FAR PART 141

TRAINING COURSE OUTLINE AND CURRICULUM SAFETY AND PROCEDURES

CONCURRENT COMMERCIAL PILOT AND INSTRUMENT RATING COURSE

Air Agency Certificate #CG9S059R

PURDUE UNIVERSITY

PURDUE UNIVERSITY
1401 AVIATION DRIVE
WEST LAFAYETTE, IN 47907

PREFACE

PURPOSE

This manual has been prepared to cover the training course outline and curriculum, as well as safety and operating procedures, for the Concurrent Commercial Pilot and Instrument Rating Training Course at Purdue University's Department of Aviation Technology. This manual provides firm guidelines to enable all personnel to carry out their assigned duties and responsibilities in accordance with company policies, FAA regulations, and training course outlines and curriculum.

DISTRIBUTION

An electronic copy of this manual will be furnished to all areas of responsibility with the Flight Operations area of the Department of Aviation Technology at Purdue University, including but not limited to:

1. Flight Instructors
2. Maintenance Personnel
3. Dispatch Personnel
4. FAA (Flight Standards District Office)
5. Enrolled Part 141 Flight Students (Training Syllabus only)

REVISION CONTROL

In accordance with FAR 141.53, revisions will be prepared by the Chief Flight Instructor or his/her designee. Revisions will be identified by a vertical line adjacent to the changed text in the margin. Each revision will have a revision number, date and page numbers being revised. Revisions will be consecutively numbered.

The sole official copy of the Training Course Outline & Curriculum and Safety and Procedures Manual will be maintained in the chief flight instructor's office. Once the electronic copy is downloaded, it no longer will be an official copy. It will be the responsibility of each manual holder to keep his/her manual current and record any revisions on the Record of Revisions. In order to facilitate recordkeeping and ensure that all manuals are current, a List of Effective Pages will be distributed with each revision and will instruct personnel as to which pages are to be removed or replaced.

All revisions to the Training Course Outline & Curriculum will be submitted to the Certificate Holding District Office (CHDO) for review and approval, prior to being implemented.

Purdue University

Part 141 Concurrent Commercial Pilot and Instrument Rating Course

TCO RECORD OF REVISIONS

Rev No.	Revision Date	Insertion Date	By	Comments	

On receipt of revision, insert revised pages in the manual, remove supplanted pages, and enter revision number, revision date, and initials of employee handling the revision.

NOTE: Retain this record in the front of the manual or in front of the chapter or section if it is bound separately.

PURDUE
UNIVERSITY

Purdue University

Flight Operations
Safety & Procedures

S&P RECORD OF REVISIONS

Rev No.	Revision Date	Insertion Date	By	Comments	

On receipt of revision, insert revised pages in the manual, remove supplanted pages, and enter revision number, revision date, and initials of employee handling the revision.

NOTE: Retain this record in the front of the manual or in front of the chapter or section if it is bound separately.

Purdue University

Part 141 Concurrent Commercial Pilot and Instrument Rating Course
Flight Operations Safety & Procedures

LIST OF EFFECTIVE PAGES

	Page Number	Revision	Date
Title Page	**1**	**12**	**June 01, 2016**
Preface	**2**	**12**	**June 01, 2016**
Record of Revisions	**ROR-1**	**12**	**June 01, 2016**
	ROR-2	**12**	**June 01, 2016**
List of Effective Pages	**LEP-1**	**12**	**June 01, 2016**
	LEP-2	**12**	**June 01, 2016**
	LEP-3	**12**	**June 01, 2016**
	LEP-4	**12**	**June 01, 2016**
	LEP-5	**12**	**June 01, 2016**
	LEP-6	**12**	**June 01, 2016**
	LEP-7	**12**	**June 01, 2016**
	LEP-8	**12**	**June 01, 2016**
Table of Contents	**TOC-1**	**12**	**June 01, 2016**
	TOC-2	**12**	**June 01, 2016**
Overview, Enrollment & Recordkeeping	**1-1**	**12**	**June 01, 2016**
	1-2	**12**	**June 01, 2016**
	1-3	**12**	**June 01, 2016**
	1-4	**12**	**June 01, 2016**
Stages and Stage Check	**2-1**	**12**	**June 01, 2016**
	2-2	**12**	**June 01, 2016**
	2-3	**12**	**June 01, 2016**
	2-4	**12**	**June 01, 2016**
	2-5	**12**	**June 01, 2016**
	2-6	**12**	**June 01, 2016**
	2-7	**12**	**June 01, 2016**
	2-8	**12**	**June 01, 2016**
	2-9	**12**	**June 01, 2016**
	2-10	**12**	**June 01, 2016**
	2-11	**12**	**June 01, 2016**
	2-12	**12**	**June 01, 2016**
Facilities	**3-1**	**12**	**June 01, 2016**
	3-2	**12**	**June 01, 2016**
	3-3	**12**	**June 01, 2016**
	3-4	**12**	**June 01, 2016**
	3-5	**12**	**June 01, 2016**
	3-6	**12**	**June 01, 2016**
Equipment	**4-1**	**12**	**June 01, 2016**
	4-2	**12**	**June 01, 2016**

Personnel	**5-1**	**12**	**June 01, 2016**
	5-2	**12**	**June 01, 2016**
	5-3	**12**	**June 01, 2016**
	5-4	**12**	**June 01, 2016**
	5-5	**12**	**June 01, 2016**
	5-6	**12**	**June 01, 2016**
Aircraft Maintenance Overview & Procedures	**6-1**	**12**	**June 01, 2016**
	6-2	**12**	**June 01, 2016**
	6-3	**12**	**June 01, 2016**
	6-4	**12**	**June 01, 2016**
	6-5	**12**	**June 01, 2016**
	6-6	**12**	**June 01, 2016**
Training Syllabi	**7-1**	**12**	**June 01, 2016**
	7-2	**12**	**June 01, 2016**
AT-24900	**7-3**	**12**	**June 01, 2016**
	7-4	**12**	**June 01, 2016**
	7-5	**12**	**June 01, 2016**
	7-6	**12**	**June 01, 2016**
AT-25400	**7-7**	**12**	**June 01, 2016**
	7-8	**12**	**June 01, 2016**
	7-9	**12**	**June 01, 2016**
	7-10	**12**	**June 01, 2016**
AT-24302	**7-11**	**12**	**June 01, 2016**
	7-12	**12**	**June 01, 2016**
	7-13	**12**	**June 01, 2016**
	7-14	**12**	**June 01, 2016**
	7-15	**12**	**June 01, 2016**
	7-16	**12**	**June 01, 2016**
	7-17	**12**	**June 01, 2016**
	7-18	**12**	**June 01, 2016**
	7-19	**12**	**June 01, 2016**
	7-20	**12**	**June 01, 2016**
	7-21	**12**	**June 01, 2016**
	7-22	**12**	**June 01, 2016**
	7-23	**12**	**June 01, 2016**
	7-24	**12**	**June 01, 2016**
	7-25	**12**	**June 01, 2016**
	7-26	**12**	**June 01, 2016**
	7-27	**12**	**June 01, 2016**
	7-28	**12**	**June 01, 2016**
AT-24802	**7-29**	**12**	**June 01, 2016**
	7-30	**12**	**June 01, 2016**
	7-31	**12**	**June 01, 2016**
	7-32	**12**	**June 01, 2016**
	7-33	**12**	**June 01, 2016**
	7-34	**12**	**June 01, 2016**
	7-35	**12**	**June 01, 2016**
	7-36	**12**	**June 01, 2016**
	7-37	**12**	**June 01, 2016**
	7-38	**12**	**June 01, 2016**
	7-39	**12**	**June 01, 2016**
	7-40	**12**	**June 01, 2016**
	7-41	**12**	**June 01, 2016**

	7-42	**12**	**June 01, 2016**
	7-43	**12**	**June 01, 2016**
	7-44	**12**	**June 01, 2016**
AT-25302	**7-45**	**12**	**June 01, 2016**
	7-46	**12**	**June 01, 2016**
	7-47	**12**	**June 01, 2016**
	7-48	**12**	**June 01, 2016**
	7-49	**12**	**June 01, 2016**
	7-50	**12**	**June 01, 2016**
	7-51	**12**	**June 01, 2016**
	7-52	**12**	**June 01, 2016**
	7-53	**12**	**June 01, 2016**
	7-54	**12**	**June 01, 2016**
	7-55	**12**	**June 01, 2016**
	7-56	**12**	**June 01, 2016**
	7-57	**12**	**June 01, 2016**
	7-58	**12**	**June 01, 2016**
	7-59	**12**	**June 01, 2016**
	7-60	**12**	**June 01, 2016**
	7-61	**12**	**June 01, 2016**
	7-62	**12**	**June 01, 2016**
	7-63	**12**	**June 01, 2016**
	7-64	**12**	**June 01, 2016**
	7-65	**12**	**June 01, 2016**
	7-66	**12**	**June 01, 2016**
AT-21000	**7-67**	**12**	**June 01, 2016**
	7-68	**12**	**June 01, 2016**
	7-69	**12**	**June 01, 2016**
	7-70	**12**	**June 01, 2016**
	7-71	**12**	**June 01, 2016**
	7-72	**12**	**June 01, 2016**
	7-73	**12**	**June 01, 2016**
	7-74	**12**	**June 01, 2016**
	7-75	**12**	**June 01, 2016**
	7-76	**12**	**June 01, 2016**
	7-77	**12**	**June 01, 2016**
	7-78	**12**	**June 01, 2016**
	7-79	**12**	**June 01, 2016**
	7-80	**12**	**June 01, 2016**
	7-81	**12**	**June 01, 2016**
	7-82	**12**	**June 01, 2016**
	7-83	**12**	**June 01, 2016**
	7-84	**12**	**June 01, 2016**
	7-85	**12**	**June 01, 2016**
	7-86	**12**	**June 01, 2016**
	7-87	**12**	**June 01, 2016**
	7-88	**12**	**June 01, 2016**
	7-89	**12**	**June 01, 2016**
	7-90	**12**	**June 01, 2016**
	7-91	**12**	**June 01, 2016**
	7-92	**12**	**June 01, 2016**
	7-93	**12**	**June 01, 2016**
	7-94	**12**	**June 01, 2016**

	7-95	**12**	**June 01, 2016**
	7-96	**12**	**June 01, 2016**
	7-97	**12**	**June 01, 2016**
	7-98	**12**	**June 01, 2016**
	7-99	**12**	**June 01, 2016**
	7-100	**12**	**June 01, 2016**
AT-21100	**7-101**	**12**	**June 01, 2016**
	7-102	**12**	**June 01, 2016**
	7-103	**12**	**June 01, 2016**
	7-104	**12**	**June 01, 2016**
	7-105	**12**	**June 01, 2016**
	7-106	**12**	**June 01, 2016**
	7-107	**12**	**June 01, 2016**
	7-108	**12**	**June 01, 2016**
	7-109	**12**	**June 01, 2016**
	7-110	**12**	**June 01, 2016**
	7-111	**12**	**June 01, 2016**
	7-112	**12**	**June 01, 2016**
	7-113	**12**	**June 01, 2016**
	7-114	**12**	**June 01, 2016**
	7-115	**12**	**June 01, 2016**
	7-116	**12**	**June 01, 2016**
	7-117	**12**	**June 01, 2016**
	7-118	**12**	**June 01, 2016**
	7-119	**12**	**June 01, 2016**
	7-120	**12**	**June 01, 2016**
	7-121	**12**	**June 01, 2016**
	7-122	**12**	**June 01, 2016**
	7-123	**12**	**June 01, 2016**
	7-124	**12**	**June 01, 2016**
	7-125	**12**	**June 01, 2016**
	7-126	**12**	**June 01, 2016**
	7-127	**12**	**June 01, 2016**
	7-128	**12**	**June 01, 2016**
	7-129	**12**	**June 01, 2016**
	7-130	**12**	**June 01, 2016**
	7-131	**12**	**June 01, 2016**
	7-132	**12**	**June 01, 2016**
	7-133	**12**	**June 01, 2016**
	7-134	**12**	**June 01, 2016**
Safety & Procedures Introduction	**8-0-1**	**12**	**June 01, 2016**
	8-0-2	**12**	**June 01, 2016**
Safety Program	**8-1-1**	**12**	**June 01, 2016**
	8-1-2	**12**	**June 01, 2016**
	8-1-3	**12**	**June 01, 2016**
	8-1-4	**12**	**June 01, 2016**
	8-1-5	**12**	**June 01, 2016**
	8-1-6	**12**	**June 01, 2016**
	8-1-7	**12**	**June 01, 2016**
	8-1-8	**12**	**June 01, 2016**
	8-1-9	**12**	**June 01, 2016**
	8-1-10	**12**	**June 01, 2016**
	8-1-11	**12**	**June 01, 2016**

	8-1-12	**12**	**June 01, 2016**
	8-1-13	**12**	**June 01, 2016**
	8-1-14	**12**	**June 01, 2016**
	8-1-15	**12**	**June 01, 2016**
	8-1-16	**12**	**June 01, 2016**
Instructor Information	**8-2-1**	**12**	**June 01, 2016**
	8-2-2	**12**	**June 01, 2016**
	8-2-3	**12**	**June 01, 2016**
	8-2-4	**12**	**June 01, 2016**
	8-2-5	**12**	**June 01, 2016**
	8-2-6	**12**	**June 01, 2016**
	8-2-7	**12**	**June 01, 2016**
	8-2-8	**12**	**June 01, 2016**
	8-2-9	**12**	**June 01, 2016**
	8-2-10	**12**	**June 01, 2016**
Rules & Regulations	**8-3-1**	**12**	**June 01, 2016**
	8-3-2	**12**	**June 01, 2016**
	8-3-3	**12**	**June 01, 2016**
	8-3-4	**12**	**June 01, 2016**
	8-3-5	**12**	**June 01, 2016**
	8-3-6	**12**	**June 01, 2016**
	8-3-7	**12**	**June 01, 2016**
	8-3-8	**12**	**June 01, 2016**
	8-3-9	**12**	**June 01, 2016**
	8-3-10	**12**	**June 01, 2016**
Weather Limitations	**8-4-1**	**12**	**June 01, 2016**
	8-4-2	**12**	**June 01, 2016**
Cross Country Procedures	**8-5-1**	**12**	**June 01, 2016**
	8-5-2	**12**	**June 01, 2016**
	8-5-3	**12**	**June 01, 2016**
	8-5-4	**12**	**June 01, 2016**
	8-5-5	**12**	**June 01, 2016**
	8-5-6	**12**	**June 01, 2016**
	8-5-7	**12**	**June 01, 2016**
	8-5-8	**12**	**June 01, 2016**
	8-5-9	**12**	**June 01, 2016**
	8-5-10	**12**	**June 01, 2016**
Aircraft Operations	**8-6-1**	**12**	**June 01, 2016**
	8-6-2	**12**	**June 01, 2016**
	8-6-3	**12**	**June 01, 2016**
	8-6-4	**12**	**June 01, 2016**
	8-6-5	**12**	**June 01, 2016**
	8-6-6	**12**	**June 01, 2016**
	8-6-7	**12**	**June 01, 2016**
	8-6-8	**12**	**June 01, 2016**
	8-6-9	**12**	**June 01, 2016**
	8-6-10	**12**	**June 01, 2016**
Airports of Use	**8-7-1**	**12**	**June 01, 2016**
	8-7-2	**12**	**June 01, 2016**
Procedures	**8-8-1**	**12**	**June 01, 2016**
	8-8-2	**12**	**June 01, 2016**
	8-8-3	**12**	**June 01, 2016**
	8-8-4	**12**	**June 01, 2016**

	8-8-5	**12**	**June 01, 2016**
	8-8-6	**12**	**June 01, 2016**
	8-8-7	**12**	**June 01, 2016**
	8-8-8	**12**	**June 01, 2016**
	8-8-9	**12**	**June 01, 2016**
	8-8-10	**12**	**June 01, 2016**
	8-8-11	**12**	**June 01, 2016**
	8-8-12	**12**	**June 01, 2016**
	8-8-13	**12**	**June 01, 2016**
	8-8-14	**12**	**June 01, 2016**
VFR and IFR Maneuvers	**8-9-1**	**12**	**June 01, 2016**
	8-9-2	**12**	**June 01, 2016**
	8-9-3	**12**	**June 01, 2016**
	8-9-4	**12**	**June 01, 2016**
	8-9-5	**12**	**June 01, 2016**
	8-9-6	**12**	**June 01, 2016**
	8-9-7	**12**	**June 01, 2016**
	8-9-8	**12**	**June 01, 2016**
	8-9-9	**12**	**June 01, 2016**
	8-9-10	**12**	**June 01, 2016**
	8-9-11	**12**	**June 01, 2016**
	8-9-12	**12**	**June 01, 2016**
	8-9-13	**12**	**June 01, 2016**
	8-9-14	**12**	**June 01, 2016**
	8-9-15	**12**	**June 01, 2016**
	8-9-16	**12**	**June 01, 2016**
	8-9-17	**12**	**June 01, 2016**
	8-9-18	**12**	**June 01, 2016**
	8-9-19	**12**	**June 01, 2016**
	8-9-20	**12**	**June 01, 2016**
	8-9-21	**12**	**June 01, 2016**
	8-9-22	**12**	**June 01, 2016**
	8-9-23	**12**	**June 01, 2016**
	8-9-24	**12**	**June 01, 2016**
	8-9-25	**12**	**June 01, 2016**
	8-9-26	**12**	**June 01, 2016**
	8-9-27	**12**	**June 01, 2016**
	8-9-28	**12**	**June 01, 2016**
	8-9-29	**12**	**June 01, 2016**
	8-9-30	**12**	**June 01, 2016**
	8-9-31	**12**	**June 01, 2016**
	8-9-32	**12**	**June 01, 2016**
	8-9-33	**12**	**June 01, 2016**
	8-9-34	**12**	**June 01, 2016**
	8-9-35	**12**	**June 01, 2016**
	8-9-36	**12**	**June 01, 2016**
	8-9-37	**12**	**June 01, 2016**
	8-9-38	**12**	**June 01, 2016**
Study Guide	**8-10-1**	**12**	**June 01, 2016**
	8-10-2	**12**	**June 01, 2016**

This Page Intentionally Left Blank

This Page Intentionally Left Blank

Table of Contents

This Page Intentionally Left Blank

OVERVIEW, ENROLLMENT & RECORDKEEPING

Prerequisite for enrollment is a Private Pilot Certificate. The concurrent Commercial Pilot and Instrument Rating training course offered by the School of Aviation and Transportation Technology (SATT) at Purdue University consists of a total of seven academic semester courses. There are two ground lecture courses, three flight courses and two simulator courses taught, utilizing the following sequence:

Semester 1	AT-24302 Commercial Flight I	40 total hours
Semester 2	AT-21000 Ground Trainer I	25 total hours
	AT-24802 Commercial Flight II	40 total hours
	AT-24900 Instrument Lecture	40 total hours
Semester 3	AT-21100 Ground Trainer II	25 total hours
	AT-25302 Instrument Flight	38 total hours
	AT-25400 Commercial Lecture	40 total hours

A stage check is given at the completion of AT-24302, AT-21000, AT-21100 and AT-24802.

The Instrument Rating graduation check is given approximately two thirds of the way through AT-25302, which is followed by the Instrument Rating Practical Test.

The Commercial Pilot graduation check is given at the end of AT-25302, which is followed by the Commercial Pilot Practical Test.

The Instrument Rating Knowledge Test is completed in AT-24900 and the Commercial Pilot Knowledge Test is completed in AT-25400.

Part 141 states that 40% of the 35 hours for the Instrument Rating and 20% of the 120 hours for the Commercial Pilot Certificate can be accomplished in an approved training device. Therefore, the 118 flight hours and 50 training device hours in the Purdue courses exceed the minimum requirements for the concurrent Commercial and Instrument Rating Course.

AT-24302 is a flight course that includes dual and solo training, which reviews Private Pilot maneuvers, introduces commercial pilot maneuvers, includes dual and solo cross country and has night experience. A stage check is given at the end of the course.

AT-21000 is a training device course that includes basic attitude instrument flying and introduces the student to navigation, holding patterns and instrument approaches. A stage check is given at the end of the course.

AT-21100 is a training device course that continues the proficiency level of holding patterns and instrument approaches and includes several IFR cross countries. A stage check is given at the end of the course.

AT-24802 is a flight course that includes dual and solo flight training to further develop proficiency in the commercial maneuvers. It also includes dual and solo cross country as well as basic attitude instrument flying. A stage check is given at the end of the course.

AT-25302 is a flight course that includes instrument navigation, holding patterns and instrument approaches. The course includes several IFR cross countries. It also includes final commercial pilot review. Both the instrument rating practical test and the commercial pilot practical test is given in this course.

Enrollment

In accordance with FAR 141.93, each student will receive an electronic certificate of enrollment that includes the name of the course in which the student is enrolled and the date of that enrollment. In addition, each student will be provided with a copy of the student's training syllabus and the Safety and Procedures Manual. The Safety and Procedures Manual includes the information required under FAR 141.93 (a)(3), as well as additional school policies and procedures believed necessary to provide the highest standards of safety and operational control.

