Gleim Private Pilot Flight Maneuvers

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NOTE: Sections with changes are indicated by a vertical bar in the left margin. Text that should be deleted is displayed with a line through it. New text is shown with blue underlined font.

If you are tested on any content not represented in our materials or this update, please share this information with Gleim so we can continue to provide the most complete test preparation experience possible. You can submit feedback at www.GleimAviation.com/questions. Thank you in advance for your help!

The changes described and reproduced in this update are for clarification, to reflect changes in FAA and/or industry usage, or to reflect the FAA's revised Private Pilot Airman Certification Standards (FAA-S-ACS-6B, Change 1), effective June 2019. Language was updated throughout the book, including "cockpit" to "panel," "panel display," or "flight deck;" "student" to "learner," "certificate holder," "candidate," or "trainee;" and "Notices to Airmen" to "Notices to Air Missions."

To view the current ACS, go to
www.faa.gov/training_testing/testing/acs/media/private_airplane_acs_change_1.pdf

The Task reproductions at the beginning of each Part II study unit as well as each Task element within each subunit have been updated to match the FAA ACS document above.

Study Unit 2 – Your FAA Practical (Flight) Test

Page 8, Subunit 2.1, Item 2.:

2. The ACS consists of **Areas of Operation** arranged in a logical sequence, beginning with Preflight Preparation and ending with Postflight Procedures. Each Area of Operation includes tasks appropriate to that Area of Operation.

   a. Each task begins with an **Objective** stating what the applicant should know, consider, and/or do. The ACS then lists the aeronautical knowledge, risk management, and skill elements relevant to the specific task, along with the conditions and standards for acceptable performance. Below is an example of the task structure.

      PA.IV.F.K1:

      PA = Applicable ACS (Private Pilot – Airplane)
      IV = Area of Operation (Takeoffs, Landings, and Go-Arounds)
      F = Task (Short-Field Approach and Landing)
      K1 = Task Element Knowledge 1 (A stabilized approach, to include energy management concepts.)

Page 10, Subunit 2.3, Item 1. and New item 2.:

1. You are required to provide an appropriate and airworthy airplane for the practical test per 14 CFR 61.45. The airplane must be equipped for, and its operating limitations must not prohibit, the pilot operations required on the practical test.

2. If 14 CFR 61.45(d)(2) requires the applicant to provide a view-limiting device that is acceptable to the evaluator, the applicant and the evaluator should establish procedures for when and how this device should be donned and removed and brief these procedures before flight.

   a. The device must be used during all testing that requires flight "solely by reference to instruments" as part of the task objective.

   b. The device must prevent the applicant from having visual reference outside the aircraft, but it must not restrict the evaluator's ability to see and avoid other traffic.

   c. Use of the device does not apply to specific task elements that require visual references.

Study Unit 3 – Pilot Qualifications

Page 23, Subunit 3.1, Item 3.b.1)-2):

1) You must undergo a routine medical examination that may be administered only by FAA-designated AMEs.

   a) For operations requiring a private, recreational, or student pilot certificate, a first-, second-, or third-class medical certificate expires ~~at the end of the last day of the month either~~

      i) ~~5 years (~~60 months (5 years) after the month of the date of examination shown on the certificate, if you have not reached your 40th birthday on or before the date of examination or

      ii) ~~2 years (~~24 months (2 years) after the month of the date of examination shown on the certificate, if you have reached your 40th birthday on or before the date of examination.

2) ~~Even if you have a physical handicap~~For persons with a disability, medical certificates can be issued in many cases. Operating limitations may be imposed depending upon the nature of the disability.

Page 25, Subunit 3.1, Item 4.a.:

a. Although you are required to carry your medical and pilot certificates, you are not required to have your logbook with you at all times ~~(unless you are a student pilot)~~.

Study Unit 4 – Airworthiness Requirements

Page 33, Subunit 4.1, Item 3.a.1)a)-e):

a) Use the memory aid A TOMATOE FLAMES to help you remember the equipment.

