your CFI has communicated with the stage check CFI prior to the stage check to verify what amount of time shall be flown off during the flight, such as 0.2 hours hood time.
- Documents. Verify that all your documents are uploaded into talon and that they are unexpired! No temporary documents should exist at this point, unless it is a temporary driver's license. The stage check instructor will know the required documents for talon. If you do not have them uploaded your stage check will be terminated.

## Logbook

Most complaints from our DPE's have come because of mistakes missed in our student's logbooks. We need our students, CFI's, and stage check CFI's to verify ALL information entered in the student's logbooks, especially for Private! The hot topics are listed below:

## Private-

You, as the student, should verify and discuss the following with your CFI. Items listed below are found in the FAR's for the checkride-

- 3 hours of cross-country flight training in a single-engine airplane
- 3 hours of night flight training in a single-engine airplane that includes –
    - One cross-country flight of more than 100-nautical-miles total distance; and
    - 10 takeoffs and 10 landings to a full stop (with each landing involving a flight in the traffic pattern) at an airport.
- 3 hours of flight training in a single engine airplane on the control and maneuvering of a single engine airplane solely by reference to instruments.
- 3 hours of flight training in a single-engine airplane in preparation for the practical test within 60 days preceding the date of the test.

- For an airplane single-engine course: 5 hours of solo flight training in a single-engine airplane on the approved areas of operation in paragraph (d)(1) of section No. 4 of this appendix that includes at least -
- One solo 100 nautical mile cross country flight with landings at a minimum of three points and one segment of the flight consisting of a straight-line distance of more than 50 nautical miles between the takeoff and landing locations; and
- Three takeoffs and three landings to a full stop (with each landing involving a flight in the traffic pattern) at an airport with an operating control tower.

Please verify all these times in your logbook. Also verify that the cross-country flights are listed exactly in the logbook as the endorsement specifies for the route. Please verify that all of the airports of intended landing are listed. We had a checkride end early because the student landed in Preston and the endorsement did not specify Preston and it was not caught prior to the checkride.

### Instrument-

You should have in your logbook at least one cross-country flight that -

- Is in the category and class of airplane that the course is approved for, and is performed under IFR;
- Is a distance of at least 250 nautical miles along airways or ATC-directed routing with one segment of the flight consisting of at least one straight-line distance of 100 nautical miles between airports;
- Involves an instrument approach at each airport; and
- Involves three different kinds of approaches with the use of navigation systems

We have had check rides end early from logbooks not showing three different approaches into 3 different airports so make sure the logbook has this entry and is indeed 250 nm long!!

### Commercial-

- Ten hours of solo flight time in a multiengine airplane, or 10 hours of flight time while performing the duties of pilot in command in a multiengine airplane with an authorized instructor on board. The training must consist of the approved areas of operation under paragraph (d)(2) of section 4 of this appendix, and include -
- One cross-country flight, if the training is being performed in the State of Hawaii, with landings at a minimum of three points, and one of the segments consisting of a straight-line distance of at least 150 nautical miles;
- One cross-country flight, if the training is being performed in a State other than Hawaii, with landings at a minimum of three points and one segment of the flight consisting of straight-line distance of at least 250 nautical miles; and
- 5 hours in night VFR conditions with 10 takeoffs and 10 landings (with each landing involving a flight with a traffic pattern) at an airport with an operating control tower.

- One 2-hour cross country flight in daytime conditions in a multiengine airplane that consists of a total straight-line distance of more than 100 nautical miles from the original point of departure;
- One 2-hour cross country flight in nighttime conditions in a multiengine airplane that consists of a total straight-line distance of more than 100 nautical miles from the original point of departure; and
- 3 hours in a multiengine airplane in preparation for the practical test within 60 days preceding the date of the test.
-

### Flight Instructor-

This one is straight forward. Just make sure you have all the minimums met in Talon. By the end of stage 2, you should also have the spin endorsement.

## Stage Check Grading

There are three possible grades for stage checks:

- Satisfactory (Pass)
  - Student displayed knowledge and skill to satisfy all line items
  - Student was able to demonstrate safe operational knowledge
  - Student operated the aircraft safely with no input or corrections needed from instructor
- Unsatisfactory (Fail)
  - Student did not display the required knowledge
  - Student operated the aircraft in an unsafe or reckless manner
  - Stage Check Instructor had to take controls away from the Student in order to correct any unsafe situation directly caused by the student.
  - Any oral check that exceeds 4 hours
  - Any other issue that the Stage Check Examiner deems as an issue or point of failure
- Incomplete
  - Weather did not permit the flight to be completed
  - Any situation outside of the students control such as, but not limited to, an aircraft mechanical issue, sickness, etc...
  -
  - Student elected to end the stage check themselves.

For each stage check, students must complete the oral and practical parts in order to progress to the next stage. No flights or activities can be started until all previous stages are passed. These must be done by a stage check instructor, assistant chief, or chief flight instructor. Below are descriptions and requirements for stage checks:

## Oral Section

The initial portion of a stage check consists of an oral exam between the student and stage check instructor. During this time, the stage check instructor will ask various questions regarding the stage material. Questions asked by the stage check instructor are completely at the discretion of the instructor. <u>This means that the stage check instructor can ask questions outside of the course material if the stage instructor deems it necessary.</u>

For the Oral portion students are **required** to be in uniform and bring their:

- Logbook
- Pilots License
- Medical
- Flight ID Badge
- Government ID
- FARs – Digital or print, no more than 2 years old
- Airmen Certification Standards (ACS)
- Pen and/or Pencil
- Notebook/scratch piece of paper
- Flight plan **Excluded for Private Stage 1*

## Practical (Flight) Section

The practical portion will consist of various in-flight maneuvers that the student pilot is required to know and demonstrate. Requirements vary for each stage check. However, any unsafe or reckless flying as determined by the Stage Check Instructor will **ALWAYS** be grounds for immediate failure.

For the Practical, students are **required** to be in uniform and bring their:

- Logbook
- Pilots License
- Medical
- Flight ID Badge
- Government ID
- Headset
- Hood*
- Flight Plan*
- Appropriate Charts*
- E6B*
- Map Plotter*

* May or may not be required. Ask Stage Check Instructor.

If the student is missing any of the required documents above for oral or practical sections, the stage check will end, and the student will be charged a No-Show fee.

# Talon & Scheduling

## Talon

Talon, also known as ETA, is the system that USU Aviation uses to schedule and operate the fleet. Additionally, each pilot has their own Talon profile which is used to track training, information, documentation, and flying funds as well as multiple other training parameters. All students will receive their own individual login for Talon as well as a PIN. Students are expected to remember their login, password, and PIN. You are expected to login and check Talon weekly to verify scheduled lessons and read any important messages that have been sent out.

Talon Website: www.talon-systems.com/usu

In the event of a lost password or PIN, contact Dispatch to reset them.

## Scheduling

Flights are scheduled by your Flight Instructor and approved by admin. We strive to get as many flights on the schedule as possible. To maintain smooth operations, we post the schedule multiple days in advance, mitigating as many issues with aircraft maintenance as possible. We suggest that students contact their CFI's to schedule 5 days prior to the date requested. Flights scheduled with less than 5 days are at the mercy of previously scheduled aircraft, time, schedule availability, and instructor conflicts. Priority is given to those who schedule in advance.

Once your flight is scheduled, the aircraft will need to be flown for the majority of the time that it is scheduled. For example- a flight that is scheduled for 4 hours must be flown for 3.5 of those 4 hours. Flights will be limited to 4 hours in length during the week, M-F. Exceptions can be made at the discretion of a Chief, based on the current schedule. Food stops can be made but must adhere to the flight scheduling guidelines. Again, exceptions can be made at the discretion of a Chief, based on the current schedule. These guidelines can be changed based on the ever-changing circumstances of the program.

**Students cannot and will not schedule their own flights.**

## Flight Late Returns

In order to facilitate organized fleet performance, students and instructors must return the aircraft before the end of their allotted time. This means the aircraft is on the ramp, parked, and shut down no later than the scheduled return time.

**Failure to return on time will result in disciplinary action.**

## Cancellation and No-Show Policies

To ensure efficient use of instructors and aircraft availability, all ground and flight sessions must be canceled on ETA. We have a 24-hour cancellation policy make sure

that you arrange your schedule to meet the flights set up for you. Any sessions not canceled by this deadline will be billed as a no-show!

Students are expected to show up **30 minutes prior** to any scheduled flight. If a student does not show up within **10 minutes after** their scheduled session, they will be billed a "No-Show" fee and the scheduled aircraft and/or instructor may be reassigned.

Any "No-Show's" will be billed for the total time the student was scheduled for that aircraft and/or instructor. This includes stage checks that cannot be completed because of problems not addressed prior to the date and time.

## Scheduling FAA Check rides

Upon completion of Private Pilot, Instrument, ME Commercial 3, Commercial SE add-on, CFI, CFII, and MEI flight courses, students will take an FAA Checkride. Checkride schedule requests will be submitted by the end of course instructor and the student's flight instructor to Student Services. They will then contact available DPE's to get dates for the Checkride.

**Scheduling of check rides must go through the student's flight instructor. Students may not schedule their own check rides!**

The Checkride fee is included in the flight course fee. If the student exceeds the flight course fee, they will be responsible to cover any necessary costs, including the Checkride fee. This must be paid with additional flight funds that are posted and paid prior to the Checkride.

**Checkride Schedule Requests will only be processed during business hours.**

*Rotorcraft students please send requests to the Rotorcraft Chief.

Students are required to bring all documents required for stage checks to their FAA Check rides. In addition, students must bring their original written test report.

## Scheduling FAA Written Test

All written tests are scheduled through test proctors and are by appointment only. Contact information for proctors can be obtained at dispatch or Jensea Moore.

The Written test fees are included in the initial ground course fee for USU students. If a student fails a written test, they must retake it, and additional fees will be assessed. Students must not lose any written test endorsement(s) or report(s).

A lost test report cannot be reprinted by any testing center. In order to replace a lost test report, the student must contact the FAA Airman Testing Branch to acquire a new one. This process may take a few days to several weeks.

# Aircraft Operations

The following safety procedures have been established to protect Utah State University students, instructors, and aircraft. These procedures are based upon, but do not overrule, the Federal Aviation Regulations. Violation of any of these procedures will be considered as grounds for disciplinary action or dismissal. The Chief Flight Instructor, Assistant Chief Instructor, or Designee must approve deviations from any of these rules not federally mandated. Deviations from the operations manual must be approved prior to the flight by the Chief or Assistant Chief Flight Instructor and are a case-by-case, one-time approval only.

## All Flights

**Aircraft Sanitation Procedure** (Must be adhered to)

a. Upon arrival, the student will be let into dispatch by a dispatcher.
b. The student will then be checked in by answering the student check-in questions and having their temperature checked.
c. After satisfactorily completing the check in process, the student will then be assigned an instructor office and airplane tail number.
d. No more than 10 people will be allowed in dispatch at a time. This will be verified by the assigned dispatcher prior to letting a new student in. If there are more than 10 people in dispatch, the students will wait outside in a line 6 ft. apart. Students and instructors will not be permitted to “hang-out” in dispatch. After hour flights will be approved and assigned prior to their flight block. Weekend and night flights will adhere to the same social distancing policies and procedures.
e. The student will then go to their assigned office in FL 9 to conduct all preflight briefings and activities with their instructor.
f. Prior to entering the office, the student and instructor will wash/sanitize their hands.
g. Upon entering the office, the student or instructor will be required to sanitize the computer, desk, door handles, and all other high touch areas in the office.
h. The student will then head to their assigned airplane with the sanitation kit to begin the preflight while the instructor turns in the weight and balance and gets the airplane can.
i. The first step of the preflight will be sanitizing the handles, throttles, stick, seatbelt buckle and strap, and G-1000 touch buttons.
j. They will then return the sanitation kit to the hangar.
k. After the preflight is complete, the student and instructor will then fly.
l. Upon landing and securing of the aircraft, the instructor and student will sanitize the high touch areas of the aircraft and then wait outside of dispatch for the instructor to hand the can over to the dispatcher and be assigned a new office.

m. If all offices are full, the instructor and student will be asked to wait outside or in the hangar while practicing social distancing.
n. The student and instructor will then go to the assigned office.
o. Prior to entering, the student and instructor will wash/sanitize hands.
p. Upon entering the office, the student or instructor will be required to sanitize the computer, desk, door handles, and all other high touch areas in the office.
q. Upon completing the flight in talon, post-flight briefing, and logbook; the student will leave the airport through the backdoor of FL 9 Hangar.

1. **Dispatching a Flight** - All flights must be properly dispatched through USU Dispatch and Talon Systems:
   - **a.** ANY pilot at USU who is assigned an aircraft is responsible for the safe use and return of the aircraft and is responsible for securing the aircraft upon return from the flight (either tied down or put in a hangar [preferred]).
   - **b.** No USU pilot will be dispatched an aircraft without a completed and current weight and balance form that is signed by a USU instructor who is present at the airport. Weight and Balance forms can never be signed prior to its completion and applicable flight plan attached.
   - **c.** All flights done for ratings at USU will include a lesson briefing. This is to include flight items to be covered, route of flight, safety considerations, fuel on board and performance expectations.
   - **d.** Weight and balance sheets must be filled out (completely) including:
     - LOCAL- Weather data including METAR's and TAF's for KLGU, KBMC.
     - CROSS COUNTRY- Weather data including METAR's and TAF's for KLGU, destination airport and all airports along the intended route of flight. If no METAR is available for the destination airport, then the closest available will be used.
     - Regardless of departure time, students <u>shall</u> have the aircraft back at the end of their scheduled period unless otherwise previously arranged.
   - **e.** Dispatch will hand you a binder with information concerning the aircraft you are to fly. This binder will have the keys, hours, inspections, fuel on board, and any discrepancies. Verification of hours, inspections, and aircraft status is the responsibility of the pilot. If things are not in compliance the students are expected to return to dispatch to solve the issues.
   - **f.** USU Dispatch will oversee the tracking of flights during business hours.
   - **g.** All flights occurring outside business hours (i.e. when dispatch is closed) require notification of the on-call instructor.
   - **h.** Dispatch hours are typically 0800-2000. However, hours can be reduced in the winter months or during severe weather. The most up to date hours are posted at Dispatch.
   - **i.** You are not allowed to have FOOD or DRINKS in the aircraft, except for bottled water and a granola bar. You are responsible for cleaning up any messes you make. Cleaning fees will be assessed for failure to do so.

**j.** Flights may be recalled by dispatch, management, or the supervising instructor at any time and this must be followed safely and promptly.

2. **Preflight Briefing** – A preflight briefing will be conducted on each training flight. This briefing will include, but not be limited to;
   - **a.** A pre-flight briefing with discussions concerning fuel, destinations, weather, weight and balance, flight time and contingency plans.
   - **b.** Introduction to new maneuvers and review of SOP's.
   - **c.** CFI and student's responsibilities during the flight.
   - **d.** Weather conditions expected for the route of flight, NOTAMS, and any TFRs.
   - **e.** Mandatory use of the aircraft checklist.
   - **f.** Proper utilization of maintenance logbooks/correspondence regarding maintenance performed on the aircraft.
   - **g.** Pilot documents, photo ID, and current medical are on/with each pilot.
   - **h.** CFIs and students are also encouraged to discuss three-way exchange of the flight controls and CFI/Student responsibilities in the event of an emergency.
   - **i.** ***The CFI is directly responsible (at all times) for safety and is the final authority as to the operation of the aircraft. This authority is only superseded by the chief flight instructor or an assistant chief flight instructor. Prior to flight, each CFI is responsible for being familiar with all the information concerning that flight as well as the aircraft (FAR 91.3).**

3. **Required Items**- Items to be confirmed inside the aircraft prior to all flights;
   **1)** Airworthiness certificate
   **2)** Aircraft registration
   **3)** Pilot's Operating Handbook (AFM, RFM)
   **4)** Weight and Balance
   **5)** Headsets for each pilot and passenger
   **6)** Checklists
   **7)** Aircraft binder/can
   **8)** Handheld microphone
   **9)** Tie Downs
   **10)** Chocks
   **11)** Fuel Sump

   **Visual Inspection-** A visual inspection consists of: examination for damage, cracks, delamination, excessive play, load transmission, correct attachment and general condition. In addition, control surfaces should be checked for freedom of movement. In low ambient temperatures the airplane should be completely cleared of ice, snow and similar accumulations.

   Snow, ice, and frost may ONLY be removed by placing the aircraft in a heated hangar and using the approved aircraft squeegee to remove the residual water!

DO NOT ATTEMPT TO SCRAPE ICE OR FROST FROM THE AIRCRAFT WITH ANY TOOL WHATSOEVER!

Prior to flight, remove such items as tie-downs, control surface gust locks, pitot cover, stall warning cover, chocks, tow bar, etc.

**Items to note:**

• While checking the G1000, make sure not to touch the displays. If there are fingerprints or marks, take care to remove them with approved cleaners found in the Maintenance hangar and by dispatch.
• Clean windshields with clean microfiber cloths in a front to back motion only. No circular motions. These micro scratches will allow the water from rain, etc. to roll back off the windscreen.
• Verify proper brake pad thickness prior to starting any USU aircraft.
• Stay on approved wing walk areas.
• Make sure to remove any items brought with you to the aircraft.
• Do not pull on the canopy window, use care when opening and closing doors and canopies.
• Always close canopies and doors when not actively in use.

4. **CFI/PIC's** are responsible for the condition of the aircraft prior to, during, and after the flight. If a discrepancy is found the CFI/PIC shall alert the Chief Flight Instructor, Assistant Chief Instructor, Dispatcher, Designee, Director of Maintenance, and/or other Maintenance Personnel as soon as possible. Reporting all discrepancies and/or damage is the responsibility of the CFI/PIC.
    **1)** Unless previously reported, when damage is discovered by a CFI/PIC prior to a flight, the previous CFI/PIC will be held responsible for that damage.
    **2)** If there is an issue or an open discrepancy (written up problem that has not been closed) the aircraft will be grounded until it is returned properly to service with a signature from an authorized maintenance personnel.

5. **Passenger Briefing** – When a flight is being conducted with passengers or a student who has flown less than three flights, the PIC shall, at a minimum, brief all occupants of the aircraft on the following items, utilizing the SAFE-T.P.N. acronym;
    **1)** Seatbelts and how to use them
    **2)** Air vents
    **3)** Fire extinguishers- location and how to use
    **4)** Emergency Exits- how to evacuate from the front and rear doors
    **5)** Taxi and Traffic- the route of taxi, zones, or areas of scanning, and what to do if you spot another aircraft
    **6)** Positive Exchange of flight controls (3-way challenge)
    **7)** NO SMOKING
    **8)** Use of Cellphones or Cameras
    **9)** Front passenger – how to not interfere with flight controls

6. **Emergency Equipment** – USU Dispatch has cross country bags that have minimal food, lights, and water in the event that the aircraft and passengers are stranded. USU encourages students to make and maintain their own kits and adjust them by season.

7. **Aircraft Operations** – The PIC of the aircraft is responsible for the safe operation of the aircraft. This means that from the time of dispatch until the return of the binder. You are in positive possession of keys and KNOW that the aircraft is secure.

    **a.** Formation flight is Prohibited for USU training flights.
    **b.** Never exit a running aircraft
    **c.** Never leave a plane unattended with an open canopy.
    **d.** At all times when parked outside, make sure the aircraft is chocked and gust lock is in place. When possible and parked outside, tie down the aircraft. Every airplane has tie-downs for this purpose.
    **e.** Never leave an aircraft in an UNFLIGHT WORTHY state- such as open fuel tanks, oil dip stick left out of the engine, etc.
    **f.** Your account for the items brought into the aircraft, such as pens, flashlights, etc., MUST leave with you.
    **g.** You are not allowed to remove SD cards as per NTSB.
    **h.** Keys are removed from the aircraft at the end of every flight.

8. **Post Flight Procedures –** Upon completion of each flight, the post flight procedures checklist will be complied with and the correct Hobbs will be recorded. Flight Plans must be closed. Flights will be checked-in using Talon Systems and the activity will be completed. To complete the activity, both the CFI and the student will record progress, make notes for improvement, and input their digital signatures (pins) into ETA. The post flight briefing will give the student an accurate and clear understanding of their performance, completion, and expectations of their next lesson.

## Weather Minimums

Before any flight, the PIC of the aircraft must be aware of a synopsis of weather conditions, including but not limited to, METARS, TAFs, AIRMETs, SIGMETs, Convective SIGMETs and winds along the intended route of flight. All Flights will adhere to the regulations found in 14 CFR 91.155.

USU will adhere to Title 14 CFR's for all weather minimum. If found in contradiction to the FAR's we will default to the FAR's.

Weather must be forecast to remain at the minimums listed or be improving for at least 2 hours prior to and past the estimated time of departure and arrival at each airport(s) of intended use.

1. Please refer to the chart below-
2. For any deviations to minimums you need chief approval
3. Temperature must be -40 C or warmer
4. Visual Reference MUST be maintained for the entire duration of the flight (except for IFR flights)
5. Ceilings must allow for all obstacle clearances
6. * indicates that visibility for the airspace supersedes posted values
7. No solo flights if density altitude exceeds 9,000 feet
8. No intro flights in winds in excess of 15 knots
9. No flights into known or forecast icing conditions

Dual Wind Limitations – No training flights will be conducted when the surface winds exceed 25 knots or in the presence of gust spreads exceeding 15 knots. The chart to follow will reflect ramp out limitations and not maximums. Instrument flights are further reduced, even though they are dual, to an acceptable level for training.
**Any dual flights where the winds indicate over 35 knots <u>including gust factors</u> will terminate training and return to the airport.**

Solo Wind Limitations - each student will observe the surface winds and gust limitations as directed by his/her instructor and as endorsed in the student's logbook.

- *Under no circumstances are students permitted to fly solo with wind gust spreads in excess of 7 knots. Example "winds at 170 at 5 knots gusting 13." This would exceed the 7 knots and cause the flight to be terminated.*

Gust factor - is the speed of the possible gusts. Winds reported at 12 gusting 21 would have a solid wind factor of 12 and a gust factor of 9.

Field Condition Reports (FICON) - The FICON score is awarded by the airport manager and is reported in the ATIS. Below are the limits for USU fixed wing aircraft-

| FICON RCC code Limitations | |
|---|---|
| < 3 | No Flights |
| 3 | Dual only - soft field proc. |
| 4 | Solo Instrument rating |
| 5 | Solo PVT/STUD with briefing |
| 6 | No restrictions |

***FICON scores must be altered by a adding (-1) to the score if the following conditions are reported or exist- Ice, Slush, or Compacted Snow***

While field conditions are apt to change quickly, all attempts for safety will be taken into consideration prior to any flights at USU. We maintain the right to deny flights as administration for any reason, even if the weather appears to be improving, at minimums, etc.

Special VFR (SVFR) – No flights are to be flown in SVFR unless approved by the Chief Flight Instructor, Assistant Chief Flight Instructor, or Designee.

Icing – No flights will be conducted into visible moisture when visibility is 4 SM or less and reported or indicated temperatures are less than 50° Fahrenheit/10° Celsius.
This includes, but is not limited to flight into:

- Clouds
- Precipitation
- Virga
- Fog
- No flights ever in freezing fog

When mist is reported- no flights will be conducted if visibility is 4 SM or less during the day (common during Cache Valley winters).
No **solo or night** flights will be conducted in mist (Night defined as 1 hour before sunset and 1 hour after sunrise)

- **AFM/POH stipulations must be followed.**
  - DA-40FP/ DA-40CS; pg. 2-18
  - DA-42; pg. 2-21
- **If icing or visible moisture is detected, land as soon as practical.**
- **Extenuating circumstances for a flight may be approved by providing the safety officer during business hours or the on-call chief after hours, with the proper evidence that the flight can depart and land safely.**

Bell 2009 Known Icing Legal interpretation

"Pilots should also carefully evaluate all of the available meteorological information relevant to a proposed flight, including applicable surface observations, temperatures aloft, terminal and area forecasts, AIRMETs, SIGMETs, and pilot reports (PlREPs). As new technology becomes available, pilots should incorporate the use of that technology into their decision-making process. If the composite information indicates to a reasonable and prudent pilot that he or she will be operating the aircraft under conditions that will cause ice to adhere to the aircraft along the proposed route and altitude of flight, then known icing conditions likely exist."

Instrument flights **- ANY INSTRUMENT TRAINING, ACTUAL IMC, OR IFR FLIGHT PLANS WILL BE DONE WITH A CFII ON BOARD!**

Weather Minimums **–** The following rubric is laid out to provide clarification as to what is acceptable by USU as far as safe weather decisions. Each section is presented with the rating that the PIC holds.

- For example- a solo student flying in a practice area would look at the first section second line. There they would see for the requirements that 10 KTS total on wind, no gusts, 5 KTS maximum for crosswind component, 7 SM visibility, maintain reference to the ground, and a ceiling of 4,000' AGL. If it is during the winter and there is snow or ice the FICON score would also affect the ability to fly.

- Another example- An instrument rated pilot working on his Commercial maneuvers course doing a Cross Country (X-C) would reference the third section.

## Minimum Weather for USU Dispatch

| PIC - Minimums | Wind Speed (KTS) | Gust Factor (KTS) | Crosswind Component (KTS) | Flight visibility (SM) | Visual Reference to Ground | Ceiling (Feet) | FICON Score |
|---|---|---|---|---|---|---|---|
| **Student Pilot (solo)** | | | | | | | |
| Pattern | 10 | 0 | 5 | 5 | X | 1,500 | 5*,6 |
| Practice Area | 10 | 0 | 5 | 7 | X | 4,000 | 5*,6 |
| Cross Country | 10 | 0 | 5 | 10 | X | 5,000 | 5*,6 |
| Night | PROHIBITED | | | | | | |
| FICON of 5 requires an instructor briefing | | | | | | | |
| **Private Pilot (solo)** | | | | | | | |
| Pattern | 12 | 5 | 8 | 5 | X | 1,500 | 5*,6 |
| Practice Area | 12 | 5 | 8 | 5 | X | 4,000 | 5*,6 |
| Cross Country | 12 | 5 | 8 | 5 | X | 5,000 | 5*,6 |
| Night | PROHIBITED | | | | | | |
| FICON of 5 requires an instructor briefing | | | | | | | |
| **Instrument Rated (solo)** | | | | | | | |
| Pattern | 15 | 7 | 8 | 3 | X | 1,500 | 3 |
| Practice Area | 15 | 7 | 8 | 4 | | 4,000 | 3 |
| Cross Country | 15 | 7 | 8 | 4 | | 4,000 | 3 |
| Night Local | 15 | 5 | 8 | 5 | X | 3,000 | 3 |
| Night X-C | 15 | 5 | 8 | 5 | | 4,000 | 3 |
| Gusting less than 20 KTS when all combined | | | | | | | |
| **ALL DUAL and Commercial Rating** | | | | | | | |
| Pattern | 25 | 10 | Max Demo | 3* | X | 1,500 | 3 |
| Local Practice Area | 25 | 10 | Max Demo | 3* | | 3,000 | 3 |
| Cross Country | 25 | 10 | Max Demo | 3* | | 3,000 | 3 |
| Night | 25 | 10 | Max Demo | 5 | X | 4,000 | 3 |
| Gusting less than 35 KTS when all combined, | | | | | | | |
| IFR Clearance | 20 | 10 | Max Demo | 1 | | 800 AGL | |

**Gust factor** – is the speed of the possible gusts. Winds reported at 12 gusting 21 would have a solid wind factor of 12 and a gust factor of 9.

## Collision Avoidance

1. **Ground** – No USU Instructor or student shall operate an aircraft on the ground so close to another as to create a collision hazard and shall adhere strictly to the general operating and flight rules of FAR part 91.111 and 91.113. Nor shall aircraft be operated within 10 feet of any other aircraft, vehicle, structure, or hazard.
2. **In-flight** – No USU Instructor or student shall operate an aircraft in flight so close to another as to create a collision hazard and shall adhere strictly to the general operating and flight rules of FAR part 91.111 and 91.113

## Taxiing Precautions

All pilots shall avoid taxiing over any surface which has debris or litter which may be ingested by the aircraft or thrown by the propeller. All aircraft will avoid blasting any other vehicle, hangar, or person. Lowest power settings necessary for movement will be used. When taxiing into tie down locations, USU aircraft will stop, verbally announce they are clear of any debris, chains, ropes, or chocks- then they can taxi into their final spot. If you cannot taxi through, then you will park 90 degrees to the parking spot and push the aircraft into its tie down location. We do not do 180 degree turns or taxi into hangars, and we avoid blasting any rotorcraft with prop wash.