As required by FAR Part 141, Purdue University will electronically forward a copy of each enrollment certificate within five days to the CHDO. The enrollment certificate will be maintained in the student's electronic record. A monthly listing of students enrolled in each training course will be maintained in the general files at Hangar 6.

Recordkeeping

In accordance with FAR 141.101, training records will be maintained in both paper and electronic formats and will include the date the student was enrolled in the approved course, a chronological log of the student's course attendance, subjects and flight operations covered in the student's training and the names and grades of any tests taken by the student. In addition, the date the student graduated, terminated training or transferred to another school will be recorded. Student records will be maintained for at least one year from the date that the student graduates, terminates enrollment or transfers to another school and will be certified by the Chief Flight Instructor at that time. Students will have access to their training records upon request. The CHDO personnel overseeing the certificate holder will also be granted remote access to the electronic files; paper files are available for inspection in Hangar 6, Room 120, KLAF. Upon completion of the course of training, students will be provided with a graduation certificate. A sample of the graduation certificate, which meets all requirements of 14 CFR 141.95, is provided on the following page.

PURDUE
UNIVERSITY

This is to certify

Sample Certificate

Has successfully completed all phases, tests and course requirements and has graduated from the
FEDERAL AVIATION ADMINISTRATION
APPROVED CONCURRENT COMMERCIAL PILOT AND INSTRUMENT RATING COURSE
Conducted by Purdue University.

CG9S059R
Air Agency Certificate Number

I certify the above statements are true.

_____

Chief Flight Instructor
Date XXX XX, XXXX

This Page Intentionally Left Blank

STAGES AND STAGE CHECKS

As indicated previously in the overview, each of the three flight courses and the two simulator courses represent a stage in the student's training. Each course (stage) has a stage check at the completion of the course. The sequence of the lessons within a course (stage) can be altered depending on weather and the progress of the student.

Expanded descriptions of the stage checks are included, as well as copies of the stage check forms.

AT-24302 Commercial Flight I Stage Check

The purpose and objectives of the AT-24302 stage check is to determine that the student can properly plan and execute cross country flying and that the student understands and can perform all of the commercial pilot take offs, landings and maneuvers to a reasonable level of competency.

The student shall complete all items to the satisfaction of the check instructor. At the instructor's discretion, (s)he may provide remedial training for up to three, non-safety related, items. Providing remedial training will lower the stage check grade by one letter grade.

The student will plan a VFR cross country to either Kalamazoo, Decatur or Richmond, as assigned by the stage check instructor. All cross country planning, plus the weight and balance and performance calculations must be completed as per the Purdue cross country planning log prior to the beginning of the stage check.

The student will start off on the cross country without the use of the GPS and demonstrate the ability to navigate by pilotage and dead reckoning. The student may accomplish a ground speed check and divert to or towards an alternate airport.

The student must also demonstrate the ability to navigate using the GPS and VOR receivers.

The student must demonstrate competency in take offs and landings and the commercial flight maneuvers.

The stage check instructor must use the AT-24302 Stage Check electronic record keeping system to record the detailed results of the stage check.

AT-24802 Commercial Flight II Stage Check

The purpose and objectives of the AT-24802 stage check is to determine that the student has learned the basic attitude instrument skills prior to entering AT-25302 Instrument Flight and that the student has mastered the commercial flight maneuvers.

The student shall complete all items to the satisfaction of the check instructor. At the instructor's discretion, (s)he may provide remedial training for up to three, non-safety related, items. Providing remedial training will lower the stage check grade by one letter grade.

The student must demonstrate competency in basic attitude instrument flying by performing the maneuvers in the AT-24802 course outline.

The student must also demonstrate mastery of the commercial flight maneuvers and take offs and landings.

The stage check instructor must use the AT-24802 stage check electronic record keeping system to record the detailed results of the stage check.

AT-21000 Ground Trainer I Stage Check

The purpose and objective of the AT-21000 stage check is to determine that the student has adequately developed basic attitude instrument skills and can properly hold and execute instrument approaches.

The student shall complete all items to the satisfaction of the check instructor. At the instructor's discretion, (s)he may provide remedial training for up to three, non-safety related, items. Providing remedial training will lower the stage check grade by one letter grade.

The stage check instructor will issue an IFR clearance to one of the following navigation facilities or intersections: The Boiler VOR, the OCKEL intersection, the VAGES intersection or the POTES intersection. The student will then be issued holding instructions for the appropriate fix.

The student must accomplish three instrument approaches as follows:

- An ILS approach
- A GPS approach (without LPV)
- A VOR approach

The entire stage check must be completed with all instruments available (no partial panel).

The winds used for the stage check must not exceed 10 knots in velocity.

The stage check instructor must use the AT-21000 Stage Check electronic record keeping system to record detailed results of the stage check.

AT-21100 Ground Trainer II Stage Check

The purpose and objectives of the AT-21100 course completion check is that the student will demonstrate a high level of competency in IFR cross country planning and flying in addition to holding and instrument approaches.

The student shall complete all items to the Instrument Rating Airplane Practical Test Standards or Airmen Certification Standards, as applicable. At the instructor's discretion, (s)he may provide remedial training for up to three, non-safety related, items. Providing remedial training will lower the stage check grade by one letter grade.

The student will plan an IFR cross country to either Danville, IL or Terre Haute, IN as assigned by the stage check instructor. All cross-country planning must be completed as per the Purdue

IFR planning log prior to the beginning of the stage check. The stage check instructor will issue the appropriate IFR clearance and the student will fly the assigned cross country.

A holding pattern must occur at some point during the flight.

The student must accomplish three instrument approaches as follows:

- An ILS approach
- A GPS approach (without LPV)
- A VOR approach

The GPS approach must be LNAV only
A Dual AHRS failure will be on either the GPS or VOR approach.
The autopilot will be used on either the GPS or VOR approach.

The winds used for the stage check must not exceed 15 knots in velocity.

The stage check instructor must use the AT-21100 stage check electronic record keeping system to record detailed results of the stage check.

AT-25302 Instrument/Commercial Flight
Instrument Stage Check

All previous lessons in the instrument stage, including the instrument knowledge test, must be completed prior to this lesson.

The purpose of the AT-25302 Instrument Stage Check is to determine that the student is competent to pass the Instrument Rating Airplane Practical Test. The student will demonstrate a high level of competency in IFR cross country planning and flying, in addition to holding and instrument approaches.

The student will plan an IFR cross country to either Rockford, IL or Louisville, KY, as assigned by the stage check instructor. All cross country planning must be complete as per the Purdue IFR planning log, prior to the beginning of the stage check. The stage check instructor will issue an appropriate IFR clearance and the student will comply with departure, en route, and arrival procedures and clearances.

If available, a Cirrus GTS aircraft will be used for the stage check. The student is expected to operate the landing gear retraction handle as though the aircraft has retractable gear; failure to do so, will lower the stage check grade by one letter grade.

A holding pattern must occur at some point during the flight.

The student must accomplish three instrument approaches as follows:

- A precision (ILS or GPS LPV) approach
- A GPS LNAV approach
- A VOR or VOR/DME approach

The GPS LNAV will be flown without the use of WAAS.

A dual AHRS failure will be on either the GPS LNAV or VOR approach.

The autopilot will be used on either the GPS LNAV or VOR approach (whichever approach does not include the AHRS failure).

The stage check instructor must use the AT-25302 instrument stage check electronic record keeping system to record the detailed results of the stage check.

AT-25302 Instrument/Commercial Flight
Commercial Stage Check

All previous lessons in the commercial stage, including the commercial knowledge test, must be completed prior to this lesson.

The purpose of the AT-25302 Commercial Stage Check is to determine that the student is competent to pass the Commercial Pilot Airplane Practical Test. The student will demonstrate a high level of competency in commercial flight maneuvers, in addition to VFR cross country planning and flying.

The student will plan a VFR cross country either to Quincy, IL or Bowling Green, KY as assigned by the stage check instructor. All cross country planning must be completed as per the Purdue VFR planning log, prior to the beginning of the stage check.

A Piper Arrow aircraft will be used for the stage check.

The stage check instructor must use the AT-25302 commercial stage check electronic record keeping system to record the detailed results of the stage check.

AT-24302 Stage Check Record

Stage Check

Item	Points Possible	Points Given	Remarks
Oral			
A. Pilot and aircraft airworthiness	10		
B. Airplane performance / weight and balance	10		
C. Aircraft systems / instruments / limitations	10		
D. Emergency procedures / light gun signals	10		
E. National Airspace System / Special Use Airspace / TFRs	10		
F. Weather	10		
Normal Operations			
A. Checklist Usage	5		
B. Starting / taxiing / runup / shutdown procedures	5		
C. Radio procedures	5		
D. Traffic pattern	5		
Cross Country Procedures (the check pilot shall select at least tasks A and B)			
A. Maintaining planned course	20		
B. Altitude control	20		
C. Ground speed check	20		
D. Diverting to an alternate	20		
Flight at Critically Slow Airspeed (the check pilot shall select at least task A and one other task)			
A. Slow Flight	20		
B. Takeoff stall	20		
C. Departure stall	20		
D. Approach to landing stall	20		
Commercial Maneuvers (the check pilot shall select at least tasks A, B, and C)			
A. Steep turns	20		
B. Chandelles	20		
C. Lazy eights	20		
D. Gliding spirals about a point	20		
E. Eights-on-pylons	20		
Maneuvering by Reference to Instruments (the check pilot shall select at least tasks A and one other task)			
A. Four Fundamentals	10		
B. VOR orientation / tracking	10		
C. Unusual Attitudes	10		
Emergency Procedures			
A. Simulated power loss (partial or full)	15		
B. Other emergency procedure at the discretion of the check pilot	5		
Takeoffs and Landings (the check pilot shall select at least 2 takeoffs and 2 landings)			
A. Short field takeoff	20		
B. Short field landing	20		
C. Soft field takeoff	20		
D. Soft field landing	20		
E. Crosswind takeoff	20		
F. Crosswind landing	20		
G. Accuracy landing	20		
Student Performance			
A. Cockpit organization	5		
B. Vigilance	5		
C. Judgment	5		

Figure 2.1 AT-24302 Example Electronic Stage Check Record

AT-24802 Stage Check Record

Stage Check

Item	Points Possible	Points Given	Remarks
Oral			
A. Pilot and aircraft airworthiness	10		
B. Aircraft performance / weight and balance	10		
C. Aircraft systems / instruments / limitations	10		
D. Emergency procedures / light gun signals	10		
E. National Airspace System / Special Use Airspace / TFRs	10		
F. Weather	10		
Normal Operation			
A. Line inspection (at the discretion of the check pilot)	5		
B. Checklist Usage	5		
C. Starting / Taxiing / Runup / Shutdown Procedures	5		
D. Radio procedure	5		
E. Traffic Pattern	5		
Basic Instrument Maneuvers (the check pilot shall select at least task A or E, and 2 more tasks)			
A. Steep turns	10		
B. Timed turns to Magnetic Compass Headings	15		
C. Partial panel stall(s)	5		
D. Partial panel unusual attitude	15		
E. Lateral "S"	10		
F. Vertical S1	10		
Commercial Maneuvers (the check pilot shall select at least tasks A, B, and C, and at least D or E)			
A. Steep Turns	20		
B. Chandelles	20		
C. Lazy Eights	20		
D. Gliding Spiral about a point	20		
E. Eights-on-Pylons	20		
Emergency Procedures			
A. Simulated Power Loss (partial or full)	15		
B. Other emergency procedures at the discretion of the check pilot	5		
Takeoffs and Landings (the check pilot shall select at least 2 takeoffs and 2 landings)			
A. Short field takeoff	20		
B. Short field landing	20		
C. Soft field takeoff	20		
D. Soft field landing	20		
E. Normal or Crosswind takeoff	20		
F. Normal or Crosswind landing	20		
G. Accuracy landing	10		
Student Performance			
A. Cockpit organization	5		
B. Coordination	5		
C. Vigilance	5		
D. Judgment	5		

Figure 2.2 AT-24802 Example Electronic Stage Check Record

AT-21000 Stage Check Record

Stage Check

Item	Points Possible	Points Given	Remarks
Ground Operations			
A. Cockpit organization	5		
B. Copying clearance and readback	5		
C. Radio set up	5		
Departure Procedures			
A. Proper technique relative to power and landing gear	10		
B. Aircraft Control (heading, bank, altitude, etc.)	5		
C. Communications	5		
D. Compliance with the clearance	10		
E. Tracking technique	5		
Holding			
A. Proper Entry	15		
B. Completion of the 5 T's	10		
C. Navigation radio set up	15		
D. Adjustments for wind and time	20		
E. Altitude control	15		
GPS Approach			
A. Navigation radio set up (primary and secondary)	10		
B. Approach course tracking	20		
C. Approach procedures (5 T's and 4 T's)	20		
D. Altitude	10		
E. Communications/Callouts	15		
F. Adjustments for wind and time (if applicable)	15		
G. Missed approach procedures (if applicable)	15		
VOR Approach			
A. Navigation radio set up (primary and secondary)	10		
B. Approach course tracking	20		
C. Approach procedures (5 T's and 4 T's)	20		
D. Altitude	10		
E. Communications/Callouts	15		
F. Adjustments for wind and time (if applicable)	15		
G. Missed approach procedures (if applicable)	15		
ILS Approach			
A. Navigation radio set up (primary and secondary)	10		
B. Approach course tracking	20		
C. Approach procedures (5 T's and 4 T's)	20		
D. Altitude/Glideslope	10		
E. Communications/Callouts	15		
F. Adjustments for wind and time (if applicable)	15		
G. Missed approach procedures (if applicable)	15		
Basic Instrument			
A. Altitude	10		
B. Heading	10		
C. Coordination	10		
D. Bank	10		

Figure 2.3 AT-21000 Example Electronic Stage Check Record

AT-21100 Stage Check Record

Stage Check

Item	Points Possible	Points Given	Remarks
Ground Operations			
A. Cockpit organization	5		
B. Copying clearance and readback	5		
C. Radio set up	5		
Departure Procedures			
A. Proper technique relative to power and landing gear	10		
B. Aircraft Control (heading, bank, altitude, etc.)	5		
C. Communications	5		
D. Compliance with the clearance	10		
E. Tracking technique	5		
Holding			
A. Proper Entry	15		
B. Completion of the 5 T's	10		
C. Navigation radio set up	15		
D. Adjustments for wind and time	20		
E. Altitude control	15		
GPS Approach			
A. Navigation radio set up (primary and secondary)	10		
B. Approach course tracking	20		
C. Approach procedures (5 T's and 4 T's)	20		
D. Altitude	10		
E. Communications/Callouts	15		
F. Adjustments for wind and time (if applicable)	15		
G. Missed approach procedures (if applicable)	15		
VOR Approach			
A. Navigation radio set up (primary and secondary)	10		
B. Approach course tracking	20		
C. Approach procedures (5 T's and 4 T's)	20		
D. Altitude	10		
E. Communications/Callouts	15		
F. Adjustments for wind and time (if applicable)	15		
G. Missed approach procedures (if applicable)	15		
ILS Approach			
A. Navigation radio set up (primary and secondary)	10		
B. Approach course tracking	20		
C. Approach procedures (5 T's and 4 T's)	20		
D. Altitude/Glideslope	10		
E. Communications/Callouts	15		
F. Adjustments for wind and time (if applicable)	15		
G. Missed approach procedures (if applicable)	15		
Basic Instrument			
A. Altitude	10		
B. Heading	10		
C. Coordination	10		
D. Bank	10		

Figure 2.4 AT-21100 Example Electronic Stage Check Record

Instrument Stage Check

Stage Check

Item	Points Possible	Points Given	Remarks
Oral			
A. Pilot and aircraft airworthiness for IFR flight	10		
B. Weather	10		
C. IFR Cross Country Flight Planning	10		
D. Aircraft Flight Instruments and Navigation Equipment	10		
E. Approach & Enroute Charts	10		
F. 14 CFRs (FARs) applicable to IFR flight	10		
Ground Operations			
A. Cockpit Organization	5		
B. Copying clearance and readback	5		
C. Radio set up	5		
Departure Procedures			
A. Proper technique relative to power and landing gear	5		
B. Aircraft Control (heading, bank, altitude, etc.)	5		
C. Communications	5		
D. Compliance with the clearance	10		
E. Tracking technique	5		
Holding			
A. Proper Entry	5		
B. Completion of the 5 T's	20		
C. Navigation radio set up	20		
D. Adjustments for wind and time	20		
E. Altitude control	20		
Precision Approach (ILS or GPS LPV)			
A. Navigation radio set up	15		
B. Approach course tracking	20		
C. Approach procedures (5 T's and 5 T's)	20		
D. Altitude	20		
E. Communications/Callouts	15		
F. Adjustments for wind and time	15		
G. Missed approach procedures	10		
Non-precision approach (VOR, VOR/DME or GPS LNAV)			
A. Navigation radio set up	15		
B. Approach course tracking	20		
C. Approach procedures (5 T's and 5 T's)	20		
D. Altitude	20		
E. Communications/Callouts	15		
F. Adjustments for wind and time	15		
G. Missed approach procedures	10		
Non-precision approach (VOR, VOR/DME or GPS LNAV) with dual AHRS failure			
A. Navigation radio set up	15		
B. Approach course tracking	20		
C. Approach procedures (5 T's and 5 T's)	20		
D. Altitude	20		
E. Communications/Callouts	15		
F. Adjustments for wind and time	15		
G. Missed approach procedures	10		
DME Arc (at the discretion of the check pilot)			
A. Navigation radio set up	5		
B. Tracking	5		
C. Altitude	5		

Figure 2.5 Example Electronic Instrument Stage Check Record

Commercial Stage Check

Stage Check

Item	Points Possible	Points Given	Remarks
Oral			
A. Pilot and aircraft airworthiness	10		
B. Weather	10		
C. Cross country flight planning	10		
D. National airspace system	10		
E. Aircraft systems/limitations/weight and balance	10		
F. Emergency procedures/spin awareness	10		
Normal Operation			
A. Line inspection (at the discretion of the check pilot)	5		
B. Checklist Usage	10		
C. Radio procedure	5		
Cross Country Procedures (the check pilot shall select at least task A and B)			
A. Maintaining planned course	10		
B. Altitude control	10		
C. Diversion to an alternate	15		
D. Uncontrolled airport operations	15		
Stalls and Slow Flight (the check pilot shall select at least 3 tasks: A and E, and either B, C, or D)			
A. Slow flight	10		
B. Approach to landing stall	10		
C. Takeoff stall	10		
D. Departure stall	10		
E. Accelerated stall	15		
Commercial Maneuvers (the check pilot shall select at least 3 tasks: either A or B, either C or D, and E)			
A. Steep turns	20		
B. Steep spiral	20		
C. Chandelle	20		
D. Lazy Eight	20		
E. Eights on pylons	20		
Emergency Procedures			
A. Emergency descent	15		
B. Emergency approach and landing (simulated)	15		
C. Systems and equipment malfunction, at the discretion of the check pilot	5		
Takeoffs and Landings (the check pilot shall select at least 3 takeoffs and 3 landings)			
A. Normal or crosswind takeoff	20		
B. Normal or crosswind landing	20		
C. Soft field takeoff	20		
D. Soft field landing	20		
E. Short field takeoff	20		
F. Short field landing	20		
G. Accuracy landing	20		
Student Performance			
A. Cockpit organization	5		
B. Vigilance	5		
C. Judgment	5		

Figure 2.6 Example Electronic Commercial Stage Check Record

This Page Intentionally Left Blank

FACILITIES

All Facilities are located at the Purdue University Airport (KLAF) in West Lafayette, IN and are maintained by the Physical Facilities Department. Building Deputies for each facility are responsible for communicating any issues to Physical Facilities and ordering repairs. Detailed floorplans for each building are included on subsequent pages in this section.

A. Niswonger Aviation Technology Building – ground instruction facilities

Four lecture rooms:

Room #149	Max # of students: 72	40’ x 44’
Room #157	Max # of students: 60	33’ x 44’
Room #184	Max # of students: 40	31’ x 29’
Room #187	Max # of students: 46	34’ x 30’

Each room is equipped with the following audio visual equipment: two computer projectors, chalkboard, computer, computer projection, document camera.

B. Hangar 5 (120’ x 100’) – these facilities are used exclusively by Purdue University Aviation Technology students and instructors.

Flight Planning Room 28’ x 19’; contains tables for planning purposes, computers to obtain weather information, large wall maps with mileage computation ability, telephones for obtaining briefings and filing plans.

Ten (10) Pilot Briefings areas 8’ x 7’ each; features desk, 2-3 chairs and whiteboard.

