## Contents

Revision History ............................................................................................................................................ 4  
Orientation Briefing Guide ............................................................................................................................ 5  
Checkout Requirements for Pilots ................................................................................................................ 7  
How to Expedite Your Training and Save Money .......................................................................................... 9  
Aero Club Aircraft Performance Chart ......................................................................................................... 10  
How to Obtain a Good Weather Brief .......................................................................................................... 11  
METAR / TAF Decoder .................................................................................................................................. 12  
Airport Diagram ........................................................................................................................................... 14  
Academy Airspace ....................................................................................................................................... 15  
Radio Call Basics ......................................................................................................................................... 17  
Tower Departure ......................................................................................................................................... 17  
No Tower Departure ................................................................................................................................... 17  
USAF Academy Radio Calls .......................................................................................................................... 18  
Departure and Outside Downwind 16L and 34R ........................................................................................ 18  
Arrivals 16L and 34R .................................................................................................................................... 19  
North Arrival – Tower, Runway 34R / 16L .................................................................................................. 20  
South Arrival – Tower, Runway 34R / 16L .................................................................................................. 20  
North Arrival – No Tower, Runway 34R / 16L ............................................................................................. 21  
South Arrival – No Tower, Runway 34R / 16L ............................................................................................. 22  
Radio Calls for Closed Traffic Pattern ......................................................................................................... 23  
HIGBY .......................................................................................................................................................... 24  
JOYAL ........................................................................................................................................................... 25  
NAIL ............................................................................................................................................................. 26  
SAW ............................................................................................................................................................... 27  
SLEDG .......................................................................................................................................................... 28  
Mnemonic Aids for Checklist (Checklist Takes Precedence) ................................................................. 29  
Flight Maneuver Profile .............................................................................................................................. 31  
Emergency Procedures Closed Book Exam ................................................................................................. 38  
Emergency Procedures Closed Book Answer Sheet ................................................................................... 39  
—Student Pilot Information— .................................................................................................................... 40
Runway Markings........................................................................................................................................ 41
Taxiing Wind Diagram ................................................................................................................................ 43
Cloud Clearance Criteria ............................................................................................................................. 44
Required Paperwork for Solo ...................................................................................................................... 45
Pre-Solo Written Exam ................................................................................................................................ 46
Solo Navigation Exam ................................................................................................................................. 54
FAA Testing Procedures and Contact Information ......................................................................................... 57
## Revision History

<table>
<thead>
<tr>
<th>Revision Number</th>
<th>Description of Changes With Page Number</th>
<th>Date of Revision</th>
<th>Changes Performed By (Name)</th>
<th>Signed off by (name)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Document Created</td>
<td>2/13/19</td>
<td>Brent Sonin</td>
<td>Chris Carper</td>
</tr>
<tr>
<td>1</td>
<td>Reordered Pages, updated responses for requesting closed traffic, added call signs to aero club performance chart, fixed error on arrivals 16L 34R.</td>
<td>4/4/19</td>
<td>Brent Sonin, Vivien Wu, Dan Hall,</td>
<td>Chris Carper</td>
</tr>
<tr>
<td>2</td>
<td>Flight watch frequency corrected pg. 11</td>
<td>5/8/19</td>
<td>Bergan Hugos</td>
<td>Chris Carper</td>
</tr>
<tr>
<td>3</td>
<td>Updated page 10 to new v-speeds and added page 57 new IACRA Testing Procedures</td>
<td>03/11/20</td>
<td>Chris Carper</td>
<td>Chris Carper</td>
</tr>
</tbody>
</table>
## Orientation Briefing Guide

### PURPOSE:
This checklist shall be completed prior to any flight without a Certified Flight Instructor (CFI). Items 1 through 3 shall be thoroughly covered with the new member by a CFI. Items 4 through 9 shall be completed prior to completion of initial checkout.

### 1. Academy Flight Training Center Purpose and Organization:
- a. AFI 34-117
- b. Flight Training Center Standard Operating Procedures

### 2. Administration and Management:
- a. Aero Club Manager
- b. Aircraft / Instructor Rates
- c. Use of Flight Training Center Telephones
- d. Aircraft Scheduling and Cancellations
- e. No show / late show penalty
- f. Aircraft Books and Record Keeping
- g. Charges and Incurred Expenses (Safe)
- h. Payments
- i. Flight Training Center (FTC) Access and Security
- j. Aircraft Key box Access
- k. Covenant Not To Sue Form (AF Form 1585)

### 3. Safety:
- a. Safety Meeting Attendance and Documentation
- b. Safety Meeting Viewing and Documentation
- c. Accident / Incident Reporting Procedures
- d. Ground Safety / Ramp and Refueling Safety

### 4. Flight Operations:
- a. FTC Written Exams
- b. FTC / Aircraft Check Out
- c. Operations Environment
- d. Pilot-in Command
- e. Sign-out / Clearing Procedures
- f. Refueling Procedure, Emergency Fuel Shut-off, and Use of Fire Extinguisher
- g. Oil Supply / Window Cleaning Materials Storage
- h. Base Operations / Weather Service / METAR
- i. Hangar and Outside Parking
- j. Aircraft Maintenance / Discrepancy Status (AF Form 781)
- k. VFR Departure / Corridor / Arrival Procedures
- l. Closed Traffic and Center Runway Procedures
- m. Uncontrolled Airfield Procedures
- n. Aircraft Tiedown Use / Technique
- o. Aircraft Discrepancies
- p. Pilots Induced Costs
- q. Egress Training / Orientation

### 5. Pre-Flight Clearance Procedures:
- a. Flight Circle Use and Certifications
- b. Weather Minimums
- c. FTC Local / X-C Flight Plans
- d. Status Board and WX Information Systems
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>( ) e. FTC Clearing Form (0-435)</td>
<td>( ) f. Aircraft Book</td>
<td>( ) g. Sign-Out / In Procedures (Schedule, Magnet Board, 0-435)</td>
</tr>
</tbody>
</table>

### 6. Aircraft Checkout / Currency:
- ( ) a. Use of Aircraft Checklist
- ( ) b. Check-Out Requirements (C-172 / T-41 C / DA-20), AF Form 1584
- ( ) c. Initial Night / Mountain / Instrument Check Out
- ( ) d. FTC Currency Requirements

### 7. Training:
- ( ) a. Training Records / Folders
- ( ) b. Instructor Assignment
- ( ) c. Stage Check Procedures

### 8. Aircraft Maintenance:
- ( ) a. Member Responsibilities
- ( ) b. Certificates and Documents
- ( ) c. Log Books, Weight and Balance, 337’s
- ( ) d. Aircraft Status Board
- ( ) e. Ground Support Equipment and Location
- ( ) f. Aircraft Security (Tiedown, Gust Lock, Chocks, Sunshield)
- ( ) g. Winter / Summer Operation of Aircraft
- ( ) h. Aircraft Cleanliness (including Windshield)
- ( ) i. Disabled Aircraft Recovery
- ( ) j. Flight Line Driving Procedures and Tractor
- ( ) k. Maintenance Functional Check Flight and Ops Checks

The Above Outline was Briefed in Detail to:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Member</td>
<td>Signature</td>
<td>Date</td>
</tr>
</tbody>
</table>

By Academy Flight Training Center CFI:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CFI</td>
<td>Signature</td>
<td>Date</td>
</tr>
</tbody>
</table>
## Checkout Requirements for Pilots

<table>
<thead>
<tr>
<th>GENERAL KNOWLEDGE*</th>
<th>CFI INITIALS</th>
<th>PILOT INITIALS</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Academy Flight Center Restrictions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Local Ground Movement Area and Airspace</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Billing, Scheduling System and Clearing Procedures</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## PREFLIGHT*

| 4. Weather Information and Sources |              |                |      |
| 5. Access to Aviation Information at the Training Center |              |                |      |
| 6. Maintenance Log and Practices |              |                |      |
| 7. Use of Hangars, Parking Ramps, and Refueling Area |              |                |      |

## ACADEMY AIRFIELD OPERATIONS*

| 8. Airspace Overview, Departure and Arrival Procedures |              |                |      |
| 9. Approved Radio Calls: Towered and Non-Towered |              |                |      |
| 10. Pattern Procedures, Runway Change and Breakouts |              |                |      |

## AIRCRAFT MANEUVERS REQUIRED VFR*

| 11. Steep Turns, Slow flight, Power-on, Power-off Stalls |              |                |      |
| 12. Normal, No-Flap, and Power Off 180 Landings |              |                |      |

## AIRCRAFT MANEUVERS REQUIRED IFR**

| 13. Operating on Instrument References |              |                |      |
| 14. Conducting Precision and Non-Precision Approaches |              |                |      |