## Disabled Aircraft

If a USU aircraft has become disabled on a runway, the actions to take are as follows:

- Announce over the radio that there is a disabled aircraft on the runway.
- Ask ATC for assistance to move the aircraft, if at a controlled airport or the local FBO if at a non-controlled airport
- Call the Chief mechanic
- Call the Safety Officer
- Call the Flight Instructor (if not on board)
- If at night, leave the strobes and position lights on to alert other aircraft of your position on the runway

## Practice Areas

The FAA approves and mandates that all 141 flights are to be done in an approved practice area. USU has received approval for the practice areas found in this document. They are for the use and benefit of student training.
Flights Enroute to the practice areas should not conflict with traffic already assigned to those practice areas nor the airport traffic pattern. Maneuvers conducted in these areas will be at the instructor's discretion. However, be aware that certain maneuvers are not authorized for solo operations, these will be listed in another section.

## Flight Altitudes

- All flights will be conducted at a minimum of 700 ft. AGL except for the purposes of takeoff, landings, traffic pattern work, and as necessary to comply with FAA Air Traffic Control.
- Simulated emergency and off-airport landings may only be conducted with a USU Flight Instructor on board and must be performed in a manner that allows for full go around and recovery procedures to be completed before 500' AGL
- If a flight will climb above 12,500' MSL for ANY length of time, oxygen is to be brought with you in the aircraft. Flights above 12,500' must also adhere to FAR 91.211

## Inflight Operations

Students are not allowed to listen to music or make telephone calls while flying USU aircraft. It is important that all students be able to hear radio calls and communications. Also, we discourage any use of telephones in the aircraft unless there is an emergency. Students and CFI's will follow the checklists as they are printed and keep up with the most current version. Review and understand the operational limitations for flight, including Carb heat, Engine leaning, power settings, etc.

## Precautionary Landings

In the event of a precautionary landing off field, the Chief Flight Instructor, Assistant Chief Instructor or Designee must be notified as soon as practical. The pilot in command will be responsible for the aircraft until released to authorized personnel at USU. The aircraft will not be approved for flight until the cause of the precautionary landing has been examined by the Director of Maintenance, an Authorized Mechanic, and/or Chief Flight Instructor, Assistant Chief Instructor, or Designee and has been found to be flight worthy and authorized to return to service.

**PIC must be familiar with the Emergency Response Plan in the event of any precautionary landing.**

## Flight Discrepancies

All pilots that utilize USU aircraft will report any discrepancies or deviations from normal operations, policies, or POH requirements. Utah State Aviation has maintenance and safety discrepancy reporting procedures in place for this purpose. If pilot(s) fail to report a discrepancy/deviation that results in unscheduled maintenance, inspections, or replacement of parts, PIC(s) could be held liable for negligence. Please take your responsibility as Pilot in Command serious and treat the aircraft appropriately.

## Maintenance and Squawks

Each pilot shall check the Maintenance Reminders prior to each flight. The Hobbs time shall be checked against all maintenance times, and the aircraft will not be flown over any times stated in the maintenance reminders. All maintenance discrepancies shall be

recorded in the Discrepancy Log and USU management and Dispatch will be notified of the discrepancy. No flight will be conducted in an aircraft unless maintenance discrepancies have been addressed and the aircraft has been found to be flight worthy and authorized to return to service by the Mechanic, Chief Flight Instructor, Assistant Chief Instructor, or Designee.

## Aircraft Starting

Do not overheat the starter motor. Do not operate the starter motor for more than 10 seconds per start attempt. After each failed attempt to start the engine, let the starter cool off for 20 seconds. After 6 attempts to start the engine, allow the starter to cool off for 30 minutes.

NEVER engage the starter with the propeller still in motion.

During winter operations, the use of an external pre-heater and external power source is recommended whenever possible, particularly at ambient temperatures below 0 °C (32 °F). Pre-heating will reduce wear and tear on the engine and electrical system. Preheating warms the oil trapped in the oil cooler, which can be congealed in extremely cold temperatures. If pre-heating or external power is required, a USU Mechanic or Flight Instructor must be present to help. After a warm-up period of approximately 2 to 5 minutes (depending on the ambient temperature) at 1500 RPM, the engine is ready for take-off as long as it accelerates smoothly, and the oil pressure is normal and steady.

## CARBURETOR HEAT USAGE

Carburetor heat should be used as deemed necessary by the pilot to avoid carburetor ice formation! It should be used anytime carburetor icing is suspected or anytime the potential for carburetor ice is present, including anytime visible moisture is present.

**Standard USU Procedure:**
Carburetor heat will be ON for Descent and may be turned OFF upon leveling-off. Carburetor heat will be ON during the downwind leg and turned OFF with flap application on Base. Carburetor heat will be turned OFF 200 feet above MDA or DH on an instrument approach and then used as necessary after arriving at MDA or DH.

***CAUTION:*** *Carburetor heat should be used during prolonged glides with the throttle closed because of rapid engine cooling. The aircraft engine may not respond with rapid throttle application; therefore, the throttle should be fully opened every thirty seconds to clear the engine.*

## Fuel

Fuel is calculated at a certain rate to stabilize the aircraft costs. This means the reimbursement limit could be less than the cost of the fuel at the destination, to not incur additional fees we suggest. We highly suggest finding cheaper fuel along the intended route should your destination be above that which is reimbursed. As of Fall 2020 the maximum amount to be reimbursed is $6.00/Gallon.

**(a)** No VFR flights local or Cross-Country flights (X/C) will be initiated with less than enough fuel to make your planned flight plus 45 min. reserve at normal cruise speed and mixture setting for airplanes.

**(b)** For IFR flight plans, there must be enough fuel on board to fly to the first airport of intended landing, then to the alternate airport, and fly for 45 minutes after that at normal cruise speed and mixture setting.

**(c)** Under no circumstances will USU allow "hot fueling" an aircraft, this is when fueling with the engine running- due to the possible risk of fire.

**(d)** Always ground the aircraft to the fueling body. (i.e., fuel tank, fuel truck)

**(e)** Self-Serving an aircraft Solo is prohibited.

**(f)** No fueling if lightning is within 5 miles of the aircraft.

**(g)** Fuel spills need to be treated with immediate attention. Due to the high flammability of aviation fuel, fuel spills create a large hazard to persons as well as property. The following guidelines will be implemented to help.

**1)** Wipe all fuel off the aircraft immediately with a rag. Fuel eats paint.
**2)** If a puddle accumulates under the aircraft do not start the engine. Move the aircraft in case it backfires which can cause ignition of the fuel.
**3)** If the spill is larger than six feet in any dimension it needs to be reported to the airport for cleanup.
**4)** Do not walk through a fuel spill. Static charge on clothing can cause an ignition source.

**(h)** Fuel caps must be secured before flight! Forgetting a fuel cap is means for probationary action.

**(i)** Smoking is always prohibited on the aircraft ramp and is only allowed in designated areas on the public side of the ramp.

## FUEL PUMP USAGE

Fuel Pump should be off when above 500' AGL unless deemed necessary of flight. Verify Fuel pressure prior to turning off the fuel pump.

## Ramp Operations Procedures

**(a)** All aircraft will be positioned/repositioned with at least two people. Ask for assistance from dispatch if you are going solo.

**(b)** The Pilot in Command shall do a final walk-around to assure the aircraft is in good working condition. Verify that the gas caps are tight, there is enough oil, the windscreens are clean, brakes and tires are sufficient, and that chocks and tie downs have been removed and stowed.

**(c)** When leaving the aircraft unattended, canopies must be closed and chocks deployed.

**(d)** Precautions will be taken as to not taxi close to or prop blast any helicopters with their blades turning.

**(e)** Taxi speeds shall not exceed 12 knots. The aircraft keys will remain in the dispatch can when not in the ignition.

**(f)** Care when moving aircraft to avoid hangar rash is always expected! Two people are required to move aircraft. If in doubt of clearing objects, stop moving the aircraft and look around the area.

**(g)** When returning from a flight pilots must contact dispatch on 129.075 to receive parking instructions. The parking options that are given are as follows:

(I) "Up Front" – park the aircraft in one of the six Tees in front of FL9A. Chocks must be applied.
(II) "In a Tee" – Park the aircraft in one of the available Tees in front of FL10 or FL11. The aircraft must be chocked and tied down via the wing and tail securement points
(III) "In the Hangar" – Shut the aircraft down perpendicular to the hangar doors per the aircraft checklist. Then move the aircraft into an outlined spot following paragraphs (a) and (f). Once in position, apply chocks.

**(h)** You may taxi into a tee (only if you can pull straight through) upon visually clearing the tee of any objects.

**(i)** If you cannot pull straight in a tee, all aircraft are to be positioned 90 degrees to the parking space and shut down. Upon shutdown and completion of the checklist, the airplane will then be manually maneuvered into the tee.

a. When you are leaving or pulling into a parking spot, be aware of airplanes with open canopies around you. Avoid prop washing any aircraft with an open canopy.

## RUN-UP AREAS KLGU

Engine run-up is to be performed in areas designated for that operation. Consult publications or local procedures for operations at other locations. Position the aircraft as nearly into the wind as practical while not allowing propeller blast to throw debris at other aircraft or structures.

## Emergency Procedures

(a) In the event of an emergency, (i.e. aircraft fire), the pilot in command shall follow the Emergency Procedures as outlined in the aircraft's Pilot Operating Handbook.

As soon as all occupants have exited the aircraft, or the need arises, contact the appropriate Emergency Services and the Chief Pilot.
**Note: PIC must be familiar with the Emergency Response Plan in the event of any emergency landing. (See Emergency Section Below)**

## Maneuver Limitations

No more than 4 aggies in the pattern practicing landings.

**(a) Solo Limitations**

**1)** No solo power off 180 landings are authorized.
**2)** No solo Touch-and-Go's are approved.
**3)** No airports with only one landing direction will be approved by USU.

**(b)** Dual Limitations

**1)** VFR or IFR flights must comply with all sections of FAR part 91.
**2)** All flights must additionally comply with any restrictions within this section.

## Cross Country Flights

Cross Country flights are at the choice of the student and instructor. The choice to go or not go is up to the weather briefing and safety choices of the PIC/CFI. Since the pilots are making an informed decision to go, they will be responsible for maintaining the safety of the flight. This includes being aware of fatigue (see below).

Since weather is both difficult to plan around and constantly changing, the PIC should be aware that they might be spending the night away from home base on the cross-country flights. If the flight is to a sparsely populated airport, second options should be made in the event a return flight is not possible. Since USU does not mandate the time and destination of the flight, any ancillary costs related to the flight are solely the responsibility of the PIC. Therefore, a good briefing is necessary.

Since the flights are being done in accordance with 141, the filed flight plan is the route that the plane will fly. If for any reason the flight cannot be done as planned, (for example- the weather changes), a new flight plan is necessary to satisfactorily complete a 141 flight.

A VFR (or if applicable an IFR) flight plan must be filed for all Cross-Country flights that the students and CFI will complete. All solo and cross-country flights must be filed with flight service. All cross-country daylight flights must be planned to terminate 30 minutes prior to sunset.

There are no flights necessary beyond 250 N.M. therefore they are not authorized. If a special request is made to management, it could be considered. Any flight made beyond the FAA required distances are at the discretion of the student and costs associated with recovering the aircraft (if needed) are also the student's responsibility.

Solo Cross-Country Flight – Since the student will be acting as the PIC for the solo flight, it is expected that all flights include time for un-forecast weather and winds, fuel delays, rest stops, and still be back on time. Under no circumstances will any solo cross-country flights be permitted at night, unless required by an FAA regulation for that specific course. Therefore, all solo flights are required to land at the aircraft's home field no later than one hour before that day's published sunset time. Solo students are not allowed to take the planes overnight.

The only airports that do not need a flight plan are Preston and Brigham City. But the PIC is responsible for obtaining weather at those airports.

## Overall Health and Safety

USU pilots both the flight instructors and students should verify that they have sanitized the aircraft prior to flight.

Fatigue is a real issue. The idea of flying while being fatigued should be scary for all. There is no flight that is worth your life. The issue of fatigue should be briefed prior to any flight.

Please reference the FAR's for instructions on specific medications. Before taking ANY medication please double check its approval by the FAA.

USU encourages all pilots to be fully rested, alert and feeling well before getting into an aircraft. Please bring specific concerns to the Chief Flight Instructor/Director of Operations. We want all students to be safe and keep their schedules in line with what the FAA recommends, including 14-hour duty days (starting with any work, class, or commitment). This allows for 10 hours of rest to eat, do laundry, and sleep. Furthermore, CFI's are only allowed to fly for 8 hours of flight instruction in any 24-hour period.

## End of Day Procedures

USU expects everyone to work as a team. If you are the last flight of the day, please make sure that all aircraft get back in the Hangar, doors locked, lights off, and the premises is secured.

## Maintenance Test Flights

Maintenance test flights are to be performed by the most qualified USU Flight instructors available. Only USU employees, required for the completion of the flight, can be on board the aircraft. If there is any question regarding the safe completion of the flight, contact the Chief Flight Instructor, Assistant Chief Instructor, or Designee for assistance.

# Helicopter Operations Manual

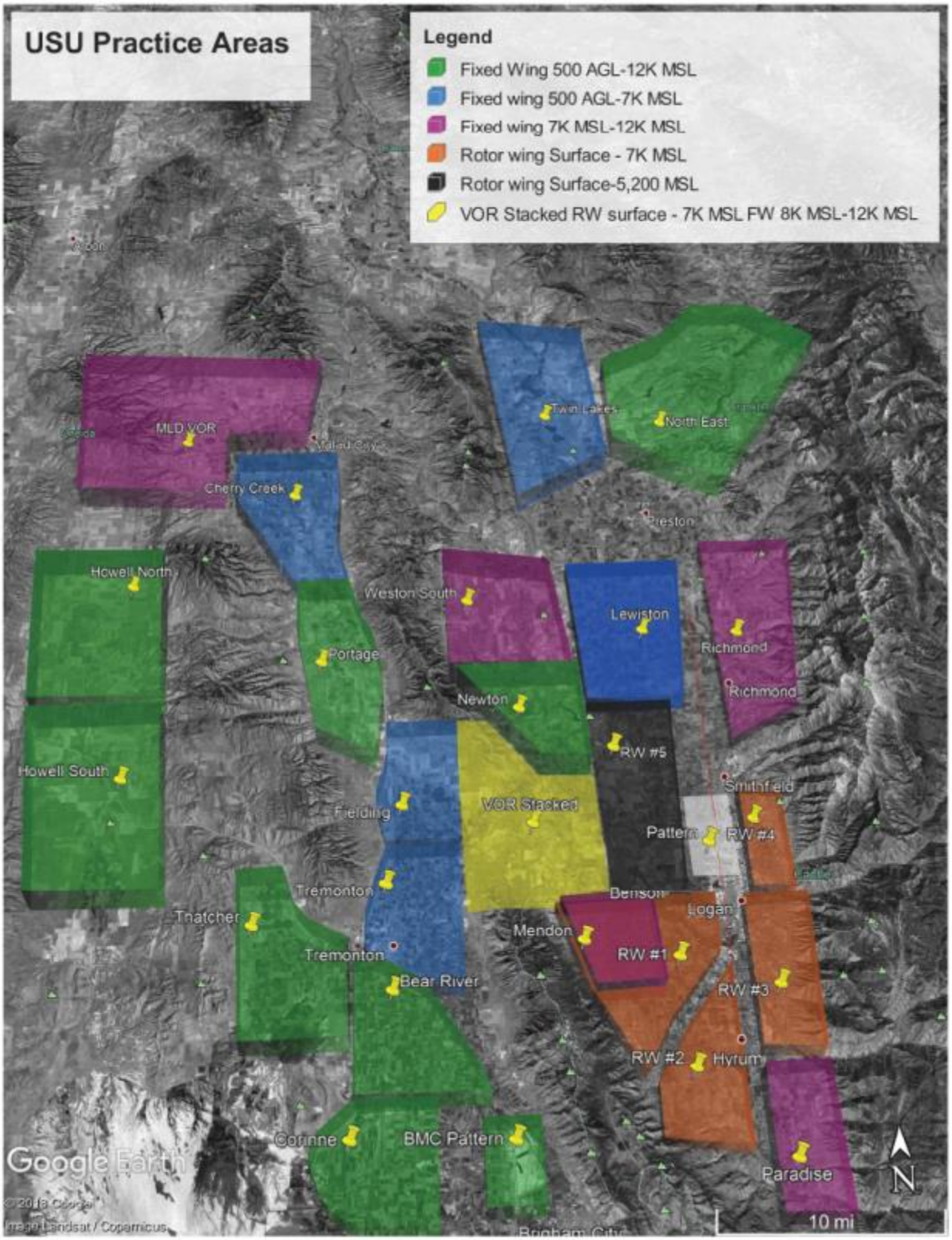
**See appendix for Helicopters**

# Approved Airports

| Utah Airports Approved | Code | Stipulation | Elevation |
|---|---|---|---|
| Bountiful Skypark Airport | BTF | No Restrictions | 4,234' |
| Brigham City Airport | BMC | No Restrictions | 4,230' |
| Cedar City Regional Airport | CDC | No Restrictions | 5,622' |
| Delta Muni Airport | DTA | No Restrictions | 4,759' |
| Huntington Municipal | 69V | No Restrictions | 5,915’ |
| Logan-Cache Airport | LGU | No Restrictions | 4,457' |
| Moab Canyonlands Airport | CNY | No Restrictions | 4,590' |
| Ogden Airport | OGD | No Restrictions | 4,473' |
| Price -Carbon County | PUC | No Restrictions if primary training airport. With instructor at night from KLGU | 5958 |
| Provo Muni Airport | PVU | No Restrictions | 4,497' |
| Salt Lake City International Airport | SLC | No Restrictions | 4,230' |
| South Valley Regional Airport | U42 | No Restrictions | 4,606' |
| Spanish Fork Springville Airport/Woodhouse Field | SPK | No Restrictions | 4,529' |
| St George Muni Airport | SGU | No Restrictions | 2,884' |
| Utah Airports with Restrictions | | | |
| Heber City Muni/Russ McDonald Field | HCR | Student pays landing Fee | 5,637' |
| Vernal Airport | VEL | Only with an Instructor | 5,280' |
| Idaho Airports Approved | Code | Stipulation | Elevation |
| American Falls Airport | U01 | No Restrictions | 4,419' |
| Bear Lake County Airport | 1U7 | No Restrictions | 5,933' |
| Boise Air Terminal (Gowen Field) | BOI | No Restrictions | 2,871' |
| Caldwell Industrial Airport | EUL | No Restrictions | 2,432' |
| Driggs-Reed Memorial Airport | DIJ | No Restrictions | 6,231' |
| Idaho Falls Regional Airport | IDA | No Restrictions | 4,744' |
| Jerome County Airport | JER | No Restrictions | 4,053' |
| Nampa Muni Airport | MAN | No Restrictions | 2,537' |
| Pocatello Regional Airport | PIH | No Restrictions | 4,452' |
| Preston Airport | U10 | No Restrictions | 4,728' |
| Twin Falls/Joslin Magic Valley Reg | TWF | No Restrictions | 4,154' |
| Idaho Airports with Restrictions | | | |
| McCall | MYL | Only with an Instructor | 5,024' |
| Sun Valley - Friedman Memorial | SUN | Only with an Instructor/No night flights | 5320 |

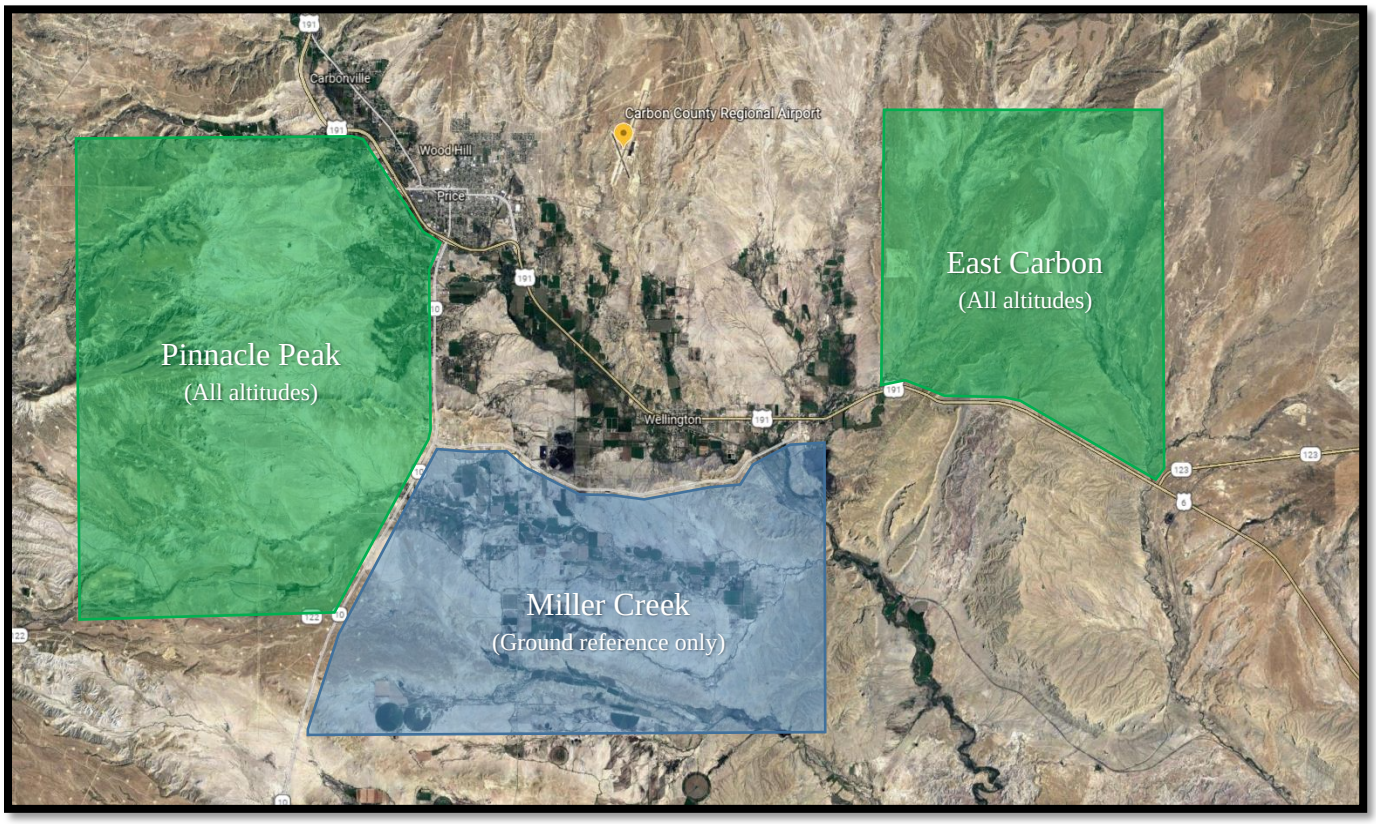
| Montana Airports Approved | Code | Stipulation | Elevation |
|---|---|---|---|
| Bert Mooney (Butte) | BTM | No Restrictions | 5,550' |
| Billings International | BIL | No Restrictions | 3,662' |
| Bozeman Yellowstone | BZN | No Restrictions | 4,473' |
| Helena Regional | HLN | No Restrictions | 3,877' |
| West Yellowstone | WYS | When open, no restrictions | 6,649' |
| Montana Airports with Restrictions | | | |
| Dillon | DLN | Night flights with Instructor only | 5,245' |
| Wyoming Airports Approved | Code | Stipulation | Elevation |
| Casper County International | CPR | No Restrictions | 5,344' |
| Wyoming Airports with Restrictions | | | |
| Afton Muni Airport | AFO | Only with an Instructor | 6,221' |
| Evanston - Uinta Co Burns Field | EVW | Day VFR Only, No Winter Flights | 7,143' |
| Fort Bridger Airport | FBR | Day VFR Only, No Winter Flights | 7,038' |
| Jackson Hole Airport | JAC | Only with an Instructor, VFR Only, No Reported or forecast ceiling | 6,451' |
| Kemmer Muni Airport | EMM | Day VFR Only, No Winter Flights | 7,289' |
| Laramie Regional | LAR | Only with an Instructor | 7,284' |
| Rawlins - Harvey | RWL | Only with an Instructor | 6,817' |
| Riverton Regional | RIW | Only with an Instructor | 5,516' |
| Rock Springs Sweetwater Co | RKS | Only with an Instructor | 6,765' |
| Sheridan County | SHR | Only with an instructor | 4,021' |
| Yellowstone Regional/Cody | COD | Only with an Instructor | 5,102' |
| Nevada Airports with Restrictions | | | |
| Elko | EKO | Only with an Instructor | 5,140' |
| Eureka | 05U | Only with an Instructor - No night flights | 5,958' |
| Jackpot/Hayden | 06U | No Night Flights | 5,224' |
| Wendover | ENV | Only with an instructor | 4,237' |
| Colorado Airports Approved | Code | Stipulation | Elevation |
| Grand Junction Regional | GJT | No Restrictions | 4,858' |
| Oregon Airports Approved | Code | Stipulation | Elevation |
| Ontario | ONO | No Restrictions | 2193 |
| Arizona Airports Approved | Code | Stipulation | Elevation |
| Page | PGA | | 4,316' |

# Practice Areas


USU Practice Areas
Legend
Fixed Wing 500 AGL-12K MSL
Fixed wing 500 AGL-7K MSL
Fixed wing 7K MSL-12K MSL
Rotor wing Surface - 7K MSL
Rotor wing Surface-5,200 MSL
VOR Stacked RW surface - 7K MSL FW 8K MSL-12K MSL
MLD VOR
Cherry Creek
Twin Lakes
North East
Preston
Howell North
Weston South
Lewiston
Richmond
Richmond
Portage
Newton
RW #5
Howell South
Fielding
VOR Stacked
Smithfield
Pattern
RW #4
Tremonton
Thatcher
Benson
Logan
Mendon
RW #1
Tremonton
Bear River
RW #3
RW #2
Hyrum
Corinne
BMC Pattern
Paradise
Google Earth
Image Landsat / Copernicus
10 mi
N

Practice Areas-All practice areas are available for the use and benefit of student training. Flights en-route to the practice areas shall maintain the minimum altitude as stated in paragraph 6 and should not conflict with the airport traffic pattern for the current runway in use. Maneuvers conducted in these areas will be at the instructor's discretion. However, during solo flight operations the maneuvers stated in paragraph 12 of this document will not be permitted.

## Price Satellite Practice areas



# Maneuvers

## Maneuver SOP's

### Ground Reference Maneuvers: Turns Around A Point

14 CFR part 61; FAA-H-8083-2, FAA-H-8083-3

Key Terms

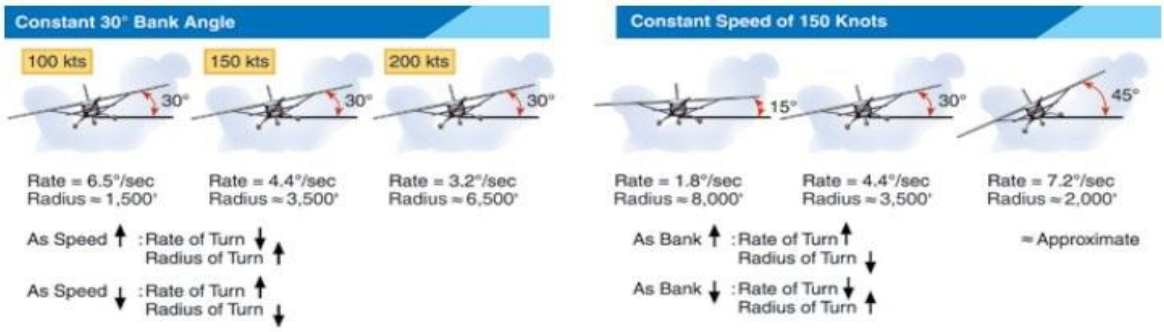
- Ground Track
- Ground Speed
- Rate of Turn v. Radius of Turn

The objective of performing ground reference maneuvers is to teach pilots control of an aircraft while using references on the ground to maintain desired ground tracks. Pilots must utilize multiple visual ground-based reference points to prevent the aircraft from drifting off the desired flight path. In order to perform the maneuver successfully, situational awareness of the wind speed and direction are important. The objective in the ACS states: that the applicant must exhibit satisfactory knowledge, risk management, and skills associated with ground reference maneuvering which may include a rectangular course, S-turns, and turns around a point.