Aircraft storage area (~100’ x 95’)

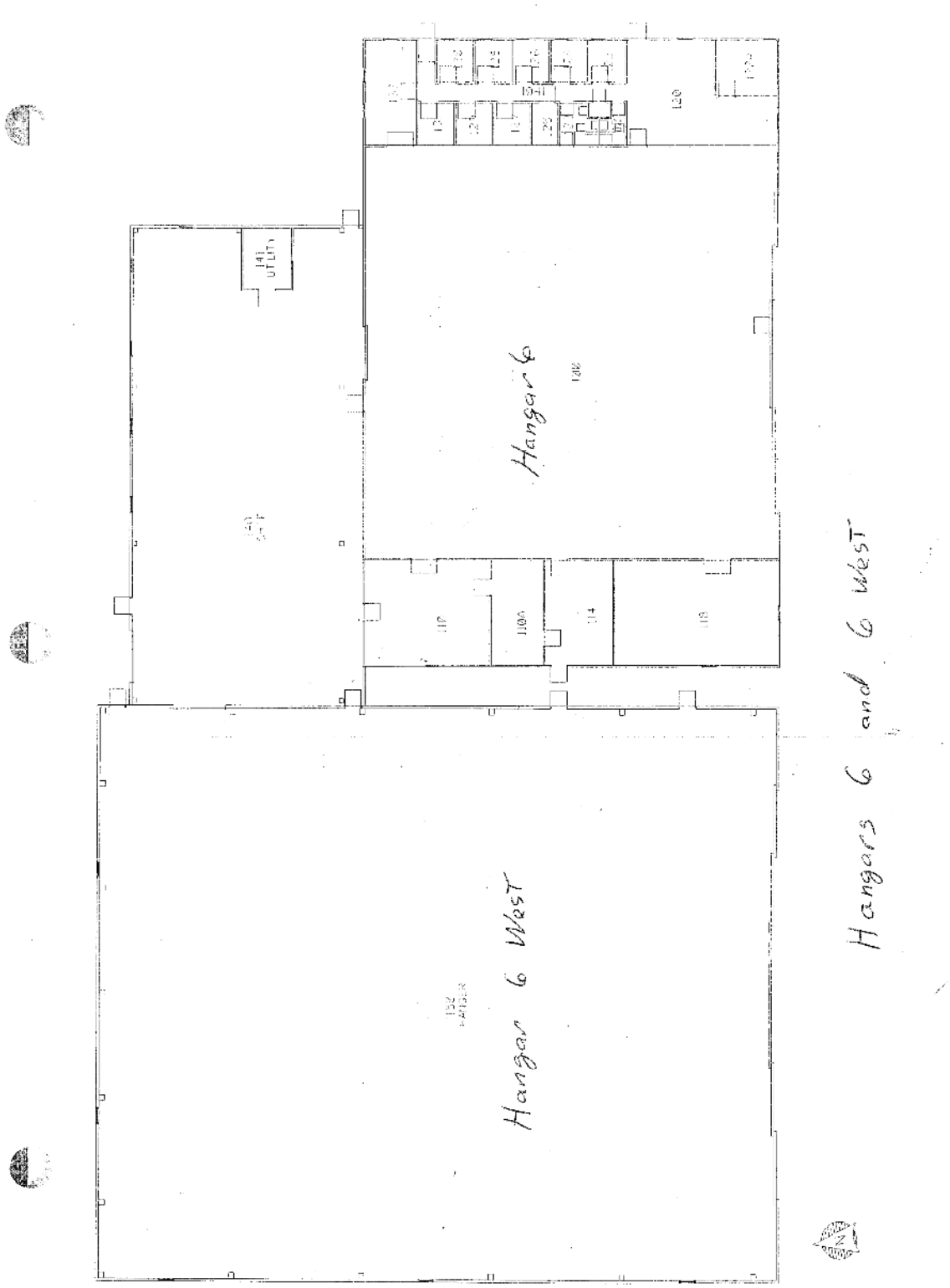
C. Hangar 6 – Bulletin boards are located in the Dispatch area containing important information for students/instructors, including a detailed map depicting local practice areas.

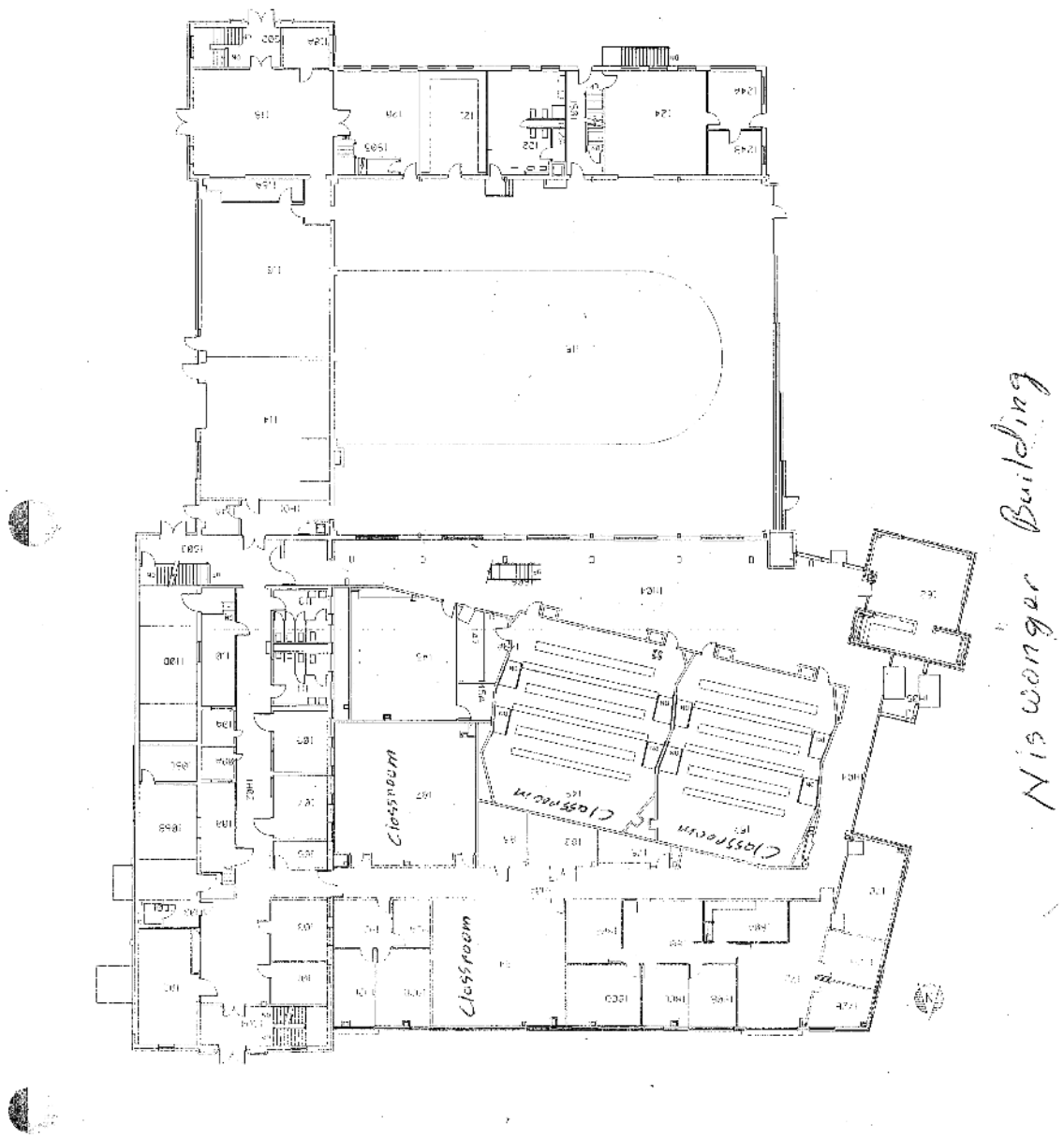
Aircraft Dispatch area	20’ x 17’ & 12’ x 8’
Ten (10) Instructor Offices	7’ x 8’
Chief Flight Instructor Office	11’ x 12’
Aircraft Maintenance Office	30’ x 21’
Aircraft maintenance and storage area	80’ x 80’
Shop area	91’ x 44’

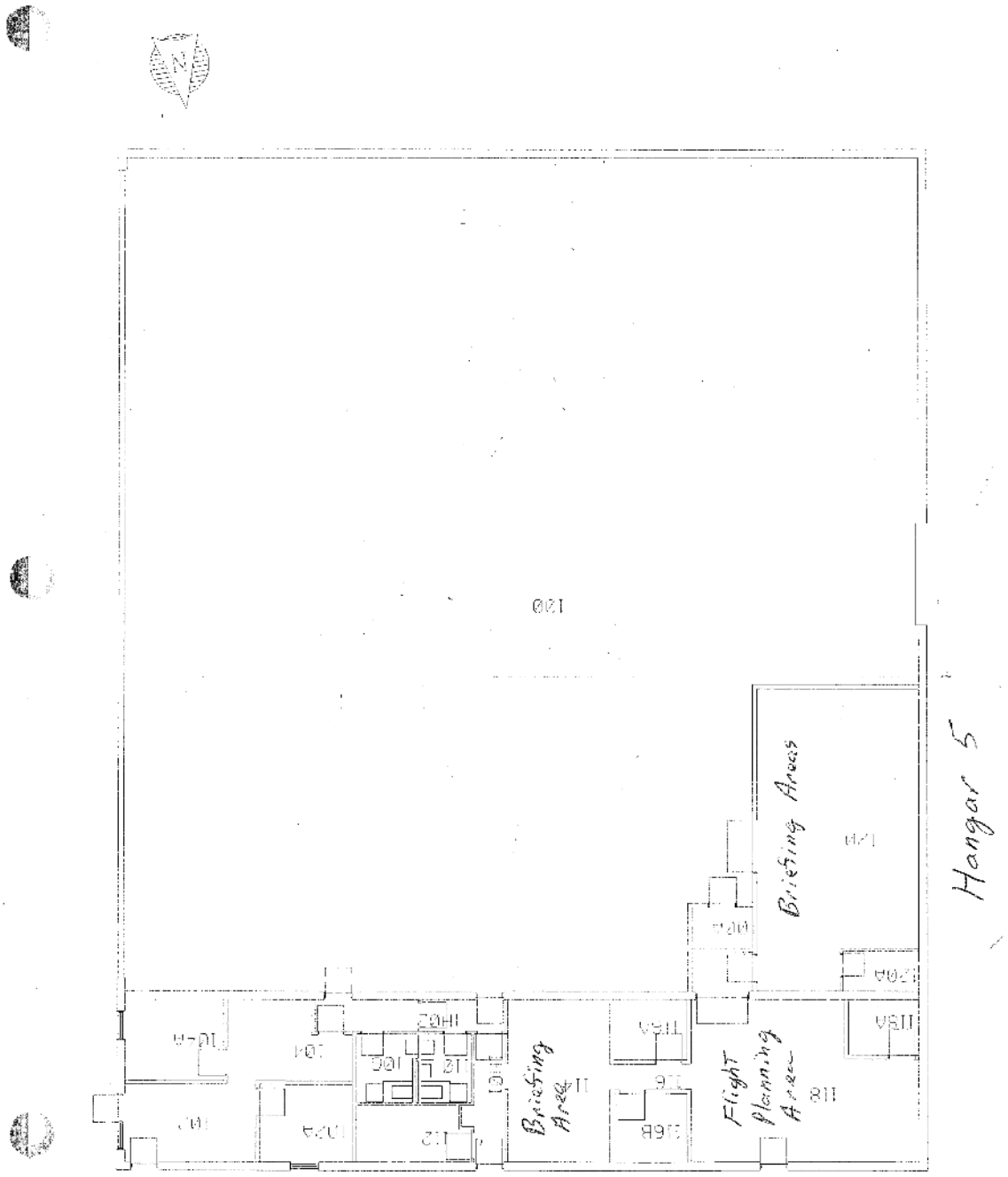
D. Hangar 6 West

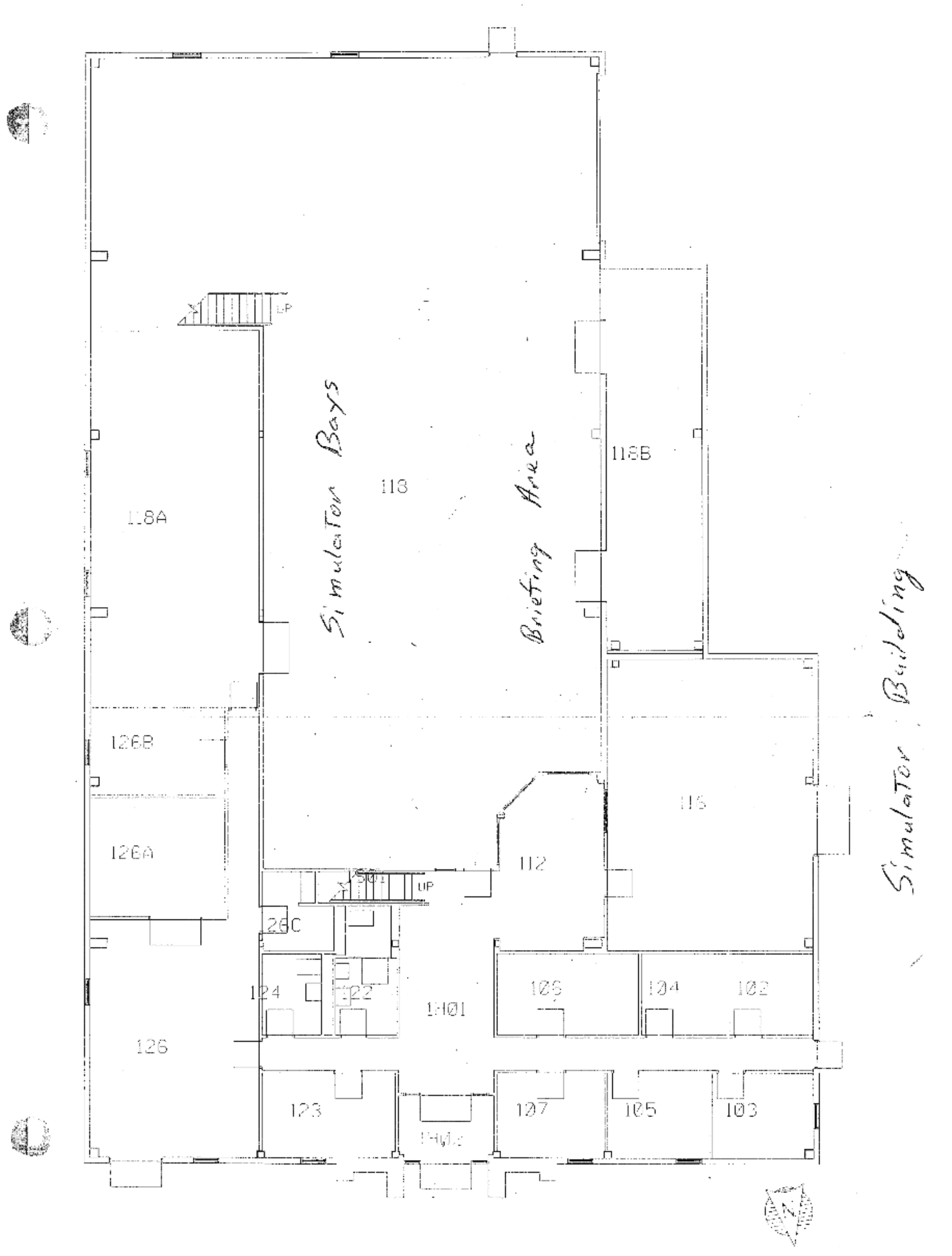
Aircraft maintenance and storage area	125’ x 110’

E. Holleman-Niswonger Simulator Facility
Three (3) Cirrus SR-20 Ultra AATDs used for training in this course are located in this building at KLAF.


Hangar 6
Hangar 6 West
Hangars 6 and 6 West


Classroom
Classroom
Classroom
Classroom
Nissanger Building


Hangar 5
Briefing Area
Flight Planning Area
Briefing Area


Simulator Bays
Briefing Area
118
118A
118B
126B
126A
126
26C
124
122
1H01
112
115
106
104
102
123
107
105
103
UP
Simulator Building

This Page Intentionally Left Blank

EQUIPMENT

A. Cirrus SR-20 and Piper Arrow PA-28R-201 aircraft will be used for all flight training in this course. These aircraft will meet the requirements of FAR 141.39. Each aircraft is equipped for day and night VFR & IFR flying as specified in FAR 91.205. Every aircraft contains a checklist, which includes pre-takeoff and pre-landing items, as well as aircraft registration, airworthiness certificate and manufacturer-issued POH. These items are verified to be on the aircraft by the pilot prior to every flight, as well as phase inspection/cycle due times, system inspections (i.e. pitot/static, transponder, ELT and ELT battery replacement) and any applicable AD(s) compliance.

Sixteen (16) Cirrus SR-20 Aircraft (Each aircraft is equipped with G-1000 Cirrus Perspective by Garmin system)

Aircraft	S/N
N580PU	20-2039
N581PU	20-2041
N582PU	20-2042
N583PU	20-2043
N584PU	20-2044
N585PU	20-2045
N586PU	20-2047
N587PU	20-2048
N588PU	20-2049
N589PU	20-2050
N590PU	20-2051
N591PU	20-2052
N592PU	20-2053
N593PU *	20-2040
N594PU *	20-2046
N595PU *	20-2054

*Equipped with GFC-700 Autopilot System

Four (4) Piper Arrow PA-28R-201 Aircraft (Each aircraft is equipped with One (1) GNS430 and One (1) GNS430W

Aircraft	S/N
N540PU	2844096
N541PU	2844097
N542PU	2844099
N543PU	2844100

B. Flight Training Devices
Three (3) Cirrus SR-20 Ultra FTD’s with G-1000 Cirrus Perspective by Garmin system (manufactured by Paradigm Shift Solutions) FTD Level 4 compliant.

The FTD's are approved in accordance with 14 CFR 61.4(c) and are authorized for use in satisfying Tasks/Maneuvers and Procedures under 14 CFR Part 141. Authorization documentation from the FAA is posted in the Simulator Facility and is also maintained in the general files at Hangar 6.

FTD's are preflighted every business day and an appropriate entry is made on the log sheet for each FTD. A copy of the log sheet is shown below as Figure A.
Discrepancies and maintenance issues on these devices are reported to the Manager of the Simulator Facility or his/her designee who will then make the necessary repairs or contact the manufacturer, Paradigm Shift Solutions, Inc. if required. FTD's are placed out of service until discrepancy is resolved by the appropriate personnel.

FTD	S/N
#1	1048625
#2	1048514
#3	1048626

Figure A.

Holleman-Niswonger Flight Simulation Center Sem. _____ Year _____

Cirrus 2 FTD Logsheet

Date	Session	Student	Instructor	Start Time	End Time	Total Time	Remarks

PERSONNEL

Flight Personnel

All flight and ground instructors employed by Purdue University's Department of Aviation Technology should attend the Instructor Workshop held each August prior to the start of the fall semester. This workshop is conducted by the Chief Flight Instructor and is a comprehensive review of all training courses, policies, procedures and safety practices.

Assistant Chief Flight Instructors must complete a proficiency flight with the Chief Flight Instructor every 12 calendar months in each aircraft in which he or she will be providing instruction. The Chief Flight Instructor will use the appropriate Proficiency Flight electronic record keeping system to record detailed results of the flight. See Figure 5.1, 5.2, 5.3. The "Cirrus GTS" standardization flight can take the place of the "Cirrus" standardization flight.

The Chief Flight Instructor and Assistant Chief Flight Instructors will complete a Flight Instructor Refresher Course annually.

Instructors assigned to teach AT-24302, AT-24802, AT-21000, AT-21100 and the commercial portion of AT-25302 must hold at least a commercial pilot certificate with an airplane category rating and a single-engine land class rating. Instructors must also hold a flight instructor certificate with an airplane category rating with a single-engine class rating.

Instructors assigned to teach the instrument portion of AT-25302 must hold at least a flight instructor certificate with airplane, single engine and instrument airplane ratings.

A current list of all flight and ground instructors, including their CFI number, and Part 141 training dates is maintained at Hangar 6.

Chief Flight Instructor

This is a Full Time Flight Instructor, as stated below, who meets all requirements of FAR §141.35. Duties include, but are not limited to: Duties of Assistant Chief Flight Instructor; responsibilities as outlined in FAR §141.85; assist with closing, Sunday, and night flight duties as required; revise Part 141 manuals and documents as required; and perform additional duties as assigned by his/her superiors and/or the Certificate Holder District Office.

Assistant Chief Flight Instructors

These are Full Time Flight Instructors, as stated below, who meet all requirements of FAR §141.36. Assistant Chief Flight Instructors must complete a standardization flight with the Chief Flight Instructor in each aircraft in which he or she will be providing training prior to conducting any instruction. The check pilot that conducts the standardization flight must use the Standardization Flight electronic record keeping system to record detailed results of the flight (See figure 5.1). Duties include, but are not limited to: Duties of Check Instructor, be "on call" per FAR §141.85(b) as assigned, conduct standardization flights as assigned, and perform additional duties as assigned by the Chief Flight Instructor or his/her designee.

Check Instructor

These are Full Time Flight Instructors, as outlined below, who meet all requirements of FAR §141.37. Duties include, but are not limited to: Duties of Full Time Flight Instructor, conduct stage checks as assigned, and perform additional duties as assigned by the Chief Flight Instructor or his/her designee.