~~1)~~i) Anticollision light system (approved aviation white or aviation red)

~~1.~~ii) Tachometer for each engine

~~2.~~iii) Oil pressure gauge for each engine using a pressure system

~~3.~~iv) Manifold pressure gauge for each altitude engine

~~4.~~v) Altimeter

~~5.~~vi) Temperature gauge for each liquid-cooled engine

~~6.~~vii) Oil temperature gauge for each air-cooled engine

viii) Emergency equipment (flotation devices beyond power-off glide from the shore if operating for hire and at least one pyrotechnic signaling device)

~~1.~~ix) Fuel gauge indicating the quantity of fuel in each tank

~~2.~~x) Landing gear position indicator, if the aircraft has a retractable landing gear

~~3.~~xi) Airspeed indicator

~~4.~~xii) Magnetic direction indicator (compass)

~~5.~~xiii) An Emergency locator transmitter (ELT), if required by 14 CFR 91.207

~~6.~~xiv) Approved Safety belt with approved metal-to-metal latching device for each occupant who is 2 yr. of age or older

b) For small civil airplanes manufactured after July 18, 1978, an approved shoulder harness for each front seat

~~c) For normal, utility, and acrobatic category airplanes with a seating configuration, excluding pilot seats, of nine or less, manufactured after December 12, 1986, a shoulder harness for each seat in the airplane~~

~~d) For small airplanes certificated after March 11, 1996, an approved anticollision light system~~

~~e) Approved flotation gear for each occupant and one pyrotechnic signaling device if the aircraft is operated for hire over water beyond power-off gliding distance from shore~~

Page 35, Subunit 4.1, Item 3.d.5)a):

5) Some examples of placards include

a) Airspeed limitations that are not marked on the face of the ASI.

Study Unit 5 – Weather Information

Page 40, Subunit 5.1, New item 1.c.:

c. Flight Service communicates directly with pilots for pilot briefings, flight plans, in-flight advisory services, search and rescue initiation, aircraft emergencies, and Notices to Air Missions (NOTAMs).

1) The Flight Service Pilot Web Portal at www.1800wxbrief.com enables pilots to receive online preflight briefings, file flight plans, and get automatic notifications and alerts.

Page 48, Subunit 5.1, Item 2.r.1):

r. If you are already in flight and you need weather information and assistance, the following services are provided by flight service stations (FSSs). They can be accessed over the proper radio frequencies listed on aeronautical charts and the Chart Supplement.

1) ~~Hazardous Inflight Weather Advisory Service (HIWAS) is a continuous broadcast service over selected VORs of in-flight aviation weather advisories, i.e., AIRMETs, SIGMETs, convective SIGMETs, severe weather forecast alerts (AWW), center weather advisories (CWA), and urgent pilot reports (PIREPs).~~**Flight Information Services-Broadcast (FIS-B).** The implementation of ADS-B has provided pilots the ability to obtain real-time weather advisory information in flight via data-link service. This system supplements preflight briefings, enhancing safety of flight by enabling pilots to receive weather products in the air.

FIS-B Over UAT Product Update and Transmission Intervals

Product	Update Interval[1]	Transmission Interval (95%)[2]	Basic Product
AIRMET	As Available	5 min.	Yes
AWW/WW	As Available, then at 15 min. intervals for 1 hr.	5 min.	No
Ceiling	As Available	10 min.	No
Convective SIGMET	As Available, then at 15 min. intervals for 1 hr.	5 min.	Yes
D-ATIS	As Available	1 min.	No
Echo Top	5 min.	5 min.	No
METAR/SPECI	1 min. (where available), As Available otherwise	5 min.	Yes
MRMS NEXRAD (CONUS)	2 min.	15 min.	Yes
MRMS NEXRAD (Regional)	2 min.	2.5 min.	Yes
NOTAMs-D/FDC	As Available	10 min.	Yes
NOTAMs-TFR	As Available	10 min.	Yes
PIREP	As Available	10 min.	Yes
SIGMET	As Available, then at 15 min. intervals for 1 hr.	5 min.	Yes
SUA Status	As Available	10 min.	Yes
TAF/AMEND	6 hr. (±15 min.)	10 min.	Yes
Temperature Aloft	12 hr. (±15 min.)	10 min.	Yes
TWIP	As Available	1 min.	No
Winds aloft	12 hr. (±15 min.)	10 min.	Yes
Lightning strikes[3]	5 min.	5 min.	Yes
Turbulence[3]	1 min.	15 min.	Yes
Icing, Forecast Potential (FIP)[3]	60 min.	15 min.	Yes
Cloud tops[3]	30 min.	15 min.	Yes
1 Minute AWOS[3]	1 min.	10 min.	No
Graphical-AIRMET[3]	As Available	5 min.	Yes
Center Weather Advisory (CWA)[3]	As Available	10 min.	Yes
Temporary Restricted Areas (TRA)	As Available	10 min.	Yes
Temporary Military Operations Areas (TMOA)	As Available	10 min.	Yes

[1]The Update Interval is the rate at which the product data is available from the source.
[2]The Transmission Interval is the amount of time within which a new or updated product transmission must be completed (95%) and the rate or repetition interval at which the product is rebroadcast (95%).
[3]The transmission and update intervals for the expanded set of basic meteorological products may be adjusted based on FAA and vendor agreement on the final product formats and performance requirements.
NOTE: NOTAM-D and NOTAM-FDC products broadcast via FIS-B are limited to those issued or effective within the past 30 days.