### BI-ANNUAL FLIGHT REVIEW see AC 61-98D**

<p>| 15. Review of Part 91 Operating and Flight Rules |              |                |      |
| 16. Pilot Deviation Avoidance |              |                |      |
| 17. Automation Competency |              |                |      |
| 18. Angle of Attack Systems |              |                |      |
| 19. Review of Maneuvers and Procedures |              |                |      |
| 20. Flight Maneuvers as required by the Instructor |              |                |      |</p>
<table>
<thead>
<tr>
<th>CHECKOUT REQUIREMENTS FOR PILOTS CONTINUED</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Instrument Proficiency Check see AC 61-98D**</th>
<th>CFI Initials</th>
<th>Pilot Initials</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. Ground Review of Flight Profiles to be Flown</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Aircraft Control by Reference to Instruments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. Systems and Procedures within the IFR Realm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. Aeronautical Decision Making</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. Stabilized Approaches and Landings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NIGHT OPERATIONS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. Night Preparation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. Night Flight Checkout</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LOCAL EMERGENCY PROCEDURES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. Radio Out Procedures for the Academy Airfield</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. Alternate Airfields for Divert Purposes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. Survival Equipment for Local and Mountain Flights</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>POSTFLIGHT PROCEDURES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. After Landing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32. Parking, Refueling and Securing Aircraft</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* - Required for Local Area Checkout

** - As required for Bi-Annual Flight Review, Night or Instrument Checkouts
How to Expedite Your Training and Save Money

Comment: Remember that time is money. The longer it takes you to gain proficiency, the longer it takes you to get your license and the more money it costs you. Following are some recommendations of how to speed up your training and save money.

Preflight — Many hours are spent by instructors watching students perform long and monotonous preflights. After the instructor shows you how to do a preflight, come to the Aero Club and practice. Sit in a cockpit with the checklist and run through a preflight over and over and over. Learn it so well that you can get it done in 5 to 10 minutes.

Engine Startup — Same thing. Come to the Aero Club, sit in a cockpit with the checklist and simulate running through the startup sequence.

Engine Run Up — Same thing. Come to the Aero Club, sit in a cockpit with the checklist and simulate running through the engine run up sequence. Try to minimize engine run time on the ground. (Note: During cold weather operations, allow the aircraft to reach operating temperature before doing the run up.) Remember, every six minutes of running costs you about $11.00 for the airplane and $3.80 dollars for the instructor’s time.

Radio Calls — You have to commit the radio calls to memory. Practice what you have been given in the radio call handouts. They are not hard to do. So practice. You have to know the radio calls before you can fly solo.

Arrivals and Departures — Study the diagrams. They’re described and illustrated in the Aero Club Standard Operating Procedures and in the In-Flight Guide, which you can find in the Aero Club website. You have to know the arrivals and departures and be able to fly them before you can solo.

Ground Reference Points — Know them. They’re described and illustrated in the Aero Club Standard Operating Procedures and in the In-Flight Guide, which you can find in the Aero Club website. You have to be able to navigate to them and be able to identify them from the air before you can fly solo.

Landings and Maneuvers — Chair fly them at home or sit in a cockpit at the Aero Club and simulate flying them. Practice makes perfect and eliminates repeating flights. Repeating flights is expensive. Remember: $14.80 for every six minutes.

Lesson Preparation — Be prepared for the next lesson, read the text, and watch the video. If necessary, ask questions and clarify with the instructor. A flight lesson cannot be flown if the ground lesson has not been completed.

One final thing — Fly with precision. Repeat: Fly with precision. Become your very best. You’ll gain proficiency faster and complete the training faster. And, you’ll be a better pilot.
### Aero Club Aircraft Performance Chart

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>N1370U</th>
<th>N1401E</th>
<th>N6601K</th>
<th>N98306</th>
<th>N78512</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call-Sign</td>
<td>Rally 70</td>
<td>Rally 14</td>
<td>Rally 01</td>
<td>Rally 06</td>
<td>Rally 12</td>
</tr>
<tr>
<td>Model</td>
<td>C-172 M</td>
<td>C-172 N</td>
<td>C-172 P</td>
<td>C-172 P</td>
<td>C-172 K</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IAS</th>
<th>KTS</th>
<th>KTS</th>
<th>KTS</th>
<th>KTS</th>
<th>MPH</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>55</td>
<td>55</td>
<td>55</td>
<td>55</td>
<td>60</td>
</tr>
</tbody>
</table>

| NORMAL CLIMB | 70 | 70 | 70 | 70 | 80 |

| BEST GLIDE | 65 | 65 | 65 | 65 | 80 |

| STALL ENTRY | 70 | 70 | 70 | 70 | 80 |

| V_{ne} | 160 | 160 | 158 | 158 | 174 |

| V_{no} | 128 | 128 | 127 | 127 | 140 |

<table>
<thead>
<tr>
<th>V_{a} (Weight)</th>
<th>97/89/80</th>
<th>97/89/80</th>
<th>99/92/82</th>
<th>99/92/82</th>
<th>122</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_{fe}</td>
<td>85</td>
<td>85</td>
<td>110/85</td>
<td>110/85</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>V_{y} (SL—10,000MSL)</th>
<th>78-68</th>
<th>73-68</th>
<th>76-71</th>
<th>76-71</th>
<th>82-79</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_{x} (SL—10,000MSL)</td>
<td>59</td>
<td>59</td>
<td>56</td>
<td>56</td>
<td>68-74</td>
</tr>
</tbody>
</table>

| V_s | 47 | 47 | 44 | 44 | 57 |

| V_{so} | 41 | 41 | 33 | 33 | 49 |

| DOWNWIND | 85 | 85 | 85 | 85 | 95 |

| BASE | 75 | 75 | 75 | 75 | 85 |

| FINAL | 65 | 65 | 65 | 65 | 75 |

| SHORT FINAL FLAPS UP | 60 | 60 | 65 | 65 | 70 |

| SHORT FINAL FLAPS DOWN | 55 | 55 | 60 | 60 | 65 |

| TOTAL FUEL (GALS) | 42 | 43 | 54 | 43 | 42 |

| USABLE FUEL (GALS) | 38 | 40 | 50 | 40 | 38 |

| MAX WEIGHT (lbs) | 2550 | 2550 | 2550 | 2550 | 2500 |
How to Obtain a Good Weather Brief

- First, get the “big picture”. Use all available sources such as the weather channel, local weather, and any computer sources at your disposal.
- Next comes FSS, 1-800-WX-BRIEF (992-7433) or 306 OSS Weather 719-333-2058 to get one of three weather briefings. For 306 OSS, request 1 hour prior to briefing:
  - Outlook — Used when the flight is more than six hours away.
  - Standard — Used to provide all information throughout the flight
  - Abbreviated — Used just prior to takeoff to update information
- Information to provide to FSS:
  - Certificate Held (Student, Private, Commercial)
  - Aircraft Tail Number
  - Type of flight (IFR or VFR)
  - Aircraft Type
  - Departure Point
  - Estimated time of departure in Zulu time
  - Proposed altitude and route
  - Destination
  - Estimated time enroute
  - Contact information (name and phone number)
- You will get:
  - Adverse Conditions (thunderstorms, icing, turbulence, ceilings, visibility)
  - Synopsis (cause of weather such as fronts or pressure systems)
  - Current conditions
  - Enroute forecast
  - Destination forecast
  - Winds aloft
  - NOTAMs
  - Ask for TFR’s and frequencies to open and close flight plan on
- Weather during flight is observed on local FSS frequency of on Flight Watch (122.2) for in route weather.
- 175-1 (Dash—One) from 306 OSS / OSW can be requested one day prior. 306 OSS / OSW will provide if time permits.
### METAR / TAF Decoder