During ground reference maneuvers, pilots will be flying the aircraft relatively close to the ground (600-1000 feet AGL), USU uses 800' above ground level when performing ground reference maneuvers. Due to the altitudes in which these maneuvers are to be performed, an appropriate EMERGENCY LANDING SITE should be determined and verbalized beforehand. Be aware that little time will remain in the event the emergency landing site arises.

Ground reference maneuvers teach students that groundspeed plays a major factor in ground reference maneuvers. Ground speed is the horizontal speed of the aircraft in relation to the ground. Therefore, knowing the wind direction and its effects on the aircraft such as, ground track, and associated changes regarding bank angle should be taught prior to performing the maneuver. Ground track is the horizontal flight path in relation to the ground. The objective of ground reference maneuvers is to keep a constant ground track by becoming proficient at correcting for wind and maintaining airspeed and altitude throughout the maneuver.

It's important to understand the difference between radius and rate of turn when performing these maneuvers.




Maneuver Preparation is key for successful completion of the maneuver. Remember that you must know which way the wind is blowing determined using visual cues such as: dust, trees, smoke, or waves on the water. If in doubt, fly a wind drift circle. This is accomplished by choosing an intersection and flying a 360° constant bank circle (a 30° bank angle) around the intersection and noting which direction you were pushed during the circle.

When setting up for the maneuver select your ground-based reference points and an emergency landing site. Perform clearing turns and prepare the aircraft for the maneuver with the appropriate power setting (for DA-40F 95Kt) and trim the aircraft accordingly.

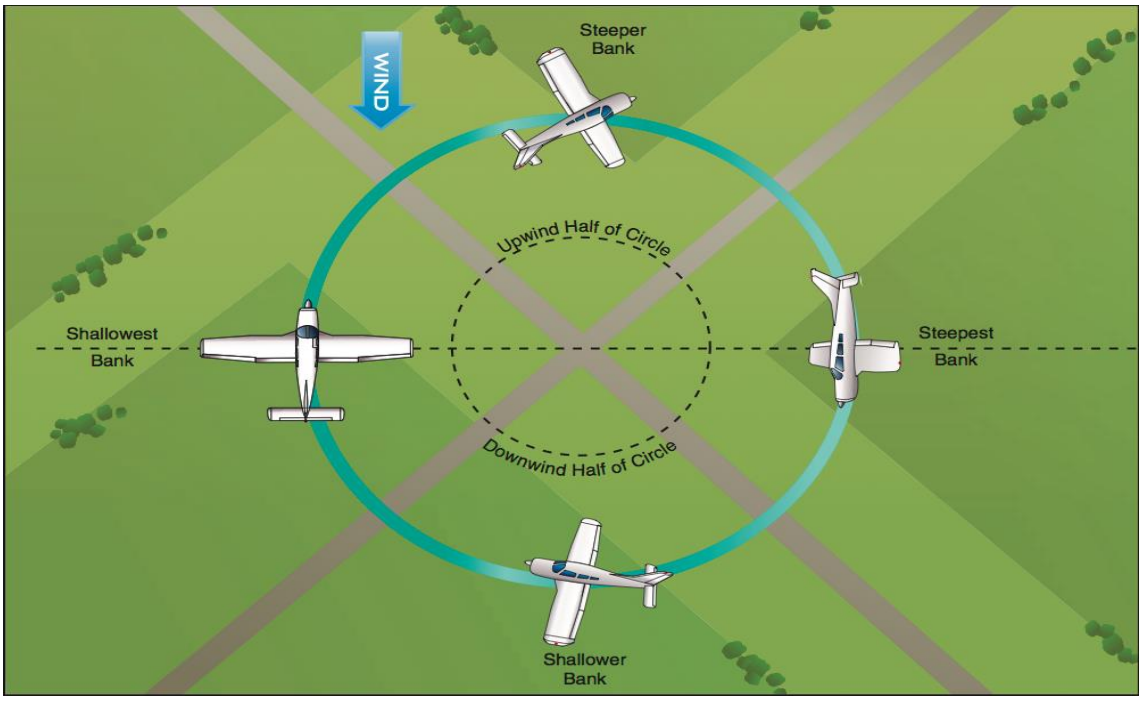
## Turns Around A Point

This maneuver consists of two or more complete circles of a uniform radius from a prominent ground reference point using a maximum, bank of 45° while maintaining a constant altitude. Its objective, as in other ground reference maneuvers is to help the pilot develop the ability to subconsciously control the aircraft while dividing attention between the flight path and ground references while maintaining situational awareness. Turns-around-a-point are a Private Pilot maneuver; it is not required during Commercial Pilot training. All aspects covered in this maneuver can be incorporated into other ground reference maneuvers.

The key to executing this maneuver correctly is to adjust bank as necessary throughout the maneuver to compensate for the effects of the wind on the aircraft's flight path, thereby maintaining a uniform radius around the selected ground reference point. The necessary amount of bank varies depending on aircrafts ground speed. A relatively faster ground speed will require a relatively steeper bank; and a relatively slower ground speed will require a relatively shallower bank. Ground speed is faster with a tailwind and slower with a headwind. This translates into a progressively shallower bank turning into the wind and a progressively steeper bank turning away from the wind. The shallowest bank will be experienced with a direct headwind and the steepest bank will occur when

the wind is directly behind the aircraft. If power and altitude are maintained, and there is no wind, the ground speed of the aircraft will not change. If the maneuver is flown perfectly in calm winds the bank will remain constant throughout the maneuver. Winds which change the groundspeed (or pilot error) create the need to adjust the bank. Understanding how the wind affects the ground speed will enable the pilot to anticipate the necessary bank changes throughout the maneuver. You should anticipate the bank changes and not let them catch you off-guard.

Since this is a turning maneuver there is no need to consider a crab-angle for wind correction. Crab angles are used to compensate for crosswinds in maneuvers with straight legs. Crosswind corrections are made in this maneuver by properly adjusting the bank angle. The bank angle adjustments are discussed in the Maneuver Execution section below.




Set Up

- Winds Identified
- Ground Based Reference Point Selected
- Emergency Landing Site Located
- Clearing Turns Completed
- Altitude selected and trimmed for
- Aircraft configured (fuel pump on, carb heat cold(da-40), fuel selector on the fullest tank)
- Power set at roughly 2350 RPM and 95 KIAS
- Heading Bug Set

Entry

- The maneuver should be entered on a downwind leg

- Set up roughly ¾ of a mile from the ground-based reference point
- Unless specified by examiner or instructor turns should be made to the left

Maneuver Execution

- Correct bank throughout the maneuver to maintain uniform distance from reference point

- Downwind- Steep Bank

With the wind blowing directly behind the aircraft, the ground speed is at its maximum. To avoid being blown outside of the desired radius the bank must be increased by a function of the wind velocity. A higher wind velocity will require a higher bank angle because it creates a higher groundspeed. This point in the maneuver will require the steepest relative bank angle.

- Crosswind (Downwind)- Medium Bank

Both crosswind positions in this maneuver require a medium bank when compared to the upwind and downwind positions. This position is the crosswind position on the downwind side. The appropriate bank angle at this point varies depending on ground speed and wind velocity but it will be relatively steeper than the bank angle used on the other crosswind portion of the maneuver (the upwind side). This medium bank angle is relatively steeper because the crosswind originates from the inside and works to push the aircraft outside the desired radius. More bank angle is needed to counteract the force trying to blow the aircraft away from the selected point.

- Upwind- Shallow Bank

A direct headwind creates the slowest ground speed. The bank angle must be the shallowest at this point; if the bank angle is too steep the aircraft will turn inside the desired radius. This is because the headwind has slowed the movement relative to the reference point and the aircraft has more time to turn at this point than at any other point in the maneuver. A shallower bank compensates for the increase in time.

- Crosswind (Upwind)- Medium Bank

This position is the crosswind position on the upwind side. The appropriate bank angle at this point varies depending on ground speed and wind velocity but it will be relatively shallower than the bank angle used on the other crosswind portion of the maneuver (the downwind side). This medium bank angle is relatively shallower because the crosswind originates from the outside and helps turn the aircraft along the desired radius. Less bank angle is necessary to avoid being blown toward the selected point.

- Downwind- Steep Bank

The maneuver concludes at the point where it started. Returning to the starting point the relative bank should again be increased to its steepest. At the completion point (original

heading) roll the wings level from the steepest bank and exit on the downwind maintaining bugged heading.

- Correct Pitch and Power throughout the maneuver
- Maintain and correct altitude throughout the maneuver
- Perform clean-up checklist specified in the USU checklist

## Ground Reference Maneuvers: Rectangular Course

14 CFR part 61; FAA-H-8083-2, FAA-H-8083-3

Key Terms

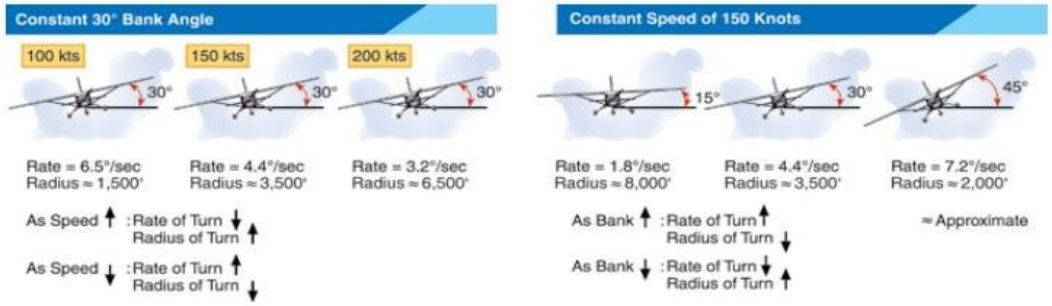
- Ground Track
- Ground Speed
- Rate of Turn v. Radius of Turn

The objective of performing ground reference maneuvers is to teach pilots control of an aircraft while using references on the ground to maintain desired ground tracks. Pilots must utilize multiple visual ground-based reference points to prevent the aircraft from drifting off the desired flight path. In order to perform the maneuver successfully, situational awareness of the wind speed and direction are important. The objective in the ACS states: that the applicant must exhibit satisfactory knowledge, risk management, and skills associated with ground reference maneuvering which may include a rectangular course, S-turns, and turns around a point.

During ground reference maneuvers, pilots will be flying the aircraft relatively close to the ground (600-1000 feet AGL), USU uses 800’ above ground level when performing ground reference maneuvers. Due to the altitudes in which these maneuvers are to be performed, an appropriate EMERGENCY LANDING SITE should be determined and verbalized beforehand. Be aware that little time will remain in the event the emergency landing site arises.

Ground reference maneuvers teach students that groundspeed plays a major factor in ground reference maneuvers. Ground speed is the horizontal speed of the aircraft in relation to the ground. Therefore, knowing the wind direction and its effects on the aircraft such as, ground track, and associated changes regarding bank angle should be taught prior to performing the maneuver. Ground track is the horizontal flight path in relation to the ground. The objective of ground reference maneuvers is to keep a constant ground track by become proficient at correcting for wind and maintaining airspeed and altitude throughout the maneuver.

It’s important to understand the difference between radius and rate of turn when performing these maneuvers.




Maneuver Preparation is key for successful completion of the maneuver. Remember that you must know which way the wind is blowing, determined using visual cues such as: dust, trees, smoke, or waves on the water. If in doubt, fly a wind drift circle. This is accomplished by choosing an intersection and flying a 360° constant bank circle (a 30° bank angle) around the intersection and noting which direction you were pushed during the circle.

When setting up for the maneuver select your ground-based reference points and an emergency landing site. Perform clearing turns and prepare the aircraft for the maneuver with the appropriate power setting (for DA-40F 95Kt) and trim the aircraft accordingly.

## Rectangular Course

The rectangular course is a practice maneuver in which the ground track of the airplane is equidistant from all sides of a selected rectangular area on the ground. While selecting the field make sure to enter in on a 45° entry to the downwind, that you have selected a suitable location, and that there are no obstructions (tower, buildings, etc.) that would cause you to break a FAR.
While performing this maneuver, altitude and airspeed should be constant. Like other ground track maneuvers, one of the objectives is to develop division of attention between the flight path and ground-based references, additionally controlling the aircraft and maintaining situational awareness.

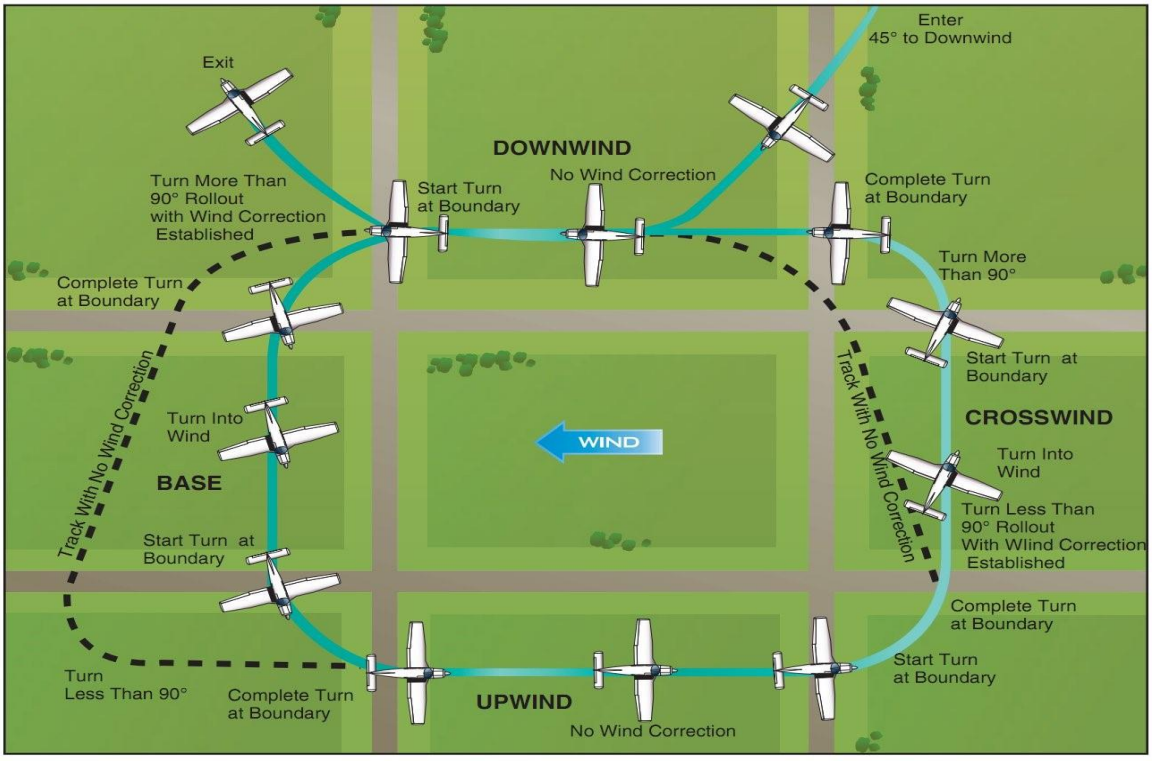
Another objective is to develop recognition of drift toward or away from a line parallel to the intended ground track. This will help you to establish a better course in flying a pattern.

First select a field with sides of approximately 1 mile. Determine wind direction. Enter the maneuver downwind with a tailwind. The distance between field boundaries should be 1/4 to 1/2 mile. To correct for wind drift, turn the nose of the aircraft towards the wind, and maintain a constant distance from the selected field. When wind conditions

exist, the angles have to be more or less than 90° to correctly establish the next leg of the course. Bank angles should not exceed 45°.

You will need to maintain a consistent altitude throughout the maneuver. As you turn the equivalent of a base leg, this will be the steepest turn, and could require the most crabbing in the maneuver. The final/upwind turn will be the shortest; less than 90°, and the leg will take the longest due to the slowest ground speed.

When exiting the pattern, you should exit on a 45° leg from the downwind.




Set Up

- Winds Identified
- Ground Based Rectangular Course Selected
- Emergency Landing Site Located
- Clearing Turns Completed
- Altitude selected and trimmed for
- Aircraft configured (fuel pump on, carb heat cold(da-40), fuel selector on fullest tank)
- Power set at roughly 2350 RPM and 95 KIAS
- Heading Bug Set

Entry

- The maneuver should be entered on a 45° to the downwind leg
- Set up roughly ½ a mile from the ground based rectangular course
- Unless specified by examiner or instructor turns should be made to the left

Maneuver Execution

- Correct bank throughout maneuver to maintain uniform distance from reference point
- Correct Pitch and Power throughout the maneuver
- Correct and maintain altitude throughout the maneuver

Clean Up

- Perform clean-up checklist specified in USU checklist

## Ground Reference Maneuvers: S-Turns

14 CFR part 61; FAA-H-8083-2, FAA-H-8083-3

Key Terms

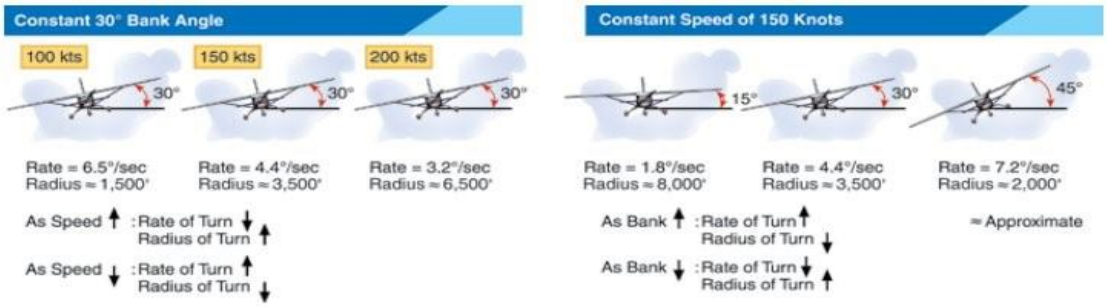
- Ground Track
- Ground Speed
- Rate of Turn v. Radius of Turn

The objective of performing ground reference maneuvers is to teach pilots control of an aircraft while using references on the ground to maintain desired ground tracks. Pilots must utilize multiple visual ground-based reference points to prevent the aircraft from drifting off the desired flight path. In order to perform the maneuver successfully situational awareness of the wind speed and direction are important. The objective in the ACS states: that the applicant must exhibit satisfactory knowledge, risk management, and skills associated with ground reference maneuvering which may include a rectangular course, S-turns, and turns around a point.

During ground reference maneuvers, pilots will be flying the aircraft relatively close to the ground (600-1000 feet AGL), USU uses 800’ above ground level when performing ground reference maneuvers. Due to the altitudes in which these maneuvers are to be performed, an appropriate EMERGENCY LANDING SITE should be determined and verbalized beforehand. Be aware that little time will remain in the event the emergency landing site arises.

Ground reference maneuvers teach students that groundspeed plays a major factor in ground reference maneuvers. Ground speed is the horizontal speed of the aircraft in relation to the ground. Therefore, knowing the wind direction and its effects on the aircraft, such as ground track, and associated changes regarding bank angle, should be taught prior to performing the maneuver. Ground track is the horizontal flight path in relation to the ground. The objective of ground reference maneuvers is to keep a constant ground track by become proficient at correcting for wind and maintaining airspeed and altitude throughout the maneuver.

It's important to understand the difference between radius and rate of turn when performing these maneuvers.




Maneuver Preparation is key for successful completion of the maneuver. Remember that you must know which way the wind is blowing determined using visual cues such as: dust, trees, smoke, or waves on the water. If in doubt fly a wind drift circle. This is accomplished by choosing an intersection and flying a 360° constant bank circle (a 30° bank angle) around the intersection and noting which direction you were pushed during the circle.

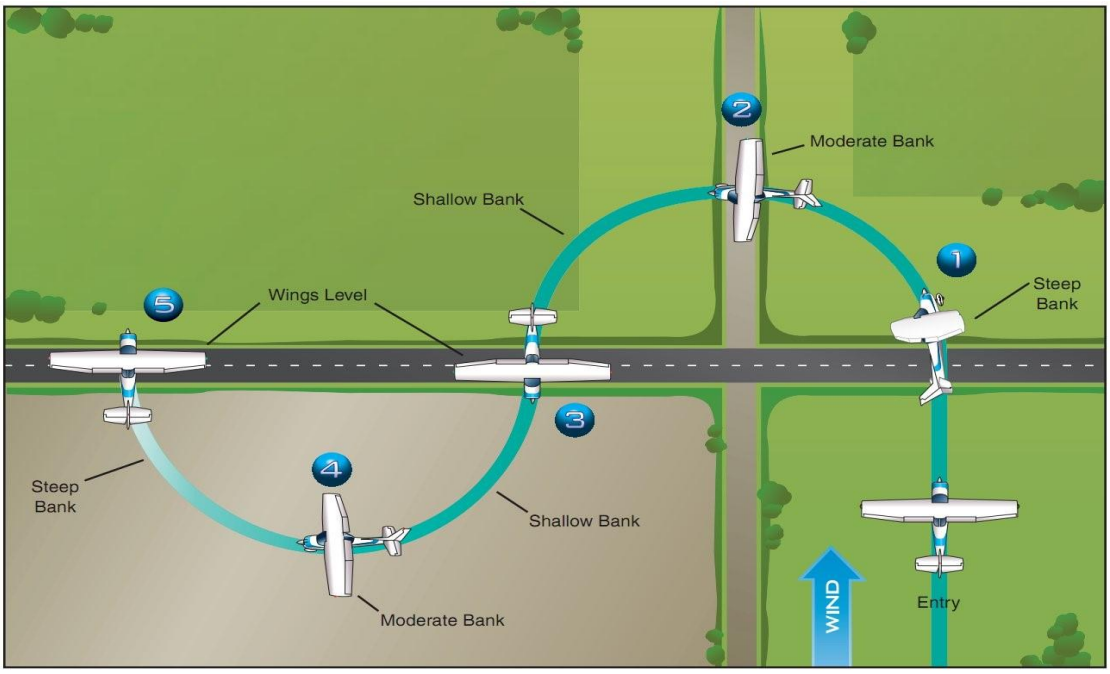
When setting up for the maneuver select your ground-based reference points and an emergency landing site. Perform clearing turns and prepare the aircraft for the maneuver with the appropriate power setting (for DA-40F 95Kt) and trim the aircraft accordingly.

## S-Turns

An S-turn across a road, is the aircrafts ground track making two equal radii half circles on either side of a road (or straight line, e.g. a fence). The objective for the S-turn is to develop the ability to combine two main operations: wind drift correction, and orientation of flight path using ground references, while arriving at a specified location at a specified attitude

The maneuver consists of setting up in a downwind (e.g. wind at/near your back) attitude, crossing the straight line at a 90° angle and immediately beginning a series of 180° turns (in opposite directions) of uniform radii, and crossing the selected line at 90° in the opposite direction from the entry, wings level, at the 180° point.

Before performing the maneuver determine the wind direction. Select the straight line so as to start the maneuver on a downwind. Be aware that the angle of bank needs to constantly change, so as to keep each half circle the same radius.




Set Up

- Winds Identified
- Ground Based Reference Point Selected
- Emergency Landing Site Located
- Clearing Turns Completed
- Altitude selected and trimmed for
- Aircraft configured (fuel pump on, carb heat cold(da-40), fuel selector on the fullest tank)
- Power set at roughly 2350 RPM and 95 KIAS
- Heading Bug Set

Entry

- The maneuver should be entered on a downwind leg
- Unless specified by examiner or instructor initial turn should be made to the left

Maneuver Execution

- Correct bank throughout the maneuver to maintain uniform distance from reference point
- Cross selected reference with wings level 180° from initial entry heading on first turn and then on the initial entry heading after the second turn again with wings level
- Correct Pitch and Power throughout the maneuver
- Correct and maintain altitude throughout the maneuver

Clean Up

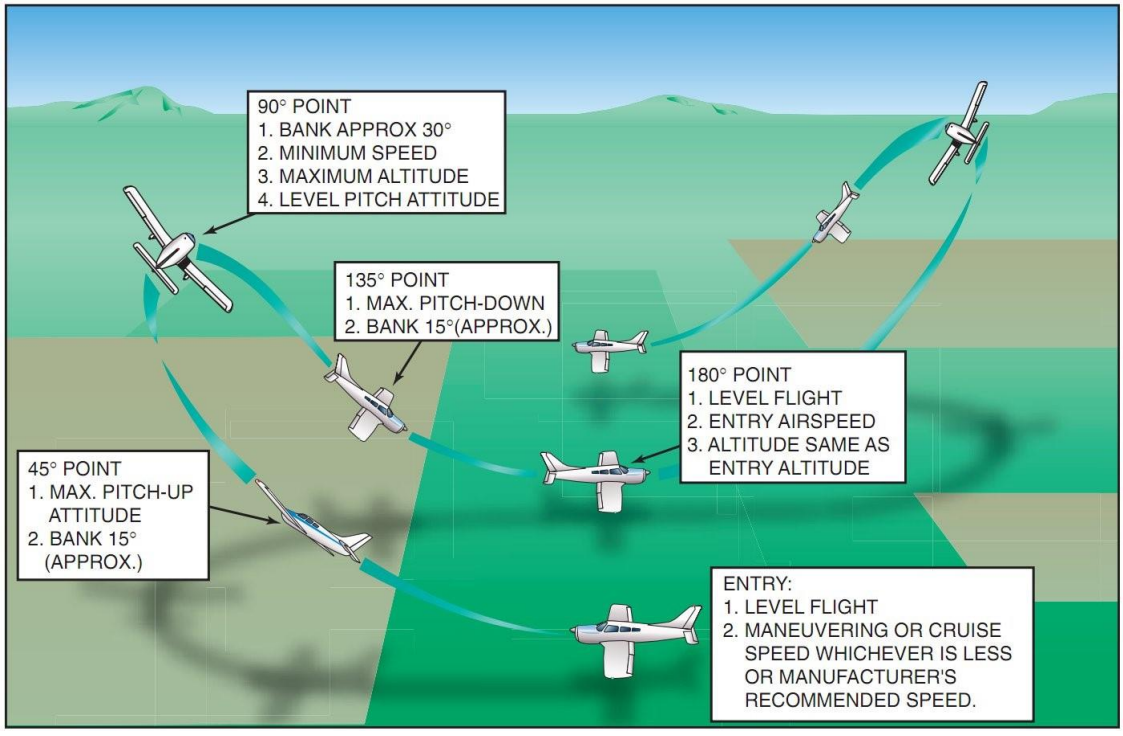
- Perform clean-up checklist specified in USU checklist

## Lazy 8's

References: FAA-H-8083-3, Commercial ACS

Lazy eights are practiced to refine the pilot's feel for varying control forces and the ability to plan and remain orientated while maneuvering the airplane with positive and accurate control. This maneuver is the only standard training maneuver in which forces on the controls will not remain constant for any given time throughout the maneuver. Due to the maneuver's complexity, it trains and test a pilot's ability to act ahead of the aircraft. The outlined objective in the Commercial ACS states that pilots: must exhibit satisfactory knowledge, risk management, and skills associated with Lazy Eights.

A lazy eight maneuver consists of two 180° turns similar to the track of a ground reference S-Turn, while making a climb and descent in a symmetrical pattern during each of the turns. In its execution, the dive, climb, and turn are all combined, and the combinations are varied and applied throughout the performance range of the airplane. Previously noted as the Bank-then-Yank. This maneuver is always in motion, at no point should the pilot be "level" or "stuck" in the maneuver. The maneuver is best performed with the majority of attention given to outside visual references.