Page 59, Subunit 5.1, New items 3.j.8) and 3.l.:

8) Mist is a visible aggregate of minute water droplets or ice crystals suspended in the atmosphere that reduces visibility to less than 7 SM but greater than or equal to 5/8 SM.

a) Mist forms a thin grayish veil that covers the landscape.

b) It is similar to fog, but it has lower relative humidity (95-99%) and does not obstruct visibility to the same extent.

k. Frost

[. . .]

l. **Obstructions to visibility (e.g., smoke, haze, volcanic ash, etc.)**

1) **Smoke** is the collection of small particles suspended in the air as a result of combustion, fires, industrial burning, etc.

a) Compounds of smoke are toxic.

b) Smoke can reduce visibility to zero.

c) Smoke transitions to haze as it travels larger distances.

2) **Haze** is the collection of extremely small particles invisible to the naked eye and sufficiently numerous to create an opalescent appearance of the air.

a) Haze infuses a blue tone when viewed against a darker background. The tone is slightly yellow when viewed against a lighter background.

b) Haze occurs in stable air and has a definite ceiling.

3) **Volcanic ash** is a combination of very fine particles of silica and rock powder originating from a volcano that can remain airborne for extended periods.

a) If a jet engine ingests certain quantities of silica, the silica will gradually form a soft adhesive molten substance that adheres to the internal components, which could slow the engine and lead to a flameout.

4) **Precipitation** is any of the forms of water particles, whether liquid or solid, that fall from the atmosphere and reach the ground, including drizzle, rain, and snow.

a) Drizzle restricts visibility more than rain, forms in stable air, and is often accompanied by fog.

b) Rain only reduces visibility below 1 SM briefly in very heavy showers.

c) Snow often reduces visibility to zero.

Pages 68-69, Subunit 5.3, Items 1.d.-v. and 2. and New item 3.: This edit moves Item 2. where indicated, inserts New item 3., and renumbers subsequent items accordingly.

c. Be able to explain to the evaluator how you obtained a weather briefing and that it is from approved sources.

1) Subunit 5.1, item 2., beginning on page 40, has more information on this topic.

2. **The applicant demonstrates the ability to discuss the implications of at least three of the conditions listed in Subunit 5.1, items 3.a.-3.~~k.~~l., using actual weather or weather conditions in a scenario provided by the evaluator.**

a. Using your best judgment based on the knowledge and risks discussed previously, respond to the evaluator's weather scenario.

3. **The applicant demonstrates the ability to correlate weather information to make a competent go/no-go decision.**

~~d.~~a. Every planned flight requires a go/no-go decision. To be able to make a decision based on weather conditions, you must first understand the overall weather situation and the dangers associated with the flight environment.

[. . .]

~~r.~~o. ~~HIWAS,~~ SIGMETs~~,~~ and Center Weather Advisories (CWAs) combined with automated flight deck weather can help you make in-flight diversion decisions.

Study Unit 6 – Cross-Country Flight Planning

Pages 74-76, Subunit 6.1, Item 4.:

4. **The applicant demonstrates understanding of elements of a VFR flight plan.**

NOTE: ~~Currently, pilots file flight plans in the U.S. under either a domestic or International Civil Aviation Organization (ICAO) format. The FAA is proposing to implement flight plan filing for civil aircraft exclusively under the ICAO format. This section includes information for both domestic and ICAO formats.~~On August 27, 2019, the FAA transitioned to mandatory use of the international (ICAO) flight plan format for all IFR and VFR domestic and international civil flights.

a. ~~A domestic flight plan requires the following 17 points of information:~~ ICAO Flight Plan

1) ~~Type -- VFR, IFR, DVFR~~Flight plans contain specific information relating to the proposed flight of an aircraft, and controllers use them to provide air traffic services. The use of one format will simplify the process and align U.S. flight plans with ICAO standards.

~~a) DVFR refers to defense VFR flights. They are VFR flights into air defense identification zones that require a VFR flight plan to be filed.~~

2) ~~Airplane identification~~ Switching from the domestic flight plan format to the ICAO format is relatively simple and aided by the fact that most of the fields in the domestic form are found in the international form.

3) ~~Airplane type/special equipment~~ While some wording is slightly different, pilots experienced with filing domestic plans will see close similarities with most of the international fields, allowing them to file ICAO plans with ease. The table below illustrates the similarity between domestic and ICAO fields.