<table>
<thead>
<tr>
<th>Forecast</th>
<th>Explanation</th>
<th>Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAF</td>
<td>Message type: TAF-routine or TAF AMD-amended forecast, METAR-hourly, SPECI-special or TESTIM-non-commissioned ASOS report</td>
<td>METAR</td>
</tr>
<tr>
<td>K PIT</td>
<td>ICAO location indicator</td>
<td>K PIT</td>
</tr>
<tr>
<td>091730Z</td>
<td>Issuance time: ALL times in UTC “Z”, 2-digit date, 4-digit time</td>
<td>091955Z</td>
</tr>
<tr>
<td>0918/1024</td>
<td>Valid period, either 24 hours or 30 hours. The first two digits of EACH four digit number indicate the date of the valid period, the final two digits indicate the time (valid from 18Z on the 9th to 24Z on the 10th). In U.S. METAR: COrrected of; or AUtoMated ob for automated report with no human intervention; omitted when observer logs on.</td>
<td>COR</td>
</tr>
<tr>
<td>15005KT</td>
<td>Wind: 3 digit true-north direction, nearest 10 degrees (or VaRiaBlE); next 2-3 digits for speed and unit, KT (KMH or MPS); as needed, Gust and maximum speed; 0000KT for calm; for METAR, if direction varies 60 degrees or more, Variability appended, e.g., 180V260</td>
<td>22015G25KT</td>
</tr>
<tr>
<td>5SM</td>
<td>Prevailing visibility; in U.S., Statute Miles &amp; fractions; above 6 miles in TAF Plus6SM. (Or, 4-digit minimum visibility in meters and as required, lowest value with direction)</td>
<td>3/4SM</td>
</tr>
<tr>
<td>HZ</td>
<td>Significant present, forecast and recent weather: see table (on back)</td>
<td>TSRA</td>
</tr>
<tr>
<td>FEW020</td>
<td>Cloud amount, height and type: SK Clear 0/8, FEW &gt;0-8-2/8, SCaItered 3/8-4/8, BroKeN 5/8-7/8, OKVerCast 8/8; 3-digit height in hundreds of ft; Towering ClouD or CumulonimBus in METAR; in TAF, only CR VeRtical Visibility for obscured sky and height “VV004”. More than 1 layer may be reported or forecast. In automated METAR reports only, CLeaR for “clear below 12,000 feet”</td>
<td>OVC 010CB</td>
</tr>
<tr>
<td></td>
<td>Temperature: degrees Celsius; first 2 digits, temperature “/” last 2 digits, dew-point temperature; Minus for below zero, e.g., M06</td>
<td>18/16</td>
</tr>
<tr>
<td></td>
<td>Altimeter setting: indicator and 4 digits; in U.S., A-inches and hundredths; (Q-hectoPascals, e.g., Q1013)</td>
<td>A2992</td>
</tr>
<tr>
<td>WS010/31022KT</td>
<td>In U.S. TAF, non-convective low-level ($\leq 2,000$ ft) Wind Shear; 3-digit height (hundreds of ft); “/”; 3-digit wind direction and 2-3 digit wind speed above the indicated height, and unit, KT</td>
<td>31022KT</td>
</tr>
</tbody>
</table>

**Note:** Users are cautioned to confirm **DATE** and **TIME** of the TAF. For example FM100000 is 0000Z on the 10th. Do not confuse with 1000Z!
In METAR, ReMark indicator & remarks. For example: Sea-level pressure in hectopascals & tenths, as shown: 1004.5 hPa; Temp/dew-point in tenths C, as shown: temp. 18.2 C, dew-point 15.9 C

| FM091930 | From changes are expected at 2-digit date, 2-digit hour, and 2-digit minute beginning time: indicates significant change. Each FM starts on a new line, indented 5 spaces |
| TEMPO 0920/0922 | TEMPO: changes expected for <1 hour and in total, < half of the period between the 2-digit date and 2-digit hour beginning, and 2-digit date and 2-digit hour ending time |
| PROB30 1004/1007 | PROBability and 2-digit percent (30 or 40): probable condition in the period between the 2-digit date & 2-digit hour beginning time, and the 2-digit date and 2-digit hour ending time |
| BECMG 1013/1015 | BECoMinG: change expected in the period between the 2-digit date and 2-digit hour beginning time, and the 2-digit date and 2-digit hour ending time |

Table of Significant Present, Forecast and Recent Weather - Grouped in categories and used in the order listed below; or as needed in TAF, No Significant Weather.

<table>
<thead>
<tr>
<th>Qualifiers</th>
<th>Intensity or Proximity</th>
</tr>
</thead>
<tbody>
<tr>
<td>“-“ = Light</td>
<td>No sign = Moderate</td>
</tr>
<tr>
<td>“VC“ = Vicinity, but not at aerodrome. In the US METAR, 5 to 10 SM from the point of observation. In the US TAF, 5 to 10 SM from the center of the runway complex. Elsewhere, within 8000m.</td>
<td></td>
</tr>
</tbody>
</table>

| Descriptor | BC – Patches | BL – Blowing | DR – Drifting | FZ – Freezing |
| MI – Shallow | PR – Partial | SH – Showers | TS – Thunderstorm |

<table>
<thead>
<tr>
<th>Weather Phenomena</th>
<th>Precipitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>DZ – Drizzle</td>
<td>GR – Hail</td>
</tr>
<tr>
<td>IC – Ice Crystals</td>
<td>GS – Small Hail/Snow Pellets</td>
</tr>
<tr>
<td>SN – Snow</td>
<td>UP – Unknown Precipitation in automated observations</td>
</tr>
<tr>
<td>BR – Mist (&lt;5/8SM)</td>
<td>DU – Widespread Dust</td>
</tr>
<tr>
<td>HZ – Haze</td>
<td>FC – Funnel Cloud</td>
</tr>
<tr>
<td>SA – Sand</td>
<td>SQ – Squall</td>
</tr>
<tr>
<td>VA – Volcanic Ash</td>
<td></td>
</tr>
</tbody>
</table>

- Explanations in parentheses “( )” indicate different worldwide practices.
- Ceiling is not specified; defined as the lowest broken or overcast layer, or the vertical visibility.
- NWS TAFs exclude BECMG groups and temperature forecasts. NWS TAFs do not use PROB in the first 9 hours of a TAF; NWS METARs exclude trend forecasts. US Military TAFs include Turbulence and Icing groups.

***Note when visibility drops below 3 statute miles, military weather facilities broadcast METAR and TAF in meters.
Radio Call Basics

1. WHO are you calling
2. WHO you are (Call Sign)
3. WHERE you are
4. WHAT do you want to do
5. Special Information

Tower Departure

1) ATIS (128.525)

2) TAXI (Ground: 118.125)
   “Academy ground, Rally _ _ (transient ramp / south ramp) taxi with ATIS _____, N/S Departure or Closed Pattern”

3) Takeoff (Tower 124.15)
   “Academy tower, Rally _ _ Holding short Runway _ _”

4) At 6,900’
   “Rally _ _ (L/R) request closed”
   Or announce
   “Rally _ _ (L/R) crosswind”

No Tower Departure

1) TAXI (CTAF: 124.15)
   “Academy traffic, Rally _ _ Taxi from (transient ramp / south ramp) to (16L / 34R), Academy”

2) Takeoff
   “Academy traffic, Rally _ _ taking off (16L/34R), N/S Departure or Closed Pattern, Academy”

3) At 6,900’
   “Academy Traffic Rally _ _ (L/R) request closed, Academy”
   or
   “Academy Traffic Rally _ _ (L/R) crosswind, Academy”
USAF Academy Radio Calls

Departure and Outside Downwind 16L and 34R

Aero Club Departure (8,500’) from 34R only

“Rally ___ Right Crosswind”

To Ninja

(From 16L Only)

NAIL (7,900’)

“To Notch

“Rally ___ NAIL”

KAFF Airfield (7,900’)

(8,400’) if departing North / South

“Rally ___ SAW”

SAW (7,900’)

(8500) To SOKET

To COS

(8500) To SOKET
Arrivals 16L and 34R

Initial 1 mile from runway.
Break midfield or as directed

At JOYAL (9,000’)
“Academy Tower Rally ___
JOYAL with (ATIS) closed pattern / full stop”

At Initial 16L (7,900’)
“Rally ___ Initial 16L”

KAFF Airfield

At Initial 34R (7,900’)
“Rally ___ Initial 34R”

At SLEDG (7,900’/8,500)
“Rally ___ SLEDG with (ATIS) closed pattern / full stop”

At HIGBY (Tower 124.15) (9,000’)
“Rally ___ HIGBY”

NAIL (8,500’ from JOYAL)
“Rally ___ NAIL”

Descend to (7,900’)

SAW (8,500’) from SLEDG
“Rally ___ SAW”
North Arrival – Tower, Runway 34R / 16L

1) **ATIS (128.525)**

2) **At HIGBY, 9,000’, (Tower 124.15)**
   “Rally ___ HIGBY”

3) **At JOYAL, 9,000’ (Tower 124.15)**
   “Academy tower, Rally ___ JOYAL with ATIS ___ full stop/closed pattern”
   ***(Skip to step 6 for runway 16L Arrival)***

4) **At NAIL 8,500’**
   “Rally ___ NAIL”

5) **SAW 7,900’**
   “Rally ___ SAW”

6) **Initial 7,900’**
   “Rally ___ Initial, 34R/16L”

7) **In the Break, 7,900’**
   “Rally ___ in the break, 34R/16L”

8) **Base Turn**
   “Rally ___ base 34R / 16L”

9) **After Landing (Ground 118.12)**
   “Academy ground, Rally ___ taxi to transient ramp”

______________________________________________________________________________

South Arrival – Tower, Runway 34R / 16L

1) **ATIS (128.525)**

2) **At SLEDG, 8,000’ or 9,500’ (Tower 124.15)**
   “Academy tower, Rally ___ SLEDG with ATIS __, full stop/closed pattern”
   ***(Skip to step 5 for runway 34R Arrival)***

3) **At SAW 7,900’**
   “Rally ___ SAW”

4) **At NAIL 7,900’**
   “Rally ___ NAIL”

5) **At Initial 7,900’**
   “Rally ___ Initial 34R/16L”
6) In the Break, 7,900’
“Rally __ in the break, 34R/16L”

7) Base Turn
“Rally __ base 34R / 16L”