Full Time Flight Instructors

These are full time employees. As stated above, they need to possess the applicable certifications to instruct the students assigned to them. Full Time Instructors must complete a standardization flight with the Chief Flight Instructor or Assistant Chief Flight Instructor in each aircraft in which he or she will be providing training prior to conducting any instruction. The check pilot that conducts the standardization flight must use the Standardization Flight electronic record keeping system to record detailed results of the flight (See figure 5.1). Duties include, but are not limited to: Instruct assigned students; perform closing, night flight, and Sunday duties as assigned; assist in supervision mentoring of part time instructors; assist in auditing student flight records; and perform additional duties as assigned by the Chief Flight Instructor or his/her designee.

Part Time Flight Instructors (40-60)

These are part time student employees – current list, including pilot certificate number, Flight Instructor Certificate number, flight time and proficiency flight check records are maintained in general files at Hangar 6. Part Time Instructors must complete a standardization flight with the Chief Flight Instructor or Assistant Chief Flight Instructor in each aircraft in which he or she will be providing training prior to conducting any instruction. The check pilot that conducts the standardization flight must use the Standardization Flight electronic record keeping system to record detailed results of the flight. See figure 5.1

Maintenance Administrative Staff

Job descriptions outlining duties and responsibilities are included in the Aircraft Maintenance Overview & Procedures section of this Training Course Outline & Curriculum.

Director of Maintenance	Michael Davis, A&P, IA
Director of Quality Control & Chief Inspector	Mark Hopkins, A&P, IA
Flight Maintenance Technician Supervisor	John Plank, A&P

Student Flight Dispatcher

These are part time student employees – current list is maintained in general files at Hangar 6. Student dispatchers attend an annual training session held at the beginning of each academic calendar year that includes dispatch procedures, safety program, TSA General Aviation Security Awareness Training and specific job responsibilities and requirement

Records

Records include, but are not limited to, attendance at an annual Instructor Workshop, completion of FIRC, flight proficiency checks, and TSA General Aviation Security Awareness Training. All training records are located in the Dispatch office at Hangar 6 and are available for inspection.

FLIGHT INSTRUCTOR INFORMATION FORM

NAME: _____ DATE: _____

PURDUE ID: _____ PHONE #:_____

HOME ADDRESS: _____

EMAIL ADDRESS: _____

CERTIFICATE & RATINGS	CERTIFICATE NUMBER	DATE ISSUED
Commercial Pilot Certificate	_____	_____
Instrument Rating	_____	_____
Multiengine Rating	_____	_____
Flight Instructor Certificate	_____	_____
Instrument Flight Instructor		_____
Multiengine Flight Instructor		_____
Basic Ground Instructor	_____	_____
Advanced Ground Instructor	_____	_____
Instrument Ground Instructor	_____	_____

Total Flight Time

Single Engine: _____ Multiengine: _____
Instrument (actual and simulated): _____
Private & Commercial Flight Instruction Given: _____
Instrument Flight Instruction Given: _____

Recommendations

	Number Recommended	Number Passed First Attempt
Private Pilot Recommendations:	_____	_____
Commercial Pilot Recommendations:	_____	_____
Instrument Rating Recommendations:	_____	_____

Accidents or Incidents

Have you, as a pilot in command, ever been involved in an accident or incident?
YES: ___ NO: ___. If YES, please explain in detail on the back of this form.

Have any students under your supervision been involved in an accident or an incident?
YES: ___ NO: ___. If YES, please explain in detail on the back of this form.

Cirrus Standardization Check Record

Item	Points Possible	Points Given	Remarks
Ground (show location or operation of each of the following)			
A. First aid kit	1	1	
B. Fire extinguishers	1	1	
C. Oil and oil recording sheets	1	1	
D. Windshield cleaning supplies	1	1	
E. Aircraft maintenance records	1	1	
F. iPad usage	1	1	
G. Operation of the T-hangar doors	1	1	
Normal Operations (all tasks required)			
A. Review maintenance inspection card	1	1	
B. Checklist Usage	1	1	
C. Taxi	1	1	
D. Starting/runup/shutdown procedures	1	1	
E. Radio procedures	1	1	
F. Traffic pattern	1	1	
Ground Reference Maneuvers (the check pilot shall select at least two tasks)			
A. Rectangular course	1	1	
B. S-Turns across a road	1	1	
C. Turns about a point	1	1	
D. Eight-on-pylons	1	1	
Flight at Critically Slow Airspeeds (the check pilot shall select at least task A and another task)			
A. Slow flight	1	1	
B. Takeoff stall	1	1	
C. Departure stall	1	1	
D. Approach to landing stall	1	1	
Commercial Maneuvers (the check pilot shall select at least two tasks)			
A. Steep turns	1	1	
B. Steep spiral	1	1	
C. Chandelle	1	1	
D. Lazy eight	1	1	
Emergency Procedures (the check pilot shall select at least task A)			
A. Simulated engine failure	1	1	
B. Emergency descent	1	1	
C. Systems and equipment malfunction	1	1	
Takeoffs and Landings (the check pilot shall select at least two takeoffs and two landings)			
A. Normal/Crosswind takeoff	1	1	
B. Normal/Crosswind landing	1	1	
C. Short field takeoff	1	1	
D. Short field landing	1	1	
E. Soft field takeoff	1	1	
F. Soft field landing	1	1	
G. Accuracy landing	1	1	
Cirrus FTD (task is required)			
A. Operation of the Cirrus FTD	1	1	
Purdue FAR 141 Training (all tasks required)			
A. Review of Purdue Training Course Outline	1	1	
B. Review of Purdue Safety and Procedures Manual	1	1	
Signing Agreemend (all tasks required)			
A. By signing this logbook entry the instructor aknowledges that they have received training in the Purdue FAR Part 141 Training Course Outline and Safety & Procedures Manual.			

Figure 5.1 – Cirrus Standardization Check Electronic Record

Arrow Proficiency Check Record

Item	Points Possible	Points Given	Remarks
Normal Operations (all tasks required)			
A. Review maintenance inspection card	1	1	
B. Checklist Usage	1	1	
C. Taxi	1	1	
D. Starting/runup/shutdown procedures	1	1	
E. Radio procedures	1	1	
F. Traffic pattern	1	1	
Ground Reference Maneuvers (task is optional)			
A. Eights-on-pylons	1	1	
Flight at Critically Slow Airspeeds (the check pilot shall select at least task A and one other task)			
A. Slow flight	1	1	
B. Takeoff stall	1	1	
C. Departure stall	1	1	
D. Approach to landing stall	1	1	
Commercial Maneuvers (the check pilot shall select at least two tasks)			
A. Steep turns	1	1	
B. Steep spiral	1	1	
C. Chandelle	1	1	
D. Lazy eight	1	1	
Emergency Procedures (the check pilot shall select at least one task)			
A. Simulated engine failure	1	1	
B. Emergency descent	1	1	
C. Systems and equipment malfunction	1	1	
Instrument Procedures (task A and one other task are required)			
A. Holding	1	1	
B. Non-precision approach	1	1	
C. Precision approach	1	1	
Takeoffs and Landings (the check pilot shall select at least two takeoffs and two landings)			
A. Normal/Crosswind takeoff	1	1	
B. Normal/Crosswind landing	1	1	
C. Short field takeoff	1	1	
D. Short field landing	1	1	
E. Soft field takeoff	1	1	
F. Soft field landing	1	1	
G. Accuracy landing	1	1	
Purdue FAR 141 Training (all tasks required)			
A. Review of Purdue Training Course Outline	1	1	
B. Review of Purdue Safety and Procedures Manual	1	1	
Signing Agreemend (all tasks required)			
A. By signing this logbook entry the instructor aknowledges that they have received training in the Purdue FAR Part 141 Training Course Outline and Safety & Procedures Manual.			

Figure 5.2 – Arrow Proficiency Check Electronic Record

Cirrus GTS Proficiency Check Record

Item	Points Possible	Points Given	Remarks
Normal Operations (all tasks required)			
A. Review maintenance inspection card	1	1	
B. Checklist Usage	1	1	
C. Taxi	1	1	
D. Starting/runup/shutdown procedures	1	1	
E. Radio procedures	1	1	
F. Traffic pattern	1	1	
Ground Reference Maneuvers (the check pilot shall select at least one task)			
A. Rectangular course	1	1	
B. S-turns across a road	1	1	
C. Turns about a point	1	1	
D. Eights-on-pylons	1	1	
Flight at Critically Slow Airspeeds (the check pilot shall select at least two tasks)			
A. Slow flight	1	1	
B. Takeoff stall	1	1	
C. Departure stall	1	1	
D. Approach to landing stall	1	1	
Demonstration Stalls (the check pilot shall select at least one task)			
A. Crossed-control stall	1	1	
B. Elevator trim stall	1	1	
C. Secondary stall	1	1	
D. Accelerated stall	1	1	
Commercial Maneuvers (the check pilot shall select at least two tasks)			
A. Steep turns	1	1	
B. Steep spiral	1	1	
C. Chandelle	1	1	
D. Lazy eight	1	1	
Emergency Procedures (the check pilot shall select at least one task)			
A. Simulated engine failure	1	1	
B. Emergency descent	1	1	
C. Systems and equipment malfunction	1	1	
Instrument Procedures (the check pilot shall select at least two tasks)			
A. Holding	1	1	
B. Non-precision approach	1	1	
C. Precision approach	1	1	
Takeoffs and Landings (the check pilot shall select at least two takeoffs and two landings)			
A. Normal/Crosswind takeoff	1	1	
B. Normal/Crosswind landing	1	1	
C. Short field takeoff	1	1	
D. Short field landing	1	1	
E. Soft field takeoff	1	1	
F. Soft field landing	1	1	
G. Accuracy landing	1	1	
Purdue FAR 141 Training (all tasks required)			
A. Review of Purdue Training Course Outline	1	1	
B. Review of Purdue Safety and Procedures Manual	1	1	
Signing Agreemend (all tasks required)			
A. By signing this logbook entry the instructor aknowledges that they have received training in the Purdue FAR Part 141 Training Course Outline and Safety & Procedures Manual.			

Figure 5.3 – Cirrus GTS Proficiency Check Electronic Record

Aircraft Maintenance Overview & Procedures

Overview

All Cirrus SR20 and Piper PA-28R-201 “Arrow” aircraft maintenance and inspections are performed by FAA-certified Airframe and Powerplant (A&P) maintenance technicians employed by Purdue University. The Director of Maintenance and Director of Quality Control/Chief Inspector and several of the A&P maintenance technicians currently hold Inspection Authorization (IA) privileges. The Director of Quality Control/Chief Inspector, or his designees (A&P technician holding Inspection Authorization (A&P/IA)) is responsible for supervising and conducting approved Progressive Inspections. All inspections are performed in accordance with progressive inspection programs approved by the CHDO under FAR 91.409(d). Copies of the approved progressive inspection programs have been provided to the appropriate personnel at the CHDO. In addition, aircraft are maintained in accordance with 14 CFR parts 43, 65 and 91 and all required records are maintained in the associated aircraft logbooks and aircraft maintenance files located in the Aircraft Maintenance Office in Hangar 6 at KLAF.

Organizational Structure

The aircraft maintenance department currently consists of a Director of Maintenance, a Director of Quality Control & Chief Inspector, a Flight Maintenance Technician Supervisor and Aircraft Maintenance Technicians.

Director of Maintenance responsibilities include:

1) Manage aircraft maintenance personnel
2) Direct aircraft maintenance scheduling
3) Oversee management of parts department
4) Develop and oversee budget for each fiscal year
5) Evaluate, select, and coordinate scheduling of maintenance by third party maintenance providers for such work as engine and propeller overhauls, painting, and avionics upgrades
6) Oversee purchase of special tools and equipment
7) Develop and implement plans for improvement and, if necessary, expansion of maintenance facilities
8) Oversee maintenance of ground support equipment and maintain related records

Director of Quality Control & Chief Inspector responsibilities include:

1) Evaluate manufacturer’s service recommendations and determine appropriate action
2) Supervise administration of approved Progressive Inspection programs
3) Maintain current status of Airworthiness Directives and Service Bulletins for each aircraft
4) Approve final disposition of inspection and flight discrepancies
5) Supervise maintenance staff to the extent necessary to assure that correct maintenance procedures are being followed and that the quality of finished work meets or exceeds FAA requirements
6) Ensure that new or revised service information is communicated to maintenance staff

7) Develop and maintain a Supplemental Maintenance Procedures Manual for communicating aircraft maintenance procedures and policies to maintenance staff
8) Maintain manufacturer's electronic and printed technical publications
9) Maintain status of life limits, special inspection items, and airworthiness limitations for each aircraft
10) Oversee aircraft maintenance related training of maintenance staff
11) Inspect and approve work performed by third party maintenance providers (e.g. return to service after repaint or avionics upgrade)
12) Supervise the development and implementation of special projects requiring modification to Purdue aircraft
13) Compile inspection documents for each scheduled inspection
14) Develop and oversee Required Inspection Item (RII) procedures and policies
15) Create and submit revisions to progressive inspection programs (when necessary)
16) Oversee scheduling of tools and equipment for calibration and repairs and maintain applicable records
17) Archive aircraft maintenance records as required

Flight Maintenance Technician Supervisor responsibilities include:

1) Supervise the Aircraft Maintenance Technicians on staff by directing and scheduling their activities as it relates to the aircraft maintenance workload.
2) Function as an airframe and powerplant technician and perform FAA required inspections and maintenance on department aircraft
3) Oversee the implementation of university and department safety standards as related to occupational health, hazardous materials handling, and work area environment
4) Supervise the aircraft maintenance technicians, work study and part time student employees by directing and scheduling their activities as it relates to special projects and non-aircraft related jobs.
5) Instruct aviation maintenance students, as assigned by Director of Maintenance
6) Assist in the completion, recording, and filing of aircraft maintenance records, under the direction of the Director of Quality Control & Chief Inspector
7) Perform ancillary functions relative to the operation of the department's aircraft fleet, including but not limited to: towing aircraft, ground deicing, aircraft cleaning, refueling, aircraft storage, and security
8) Assist in the maintenance of ground support equipment and physical facilities, as directed by the Director of Maintenance

Aircraft Maintenance Technician responsibilities include:

1) Perform FAA required inspections and maintenance on department aircraft, as directed by the Flight Maintenance Technician Supervisor or his/her designee
2) Supervise part-time student employees, as directed by the Flight Maintenance Technician Supervisor or his/her designee
3) Comply with university and department safety practices and procedures
4) Instruct aviation maintenance students, as assigned by the Flight Maintenance Technician Supervisor or his/her designee

5) Assist in the completion, recording, and filing of aircraft maintenance records, under the direction of the Director of Quality Control & Chief Inspector
6) Perform ancillary functions relative to the operation of the department's aircraft fleet, including but not limited to: towing aircraft, ground deicing, aircraft cleaning, refueling, aircraft storage, and security
7) Assist in the maintenance of ground support equipment and physical facilities, as directed by the Flight Maintenance Technician Supervisor
8) Perform post-inspection return to service inspections and complete all required maintenance record entries (for maintenance technicians holding IA only)
9) Perform and document Required Inspection Item (RII) inspections (for maintenance technicians holding IA only)

Maintenance Process

Discrepancies:
Flight instructors and students shall report maintenance discrepancies by completing a "Flight Discrepancy Report" form (FDR-4/2013; a sample form is provided in this chapter), which is provided with the dispatch paperwork for each aircraft or available from the Dispatch office. They should also report the discrepancy to Dispatch personnel, who will then ground the aircraft through the AT Dispatch software program. The Flight Discrepancy Report shall then be forwarded to the maintenance staff, either by the individual reporting the discrepancy or by Dispatch personnel. Once the aircraft has been grounded by Dispatch personnel, the AT Dispatch software program will not allow the aircraft to be dispatched until the discrepancy has been corrected and the maintenance technician approving the aircraft for return to service has removed the grounding restriction from the AT Dispatch software program.

After the discrepancy has been evaluated and the appropriate corrective action taken by maintenance personnel, the aircraft will be returned to service in accordance with applicable Federal Aviation Regulations. A written description of the corrective action, which shall be made in accordance with 14 CFR 43.9 (content, form, and disposition of maintenance, preventive maintenance, rebuilding, and alteration records) which constitutes the approval for return to service, will be recorded on the lower section of the Flight Discrepancy Report by the maintenance technician approving the aircraft for return to service. The completed report will then be filed with the applicable aircraft maintenance records for that particular aircraft, which are located in the Aircraft Maintenance Office and are available for inspection. All aircraft maintenance records are retained for the specified periods as required by 14 CFR 91.417(a)(1). After the Flight Discrepancy Report has been completed and the aircraft returned to service, the maintenance technician approving the return to service shall remove the grounding restriction from the AT Dispatch software program, which will then allow the aircraft to be dispatched.

In the event that a maintenance discrepancy occurs while the aircraft is away from LAF, the student or instructor shall report maintenance discrepancies by completing a "Flight Discrepancy Report" form (FDR-4/2013), which is provided with the dispatch paperwork for each aircraft. A copy of the Flight Discrepancy Report may then be sent by fax, emailed or verbally transferred back to the Dispatch Office, who will forward the report to maintenance staff. The student or instructor shall also contact the Dispatch Office, who will then relay the information to the Chief

Flight Instructor or his/her designee. The maintenance personnel will then be contacted in the following order 1) Director of Maintenance, 2) Chief Inspector, 3) Flight Maintenance Technician Supervisor. The maintenance personnel will then determine the appropriate course of action. Depending upon the nature of the discrepancy, the Director of Maintenance (or his designee) may contract with a locally based aircraft maintenance provider to help assess the situation and provide appropriate assistance. If necessary, the Director of Maintenance (or his designee) may choose to send one (or more) of our maintenance technicians to the site to address the discrepancy. In any case, the student and instructor are not permitted to operate the aircraft in question until a written description of the corrective action, which shall be made in accordance with 14 CFR 43.9 9 (content, form, and disposition of maintenance, preventive maintenance, rebuilding, and alteration records) which constitutes the approval for return to service, will be recorded on the lower section of the Flight Discrepancy Report by the maintenance technician approving the aircraft for return to service. The completed report will then be filed with the applicable aircraft maintenance records for that particular aircraft upon the aircraft return to LAF. All aircraft maintenance records are retained for the specified periods as required by 14 CFR 91.417(a)(1). After the Flight Discrepancy Report has been completed and the aircraft returned to service, the maintenance technician approving the return to service shall notify the Dispatch Office and Chief Flight Instructor or his/her designee. The student or instructor will be notified by Dispatch Office or the maintenance technician onsite that the aircraft is approved for return to service which will then allow for continued operation of the aircraft.

Inspections:

The AT Dispatch software program monitors the time remaining until the next inspection for each aircraft and automatically “grounds” the aircraft when that time has been reached. The AT Dispatch software program will not allow an aircraft to be dispatched when the inspection due time has been reached. The Director of Maintenance and/or the Flight Maintenance Technician Supervisor monitors the inspection status of each aircraft throughout the day and plans the aircraft maintenance schedule accordingly. Dispatch will notify the Director of Maintenance or the Flight Maintenance Technician Supervisor when an aircraft has reached its inspection due time and has been grounded. The Flight Maintenance Technician Supervisor will then assign the inspection to a maintenance technician(s), who will perform the inspection. All inspections are performed in accordance with progressive inspection programs that have been approved for use by Purdue University Department of Aviation Technology by the Indianapolis Flight Standards District Office under FAR 91.409(d). Upon completion of a 50-hour or Phase inspection (Cirrus) or an Event inspection (Piper), an A&P/IA will verify that all inspection requirements have been complied with, and will complete the required maintenance record entries in accordance with 14 CFR 43.11 (content, form, and disposition of records for inspections), which constitutes the approval for return to service. Upon completion of all maintenance record entries, the A&P/IA approving the return to service will then update the applicable aircraft inspection times in the AT Dispatch software program and remove the grounding restriction, which will then allow the aircraft to be dispatched.

Airworthiness Directives and Instructions for Continued Airworthiness:

AD’s and ICA’s are monitored and compliance tracked by the Director of Quality Control/Chief Inspector. Records are available for inspection in the Aircraft Maintenance Office (Room 118, Hangar 6).

Procedure for Determining Airworthiness:

Prior to every flight, students/instructors are required to determine that the aircraft they have been assigned is airworthy. Every aircraft contains a checklist, which includes pre-takeoff and pre-landing items, as well as aircraft registration, airworthiness certificate and manufacturer-issued POH. These items are verified to be on the aircraft by the pilot prior to every flight, as well as phase inspection/cycle due times, system inspections (i.e. pitot/static, transponder, ELT and ELT battery replacement) and any applicable AD(s) compliance.