Domestic Fields	ICAO Field Equivalents
Aircraft Identification	Aircraft Identification
Type (of Flight)	Flight Rules
Aircraft Type	Type of Aircraft
Special Equipment*	Equipment (COM/NAV)*
Departure Point	Departure Aerodrome**
Departure Time	Time
True Airspeed	Cruising Speed
Cruising Altitude	Level
Route of Flight	Route**
Destination	Destination Aerodrome**
Est Time Enroute	Total EET
Remarks	Other Information/Remarks
Fuel on Board	Endurance
Number Aboard	Persons on Board
Color of Aircraft	Aircraft Color and Markings
Pilot's Name & Other Information	Pilot in Command

*This field is optional
**ICAO IFR Flight Plans require 4-character location identifiers

~~a) The following table contains the special equipment suffixes and their meanings:~~

~~/X -- No transponder~~
~~/T -- Transponder with no altitude-encoding capability~~
~~/U -- Transponder with altitude-encoding capability~~
~~/D -- DME, but no transponder~~
~~/B -- DME and transponder, but no altitude-encoding capability~~
~~/A -- DME and transponder with altitude-encoding capability~~
~~/I -- RNAV and transponder with altitude-encoding capability~~
~~/C -- RNAV and transponder, but no altitude-encoding capability~~
~~/W -- RNAV, but no transponder~~
~~/G -- GPS equipped with oceanic, en route, terminal, and GPS approach capability~~

4) ~~True airspeed (kt.)~~For additional guidance, refer to the *Aeronautical Information Manual (AIM)*, Appendix 4.

~~5) Departure point~~

~~6) Departure time in Universal Coordinated Time (UTC)~~

~~a) You supply the proposed departure time, and the FSS will fill in the actual departure time when you activate the flight plan after takeoff.~~

~~7) Cruising altitude~~

~~8) Route of flight~~

~~9) Destination airport identifier or airport name (name of airport and city if needed for clarity)~~

~~10) Estimated time en route (hours and minutes)~~

~~11) Remarks~~

~~12) Fuel on board (total amount expressed in hours and minutes)~~

~~13) Alternate airport(s) (NOTE: This is not required for a VFR flight plan.)~~

~~14) Pilot's name, address, and telephone number, and airplane home base~~

~~15) Number of people aboard~~

~~16) Color of aircraft~~

~~17) Destination contact/telephone (NOTE: This is optional, not required.)~~

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Exp. 7/31/2020

U S Department of Transportation
Federal Aviation Administration

International Flight Plan

PRIORITY
<=FF

ADDRESSEE(S)

FILING TIME

ORIGINATOR

SPECIFIC IDENTIFICATION OF ADDRESSEE(S) AND / OR ORIGINATOR

3 MESSAGE TYPE
<=(FPL

7 AIRCRAFT IDENTIFICATION

8 FLIGHT RULES

TYPE OF FLIGHT

9 NUMBER

TYPE OF AIRCRAFT

WAKE TURBULENCE CAT.

10 EQUIPMENT

13 DEPARTURE AERODROME

TIME

15 CRUISING SPEED

LEVEL

ROUTE

TOTAL EET

16 DESTINATION AERODROME

HR MIN

ALTN AERODROME

2ND ALTN AERODROME

18 OTHER INFORMATION

SUPPLEMENTARY INFORMATION (NOT TO BE TRANSMITTED IN FPL MESSAGES)

19 ENDURANCE
HR MIN
E/

PERSONS ON BOARD
P/

EMERGENCY RADIO
UHF VHF ELT
R/ U V E

SURVIVAL EQUIPMENT
POLAR DESERT MARITIME JUNGLE
/ P D M J

JACKETS
LIGHT FLUORES UHF VHF
/ L F U V

DINGHIES
NUMBER CAPACITY COVER COLOR
D / C

AIRCRAFT COLOR AND MARKINGS
A/

REMARKS
N /

PILOT-IN-COMMAND
C/)<=

FILED BY | ACCEPTED BY | ADDITIONAL INFORMATION

FAA Form 7233-4 (7/15)

Study Unit 7 – National Airspace System

Pages 87-88, Subunit 7.1, Items 1.c.-h.:

c. **Class A** airspace is generally the airspace from 18,000 ft. MSL up to and including flight level (FL) 600, including the airspace overlying the waters within 12 NM of the coast of the 48 contiguous states and Alaska.