8) After Landing (Ground 118.12)
“Academy ground, Rally __ taxi to transient ramp”

---

**North Arrival – No Tower, Runway 34R / 16L**

1) At HIGBY, 9,000’, (CTAF 124.15)
“Rally __ HIGBY”

2) At JOYAL, 9,000’
“Academy, Rally __ JOYAL, full stop / closed pattern”

***(Skip to step 6 for runway 16L Arrival)***

3) At NAIL, 8,500’
“Academy Rally __ NAIL”

4) At SAW, 7,900’
“Rally __ SAW”

5) At Initial 7,900’
“Rally __ Initial 34R/16L”

6) In the Break, 7,900’
“Rally __ in the break, 34R/16L”

7) Base Leg
“Rally __ Base, 34R/16L”

8) After Landing, (CTAF 124.15)
“Academy, Rally __ clear of 34R/16L, taxi to transient ramp, Academy”
South Arrival – No Tower, Runway 34R / 16L

1) At SLEDG, 8,000’ or 9,500 (CTAF 124.15)
   “Academy, Rally __ SLEDG Runway 34R/16L full stop/closed pattern”
   ***(Skip to step 4 for runway 34R Arrival)***

2) At SAW, 7,900’
   “Academy Rally __ SAW”

3) At NAIL, 7,900’
   “Rally __ NAIL”

4) At Initial 7,900’
   “Rally __ Initial 34R/16L”

5) In the Break, 7,900’
   “Rally __ in the break, 34R/16L”

6) Base Leg
   “Rally __ Base, 34R/16L”

7) After Landing, (CTAF 124.15)
   “Academy, Rally __ clear of 34R/16L, taxi to transient ramp, Academy”
Radio Calls for Closed Traffic Pattern

Clear Final
"Academy Tower, Rally xx, base, touch and go (full stop)"
Flaps – 20°

Base Turn
Bank – 30°
Hold A/S – 85 mph/75 kts

Reduce Power
Start Descent
(3° glide path)
Flaps – 10°

Before Landing Check
L – Lights
C – Carb Heat (on)
G – Gas (both)
R – Radio
U – Undercarriage
M – Mixture
P – Prop / Power
S – Seat Belt/Shoulder Harness

Descend to 7300’ MSL

Entry Point
"Academy Tower, Rally xx, Entry for 16L (34R)"
8000’ MSL
95 mph/85 kts

7000’ MSL
“Academy Tower, Rally xx, request closed”

Establish Aimpoint
Flaps – 30°
Final A/S
75 mph/65 kts

6900’ MSL
Mnemonic Aids for Checklist (Checklist Takes Precedence)

<table>
<thead>
<tr>
<th>PRE-TAKEOFF</th>
<th>PRE-LANDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>L - Lights</td>
<td>L - Lights</td>
</tr>
<tr>
<td>H – Heading</td>
<td>C – Carb heat</td>
</tr>
<tr>
<td>A – Altimeter</td>
<td>G – Gas (both)</td>
</tr>
<tr>
<td>T – Transponder</td>
<td>U – Undercarriage down</td>
</tr>
<tr>
<td>(Altitude)</td>
<td>M - Mixture</td>
</tr>
<tr>
<td>T – Trim/Time</td>
<td>P – Prop / Power</td>
</tr>
<tr>
<td>S – Seatbelts</td>
<td>S – Seatbelts</td>
</tr>
</tbody>
</table>

(Lights, Camera, Action, Time)

---------------------------------------------------------------------

DOWNWIND (Midfield)
- Pattern altitude - 7300
- Speed - 85kts or 95mph
- Parallel runway
- Runway halfway up wing strut
- LCGUMPS

ABEAM THE NUMBERS
- Power 1500 rpm
- Airspeed in the white, flaps 10 (depends on winds and type of landing)
- Trim for 500 fpm descent

BASE TURN
- Radio call (L or R base)
- Start base turn (30 degree bank)
- Wings level
- Flaps 20 (if desired, depends on winds and type of landing)
- Check power, check speed, check pitch, alt (high/low, fast/slow)

FINAL TURN
- Radio call (final)
- Start final turn (30 degree bank)
- Wings level (if no crosswind)
- Check power
- Stabilize the approach (speed, centerline, glide path)
- Verbalize airspeed and centerline repeatedly (Ex: 65, centerline)
- Pitch for speed, Power for altitude
  (Never try to recover a botched approach/landing – go around)

ONCE RUNWAY MADE
- Power as needed
- Flare, glide to touchdown
- Keep flying airplane to tie-downs (aileron, elevator control for wind)
TOUCH and GO’S (STUDENT PILOTS MUST PERFORM FULL STOP TAXI-BACK)

Pitch for level flight
Full power
Carburetor heat in
Flaps to 20 or accelerate to Vy
Positive rate of climb
Flaps to 10, flaps to 0
Flight Maneuver Profile

TRAFFIC PATTERN

Normal Takeoff
1. Prepare the aircraft for the maneuver (takeoff checklist-LHATTS)
2. Takeoff clearance
3. Taxi onto runway centerline
4. Apply full power (2000 RPM Minimum) (75% Airspeed @ ½-computed takeoff distance)
5. Rotate at Vr
6. Climb at Vy
7. Climb Checklist (power full, flaps up, airspeed Vy, and landing light Off)

Normal Landing
1. Prepare the aircraft for the maneuver (Altitude 7300)
2. Downwind Altitude (LCGUMPS-prior to mid field)
3. Abeam touchdown point (Flaps 10)
4. Base Leg (Flaps 20)
5. Final Approach (Flaps 30)
6. Stabilized approach (aim point/touch down point, airspeed, longitudinal axis aligned with centerline, windsock)
7. Threshold (Power idle, 3 deg pitch up)
8. Touch down at minimum controllable airspeed
9. After landing checklist (flaps ups up, carb heat off, landing light off)

Soft Field Takeoff
1. Prepare the aircraft for the maneuver (takeoff checklist, flaps per POH)
2. Takeoff clearance
3. Taxi onto runway centerline (keep aircraft moving)
4. Apply full power (maintain full back pressure on the yoke)
5. Lift off in ground effect (stay in ground until either Vx or Vy)
6. Climb at Vx or Vy
7. Climb Checklist (power full, flaps up, and landing light Off)

Soft Field Landing
1. Prepare the aircraft for the maneuver (Altitude 7300)
2. Downwind (LCGUMPS-prior to mid field)
3. Abeam touchdown point (Flaps 10)
4. Base Leg-Flaps 20
5. Final Approach Flaps 30 airspeed 1.3 x Vso
6. Stabilized approach (aim point/touch down point, longitudinal axis aligned with centerline)
7. Threshold (5 degrees pitch up)
8. Touch down at minimum controllable airspeed
9. Control yoke full aft – no braking or minimum braking
10. After landing checklist (flaps ups up, carb heat off, landing light off)

Short Field Takeoff
1. Prepare the aircraft for the maneuver (takeoff checklist, flaps per POH)
2. Takeoff clearance
3. Taxi onto runway centerline (begin at runway threshold)
4. Apply brakes and add full power (2000 RPM Minimum)
5. Release brakes and accelerate to and rotate at Vr
6. Climb at Vx until clear obstacle
7. Climb at Vy
8. Climb Checklist (flaps ups up, carb heat off, landing light off)

**Short Field Landing**
1. Prepare the aircraft for the maneuver (Altitude 7300)
2. Downwind (LCGUMPS-prior to mid field)
3. Abeam touchdown point (Flaps 10)
4. Base Leg (Flaps 20)
5. Final Approach Flaps 30 airspeed 1.3 x Vso
6. Stabilized approach (aim point/touch down point, longitudinal axis aligned with centerline)
7. Touch down at minimum controllable airspeed
8. Control yoke full aft
9. Brakes - apply
10. After landing checklist (flaps ups up, carb heat off, landing light off)

**No-Flap Approach and Landing**
*Steps 1-4 are identical to a normal approach and landing procedure.*
5. When abeam touchdown point, on extended base, or on extended final (when ready to descend out of pattern altitude): Reduce power to approx. 1300 RPM
6. Slow to Vy
7. Descend out of TPA at Vy
8. Maintain Vy until landing is assured, then slow to final approach speed until 10' to 20' above the runway (aim point/touch down point, longitudinal axis aligned with centerline)

**Abort**
1. Throttle Idle
2. Brakes as required
3. Flaps up

**Go Around**
1. Power full (carb heat off)
2. Flaps 20
3. Airspeed Vy
4. Radio call (Rally xx on the go)

**Slips**
1. Prepare the aircraft for the maneuver - Stabilized approach
2. Power idle
3. Airspeed 1.3 Vso
4. Upwind wing lower into wind
5. Rudder opposite (enough to maintain ground track)
6. Recover to desired glide path

**HIGH ALTITUDE MANEUVERS**

**Practice Area Procedures**
1. Prepare the aircraft for the maneuver - Altitude 9000, airspeed Va
2. Identify boundaries, Perform, select emergency landing site