Purdue University
Flight Discrepancy Report

Report All Discrepancies to Dispatch

Aircraft: N _____ Date: _____

Hobbs Hourmeter: _____

Maintenance Hourmeter: _____

Discrepancy: _____

_____

_____

_____

_____

Name (Printed): _____

Contact Phone #: _____

Maintenance Department Corrective Action:

_____

_____

_____

_____

_____ _____

Signature and A&P # Date

Required Inspection Item (RII) (If Applicable):

_____

_____

_____ _____

Signature and A&P/IA# Date

FDR-4/2013

TRAINING SYLLABI

This Page Intentionally Left Blank

AT-24900 INSTRUMENT FLIGHT LECTURES

Instructor: Prof. Larry W. Gross
Office: Holleman-Niswonger Simulator Building
Room 106
765-494-9971 lwgross@purdue.edu
Office Hours: By appointment

Course Description: A study of the operation of flight instruments and navigation aids, Federal Aviation Regulations pertinent to instrument flight, meteorology, instrument charts, instrument flight planning, and air traffic control procedures. Preparation for the FAA Instrument Rating written examination.
Prerequisite: Private Pilot Certificate

Required Texts and Materials:
1. Instrument Flying Handbook
2. Instrument Procedures Handbook
3. Aviation Weather
4. Aviation Weather Services
5. FAR-AIM, ASA
6. Instrument Pilot FAA Knowledge Test, Gleim
7. Enroute and Approach packet, Purdue Aviation / News & Resources

Course Goal:
Instrument Flight Lectures is intended to present the aeronautical knowledge needed to operate an airplane safely and efficiently as an instrument rated pilot in instrument meteorological conditions.

Learning Objectives:
1. Demonstrate competency in aircraft flight instruments and navigation systems.
2. Demonstrate competency in the Federal Aviation Regulations for instrument flight.
3. Demonstrate competency in using instrument enroute charts, approach charts, SIDS and STARS.
4. Demonstrate knowledge in conducting instrument approaches.
5. Demonstrate knowledge of holding pattern procedures.
6. Demonstrate competency in IFR flight planning.
7. Demonstrate knowledge in aviation weather and aviation weather services.

Topics:
1. Flight Instruments
2. Attitude Instrument Flying
3. Navigation Systems
4. Federal Aviation Regulations
5. Airport Lighting and Markings
6. Aeronautical Factors
7. Holding Pattern Procedures
8. Instrument Approach Procedures
9. Instrument Departure, Enroute, Arrival
10. Instrument (IFR) Charts
11. Aviation Weather and Weather Services
12. IFR Flight Planning

Course Requirements:
The course will be conducted in an informal lecture/discussion format. The course will consist of four hourly exams of multiple choice and fill in the blank questions worth 566 points. The FAA Instrument Rating Knowledge Test must be taken, which is worth 100 points. Total points for the course is 666. If a student does not pass the FAA Instrument Rating Knowledge Test on the first attempt, the student will not receive a grade higher that a "C" for the course.
On any test during the course, either multiple choice or fill in the blank, the student must score at least 70%. If the student does not score 70%, the test must be repeated until a score of 70% is achieved. However, the first score is the score that will be used to calculate the final grade for the course.

A short paper on a topic determined by the instructor is required. The paper is due by the end of the eighth week of the semester.

Grading:

92% – 100%	A
84% – 91%	B
76% – 83%	C
70% – 75%	D
Below 70%	F

Class/Laboratory Schedule:
There are two one-hour fifteen minute classroom sessions per week.

Attendance: Attendance is required at all regularly scheduled class sessions. Students who miss a regularly scheduled class must write a paper on the topic that was covered in the missed session and submit it to the course instructor. Attendance records and papers for missed class sessions will be provided to the Chief Flight Instructor at the end of each semester and these records will be maintained in the general files.

FAA Instrument Rating Knowledge Test:
All students in the course must take the Instrument Rating Knowledge Test. The test will count as the final exam and will be equally included in calculating the student's final grade. Only the first test results will be accepted for the course. A copy of the FAA test results must be submitted to the Professor of the course prior to 5:00 p.m. Friday of finals week. If this is not accomplished, a grade of E (conditional failure) will be recorded for the student's grade. The highest grade that can then be received by the student is a letter grade of D. The FAA Knowledge Test can be taken at any FAA Knowledge Testing site. Lafayette Aviation at the Purdue University Airport is the closest location. A testing fee is assessed at the time of the test. An authorization letter to take the test will be issued by the instructor of the course.

Reading Assignments:

Topic	Reading Assignment
Flight Instruments	Instrument Flying Handbook, Chapter 3 Gleim, Unit 1
Maintenance Records/Requirements	FAR's 91

Attitude Instrument Flying	Instrument Flying Handbook, Chapters 2, 4, 5 Gleim Unit 2
Navigation Systems for IFR	Instrument Flying Handbook, Chaper 7 Gleim Unit 3
Federal Aviation Regulations that apply to IFR Operations	FAR/AIM, Part 91 Gleim Unit 4
Airport Marking/Lighting Air Traffic Control Systems & Procedures Airspace	Instrument Flying Handbook, Chapters 8, 9 AIM, Chapters 2, 3 and 4 Gleim, Unit 5
Aeromedical Factors, Aeronautical Decision Making and Judgment Crew Resource Management	Instrument Flying Handbook, Chapter 1 AIM, Chapter 8 Gleim, Unit 7
Holding Patterns	Instrument Flying Handbook, Chapter 10 Instrument Procedures Handbook, Chapter 3 AIM, Chapter 5 Gleim, Unit 6
Instrument Approach Procedures and IFR Operations	Instrument Flying Handbook, Chapter 10 Instrument Procedures Handbook, Chapters 4, 5 AIM, Chapter 5 Gleim, Unit 6
Instrument Procedures – Preflight, Departure, Enroute, Arrival, including Charts	Instrument Flying Handbook, Chapter 10 Instrument Procedures Handbook, Chapters 2,3,4 AIM, Chapter 5 Gleim, Units 10, 11
Aviation Weather, including Elements of Forecasting Based on Trends and Personal Observation	Aviation Weather Gleim, Unit 8
Procurement and Use of Aviation Weather Reports and Forecasts, Recognition of Critical Weather and Wind Shear Avoidance	Aviation Weather Services Gleim, Unit 9
IFR Flight Planning and Safe and Efficient Operations under IFR	Instrument Flying Handbook, Chapters 10, 11 Gleim, Units 10,11

Academic Dishonesty:
Students should be familiar with rules and specific guidelines addressed in student handbooks and University Regulations, Part 5, Sec. III.

Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism or knowingly furnishing false information to the University are examples of

dishonesty." [Part 5, Section III-B-2-a, University Regulations] Furthermore, the University Senate has stipulated that "the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest."
[University Senate Document 72-18, December 15, 1972]

Safety:
Safety is a top priority of the Aviation Technology Department. In order to comply with the University safety policy, and to be proactive in all flight, laboratory, classroom and airport operations, an Aviation Technology safety manual is being developed. This will include an active Safety Committee and an on-line hazard reporting system. During the interim, any observed safety hazards or concerns should be reported to the AT Safety Committee via email to: atsec@purdue.edu or submitted in one of the safety comment boxes.

AT 25400 Commercial Pilot Lectures

Instructor: Prof. Bernie Wulle
Office: SIML 103, 765-494-9973, wulleb@purdue.edu
Office Hours: Appointment only

Course Description: The course is designated to review the principles of flight, aircraft systems, pertinent federal aviation regulations, and airman publications and service in order to prepare the student for the FAA Commercial Pilot written examination.
Prerequisites or Co-requisites: None

Required Texts and Materials:

1. *Commercial Pilot FAA Written Exam*, Irvin N. Gleim
2. *FAR/AIM ASA* or equivalent. (You need a copy of FARs 1, 61, 67, 91, 135, and NTSB 830).
3. *Flight Training Handbook*, AC61-21A; U.S. Dept. of Transportation, FAA.
4. *Pilot's Weight and Balance Handbook*, AC91-23; U.S. Dept. of Transportation, FAA.

Course Goals:

1. Review selected concepts from previous flight and ground courses;
2. Discuss advanced aircraft systems and appropriate regulations needed in commercial operations
3. Establish a basis for continuation in either the Airline or Corporate options
4. Assist with preparation for the Commercial Pilot Exam.

Learning Objectives:

1. Students should be able to pass the FAA Commercial written test with an 85% or higher score.
2. Students should be prepared to pass the FAA Commercial pilot practical test.

Topics & Class Schedule:

This schedule is subject to change as the semester requires

WEEK	SUBJECT
1.	Syllabus, goals, & grades
2.	Aerodynamics and principles of flight
3.	Stability and Control (Flight Computer Worksheet)
4.	Weight and Balance, Performance and their effects on performance (Weight and Balance Worksheet)
5.	Performance and safe efficient operation of aircraft (Performance Worksheet)
6.	Test 1 Airspace and the use of aeronautical charts for pilotage and dead reckoning, navigation facilities, and national airspace system
7.	FAR's (FAR Worksheet) which include commercial pilot privileges, limitations, and flight operations, Also NTSB accident reporting requirements.
8.	Test 2

Engines, and propellers
9. Alertness Management, Aero Medical Factors, Accident Investigation
10. Midterm (Gleim study guide) – Sign off for FAA written
11. Complex Aircraft Systems, PA28R-201
12. Test 3
Weather including windshear, reports, forecasts (Weather Worksheet)
Commercial Maneuvers
13. Commercial PTS
14. Multiengine (Multiengine Worksheet)
FMS & Review for Test **Copy of the FAA written test due**
Test

Course Requirements:

There are regular classroom tests, quizzes, a midterm test, the FAA Commercial test, and a final exam. Students are responsible for successfully completing the FAA Commercial test on their own. The FAA exam is administered only by computer. Failure to complete this exam **by the fourteenth week of classes or receiving a score less than 85% on the FAA Commercial written** will result in **failing grade for the course.**

Grading:

Midterm	75 points
FAA Exam	100 points
Final Exam	100 points
Test & Quizzes	90 points
Worksheets	85 points
TOTAL	**450 points**

Letter Grades:

GRADES	**Percentage**
A	**93% +**
B	**86%**
C	**79%**
D	**72%**
F	

General Course Policies:

a) If for any reason a student determines they need help because of disability, the student should inform the Dean of Students Office.
b) If a students is disruptive to other students, instructors, or staff, the student will be requested to leave the class and received a failing grade for ay project, quiz, or test presented on that class date.

Academic Dishonesty:

Purdue prohibits “dishonesty in connection with any University activity. Cheating plagiarism, or knowingly furnishing false information to the University are examples of dishonesty.” [Part 5, Section III-B-2-a, University Regulations] Furthermore, the University Senate has

stipulated that “the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet directly or indirectly, other parties in committing dishonest acts is in itself dishonest.” [University Senate Document 72-18, December 15, 1972]

Attendance:

Attendance is required at all regularly scheduled class sessions. Students who miss a regularly scheduled class must view the PowerPoint presentation of the missed session and successfully pass a quiz on that presentation. Attendance records and quiz results will be provided to the Chief Flight Instructor at the end of each semester and these records will be maintained in the general files.

Students with Disabilities:

Purdue University is required to respond to the needs of the students with disabilities as outlined in both the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 through the provision of auxiliary aids and services that allow a student with a disability to fully access and participate in the programs, services, and activities at Purdue University. If you have a disability that requires special academic accommodation, please make an appointment to speak with me within the first three (3) weeks of the semester in order to discuss any adjustments. It is important that we talk about this at the beginning of the semester. It is the student's responsibility to notify the Disability Resource Center (http://www.purdue.edu/drc) of an impairment/condition that may require accommodations and/or classroom modifications.

Emergencies:

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor’s control. Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. You are expected to read your @purdue.edu email on a frequent basis.

Safety:

Safety is a top priority of the Aviation Technology Department. In order to comply with the University safety policy, and to be proactive in all flight, laboratory, classroom and airport operations, an Aviation Technology safety manual is being developed. This will include an active Safety Committee and an on-line hazard reporting system. During the interim, any observed safety hazards or concerns should be reported to the AT Safety Committee via email to: atsec@purdue.edu or submitted in one of the safety comment boxes.

Nondiscrimination:

Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to

develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.

Purdue University prohibits discrimination against any member of the University community on the basis of race, religion, color, sex, age, national origin or ancestry, marital status, parental status, sexual orientation, disability, or status as a veteran. The University will conduct its programs, services and activities consistent with applicable federal, state and local laws, regulations and orders and in conformance with the procedures and limitations as set forth in Executive Memorandum No. D-1, which provides specific contractual rights and remedies.

AT-24302 Commercial Flight I

The objective of AT-24302 Commercial Flight I is to review the knowledge and skills learned in the Private Pilot Flight Course and to introduce and practice the commercial flight maneuvers. The minimum total time for this course is 40 hours; unless specifically denoted all other times are approximate.

Total Time.....40 Hours

Dual Instruction .....20 Hours
- Dual Cross Country.....4 Hours
- Simulated Instrument..... **min.** 3 Hours

Solo Flight.....19 Hours
- Cross Country .....7 Hours
- Night Cross Country ..... (with an instructor on board) 2.5 Hours

Discussion.....10 Hours

End of Course Stage Check ..... 1 Hour

It is required that each Part-Time Flight Instructor maintain a close relationship with the Full-Time Faculty in order to closely monitor the progress of each student.

Unless otherwise noted, each flight lesson will be at least 1.1 hours, and each discussion lesson at least 1.0 hours.

All AT-24302 students are required to attend scheduled safety meetings. The meetings are held beginning the first Wednesday of each semester or as otherwise published by the safety officer. Meetings will be held either on-line or in person. Attendance at these meetings and quiz grades are used to calculate the student's "aeronautical knowledge" portion of their course grade.

Students who have not taken AT-14500 at Purdue and have not flown the Cirrus aircraft must have at least 10 hours of dual before solo. This may include, but are not limited to, Flight Lessons 1, 2, 4, 7 and 8. In addition, these students must complete the pre solo and pre solo cross country written tests.

Aviation Technology 24302
Student Course Outline

OBJECTIVES: The AT 24302 course is designed to introduce the private pilot flight student to commercial pilot maneuvers, fly cross-country, night and simulated instrument flight time to begin working toward the FAA Instrument Rating and Commercial Pilot Certificate. To enroll in the course the student must possess an FAA Private Pilot Certificate.

COMPLETION REQUIREMENTS: For course completion, the student must complete 40 hours of flight time by accomplishing the lessons below.

DISCUSSION LESSON 1 OBJECTIVES: The student will become familiar with the Student Course Outline, course objectives, school regulations, grading procedures, and any recent changes. If this is the first flight course at Purdue University, the student must sign the affidavit page. **This lesson must be completed prior to beginning any other lesson.**

CONTENT:

A. Discussion of the course outline, course objectives, materials, and school regulations relating to aircraft operation and student conduct in flight courses.
B. Discussion of grading procedures, as well as attendance, including cancellation fee.
C. Explain the required AT Safety Meetings and ensure the student understands that the meetings are mandatory. The schedule of meeting dates and times will be provided by Hangar 6 staff.
D. Explain the weekly quiz requirement.
E. Discuss required materials including Purdue logbook, Safety & Procedures Manual, Cirrus manual, Chicago and St. Louis sectional charts, flight computer, and plotter, pad and pencil, pilot certificate and medical certificate, Commercial Pilot Practical Test Standards, an instrument hood and communication headset.
F. THE INSTRUCTOR WILL CHECK THE DUE DATE OF THE STUDENT'S FLIGHT REVIEW.
G. Review the procedures for the maneuvers in Flight Lesson 1 in Section 8 of the Safety & Procedures Manual and the Airplane Flying Handbook.
H. Reading assignment – Airplane Flying Handbook (FAA-H-8083-3A) Chapter 9, p. 9-1 through 9-8.
I. Show the location of oil, windshield cleaning materials, and fire extinguishers.
J. Discussion of Land and Hold Short Operations and Procedures and runway incursions.
K. If this is the student's first Purdue Flight Course (obtained their private outside of Purdue) they must take the Pre-solo and Pre-solo x-c written exams before flying solo.

COMPLETION REQUIREMENTS: At the end of this lesson the student will know his/her expectations concerning daily conduct, course requirements, school rules, and grading procedures. The student will have ground knowledge and understanding of the maneuvers to be performed in Flight Lesson 1.

The following discussion lessons must be completed during the course, preferably on days when weather does not permit dual or solo flight:

DISCUSSION LESSON 2 OBJECTIVE: This lesson is only required if the student did not take Purdue's pre-solo written exam in a previous course. The student will pass the Purdue pre-solo written exam. **This lesson must be completed prior to any solo or PIC flights.**

A. The student will take the pre-solo written exam
B. The instructor will grade the exam and discuss any incorrect answers with the student.
C. The instructor will record the exam grade in the student's logbook.

COMPLETION REQUIREMENTS: The student must pass the pre-solo written exam with a minimum grade of 70%.

DISCUSSION LESSON 3 OBJECTIVE: This lesson is only required if the student did not take Purdue's pre-solo cross country exam in a previous course. The student will pass the Purdue pre-solo cross country written exam. **This lesson must be completed prior to any solo or PIC flights.**

A. The student will take the pre-solo cross country written exam
B. The instructor will grade the exam and discuss any incorrect answers with the student.
C. The instructor will record the exam grade in the student's logbook.

COMPLETION REQUIREMENTS: The student must pass the pre-solo cross country written exam with a minimum grade of 70%.

DISCUSSION LESSON 4 OBJECTIVE: To ensure the student has a working knowledge of performance charts and weight and balance.

CONTENT:
A. Computation of pressure altitude
B. Proper use of all Cirrus performance charts using multiple situations.
C. Cirrus weight and balance computations using various loading combinations and various calculation methods.
D. Effect of C.G. location on aircraft performance

COMPLETION REQUIREMENTS: This lesson is complete when the instructor determines the student has a working knowledge of Cirrus performance charts and Cirrus weight and balance.

DISCUSSION LESSON 5 OBJECTIVE: To ensure the student has the proper knowledge of Cirrus aircraft systems and maintenance procedures.

CONTENT:
A. Discussion and location of aircraft certificates and operating limitations (flight manual)
B. Review of the aircraft maintenance records, including a discussion of inspections, transponder/encoder/static system/altimeter checks ELT battery check, and Airworthiness Directives.

C. Aircraft systems including engine, fuel system, electrical system, vacuum system, pitot static system, heating and ventilation system, avionics (Perspective Integrated Avionics System), flight instruments. *The instructor should seek out an aircraft in maintenance to show the student the components of the systems mentioned above to the extent available.*
D. Discussion and thorough knowledge of the emergency procedures for the Cirrus from the Cirrus Manual.

COMPLETION REQUIREMENTS: This lesson is complete when the instructor determines that the student has an acceptable knowledge of the material.

DISCUSSION LESSON 6 OBJECTIVE: To ensure the student has the necessary knowledge of sectional charts and the National Airspace System.

CONTENT:
A. Discussion of all sectional chart symbols
B. Explanation of airspace including Class A, Class B, Class C, Class D, Class E, and Class G, and airports where controlled airspace extends to the surface, prohibited/restricted/ warning/alert areas, national security areas, military operating areas, military training routes and terminal radar service areas
C. Minimum weather requirements including blue and magenta shading, VFR and special VFR weather requirements above 10,000 feet.

COMPLETION REQUIREMENTS: This lesson is complete when the student has a working knowledge of the subject matter.

DISCUSSION LESSON 7 OBJECTIVE: To familiarize the student with the symptoms, effects, and corrective actions for the listed Aeromedical factors.

CONTENT:
A. Hypoxia-day and night
B. Hyperventilation
C. Middle ear and sinus problems
D. Spatial disorientation
E. Motion sickness
F. Carbon monoxide poisoning
G. Stress and fatigue
H. The effects of alcohol and drugs including FAR's concerning the use of alcohol and drugs.
I. Nitrogen excesses during scuba dives

COMPLETION REQUIREMENTS: This lesson is complete when the student is able to describe the systems, effects, and corrective action for all of the above aeromedical factors.

DISCUSSION LESSON 8 OBJECTIVES: To have the student become familiar with the procurement and use of aeronautical weather reports, forecasts, charts, and the NOTAM system. *It is expected that the student and instructor will become familiar with the following subject*

matter before and during each flight. This discussion lesson will serve as a means to verify that the student has retained all of the information discussed throughout the semester.

CONTENT:

A. Weather Reports and Forecasts:
    a. METARs, SPECIs, TAFs, Area Forecasts (FA), Winds Aloft (FD), PIREPs (UA), Airmets (WA), Sigmets (WS), Convective Sigmets (WST), Severe Weather Watch (WWs), and Alert Messages (AWWs)
B. Weather charts
    a. Weather Depiction, Radar Summary, Surface Analysis, Prognostic Charts
C. Weather reporting systems
    a. AWOS (a, 1, 2, 3), ASOS, Manual Observations, RVR, TWEB, HIWAS, EFAS, FSS, ADDS, WSI, DTN, DUATS, NWS
D. NOTAM System
    a. Notams, Temporary Flight Restrictions

COMPLETION REQUIREMENTS: This lesson is complete when the student has a working knowledge of weather reports, forecasts, charts, and the NOTAM system.

DISCUSSION LESSON 9 OBJECTIVE: The commercial pilot maneuvers will be introduced with a thorough explanation of the definition, objectives, elements, and common student pilot errors for each of the maneuvers. The reference material will be the Airplane Flying Handbook, CA PTS or ACS (as applicable), and Section 8 of the Safety & Procedures Manual. This lesson may require more than one session.