As an aid to learning, reference points can be selected at 45°, 90°, and 135°. These reference points aid in making symmetrical loops during each turn. Start the maneuver by accelerating and holding at or below the maneuvering speed indicated by the AFM/POH. The correct power setting for the lazy eight is one that will maintain the

altitude for the maximum and minimum airspeeds used during the climbs and descents of the maneuver. Obviously, if excess power were used, the airplane would have gained altitude when the maneuver is completed; if insufficient power were used, altitude would have been lost. For the DA-40F use 84 KTS (below 2161) or 95 KTS (up to 2535).

Orient your aircraft in straight and level flight at an altitude that will allow the maneuver to be performed no lower than 1,500 feet AGL. Set the power and leave it to hold the assigned speed. Slowly increase your pitch while slightly increasing your bank. The climb should be planned so that the aircraft reaches its maximum pitch attitude at the 45° point and about half the permissible rate of bank (approximately 15°). As the back pressure and pitch are increased, the airspeed decelerates, causing the rate of turn to increase. Increasing both bank and pitch will cause the rate of turn to increase. Therefore, we should “lazily” control the aircraft, and plan to reach the 45° reference point at the same time as we reach our maximum pitch up. As bank rate increases be aware to avoid a rate that is too rapid and may cause over banking. Failure to compensate for the increases in rate of turn will position us at our 45° reference point prior to having our maximum pitch up.

At this point, slowly increase the back pressure, and the pitch will start to decrease while the bank continues to increase. Since the airspeed is still decreasing, right-rudder pressure will have to be applied to counteract the torque effect, a slight amount of opposite aileron pressure may be required to prevent the bank from becoming too steep.

At the 90° point the aircraft will have a pitch of 0° and a maximum bank angle (approximately 30°). FAA’s Airplane flying handbook states, “Lazy eights normally should be performed with no more than approximately a 30° bank. Steeper banks may be used, but control touch and technique must be developed to a much higher degree than when the maneuver is performed with a shallower bank.” At this point airspeed will be at a minimum around 5 to 10 knots above stall speed, and the airplane pitch attitude should be passing through level flight configuration.

Continue flying the airplane and decrease both pitch and bank angle. It is important that the pilot attempt to make an identical loop in the “down” direction at this point. Note to pitch down as much as previously used in the climb portion of the loop. As the airspeed increases, less rudder and aileron forces will be necessary. The bank and pitch will have to be adjusted and noted by the pilot to make the necessary adjustments. At the 135° point, the pitch should be maximum negative or lowest pitch down and a bank angle equivalent to the initial 45° point.

Use the remaining degrees to attain the same altitude and airspeed as was used at the entry of the maneuver until the aircraft is at the 180° reference point. The aircraft attitude should be in the “straight and level.” Power may need to be adjusted prior to starting the second turn. The ACS states that at the 180°-point altitude error allows for ±100 feet from entry altitude. For Airspeed and Heading the ACS allows error up to ±10 knots from entry airspeed and ±10° error from the reciprocal entry heading.

More right-rudder pressure will be needed in the climbing right turn than in the left turn, because more torque correction is needed to prevent adverse yaw from decreasing the rate of turn. The feel of the aircraft must be gained by the pilot. In the left climbing turn, the torque will tend to contribute to the turn; consequently, less rudder pressure is needed. It will be noted that the controls are slightly crossed in the right climbing turn because of the need for left aileron pressure to prevent over banking and right rudder to overcome torque.

## Chandelle

Pilots must have a basic understanding of the following term as it relates to Chandelles.

- Overbanking tendencies

The objective of chandelles is to familiarize pilots with the maximum performance capabilities of the aircraft and develop positive control techniques at varying airspeeds and attitudes. Pilots must exhibit proficiency in maximizing climb performance for the power and bank selected. The maneuver demands that the maximum flight performance of the airplane be obtained, that is the airplane should gain the most altitude possible for a given degree of bank and power setting without stalling. The outlined objective in the Commercial ACS states that pilots: must exhibit satisfactory knowledge, risk management, and skills associated with chandelles.

A chandelle is a maximum performance climbing turn beginning from approximately straight-and-level flight and ending at the completion of a precise 180° of turn in a wings-level, nose-high attitude at the minimum controllable airspeed. The first 90° of turn is described as constant bank and changing pitch; and the second 90° as constant pitch and changing bank. Chandelles are a visual maneuver that pilots should use visual references for. Before entering a chandelle define three visual reference points: 0° (or starting point), 90° (transition point), and 180° (Ending point). Be sure that you are at or below the VA for the aircraft:

First bank the aircraft to 30° of bank followed by a smooth application of full power, then start your climb at a constant bank to the selected 90° point (transition reference) while

slowly increasing the pitch angle. This will result in a maximum pitch angle at the transition (90°) point. The maneuver is continued by slowly decreasing your bank while keeping the maximum pitch from the transition point. The result: the aircraft will be several hundred feet higher at the maximum pitch without inducing a stall, with 0° of bank at the 180° ending point with an allowable ±10° of heading error. Coordination is paramount during this maneuver. A chandelle is completed when the pilot is able to level off and accelerate to the training cruise speed.

Remember that at the top of a chandelle where airspeed is minimal the left turning tendencies are increased and may require right rudder to maintain coordination. The maximum performance should be equal to both left and right. Like ground reference maneuvers, this one should be initiated into the wind. Any subsequent turns in the opposite direction will result in a turn into the wind again, thus matching performance expectations of the aircraft to have symmetrical loops.

### Steep Turns

References: FAA-H-8083-2, FAA-H-8083-3; POH/AFM, Private and Commercial ACS

Key Terms

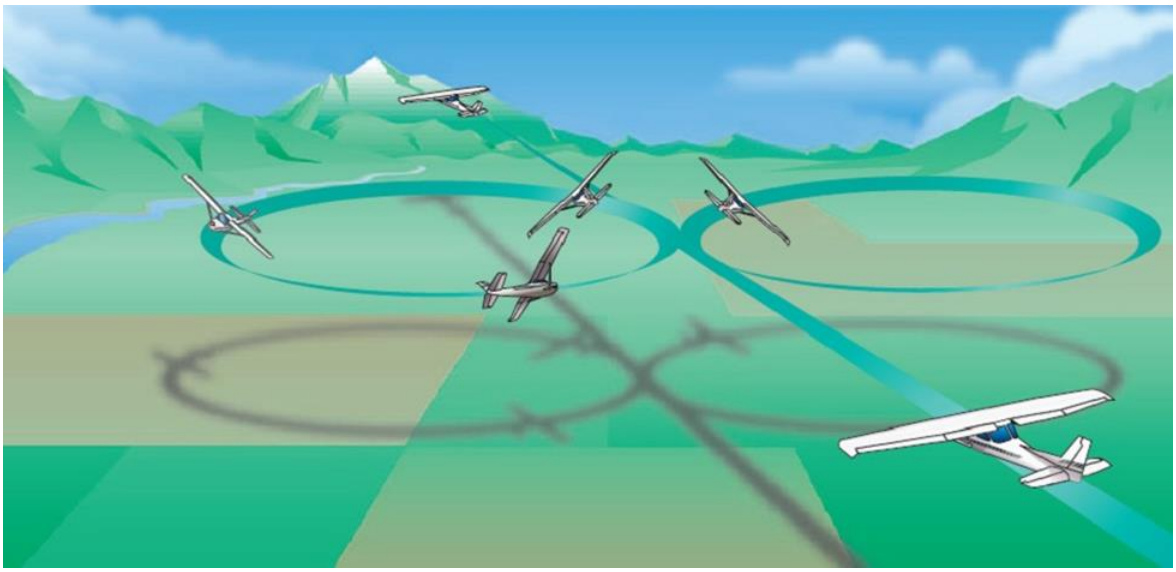
Applicants must have a basic understanding of the following terms as they relate to Steep Turns.

- Adverse Yaw
- Over banking tendencies
- Load Factor
- Accelerated Stalls

The objective of steep turns is to familiarize pilots with the operation of the aircraft near the limits of the plane's operational capabilities. As well as to exercise the pilot’s skill needed to perform a smooth and coordinated maneuver while maintaining awareness of their orientation by using both visual cues.

The objective outlined in the ACS is to determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with steep turns.

Steep turns consist of two 360° turns at a bank angle noticeably steeper than those required for normal turning maneuvers. The forces experienced by the pilot and the aircraft at these steeper angles are also noticeably greater. Likewise, the negative effects of the turning forces of adverse yaw and increased g-loads are more pronounced. The performance of this maneuver requires development of certain skills and understanding.



This is a visual maneuver and therefore should be flown using mainly visual references outside the aircraft. A visual landmark is used to establish the maneuver entry heading. Align the aircraft with an entry landmark and trim for straight-and-level flight at either 95 KIAS DA40 and 105 KIAS DA42. The heading bug is synced to the resultant heading. Initiate the turn using a normal rate of roll and appropriate rudder pressure. Roll through 30° to either a target angle of 45° for Private ACS or 50° for Commercial ACS.

Maintain altitude and bank angle visually by placing the appropriate deck angle for the aircraft or windscreen reference point on the horizon. Your instructor will demonstrate these reference points to you in flight. Use visual references outside the aircraft, engine cowling, point on the windshield, etc. to maintain the nose on or near the horizon and a near 0 VSI indication, if desired you may use trim also.

Because of the steep bank angle, the rate of turn is extremely high. The high rate of turn causes the outside wing to travel much faster than the inside wing. Because of the influence of wind velocity in the lift formula ($L=C_L \times (1/2\ \rho\ V^2) \times S$) more lift is generated on the outside wing than the inside wing. The unbalanced lift creates an over-banking tendency which works to increase the bank angle even further. To control this overbanking tendency, aileron pressure towards the outside of the turn must be applied when established in the steep turn. Drag is a byproduct of lift. Anytime lift is increased drag is also increased. The unbalanced lift condition in the steep turn creates an unbalanced drag condition. The faster the outside wing travels, the more pronounced the adverse yaw becomes. The stronger force of adverse yaw requires greater rudder pressure to compensate. This means that rudder pressure will be required even when established in the steep turn. By adding yaw toward the outside of the turn, (no more than a half ball deflection) we can overcome much of the induced over banking

tendencies. Adequate compensation for these increased forces must be dealt with to successfully execute steep turns.

Key Terms in Relation to Steep Turns:

Adverse yaw, also known as aileron drag, is a result of the ailerons movement into the airstream. The aileron in the down position will increase the induced drag on the upward tilting wing, and the aileron tilted up will decrease drag on the down wing. Ultimately creating an initial yawing tendency in the opposite direction of the turn. As discussed previously this is counteracted by maintaining proper coordination with rudder pedals.

Overbanking tendency occurs when the maximum turning performance is attained, and relatively high load factors are imposed. Because of the high load factors imposed, these turns should be performed at an airspeed that does not exceed the airplane's design maneuvering speed (VA).

Aerodynamic principles for steep turns are as follows: as the bank of the aircraft increases, the vertical lift decreases; therefore, back pressure is necessary to hold your altitude.

Load factor is defined as a force applied to an aircraft that deflects its path producing greater stress on the aircrafts structure; the amount of force is the load factor. The ratio of aerodynamic force on the aircraft compared to the aircrafts gross weight is the ratio of load factor (e.g., lift/weight).

Performing the Maneuver:

Before starting the maneuver, configure the aircraft, perform clearing turn/(s), make a radio call, establish and trim for an appropriate airspeed, establish a safe altitude of at least 2000 feet AGL, establish and note heading with a visual landmark, establish appropriate airspeed and verbally select an emergency landing spot.

Airspeed:
DA40CS- 95 KTS
DA42 - 105 KTS

Initiate the steep turn with a normal bank through 30° (remember to keep it coordinated with proper aileron and rudder). As you roll past 30° apply both back pressure and power necessary to maintain speed and/or altitude and continue to roll until a 45° (private pilot) or a 50° (commercial pilot/CFI) bank angle is reached.

If you are too low, you must first decrease the bank angle to re-establish your initial altitude. If you are too high, increase your bank angle to re-establish the initial altitude. You may also increase the pressure on the rudder to induce a yawing action in the direction the aircraft needs to go. REMEMBER ONLY HALF BALL DEFECTION IS ALLOWED. If the bank is too steep, with low power, it is necessary to decrease the bank angle to increase the back pressure; or you will find yourself in a steep spiral.

Rolling out of a steep turn with a:
bank angle of 45° -should be led by 13.5° prior to reaching your initial heading.
bank angle of 50° -should be led by 15° prior to reaching your initial heading.

Roll out the same way you entered, decreasing power to avoid climbing, and simultaneously relieving back pressure when passing through 30°. Turn direction transitions should be anticipated and performance adjustments planned prior to the transition from one direction to another.

You must be aware of accelerated stalls as they are defined as a stall that is reached while the aircraft is above 1-g. They are often reached due to high load factors and abrupt loss of lift over a wing. During a steep turn, the aircraft is at an increased load factor when compared to normal flight. This increases your chances of reaching an accelerated stall. They can be avoided by avoiding abrupt flight inputs.

Airmen Certification Standards:

Private Pilot ACS- Maintain the entry altitude ±100 feet, airspeed ±10 knots, bank ±5°, and roll out on the entry heading ±10°. Roll into a coordinated 360° steep turn with approximately a 45° bank.

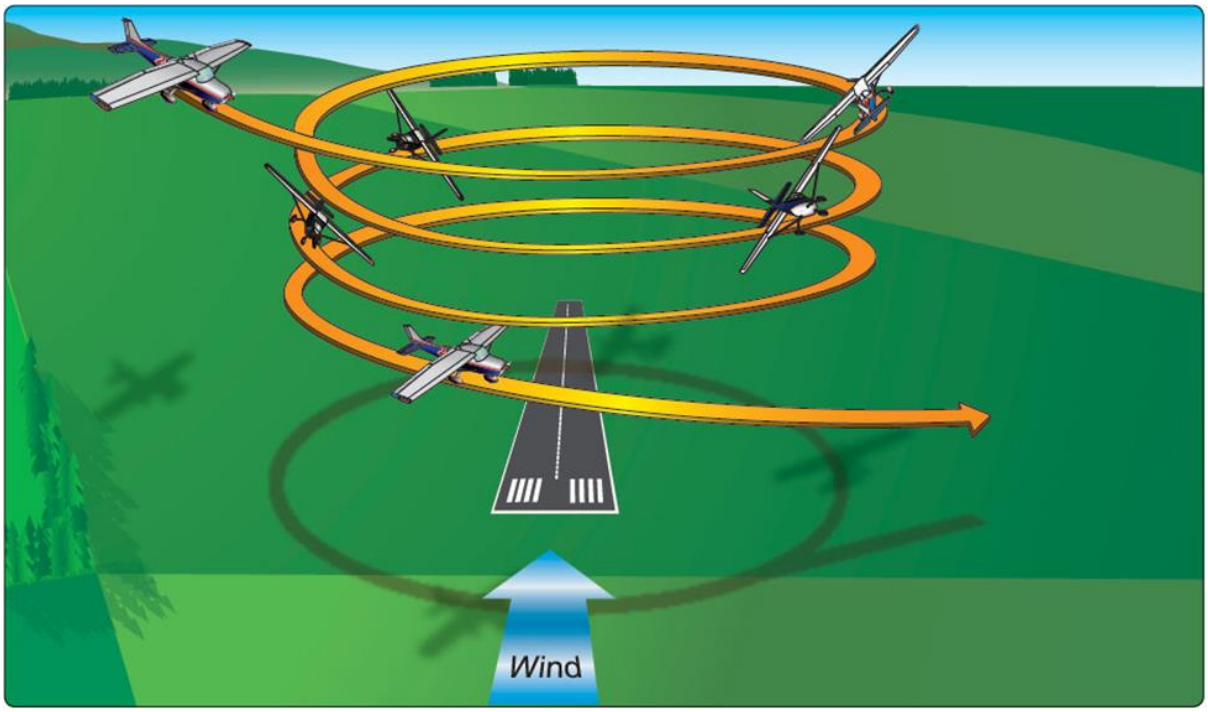
Commercial Pilot ACS- Maintain the entry altitude ±100 feet, airspeed ±10 knots, bank ±5°, and roll out on the entry heading ±10°. Roll into a coordinated 360° steep turn with approximately a 50° bank.

## Steep Spirals

References: FAA-H-8083-2, FAA-H-8083-3; POH/AFM, Commercial ACS

The objective of performing Steep spirals is to prepare pilots for situations where it's necessary for a maneuver with rapidly dissipating amounts of altitude while simultaneously remaining over a selected spot. This is a practical procedure in preparation for landing, especially for emergency forced landing situations. The outlined objective in the Commercial ACS states that pilots: must exhibit satisfactory knowledge, risk management, and skills associated with steep spirals.

A steep spiral is a continuous gliding turn around a ground-based reference point. The steep spiral maneuver consists of at least 3 gliding 360° turns around a point with an initial bank angle of 50° to 55° (limited to 60° of max bank per ACS) and recovery toward a definite object or on a specific heading. The pilot should be aware that similar techniques used in turns around a point, steep turns, and power off 180° are integrated into this maneuver. Remember planning and orientation must be done prior to entering the steep spiral.




As the pilot learns this maneuver, they should recall its relationship to emergency forced landing situation. When selecting the entry altitude, it must allow three turns and recovery above minimum safe altitude (1,500 feet AGL USU and ACS). The pilot will be required to clear the area and take all necessary measures for safety. Some items to consider are mixture rich, CHT, engine gauges checked, fuel checked.

Factors affecting the aircraft will be wind which can be corrected with proper wind drift corrections. Best glide speed as mentioned by AFM/POH. This is NOT a constant bank angle turn and the bank angle is directly proportional to winds encountered. Idling the engine for a prolonged period could result in excessive engine cooling and/or fouling of spark plugs. The engine should be cleared at the completion of a 360° turn, by briefly advancing the throttle to normal cruise power, while adjusting the pitch attitude to maintain a constant airspeed. This should be done while headed into the wind to minimize any variation in groundspeed and radius of turn.

We enter this maneuver downwind, abeam reference point, like all ground reference maneuvers. Use of roads, intersections or prominent points helps define the ground track. Once the power is brought to idle, best glide should be established (73 KIAS DA-40). To maintain the constant ground track, you should not lose sight of the reference at any points. Wind correction must be added to come out at the right spot and location. Downwind corrections will be a steeper bank and lower pitch. The upwind portion will be a shallower bank and an increased pitch. Using outside references allows more accurate directional control.

Recovery is made after the third and final 360° turn, a smooth roll out to a straight glide while maintaining the best glide speed and above 1,500 feet AGL for USU standards. This maneuver may be terminated if the third turn cannot be completed prior to the 1,500' altitude. It would be considered failed at this point. Examiners have been known to pull the power at altitudes lower than what is practiced, and expect the pilot compensate.

Always have an emergency spot located, use carburetor heat as necessary, and plan to roll out on a base to final turn for the planned landing spot for this maneuver.

## Slow Flight

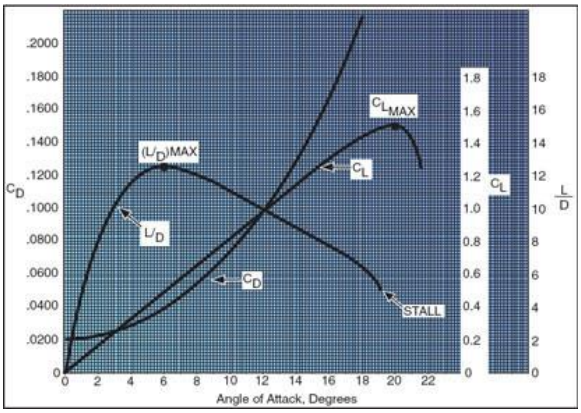
References: FAA-H-8083-2, FAA-H-8083-3 Ch. 4; POH/AFM, Private Pilot and Commercial ACS
Key Terms:
Applicants should have a basic understanding of the following terms and how they relate to slow flight.

- Angle of attack
- Load factor
- Center of gravity
- Airplane attitude
- Yaw effects

The objective of slow flight is to simulate the controllability of the aircraft while in the critical phases of flight. The critical phases of flight include takeoff/departure and approach/landing. Pilots must develop a better sense of feel for the aircraft, while perfecting control inputs, and improving proficiency in performing maneuvers at low airspeeds and high angles of attack. When examined by a Designated Pilot Examiner (DPE), pilots must exhibit satisfactory knowledge, risk management, and skills associated with maneuvering during slow flight.

This maneuver demonstrates the flight characteristics and decreased controllability of an airplane at its minimum controllable airspeed (Vmca). Pilots must develop a sense of awareness for the aircrafts flight characteristics at slow speeds to avoid stalling. At Vmca, the increased angle of attack and load factor will cause a disturbance of laminar airflow over the wing of the aircraft resulting in sluggish controls. Any change in pitch, bank, etc. could result in a stall.

When performing the maneuver, it's imperative that pilots use half standard rate turn while on the back side of the power curve and stay within a max 15° of nose up pitch. To maintain altitude during the maneuver, low airspeeds, high angles of attack, and high-power setting are required to control the aircraft, use pitch to maintain airspeed and power to hold altitude. Known as the area of reverse command, because it is contrary of normal flight inputs where pitch is used for altitude and power for airspeed. This area of reverse command is proportionately affected by bank angle. The greater the bank angle the more airspeed needed to offset the horizontal component of lift created in a turn.





During training and examination, the examiner or flight instructor might ask you to climb, descend, or turn with the settings required to maintain slow flight. For climbing or descending use reverse commands to achieve the task asked of you. When turning you must bank roughly 5 degrees in the direction of the turn.

Be careful as you practice this maneuver in all different configurations, anticipate the lift and drag as you add or take away flaps, gear, etc. The steps below are to be used for a full flap setting. You may practice other variations, but you can expect slow flight to be full flaps and gear (if applicable, unless the examiner or instructor direct otherwise.

To recover from slow flight upon completion of the maneuver, stabilize the aircraft in a wings level attitude, increase throttle to full power, retract first and second notches of flaps one at a time, retract gear if applicable, and return to normal cruise speed and configuration.

When transitioning between the maneuver and normal cruise remember to allow the aircraft to stabilize in its new configuration prior to making additional changes. Stabilization can be classified as greater than stall speed, and less than maneuvering speed, which will allow the aircraft to be maneuvered without inducing a secondary stall. Transitions should be made in a timely manner until recovered.

*Reference most current ACS

Private Standards:
Maintain the specified altitude, ±100 feet; specified heading, ±10°; airspeed, +10/-0 knots; and specified angle of bank, ±10°.

Commercial Standards: (Commercial students utilize the following parameters)
Maintain the specified altitude, ±50 feet; specified heading, ±10°; airspeed, +5/-0 knots; and specified angle of bank, ±5°.

# Stalls

## Stalls: Power-Off

References: FAA-H-8083-2, FAA-H-8083-3; AC 61-67, POH/AFM, Private Pilot and Commercial ACS

Key Terms:

Applicants must have a basic understanding of the following terms as they relate to Stalls.

- Angle of attack
- Load factor
- Center of gravity
- Airplane attitude
- Yaw effects

The objective of performing stalls in a controlled setting is to familiarize pilots with stalling characteristics of the aircraft and proper recovery techniques. Stalls commonly occur during critical phases of flight (take-off, departure, approach, landing and go-around) when the aircraft is slow and requires high angles of attack. When examined by a DPE they will access pilots to determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with power-on and power-off stalls.

Stalls are extremely dangerous especially at low altitudes where pilots have minimal time to recover. Prompt and proper recovery is essential to the safety of the flight and for the success of the demonstration. Power-on stalls are practiced demonstrating the flight characteristics of the aircraft during take-off and departure while exceeding the critical angle of attack. The student must recognize and recover from the stall with minimal loss of altitude.

## Power-Off Stalls

To accomplish a power-off stall, reduce speed and hold the altitude while establishing the aircraft in the approach or landing configuration with the appropriate VTGT. Descend at around 500 feet per minute while maintaining the specified airspeed without adding power. If requested by the examiner or instructor, bank up to 30° to either side of the heading to simulate a turn to final. The instructor/examiner will assign a hard deck which simulates the altitude of the ground where pilots should initiate a simulated flare over the runway. Simulated flare should begin roughly 100ft above the hard deck altitude previously assigned by instructor/examiner. When you initiate the flare back pressure is needed to maintain the altitude while the airspeed decreases. Be conscious not to over bank the aircraft since the airplane tends to increase the bank angle as airspeed decreases. When the stall warning horn sounds announce: ‘’Stall warning’’ Upon reaching a full stall, initiate the recovery process for the specific aircraft.

Commercial students initiate the recovery process at the first indication of a Stall (warning horn).

Recovering the aircraft is accomplished by reducing the angle of attack and smoothly applying max power. Pilots should accelerate to VY in order to recover and climb. Appropriate trim input should be anticipated. Recovery follows slow flight to acceleration to prevent further loss of altitude. This recovery process should be completed with a minimum loss of altitude, appropriate to the aircraft characteristics (See AFM/POH). At USU we intend to enter the SLOW FLIGHT REGIEM, therefore we will reduce pitch close to the horizon or just above during the recovery. This will allow for minimal loss of altitude and give the student the ability to FLY out of the situation.

In this maneuver it is also imperative to maintain coordinated control of the aircraft to maintain directional control and avoid a spin. The flap setting should be reduced immediately from “landing” configuration to T/O position, the remaining flaps are then retracted when a positive rate of climb has been established.

Once the descent is stopped, be sure that you are still above the predetermined altitude, you can start climbing to the Minimum Safe Altitude of 500’ above the “assigned” field altitude or to the altitude determined by the examiner.

Be aware not to enter a secondary stall. The pilot of an airplane placarded against intentional spins, should assume that the airplane might become uncontrollable in a spin. However, if it becomes necessary to recover from a spin in any aircraft the following always applies: to spin you need to have the aircraft stalled and in a yawing motion (uncoordinated flight). To get out of a spin you need to break the yaw (coordinate the aircraft) and/or break the stall. For further information refer to and become familiar with your checklist.

Power-Off Stall Standards

Private pilot ACS standards- Recover when full stall occurs
Maintain a specified heading ±10° if in straight flight; maintain a specified angle of bank not to exceed 20°, ±10° if in turning flight, while inducing the stall

Commercial ACS standards- Recover at stall warning
Maintain a specified heading, ±10° if in straight flight; maintain a specified angle of bank not to exceed 20°, ±5°, if in turning flight, until an impending or full stall occurs, as specified by the evaluator

## Stalls: Power- On

References: FAA-H-8083-2, FAA-H-8083-3; AC 61-67, POH/AFM, Private Pilot and Commercial ACS

Key Terms:

Applicants must have a basic understanding of the following terms as they relate to Stalls.

- Angle of attack
- Load factor
- Center of gravity
- Airplane attitude
- Yaw effects

The objective of performing stalls in a controlled setting is to familiarize pilots with stalling characteristics of the aircraft and proper recovery techniques. Stalls commonly occur during critical phases of flight (take-off, departure, approach, landing and go-around) when the aircraft is slow and requires high angles of attack. When examined by a DPE they will access pilots to determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with power-on stalls.

Stalls are extremely dangerous especially at low altitudes where pilots have minimal time to recover. Prompt and proper recovery is essential to the safety of the flight and for the success of the demonstration. Power-on stalls are practiced demonstrating the flight characteristics of the aircraft during take-off and departure while exceeding the critical angle of attack. The student must recognize and recover from the stall with minimal loss of altitude.

## Power-On Stalls

To demonstrate a power-on stall the airplane should be established in the take-off or departure configuration (either clean or with first notch of flaps). The maneuver begins by slowing the aircraft to bleed off excessive speed. Once reaching simulated take-off speed specified in checklist increase power to full or 65% depending on what is specified by instructor or examiner. As you increase throttle simultaneously increase the pitch attitude to roughly 18°- 20° nose up. It is extremely imperative that throughout the entirety of the maneuver the plane maintains coordination to ensure the aircraft does not enter a spin.