**Steep Turns**
1. Prepare the aircraft for the maneuver (Altitude 9000, airspeed Va)
2. Select heading reference point (inside and outside)
3. Bank aircraft 45 degrees
4. Power add 200 rpm
5. Trim 2 turns
6. Complete 360-degree turn
7. Recover (begin rollout at ½ bank angle)
8. Cruise checklist (flaps, mixture, power carb heat, trim)

**Slow flight Flaps Up**
1. Prepare the aircraft for the maneuver- Altitude 9000, power 2100, and airspeed Va
2. Select heading reference point (inside and outside)
3. Power 1500-1600 rpm (carb heat and trim)
4. Airspeed Vs plus 5kts (trim)
5. Power 1800rpm (trim)
6. Recover
7. Cruise checklist (flaps, mixture, power carb heat, rim)

**Slow flight Flaps Down**
1. Prepare the aircraft for the maneuver- Altitude 9000, power 2100, and airspeed Va
2. Select heading reference point (inside and outside)
3. Power 1500-1600 rpm (carb heat and trim)
4. Flaps 10 (trim)
5. Flaps 20 (trim)
6. Flaps 30 (trim)
7. Airspeed Vso plus 5kts (trim)
8. Power 2100rpm (trim)
9. Recover power full, flaps 20, airspeed Vx flaps 10, airspeed Vy flaps 0,
10. Cruise checklist (flaps, mixture, power carb heat), (trim)

**Power on Stalls**
1. Prepare the aircraft for the maneuver- Altitude 9000, power 2100, and airspeed Va
2. Select heading reference point (inside and outside)
3. Power 1500-1600 rpm (carb heat and trim)
4. Airspeed Vr
5. Pitch 20 deg nose up, add full power
6. Acknowledge stall warning horn and buffet
7. Recover (power full, nose to horizon)
8. Cruise checklist (flaps, mixture, power carb heat, trim)

**Power off Stalls**
1. Prepare the aircraft for the maneuver- Altitude 9000, power 2100, and airspeed Va
2. Select heading reference point (inside and outside)
3. Power 1500-1600 rpm (carb heat and trim)
4. Flaps 30
5. Airspeed 1.3 Vso
6. Stabilized approach
7. Pitch 20 deg nose up
8. Acknowledge stall warning horn and buffet
9. Recover power full, nose to horizon, flaps 20, airspeed Vx, flaps 10, airspeed Vy, flaps 0
10. Cruise checklist (flaps, mixture, power, carb heat)
LOW ALTITUDE MANEUVERS

Turns Around a Point
1. Prepare the aircraft for the maneuver (Altitude 1000 AGL, power 2100, Airspeed 90)
2. Select a small but prominent reference point (close to a suitable landing spot)
3. Enter the maneuver approximately downwind
4. Maintain a constant radius around the reference point
5. Plan to depart on the entry heading after two turns

S-Turns
1. Prepare the aircraft for the maneuver (Altitude 1000 AGL, power 2100, Airspeed Va)
2. Select a reference line running approximately perpendicular to the wind. (Close to a suitable landing spot)
3. At a point directly over the reference line, heading downwind, initiate a 180° constant radius turn
4. At the completion of the turn, the aircraft should be directly over and perpendicular to the reference line with the wings level
5. Immediately upon completion of the first turn, an identical turn is begun on the upwind side of the reference line in the opposite direction
6. Bank and WCA should be adjusted, as necessary, through the maneuver to achieve two complete semicircles of equal radius

INSTRUMENTS

ATTITUDE INSTRUMENT FLYING
Attitude instrument flying may be defined in general terms as the control of an airplane’s spatial position by use of instruments rather than by outside visual reference. Thus, proper interpretation of the flight instruments provides the same information as visual references outside the airplane. Attitude control is stressed in terms of pitch control, bank control, power control, and trim control. Instruments are divided into the following three categories:

A. Pitch instruments
1) Attitude indicator (AI)
2) Altimeter (ALT)
3) Airspeed indicator (ASI)
4) Vertical speed indicator (VSI)

B. Bank instruments
1) Attitude indicator (AI)
2) Heading indicator (HI)
3) Turn coordinator (TC) or turn-and-slip indicator (TandSI)
4) Magnetic compass

C. Power instruments
1) Manifold pressure gauge (MP), if equipped
2) Tachometer (RPM)
3) Airspeed indicator (ASI)

Attitude instrument flight consists of three fundamental skills: instrument cross-check, instrument interpretation, and airplane control. Trim technique is a skill that should be refined.
1. **Cross-checking** (also called scanning) is the continuous and logical observation of instruments for attitude and performance information.

2. **Instrument interpretation** requires you to understand each instrument’s construction, operating principle, and relationship to the performance of your airplane.

3. **Airplane control** requires you to maintain your airplane’s attitude or change it by interpretation of the instruments.

**COMMON ERRORS DURING INSTRUMENT CROSS-CHECK**

1. **Fixation**, or staring at a single instrument, usually occurs for a good reason, but with poor results.

2. **Omission** of an instrument from the cross-check may be caused by failure to anticipate significant instrument indications following attitude changes.

3. **Emphasis** on a single instrument, instead of on the combination of instruments necessary for attitude information, is normal during the initial stages of instrument training.

**Unusual Attitudes**

**Nose-High Attitudes**

If the airspeed is decreasing, or below the desired airspeed, increase power (as necessary in proportion to the observed deceleration), apply forward elevator pressure to lower the nose and prevent a stall, and correct the bank by applying coordinated aileron and rudder pressure to level the miniature aircraft and center the ball of the turn coordinator. The corrective control applications are made almost simultaneously, but in the sequence given above. A level pitch attitude is indicated by the reversal and stabilization of the ASI and altimeter needles. Straight coordinated flight is indicated by the level miniature aircraft and centered ball of the turn coordinator.

**Nose-Low Attitudes**

If the airspeed is increasing, or is above the desired airspeed, reduce power to prevent excessive airspeed and loss of altitude. Correct the bank attitude with coordinated aileron and rudder pressure to straight flight by referring to the turn coordinator. Raise the nose to level flight attitude by applying smooth back elevator pressure.

**Get the bearing.**

Determine which radial you are on by turning the OBS (Omni Bearing Selector) knob until the CDI (Course Deviation Indicator) needle is centered and you have a FROM indication. In order to fly to the station, you would first twist the OBS knob until the needle is centered and the white triangle points to "TO." Note that this will be exactly 180° from the current radial. Now turn the aircraft to this new heading and keep the needle centered- this will take you to the VOR station.
VOR Procedures
1. Locate the airplane’s position using the navigation system.
2. Intercept and tracks a given course, radial, or bearing, as appropriate.
3. Recognize and describes the indication of station passage, if appropriate.

BASIC VOR NAVIGATION
1. Pick a VOR for use in navigation.
2. Tune and identify the VOR.

Locate the airplane’s position using the navigation system
1. Tune the VOR frequency in the navigation radio.
2. Identify that you have the correct station and the signal is reliable by listening to the Morse code identifier.
3. Set the course by turning the OBS (Omni Bearing Selector) knob until the CDI (Course Deviation Indicator) needle is centered and you have a FROM indication.

Intercept and tracks a given course, radial, or bearing, as appropriate
1. In order to fly to the station, you would first twist the OBS knob until the needle is centered and the white triangle points to “TO”.
   Note that this will be exactly 180° from the current radial.
2. Now turn the aircraft to this new heading.
3. Fly the heading of the desired course. Once established on the heading, note the position of the CDI. If it is to the right, your course is to the right. Likewise, if it is left, the course is left.
4. Track the course. As the CDI moves close to the center, turn your heading to match the course. Keep the needle centered to stay on course. If it starts drifting left, turn left to get back on course.
5. Tracking inbound (towards the station) and outbound (away from the station) radials is exactly the same, except you should get a TO indication when flying inbound and a FROM indication when flying outbound on a radial.
6. Adjust for wind.
1. On intercept, first maintain same heading as desired course
2. Note drift off course downwind
3. Turn 20° into wind back toward course
4. When CDI centers on course, reduce wind correction to 10°

EMERGENCIES
M-aintain aircraft control
A-nalyze the situation
T-ake proper action
L-and as soon as conditions permit

Emergency Descent
During a simulated emergency descent, the student must be able to recognize situations requiring an emergency descent, such as cockpit smoke and/or fire. Situational awareness, appropriate division of attention, and positive load factors should be maintained during the maneuver and descent.
1. Perform two 90° clearing turns
2. Clean configuration flow
3. Reduce throttle to idle
4. Initiate turning descent, while clearing for traffic
5. Maintain (training) 120 KIAS
6. Notify ATC/Traffic as appropriate

EMERGENCY APPROACH AND LANDING (SIMULATED)
1. Analyze the situation and select an appropriate course of action
2. Establish and maintain best-glide airspeed, ±10 knots
3. Select a suitable landing area
4. Considering the flight and ground environment, plan and follow a flight pattern to the landing area
5. Prepare for landing, or go-around, as specified by the examiner
6. Follow the appropriate checklist

SYSTEMS AND EQUIPMENT MALFUNCTIONS
Understand system and equipment malfunctions appropriate to the airplane.
Take appropriate action in at least three simulated emergencies appropriate to the airplane.
Follow the appropriate checklist or procedure.