CONTENT:

Discussion of the following:

A. Steep power turns
B. Steep spirals around a point on the ground
C. Chandelles
D. Lazy eights
E. Eights-on-pylons
F. Power-off accuracy landings

COMPLETION REQUIREMENTS: When the student is able to state the definition, objectives, elements and common student pilot errors of the listed maneuvers, the lesson is complete.

DISCUSSION LESSON 10 OBJECTIVES: This period is to teach the student the proper procedures for planning and executing a cross-country flight using the Purdue University Flight Navigation Log. **This lesson must be complete prior to any cross country flight.**

CONTENT:

A. The use of aeronautical charts, pilotage, and elementary dead reckoning using the magnetic compass.
B. The use of radio for VFR navigation, and for two-way communication, including VOR orientation and GPS operation.

C. Recognition of critical weather situations- low level wind shear, estimating visibility while in flight, and the procurement and use of aeronautical weather reports and forecasts.
D. Use of plotter.
E. Altitude selection.
F. Use of flight computer.
G. Use of performance charts to determine power settings, fuel consumption and range, and true airspeed.
H. Use of Airport/Facility Directory and AIM.
I. Weight and balance computations.
J. Proper fuel management procedures.
K. Controlled and uncontrolled airport procedures, including Stage II and III radar service for VFR pilots.
L. Filing, activating, and canceling a VFR flight plan.
M. Purdue regulations and proper endorsements relating to solo X-C.
N. Use of transponder.
O. Use of VOR and GPS.

COMPLETION REQUIREMENTS: At the end of this lesson, the student should be able to plan a cross-country flight with a minimum of assistance from the instructor and have a working knowledge of the other areas listed in the content portion of this lesson.

FLIGHT LESSON 1 DUAL OBJECTIVES: This flight lesson is for review of the private pilot maneuvers in order to detect weak areas that need work and begin to advance towards the CA flight test standards. Minimum flight time for this lesson is **1.3 hours**. This lesson may require more than one flight if the student obtained a Private Pilot Certificate away from Purdue and is not familiar with the Cirrus, Purdue procedures and the local practice area.

CONTENT:

I. Preflight briefing and a walk around preflight to check the student's technique. This must include determining aircraft legality for flight.
II. Flight maneuvers and procedures - review
    1. Flight at minimum controllable airspeed
    2. Takeoff stalls, imminent and full
    3. Departure stalls, imminent and full
    4. Approach to a landing stalls, imminent and full
    5. Accelerated stalls
    6. 45° bank turns
    7. VOR orientation and tracking; GPS tracking
    8. Simulated engine failure, including emergency descent
    9. Normal takeoff and landing

COMPLETION REQUIREMENTS: Upon completion of this flight lesson, the student will be aware of maneuvers that need extra work and have thorough understanding of the final expectations in the course.

FLIGHT LESSON 2 DUAL OBJECTIVES: This flight lessons is to review normal, short, soft and crosswind take offs and landings.

CONTENT:

I. Flight Maneuvers
   1. Normal takeoffs and landings
   2. Short field takeoffs and landings
   3. Soft field takeoffs and landings
   4. Crosswind takeoffs and landings
   5. Discuss land and hold short operations
   6. Discuss runway incursions

COMPLETION REQUIREMENTS: Upon completion of this flight lesson, the student will be competent in executing normal, soft and short field take offs and landings.

FLIGHT LESSON 3 SOLO OBJECTIVES: The student will attempt to increase proficiency by practicing the maneuvers listed in Lesson 1. A minimum of **1.3 hours** will be flown in this lesson. SIMULATED ENGINE OUT EMERGENCIES WILL NOT BE PRACTICED WHILE SOLO. **The pre-solo written test must be complete prior to this flight.**

CONTENT:

I. Preflight briefing and discussion
II. Flight Maneuvers and procedures listed in Lesson 1
III. Postflight briefing

COMPLETION REQUIREMENTS: This lesson is complete when all maneuvers listed have been reviewed to the student's own satisfaction. 1.3 Hours minimum must be flown.

FLIGHT LESSON 4 DUAL OBJECTIVES: The student will conduct a three legged two hour day dual cross-country flight. The route must be from one of the following: LAF-BEH-SBN-LAF or LAF-LWV-CMI-LAF. The first two legs must be flown without the use of GPS for navigation. **The cross country planning discussion must be complete prior to this flight.**

CONTENT:

I. Preflight briefing-check planning, performance and weather.
II. Flight procedures and maneuvers – review
   1. Pilotage
   2. GPS navigation
   3. Dead reckoning
   4. VFR flight planning procedures
   5. Leaning and power settings
   6. Determination of groundspeed and ETA
   7. Communication with FSS and ATC
   8. Operations in Class C airspace and an uncontrolled field
   9. Cross-country emergencies
   10. Proper fuel management procedures

III. Post-flight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the flight has been flown with a minimum of assistance from the instructor. The last leg must be flown with no assistance from the instructor. This dual cross-country must be a minimum of two hours.

FLIGHT LESSON 5 SOLO OBJECTIVE: After completing Flight Lesson 4, the student will be expected to fly the long, commercial cross-country. Approved routes are listed in the Safety and Procedures Manual, section 5. **The pre-solo and pre-solo cross country written test lessons must be complete prior to this flight.**

CONTENT:

I. Preflight briefing - instructor should check all planning and routes to be sure routes and procedures are correct.
II. Flight maneuvers and procedures
    1. All necessary VFR flight planning, including the Purdue University Flight Navigation log. Use the 18 step guide for VFR cross-country planning in the Safety and Procedures Manual.
    2. Pilotage, dead reckoning, and radio navigation.
III. Post-flight briefing as required.

COMPLETION REQUIREMENTS: This lesson is complete when the student has flown the selected cross-country.

FLIGHT LESSON 6 SOLO OBJECTIVE: After completing Flight Lesson 4, the student will be expected to fly one of the following cross-countries: LAF-MZZ-SBN-LAF, LAF-CMI-IKK-LAF, LAF-BMI-HUF-LAF or LAF-BMG-MTO-LAF. **The pre-solo and pre-solo cross country written test lessons must be complete prior to this flight.**

CONTENT:

I. Preflight briefing - instructor should check all planning and routes to be sure routes and procedures are correct.
II. Flight maneuvers and procedures
    1. All necessary VFR flight planning, including the Purdue University Flight Navigation log. Use the 18 step guide for VFR cross-country planning in the Safety and Procedures Manual.
    2. Pilotage, dead reckoning, and radio navigation.
III. Post-flight briefing as required.

COMPLETION REQUIREMENTS: This lesson is complete when the student has flown the selected cross-country.

FLIGHT LESSON 7 DUAL OBJECTIVE: After the Commercial Maneuvers discussion lesson, each of the maneuvers will be introduced and practiced.

CONTENT:

I. Preflight briefing – review the procedures for the maneuvers to be flown.
II. Flight maneuvers and procedures – new
    1. Steep Turns
    2. Chandelles
    3. Lazy Eights
III. Post-flight briefing

COMPLETION REQUIREMENTS: The student should be able to recognize errors and know how to correct them in order to sharpen their skills during solo practice.

FLIGHT LESSON 8 DUAL OBJECTIVE: After the Commercial Maneuvers discussion lesson, each of the maneuvers will be introduced and practiced.

CONTENT:
I. Preflight briefing – review the procedures for the maneuvers to be flown.
II. Flight maneuvers and procedures
    1. Gliding Spirals about a point
    2. Eights-on pylons
    3. Power-off accuracy landings
III. Post-flight briefing

COMPLETION REQUIREMENTS: The student should be able to recognize errors and know how to correct them in order to sharpen their skills during solo practice.

FLIGHT LESSON 9 SOLO OBJECTIVE: The student will practice the maneuvers introduced in Lessons 7 and 8 and begin developing the aptitude required for the CA maneuvers.

CONTENT:
I. Preflight briefing
II. Flight maneuvers and in Lesson 7 and 8
III. Post-flight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the listed maneuvers have been practiced to the student's own satisfaction.

FLIGHT LESSON 10 DUAL OBJECTIVE: **This lesson is only required if the student is not current to act as PIC at night as required by FAR 61.57(b)**. The student will make at least three takeoffs and three landings to a full stop beginning at least 1 hour after sunset.

CONTENT:
I. Preflight briefing – discussion of vertigo, FAR 91.71, airport lighting, night emergencies including electrical and engine failure, the need for a flashlight.
II. The student should do at least three takeoffs and landings beginning at least 1 hour after sunset.
III. Post-flight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the student is current to act as PIC at night as required by FAR 61.57.

FLIGHT LESSON 11 PIC OBJECTIVE: Night flying will be accomplished to ensure the student has the proper techniques to safely and efficiently fly night VFR cross country. The student must be current to act as PIC at night as required by FAR 61.57, and by Purdue operations, prior to beginning this lesson. The route will be LAF-DEC-HUF-LAF or LAF-FWA-SBN-LAF. **An instructor will be on board during this flight**. **The pre-solo and pre-solo cross country written test, and cross country planning discussion lessons must be complete prior to this flight.**

CONTENT:

I. Preflight briefing – discussion of vertigo, FAR 91.73, airport lighting, night emergencies including electrical and engine failure, the need for a flashlight, and night VFR navigation.
II. The student should do at least three take offs and landings at both Decatur and Terre Haute or Fort Wayne and South Bend. The student will accomplish take offs and landings upon return to Lafayette to bring the time for the flight to at least 2.5 hours.
III. At least five (5) landings with the control tower in operation.
IV. Post-flight briefing
V. This flight is NOT logged as dual. It is logged as PIC, Total Time, PIC Cross Country and Night PIC.

COMPLETION REQUIREMENTS: The student will fly the night cross country with a minimum of at least 2.5 hours of total time and at least five (5) take offs and landings with the control towers in operation.

FLIGHT LESSON 12 DUAL OBJECTIVE: The student will plan a dual cross country to either IKK, MZZ, or HUF. The student will practice normal, short and soft field operations at the selected airport, then return to LAF within the normal flight period. **The cross country planning discussion lesson must be complete prior to this flight.**

CONTENT:

I. Preflight briefing
II. Cross country procedures.
III. Take offs and landings.
    1. Short field operations
    2. Soft field operations
    3. Normal/Crosswind operations
IV. Post-flight briefing as required

COMPLETION REQUIREMENTS: This lesson is complete when the student has flown to the selected airport and returned.

FLIGHT LESSON 13 DUAL OBJECTIVE: The student will continue development of proficiency of commercial maneuvers.

CONTENT:

I. Preflight briefing – as required to quiz the student on his knowledge of the commercial maneuvers
II. Flight maneuvers and procedures – review
    1. Chandelles
    2. Lazy eights
    3. Steep turns
    4. Gliding spirals around a point on the ground
    5. Eights-on pylons
    6. Power-off accuracy landings
III. Post-flight briefing

COMPLETION REQUIREMENTS: An improvement in the student's level of proficiency in the commercial pilot maneuvers will complete this lesson.

FLIGHT LESSON 14 SOLO OBJECTIVE: The student will continue to practice the commercial pilot maneuvers.

CONTENT:

I. Preflight briefing as required
II. Flight maneuvers and procedures – review
    1. Chandelles
    2. Lazy eights
    3. Steep turns
    4. Gliding spirals around a point on the ground
    5. Eights-on pylons
III. Post-flight briefing as required

COMPLETION REQUIREMENTS: An improvement in the student's level of proficiency in the commercial pilot maneuvers will complete this lesson.

FLIGHT LESSON 15 DUAL OBJECTIVE: The student will practice basic attitude instrument flying and elementary navigation using flight instruments only.

CONTENT:

I. Preflight briefing will center on a discussion of attitude instrument flying including the skills necessary, common errors, procedures for proper attitude control and the meaning and use of primary flight/control instruments. The entire flight will be done with the student under the hood.
II. Flight maneuvers and procedures – new to this course
    1. Four fundamentals
    2. Airspeed transitions from cruise to approach speed
    3. VOR tracking to/from a VOR
    4. GPS navigation
III. Postflight briefing as required

COMPLETION REQUIREMENTS: The minimum requirements will be the same as those necessary to pass the PA flight test.

FLIGHT LESSON 16 SOLO OBJECTIVE: The student will continue to work on improving proficiency level in the commercial pilot maneuvers.

CONTENT:

I. Preflight briefing - review procedures for the maneuvers and for collision avoidance procedures.
II. Flight maneuvers and procedures – review
    1. Steep turns
    2. Chandelles
    3. Lazy eights
    4. Gliding spirals around a point on the ground
    5. Eights-on-pylons
III. Postflight briefing as required

COMPLETION REQUIREMENTS: This lesson is complete when the student is satisfied that his/her level of proficiency has improved in the listed maneuvers.

FLIGHT LESSON 17 DUAL OBJECTIVE: This lesson will be used to refine the student's skills in operating the aircraft at critically low airspeeds.

CONTENT:

I. Preflight briefing – discuss the procedures for short/soft-field operations, stalls from critical situations, flight at minimum controllable airspeed, and full flap go-around from the landing configuration. The student must compute the proper speeds for minimum effort takeoffs over obstacles and minimum distance landings over obstacles.
II. Flight maneuvers and procedures – review
    1. Short-field operations
    2. Soft-field operations
    3. Combined soft/short-field operations
    4. Takeoff stalls and recoveries
    5. Approach to a landing stalls and recoveries, including accelerated stalls
    6. Flight at minimum controllable airspeed
    7. Full flap go-arounds from the landing configuration
III. Postflight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the student's performance exceeds the requirements for the Private Pilot Certificate.

FLIGHT LESSON 18 DUAL OBJECTIVE: The objective of this lesson is to increase the student's competence in crosswind. This lesson may be done at any time in this course.

CONTENT:

I. Preflight briefing will be a detailed discussion of the procedures for crosswind operations. It is desired to have the maximum possible crosswind for this lesson. It may also be necessary to go to another airport to accomplish this lesson.
II. Flight maneuvers and procedures – review
    1. Crosswind taxiing
    2. Crosswind takeoffs
    3. Crosswind landings
    4. Caution for downwind turns (i.e. turns made while taxiing from downwind to upwind)
    5. Be sure proper crab angle is applied to maintain the constant desired ground track while in the pattern
    6. The landing approach should be crabbed on final and go into the slip when the flare is started.
III. Postflight briefing should ensure the student knows how to recognize a crosswind situation and knows the crosswind limits of the airplane and himself/herself.

COMPLETION REQUIREMENTS: This lesson is complete when the student can make crosswind takeoffs and landings without assistance from the instructor.

FLIGHT LESSON 19 SOLO OBJECTIVE: The student will practice short-field operations, soft operations, normal takeoffs and landings and accuracy landings.

CONTENT:
I. Preflight briefing will ensure the student knows the meaning of the “option” clearance, when to request a short approach, and the proper speeds for the operations to be conducted.
II. Flight maneuvers and procedures – review
    1. Short-field operations
    2. Soft-field operations
    3. Accuracy landings
III. Postflight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the student is satisfied that his/her level of proficiency has improved.

FLIGHT LESSON 20 DUAL OBJECTIVE: The student will practice simulated instrument flying to begin working toward the requirements for the IRA flight test. The entire flight will be under the hood.

CONTENT:
I. Preflight briefing will include a discussion of the procedures and situations leading into recoveries from unusual attitudes and a review of timed turns to compass headings.
II. Flight maneuvers and procedures – new to this course
    1. Recoveries from unusual attitudes
    2. Timed turns to compass headings
    3. Simulated radar vectors to the airport (simulated ASR)
III. Flight maneuvers and procedures – review

1. Four fundamentals
2. Tracking to/from a VOR station
3. Airspeed transitions during straight flight and during turns

IV. Postflight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the student can use the proper procedures to recover from unusual attitudes, make magnetic compass turns showing knowledge of the compass errors, and show improved proficiency in the other areas over previous simulated instrument flying.

FLIGHT LESSON 21 SOLO OBJECTIVE: During this lesson the student will practice all previously introduced maneuvers and bring total solo time for the course to approximately 19.0 hours. This lesson may require more than one flight.

CONTENT:

I. Preflight briefing will review procedures as necessary
II. Flight maneuvers and procedures - review all previously introduced VFR maneuvers
III. Post-flight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the student is satisfied with his/her level of proficiency. Total solo time in this course will be approximately 19 hours.

FLIGHT LESSON 22 DUAL OBJECTIVE: This lesson is the final preparation for the AT-24302 course completion phase check. At the end of this lesson total simulated instrument time should be 3.0 hours minimum. The instructor will assign a one-leg cross country for the student to plan. The instructor will evaluate cross country procedures before reviewing commercial maneuvers. This lesson may require more than one flight.

CONTENT:

I. Preflight briefing should review procedures as necessary
II. Cross country procedures
III. Flight maneuvers and procedures review all previously introduced maneuvers with emphasis on weak areas
IV. Post-flight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the student can pass the AT-24302 course completion stage check and total time in this course is at least 39 hours and 3.0 hours simulated instrument minimum.

FLIGHT LESSON 23 PIC OBJECTIVE: To pass the AT-24302 stage check ride.

CONTENT:

I. Preflight briefing
II. Flight maneuvers and procedures – see figure 7.1
III. Post-flight briefing

COMPLETION REQUIREMENTS: The student must receive a satisfactory grade in the items listed on the stage check electronic record.

AT-24302 Commercial Flight I Stage Check

The purpose and objectives of the AT-24302 stage check is to determine that the student can properly plan and execute cross country flying and that the student understands and can perform all of the commercial pilot take offs, landings and maneuvers to a reasonable level of competency.

The student shall complete all items to the satisfaction of the check instructor. At the instructor's discretion, he/she may provide remedial training for up to three, non-safety related, items. Providing remedial training will lower the stage check grade by one letter grade.

The student will plan a VFR cross country to either Kalamazoo, Decatur or Richmond, as assigned by the stage check instructor. All cross country planning, plus the weight and balance and performance calculations must be completed as per the Purdue cross country planning log prior to the beginning of the stage check.

The student will start off on the cross country without the use of the GPS and demonstrate the ability to navigate by pilotage and dead reckoning. The student may accomplish a ground speed check and divert to or towards an alternate airport.

The student must also demonstrate the ability to navigate using the GPS and VOR receivers.

The student must demonstrate competency in take offs and landings and the commercial flight maneuvers.

The stage check instructor must use the AT-24302 Stage Check electronic record keeping system to record the detailed results of the stage check.

AT-24302 Stage Check Record

Stage Check

Item	Points Possible	Points Given	Remarks
Oral			
A. Pilot and aircraft airworthiness	10		
B. Airplane performance / weight and balance	10		
C. Aircraft systems / instruments / limitations	10		
D. Emergency procedures / light gun signals	10		
E. National Airspace System / Special Use Airspace / TFRs	10		
F. Weather	10		
Normal Operations			
A. Checklist Usage	5		
B. Starting / taxiing / runup / shutdown procedures	5		
C. Radio procedures	5		
D. Traffic pattern	5		
Cross Country Procedures (the check pilot shall select at least tasks A and B)			
A. Maintaining planned course	20		
B. Altitude control	20		
C. Ground speed check	20		
D. Diverting to an alternate	20		
Flight at Critically Slow Airspeed (the check pilot shall select at least task A and one other task)			
A. Slow Flight	20		
B. Takeoff stall	20		
C. Departure stall	20		
D. Approach to landing stall	20		
Commercial Maneuvers (the check pilot shall select at least tasks A, B, and C)			
A. Steep turns	20		
B. Chandelles	20		
C. Lazy eights	20		
D. Gliding spirals about a point	20		
E. Eights-on-pylons	20		
Maneuvering by Reference to Instruments (the check pilot shall select at least tasks A and one other task)			
A. Four Fundamentals	10		
B. VOR orientation / tracking	10		
C. Unusual Attitudes	10		
Emergency Procedures			
A. Simulated power loss (partial or full)	15		
B. Other emergency procedure at the discretion of the check pilot	5		
Takeoffs and Landings (the check pilot shall select at least 2 takeoffs and 2 landings)			
A. Short field takeoff	20		
B. Short field landing	20		
C. Soft field takeoff	20		
D. Soft field landing	20		
E. Crosswind takeoff	20		
F. Crosswind landing	20		
G. Accuracy landing	20		
Student Performance			
A. Cockpit organization	5		
B. Vigilance	5		
C. Judgment	5		

Figure 7.1 AT-243 Stage Check Electronic Record

AT 24302 BRIEF LESSON BY LESSON GUIDE

Discussion Lesson 1:	Course objectives etc.
Discussion Lesson 2:	Pre-solo Written Exam
Discussion Lesson 3:	Pre-solo X-C Written Exam
Discussion Lesson 4:	Cirrus performance charts and weight and balance
Discussion Lesson 5:	Cirrus systems
Discussion Lesson 6:	Sectional charts and the National Airspace System
Discussion Lesson 7:	Aeromedical factors
Discussion Lesson 8:	Weather and Notams
Discussion Lesson 9:	Commercial pilot maneuvers
Discussion Lesson 10:	Cross Country Planning
Flight Lesson 1:	Dual, review PA maneuvers
Flight Lesson 2:	Dual, review all takeoffs and landings
Flight Lesson 3:	Solo practice PA maneuvers
Flight Lesson 4:	Dual cross country
Flight Lesson 5:	Solo long commercial cross country
Flight Lesson 6:	Solo cross country
Flight Lesson 7:	Dual introduction to CA maneuvers
Flight Lesson 8:	Dual CA maneuvers
Flight Lesson 9:	Solo practice maneuvers from Flight Lesson 7
Flight Lesson 10:	Dual night currency (if required)
Flight Lesson 11:	Dual PIC Night cross country and take offs and landings
Flight Lesson 12	Dual cross-country
Flight Lesson 13	Dual CA maneuvers
Flight Lesson 14:	Solo CA maneuvers
Flight Lesson 15:	Dual simulated instrument
Flight Lesson 16:	Solo CA maneuvers
Flight Lesson 17:	Dual CA stalls, slow flt, short/soft-field ops
Flight Lesson 18:	Dual crosswind takeoffs and landings
Flight Lesson 19:	Solo takeoffs and landings
Flight Lesson 20:	Dual simulated instruments
Flight Lesson 21:	Solo all maneuvers in AT 24302 - total solo to 19 hrs
Flight Lesson 22:	Dual review for stage check
Flight Lesson 23:	PIC AT 24302 stage check

This Page Intentionally Left Blank

AT-24802 Commercial Flight II

The objective of AT-24802 Commercial Flight II is to continue developing the skills and abilities to earn the Commercial Pilot Certificate with an Instrument Rating. The Basic Attitude Instrument flying phase of the instrument curriculum is included in this course. The minimum total time for this course is 40 hours; unless specifically denoted all other times are approximate.