As your AOA increases and Airspeed bleeds off, the aircraft will produce a high-pitched noise which is the stall warning horn. When the horn goes off students must announce the warning by saying “stall waring”. Upon reaching a full stall recognizable by a buffet and loss of stick control the pilot must announce “stalling” and initiate stall recovery

procedure. The pilot must be able to immediately recognize when the stall has occurred and take prompt action to prevent a prolonged stalled condition.

A pilot's performance is unsatisfactory if a secondary stall occurs, or if the pilot fails to take proper actions to avoid excessive airspeed, excessive loss of altitude, or a spin.
*Refer to the most current ACS*

Private pilot ACS standards- Recover when full stall occurs
Maintain a specified heading, ±10° if in straight flight; maintain a specified angle of bank not to exceed 20°, ±10° if in turning flight, while inducing the stall.

Commercial pilots ACS standards- Recover at stall warning
Maintain a specified heading ±10° if in straight flight; maintain a specified angle of bank not to exceed 20°, ±10°, if in turning flight, until an impending or full stall is reached, as specified by the evaluator

# Landings & Takeoff's

## Normal Takeoff

A Normal Takeoff is the process of an airplane transitioning from the ground into the air. A "normal" takeoff is performed with calm winds or a direct headwind/tailwind. For USU student pilots, all takeoffs will be performed from an approved airport on a paved runway surface that has sufficient length for the takeoff roll. Takeoff roll will be calculated during pre-flight calculations to confirm that given current weather, wind speed and direction, density altitude, temperature, and weight, takeoff can be performed from the approved runway surface. Each takeoff performed in an airplane can be divided into four different phases:

- **Before Takeoff**
- **Takeoff Roll**
- **Lift-off (Rotation)**
- **Initial Climb**

In this lesson, we will describe the key components and steps of each phase in order to accomplish a Normal Takeoff to a departure climb.

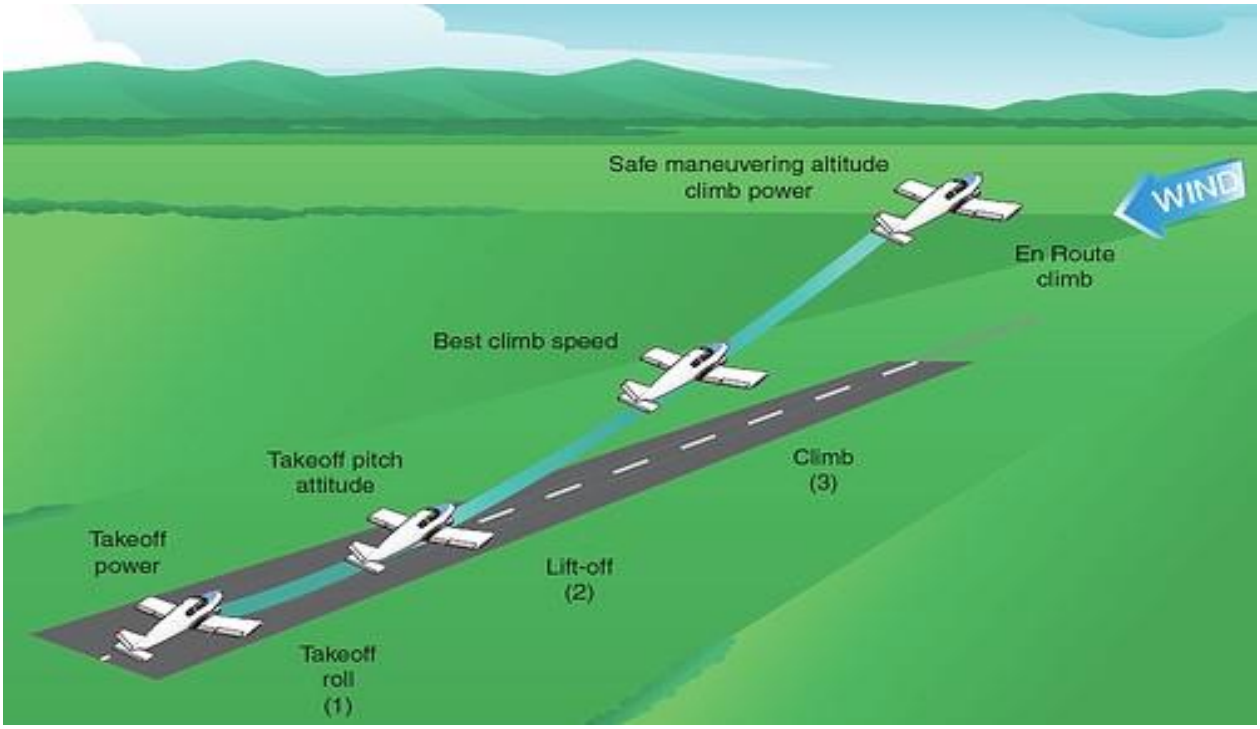



Figure 5-1, Airman's Flying Handbook

## Before Takeoff

In order to set up for the takeoff, we must taxi into a position on the runway surface to begin our takeoff roll. Before taxiing, we must ensure that:

1. Our performance calculations show that we can safely take off from the runway surface
2. Before takeoff checklist items have been completed and checked
3. The active runway area is clear of obstacles, wildlife, and any other threats to the flight
4. We have enough time and space between pattern traffic to complete takeoff and a departure climb

Additionally, identify an emergency plan. A thorough emergency plan covers identifying and resolving an emergency on the ground and shortly after takeoff. For example, identifying the fields to the northwest of Logan-Cache Airport as an emergency landing site should be included in your emergency plan. Upon taxiing onto the active runway and making proper radio calls about your movement and intentions, it is a good practice to use a visual scan to identify the following:

1. Outside visual reference points (i.e., the cell tower to the north)
2. Clear runway area and traffic pattern
3. Proper engine indications before applying takeoff power

## Takeoff Roll

After ensuring we can begin our takeoff roll safely, advance the throttle forward. Make sure to smoothly advance the throttle, as abrupt movements can cause the engine to stutter and decrease performance. In the DA-40's and 42's, use maximum throttle to establish takeoff power. Additionally, in both aircraft, it is necessary to use firm right rudder pressure to counteract the left yawing tendencies from P-factor and torque generated by our engines. Use the balls of your feet to use right rudder after initial power input but notice how much less pressure you need on the rudder as airspeed increases. Keep the stick in a neutral position until you begin to feel pressures on the controls as the elevator gains effectiveness due to airflow.

Throughout the takeoff roll, it is necessary to use a good visual scan of points outside the aircraft as well as instrument indications within the aircraft. Outside of the aircraft use your visual scan to:

1. Monitor acceleration and increase in airspeed based off reference points and peripheral blurring of the runway environment
2. Maintain runway centerline with rudder pressure
3. Ensure the runway and takeoff area remains clear
4. How much runway is remaining to complete takeoff roll

Inside the aircraft, use your scan to:

1. Monitor the airspeed indicator and ensure it is increasing to rotation speed, or Vr
2. Verify that the engine is running correctly after takeoff power is applied

Continue your takeoff roll as normal if no emergency arises and your aircraft performance is safe and as expected from your preflight calculations.

**Lift-Off (Rotation)**

As you near rotation speed, the aircraft will start to go from an “accelerated taxi” to flying. Airspeed is increasing over the aircraft and the control surfaces will begin to be more effective, meaning less pressure will be applied by the pilot for the control to apply a force. Upon reaching Vr, gently pull back on the stick while maintaining right rudder pressure. The nose gear will lift off from the runway surface as the tail gently moves down due to the elevator control pressure. The pitch attitude that you use to lift off from the runway must be constant. Abrupt or excessive pitch adjustments can cause the aircraft to reach a critical angle of attack, or AOA (the angle of attack where lift decreases rapidly), and stall or settle back to the runway.

As the aircraft lifts off from the runway, monitor its rate of climb to ensure that we have a “positive” rate of climb, and the aircraft is climbing. Verify this by using outside visual reference points and the vertical speed indicator within the cockpit to ensure a positive rate of climb. Make sure to look at the wings to ensure they are not banking due to left turning tendencies. Additionally, watch the airspeed indicator and the rate of movement outside the aircraft to ensure that you are pitching for best rate of climb, or Vy.

Remember, Vy is different for every aircraft and depends on gross weight before takeoff. USU student pilots are to check the DA-40 Airplane Flight Manual or AFM to verify Vy before takeoff.

Use pitch attitude adjustments to pitch for Vy. Account for an increase in airspeed just as you leave the runway. But as you leave ground effect (a phenomenon that decreases drag due to the airplane’s proximity to the ground) expect an increase in pitch attitude and a decrease in attitude. Adjust by pitching down and monitoring changes in airspeed.

**Initial Climb**

Continue to use pitch attitude adjustments to pitch for Vy. Failure to properly pitch and trim for Vy can result in a low altitude stall due to the critical pitch AOA being so close to the pitch needed for Vy, or an early cruise climb attitude that may not give student pilots

enough time to recover from a possible emergency. Too much pulling back on the stick will result in a stall. Not enough pulling back on the stick will result in a cruise climb.

It is important to remember that when maximum power is set, left turning tendencies will be there greatest. A change in heading due to poor directional control from the rudder can cause a change in ground track. All pilots are recommended to maintain a ground track that would be parallel to extending the centerline of the runway beyond the runway until beginning their pattern or departure procedures or an emergency arises.

Continue to scan both outside and inside the aircraft to monitor its performance. An effective scan can help in detecting hazards to the flight as well as allowing the student pilot to maintain situational awareness and stay ahead of the aircraft. Monitor the climb up to a safe maneuvering altitude and 500 ft. AGL. Complete all checklist items and continue to the next phase of flight.

**Common Errors**

Not every maneuver or lesson pilots do will be perfect, but there are some errors that can be accounted for in written instruction. These are common errors performed during the Normal Takeoff:

1. Failure to review the AFM and performance charts during pre-flight
2. Failure to ensure the runway is clear before taxiing into position for takeoff
3. Jamming the throttle instead of smoothly advancing to full power
4. Failure to monitor engine instruments after applying takeoff power
5. Not anticipating or correcting for left turning tendencies with the rudder
6. Chasing the airspeed indicator instead of maintaining a proper visual scan of both outside references and engine instrument indications
7. Not pitching for and maintaining a proper lift off attitude
8. Overcontrolling the stick during rotation and pitching
9. Failing to use proper elevator trim to assist in maintaining pitch
10. Failing to recognize wing drop off due to left turning tendencies
11. Not maintaining Vy on initial climb

## Normal Landing

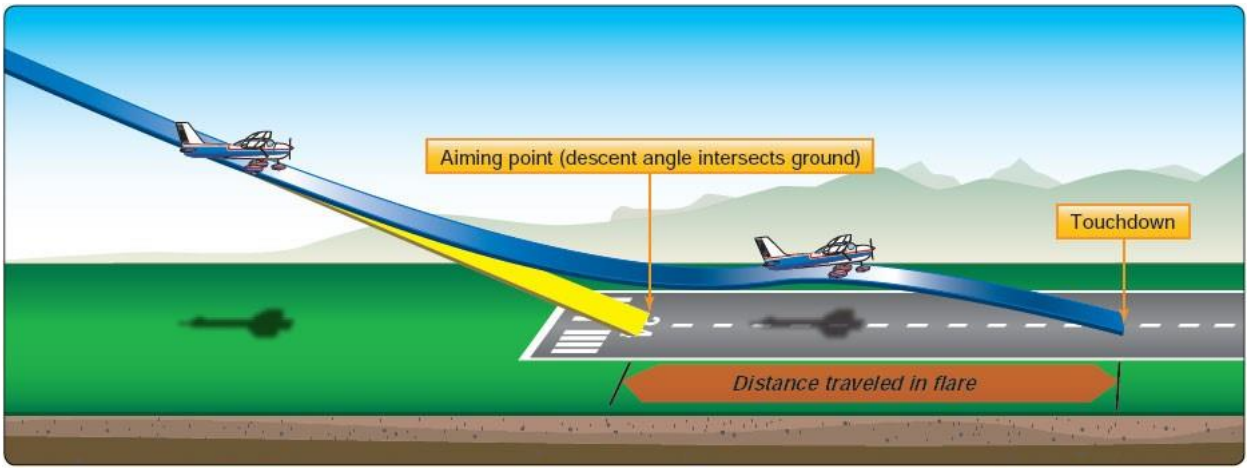
In Chapter Eight of the Airplane Flying Handbook, it gives a popular saying describing the reality of landings: "…that while takeoff is optional, landing is mandatory." A Normal Landing is the process of an airplane transitioning from the air back down to the ground. Similar to a Normal Takeoff, a Normal Landing is a landing performed with either calm winds or a direct headwind/tailwind.

For USU student pilots, all non-emergency landings will be performed to an approved airport on a paved runway surface that has sufficient length for the landing roll. Landing roll will be calculated during preflight calculations to confirm that either current or forecast weather, wind speed and direction, density altitude, temperature, and weight, landing can be performed from the approved runway surface. All landing rolls should start at a selected landing point, a point within the first third of the available landing distance that an aircraft can safely execute the landing roll.

All landings must be done from a stabilized approach. A stabilized approach has been defined by the FAA as an approach performed by a pilot that "establishes and maintains a constant angle glidepath towards a predetermined point on the landing runway." This concept will be discussed further throughout the lesson. Each landing performed in an airplane can be divided into five phases:

1. **Base Leg**
2. **Final Approach**
3. **Round-out (Flare)**
4. **Touchdown**
5. **After-landing Roll**

In this lesson, we will cover the key components and steps of each of these five phases in order to accomplish a Normal Landing.



**Base Leg**

A good Normal Landing from a stabilized approach all begins with the base leg. The base leg is the second-to-last leg of the traffic pattern before turning into the final approach. Judging the altitude, descent, and distance across the ground required to fly a base leg to set up for a stabilized final approach is incredibly important for every pilot and takes a lot of practice. It is often the difference maker between a stabilized approach to a good landing and an unstabilized approach to a go around or worse, a bad landing.

After completing the descent approach checklist on the downwind leg and flying abeam a selected landing point, we begin our descent from the traffic pattern altitude of 1000 ft above the runway surface. Our turn to base will depend on different factors:

1. Wind speed and direction
2. Rate of descent
3. Use of flaps

Wind speed and direction is a key component in determining the position of the base leg because the stronger a headwind is across the runway, the closer the position of the base leg to the runway needs to be. This is to aid with wind drift correction. As we are turning to base, we are intercepting a crosswind that is acting parallel with the direction of the runway but perpendicular to our course. A closer turn and position of base leg aids in staying close to the runway and accounting for potential drift. Additionally, ensure that a proper crosswind correction is being used to account for the sudden change in wind direction and speed. The crab method should be used on the base leg, with rudder pressure being applied into the wind in order to maintain a rectangular pattern leg ground track. Watch

For airspeed on descent, the Airplane Flying Handbook recommends a speed of 1.4 Vso, or the stalling speed with full flaps. In the DA-40 handbook, Vso is listed as 49 knots at maximum weight, so it is recommended to use a speed of around 70 knots, with or without flaps. Remember, airspeed can also be determined by traffic in the traffic pattern. It is not uncommon for most towered airports to instruct small GA aircraft to go through an approach at well past 1.4 Vso. These are only recommended speeds, and instructor/pilot's judgement should be used to find the best speed for the situation.

The rate of descent will be determined by both wind speed and the use of flaps. Flaps are not necessary for landing; in fact, many unknowing student pilots will make the mistake at some point in their careers for not checking that flaps are operational after a witty instructor pulls the circuit breaker for them. However, they will continue to a landing, albeit with very different performance characteristics through the landing. In some cases, it is best to wait to put flaps in or leave landing flaps out in order to make a stabilized approach. Additionally, remember that each flap setting corresponds to

adjustments in lift and drag. Takeoff flaps are better for generating more lift in a low airspeed condition, but landing flaps are better for generating more drag.
If flaps have been put in, expect a steeper rate of descent on the base leg, as compared to a no flap descent. Steeper descents should be completed closer to the runway threshold, as a steeper rate of descent will put you on glidepath sooner and lower to the runway surface than a shallow rate of descent. Begin the base to final turn once all checklist items have been completed, a radio call has been made, and the final approach leg has been verified as clear.

A shallow to medium banked turn should be completed to set up the final approach. The steeper the bank of the base to final turn, the likelier a stall is to develop due to the loss of lift. This is due to a net loss of lift as you bank and descend. Stay coordinated through the turn, verifying with the slip skid indicator that the turn is coordinated. Remember that for USU operations, no turn beyond 30 degrees of bank angle is allowed. As the turn is completed, consider the radius and rate of turn. Use visual references such as the runway threshold and a glideslope indicator if present to estimate the turn. Ensure that a descent is still occurring. After completing the base to final turn, the aircraft should be set up on the final approach, on an extended centerline path from the runway, ready to begin a constant angle glidepath to the aiming point and selected landing point.
If the final approach path has been overshot or undershot, make a quick decision to either get back on the final approach glidepath or execute a go around. Do not risk the safety of the flight by overbanking back onto the final approach glidepath if an overshot has occur. Overbanking leads to airplane closer to a low altitude stall into an unrecoverable spin. Remember to monitor the skip skid indicator to verify the bank angle and rudder pressure being used and if any corrections need to be made.

**Final Approach**

On the final approach leg, the components of a stabilized approach play an important role in the remainder of the landing. Similar to a Normal Takeoff, we now begin the concepts of pitching for airspeed to maintain a constant airspeed down to the runway. However, we now have the ability to make adjustments in power with the throttle throughout the final approach.

A common saying that instructors will use to describe how to maintain a constant angle glidepath down to the runway is “pitch for airspeed, power for altitude.” Similar to the Normal Takeoff, we make adjustments in pitch to maintain a given airspeed. A helpful tip is to trim the airplane for a constant rate of descent after establishing base so less adjustments need to be made. While on final approach, it is recommended to make descent at a constant airspeed of 1.3 Vso, or around 66 knots, similar to Vy.
Remember, if flaps have been used a steeper rate of descent will be made, even if it is a constant airspeed. Account for this when positioning the base leg *and* when applying landing or full flaps on final approach.

Power is a new concept that we can adjust while on final. Power correlates to changes in altitude; an increase in power means an increase in altitude because we are increasing the airspeed over the wings which increases lift. A decrease in power means a decrease in altitude because we are decreasing the airspeed over the wings which decreases lift.

When on final approach, a combination of power and pitch attitude adjustments must be made to maintain a constant angle glidepath for a stabilized approach. At Logan-Cache Airport, we have the benefit of a glidepath indicator that allows us to determine the quality of our constant angle glidepath approach. However, not all airports and runways will have a convenient glide path indicator. It is important to gain a familiarity with rate of descent using outside reference points such as depth perception of the runway and an artificial horizon.

There are many solutions to glidepath errors that can help maintain a constant angle glidepath. It is important to consider with each solution the resultant effect on the four fundamental forces of the aircraft. For example, if the pilot judges the aircraft is too high on final approach, then it is necessary to take out some power. However, taking out some power and not accounting for a decrease in airspeed when this occurs may cause the plane to regain glidepath but at too low of an airspeed. If the airspeed is too low on final approach, a decrease in pitch and an increase in power are necessary to raise the airspeed but maintain the stabilized approach.

This is why a combination of pitch and power adjustments are needed in order to maintain a constant angle glidepath to the runway. Once established on the final approach with the airplane configured and trimmed as well as power setting, pitch attitude and airspeed are set, select an aiming point on the runway. The aiming point is used as the point to begin the round-out (flare) phase and is the point on the runway which an aircraft would strike if it were to continue a constant angle glidepath to the runway. Although we will not land at this point, it accounts for the round-out and touchdown phases of landing. A stabilized approach will have the aircraft making very little power and pitch adjustments at a constant airspeed and constant pitch attitude down to that aiming point on the runway environment.

Finally, as you near the runway on the final approach glidepath, begin adjusting your line of site further down the runway from your aiming point. Do not look at your selected landing point but rather down the runway at its horizon. As airspeed decreases and power is set to idle, adjust vision closer to the aircraft in order to make more timely adjustments in pitch and power.

**Round-out (Flare)**

The round-out (sometimes called the flare) is the slow and smooth transition from the stabilized approach attitude to a touchdown landing attitude. As we near the runway landing area from our final approach leg, we need to make some final adjustments before the airplane can touchdown. Round-out is the process of adjusting the attitude and airspeed of the aircraft to allow a smooth touchdown from the stabilized approach.

A round-out will begin around 10 to 20 feet above the runway surface, ideally above our aiming point. Once we have confirmed that the runway can be made from our descent, power has been set to idle and the aircraft has been configured for landing, a gradual pull back on the stick will be applied to level off the descent and set up our landing pitch attitude. This will increase the angle of attack and cause a momentary increase in lift but will continue to decrease the airspeed to a slower, more suitable speed for touchdown.

Airspeed management is critical the closer the airplane gets to the ground. Excessive airspeed can lead to a delayed touchdown by “floating” or “ballooning” down the runway. Both are processes of the aircraft gaining lift and engaging in a delayed descent or momentary climb to a stall. Low airspeed can lead to an early stall as round-out occurs and the pitch attitude is gently increased with decreasing airspeed. Expect a hard landing as a result of low airspeed, and a hard landing can lead to a bounce or loss of control either on or just above the runway surface.

Begin using outside visual references to determine height above ground, rate of descent, and the pitch attitude for a smooth gradual touchdown. Additionally, use quick glances at the aircraft’s instrument panel to determine height above ground and airspeed. Use these numbers and feelings to adjust the rate of the round-out. A sinking round-out requires more speed and more lift while an early, high round-out requires airspeed to bleed off quicker to glide down to the selected landing point.

Changes in these outside visual references help determine adjustments needed in pitch attitude and power. If the runway begins to move up and closer to you at faster rate than normal, adjust by pitching the attitude back gently. If the runway is not moving closer to the aircraft at all, the plane is leveling off; ensure full flaps are being used as “floating” above the runway is a sign of low drag and pitch up to bleed off airspeed and lift. Remember to use small corrections throughout the round-out process as they are key to a smooth approach and landing. Overcontrolling the stick can cause loss of control close to the ground.

If a round-out is too low or too high, use combinations of pitch and minimal power inputs to adjust attitude, positive control, rate of descent, and airspeed to bring the wheels of the airplane within a few inches off the ground at a controlled rate. Never try to stretch a glide to the desired landing point; it is considered to be a harmful practice to sacrifice a

good landing to land at a specific point. If the plane begins sinking to the ground during the round out, apply minimal power and pitch up if the plane has excess airspeed in order to regain a positively controlled round-out. However, if the plane is sinking and there is little airspeed, abort the round-out and execute an immediate go-around as the plane is stalling to the ground.

Continue using gradual back elevator pressure and any other changes in pitch attitude and power to hold the airplane a few inches off the ground and allow the airspeed to bleed off. As of this moment, the airplane should be in a slightly nose high attitude, with the airspeed slowly decreasing down into the stall speeds. Begin adjusting vision closer to the desired landing spot. Remember to keep the airplane over the centerline of the runway. If the plane starts to drift laterally, use aileron pressure to realign the longitudinal axis back over the centerline. The goal for the touchdown is to land in a “semi-stalled condition” on the selected landing point. The airplane is nearing a stall but is still under positive control as it settles to the runway on the main landing gear. When the main landing gear are within a few inches of the runway, the round-out phase is complete.

**Touchdown**

While the airplane is gliding a few inches across the ground, hold the landing pitch attitude constant. The landing pitch attitude should have the nose gear higher off the ground than the main landing gear while allowing airspeed and subsequently lift to gently bleed off. Instead of flying the airplane across the runway surface, we are gliding it to land in a semi-stalled condition. In order to continue holding the landing pitch attitude constant as airspeed decreases, apply more lift from the wings’ angle of attack by gradually increasing back pressure on the stick as necessary. If the plane wants to take off again from increased pressure on the stick, then hold the stick steady until more airspeed has bled off.

Make sure that the airplane rounds-out with lower airspeed. If the airplane is continuing to fly across the ground with excessive airspeed, the plane may continue to float in ground effect or, if the landing gear do come in contact with the runway surface, skip across the ground. Avoid this from happening by holding back elevator pressure and allowing the airspeed to bleed off until the aircraft settles on the main landing gear.

As it does, continue to hold the pitch up with back elevator pressure. Once we can confirm that the weight has moved to the wheels from the wings, smoothly release back pressure to allow the nose gear to touch the ground. Do not let the nose gear fall to the ground uncontrolled, as this may lead to a momentary loss of control and damage to the nose gear structure.

Gently hold some back-elevator pressure and gain directional control of the aircraft using the rudder. Do not use the toe brakes yet as uncontrolled braking could lead to a loss of directional control shortly after touchdown. Take out any flaps that may have been used on landing and begin to use gradual pressure input on the brakes as the airplane continues to slow to a taxi.

Do not land on the nose gear. Landing directly on the nose gear is a very hazardous process and can cause many aspects of the landing to go wrong. Wheel barrowing can occur, and the aircraft loses directional control at a high speed on the runway, with very little braking available as braking is only on the main landing gear. If fast and hard enough, landing on the nose gear can cause a bounce and/or a porpoise, violently rebounding the aircraft back into the air at very low airspeed situation. If any of these situations occur, immediately go around. Saving the landing is too dangerous.

**After-landing Roll**

Although all three wheels may be on the ground, the landing still is not done. The plane must continue to slow down aerodynamically before we can use the brakes safely. Use light rudder pressure to maintain directional control and keep the longitudinal axis of the aircraft on centerline. Additionally, continue to use aerodynamic braking by using back elevator pressure.

Once the airplane has slowed down to a safe taxiing speed, use brakes as necessary to steer the aircraft onto a taxiway or to slow to a stop. Run through any after landing checklist items and exit the runway area or begin a takeoff for a touch-and-go or a stop-and-go.

Avoid using excessive braking once all three-landing gear are on the ground. Excessive braking can lead to uneven brake pressure along the landing gear. At high taxi speeds, excessive braking can lead to a loss of directional control and an inability to maintain centerline.

Additionally, avoid turning at high taxi speeds. Similar to a car, the tires of the landing gear provide ground friction, but a high-speed turn can overcome this ground friction causing the plane to tip. If braking is performed while in the turn, a skid could occur, damaging the tires and also potentially causing a tip.