EMERGENCY EQUIPMENT AND SURVIVAL GEAR
1. Understand emergency and survival equipment appropriate to aircraft and flight environment
2. Identify equipment that should be aboard the airplane

SPIN AWARENESS
1. Understand aerodynamic factors related to spins
2. Be able to discuss flight situations where unintentional spins may occur
3. Know procedures for recovery from unintentional spins
# Emergency Procedures Closed Book Exam

**Engine Fire During Start**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>CRANKING – CONTINUE</td>
</tr>
<tr>
<td></td>
<td>if engine starts:</td>
</tr>
<tr>
<td>2.</td>
<td>POWER – 1700 RPM (Few Minutes)</td>
</tr>
<tr>
<td>3.</td>
<td>ENGINE – SHUT DOWN</td>
</tr>
<tr>
<td></td>
<td>if engine fails to start:</td>
</tr>
<tr>
<td>4.</td>
<td>THROTTLE – FULL OPEN</td>
</tr>
<tr>
<td>5.</td>
<td>MIXTURE – IDLE CUT OFF</td>
</tr>
<tr>
<td>6.</td>
<td>CRANKING – CONTINUE</td>
</tr>
<tr>
<td>7.</td>
<td>ENGINE – SECURE</td>
</tr>
</tbody>
</table>

**Engine Fire During Flight**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>MIXTURE – IDLE CUT OFF</td>
</tr>
<tr>
<td>2.</td>
<td>FUEL SELECTOR VALVE – OFF</td>
</tr>
<tr>
<td>3.</td>
<td>MASTER SWITCH – OFF</td>
</tr>
<tr>
<td>4.</td>
<td>CABIN HEAT AND AIR – OFF</td>
</tr>
<tr>
<td></td>
<td>(Except overhead vents)</td>
</tr>
<tr>
<td>5.</td>
<td>AIRSPEED – 100 KIAS</td>
</tr>
<tr>
<td>6.</td>
<td>FORCED LANDING – EXECUTE</td>
</tr>
</tbody>
</table>

**Engine Failure in Flight (Cruise)**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>AIRSPEED – 65 KIAS</td>
</tr>
<tr>
<td>2.</td>
<td>CARBURATOR HEAT – ON</td>
</tr>
<tr>
<td>3.</td>
<td>FUEL SELECTOR – BOTH</td>
</tr>
<tr>
<td>4.</td>
<td>MIXTURE – RICH</td>
</tr>
<tr>
<td>5.</td>
<td>IGNITION SWITCH – BOTH</td>
</tr>
<tr>
<td>6.</td>
<td>PRIMER – IN AND LOCKED</td>
</tr>
</tbody>
</table>

**Emergency Approach and Landing**

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>AIRSPEED – 65 KIAS (FLAPS UP) 60 (FLAPS DOWN)</td>
</tr>
<tr>
<td>2.</td>
<td>MIXTURE – IDLE CUT OFF</td>
</tr>
<tr>
<td>3.</td>
<td>FUEL SELECTOR VALVE – OFF</td>
</tr>
<tr>
<td>4.</td>
<td>IGNITION SWITCH – OFF</td>
</tr>
<tr>
<td>5.</td>
<td>FLAPS – AS REQUIRED</td>
</tr>
<tr>
<td>6.</td>
<td>MASTER SWITCH – OFF</td>
</tr>
<tr>
<td>7.</td>
<td>DOORS – UNLATCH</td>
</tr>
<tr>
<td>8.</td>
<td>TOUCH DOWN – SLIGHTLY TAIL LOW</td>
</tr>
<tr>
<td>9.</td>
<td>BRAKES – APPLY HEAVILY</td>
</tr>
</tbody>
</table>

**Fill in the Blanks:**

<table>
<thead>
<tr>
<th>Step</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>$V_A$ 99 KIAS</td>
</tr>
<tr>
<td>2.</td>
<td>$V_A$ 92 KIAS</td>
</tr>
<tr>
<td>3.</td>
<td>$V_A$ 82 KIAS</td>
</tr>
<tr>
<td>4.</td>
<td>$V_{FE}$ 110 KIAS</td>
</tr>
<tr>
<td></td>
<td>(First Extension Increment)</td>
</tr>
<tr>
<td>5.</td>
<td>Best Glide Speed @ Maximum Gross Weight: 65 KIAS @ 2400 Lbs</td>
</tr>
</tbody>
</table>
## Emergency Procedures Closed Book Answer Sheet

### Engine Fire During Start

1. **if engine starts:**  
   - 
2.  
3. **if engine fails to start:**  
   - 
4. 

### Engine Fire During Flight

1.  
2.  
3.  
4. 

### Engine Failure in Flight (Cruise)

1.  
2.  
3.  
4. 

### Emergency Approach and Landing

1.  
2.  
3.  
4.  
5.  
6. 
7.  
8.  
9. 

### Fill in the Blanks:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>( V_A )</td>
<td>KIAS</td>
</tr>
<tr>
<td>2.</td>
<td>( V_A )</td>
<td>KIAS</td>
</tr>
<tr>
<td>3.</td>
<td>( V_A )</td>
<td>KIAS</td>
</tr>
<tr>
<td>4.</td>
<td>( V_{FE} )</td>
<td>KIAS</td>
</tr>
<tr>
<td>5.</td>
<td>Best Glide Speed @ Maximum Gross Weight:</td>
<td>KIAS @ 2400 Lbs</td>
</tr>
</tbody>
</table>
—Student Pilot Information—
# Runway Markings