Total Time.....40 Hours

Dual Instruction .....20 Hours
- Night Dual.....2.5 Hours
- Dual Cross Country.....4 Hours
- Simulated Instrument ..... **min.** 7 Hours

Solo .....19 Hours
- Cross Country .....5 Hours
- Night Cross Country ..... (with an instructor on board) 2.5 Hours

Discussion.....10 Hours

End of Course Stage Check ..... 1 Hour

It is required that each Part-Time Flight Instructor maintain a close relationship with the Full-Time Faculty in order to closely monitor the progress of each student.

Unless otherwise noted, each flight lesson will be at least 1.1 hours, and each discussion lesson at least 1.0 hours.

All AT-24802 students are required to attend scheduled safety meetings. The meetings are held beginning the first Wednesday of each semester or as otherwise published by the safety officer. Meetings will be held either on-line or in person. Attendance at these meetings and quiz grades are used to calculate the student's "aeronautical knowledge" portion of their course grade.

AT- 24802
STUDENT COURSE OUTLINE

COURSE OBJECTIVES: The AT-24802 course is designed to focus on basic attitude instrument flying and to review and practice commercial maneuvers, in order to continue preparation for the instrument rating and the commercial pilot certificate.

COMPLETION REQUIREMENTS: The student must complete 40 hours of flight time by accomplishing the lessons listed below:

DISCUSSION LESSON 1 OBJECTIVE: The student will become familiar with the Student Course Outline, course objectives, school regulations, grading procedures for AT-24802 and review the procedures for the maneuvers to be flown in Flight Lesson 1. **This lesson has to be completed prior to starting any other lesson.**

CONTENT:

A. Discussion of the course outline, course objectives, materials, and school regulations relating to aircraft operation and student conduct in flight courses.
B. Discussion of grading procedures, as well as attendance, including cancellation fee.
C. Explain the required AT Safety Meetings and ensure the student understands that the meetings are mandatory. The schedule of meeting dates and times will be provided by Hangar 6 staff.
D. Explain the weekly safety quiz requirement.
E. Discuss required materials including Purdue logbook, Safety & Procedures Manual, Cirrus manual, Chicago and St. Louis sectional charts, flight computer and plotter, pad and pencil, pilot certificate and medical certificate, Commercial and instrument Pilot Practical Test Standards or Airmen Certification Standards as applicable, an instrument hood and communication headset.
F. THE INSTRUCTOR WILL DETERMINE THE DUE DATE OF THE STUDENT'S FLIGHT REVIEW!
G. Review of the procedures for the maneuvers in Flight Lesson 1 in Section 8 of the Safety & Procedures Manual and the Airplane Flying Handbook.
H. Ensure the student knows the location of oil, windshield cleaning materials, and fire extinguishers.
I. Assigned reading – Instrument Flying Handbook Chapters 4 through 7, and Airplane Flying Handbook Chapters 4 through 6, 8, & 9
J. Discuss land and hold short operations and procedures and runway incursions

COMPLETION REQUIREMENTS: At the end of this lesson the student must know the Purdue rules, what is to be covered in the course, procedures for the maneuvers to be flown in Lesson 1 and the grading procedure.

The following discussion lessons must be completed during the course, preferably on days when the weather does not permit flight:

DISCUSSION LESSON 2 OBJECTIVE: To ensure the student has a working knowledge of performance charts and weight and balance.

CONTENT:

A. Computation of pressure altitude.
B. Proper use of all Cirrus performance charts using multiple situations.
C. Cirrus weight and balance computations using various loading combinations and various calculation methods.
D. Effect of C.G. location on aircraft performance

COMPLETION REQUIREMENTS: This lesson is complete when the instructor determines the student can meet the requirements set forth in the Commercial Pilot Practical Tests Standards or Airmen Certification Standards as applicable.

DISCUSSION LESSON 3 OBJECTIVE: To insure the student has the proper knowledge of Cirrus aircraft systems and maintenance procedures.

CONTENT:

A. Discussion and location of aircraft certificates and operating limitations. (Flight Manual)
B. Review of the aircraft maintenance records, including a discussion of inspections, transponder/encoder/static system/altimeter checks/ELT battery check, and Airworthiness Directives.
C. Aircraft systems including engine, fuel system, electrical system, vacuum system, pitot static system, heating and ventilation system, avionics (Perspective Integrated Avionics System), flight instruments. *The instructor should seek out an aircraft in maintenance to show the student the components of the systems mentioned above to the extent available.*
D. Discussion and thorough knowledge of the emergency procedures for the Cirrus from the Cirrus Manual.

COMPLETION REQUIREMENTS: The lesson is complete when the instructor determines that the student can meet the requirements set forth in the Commercial Pilot Practical Test Standards or Airmen Certification Standards as applicable.

DISCUSSION LESSON 4 OBJECTIVE: To ensure the student has the necessary knowledge of sectional charts and the National Airspace System.

CONTENT:

A. Discussion of all sectional chart symbols.
B. Discussion of the National Airspace System including all Classes of airspace plus Terminal Radar Service Areas, National Security Areas, Military Operating Areas, Military Training Routes, prohibited, restricted, warning and alert areas, and airspace that is controlled to the surface around an airport.
C. Minimum weather requirements including blue and magenta shading, VFR and special VFR weather requirements to take off and land, and minimum weather requirements above 10,000 feet.

COMPLETION REQUIREMENTS: This lesson is complete when the instructor determines that the student has met the requirements set forth in the Commercial Practical Test Standards or Airmen Certification Standards as applicable.

DISCUSSION LESSON 5 OBJECTIVE: To ensure the student knows the symptoms, effects, and corrective actions for the listed aeromedical factors

CONTENT:

A. Hypoxia day and night
B. Hyperventilation
C. Middle ear and sinus problems
D. Spatial disorientation
E. Motion sickness
F. Carbon monoxide poisoning
G. Stress and fatigue
H. The effects of alcohol and drugs including FAR's concerning the use of alcohol and drugs.

COMPLETION REQUIREMENTS: This lesson is complete when the instructor determines that the student has met the requirements set forth in the Commercial Pilot Test Standards or Airmen Certification Standards as applicable.

DISCUSSION LESSON 6 OBJECTIVES: To have the student become familiar with the procurement and use of aeronautical weather reports, forecasts, charts, and the NOTAM system. *It is expected that the student and instructor will become familiar with the following subject matter before and during each flight. This discussion lesson will serve as a means to verify that the student has retained all of the information discussed throughout the semester.*

CONTENT:

A. Weather Reports and Forecasts:
    a. METARs, SPECIs, TAFs, Area Forecasts (FA), Winds Aloft (FD), PIREPs (UA), Airmets (WA), Sigmets (WS), Convective Sigmets (WST), Severe Weather Watch (WWs), and Alert Messages (AWWs)
B. Weather charts
    a. Weather Depiction, Radar Summary, Surface Analysis, Prognostic Charts
C. Weather reporting systems
    a. AWOS (a, 1, 2, 3), ASOS, Manual Observations, RVR, TWEB, HIWAS, EFAS, FSS, ADDS, WSI, DTN, DUATS, NWS
D. NOTAM System
    a. NOTAMs, Tempoary Flight Restrictions

COMPLETION REQUIREMENTS: This lesson is complete when the student has a working knowledge of weather reports, forecasts, charts, and the NOTAM system.

FLIGHT LESSON 1 DUAL OBJECTIVES: The first flight will be a review of the commercial pilot maneuvers.

CONTENT:

I. Preflight briefing – discuss the procedures for the maneuvers listed below.
II. Flight maneuvers and procedures – review
    1. Takeoff stalls
    2. Approach to landing stalls
    3. Departure stalls
    4. Accelerated stalls
    5. Flight at minimum controllable airspeed
    6. Steep power turns
III. Postflight briefing

COMPLETION REQUIREMENTS: When the maneuvers have been completed to the satisfaction of the instructor to allow for solo flight, this lesson is complete. Minimum time for this lesson is 1.3 hours.

FLIGHT LESSON 2 DUAL OBJECTIVES: Continuation of commercial maneuvers as well as basic attitude instrument flying

CONTENT:

I. Preflight briefing – discuss the procedures for the maneuvers listed below
    1. Chandelles
    2. Lazy eights
    3. Steep spirals around a point
    4. Eights-on-pylons
    5. Simulated instrument 0.4 hours on the four fundamentals
    6. Simulated engine failure, including emergency descent
    7. Normal takeoff and landing
II. Postflight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the student can perform the listed maneuvers to within the maximum limits of the airplane.

FLIGHT LESSON 3 DUAL OBJECTIVE: To ensure the student has achieved a level of proficiency in maximum performance and crosswind takeoffs and landings. It may be necessary to go to another airport for the necessary conditions.

CONTENT:

I. Preflight briefing – review the performance charts for the proper speeds and distances, also check the maneuvers sheet for the correct procedures.
II. Flight maneuvers and procedures – review
    1. Short field takeoffs and landings
    2. Soft field takeoffs and landings
    3. Crosswind takeoffs and landings
    4. Combinations of the above
    5. Accuracy landings

COMPLETION REQUIREMENTS: This lesson is complete when the maneuvers have been flown to the satisfaction of the instructor.

FLIGHT LESSON 4 DUAL X-C OBJECTIVE: To ensure the student has the proper techniques to safely and efficiently fly night VFR cross countries and operate within the ATC system. The route will be from one of the following: LAF-RID-IND-LAF, LAF-RID-MQJ-LAF, or LAF-LWV-CMI-LAF, with landings or stop and goes at each airport.

CONTENT:

I. Preflight briefing – check planning with respect to weather, cruise altitude, 65% power, fuel flow leaning, estimated time enroute and ground speed checkpoints.
II. Flight maneuvers and procedures – review
    1. Pilotage
    2. Radio navigation
    3. Dead reckoning
    4. VFR flight planning procedures
    5. Leaning and power settings
    6. Determination of ground speed and ETA
    7. Communication with FSS and ATC
    8. Operations in Class C airspace and an uncontrolled field
    9. Cross country emergency procedures
    10. Proper fuel management procedures
III. Post flight briefing

COMPLETION REQUIREMENTS: This lesson is complete when at least 2.0 hours has been flown with a minimum of assistance from the instructor. The last leg must be flown with no assistance from the instructor. This lesson must be complete prior to Lesson 9.

FLIGHT LESSON 5 SOLO OBJECTIVE: The student must fly 5 hours of solo cross country. Each cross country must be from the approved cross-country list in the Safety & Procedures Manual.

CONTENT:

I. Preflight briefing – the instructor should check to make sure the route is approved, the planning is satisfactory, and the weather will permit the flight.
II. Flight maneuvers and procedures
    1. Flight planning with emphasis on weather
    2. Radio navigation, pilotage, and dead reckoning
    3. Landings at airports each of which is more than 50 nm from the previous airport.
III. Postflight briefing as required

COMPLETION REQUIREMENTS: 5 hours of solo cross-country should be accomplished in this course.

FLIGHT LESSON 6 SOLO OBJECTIVE: The student will practice the maneuvers listed in Lesson 1 and Lesson 2.

CONTENT:

I. Preflight briefing
II. Flight maneuvers and procedures – review Lesson 1 and Lesson 2.
III. Postflight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the maneuvers have been flown to the satisfaction of the student.

FLIGHT LESSON 7 DUAL OBJECTIVE: To practice the commercial maneuvers. Basic attitude instruction flying will also be reviewed.

CONTENT:

I. Preflight briefing – review the procedures for the commercial pilot maneuvers. Discuss the procedures for compass turns and recoveries from unusual attitudes.
II. Flight maneuvers and procedures
    1. Steep power turns
    2. Chandelles
    3. Lazy eights
    4. Steep spirals around a point on the ground
    5. 0.6 hours simulated instrument
        a. Four fundamentals
        b. Unusual attitude recoveries
        c. Timed turns
        d. Timed turns to magnetic compass headings
    6. Eights-on-pylons
    7. Specialty takeoff / landing
III. Postflight briefing

COMPLETION REQUIREMENTS: 5 hours of solo cross-country should be accomplished in this course.

FLIGHT LESSON 8 SOLO OBJECTIVE: The student will increase proficiency in the maneuvers listed in Lesson 7. The student will never fly simulated instrument when solo.

CONTENT:

I. Preflight briefing
II. Flight maneuvers and procedures – fly the maneuver listed in Lesson 7
III. Postflight briefing – as required

COMPLETION REQUIREMENTS: This lesson is complete when the maneuvers have been flown to the satisfaction of the student.

FLIGHT LESSON 9 PIC OBJECTIVES: The student will fly a minimum of 2.5 hours of night cross country and take offs and landings. The route will be LAF-FWA-SBN-LAF or LAF-DEC-HUF-LAF. **An instructor will be on board during this flight. Lesson 4 must be completed prior to flying this lesson.**

CONTENT:

I. Preflight briefing – check for a flashlight and proper aircraft lighting
II. The student should do at least three take offs and landings at both FWA and SBN or DEC and HUF. The student will do take offs and landings at LAF to bring the time for the flight to at least 2.5 hours.
III. At least five (5) take offs and landings with the Control Tower in operation.
IV. Postflight briefing – as required
V. This flight is NOT logged as dual. It is logged as PIC, Total Time, PIC Cross Country and Night PIC.

COMPLETION REQUIREMENTS: This lesson is complete when the student has flown at least 2.5 hours night PIC and logged at least five night PIC landings with a control tower in operation.

FLIGHT LESSON 10 DUAL OBJECTIVE: The student will fly a dual cross country to either IKK, MZZ or HUF. The student will practice normal, short and soft field operations at the selected airport, then return to LAF within the normal flight period.

CONTENT:

I. Preflight briefing – cross country procedures.
II. Takeoffs and landings
    1. Short field operations
    2. Soft field operations
III. Postflight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the maneuvers have been flown to the satisfaction of the student.

FLIGHT LESSON 11 DUAL OBJECTIVES: This lesson will begin the extensive simulated instrument work in this course and start working on the skills necessary to pass the AT-24802 course completion check. Some CA maneuvers will also be done.

CONTENT:

I. Preflight briefing – discuss constant airspeed climbs and descents and the Purdue version of "pattern A"
II. Flight maneuvers and procedures
    1. 0.9 hours simulated instrument consisting of the following:
        a. Constant airspeed climbs and descents
        b. Climbing and descending turns
        c. Slow flight in various configurations
        d. Steep 45° banked turns

e. Timed turns
f. Magnetic compass turns
g. Recoveries from unusual attitudes
h. Pattern “A”

2. Chandelles
3. Steep power turns
4. Specialty takeoff / landing

III. Postflight briefing

COMPLETION REQUIREMENTS: When the student shows positive control of the maneuvers while under the hood and is showing progress towards integrating the instruments and their indications, the lesson is complete.

FLIGHT LESSON 12 SOLO OBJECTIVE: The student will continue to practice the maneuvers required for the CA flight test.

CONTENT:

I. Preflight briefing
II. Flight maneuvers and procedures – the student will fly the maneuvers required for the CA flight test that the student feels need the most improvement.
III. Postflight briefing

COMPLETION REQUIREMENTS: When the maneuvers have been flown to the student's satisfaction, the lesson is complete.

FLIGHT LESSON 13 DUAL OBJECTIVE: To increase the difficulty of the simulated instrument maneuvers done by the student and to practice some CA maneuvers. Rate climbs and descents will be introduced.

CONTENT:

I. Preflight briefing
II. Flight maneuvers and procedures
    1. 0.9 hours simulated instrument consisting of the following:
        a. Timed turns
        b. Magnetic compass turns
        c. Steep 45° banked turns
        d. Lateral “S”
        e. Constant rate climbs and descents
    2. Flight at minimum controllable airspeed
    3. Lazy eights
    4. Accuracy landing
III. Postflight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the maneuvers are performed to the satisfaction of the instructor.

FLIGHT LESSON 14 SOLO OBJECTIVE: The student will practice the CA maneuvers.

CONTENT:

I. Preflight briefing
II. Flight maneuvers and procedures - selected CA maneuvers as the student sees appropriate
III. Postflight briefing – as required

COMPLETION REQUIREMENTS: This lesson is complete when it has been flown to the satisfaction of the student.

FLIGHT LESSON 15 DUAL OBJECTIVE: Partial panel and approaches to stalls under the hood will be introduced.

CONTENT:

I. Preflight briefing – discuss partial panel and approaches to stalls.
II. Flight maneuvers and procedures
    1. 0.9 hours simulated instrument consisting of the following:
        a. Constant rate climbs and descents
        b. Vertical "S"
        c. Vertical circle
        d. Partial panel – four fundamentals
        e. Partial panel – recoveries from unusual attitudes
        f. Approach to stalls
    2. Lazy eights
    3. Steep spirals around a point
    4. Eights-on-pylons
    5. Short/soft/crosswind field operations
III. Postflight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the maneuvers are performed to the satisfaction of the instructor.

FLIGHT LESSON 16 SOLO OBJECTIVE: To continue to improve proficiency in the commercial pilot maneuvers.

CONTENT:

I. Preflight briefing
II. Flight maneuvers and procedures - practice commercial pilot maneuvers.
III. Postflight briefing – as required

COMPLETION REQUIREMENTS: This lesson is complete when it has been flown to the satisfaction of the student.

FLIGHT LESSON 17 DUAL OBJECTIVE: This lesson will introduce the VS1 and will continue to work on other maneuvers previously introduced.

CONTENT:

I. Preflight briefing – discuss the VS1 and any other areas the instructor/student feels necessary
II. Flight maneuvers and procedures
    1. 0.9 hours simulated instrument consisting of the following:
        a. Constant rate climbs and descents
        b. Vertical circle
        c. Vertical S1
        d. Partial panel – four fundamentals
        e. Partial panel – recoveries from unusual attitudes
        f. Partial panel – magnetic compass turns
        g. Approach to stalls
    2. All stalls listed in the CA Practical Test Standards or Airmen Certification Standards
    3. Simulated engine failure, including emergency descent
    4. accuracy landing or short/soft/crosswind operations
III. Postflight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the maneuvers are performed to the satisfaction of the instructor.

FLIGHT LESSON 18 SOLO OBJECTIVE: To continue to improve the proficiency level of the student in the commercial pilot maneuvers.

CONTENT:

I. Preflight briefing
II. Flight maneuvers and procedures – any previously done VFR commercial pilot maneuvers
III. Postflight briefing – as required

COMPLETION REQUIREMENTS: This lesson is complete when the maneuvers have been flown to the satisfaction of the student.

FLIGHT LESSON 19 DUAL OBJECTIVE: The first dual review for the VFR portion of the AT-24802 course completion stage check. The lesson will consist of a flight approximately 1.0 hour long.

CONTENT:

I. Preflight briefing – review all the maneuvers as necessary
II. Flight maneuvers and procedures
    1. All the stalls in the CA Practical Test Standards
    2. Flight at minimum controllable airspeed
    3. Chandelles
    4. Lazy eights
    5. Steep power turns
    6. Gliding spirals around a point
    7. Eights-on-pylons
    8. Short/soft/crosswind operations

9. Accuracy landings
10. Emergency procedures

III. Postflight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the maneuvers are performed to the satisfaction of the instructor.

FLIGHT LESSON 20 DUAL OBJECTIVE: Final preparation for the VFR portion of the AT-24802 course completion stage check. The lesson will consist of a flight approximately 1.0 hour long.

CONTENT:

I. Preflight briefing – review all the maneuvers as necessary
II. Flight maneuvers and procedures
    1. All the stalls in the CA Practical Test Standards or Airmen Certification Standards
    2. Flight at minimum controllable airspeed
    3. Chandelles
    4. Lazy eights
    5. Steep power turns
    6. Gliding spirals around a point
    7. Eights-on-pylons
    8. Short/soft/crosswind operations
    9. Accuracy landings
    10. Emergency procedures
III. Postflight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the instructor is satisfied that the student is competent to pass the VFR portion of the AT-24802 course completion stage check.