1) Operating rules and pilot/equipment requirements

a) An IFR clearance to enter and operate within Class A airspace is mandatory. Thus, you must be instrument-rated to act as PIC of an airplane in Class A airspace.

b) Two-way radio communication, appropriate navigational capability, and a Mode C transponder are required.

c) Aircraft operating above FL 180 (18,000 ft. MSL) must be equipped with a Mode S transponder-based ADS-B transmitter.

d. **Class B** airspace is generally the airspace from the surface to 10,000 ft. MSL surrounding the nation's busiest airports in terms of IFR operations or passenger enplanements (e.g., Atlanta, Chicago).

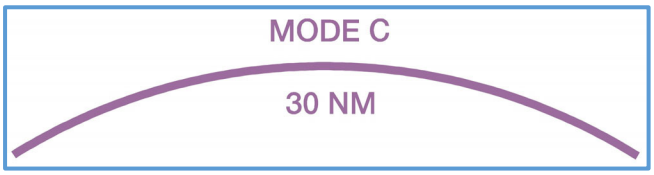
1) The configuration of each Class B airspace area is individually tailored and consists of a surface area and two or more layers.

2) Operating rules and pilot/equipment requirements for VFR operations

a) An ATC clearance is required prior to operating within Class B airspace.

b) Two-way radio communication capability is required.

c) A Mode C transponder is required within and above the lateral limits of Class B airspace and within the 30 NM Mode C veil of the primary airport regardless of altitude.



d) ADS-B Out equipment is also required within and above the Class B airspace and inside the Mode C veil.

~~d)~~e) The PIC must be at least a private pilot, or a student pilot certificate holder or recreational pilot who is under the supervision of a CFI.

[. . .]

2) Operating rules and equipment requirements

a) Two-way radio communications must be established and maintained with ATC before entering and while operating in Class C airspace.

b) ~~Mode C transponder is required within and above the lateral limits of Class C airspace.~~The minimum equipment needed to operate within and above Class C airspace includes

i) A 4096-code transponder with Mode C (altitude encoding) capability,

ii) Two-way communication capability, and

iii) ADS-B Out equipment that either operates on the frequency of 1090 MHz or operates using a UAT on the frequency of 978 MHz.

f. **Class D** airspace surrounds those airports that have both an operating control tower and weather services available, and are not associated with Class B or C airspace.

1) Class D airspace normally extends from the surface up to and including 2,500 ft. AGL and is depicted on charts in MSL.

2) Operating rules and pilot/equipment requirements

a) Two-way communications must be established and maintained with ATC prior to entering and while operating in Class D airspace.

b) No specific pilot certification is required.

g. **Class E** airspace is any controlled airspace that is not Class A, B, C, or D airspace.

1) Except for 18,000 ft. MSL (the floor of Class A airspace), Class E airspace has no defined vertical limit, but rather it extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace.

2) There are no ~~specific~~minimum pilot certification ~~or equipment~~ requirements to operate under VFR in Class E airspace.

a) ADS-B Out equipment is required in Class E airspace when

i) Above 10,000 ft. MSL over the 48 states and Washington, D.C., excluding airspace at and below 2,500 ft. AGL

ii) Over the Gulf of Mexico at and above 3,000 ft. MSL within 12 NM of the coastline of the United States

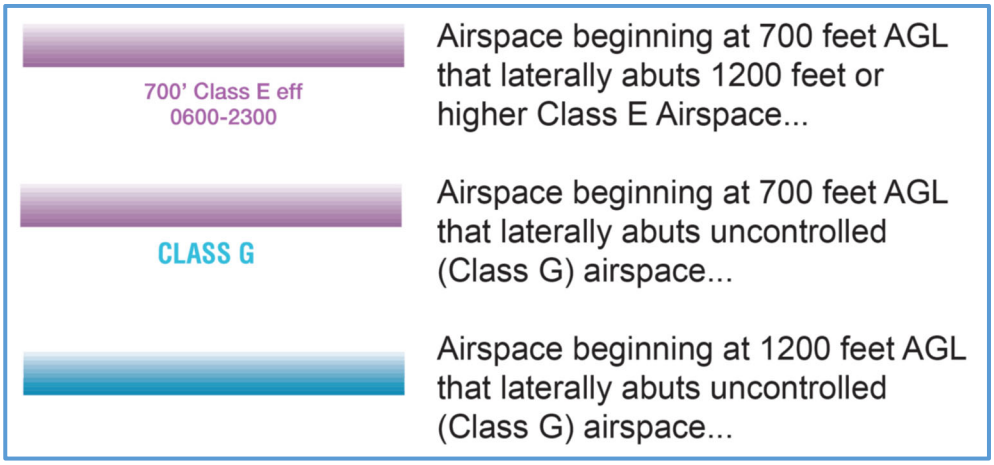
h. **Class G** airspace is that airspace that has not been designated as Class A, Class B, Class C, Class D, or Class E airspace (i.e., it is uncontrolled airspace).