<table>
<thead>
<tr>
<th>EXAMPLE</th>
<th>TYPE OF SIGN</th>
<th>PURPOSE</th>
<th>LOCATION/CUSTOMTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 - 22</td>
<td>Mandatory: Hold position for taxiway/runway intersection.</td>
<td>Denotes entrance to runway from a taxiway.</td>
<td>Located L side of taxiway within 10 feet of hold position markings.</td>
</tr>
<tr>
<td>22 - 4</td>
<td>Mandatory: Holding position for runway/runway intersection.</td>
<td>Denotes intersecting runway.</td>
<td>Located L side of rwy prior to intersection, &amp; R side if rwy more than 150' wide, used as taxiway, or has “land &amp; hold short” ops.</td>
</tr>
<tr>
<td>4 - APCH</td>
<td>Mandatory: Holding position for runway approach area.</td>
<td>Denotes area to be protected for aircraft approaching or departing a runway.</td>
<td>Located on taxiways crossing thru runway approach areas where an aircraft would enter an RSA or apron departure airspace.</td>
</tr>
<tr>
<td>ILS</td>
<td>Mandatory: Holding position for ILS critical area/precision obstacle free zone.</td>
<td>Denotes entrance to area to be protected for an ILS signal or approach airspace.</td>
<td>Located on taxiways where the taxiways enter the NAV/AID critical area or where aircraft on taxiway would violate ILS aprch airspace (including POFZ).</td>
</tr>
<tr>
<td>-</td>
<td>Mandatory: No entry.</td>
<td>Denotes aircraft entry is prohibited.</td>
<td>Located on paved areas that aircraft should not enter.</td>
</tr>
<tr>
<td>B</td>
<td>Taxiway Location.</td>
<td>Identifies taxiway on which the aircraft is located.</td>
<td>Located along taxiway by itself, as part of an array of taxiway direction signs, or combined with a runway/taxiway hold sign.</td>
</tr>
<tr>
<td>22</td>
<td>Runway Location.</td>
<td>Identifies the runway on which the aircraft is located.</td>
<td>Normally located where the proximity of two runways to one another could cause confusion.</td>
</tr>
<tr>
<td></td>
<td>Runway Safety Area / OFZ and Runway Approach Area Boundary.</td>
<td>Identifies exit boundary for an RSA / OFZ or rwy approach.</td>
<td>Located on taxiways on back side of certain runway/taxiway holding position signs or runway approach area signs.</td>
</tr>
<tr>
<td></td>
<td>ILS Critical Area/POFZ Boundary.</td>
<td>Identifies ILS critical area exit boundary.</td>
<td>Located on taxiways on back side of ILS critical area signs.</td>
</tr>
<tr>
<td>J →</td>
<td>Direction: Taxiway.</td>
<td>Defines designation/direction of intersecting taxiway(s).</td>
<td>Located on L side, prior to intersection, with an array L to R in clockwise manner.</td>
</tr>
<tr>
<td>▲</td>
<td>Runway Exit.</td>
<td>Defines designation/direction of exit taxiways from the rwy.</td>
<td>Located on same side of runway as exit, prior to exit.</td>
</tr>
<tr>
<td>22 →</td>
<td>Outbound Destination.</td>
<td>Defines directions to take-off runway(s).</td>
<td>Located on taxi routes to runway(s). Never collocated or combined with other signs.</td>
</tr>
<tr>
<td>FBO</td>
<td>Inbound Destination.</td>
<td>Defines directions to airport destinations for arriving aircraft.</td>
<td>Located on taxi routes to airport destinations. Never collocated or combined with other types of signs.</td>
</tr>
<tr>
<td></td>
<td>Information.</td>
<td>Provides procedural or other specialized information.</td>
<td>Located along taxi routes or aircraft parking/staging areas. May not be lighted.</td>
</tr>
<tr>
<td></td>
<td>Taxiway Ending Marker.</td>
<td>Indicates taxiway does not continue beyond intersection.</td>
<td>Installed at taxiway end or far side of intersection, if visual cues are inadequate.</td>
</tr>
<tr>
<td>7</td>
<td>Distance Remaining.</td>
<td>Distance remaining info for take-off/landing.</td>
<td>Located along the sides of runways at 1000’ increments.</td>
</tr>
<tr>
<td>EXAMPLE</td>
<td>TYPE OF MARKING</td>
<td>PURPOSE</td>
<td>LOCATION/CONVENTION</td>
</tr>
<tr>
<td>---------</td>
<td>----------------</td>
<td>---------</td>
<td>---------------------</td>
</tr>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td>Holding Position.</td>
<td>Denotes entrance to runway from a taxiway.</td>
<td>Located across centerline within 10 feet of hold sign on taxiways and on certain runways.</td>
</tr>
<tr>
<td><img src="image2.png" alt="Image" /></td>
<td>ILS Critical Area/POFZ Boundary.</td>
<td>Denotes entrance to area to be protected for an ILS signal or approach airspace.</td>
<td>Located on runways where the twy enters the NAVAID critical area or where aircraft on taxiway would violate ILS approach airspace (including POFZ).</td>
</tr>
<tr>
<td><img src="image3.png" alt="Image" /></td>
<td>Taxiway/Taxiway Holding Position.</td>
<td>Denotes location on taxiway or area where aircraft hold short of another taxiway.</td>
<td>Used at ATCT airports where needed to hold traffic at a twy/twy intersection. Installed provides wing clearance.</td>
</tr>
<tr>
<td><img src="image4.png" alt="Image" /></td>
<td>Non-Movement Area Boundary.</td>
<td>Delineates movement area under control of ATCT, from non-movement area.</td>
<td>Located on boundary between movement and non-movement area. Located to ensure wing clearance for taxiing aircraft.</td>
</tr>
<tr>
<td><img src="image5.png" alt="Image" /></td>
<td>Taxway Edge.</td>
<td>Defines edge of usable, full strength taxiway.</td>
<td>Located along twy edge where contiguous shoulder or other paved surface NOT intended for use by aircraft.</td>
</tr>
<tr>
<td><img src="image6.png" alt="Image" /></td>
<td>Dashed Taxiway Edge.</td>
<td>Defines taxiway edge where adjoining pavement is usable.</td>
<td>Located along twy edge where contiguous paved surface or apron is intended for use by aircraft.</td>
</tr>
<tr>
<td><img src="image7.png" alt="Image" /></td>
<td>Surface Painted Holding Position.</td>
<td>Denotes entrance to runway from a taxiway.</td>
<td>Supplements elevated holding position signs. Required where hold line exceeds 200'. Also useful at complex intersections.</td>
</tr>
<tr>
<td><img src="image8.png" alt="Image" /></td>
<td>Enhanced Taxiway Centerline.</td>
<td>Provides visual cue to help identify location of hold position.</td>
<td>Taxiway centerlines are enhanced 150' prior to a runway holding position marking.</td>
</tr>
<tr>
<td><img src="image9.png" alt="Image" /></td>
<td>Surface Painted Taxiway Direction.</td>
<td>Defines designation/direction of intersecting taxiway(s).</td>
<td>Located L side for turns to left. R side for turns to right. Installed prior to intersection.</td>
</tr>
<tr>
<td><img src="image10.png" alt="Image" /></td>
<td>Surface Painted Taxiway Location.</td>
<td>Identifies taxiway on which the aircraft is located.</td>
<td>Located R side. Can be installed on L side if combined with surface painted hold sign.</td>
</tr>
</tbody>
</table>
Taxiing Wind Diagram

Use UP aileron on LEFT wing and NEUTRAL elevator

Use UP aileron on RIGHT wing and NEUTRAL elevator

Use DOWN aileron on LEFT wing and DOWN elevator

Use DOWN aileron on RIGHT wing and DOWN elevator
Cloud Clearance Criteria

- *Clear of Clouds (Class B)*
- F-111 = 5 SM Visibility, 1,000’ above and below, 1 SM horizontally
- 3-152 = 3 SM Visibility, 1,000’ above, 500’ below, 2,000’ horizontally
- 1-152 = 1 SM Visibility, 1,000’ above, 500’ below, 2,000’ horizontally

Basic VFR Minimums: 1,000’ Ceiling and 3NM visibility (minimum weather needed for takeoff and landings).
Required Paperwork for Solo

- Fill out AF Form 1710 (Aero Club Membership Application) including the credit card authorization form (on back) and AF Form 15865 (Covenant Not to Sue).
- Give credit/debit card number to Aero Club Ops/Admin personnel and open an Aero Club Account
- The club then needs copies of the following: Military Identification (CAP, DOD, NAF, and Government Employees/contractors), FAA Medical, and Pilot Certificate.
- Read and become familiar with the Aero Club Standard Operating Procedures (SOP). Available at the Aero Club or online at: [http://usafaservices.com/aerclub.htm](http://usafaservices.com/aerclub.htm)
- Complete the following exams (available at the Aero Club or online at the above address), you must score 80% to pass. These tests are easy hover, they are time consuming! Approximate times to complete the tests have been included.

**Local Procedures** (Takes about 1.5 hours)

**Aircraft test** (takes about 1.5 hours) for whichever aircraft you will be flying. Open and closed book portions.

**Pre-Solo Test** (Takes about 1.5 hours)

Instructor will grade your exams.

- All tests and local flights will be completed before your instructor can fill out AF Form 1584. This form must be completed and have two signatures on it to be valid, instructor and pilot. You must have this form completed to fly solo.
- Read and sign off the Pilots Induced Cost (PIC).
- Attend this month’s safety meeting or make-up safety meeting. Sign roster showing you attended the meeting.
- You and your instructor will also need to go through and sign off the Orientation Briefing Guide.
- All tests, standardization, aircraft checks, safety meetings, and landings need to be signed off by your instructor.
- Membership folder needs to be built including all of the above paperwork. Your checkout instructor will do this for you.
- TSA logbook endorsement
- Pre-solo aeronautical knowledge logbook endorsement — FAR 61.87
- Solo Flight logbook endorsement — FAR 61.87 (change to 30 day for the Air Force)
- Endorsement on the student pilot medical
Pre-Solo Written Exam

Instructions
Complete the following exam using the same sheet. This exam contains questions of FAA Parts 61, 91, Aircraft Systems, and Local Procedures. Do not assume information not specifically provided in the questions. Each numbered question is worth 2 points, if any part of an answer is wrong, the question is wrong! Passing score is 80%.

Student's Name __________________________    Instructor Name______________________________
Grade ___________________________________ Date _______________________________________

I have administered and reviewed this written exam as required by FAR 61.87 (b) and find the student's aeronautical knowledge satisfactory for solo flight.

IP_____________________________ Cert. #____________________________Date_________________

THE FOLLOWING QUESTIONS ARE COVERED IN FAR PART 1

1. Give an example of the following terms. (FAR 1.1)
   A. Category________________________________________________________________________
   B. Class ___________________________________________________________________________

2. Define the term pilotage. (FAR 1.1)
   A.________________________________________________________________________________

3. Define the following terms. (FAR 1.1)
   A. Va ______________________________________
   B. Vfe _____________________________________
   C. Vne _____________________________________
   D. Vr ______________________________________
   E. Vs ______________________________________
   F. Vso _____________________________________
   G. Vx ______________________________________
THE FOLLOWING QUESTIONS ARE COVERED IN FAR PART 61

4. What three documents must a pilot have in their possession while exercising the privileges of a pilot certificate? (61.3 a / c)

A. ________________________________________ B. ________________________________________

C. ________________________________________

5. What are the limitations on student pilots while operating an aircraft in solo flight? (61.87n)

A. __________________________________________________________________________

B. __________________________________________________________________________

6. What general limitations are placed on a student pilot while acting as pilot in command? (61.89)

A. __________________________________________________________________________

B. __________________________________________________________________________

C. __________________________________________________________________________

D. __________________________________________________________________________

E. __________________________________________________________________________

F. __________________________________________________________________________

G. __________________________________________________________________________

H. __________________________________________________________________________
THE FOLLOWING QUESTIONS ARE COVERED IN FAR PART 91

7. Who is responsible for the operation of the aircraft? (FAR 91.3)
   A. ________________________________________________________________

8. Who is responsible for determining whether an aircraft is in condition for a safe flight? (91.7)
   A. ________________________________________________________________

9. What action is required if the PIC discovers an un-airworthy condition is discovered? (FAR 91.7)
   A. ________________________________________________________________

10. No person may act as a crewmember after consuming alcohol or while using any drug that affects
    the person’s faculties in any way contrary to safety until what conditions are meet? (91.17)
    A. ________________________________________________________________
    B. ________________________________________________________________
    C. ________________________________________________________________

11. A PIC shall before beginning a flight, become familiar all available information concerning that flight.
    This information must include, for a flight not in the vicinity of an airport. (91.103)
    A. ________________________________________________________________
    B. ________________________________________________________________
    C. ________________________________________________________________
    D. ________________________________________________________________
    E. ________________________________________________________________
    F. ________________________________________________________________
    G. ________________________________________________________________
12. Who has the right-of-way when two aircraft are on final approach to a landing? (FAR 91.113)  
A.  