**Errors**

Not every maneuver or lesson pilots do will be perfect, but there are some errors that can be accounted for in written instruction. These are common errors performed during the Normal Landing:

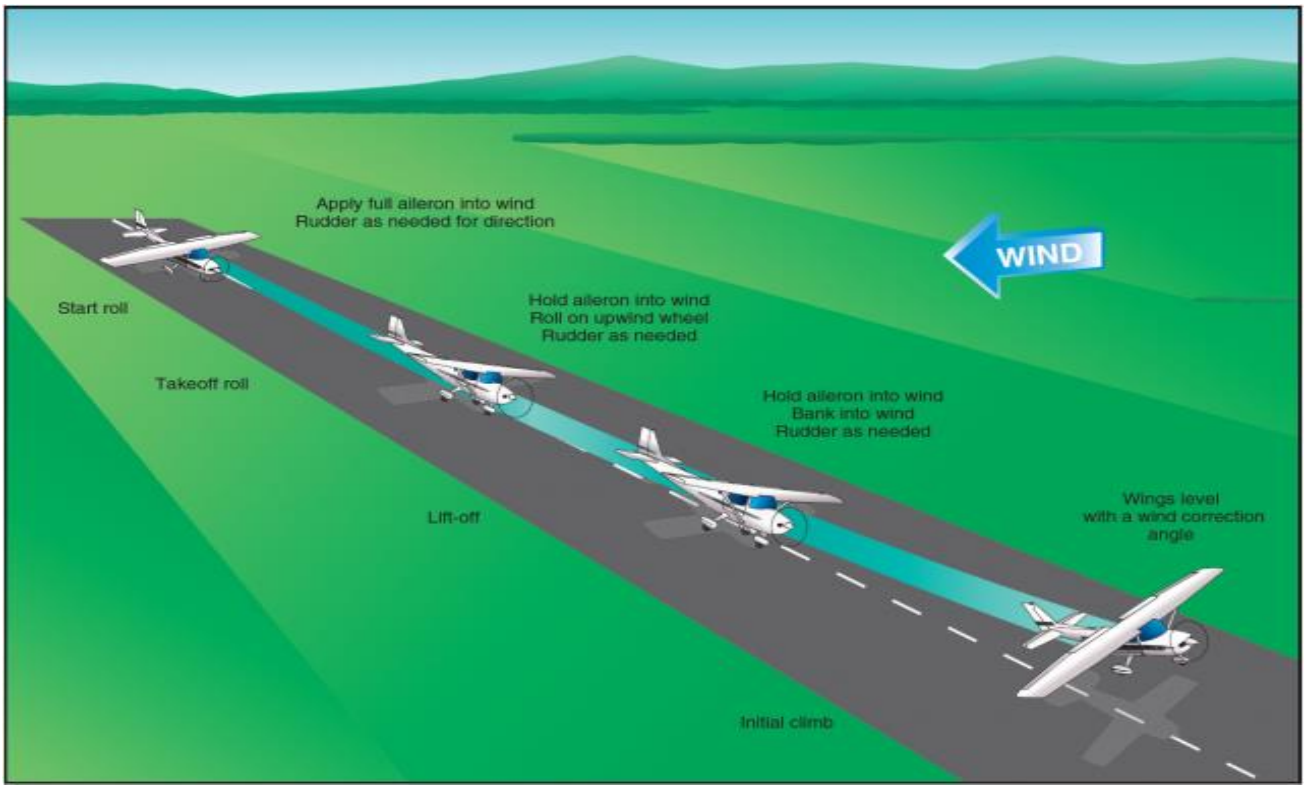
1. Inadequate wind correction on base leg
2. Overshooting or undershooting the base to final turn
3. Overbanking, skidding, or flat turning to correct for the base to final turn
4. Uncoordinated during base to final turn
5. Incomplete landing checklist
6. Unstabilized approach
7. Failure to account for the use of flaps
8. Poor use of trim
9. Stretching the glide to make the runway with only pitch adjustment and not power
10. Not looking down the runway horizon to verify round out
11. Looking well past the runway horizon to verify round out
12. Touching down before achieving proper landing attitude
13. Failure to hold sufficient back elevator pressure for the landing attitude on touchdown
14. Excessive braking on after-landing roll
15. Losing positive control at any time

## Crosswind Takeoff

Expanding off the Normal Takeoff Lesson, a Crosswind Takeoff uses many of these same concepts. The difference is that now the pilot must account for the crosswind. A crosswind is a wind that comes at an angle, it has a parallel (headwind/tailwind and perpendicular component to the direction of the airplane's movement. Throughout the phases of takeoff, pilots must correct for this crosswind using various correction techniques and knowledge gained from practice and experience. Again, we will be discussing the crosswind takeoff in four different phases:

- **Before Takeoff**
- **Takeoff Roll**
- **Lift-off (Rotation)**
- **Initial Climb**

Each phase will review some of the basic principles discussed in Normal Takeoff but will mainly focus on the key components and steps of correcting for a crosswind throughout the Crosswind Takeoff and departure climb.




**Before Takeoff**

Similar to a Normal Takeoff, we have steps to complete before beginning our takeoff roll. However, for a Crosswind Takeoff, we now have a crosswind to consider

throughout taxi and ground operations. In order to correct for a crosswind throughout taxi and ground operations we must:

1. Verify wind speed and direction, using the windsock and reported surface conditions
2. Consider how that wind speed and direction will affect our aircraft using the Wind Components Chart during our preflight calculations
3. Determine which runway to use in order to correct for the crosswind

Remember, the most optimal takeoff is one that can be performed with the most amount of headwind. So, for example, the winds from the METAR (Meteorological Aerodrome Report) for Logan-Cache Airport for the day are *from* a 300º heading at 10 knots. We have northwesterly winds and we could use Runway 35 for takeoff, but we will have a crosswind component of nearly 8 knots, coming at a quarterly headwind direction.

Considering the difference between our desired heading and wind speed and direction is important for using a proper crosswind correction during takeoff. In the example, instead of using Runway 35, we could use Runway 28 for takeoff. Runway 28 has a more optimal heading, because we have less of a crosswind component and more of a headwind component.

However, in some cases, taking off with a strong crosswind is inevitable and will happen at some point in nearly every pilot's career. Being able to correct for a crosswind while on the ground or in the air is a necessary skill to our careers. After identifying the direction and speed of the winds while on the ground, taxiing using aileron and elevator pressures to correct for the crosswind.

The idea of crosswind correction is to prevent the crosswind from picking up the upwind wing and shifting the weight of the plane. If the crosswind is a quartering headwind, we must use aileron pressure *into* the wind while keeping the elevators neutral. If the crosswind is a quartering tailwind, push the stick forward to keep the elevators down and apply aileron pressure *away* from the wind.

**Takeoff Roll**

After taxiing into position for takeoff, apply *full* aileron pressure into the crosswind. After applying full throttle to set takeoff power, continue to hold that aileron pressure into the wind. Additionally, make sure to watch out for the aircraft's tendency to weathervane when a crosswind is present.

Weathervaning is the process of a crosswind hitting the "side profile" of an aircraft and turning it into the wind. This happens because the Center of Gravity, or CG is located more forward in the aircraft, meaning that more of the profile of the aircraft is behind the CG. When the wind hits the aircraft, the fuselage tends to rotate about the CG and the

directional axis *into* the wind. To correct for weathervaning, use the rudder to keep the aircraft directionally controlled on centerline.

Notice that depending on the direction of the crosswind, either the aileron pressure or rudder pressure will be difficult to maintain. A crosswind from the right is easier to control with the rudder, but difficult to control with aileron due to left turning tendencies.

A crosswind from the left is difficult to control with the rudder due to left yawing tendencies, but easier to control with the aileron. As airspeed increases and the aircraft accelerates down the runway surface, less aileron and rudder pressure is needed to maintain centerline due to increased airflow over the control surfaces.

Do not let the upwind wing rise due to the crosswind. Allowing the upwind wing to rise can cause the weight to be distributed to the downwind main landing gear. If this occurs, the airplane can skip across the ground as one landing gear is supporting the entire weight of the aircraft. This imposes a severe side load on the main landing gear and the entire structure can collapse due to the weight.

**Lift-off (Rotation)**

As the aircraft accelerates to Vr, continue to keep the crosswind correction into the wind with the aileron. At high speeds, this aileron correction can cause the downwind wheel to lift off from the ground early and the rest of lift off performed on one wheel. This is an acceptable practice as more of the weight of the aircraft is on the wings as lift occurs instead of the wheel.

The aircraft has an increased tendency to drift as it lifts off from the ground. When the wheels are off the runway surface, ground friction is no longer a stabilizing force that keeps the aircraft on an extended centerline ground track. Account for this with gradual increases in pressure from both the aileron and the rudder.

Remember to use outside visual references and instrument indications to monitor aircraft performance. Additionally, with a crosswind, a proper visual scan of both outside and inside the aircraft can aid in navigating the aircraft with a strong crosswind.
With strong, gusty winds, it is advised to keep the landing gear on the runway surface longer. Do not force the plane on the ground but merely hold off on rotating. Use a higher rotation speed. This is done to ensure that positive static and dynamic control can be maintained after liftoff as the increase in airspeed allows control surfaces to generate more force.
**Initial Climb**

Upon establishing a positive rate of climb and reaching a safe maneuvering altitude, begin to gradually take out the crosswind correction. The crosswind correction used on

takeoff is known as a “sideslip”. A sideslip is the use of aileron to dip the wings *into* a crosswind in order to keep a desired ground track. At higher altitudes and airspeeds, it is advised that more rudder pressure be used to point the nose and correct for a crosswind. This is known as a “crab”. Crabbing is easier to maintain and safer, as the airplane is in a more stabilized and level flying attitude than in a sideslip

Continue using the crab crosswind correction method and the principles learned in the Normal Takeoff Lesson for the remainder of the departure climb.

**Errors**

Not every maneuver or lesson pilots do will be perfect, but there are some errors that can be accounted for in written instruction. These are common errors performed during the Crosswind Takeoff:

1. Failure to review the AFM and performance charts during pre-flight
2. Failure to ensure the runway is clear before taxiing into position for takeoff
3. Not using *full* aileron pressure into the wind
4. Inability to determine necessary crosswind correction based off outside visual references and proper aileron correction
5. Side-skipping due to improper crosswind correction
6. Not using enough rudder pressure to maintain centerline during takeoff roll and extended centerline on lift-off and initial climb
7. Using *too much* aileron during lift-off and initial climb, resulting in a sudden bank as aircraft lifts off
8. Not accounting for crosswind speed and direction and allowing aircraft to drift off desired ground track

## Cross Wind Landing

Adding to the already tricky and highly technical nature of a landing, crosswinds continue to challenge the knowledge and execution of landing skills. The fundamental principles are similar to the Normal Landing; however, we must now correct for a crosswind throughout the phases of landing. Again, we will break down the techniques used for a Crosswind Landing using the five phases:

- **Base Leg**
- **Final Approach**
- **Round-out (Flare)**
- **Touchdown**
- **After-landing Roll**

In each phase, key components and principles discussed in the Normal Landing Lesson will be reviewed, but the focus will be on new key components and principles for a proper Crosswind Landing

**Base Leg**

Base is similar to a normal takeoff. During the descent approach and landing checklists, pay close attention to the wind speed and direction to consider the effect the winds will have on the aircraft throughout the Crosswind Landing. Remember to verify in the AFM that the landing can even be attempted given the max demonstrated crosswind. If the crosswind exceeds the maximum demonstrated crosswind limitation, use another runway or find an alternate. Additionally, consider the position of the base leg relative to the runway as well as airspeed and rate of descent. For higher speed crosswinds, use a faster descent airspeed, but not rate of descent, in order to retain positive control throughout descent and landing.

Throughout the base leg, monitor and verify ground track with outside visual references and instrument indications. Continue to use the crab method by pointing the nose into the wind with the rudder to maintain desired ground track on the base leg and pay close attention to ground track during the turn. Use knowledge from maneuvering in crosswinds and consideration of a crosswinds effect on the descending base to final turn to complete a coordinated turn to the final approach leg. Remember that throughout the landing process, as airspeed decreases, the headwind component of the crosswind decreases but the crosswind component remains constant. Correct for the constant crosswind using appropriate rudder, aileron, and pitch pressures and corrections throughout the turn; it may be necessary to use increased control pressure near touchdown and the landing roll than during the base and final descents. Consider how the decreasing headwind may negatively affect performance.

**Final Approach**

Once established on final approach, it is time to make a key decision to the rest of the approach and landing: crosswind correction method. Essentially, there are two methods to use in order to correct for a crosswind:

1. Crab Method
2. Sideslip Method

The crab method is similar to what is used throughout most flight procedures. Using rudder pressure, we point the nose of the aircraft into the wind in order to maintain a desired ground track. This occurs because the plane flies in the direction the nose is pointed, but with a crosswind pushing us from the side, we must account for it. So, we put the nose into the wind and allow the wind to push us along our desired ground track.


However, now as we descend on final approach, we must consider the altitude and rate of descent element. Applying proper pitch and power adjustments is necessary for maintaining a stabilized approach, but now pitch is more determined by the ailerons than the elevators. When we are turned into the wind but flying along our desired ground track “at an angle”, raising and lowering the wings acts more as pitch control than elevator pressures. The longitudinal axis acts more as the lateral axis when the airplane is crabbed into the wind.

Because of this, we need to make adjustments in airspeed by altering *bank* instead of pitch. If we begin to lose airspeed, bank towards the runway to increase airspeed, similar to how on a Normal Landing, we apply forward pitch pressure to increase our descent airspeed.

The sideslip method is different to the crab method but is similar to a crosswind correction on takeoff and tends to work better for smaller, lighter airplanes. For the sideslip method, the nose stays pointed down the desired track instead of rudder pressure used to point the nose in the direction of the crosswind. Now, aileron pressure is used into the wind. Essentially, it a continuous turn into the wind with opposite rudder being used to keep the longitudinal axis on the desired track.


This method is only recommended for a short time and in low speed, low altitude conditions. In fact, the Airplane Flying Handbook recommends that for long final approaches and pattern work, using a crab then changing into a sideslip is the best practice for crosswind correction. In both methods, continue to the principles of power adjustment similar to a Normal Landing and make small corrections to account for and maintain a constant angle glidepath to the aiming point on a stabilized approach.

Continue to fly a stabilized approach to the runway. Remember to pitch/bank for airspeed and power for altitude to maintain a constant angle glidepath and to stay maintain positive control about all three axes the entire approach. Additionally, consider that with either method, drag will be significantly increased due to the orientation of the aircraft. Upon reaching a height of 10 to 20 feet above the runway area, begin the round out while continuing to use the crosswind correction method selected. If at any time during the final approach leg the crosswind correction cannot be maintained or does not sufficiently correct for the crosswind, execute a go around and either land on a different runway or navigate to an alternate airport.

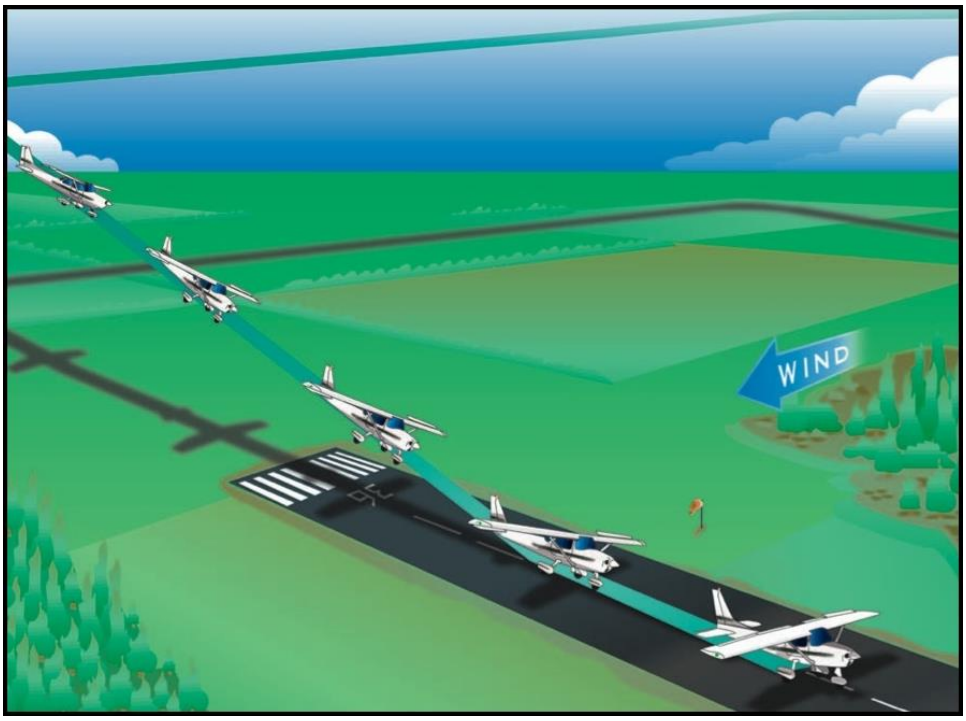
**Round-out (Flare)**

The round-out or flare can be performed in either the crab or sideslip method. Upon entering the round-out 10-20 feet above the runway, begin to pitch or bank to level the wings. Ensure that power is at idle, or in high winds are present, minimal power is input

to maintain positive control. All flaps to be used for the landing should also be configured as well.

As the aircraft pitches and banks to the required landing and touchdown attitudes, a proper visual scan becomes more important. Continue to look down the runway, slowly moving vision closer as airspeed begins to bleed off and make adjustments in pitch and bank to adjust the rate of round out. Look out and react as quickly as possible to changes in wind speed and direction, as both can change drastically between the beginning of a descent and the round-out and touchdown phases.

Remember that with decreased airspeed, all the control surfaces will be less effective than at higher airspeeds due to the lowered headwind component. More input on the ailerons, elevators, and rudder is needed in order to maintain a crosswind correction during the round-out. Use more back-elevator pressure to increase and maintain the landing pitch attitude while allowing the airspeed to bleed off. We want to be gliding across the runway in order to land in a semi-stalled condition with the landing gear easing on to the runway, not being forced or uncontrollably contacting the runway. Use the rudder and/or ailerons to maintain runway centerline as the plane nears the runway surface.




If a crab method is being used, during the transition to the touchdown phase, it is necessary to “kick” the plane back into a heading that lines up the nose with the centerline and begin to use a sideslip method for the last few moments before touchdown. Be aware that the sudden movements of removing a crab and entering a

sideslip need to be performed quickly and precisely in a low altitude setting and that changes in airspeed, lift, and directional control may occur.

Additionally, landing while still in a crab can causes the airplane to drift while landing and impose severe side loads on the main landing gear. The longitudinal axis must be lined up with the centerline of the runway before landing, regardless of the crosswind correction used throughout the final approach and beginning round-out phases.

**Touchdown**

When the landing gear tires are a few inches off the runway surface, ensure that a sideslip crosswind correction is being used and that a slightly nose high landing pitch attitude has been set that provides minimal lift as the aircraft glides across the runway to its selected landing point. Minimal airspeed should be used unless high winds are present, then more airspeed should be used to maintain positive control. Increasing rudder and control surface pressures will also help with maintaining centerline as decreasing airspeed forces the need for more force generated from these surface control pressures.

Use aileron pressure into the wind to maintain centerline and keep the upwind wing lowered into the wind. It is acceptable if the upwind main landing gear is lower than its counterpart and is even considered a good practice if it touches down first. Most of the weight is still being supported by the wings, and as airspeed bleeds off, the stability of the aircraft and ground friction of the tires will cause the plane to remain level on the runway surface. Once the upwind wheel has been smoothly planted on the runway, allow the downwind wing to lower and settle the downwind landing gear to the runway.

Remember to hold the nose wheel off until it can be lowered in a controlled manner. Continue to hold aileron pressure into the wind. Just because the aircraft has all three wheels on the ground does not mean that it has completed a Crosswind Landing. If the wind increases at any time throughout touchdown and inadequate aileron pressures are being used, the upwind wing can rise. This will cause the downwind wing to fall and can cause the downwind landing gear to contact the runway surface early, causing a side-skipping landing that imposes severe side loads on the landing gear and can lead to a loss of control. Even after touchdown, if the winds pick up, the upwind wing can rise and pull the landing gear off the runway, especially at high speeds.

**After-landing Roll**

Similar to a Crosswind Takeoff, stay alert for weathervaning and continue to apply a constant crosswind correction throughout the after-landing roll while using the steps and principles from a Normal Landing. As airspeed decreases throughout the entire landing, the headwind component of the crosswind decreases, imposing more side force on the aircraft as a whole. This side force will be especially prevalent during cornering on taxi.

With a strong crosswind present, even a small side load imposed from cornering can cause the plane to tip. With strong crosswinds, use minimal taxi speeds and lots of crosswind correction.

**Errors**

Not every maneuver or lesson pilots do will be perfect, but there are some errors that can be accounted for in written instruction. These are common errors performed during the Crosswind Landing:

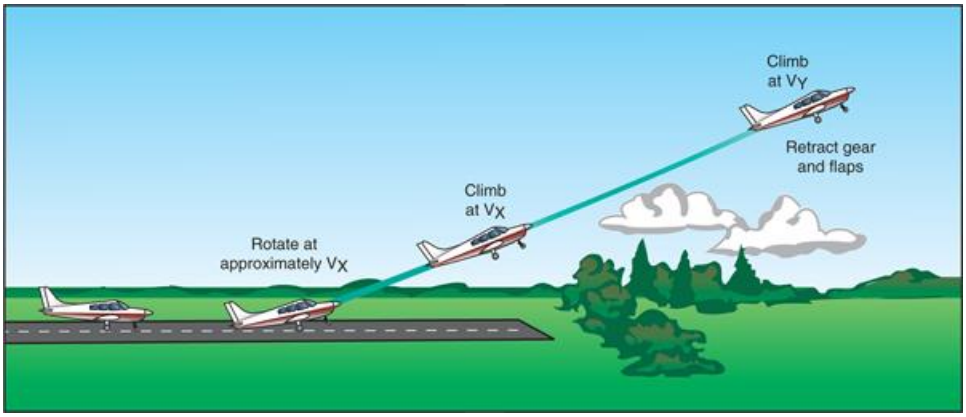
1. Attempting to land in crosswinds that exceed the airplane's maximum demonstrated crosswind limit
2. Inadequate wind correction on base leg
3. Overshooting or undershooting the base to final turn
4. Overbanking, skidding, or flat turning to correct for the base to final turn
5. Uncoordinated during base to final turn
6. Incomplete landing checklist
7. Failure to compensate for increased drag during crosswind correction
8. Touchdown while drifting
9. Excessively high airspeed on touchdown
10. Failure to apply crosswind correction on landing roll
11. Not maintaining directional control on landing roll
12. Excessive braking
13. Loss of directional control at any time

## Short Field Takeoff

A Short Field Takeoff is a Normal or Crosswind Takeoff performed from a shorter runway surface or a runway with obstacles at the opposite end that can affect a Normal initial climb. It is a takeoff that can still be made safely, but using proper technique, we can shorten our takeoff roll, maximize acceleration, and lift off into our maximum initial climb with as much runway remaining as possible. The concepts of both a Normal and Crosswind Takeoff still apply, and so we will continue to break down this takeoff into the four different phases:

1. **Before Takeoff**
2. **Takeoff Roll**
3. **Lift-off (Rotation)**
4. **Initial Climb**

In each phase, we will briefly review the principles discussed in both a Normal Crosswind Takeoff, but the focus will be on the key components and steps for accomplishing a successful and safe Short Field Takeoff




### Before Takeoff

In the Before Takeoff phase of the Short Field Takeoff there is one major difference between the Short Field and Normal/Crosswind Takeoff: taxi position onto the runway area. Of course, we will have followed all the steps of our other takeoff procedures, but taxiing onto the runway for a Short Field Takeoff we need to consider the following:

1. Available runway distance
2. Any pertinent obstacles that may affect our climb
3. Our Takeoff Roll
4. Our Takeoff Roll over a 50 ft obstacle
5. Vx, or best angle of climb

During our pre-flight we consider all of the above throughout our calculations and takeoff briefing, but for a Short Field Takeoff, these calculations can be more relevant

than a Normal or Crosswind Takeoff. At Logan-Cache Airport, we have upwards of 9000 ft of available takeoff distance on Runway 35/17. And in a DA-40 or 42, our takeoff roll can be as little as 900 ft or as much as 2000 ft of takeoff roll. But what if we are using Runway 28/10 or we are over at Preston Airport, a runway with a little under 3500 ft of available takeoff distance with a cliff drop off at one end. In cases like these, Short Field Takeoff calculations and technique is crucial to maintaining the safety of our flight.

Another good practice for all takeoffs, especially the Short Field Takeoff is, when covering the emergency plan, identify a spot on the runway for when the aircraft must be airborne. By doing this, we can make a safe decision to either continue with the takeoff or abort the takeoff. If the aircraft is not airborne by that point, abort the takeoff and taxi off the runway. During the debrief, consider what may have happened to cause the aircraft to not be airborne.

If all calculations, checklists items, and procedures have been completed and the risks have been accounted for, we can taxi into position for takeoff. For a Short Field Takeoff, we want to use maximum available takeoff distance; in other words, we need to taxi as close to the departure end of runway (DER) as we can to give ourselves the most amount of distance for takeoff roll. At Logan-Cache, that means taxiing as close to the Runway End Identifier Lights (REILs) as allowed, while maintaining caution and close vigilance to ensure wing clearance above the lights. Make sure to use firm and controlled pressure on the brakes and rudder. Once on the runway, use careful power and brake pressure to orient the aircraft onto the centerline and then firmly hold the brakes. If necessary, do not forget to use aileron pressure to account for any crosswind throughout the taxi.

**Takeoff Roll**

Continue to hold firm pressure on the brakes while advancing the throttle to takeoff power. Make sure to use increased pressure on the toes of the feet while keeping the balls of the feet on the rudder. Once full throttle has been used, verify the performance of the engine with the engine instrument indications to ensure that the engine is running smoothly, and that takeoff RPM’s have been set.

When all engine indications have been checked and verified, release the pressure from your toes on the brakes and use the balls of your feet to put in a large amount of pressure on the right rudder to maintain runway centerline. With full power set, and very little airspeed at first, the engine will have significantly increased left yawing tendencies, so expect an initial yaw to the left.

As takeoff roll continues, use less rudder pressure to maintain centerline, as with increased airspeed, the rudder will gain more effectiveness. Maintain a neutral to minimize drag through the takeoff roll. Remember, we want as little drag as possible

through the Short Field Takeoff in order to maximize acceleration. Continue to use the principles, steps, and procedures from a Normal Takeoff. If applicable, use a crosswind correction and other principles, steps, and procedures from a Crosswind Takeoff as well.

**Lift-off (Rotation)**

As the aircraft continues to accelerate down the runway, continue maintaining centerline and, if necessary, applying a crosswind correction. Monitor the engine performance and the overall takeoff roll to ensure that there is enough available takeoff distance for a safe initial climb for the rest of the departure. If at any time it becomes apparent that the aircraft will not be able to make a safe takeoff climb by using a predetermined point on the runway, use emergency procedures to abort the takeoff.

Once the aircraft has lifted off the runway safely at Vr, it is imperative that we use proper pitch attitude and adjustments for Vx, or the best angle of climb. Vx is the speed at which the aircraft can gain the most amount of altitude in the shortest amount of *distance*. This differs from Vy because instead of using rate of climb or time, we use angle of climb or distance. Vx tends to be a few knots slower than Vy. However, Diamond does not have a listed Vx for its airplanes, so we substitute Vy for Vx.
In some cases, there may be a need to lift off at Vy, because we are substituting Vy for Vx, to have a maximum performance climb. Remember to calculate Vy based on your weight before beginning takeoff. If this is the case, maintain neutral elevator past Vr and resist rotating early. Rotating at Vr may not ensure a “maximum performance” climb. Avoid applying forward elevator pressure to force the plane to stay on the ground as this could cause too much weight to fall on the nose gear and a loss of directional control, a process known as wheel barrowing. As the aircraft nears Vy, gently apply a back-elevator pressure on the stick and maintain the pitch attitude for Vy.

**Initial Climb**

Maintaining Vx through the initial climb gives us better clearance from obstacles at the end of the runway and gives us more altitude to work with in the unlikely event of an engine failure. Continue to follow steps and procedures for a Normal Takeoff initial climb to the safe maneuvering altitude during departure climb and, if applicable, use any crosswind correction and procedures for a Crosswind Takeoff initial climb.

**Errors**

Not every maneuver or lesson pilots do will be perfect, but there are some errors that can be accounted for in written instruction. These are common errors performed during the Short Field Takeoff:

1. Failure to review the AFM and performance charts during pre-flight

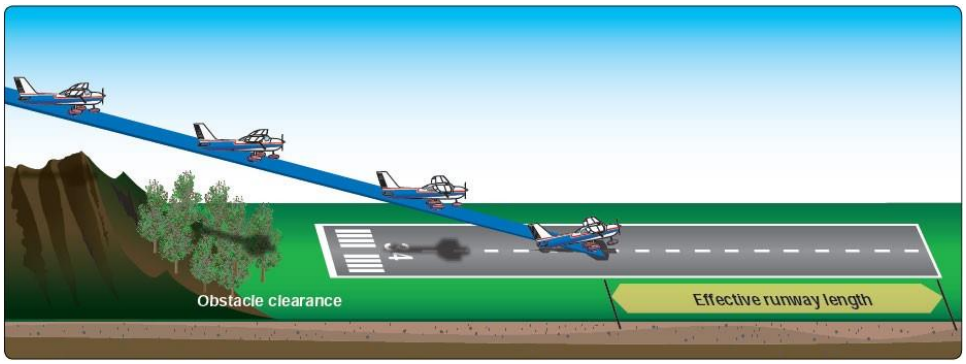
2. Failure to ensure the runway is clear before taxiing into position for takeoff
3. Using less than all available runway takeoff distance
4. Improper trim set for takeoff
5. Lifting off too early
6. Excessive speed after liftoff due to low pitch
7. Inability to maintain Vx
8. Fixating on the airspeed indicator instead of using pitch and proper visual scan to determine airspeed
9. Retracting flaps too early after takeoff

## Short Field Landing

A Short Field Landing is a Normal or Crosswind Landing performed from a shorter runway surface or a runway with obstacles on the approach path to the runway area. It is a landing that can still be made safely given the available landing distance, but proper technique throughout the approach can shorten the landing roll, maximize deceleration, and adjust for obstacles. The components and principles of Normal and Crosswind Landings still apply, so we will continue to break down the landing into five different phases:

1. **Base Leg**
2. **Final Approach**
3. **Round-out (Flare)**
4. **Touchdown**
5. **After-landing roll**

In each phase, we will briefly review the principles discussed in both a Normal Crosswind Takeoff, but the focus will be on the key components and steps for accomplishing a successful and safe Short Field Landing.