1) No specific pilot certification or airplane equipment is required to operate under VFR in Class G airspace.

NOTE: While generally there is no equipment required to operate VFR in Class ~~E or Class~~ G airspace, there are some airports located within the surface area of an airport with an operational control tower. In these circumstances, you must establish and maintain two-way radio communication with the control tower if you plan to operate to, from, or through an area within 4 NM from the airport, from the surface up to and including 2,500 ft. AGL.

Page 89, Subunit 7.1, Item 2.5)b):

b) The lateral and vertical limits of all Class E airspace (up to but not including 18,000 ft.) are shown by narrow bands of vignette on Sectionals and TACs.



Page 92, Subunit 7.1, New items 3.a.8)-3.b.:

8) **National security areas (NSAs)** -- airspace of defined vertical and lateral dimensions established at locations where there is a requirement for increased security and safety of ground facilities. Pilots are requested to voluntarily avoid flying through the depicted NSA.

a) A NOTAM will be issued to prohibit flight in NSAs when it is necessary to provide a greater level of security and safety.

b. Other Airspace Areas

1) **Airport advisory areas** encompass the areas within 10 SM of airports that have no operating control towers but where FSSs are located. At such locations, the FSS provides advisory service to arriving and departing aircraft. Participation in the Local Airport Advisory (LAA) program is recommended but not required.

2) **Military training routes (MTRs)** are developed for use by the military for the purpose of conducting low-altitude (below 10,000 ft. MSL), high-speed training (more than 250 kt.).

3) **Temporary Flight Restrictions (TFRs)**

a) TFRs (14 CFR 91.137) contain airspace where the flight of aircraft is prohibited without advance permission and/or an FAA waiver.

i) This restriction exists because the area inside the TFR is often of key importance to national security or national welfare.

ii) TFRs may also be put into effect in the vicinity of any incident or event that, by its nature, may generate such a high degree of public interest that hazardous congestion of air traffic is likely.

b) TFRs are very different from other forms of airspace because they are often created, canceled, moved, and/or changed.

i) The temporary nature of TFRs can make keeping track of their locations and durations challenging.

ii) TFRs protect government interests as well as the general public.

iii) TFRs often surround other forms of airspace when extra security is necessary.

iv) Because TFRs protect the President, pilots must be aware that large TFRs will be implemented around any area where the President is present.

c) A Notice to Air Missions (NOTAM) implementing temporary flight restrictions will contain a description of the area in which the restrictions apply.

i) The size and shape of TFRs vary based on the areas they protect.

ii) Most TFRs are in the shape of a circle and are designed to protect the center of that circle.

iii) TFRs always have defined vertical and lateral boundaries as indicated in the NOTAMs.

d) Flight limitations in the proximity of space flight operations (14 CFR 91.143) are designated in a NOTAM.

4) **Parachute jump aircraft operations areas** are coordinated with the control facility with reference to altitudes in MSL. This allows for ATC to provide meaningful traffic information. Monitoring the Common Traffic Advisory Frequency (CTAF) in areas of high jumping activity is essential.

a) Tabulations of **parachute jump areas** in the U.S. are contained in the Chart Supplement U.S.

b) Review aviation navigation charts for highlighted areas of activity.

~~b.~~c. **Special Flight Rules Areas (SFRAs)**

Page 94, Subunit 7.1, Items 3.c. and 3.d.-3.d.5) were moved as edited to new items 3.a.8)-3.b. on the previous page and above. Subsequent items were renumbered accordingly.

~~6)~~5) **VFR flyway** is a general flight path not defined as a specific course but used by pilots planning flights into, out of, through, or near complex terminal airspace to avoid Class B airspace.

Study Unit 10 – Human Factors

Page 120, Subunit 10.1, Item 1.:

1. **The applicant demonstrates understanding of the symptoms (as applicable), recognition, causes, effects, and corrective actions associated with aeromedical and physiological issues, including the following:**

   ~~NOTE: If this element is selected for testing, the evaluator must assess the applicant's knowledge of at least three of the following sub-elements.~~

   a. ~~**Hypoxic hypoxia**~~**Hypoxia** is a state of oxygen deficiency in the body sufficient to impair functions of the brain and other organs. Prolonged hypoxia may result in unconsciousness.