13. What are the minimum safe altitudes? (FAR 91.119)  
Anywhere  

Over congested areas  

Other than congested areas  

14. What are the dimensions of class D airspace, the direction of standard traffic pattern and communication requirements? (FAR 91.129 and reference to 91.126 and 91.127)  
A.  
B.  
C.  

15. What are the weather requirements to enter Class C airspace? (91.130) and (91.215)  
A.  

16. What are the weather requirements for operations in Class D airspace? (91.155)  
A.  

17. What are the fuel reserve requirements for a day VFR flight and a night VFR flight? (91.151)  
A. Day  
B. Night  
18. What are the VFR cruising altitudes and at what altitudes do they apply? (91.159)

A._____________________________________________________________________________________

19. What are the minimum equipment and instrument requirements for a day VFR flight? (91.205b)

1. ________________________________________
2. ________________________________________
3. ________________________________________
4. ________________________________________
5. ________________________________________
6. ________________________________________
7. ________________________________________
8. ________________________________________
9. ________________________________________
10. ________________________________________
11. ________________________________________

THE FOLLOWING QUESTIONS ARE COVERED IN THE AERONAUTICAL INFORMATION MANUAL (AIM)

20. Interpret the sign in figure 2-3-31 and 2-3-33 (AIM Ch. 2 sec.3 Para.9)

A._____________________________________________________________________________________

B._____________________________________________________________________________________

21. Describe Class C airspace: Dimensions, pilot requirements, equipment, communication and airspeed limit (AIM 3-2-4)

A._____________________________________________________________________________________

B._____________________________________________________________________________________
22. Describe Class D airspace: Dimensions, pilot requirements, equipment, communication and airspeed limit? (AIM 3-2-5)

A. ______________________________________________________________________

B. ______________________________________________________________________

C. ______________________________________________________________________

D. ______________________________________________________________________

E. ______________________________________________________________________

23. Name the closed pattern legs? (AIM 4-3-2)

A. _________________  B. _________________  C. _________________

D. _________________  E. _________________

24. At what point do you turn crosswind in a civilian airfield? (AIM 4-3-3 and figure 4-3-2)

A. ______________________________________________________________________

25. How can a pilot obtain radar assistance when in a difficult situation? (AIM 6-2-1)

A. ______________________________________________________________________
THE FOLLOWING QUESTIONS ARE COVERED IN AFMAN 34-232 (AERO CLUB SOP)

26. When is "student" considered a "no show" for a scheduled flight and what charges apply?
   (Chapter1 Paragraph11)
   A. __________________________________________________
   B. __________________________________________________

27. What are the wind limitations for solo student pilot? (4.9)
   A. ________________________________ B. ________________________________
   C. ________________________________

28. What is the restriction on flying with an open discrepancy? (6.2)
   A._____________________________________________________________________________________

29. What is the flight restriction for a solo student pilot with cumulonimbus cloud formations (thunderstorms) with in 15nm of the academy airfield? (AFMAN 34-232 Attachment 2, A2.4.3.7)
   A._____________________________________________________________________________________

30. All aero club flights must flight plan for a fuel reserve of __________ hours at cruise power. (AFI 4.17.12.1)

THE FOLLOWING QUESTIONS ARE COVERED IN THE AIRCRAFT PILOT OPERATING HANDBOOK USE THE POH FOR A CESSNA 172 P MODLE (6601K)

31. Describe the engine of the Cessna 172. (POH 1-3)
   A._____________________________________________________________________________________

32. What are the accept fuel grades that can be used in the Cessna 172? (POH 1-3)
   A._____________________________________________________________________________________
33. Where is the Reference Datum that is used for weight and Balance computations? (POH 6-4)

A._____________________________________________________________________________________

34. How are the flight controls operated? (POH 7-8)

A._____________________________________________________________________________________

35. What type of flaps does the Cessna 172 use; how are they operated? (POH 7-10)

A._____________________________________________________________________________________

B._____________________________________________________________________________________

36. How are the brakes actuated? (POH 7-10)

A._____________________________________________________________________________________

37. How is fuel delivered to the engine? (POH 7-20)

A._____________________________________________________________________________________

38. Describe the north departure when taking off on 16L? Include checkpoints and altitudes. (Inflight Guide)

A._____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________
Solo Navigation Exam

Instructions
This is a closed book exam and contains questions from the FAR parts 61, 91, Aeronautical Information Manual (AIM), Aero Club SOP and the excerpt from the Denver Sectional. Do not assume information not specifically provided in the questions.

1. As a student pilot, do you need to carry your logbook on a solo cross-country?
   A. _________________________________

2. From what FAR may the PIC deviate from to handle an in-flight emergency that requires immediate action?
   A. _________________________________

3. How long can you operate above 12,500' without supplemental oxygen and at what altitude must you use supplemental oxygen?
   A. _________________________________
   B. _________________________________

4. True course + or - magnetic variation equals?
   A. _________________________________

5. What is the magenta dashed line at #1 mean?
   A. _________________________________

6. When must a VFR flight plan be filed? Who do file with?
   A. _________________________________________________________________________
   B. ________________________________________________________________________

7. After opening a VFR flight plan how long after the estimated time enroute has elapsed, does the FSS wait before starting to look for you?
   A. ___________________________________

8. What is the frequency of Flight Watch? What service do they provide?
   A. _________________________________
   B. _________________________________

9. When should the heading indicator be set to the magnetic compass and how often should it be rechecked?
   A. _________________________________
10. When determining your position relative to a VOR you should you use a TO or FROM indication?
   A. ______________________________________________________________________

11. What does the airport symbol at Meadow Lake (#2) vs. airport symbol Colorado Springs East (#3) indicate?
   A. ______________________________________________________________________

12. What does the symbol at #4 indicate?
   A. ______________________________________________________________________

13. What does the flag at #5 indicate and what is its name?
   A. ______________________________________________________________________
   B. ______________________________________________________________________

14. What type of airspace is at #6?
   A. ______________________________________________________________________

15. Under what circumstances can you enter the airspace at #6?
   A. ______________________________________________________________________

16. What do the symbols at #7 indicate?
   A. ______________________________________________________________________
   B. ______________________________________________________________________

17. What kind of landmark is at #8?
   A. ______________________________________________________________________

18. What class of airspace are you in at #9 (disregard the alert area A-639A)
   A. ______________________________________________________________________

19. What is the minimum safe altitude (AGL) in the vicinity of #10?
   A. ______________________________________________________________________

20. What is the significance of a magenta colored airport symbol on a sectional chart?
   A. ______________________________________________________________________

21. What is the significance of a blue colored airport symbol on a sectional chart?
   A. ______________________________________________________________________

22. What class of airspace is indicated at #11 (blue dashed line)?
   A. ______________________________________________________________________
23. What are the VFR cloud clearance and visibility requirements to enter that airspace (#11)?
   A. ________________________________

24. Decode the airport information block for Pueblo airport (#11)
   Line 1. ________________________________
   Line 2. ________________________________
   Line 3. ________________________________
   Line 4. ________________________________
   Line 5. ________________________________

25. At #12 is an MOA, can you enter it VFR when the area is active?
   A. ________________________________

26. What kind of landmark is a #13?
   A. ________________________________

27. What is the minimum safe altitude (AGL) over #11? (City of Pueblo)
   A. ________________________________

28. What kind of landmark is at #14?
   A. ________________________________

29. What kind of landmark (5010) is at 15?
   A. ________________________________

30. What kind of landmark is at #16?
   A. ________________________________

31. A solo student pilot, on a cross country, needs to return to the academy airfield how long before sunset?
   A. ________________________________
Testing Information

WWW.FAA.PSlexams.com

*You will need your FTN # from IACRA to make an account*

Once logged in you will then be able to select your

Test Type / Location / Time

Academy Flight Training Center Schedule

Tuesdays
0800, 1100, and 1400

Fridays
0800 and 1100