### Base Leg

For the most part, the base leg utilizes the same concepts that the Normal and Crosswind Landings use. The only real considerations that need to be made are the position of the base leg in relation to any obstacles on the final approach path or that the final approach leg should be closer to the runway due to a decreased descent airspeed for optimal performance. Additionally, the Airplane Flying Handbook recommends using a slightly wider than normal pattern in order to account for this shortened final approach path. A typical pattern should maintain a horizontal distance between ½ and 1 mile from the runway, so consider using a 1-mile horizontal distance.

Due to the technical skill required on the final approach leg, consider accomplishing all checklist items as well as the use of flaps early in the pattern. Descent should also be

made at the same airspeed (1.4 Vso) as during the base leg but remembering the final approach leg's airspeed is slower can help in positioning the base leg. A base leg that is closer to the runway can account for the lower airspeed while maintaining a constant angle glidepath on final approach if obstacles are present. Continue to use a proper visual scan to estimate and plan how to approach the runway surface if there are obstacles and present as well as make any changes to pitch and power. On the base to final turn, a lower airspeed through the turn requires a shallower bank and a higher degree of coordination.

**Final Approach**

On final approach, establish and maintain a constant angle glidepath that gives optimal clearance from obstacles to the runway aiming point from an altitude of 500 ft AGL. Use a constant airspeed of 1.3 Vso, or around 64 knots, to minimize landing roll. Adjust the constant angle glidepath with adjustments in power and pitch attitude to ensure touchdown as soon as possible from the stabilized approach. With a lowered airspeed, power adjustments need to be timely and precise, as the aircraft can reach the critical angle of attack much sooner than at higher airspeeds.

Any crosswind correction angle may require more pressure than in a Normal Landing as decreased airspeed results in decreased control surface effectiveness. Additionally, any crosswind correction may require increased power in order to remain stable and retain positive control due to increased drag. With a lower airspeed, more power may be needed to maintain a constant angle glidepath for a stabilized approach. As a visual scan is completed, account for the fact that due to the decreased airspeed, the selected landing point will be closer to the aiming point than in a Normal Landing. Additionally, be aware that the round-out phase will take less time than a Normal Landing as well.

**Round-out (Flare)**

As the airplane nears the runway surface, power should be reduced to idle and the aircraft configured at the same time as a Normal Landing, but less altitude will be needed for the round out. This is because less time is needed and available for the airplane to transition into a landing airspeed and attitude due to the lower approach speed. But remember that the Short Field Landing is considered to be an "accuracy landing"; in other words, the aircraft is set to fly to a pre-determined spot with little additional available landing distance either in front of or beyond the selected landing point. Do not stretch the glide during round-out to touchdown to sacrifice a good landing using solely elevator pressure alone but use power and pitch to adjust if needed.

With a steeper angle of descent, ensure that the round-out is made sharper and quicker than in a Normal Landing to avoid descending into the ground harder or stalling quickly due to low airspeed. Remember to account for the quicker round-out with an increase in

drag if a crosswind correction angle is being used. Very little floating should occur during a Short Field Landing.

**Touchdown**

Expect touchdown to be firmer than in a Normal Landing. As discussed in the Normal Landing Lesson, lower airspeeds on approach lead to a stall quicker. Instead of a semi-stalled condition, a stall is more likely to develop at lower airspeeds. Stalls lead to firmer touchdowns as the instantaneous loss of lift forces the landing gear to contact the runway surface harder than in a semi-stalled condition that permits settling of the runway.

However, a Short Field landing is designed for minimal landing roll and maximum drag on landing. Use the principles and steps of a Normal Landing touchdown to ensure the smoothest possible touchdown given the conditions while maintaining positive control. Use rudder and aileron to maintain centerline, especially if a crosswind is present, and a slightly nose high pitch attitude to ensure the main landing gear settle onto the runway. If it becomes apparent that touchdown will be made past the selected landing point, consider using a go-around unless available landing distance still permits a safe landing roll.

**After-landing Roll**

Upon touchdown, begin to use appropriate braking measures to slow the after-landing roll as fast as possible. Do not use excessive brake pressure at high speeds, but brake as necessary. Aerodynamic braking and retraction of flaps are best practices at high speeds and as ground speed is diminished, begin to apply brake pressure with the toes while using the balls of the feet to steer with the rudder.

**Errors**

Not every maneuver or lesson pilots do will be perfect, but there are some errors that can be accounted for in written instruction. These are common errors performed during the Short Field Landing:

1. Failure on base and final to allow enough room for a stabilized approach
2. Overly steep descent, high sink rate
3. Unstabilized approach
4. Delay in glide path adjustments
5. Too low an airspeed on approach
6. Too high an airspeed on approach
7. Reducing power too early
8. Touchdown with excessive airspeed
9. Excessive, uncontrolled braking after touchdown

10. Loss of directional control
11. Failure to go around from an unstabilized approach

## Soft-field Takeoff and Climb

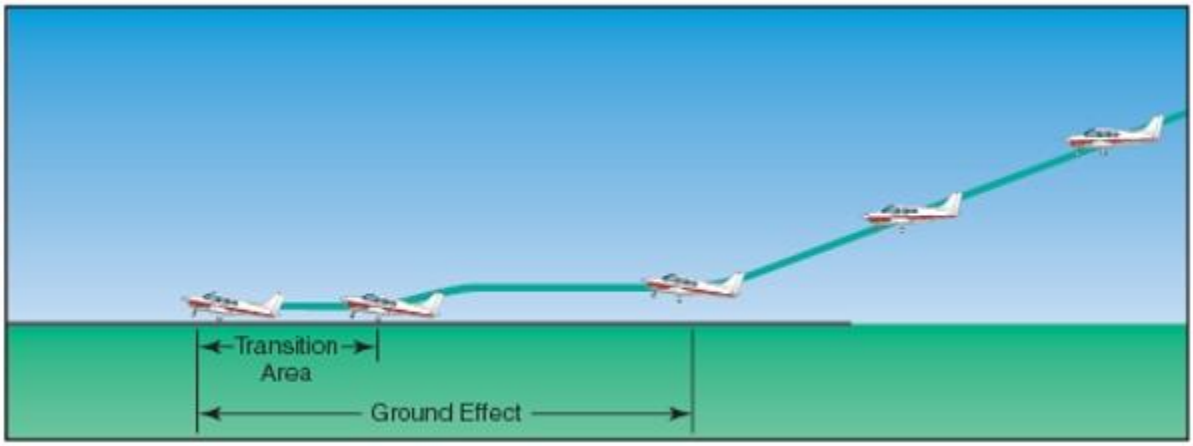
Soft-field takeoffs are practiced to simulate a non-paved, soft, or contaminated runway (grass, snow etc.) Before taxiing onto the runway, the stick or yoke should be in the full aft position. This minimizes the weight on the nose wheel. Stopping is not recommended since the main tires could sink into the 'soft' field. Power is applied smoothly and evenly to avoid Foreign Object and Debris (FOD damage) or sudden yawing movement to the left. As the nose lifts off the ground release back pressure slightly to avoid striking the tail or becoming airborne to soon and resettling back on the runway. Due to ground effect, the aircraft will become airborne below a safe airspeed. Stay in ground effect by remaining one-half the length of the wingspan and accelerate to VY while in ground effect.

Accelerate and climb at: DA40-66 KTS

At 500' AGL you can retract the flaps, perform the Above 500 Feet AGL Checklist. Continue climbing normally and accelerate to: DA40-F- 73 KTS

## Soft Field Landing

Not all airfields have paved runways. Occasionally you will encounter a grass, dirt or sand runway. You might also encounter a paved runway with snow, water, or mud. Landing with this type of environment requires the landing to be done in a certain way in order for a safe landing to occur. The goal of a soft-field landing is to land as smooth as possible and at the slowest airspeed possible so as to not damage any landing gear by excessive drag and pressure due to uneven surfaces in the landing area.




**Base Leg**

The base leg of this maneuver should be done similar to that of a short field landing. Setting up a base leg so that an appropriate approach speed can be obtained for the

final leg. 1.4 VSO is recommended for decent until the final approach leg is obtained. Keep in mind that unlike a short-field landing, the soft-field landing does not need to be setup for a 50 ft clearance and can be done at a normal decent.

**Final Approach**

Final Decent should be done at 1.3 VSO which is around 66 kts for the da 40. As mentioned before there is no obstacle clearance unless an actual obstacle needs to be cleared. Flaps should be used as normal in order to keep the airplane as slow as possible during landing.

**Round-out (Flare)**

The approach for the soft-field landing is similar to the normal approach used for normal or crosswind landings on a hard surface. The major difference between the two is that during the soft-field landing, the airplane is held 1 to 2 feet off the surface in ground effect as long as possible. This allows a more gradual dissipation of forward speed to setup the wheels to touch down gently at minimum speed. This technique minimizes the nose-over forces that quickly affect the airplane at the moment of touchdown. Power is used throughout the level-off and touchdown to ensure touchdown at the slowest possible airspeed, and the airplane is flown onto the ground with the weight fully supported by the wings until ready for touchdown.

**Touchdown**

As touchdown occurs a nose up attitude should be maintained. In a nose-wheel type airplane the main wheels should touchdown first and the nose-wheel should be kept off the ground as long as possible. This aids in avoiding striking the nose-wheel on any divots or unsmooth surfaces that might be encountered on the runway. Since the Da40 is low wing airplane there is a risk of damage to the flaps.

**After-landing Roll**

Flaps are recommended to be untouched during roll in order to maintain focus on control of the airplane. Power inputs can help in maintaining control during taxi and back pressure should be maintained as to not damage the nose-wheel. If taxiing on a soft surface, keeping back pressure will aid in helping the nose-wheel not sink into the surface.

**Errors**

Common errors in the performance of soft-field approaches and landings are:

• Excessive descent rate on final approach

• Excessive airspeed on final approach
• Unstable approach
• Round out too high above the runway surface
• Poor power management during round out and touchdown
• Hard touchdown
• Inadequate control of the airplane weight transfer from wings to wheels after touchdown
• Allowing the nose wheel to "fall" to the runway after touchdown rather than controlling its descent

# EMERGENCIES

## Emergencies - EXPLAINED

An inherent and unavoidable reality in aviation is the fact that emergencies of varying degrees can and will happen. USU has a great safety record and risks are mitigated each day by rigorous rules and procedures as well as an excellent maintenance team. Even so, it is the responsibility of each pilot to prepare for emergencies. This involves practicing them regularly with your flight instructor, and during each phase of normal flight, having a plan in place for what to do during an emergency. This section will provide guidelines for how to approach and practice each kind of emergency.

The general approach to an emergency at USU is easily remembered (intentionally so) by the memory device “A, B, C”. This device not only helps remember the first steps to be taken in an emergency, but also the order in which to take them. First Step (“A”): Airspeed. In most emergencies it is important that time in the air is maximized so that glide distance and response time are increased. To this end, the first step in an emergency is to aim for best glide speed, which depends on airframe and weight. It is the pilot’s responsibility to know best glide speed for each flight. For this reason, it is required to be put on the weight and balance sheet that is turned in to dispatch.

The second step of the “A, B, C”, to be started upon reaching best glide speed, is “B”: “Best place to land”. Although this should not be the first time during the flight that you think of an emergency landing site (this should be a constant consideration), now is the time make a definite plan. Emergency landing sites can vary, but some are better than others. Here is a guideline to prioritize potential landing sites in order from best to worst: Airfield, flat field, road, any other semi area the pilot identifies in the absence of the aforementioned. There are considerations that might move one sight up or down in the order of priority. Here are some of the considerations associated with each. Airfield: If you can make it to an airfield that is almost always the absolute best option. In case of radio operations failures, and with a choice of airfields, choose the one that is not as busy. In the case of an engine out situation with an airport out of range, you may have to choose one of the other options. Flat field or open area: The reason these are recommended in most cases over roads, is because there are no cars or moving vehicles, but they do come with negatives as well. Care must be taken to select a field without obstacles such as irrigation equipment or hay bales. It is also recommended not to choose one with high growing plants such as corn. Empty grassy pastures or freshly plowed fields are usually the best (try landing with the direction of the plow lines). Roads: There are times that roads can be preferred to fields. This especially applies at night, when they are the only lit emergency landing site. During the day, choosing roads in remote areas can also be very useful. The big dangers with roads are cars and power lines. For this reason, we avoid roads during the day. Other open areas: In the absence

of any of the above, pilots have been forced to get creative, landing on beaches or golf courses. Keep in mind that whatever site you choose, there may be people who will not hear an approaching aircraft with its engine off.

The last step of the “A, B, C” is “C”: Checklist. Once the plan for where to go is established, USU pilots go straight to the checklist. The exceptions are engine fire situations and engine problems at very low altitudes such as during landing and takeoffs, where prompt action may prevent further calamity. The steps to be taken in these situations will be discussed later. Even in these cases, after initial action is taken, the checklist should be referenced to ensure all steps were taken properly, and to find the next course of action. The checklist will help the pilot fix problems in a methodical and logical order. While the checklist is designed to help you through emergencies, knowledge of aircraft systems and reasons for steps taken in the checklist items can be crucial to pilot decision making in emergency situation. Specific emergencies and considerations involved will thus be discussed below, as well as considerations to be taken when practicing these situations.

## Fires:

Fires are one of the situations where immediate action needs to be taken to avoid a worsening of the situation, especially if the fire is in the engine or anywhere near the fuel system. This applies to situations not only when you can see open flames, but also in situations where you can see a lot of smoke, because this is often a sign of an internal fire, or a fire about to start. The following are the immediate actions to be taken in case of a fire related emergency before referring to the checklist:

### Engine Fire in Flight:

In the case of an engine fire in flight there are two main considerations. You want the fire to stop while also not having it follow the fuel lines to the tanks, and you also want to prevent the entrance of fumes into the cabin. The first steps are: Select Landing Site- You are about to shut off the engine, be sure there is a place to land.

Cabin Heat OFF- To Prevent the entrance of CO. If smoke is coming in through the vents you could close those too.

Fuel Selector OFF- This will stop the flow of fuel to the engine. The engine will shut off when all the fuel still in the lines has gone through. Hopefully with the engine off and no more fuel, the fire will stop.

Throttle full forward- With the throttle all the way open it will help the rest of the fuel to go through the engine faster.

Now that the engine and hopefully the fire are off, you can reference the checklist. If the fire persists, increasing the airflow to extreme rates with an emergency descent can help suffocate the fire.

When practicing the engine fire procedure in training, it is important to remember that we want to practice for the real thing, but we don't want to start an actual emergency. As such tasks like turning off cabin heat can be actually done, but when doing tasks such as turning fuel tanks off, we touch the control in question and annunciate the appropriate action. This always applies to adjusting mixture as well. Also make sure that before initiating an emergency descent that the throttle is at idle. A good time to do this is when the engine is to "stop" after turning off the fuel selector and advancing the throttle.

### Electrical Fire in Flight:

An electrical fire will be hard to fight if there is still electricity. As a result, the immediate actions you should take are as follows:

Emergency Switch ON- You are about to turn off all electronics. Especially in the case of instrument flight you want to turn on the emergency battery to maintain a working attitude indicator. This is the switch that is wired shut.

Master OFF- Shut off all electricity to shut off the heat source for the fire. Be aware that you will lose all electronics and electrically operated equipment.

Cabin Heat Off

If there is smoke in the cabin take steps to clear it

Use the fire extinguisher as appropriate such as if there is an open flame in the cockpit

Then proceed with the checklist and land as soon as is possible.

When practicing this scenario, you do not actually want to shut off the master switch as this can cause an actual emergency, or turn on the emergency switch, because it means the aircraft has to be downed for inspection if you do.

### Fire/ Smoke during Takeoff:

The reaction for a fire during takeoff depends on how far into takeoff you are. If still on the runway, or if you still have enough runway in front of you to stop, abort the takeoff, pull back power and apply even braking. Then proceed with shutting off cabin heat and stopping fuel flow just like with a fire in flight. Abandon the aircraft as soon as practicable after engine is secured.
If you have already lifted off and there is no more runway in front of you, you will have to climb to a safe place/ altitude before proceeding with the inflight fire procedure. This will give you time to reference your checklist.

In training an aborted takeoff should be practiced. Beyond this, the same guidelines apply to practicing these as to a fire in flight scenario.

### Fire during Engine Start:

If fire is encountered during engine start, the immediate action to take is to keep cranking the starter. If it starts, see if it turns off the fire before shutting it down and proceed with the checklist. If it does not, lean the mixture with the throttle full forward, turn the fuel selector off, and proceed with the checklist.

### Electrical Fire on the ground:

With an electrical fire on the ground, the first and automatic step is to shut down the electronics with the master switch. Then shut off the engine using the mixture and evacuate. Put the fire out if deemed safe.

## Engine Problems:

Engine issues (excluding fires), although they are still rare at USU, are some of the most common mechanical issues encountered in reciprocating engine aircraft, and many of those are even caused by pilot error. This is because fuel management is often not treated with the seriousness that it should. At USU, our procedures and checklist usage should minimize these risks, but being aware of the aircraft systems can help you save the day if your engine starts running rough or stops. When encountering a rough running engine or one that suddenly stops the general steps taken are usually similar, but following the appropriate checklist is important.  You also can follow the “A, B, C” procedure in most cases. The exception is a case of engine problems close to the ground, such as after takeoff. In this case do “A”, and “B”, and then do what you can

while landing the airplane somewhere ahead. Do not turn back to the runway, as you may not make it back.

Generally, the steps to take when having engine problems are to check the following controls as they will remediate any problems with the fuel or ignition systems. You will verify that master and ignition switches are on, turn on fuel pump and carb heat (if engine is carbureted), and adjust throttle, mixture, and fuel tanks. These steps remedy the most common engine problems, which are fuel exhaustion, carburetor icing, fuel pump failures, and mixture settings that are too lean.

In the event of an all-out engine failure, restart attempts should be made. This procedure differs depending on engine condition (windmilling vs stationary propeller), and the checklist teaches you how to do both. If the propeller is windmilling, this is a sign that fuel starvation or exhaustion are the cause, and once the steps in the checklist are taken it should start up again. If it does not immediately do so, pulling back the mixture to idle and then slowly moving it forward could help. With a stationary propeller the problem could be more mechanical, and restart is not always likely, but operating the starter as per the checklist could restart the engine in some cases. Before you do this make sure there is no smoke coming from the engine.

When practicing engine problems items such as turning on fuel pump, carb heat, and switching fuel tanks can be done as in a real emergency, but adjusting the mixture, operating the starter, or turning off the master switch, ignition system or fuel tanks (in the engine secure checklist) can lead to actual damage or an emergency. These actions are only verbalized.

Once engine restart has failed the pilot must proceed with his emergency landing, while doing the Engine Secure Checklist, which is designed to prevent fires and unnecessary damage upon landing. Make sure to put in the necessary flaps before turning off the master switch. When practicing an emergency, you should always recover before 500 ft AGL.

### Electrical System Problems:

Understanding the electrical system of the individual aircraft is helpful to dealing with electrical system problems. On a basic level most of our aircraft are the same as far as the electrical system is concerned. Alternators use engine energy to produce the electricity; batteries store it for engine start and for backup use; and two buses, the main and essential bus, offer the option of quickly shedding non-essential electrical equipment. Below the main Electrical System problems will be outlined, as well as the

principles behind coping with them. Following the checklist will help you use these principles to deal with the problem.

### Alternator Failure:

The first thing to remember in an alternator failure is that your battery will still run your electrical system, but only for a limited time. This time can be extended to approximately 30 minutes by shedding unnecessary electrical consumers. Follow the checklist to determine if and how you should use the essential bus switch. The checklist will also help you reset circuit breakers that may have popped causing the failure message. If the battery runs out, the emergency battery will still operate the backup attitude indicator and flood lights. If within 30 minutes of your home base airport it is highly advised that that is where you return. In cases where there is no suspicion of an overvoltage causing the alternator to kick off line (when no circuit breakers have popped), it could be possible to revive it by turning off the ALT side of the master switch and then turning it back on.

### Low Volts in Flight:

Low Volts in Flight would be caused by a problem with the alternator, or the battery not getting a charge from the alternator. In this case it is prudent to follow the checklist to reduce the electrical load, and then recycle the alternator. If this doesn't work treat it like an alternator failure in managing your electrical load.

### Low Volts on Ground:

The most likely cause for low volts on the ground is that the throttle has been reduced to the point where the engine is not producing enough electricity to charge the battery. Simply increasing the RPMs to about 1200 should fix this problem after a moment. If not, take the airplane to maintenance.

### Overvoltage:

An overvoltage can be dangerous because it can cause a fire. It is usually caused by the alternator. Circuit breakers are safeguards to prevent this, but they do not eliminate the risk. If receiving an Overvoltage message, shut off the ALT side of the master switch and use the essential bus to manage your battery life. Then land within 30 minutes to avoid losing all electronics. Remember that if needed, like in IMC or at night, the backup attitude indicator and floodlights will still work using the emergency switch.

## Other Issues Encountered:

You may get warning messages different from the ones already discussed. As they do not fall nicely into groups with similar considerations they will be discussed below individually:

### Starter Engaged After Engine Start:

This may damage components if the flight is not terminated. Normally you would still be on the ground while seeing this message, so pull out the checklist which will direct you to shut off the engine before turning off the master switch, which should also stop the faulty starter. Then alert maintenance.

### Defective Mixture Control:

A defective mixture control will most likely not immediately affect your flight, as you make large changes in altitude though there is a possibility of a rough running engine and loss of rpm. For that reason, it is recommended that you maintain altitude until you are within glide distance of an airport, and then maintain a little more power than you usually would for approach and landing.

### Carbon Monoxide Warning:

A CO warning is to be taken very seriously. CO can incapacitate a crew. It is important to clear it out of the cabin if it is present. One of the most likely places for it to come from is the cabin heat vents. As a result, the checklist will direct you to shut off the cabin heat and increase the ventilation after testing the CO detector. Extra caution is never wrong with this one.

### High Cylinder Head Temperature

There is a chance that this might happen during normal operations on a hot day. The worry is that there is a significant oil leak which could cause significant engine damage. Thus, check the oil pressure gauge. If oil pressure is low, go to that checklist. If not, steps that can be taken to decrease CHT are enrichening the mixture, lowering RPM, and increasing airflow (pitch down).

### High Fuel Flow

Coupled with low fuel pressure, high fuel flow can mean a leak in the fuel system. Monitor both, as well as the fuel gauges. Proceed to the nearest airport as you may be losing fuel. Prepare for fuel exhaustion.

### Low Fuel Pressure

Some steps may be taken to reduce low fuel pressure as outlined in the checklist. If the problem is due to a mechanical fuel pump failure, turning on the electrical fuel pump will fix the problem. Alternately mixture adjustments could be made. It could also be prudent to switch fuel tanks, in case there is a blockage of the filter in one tank. The fix, however, could be only temporary, and so you will want to terminate the flight as soon as possible to prevent engine failure.

### High Oil Temperature

This is similar to the High Cylinder Head Temps. It might just be due to improper mixture settings on a hot day, or it could be a sign of and oil leak. Thus, the checklist will direct you to check the oil pressure. If it is low, go to that checklist and prepare for an emergency landing. If not, enrichen the mixture, reduce throttle, and increase airspeed.

### Low Oil Pressure

Low oil pressure is a serious situation in which there may not be enough oil to properly protect the engine, and thus serious damage can occur. As a result, reduce throttle, and land as soon as possible. Prepare for a real possibility of engine failure.

## Flight into Icing Conditions

Icing will happen near freezing temperatures with moisture present. The exception is carb icing, which can happen at much higher temps. The best thing to do if icing starts is to get out of it, which usually means turning around or changing altitude. Some additional precautions can be taken to minimize the impact as outlined in the checklist. Verifying that pitot heat is on will help maintain pitot static instruments. Cabin heat can be directed onto the canopy to help maintain outside view. RPM increase will help

prevent propeller icing, carb heat prevents carb ice, and in the case of induction icing, the alternate air source in the constant speed airframes is necessary to maintain engine operation. If the pitot static tube still freezes, the alternate static port can maintain the altimeter and VSI. With ice on the wings stall speed decreases. To compensate for this, especially on approach and landing, extra airspeed should be maintained, and possibly no flaps deployed.

## Spin Recovery

A spin results when one wing on an airplane is more stalled than the other. The stalled wing will drop, and the airplane will rotate pointed downward around that wing. The DA 40 is not approved for spin practice, but it is vitally important to know how to break a spin. The acronym to help you remember these steps, which have to be taken quickly is PARE. Power goes idle to reduce the rotation of the spin, Aileron neutral, full Rudder in the opposite direction of the spin, and then Elevator full forward. Once rotation has stopped return the rudder to neutral and pull the nose carefully back up to the horizon.

## Emergency Descent

The pilot must be familiar with the airplane's emergency descent procedures. The pilot must bear in mind the following: The airplane may be severely structurally damaged to the point that its ability to remain under control could be lost at any moment. The airplane may still be on fire and susceptible to explosion. The airplane is expendable and the only thing that matters is the safety of those on board.

## Emergency Landing:

Types of Emergency Landings: The different types of emergency landings are defined as follows: Forced landing—an immediate landing, on or off an airport, necessitated by the inability to continue further flight. A typical example of which is an airplane forced down by engine failure. Precautionary landing—a premeditated landing, on or off an airport, when further flight is possible but inadvisable. Examples of conditions that may call for a precautionary landing include deteriorating weather, being lost, fuel shortage, and gradually developing engine trouble. Ditching—a forced or precautionary landing on water. Terrain Selection A pilot's choice of emergency landing sites is governed by: The route selected during preflight planning. The height above the ground when the emergency occurs. Excess airspeed (excess airspeed can be converted into distance and/or altitude)

Approach: When the pilot has time to maneuver, the planning of the approach should be governed by the following three factors: Wind direction and velocity. Dimensions and slope of the chosen field. Obstacles in the final approach path

Trees: (Forest) Although a tree landing is not an attractive prospect, the following general guidelines help to make the experience survivable. Use the normal landing configuration (full flaps, gear down). Keep the groundspeed low by heading into the wind. Make contact at minimum indicated airspeed, but not below stall speed, and "hang" the airplane in the tree branches in a nose-high landing attitude. Involving the underside of the fuselage and both wings in the initial tree contact provides a more even and positive cushioning effect, while preventing penetration of the windshield. [Figure 17-4] Avoid direct contact of the fuselage with heavy tree trunks. Low, closely spaced trees with wide, dense crowns (branches) close to the ground are much better than tall trees with thin tops; the latter allow too much free fall height (a free fall from 75 feet results in an impact speed of about 40 knots, or about 4,000 fpm). Ideally, initial tree contact should be symmetrical; that is, both wings should meet equal resistance in the tree branches. This distribution of the load helps to maintain proper airplane attitude. It may also preclude the loss of one wing, which invariably leads to a more rapid and less predictable descent to the ground.

Water: (Ditching) and Snow A well-executed water landing normally involves less deceleration violence than a poor tree landing or a touchdown on extremely rough terrain. Also, an airplane that is ditched at minimum speed and in a normal landing attitude does not immediately sink upon touchdown. Intact wings and fuel tanks (especially when empty) provide floatation for at least several minutes, even if the cabin may be just below the water line in a high-wing airplane.

## Emergency Checklist (BASIC)

This is boiled down to the basics, please refence the current AFM for the complete checklists.