Study Unit 10 and Appendix B

Pages 137 and 636, Gleim Preflight Risk Assessment Matrix:

[. . .]

enVironment						
Airport	Adequate, familiar		Barely adequate		Unfamiliar, inadequate	
Weather (IFR/VFR)	VFR		MVFR	IFR	LIFR	
Runways	Dry, hard, long	Dry, hard, short	Dry, soft, short	Wet, hard, short	Wet, soft, short	
Lighting (Day VFR=1)	Runway, taxiway		Runway only		None	
Terrain	Flat, ~~populated~~dry	Flat, swampy	Flat, ~~unpopulated~~ dense forests	Hilly	Mountainous	
External pressures						

[. . .]

Study Unit 15 – Before Takeoff Check

Page 187, Subunit 15.2, New item 4.:

4. **The applicant demonstrates the ability to identify, assess, and mitigate risks encompassing a powerplant failure during takeoff or other malfunction, considering operational factors such as airplane characteristics, runway/takeoff path length, surface conditions, environmental conditions, and obstructions.**
    a. You should have a good understanding of the engine gauge indications and safely divide your attention to monitor the trending of the gauge's operating profile to detect abnormal or potentially dangerous conditions prior to rotation and again above a safe predefined altitude.
    b. Consider all performance characteristics of the airplane when creating parameters for responding to powerplant failure
        1) On the ground roll,
        2) After takeoff with sufficient runway ahead to land and roll out safely,
        3) After takeoff with insufficient runway ahead to land again safely,
        4) On the climbout below a predefined altitude, and
        5) On the climbout above a predefined altitude.
    c. In addition to designating pilot in command responsibility in the event of a powerplant failure during takeoff, you will brief takeoff runway distance available versus actual runway length with consideration for full-length or intersection takeoff distances.
        1) You should consider attained weather data, PIREPs, and the most recent ATIS when briefing from previously calculated takeoff distances.
    d. Compensate for the impact of environmental conditions on surface conditions.
        1) EXAMPLE: Consider precipitation and its impact upon available takeoff distance and the ability to maintain directional control in the event of a powerplant failure.
    e. Compensate for environmental conditions such as temperature.
        1) EXAMPLE: A consistent rising temperature will increase potential ground roll and reduce climbout performance and the margins for recovery upon powerplant failure.
    f. A thorough preflight briefing must include
        1) Understanding and briefing potential landing/ditching sites for multiple scenarios at the departure runway
        2) Clarifying the type of performance takeoff being assessed based on the runway condition or presence of an obstacle requiring modification of climbout performance

Study Unit 17 – Traffic Patterns

Page 210, Subunit 17.1, Item 4.b.2):

2) **Automated Surface Observing System (ASOS)~~/Automated Weather Sensor System (AWSS)~~**

a) Primary surface weather observing system of the U.S.

i) ~~AWSS is a follow-on program that provides identical data as ASOS.~~ASOS provides critical aviation weather parameters relating to the airport runway touchdown zone(s).

ii) ASOS~~/AWSS~~ is ~~more sensitive~~modular by nature and provides more sophisticated information than AWOS.

b) Designed to support aviation operations and weather forecast activities~~.~~

i) ASOS~~/AWSS will~~ provides continuous minute-by-minute observations, ~~and~~ performs the basic observing functions necessary to generate a METAR and other aviation weather information~~.~~, and automatically provides automated verbal observations to aircraft in the vicinity of the airport.

c) Transmitted and received by the pilot in exactly the same way as AWOS~~.~~

Study Unit 18 – Normal Takeoff and Climb

Page 255, Subunit 18.3, New item 8.:

8. **The applicant demonstrates the ability to avoid excessive water spray on the propeller(s) (ASES, AMES).**

a. This is a seaplane task item, and it is not covered in this text.

Study Unit 19 – Normal Approach and Landing

Page 265, Subunit 19.2, Item 6.:

6. **The applicant demonstrates the ability to identify, assess, and mitigate risks encompassing distractions, loss of situational awareness, ~~and/~~incorrect airport surface approach and landing, or improper task management.**

    a. ~~For~~Study Unit 10, Subunit 2, item 3., beginning on page 132, has information on distractions, situational awareness, and task management~~, see Study Unit 10, Subunit 2, item 3., beginning on page 132~~.

    b. An incorrect airport surface approach and landing is any event wherein a loss of situational awareness and, in particular, positional awareness leads a pilot or crewmember to an unauthorized landing on a taxiway, incorrect runway, or other airport surface.