### Engine Problems on Ground

Throttle IDLE, Engine Switch to OFF.

### Engine Problems on Takeoff (with enough runway to still land):

Throttle IDLE, Get the plane on the runway, apply brakes. Shut everything off (fuel tank selector, mixture control lever, ignition switch, battery/alternator switch). Set parking brake.

### Engine Problems on Takeoff (take-off can no longer be abandoned)

(Pitch for best glide) Airspeed 72 KIAS, if traffic pattern altitude hasn't been reached (below 1,000 ft AGL) then pick a field (within sight and no bank angle in excess of 30 degrees) and land straight ahead. If traffic pattern altitude has been

reached, (make emergency call) land on most appropriate runway without putting aircraft into a dangerous flight attitude (ex. Excessive bank angle). When on ground, Shut everything off (fuel tank selector, mixture control lever, ignition switch, battery/alternator switch). Set parking brake.

### Fire on the ground

In the event of a fire on the ground the PIC must make the decision to abandon the aircraft if an aircraft fire develops on the ramp during engine cranking the PIC must continue to crank so that the running engine can extinguish the flames. Aircraft and ramp fire extinguishers must be immediately deployed as long as it is done so in a way that does not jeopardize the safety of any persons.

### Smoke and Fire During Takeoff

If takeoff can be abandoned: Throttle IDLE, Cabin Heat OFF, Brakes APPLY, Fuel Selector OFF, All Electrical Switches OFF, Airplane EVACUATE, use fire extinguisher, notify instructor and maintenance immediately.

If takeoff cannot be abandoned: After climbing to a location where an emergency landing may be executed: Airspeed TRIMMED FOR BEST GLIDE, Fuel Selector OFF, Fuel Pump OFF, Cabin Heat OFF, All Electrical Switches OFF, Emergency Windows OPEN AS REQ'D, Front Canopy UNLATCH AS REQUIRED, After Touchdown EVACUATE

### Losing an engine in flight

Airspeed TRIMMED FOR BEST GLIDE (73 knots), Landing Site SELECT, [use checklist if time is available. Always have primary focus on flying the airplane.] If propeller is windmilling ENGINE RESTART Windmilling Propeller, if propeller is stationary ENGINE RESTART Stationary Propeller, if restart is unsuccessful proceed with ENGINE SECURE

### ENGINE RESTART Windmilling Propeller

Airspeed 70-130 KIAS, Fuel Pump ON, Ignition BOTH, Carburetor Heat ON, Mixture SET APPROPRIATE, Fuel Selector CHECK, if engine does not start: Mixture FULL LEAN, Mixture PUSH FORWARD UNTIL ENGINE STARTS, if engine will not start proceed with ENGINE SECURE & EVACUATE

### ENGINE RESTART Stationary Propeller

Airspeed 70-80 KIAS, Fuel Selector CHECK, Mixture SET APPROPRIATE, Carburetor Heat ON, Electrical equipment ALL OFF, Avionics Master Switch OFF, Master Switch BATTERY ON, Fuel Pump ON, Ignition Switch START, If starter is inoperative: Expect at least 1000' altitude loss, Ignition Switch BOTH, Airspeed INCREASE ABOVE 130 KIAS, Mixture CHECK, If engine won't start, go to ENGINE SECURE & EVACUATE

### ENGINE SECURE

Mayday ANNOUNCE, Transponder SQUAWK 7700, Fuel Selector OFF, Safety Harnesses TIGHTEN, Ignition Switch OFF, when certain field can be made: Flaps SET LANDING, Master Switch OFF, Touchdown slowest airspeed & commence EVACUATE

### EVACUATE

Aircraft STOP, Canopy OPEN, Airplane EVACUATE IMMEDIATELY, Fire Suppressant USE AS NECESSARY

### Emergency Descent

Bank of 30 degrees, keep airspeed in green bar (yellow if no turbulence is present). For constant speed airplane; prop lever full forward for aerodynamic braking.

### Emergency Landing

Pick a flat area (if not available, land on an upward slope). Consider wind. With enough altitude, fly rectangular circuits and inspect the landing area on downwind leg. Keep an eye out for fences and telephone wires. Airspeed 73 KIAS. Fuel tank selector OFF. On final, flaps set to LDG, tighten safety harness. Touchdown with the lowest possible airspeed.

### In-flight Fire

(Follow the AFM/POH)
Engine: [Known by smoke and/or flames coming from engine cowling]. [Engine fires usually will have dark smoke and electrical fires will usually have white or light smoke.] Shut off fuel supply by pulling mixture all the way out. Mixture set OFF Fuel selector shutoff valve to OFF. Fuel selector OFF. Leave ignition ON. [Oil fires will be thick black smoke; fuel fires will be bright orange flames. [If oil fire, feather the prop/minimum rpm, and pitch up until prop stops rotating. This stops the engine-driven oil pump from feeding the fire. Emergency descent and land as soon as possible. [Usually caused by flammable substance; fuel, oil, or hydraulic fluid, coming in contact with a hot surface]

### Electrical Fires

[smell of burning insulation]. Check circuit breakers. Turn off battery master and alternator switches. If you need electrical power for flight, turn master switch off, turn all electrical switches off, then turn master switch back on, start turning electrical switches back on one at a time and waiting to look for signs of fire. Land as soon as possible is best course of action.

## Cabin Fire

Use fire extinguisher if needed or possible [don't spray somewhere needed to see such as the windshield or flight instruments at night]. Open cabin air, if smoke increases, close vents. Open windows, if fire becomes worse, close them. Do an immediate emergency descent.

## Possible Carbon monoxide contamination

Signs: CO detector alert buttons stays red, odor similar to exhaust gas.
Cabin heat OFF. Open vents, windows and forward canopy. Land as soon as possible.

## Inadvertent VFR flight into IMC

Recognize that the situation is serious. It takes many hours of training to safely rely solely on your instruments. Get back into VFR as quickly and safely as possible. Attitude Control: Trim the airplane for straight and level flight. Smooth and small corrections. Avoid steep banks. Constantly scan between attitude, airspeed, and altitude with enough time to process the information shown. Secondarily, scan slip/skid and heading.

## Icing

Leave icing area, Pitot heat ON, Cabin heat ON, increase RPM, Carburetor heat ON, open emergency windows if required.

If Pitot Heat fails, the alternate static valve can be opened and emergency windows closed. CAUTION: Ice build-up increases stall speed. If ice does not melt before landing, a no-flap landing may be required.

## Carburetor Icing

(Can happen even during summer weather)
Signs: Reductions of engine power, rough running engine, etc.
If carburetor icing is suspected, apply full Carburetor Heat. Power should momentarily reduce and then come back up as carburetor ice is melted.
If this does not fix the problem, an emergency landing is necessary.

## Pitot-Static System Malfunction

Verify Pitot Heat is ON. Land at nearest suitable airport.

## Recovery from unintentional spin

Immediate and simultaneously; Throttle IDLE, Rudder full deflection against direction of spin, Elevator (control stick) fully forward, Ailerons neutral, Flaps UP.

When rotation stops; Rudder neutral, Elevator (control stick) pull back slowly to not overload aircraft, and recover normal flight attitude, don't exceed VNE.

### Asymmetric Flap [Only one flap extends]

Use opposite aileron to counteract the rolling effect. Use opposite rudder will be required to stay coordinated. Do not land with a crosswind from the side of the deployed flap. Land with a higher than normal airspeed [85 knots]. Careful in the flare due to excess speed and abnormal flap settings.

### Loss of Elevator Control

Use trim to control pitch.

### Rough running engine

Adjust mixture for smooth operation. Reduce power. Land as soon as practicable.
Engine Indications CHECK, Fuel Pump ON, Ignition BOTH, Carburetor Heat ON, Mixture SET FOR SMOOTH RUNNING, Fuel Selector CHECK, Throttle/Mixture TRY VARIOUS SETTINGS, if engine is still running roughly, Land ASAP- Prepare for engine failure.

### Loss of RPM in-flight

Possible carburetor or induction icing. Use carburetor heat.
Electrical fuel pump check ON, Fuel tank selector check FULLEST, Friction adjuster of throttle quadrant check SUFFICENTLY TIGHT.

### Alternator Failure

Signs: Low Voltage Indication
Action Items: Reduce electrical load
Circuit Breakers CHECK, if no circuit breakers had popped: Ammeter CHECK, If ammeter appears normal: Continue to nearest practicable airport, monitor electrical system Have mechanic fix problem.
If any circuit breakers have popped: Allow cooling period and attempt to reset popped circuit breakers (reset only once.)
If a reset fails: Essential Bus Switch ON, Electrical Load REDUCE TO MINIMUM, Voltage CHECK REGULARLY, Electrical System MONITOR, Land at nearest suitable airport within 30 minutes
If aircraft battery becomes depleted: Emergency Battery Switch UNGUARD and ON
Possible Configuration: Popped circuit breaker, reset Alternator (side of Master switch).

### Loss of Electrical Power

Turn off all non-essential electrical consumers for safe flight. Notify ATC. Land at the nearest airport.

High oil temperature
Reduce power, land as soon as possible.

High oil pressure:
Reduce power, land as soon as possible.

Low oil pressure
Land as soon as possible and stop engine.

Fluctuating oil pressure
Land as soon as possible and stop engine.

Loss of airspeed in constant flight
Land as soon as possible.

Loss of fuel pressure
Turn on boost pumps. Switch fuel tanks.

All issues or abnormalities must be reported to maintenance and your instructor.

# Instructor Training

## Key Factors

There are quite a few items that will be covered in this section that will include the expectations of the flight program, the level of rigor expected, and clarification of a few items.
First off, here is the directive of operations at USU-

1. **Always be safe-**
    a. if you find yourself in an unsafe situation- return to a safe situation as quickly as possible.
2. **Know your profession-**
    a. This includes: FAR's, Operations Manual, Handbooks, checklists, etc. YOU put in the time first- so you are always ready for your students. Never stop learning.
3. **Do what you know-**
    a. All the above information makes you a better pilot but is useless unless your actions follow through with what you know.
4. **Have fun-**
    a. You are not only here to help mold future pilots and keep them safe, but also to keep the passion that students have for aviation alive.

## General

You have all been hired to exercise your privileges as a Utah State University part 141 instructor. This is an amazing moment for you, there is a lot to know, a lot to learn, and even more required of you.

Your new responsibility will be to mentor and fly with someone else's "baby," "child," "Father" or "Mother" please take your responsibility for their proper training and safety seriously.

We want you to aspire for the ideals of a professional now. We did not hire you to merely acquire hours and maybe teach a student. You are also taking on yourself the title of being a "mentor." It is not simply a paid position. This title has power; your influence will affect others for good or bad. The students will emulate you as they learn to fly. Hence the need for you to be a professional now. Always take the time to teach. Admonish (vent) in private, do not speak poorly of the student, program, or school in front of others. As a mentor your flight hours grow as you care for and educate pilots. Always be mindful of that as we go through this training.

In accordance with 14 CFR Part 141 and Utah State University's approved Training Course Outline, all flight instructor applicants who desire a position at Utah State must first complete ground and flight training with the Chief Flight Instructor/or Assistant Chief Flight Instructor before they are legally qualified to assume flight instructor duties for the school. This includes each new rating that the Instructor is checked out for. (Examples: adding Instrument rating (CFII), adding multi-engine, etc.)

Whereas flight instructor applicants are not fully qualified to act in the capacity of a flight instructor at Utah State University until completing all required training. They will not be compensated in any manner while satisfying the training requirements.

Understand that if an applicant does not complete all required training, they forfeit the privilege of serving as a USU Flight Instructor.

While employed at USU, instructors must fly in USU aircraft only. Also, while providing ***any*** instruction to or from KLGU or KPUC, it will be done for Utah State University. It is the instructor's responsibility to maintain all currencies (Day, Night, and IFR). USU reserves the right to assign students and duties, move students around, and ask the CFI's for IFR currency, total hours, and dual instruction given. Assignments could be given for the benefit of USU.

Instructors will be allowed to use offices and equipment at the airport for instruction purposes only. They will be used solely for preparation of student activities (flight or ground), student training, and maintaining records of assigned students. The offices and equipment may not be used for personal reasons. This includes the use of the printer. No homework, job applications, or ancillary work should be printed on USU printers.

## Risk Management

Risk Management is a full-time job! USU instructors will do all possible to mitigate risk and enhance safety while working at USU. If in doubt of safety, instructors will terminate any flight or end training and return to a safe environment. This is also in place for environmental issues such as inclement weather, poor road conditions, etc. Instructors will utilize all mandatory documents (i.e., Operations Manual, checklists, AIM, ACSs, and any other material utilized by USU) and abide by all FAR's, AD's, etc. while employed at USU.

While there are infinite ways to break the rules, we expect you to know what you are doing- if you do not know, seek guidance from management BEFORE you do it.

## Work Limitations

You are contracted for a total of 29 hours per work week for all paid positions at Utah State University. If you work as an RJ instructor, janitor, etc., those hours count against the USU totals.

***We expect you and your students to fly a minimum of 4 hours per student per week***. You will track *all* hours while working as a flight instructor through ETA/Talon-systems. Flights in ETA need to be "activity completed" prior to them counting for pay. You will input each of those completed flights and hours into Aggie Time to receive pay for the time recorded in ETA/Talon. This transfer of hours to Aggie Time is YOUR responsibility and should be done daily before you leave the airport. If there is a discrepancy in pay, it will be flagged and might be paid later. Verify that the hours match prior to the end of the pay period.

You are also REQUIRED to cease any operations that will take you outside of the contracted hours or over the 8-hour maximum training allowed in a day. Pay attention to your own hours so that you do not jeopardize your future for a couple of hours now.

While employed at USU, if there is ever a doubt of your ability to assist the students assigned to you, the program may reassign these students to better assist them. Your assigned students are the reason you are employed here. If you fail to assist them, your employment might be reviewed.

You are responsible for maintaining proper health, rest, and time off while working at Utah State University.

Below is how USU adapts and defines the rules for our training environment:

- *Calendar day* means the period of elapsed time, using Coordinated Universal Time or local time that begins at 2 A.M. and ends 24 hours later at the next 2 A.M.
- *Duty period* means the period of elapsed time between showing up for an assignment and leaving from that assignment. All time between these two points is part of the duty period, even if it is interrupted by non-flight-related duties.
- *Rest period* means a period of time that is free of all responsibility for work or duty prior to the commencement of, or following completion of, a duty period, and during which the CFI cannot be required to receive contact from the program manager.
- *WE DEFINE- that classes, work at other jobs, or obligations that start DURING the same CALENDAR DAY cannot be counted as "REST PERIOD."*

Daily maximums and minimums

- Maximum Duty period= 14 hours
  - Maximum Instruction= 8 hours
- Minimum Rest= 10 hours
- We follow the FAR's and NO CFI will flight instruct for more than 8-hours in our defined calendar day.
- We encourage 1 day off in a week
- *WE ADD- that you cannot be at the airport without it being the start of your DUTY PERIOD, so plan your DUTY PERIODS appropriately. If you have a night flight that ends at 11 PM, you are not to be back on premises prior to 9 AM. This applies to all flying personnel providing instruction at USU.*
- If you need to sign an IACRA, meet someone, etc. at the airport make sure you are properly rested and have met the REQUIRED MINIMUM REST.

You are responsible to make sure that your contracted time and hours of instruction are not exceeded on any duty day or pay period. Violations could result in termination.

## CFI Responsibilities

### Flight Scheduling

You are responsible for scheduling your student's flights. This means that you will notify them 24 hours prior to the flight.

Suggested means of notification include:

- Telling them to check the Talon App the night before.
- Notify them in person
- Notify via text
- Call the student on the phone.

Doing this will allow you to review what will be covered in the upcoming flight and verify that they are ready. If they are not, you can cancel for them and they will not receive a no-show. If you are unable to contact them or get a response it is your duty to mark that in the ETA system.

We are scheduling 2 days out to mitigate issues concerning aircraft availability. Your flights are still subject to getting bumped for check rides or maintenance issues.

You need to schedule correctly, in a timely manner, and verify that all requisite items are recorded PRIOR to the flight. Some of the issues we face constantly are defined below:

- Supervised solos- they should be charged to the student on that solo in the ground section of the activity completion in Talon. You should charge them for the total time you spent supervising. You are responsible to be there on the ground and close to a radio for the first solo, and any solos in the pattern in the private syllabus.

- No-Show- There are legitimate reasons for no-shows, but few students really have them. Your responsibility is to record any no-shows. This is done by selecting no-show on the Operations Check-in page, followed by a Talon message to the chief/assistant chief in charge, stating if it is the first, second no show, how many hours to charge the student and who it is. Also submit a payroll request showing the time you want billed for your being there. First time forgiveness is acceptable; second time a default of one-hour ground and flight is acceptable. After that you are required to submit the entire scheduled flight time.

- Return on your block end time. If for any reason you need to extend your due back time this should be done upon the realization of the estimated exceedance to the due back time. This allows us to attempt to maintain the schedule that has been posted and if able will not affect the crews after you. If you exceed your due back time by 10 minutes- you and your student might be called in, to explain why. Failure to adhere or persistent disregard to the schedule could result in disciplinary actions.

The minimum activity per pay period is 2. Paid activities per pay period are necessary to maintain employment at USU. Please notify us of any vacations, sicknesses, etc., that may prevent the minimums from getting met.

## Weather

As the CFI you are responsible for mitigating risk by making wise weather decisions. We know that the weather is not always cut and dry. Knowing what you can or should do is hard to define. You may want clarification and we willingly accept questions regarding weather and go/no-go decisions.

Most of you have had to make go/no-go decisions before. We want you to build a case for your choices that you could present to the FAA if they questioned you. This builds a history as to your decision-making abilities, and USU has put clear expectations in this Ops Manual as to the weather we are comfortable sending you and your students into. You are not to call different people in management to shop around for the answer you want. The on-call person has final say.

We know that in the winter Airmet-Z's make it hard to complete training and expect you to follow the precedents set forth in the operations manual. Two questions should go through your mind prior to each flight- Is this legal? Is it Safe? They are not always the same and remember your certificates ride on you making the right choice if you are asked to explain yourself to the FAA.

## Cross Countries

Now that you are training students as they leave the valley, you will need to exercise PIC responsibilities. You are to VERIFY all aspects of the flights (even if it is solo) prior to allowing the students to go. Route, altitudes, time, weather, emergency contingencies, tracking of the flights, etc. You will define the lesson and objectives such as FAA requirements for the flight. You will need to adhere to the weather standards, approved/non-approved airports, etc. for all flights

## Assigned Students Responsibility

The students assigned to you are solely your responsibility. You will keep their records in order (this includes but is not limited to - TSA, ID (up to date), verifying enrollment certificates, currencies, qualifications, scheduled to finish within the semester, classes are recorded in ETA, etc.). You will correctly plan, track, and log flights for your assigned students. You must be able to give updates as requested by Chief/Assistant Chief Instructors. This also means you will be on time for all activities that you set up.

Due to your position at USU you are considered to be in a position of power. This means that you may not date or be involved with anyone you fly with. This policy is to be strictly adhered to for safety and proper training.

You should be available for your students during all solo activities. This includes:

- Helping move the aircraft
- Checking them in and out of ETA
- Tracking them along their intended route.
    - Any changes to the flight plan will result in YOU notifying Dispatch and/or updating the return times in Talon.
- If you are personally unavailable, you will have another USU instructor as a point of contact PRIOR to setting up the flight, and possibly arranged aircraft movement with dispatch.
    - This will be noted in the comments section of the flight.

When you sign off on an activity by putting your pin into ETA you are affirming that the weather is properly attained, the route of flight and airports are in proper condition for the FAA part 141 flight, and that the student is prepared for the flight that they are on, including documentation, weight and balance, etc.

You are encouraged to maintain at least an 80% pass rate for your students both with stage checks and FAA check rides. Please do not send students on check rides unless you are confident, they will pass. If your pass rate drops below 80%, you may be required to turn in a report as to why it dropped.

## Student Records

The FAA is primarily proof driven. If it is not recorded it never happened, you did not have it, etc. A major part of your responsibility while working here is to take care of the students so they do not fall through the cracks or get stuck. Records are a major part of that, verify that items are updated in Talon (not only scanning them but putting expiration dates on, grades in, and lessons into ETA). All of this is to be done with and billed to the student, when they are talking with you concerning their training you are to bill them for your services.

As your student gets close to either a stage check or graduating courses make sure they are ready for that. If it is for a checkride be aware that signing of Graduation Certificates is done during normal business hours during the work week (minus holidays).

You will need to verify with your students the following to prepare them for the checkride. Remember to do this as early as possible so if a checkride slot opens up in an examiner's schedule your student is ready:

- Meet all the hours in ETA
- Perform an ETA Records check-
    - TSA is still valid
    - Photo ID is current
    - Enrollment Certification is uploaded
    - All exams are at 80% or better and recorded in ETA
    - Pass the End of Course (both flight and ground)
- Graduate from the course (Starts a 60-day countdown when passed)
    - Upload Graduation Certificate in ETA

- Be enrolled into the checkride course
- Fill out the IACRA
- Bring FAA written test (not expired)
- Sign Checkride form with DPE

## Monthly Instructor Meetings

A mandatory flight instructor meeting will be held once a month. They are held on the 1st Tuesday of every month. Flight instructors are required to attend these meetings each month and will be compensated for attending. The instructors that fail to attend this meeting will be placed on flight hold. If it continues, they will be reprimanded officially, and then if the habit continues, they could be terminated for unsatisfactory performance. Additional meetings could be assigned as deemed necessary by your Chief. The day and time of the meeting will be determined/adjusted as needed.

## Rentals

USU cannot do any rental flights so please be aware of currencies that you may need during checkouts or annual review flights. The check-outs can be used to help maintain currencies, so long as the requirements for the check-out are met.

The Frasca or Redbird simulators may be rented by an Instructor for instrument currency at a minimal cost.

## Hours and Instructor Evaluation

An instructor will periodically be required to show how much flight time he/she has obtained. When an instructor reaches certain hours, the needs of the Professional Pilot Program and the current market conditions will be assessed. You may be assigned to positions that are to better yourself and the program such as Stage Check Instructors or CFI initial ratings.

All USU flight instructors may be required to assist in the CFI initial needs. The FAA requirements of 400 hours given, and an 80% pass rate are in place for those that graduated from a 141 course. 2 years of being a flight instructor from the date of passing the checkride is required for those not coming from a 141 course.

An 80% first time student pass rate is expected from each instructor.

Raise requests will be done one time per month and are DUE at the first meeting of the month. All raises earned after that date will have to wait until the next month.

If unsatisfactory instructor performance is noted, USU Flight Operations is not obligated in any way to implement the instructor compensation scale as outlined. Instructor employment may be terminated at any time an unsatisfactory performance is noted. USU Flight Operations is an ‘at will’ employment relationship and may be terminated at any time, with or without notice.

## Compensation

Instructors are compensated in various ways.

**Instructor Interviews**

During the interview process, USU covers the costs of the Candidate's Checkout Flight which includes the aircraft rental, fuel, and the Chief Flight Instructor's time. This flight also allows the candidate to log free time in their logbooks.

After the interview process, the candidate may be invited to the 2-day training to finish the CFI Onboarding Certification. The candidate is not paid for their time to attend, but USU will provide breakfast and lunch on both days and will pay for the first two CFI uniform shirts, if hired.

**Hired Instructors**

Once hired, Instructors are assigned students and are paid twice a month for time spent doing ground and flight activities, and for attending the monthly CFI Meetings, at the hourly rates shown below:

Fixed Wing-

| **Ratings** | |
|---|---|
| XC, Adv Man, CFI Mtg | $ 19.00/hour |
| Prvt, Instru, SE Comm, ME Comm, CFII, MEI | $ 23.00/hour |
| Stage Check, CFI Initial | $ 27.00/hour |
| 1st time Pass of Student's 141 checkride | $ 50.00/each |

Rotorcraft-

| Beginning Pay: | Pay for Ratings: | Pay for Check Instructor Status: | Pay for CFI Initial Qualified Status: |
|---|---|---|---|
| $20.00/hr. CFI qualified | + $1.00/hr. CFII | + $3.00/hr. one-time increase upon Check Instructor check out. | + $4.00/hr. one-time increase upon Initial CFI Check out |

Max pay for non-stage check instructor is $25 and for a stage check instructor it is $28

**Checkout Flights required to Instruct Students paid by USU**

- USU pays for the costs (aircraft rental, fuel, and the Chief Flight Instructor's time) of all Checkout Flights required to instruct students for Private, Instrument, SE Commercial, ME Commercial, CFI Initial, and Stage Checks, again, allowing the Instructor to log free hours in their logbooks.

**Instructors may Volunteer their Time to log free hours in their logbooks:**

- **Discovery Flights**
- **Aviation Events** – flying an aircraft to an open house or other event

**Note:** Instructors are not paid for pushing in/out aircraft. This is the responsibility of everyone – Instructors, Dispatchers, Maintenance, and Chiefs (students may help as long as they are supervised by the previously listed persons).

## On-Call Person

In the 141 requirements of the FAR's, a chief or assistant chief must be available anytime flight training is occurring. This facilitates the need for proper flight planning and scheduling for training. Utilization of USU aircraft for training is assigned monthly to one of management personnel, this is the "On-Call" person. That person will be available to answer curriculum questions, post the schedule (and any deviations will be approved by the on-call person) and verify that flights return on time.

It is a month-long assignment unless a message is sent in ETA stating otherwise. Graduation Certificates can be taken care of by any of the Chief's or assistant chiefs during normal business hours. Please do not wait for the last minute to get that signed, guidelines will be given later in the training to outline what is required for graduation.

The On-Call person has the "final say" to flights, approvals, etc. They will be tracking the aircraft/your flight; you need to be in communication anytime your flight starts or terminates when dispatch will not be there. This is done by texting the tail number, route, ETA's, and any additional information about the flight.

Example-
"418FP, KENV, Round Robin, ETA 9:45 PM" OR
"418FP, KENV, stopping for food will text upon landing and leaving, There by 8, back by 10:45"

Update via text when necessary. Follow the FlightPlan you file with the on-call person. Text when you get back after you close your flight plan. Notify the person on-call of any changes as soon as practical.

From May-August, any flights that will continue past 12 PM/midnight will need to be approved by the On-Call person.
From September-April, you will need approval for any flight that exceeds 11 PM.

We know that night does not start until around 9 PM for some months, however the On-Call person needs the appropriate rest and may also have flights the next day. Therefore, you will need approval for any flight going beyond those times- and the flights MUST BE SCHEDULED in advance.

## Disciplinary Actions

It is known that you are in a training environment. We know that sometimes things happen, i.e., flat tires. But if there are common and/or consistent issues with you or your students, we will look at your preparation and attempt to provide remedial training. Instructor and student might be placed on flight hold while remedial training is given. We expect all involved to act professionally and accept training to better oneself and protect the flight program.

If it is a malevolent action (as defined earlier), flying under micro-bursts, inverted flight, disregard for safety or human life, etc., immediate termination of employment is appropriate.

For items of lesser severity, the chiefs will hold a council meeting and attempt to find ways to correct inappropriate actions. Normally the issue will be addressed as follows- first, identify the issue(s) and provide remedial training; second, (previously identified as a reckless violation) a formal letter will be placed in the instructors file after remedial training; third, issue probation and/or termination.

We desire all pilots (students and instructors) to be safe, build experiences, and progress onto their desired career paths. The acts of a few often lead to limitations and rules on all. Realize you are the final say in what happens in the aircraft for safety and abiding by regulations. We have seen pilots flying at 13,000 for over an hour with no O2, a solo student landing on the wrong runway and not telling his instructor, two solo students flying to closed airports, and finally, CFI's instructing for over 8 hours in one day. Please watch yourself and your students. Let us know what happens so we can help.

## New Hire Mentors

Prior to starting with students, we want you to follow along with an assigned student and instructor. You should also know that any of the Chief/Assistant Chiefs are available should you have any additional questions. If you feel that you need additional training to be proficient with the students, come and talk to us, we can explain, use the simulator, or arrange flights to help as necessary, (flights will need to be approved by management). The better prepared you are, the easier it is for the transition from student to CFI. We want you to pass that information, confidence, and skillset on to your mentees, aka students.