        1) It can be avoided by

            a) A thorough approach briefing, drawing emphasis to the airport diagram and lighting, with verbal review of previously briefed NOTAMs

            b) Utilizing CRM and pertinent available resources

            c) Conducting a stabilized approach to allow situational awareness of the external environment

            d) Awareness of potential hazards, night operation, low-visibility operations, parallel runway operations, taxiway orientation, etc.

        2) Any late or unexpected amendments to landing clearance should be evaluated, with strong consideration given to refusal, should it be deemed to reduce the margins of safety.

        3) Understanding expectation bias is important in making appropriate real-time, responsive decisions.

        4) Always be prepared to “go around” if any doubt exists.

Study Unit 24 – Forward Slip to a Landing

Page 339, Subunit 24.2, Item 3.e. and New item 3.f.:

e. ~~For~~Study Unit 25 has more information on how to perform a go-around/rejected landing~~, see Study Unit 25~~.

f. Section IV Introduction, item 6., on page 230, has information on LAHSO.

Page 342, Subunit 24.3, Item 8.c.:

c. Use the proper crosswind technique to ensure that your airplane’s longitudinal axis is aligned with and over the runway centerlines extended ground track.

Study Unit 36 – Straight and Level Flight

Pages 511-512, Subunit 36.1, Item 1.h.1)b)ii) and New item 1.h.2):

ii) ~~Last and certainly not least,~~Routinely interrupt your flight instrument scan ~~every few minutes~~ to review all your other instruments and engine parameters, including

- Compass to HI for precession (resetting HI as necessary)
- Engine RPM and/or MP, as appropriate
- Engine temperatures (oil, cylinder head, and EGT)
- Oil pressure
- Fuel level, mixture, and flow
- Vacuum pressure
- Ammeter

[. . .]

c) Frequent cross-check faults are

i) Fixation, or staring at a single instrument

ii) Omission of an instrument from cross-check

iii) Emphasis on a single instrument, instead of a combination of instruments necessary for attitude information

2) **Instrument interpretation** refers to understanding the information provided by cross-checking the available instruments.

a) Processing data from the instruments while continuing to successfully cross-check requires a fundamental understanding of each instrument's function, operating principle, and limitations.

b) Interpreting the information obtained while cross-checking requires understanding trend indications and how each individual piece of information relates to the others. This interpretation results in a comprehensive overview of attitude and orientation.

c) Precision develops with familiarity. For example, knowing which pitch attitudes to use for a given rate of climb or which power settings yield an approximate airspeed will lead to faster and more accurate instrument interpretation.

3) **Airplane control** is the practical and timely application of the data obtained during instrument cross-check and interpretation.

a) While training for an instrument rating, students can use the "control and performance" method or the "primary and supporting" method to learn to use these skills.

b) Successful flight can be accomplished with smooth, controlled inputs. These inputs are incremental responses of airplane control based on the instrument interpretation and are prioritized as follows:

i) Pitch control. The motion of the airplane around the lateral axis is adjusted by movement of the elevators.

ii) Bank control. The angle made by the wing to the horizon is adjusted one degree at a time by movement of the ailerons to roll the airplane about its longitudinal axis.

iii) Power control. Thrust is adjusted by moving the throttle forward or back.

iv) Trim control. Trim control devices are used to maintain the applied control input once the desired attitude is attained. Trim control allows the pilot to dedicate more time to safe flight and positive aircraft control through smooth, hands-off flight.

Study Unit 40 – Recovery from Unusual Flight Attitudes

Page 542, Subunit 40.2, New item 7.:

7. **The applicant demonstrates the ability to identify, assess, and mitigate risks encompassing exceeding the operating envelope during the recovery.**

   a. Care must be taken during unusual attitudes to interpret correctly each phase of the recovery. Without employing appropriate airplane control, the pilot can quickly aggravate an abnormal flight attitude into a potentially fatal LOC-I accident.

   b. Recovery from a nose-low unusual attitude must take place in the following sequence, but almost simultaneously, so as not to overstress the airplane or create structural failure.

Study Unit 46 – Night Preparation

Page 605, Subunit 46.3, Item 1.a.1):

1) Since you may do the preflight inspection at night, you must use your flashlight to illuminate the areas you are inspecting. You should take your time and look at each item carefully. Flashlights often come with red and blue lenses for different flight activities, such as pre/post-flight checks or cockpit chart and instrument reading.

Study Unit 47 – After Landing, Parking, and Securing

Page 615, Subunit 47.2, New item 3.i.:

h. Most potential security issues will be resolved by questioning individuals and reporting your observations to an FBO employee.

i. The Gleim TSA Security Awareness Training Course (available at www.GleimAviation.com/tsa) is free of charge for CFIs and other flight school employees required to have TSA training.