FLIGHT LESSON 21 DUAL OBJECTIVE: The first dual review for the instrument portion of the AT-24802 course completion stage check. The lesson will consist of a flight approximately 1.0 hour long.

CONTENT:

I. Preflight briefing
II. Flight maneuvers and procedures
    1. Approximately 0.9 hours simulated instrument consisting of the following:
        a. Constant rate climbs and descents
        b. Vertical circle
        c. Vertical S1
        d. Partial panel – recoveries from unusual attitudes
        e. Partial panel – magnetic compass turns
        f. Approach to stalls
        g. Lateral S
    2. Short/soft/crosswind field operations

III. Postflight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the maneuvers have been flown to the satisfaction of the instructor.

FLIGHT LESSON 22 DUAL OBJECTIVE: Final preparation for the instrument portion of the AT-24802 course completion stage check. The lesson will consist of a flight approximately 1.0 hour long.

CONTENT:
I. Preflight briefing
II. Flight maneuvers and procedures
    1. Approximately 0.9 hours simulated instrument consisting of the following:
        a. Constant rate climbs and descents
        b. Vertical circle
        c. Vertical S1
        d. Partial panel – recoveries from unusual attitudes
        e. Partial panel – magnetic compass turns
        f. Approach to stalls
        g. Lateral S
    2. Short/soft/crosswind field operations
III. Postflight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the instructor is satisfied the student is competent to pass the IFR portion of the AT-24802 course completion stage check. At the end of Lesson 22 the student should have a minimum of 7.0 hours of simulated instrument.

FLIGHT LESSON 23 SOLO OBJECTIVE: To practice for the VFR portion of the AT-24802 course completion stage check.

CONTENT:
I. Preflight briefing
II. Flight maneuvers and procedures – review CA maneuvers
III. Postflight briefing – as required

COMPLETION REQUIREMENTS: This lesson is complete when the student has flown the maneuvers and has a minimum of 39 hours total in this course.

FLIGHT LESSON 24 PIC OBJECTIVE: To pass the AT-24802 course completion stage check.

CONTENT:
I. Preflight briefing
II. Flight maneuvers and procedures – see figure 7.3
III. Postflight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the maneuvers have been demonstrated to the satisfaction of the check pilot.

AT-24802 Commercial Flight II Stage Check

The purpose and objectives of the AT-24802 stage check is to determine that the student has learned the basic attitude instrument skills prior to entering AT-25302 Instrument Flight and that the student has mastered the commercial flight maneuvers.

The student shall complete all items to the satisfaction of the check instructor. At the instructor's discretion, he/she may provide remedial training for up to three, non-safety related, items. Providing remedial training will lower the stage check grade by one letter grade.

The student must demonstrate competency in basic attitude instrument flying by performing the maneuvers in the AT-24802 course outline.

The student must also demonstrate mastery of the commercial flight maneuvers and takeoffs and landings.

The stage check instructor must use the AT-24802 stage check electronic record keeping system to record the detailed results of the stage check.

AT-24802 Stage Check Record

Stage Check

Item	Points Possible	Points Given	Remarks
Oral			
A. Pilot and aircraft airworthiness	10		
B. Aircraft performance / weight and balance	10		
C. Aircraft systems / instruments / limitations	10		
D. Emergency procedures / light gun signals	10		
E. National Airspace System / Special Use Airspace / TFRs	10		
F. Weather	10		
Normal Operation			
A. Line inspection (at the discretion of the check pilot)	5		
B. Checklist Usage	5		
C. Starting / Taxiing / Runup / Shutdown Procedures	5		
D. Radio procedure	5		
E. Traffic Pattern	5		
Basic Instrument Maneuvers (the check pilot shall select at least task A or E, and 2 more tasks)			
A. Steep turns	10		
B. Timed turns to Magnetic Compass Headings	15		
C. Partial panel stall(s)	5		
D. Partial panel unusual attitude	15		
E. Lateral "S"	10		
F. Vertical S1	10		
Commercial Maneuvers (the check pilot shall select at least tasks A, B, and C, and at least D or E)			
A. Steep Turns	20		
B. Chandelles	20		
C. Lazy Eights	20		
D. Gliding Spiral about a point	20		
E. Eights-on-Pylons	20		
Emergency Procedures			
A. Simulated Power Loss (partial or full)	15		
B. Other emergency procedures at the discretion of the check pilot	5		
Takeoffs and Landings (the check pilot shall select at least 2 takeoffs and 2 landings)			
A. Short field takeoff	20		
B. Short field landing	20		
C. Soft field takeoff	20		
D. Soft field landing	20		
E. Normal or Crosswind takeoff	20		
F. Normal or Crosswind landing	20		
G. Accuracy landing	10		
Student Performance			
A. Cockpit organization	5		
B. Coordination	5		
C. Vigilance	5		
D. Judgment	5		

Figure 7.3 AT-24802 Stage Check Electronic Record

AT-24802 BRIEF LESSON BY LESSON GUIDE

Discussion Lesson 1	Course Orientation
Discussion Lesson 2	Performance Charts and Weight & Balance
Discussion Lesson 3	Cirrus Systems
Discussion Lesson 4	Sectional Charts & the National Airspace System
Discussion Lesson 5	Aeromedical Factors
Discussion Lesson 6	Weather & NOTAMs
Flight Lesson 1	Dual, review CA maneuvers
Flight Lesson 2	Dual, CA maneuvers and basic attitude instrument flying
Flight Lesson 3	Dual takeoffs and landings
Flight Lesson 4	Dual night cross country
Flight Lesson 5	Solo cross country
Flight Lesson 6	Solo practice maneuvers in Lesson 1 and 2
Flight Lesson 7	Dual CA maneuvers and 0.6 hours simulated instrument
Flight Lesson 8	Solo practice maneuvers in Lesson 7
Flight Lesson 9	PIC night cross country and take offs and landings
Flight Lesson 10	Dual cross country and take offs and landings
Flight Lesson 11	Dual simulated instrument and CA maneuvers
Flight Lesson 12	Solo practice of commercial pilot maneuvers
Flight Lesson 13	Dual simulated instrument and CA maneuvers
Flight Lesson 14	Solo practice of commercial maneuvers
Flight Lesson 15	Dual simulated instrument, and CA maneuvers
Flight Lesson 16	Solo practice of commercial pilot maneuvers
Flight Lesson 17	Dual simulated instrument & CA maneuvers
Flight Lesson 18	Solo, CA maneuvers
Flight Lesson 19	Dual preparation for the VFR portion of the stage check
Flight Lesson 20	Final dual preparation for the VFR portion of the stage check
Flight Lesson 21	Dual preparation for the IFR portion of the stage check
Flight Lesson 22	Final dual preparation for the IFR portion of the stage check (min. 7.0 hours simulated instrument total required)
Flight Lesson 23	Solo preparation for the VFR portion of the stage check
Flight Lesson 24	PIC AT-24802 stage check ride

AT-25302 Instrument/Commercial Flight

AT-25302 is the final course in the concurrent Instrument Rating and Commercial Pilot Part 141 curriculum. The course consists of two stages. Stage one primarily focuses on instrument training, and stage two consists of training for the Commercial Certificate. In this course, the student will complete the certification flight tests for both the Instrument Rating and the Commercial Pilot Certificate.

Two aircraft are used during this course. Approximately 27 hours will be flown in the Cirrus SR-20 aircraft and approximately 11 hours in the Piper Arrow PA-28R-201 aircraft. When available, a Cirrus SR-20 GTS will be used for the instrument training. These aircraft have a mock landing gear selector switch. Students and instructors are expected to use the gear switch as if it were genuine. The flight training in the Arrow is to satisfy the 10 hours of complex training required for the Commercial Pilot Certificate.

At least one, but no more than two, of the short IFR cross countries should be flown in the Arrow aircraft with the remaining cross countries flown in the Cirrus aircraft.

Approximately 26 hours should be completed prior to the Instrument Rating stage check, which is then followed by the Instrument Rating Practical Test. The final commercial review is generally accomplished after the Instrument Rating Practical test is complete. Commercial review in the Arrow may be done while the student is waiting to complete the Instrument Rating Stagecheck and/or Instrument Rating Practical Test. The Commercial review is then followed by the Commercial stage check and the Commercial Pilot Practical Test.

Approximate flight hours for AT-25302 are:

Total flight time	38.0 hours
Instrument Training	26.0 hours
Instrument Stage Check	1.5 hours
Instrument Practical Test	1.5 hours
Commercial Review	7.0 hours
Commercial Stage Check	1.0 hour
Commercial Practical Test	1.0 hour

Discussion Lessons:
The discussion lessons should be done when weather does not permit flying, and must be completed before the corresponding stage check. Discussion lesson 1 must be completed before the first flight lesson. Discussion lesson 5 must be completed before flight lesson 12.

All flight lessons other than the cross-countries should be approximately 1.3 hours.

Advanced Operations:
Once approaches have been introduced, it is encouraged that the instructor add non-standard approach procedures, such as high speed approaches and/or continuous descent profiles for non-precision approaches, to practice approaches.

STAGE ONE: INSTRUMENT TRAINING

DISCUSSION LESSON 1 OBJECTIVE: The course objectives will be covered. **This discussion has to be completed prior to starting any other lesson.**

CONTENT:

A. Discussion of course objectives, as well as attendance, including cancellation fee
B. Explain the required AT Safety Meetings and ensure the student understands that the meetings are mandatory. The schedule of meeting dates and times will be provided by Hangar 6 staff.
C. Explain the weekly quiz requirement. Details regarding the weekly quizzes are located in the "PU Study Guide" online on Blackboard.
D. Fill out flight time review (in the front of the Purdue logbook) and determine the student's total flight time in the listed categories by using the Instrument Rating and Commercial Pilot Requirements Checklists. The following are some limitations that are sometimes overlooked:
    1. Prior to the Commercial Flight Test: 5 hours night PIC, including 10 night takeoffs and landings with tower open.
    2. The long VFR cross country must be completed prior to the Commercial Flight Test. *The instructor should verify that it meets the requirement of FAR §141 Appendix D 5(a)(2) during this first discussion lesson.*
    3. Ensure that the student has passed the FAA Instrument Rating Knowledge Test. The student should provide the instructor with a copy of the test results.
E. Determine due date of **Flight Review** and **Third Class Medical**.
F. Discuss grading and attendance procedures.
G. Familiarize the student with the Cirrus SR-20 GTS aircraft, with emphasis on the landing gear selector switch and autopilot. The speeds used for the landing gear will be: V_{LE} and V_{LO} (extension) = 129 KIAS, V_{LO} (retraction) = 107 KIAS.

COMPLETION REQUIREMENTS: This lesson is complete when the instructor determines that all prerequisites have been met and the student properly understands the course expectations.

DISCUSSION LESSON 2 OBJECTIVE: To familiarize the student with the concept of GPS navigation and the use of the Garmin G1000. The student should be comfortable with the basic use of the GPS, and be thoroughly briefed on items F & G prior to using the GPS for cross country navigation.

CONTENT:

A. Initialization of the GPS
B. Introduction to the various GROUPS and their respective PAGES.
C. Entering of waypoints and the APT, VOR, NDB, INT pages.
D. The student should be able to go "Direct" to a waypoint.
E. Discuss the use of the CDI, OBS and MSG keys.
F. Discuss and demonstrate flight plan entry and selection of GPS approaches.
G. Discuss safety factors related to use of GPS for approaches (RAIM, CDI scale).

COMPLETION REQUIREMENTS: This lesson is complete when the student can successfully initialize, enter a waypoint, select a direct course to a waypoint, enter a flight plan, and select an approach.

DISCUSSION LESSON 3 OBJECTIVE: To ensure the student can perform all necessary Cirrus and Arrow performance and weight and balance calculations.

CONTENT:

A. Computation of pressure altitude
B. Proper use of all Cirrus and Arrow performance charts using multiple situations. Proper usage of the takeoff and landing performance charts should be emphasized.
C. Cirrus and Arrow weight and balance computations using various loading combinations.

COMPLETION REQUIREMENTS: This lesson is complete when the student demonstrates proficient use of all Cirrus and Arrow performance charts and weight and balance calculations.

DISCUSSION LESSON 4 OBJECTIVE: To ensure the student has the proper knowledge of Cirrus systems and inspections.

CONTENT:

A. Discussion and location of aircraft certificates and operating limitations.
B. Review of aircraft maintenance records, including a discussion of the Cirrus Design Progressive Inspection Program, transponder/encoder/static system/altimeter checks, ELT battery check, and airworthiness directives.
C. Aircraft systems including engine, fuel system, electrical system, AHRS, pitot static system including alternate static system and ADC, heating and ventilation system, propeller system, and avionics
D. Discussion and thorough knowledge of the emergency procedures for the Cirrus aircraft.
E. Discussion of inoperative components regulation (FAR 91.213) both with, and without an MEL.

COMPLETION REQUIREMENTS: This lesson is complete when the instructor determines the student has the proper knowledge of Cirrus systems and inspections.

DISCUSSION LESSON 5 OBJECTIVE: To familiarize the student with IFR cross country planning.

CONTENT:

A. Route selection considering preferred routes, DP’s and STAR’s.
B. Altitude selection considering winds, turbulence, cloud and cloud tops, icing, and performance.
C. Computation of estimated time en route and total fuel requirement.
D. Analyzing weather reports and forecasts.
E. Correct interpretation of NOTAM’s
F. Alternate airport requirement/selection.

G. Procedures for filing IFR flight plans, obtaining IFR clearances, activating IFR clearances from controlled and uncontrolled airports, and canceling IFR clearances.
H. Proper use of flight planning software

COMPLETION REQUIREMENTS: This lesson is complete when the instructor determines that the student has the necessary knowledge to plan an IFR cross country.

DISCUSSION LESSON 6 OBJECTIVE: To ensure the student has the necessary knowledge of sectional charts and the National Airspace System.

CONTENT:
A. Discussion of all sectional chart symbols
B. Explanation of the National Airspace System including Class A, B, C, D, E, and G airspaces, Military Operating Areas, prohibited/restricted/warning/alert areas, National Security Areas, controlled firing areas and military training routes, and airports where the Class E airspace extends to the surface.
C. Minimum weather requirements including magenta shading, VFR and special VFR weather requirements to take off and land, and minimum VFR weather requirements above 10,000 feet.

COMPLETION REQUIREMENTS: This lesson is complete when the instructor determines that the student meets all the requirements for the above material set forth in the Commercial Pilot Practical Test Standards or Airmen Certification Standards, as applicable.

DISCUSSION LESSON 7 OBJECTIVE: To familiarize the student with the procurement and use of aeronautical weather reports, forecasts, charts, and the NOTAM system. *It is expected that the student and instructor will become familiar with the following subject matter before and during each flight. This discussion lesson will serve as a means to verify that the student has retained all of the information discussed throughout the semester.*

CONTENT:
A. Weather Reports and Forecasts:
    a. METARs, SPECIs, TAFs, Area Forecasts (FA), Winds Aloft (FD), PIREPs (UA), Airmets (WA), Sigmets (WS), Convective Sigmets (WST), Severe Weather Watch (WWs), and Alert Messages (AWWs)
B. Weather charts
    a. Weather Depiction, Radar Summary, Surface Analysis, Prognostic Charts
C. Weather Reporting systems
    a. AWOS (a, 1, 2, 3), ASOS, Manual Observations, RVR, TWEB, HIWAS, EFAS, FSS, ADDS, WSI, DTN, DUATS, NWS
D. NOTAM System
    a. Notams, FDC Notams, Temporary Flight Restrictions

COMPLETION REQUIREMENTS: This lesson is complete when the student has a working knowledge of weather reports, forecasts, charts, and the NOTAM system.

DISCUSSION LESSON 8 OBJECTIVE: To ensure the student is aware of the requirements of the Instrument Practical Test Standards or Airmen Certification Standards, and understands single-pilot resource management. **This lesson has to be completed prior to the instrument stagecheck.**

CONTENT:

A. Awareness and understanding of the introduction section of the Instrument Rating Practical Test Standards.
B. Single-pilot resource management
    a. Aeronautical decision making
    b. Risk management
    c. Task management
    d. Situational awareness
    e. Controlled flight into terrain awareness

COMPLETION REQUIREMENTS: This lesson is complete when the instructor determines the student understands the requirements set forth in the Instrument Rating Practical Test Standards or Airmen Certification Standards.

FLIGHT LESSON 1 OBJECTIVE: The first half of the lesson will be VFR (without the hood) and the second half of the lesson will be a review of basic attitude instrument flying.

CONTENT:

VFR

A. Slow flight
B. Approach to landing stall
C. Takeoff Stall
D. Departure Stall
E. Accelerated Stall
F. Steep turns
G. Take offs and landings

IFR – Basic attitude instrument flying

A. Discussion of the flight instruments and associated errors
B. Discussion of attitude instrument flying
C. Straight and level
D. Standard rate turns
E. Constant airspeed climbs and descents
F. Airspeed transitions
G. VOR approach to the airport

COMPLETION REQUIREMENTS: Airspeed must be within ±10 knots, altitude within ±100 feet, heading within ±10°, and vertical rate within ±200 feet per minute of that desired. In addition, the student is expected to pilot the airplane with smoothness and accuracy.

FLIGHT LESSON 2 OBJECTIVE: To practice VOR Tracking and holding.

CONTENT:

A. VOR holding
B. VOR Intersection holding
C. VOR A approach

COMPLETION REQUIREMENTS: Student selects and executes proper holding entry procedures. Airspeed must be within ±10 knots, altitude within ±200 feet, heading within ±10° and the aircraft must be flown with smoothness and accuracy.

FLIGHT LESSON 3 OBJECTIVE: To practice VOR approaches in the aircraft.

CONTENT:

A. Discussion of the approaches to be executed and a review of the applicable procedures. From this point on the student will report the winds aloft to the instructor prior to each flight.
B. The Lafayette VOR-A approach will be practiced and other VOR approaches will be practiced as time permits.
C. Practice a missed approach procedure

COMPLETION REQUIREMENTS: The student will be able to execute VOR approaches and missed approaches with a minimum of assistance from the instructor to the Instrument Rating Airplane Practical Test Standards or Airmen Certification Standards.

FLIGHT LESSON 4 OBJECTIVE: Introduction to RNAV GPS navigation, holding and GPS LPV and LNAV approaches.

CONTENT:

A. Discussion of the G1000, to include programming the G1000
B. Discussion of precision versus non-precision GPS approaches, to include LPV and LNAV minimums
C. Flying to RNAV GPS waypoints
D. Holding at a GPS waypoint
E. Practice RNAV GPS LNAV approaches (without WAAS). At least one approach should be done at a satellite airport. Suggested airports include MCX, FKR, CFJ, and DNV
F. Practice RNAV GPS LPV approaches

COMPLETION REQUIREMENTS: This lesson is complete when the student can program and fly a RNAV GPS flight plan and select and fly the approach.

FLIGHT LESSON 5 OBJECTIVE: To introduce the student to holding on the localizer and ILS approaches, straight-in and circle to land. The student will accomplish several ILS approaches during the lesson.

CONTENT:

A. Holding on the localizer at the outer marker or applicable final approach fix
B. Practice ILS approaches to the DA

C. Simulated radar vectors for ILS approaches
D. At least one ILS circle to land approach must be flown
E. Introduce ILS approaches at high approach speeds
F. Full approach including procedure turn

COMPLETION REQUIREMENTS: The student will demonstrate ILS approaches both from the full approach (procedure turn) and simulated radar vectors. The straight-in approaches will be flown to the published decision altitude, without full needle deflection after glide slope intercept.

FLIGHT LESSON 6 OBJECTIVE: To introduce and practice DME arc tracking and VOR approaches from a DME arc. This lesson will also be used to review previously introduces approaches as deemed appropriate by the instructor.

CONTENT:
A. Discuss and practice DME arc tracking
B. Review of various approaches as time permits

COMPLETION REQUIREMENTS: This lesson is complete when the student can track and fly a DME arc ±1nm.

FLIGHT LESSON 7 OBJECTIVE: Partial panel non-precision approaches will be introduced in this lesson. Continued review of all previously introduced approaches will also be accomplished in this lesson. Partial panel will be simulated by pulling the AHRS (marked) circuit breakers.

CONTENT:
A. Partial panel non-precision approaches will be discussed.
B. Non-precision approaches will be practiced partial panel.
C. Review of various approaches as time permits.

COMPLETION REQUIREMENTS: At the completion of this lesson, the student should be able to accomplish VOR and RNAV GPS approaches under partial panel in preparation for IFR cross country flights.

FLIGHT LESSON 8 OBJECTIVE: To introduce the operation of the autopilot and flight director for navigation, holding and approaches.

CONTENT:
A. Introduction of the autopilot and the flight director using all control modes, including VNAV. Departure to fixes, waypoints or intersections using the autopilot.
B. Holding using the autopilot
C. One or more approaches using the autopilot
D. One or more approaches using the flight director

COMPLETION REQUIREMENTS: At the completion of this lesson, the student will have an understanding of the basic operation of the autopilot for navigation, holding and approaches.

FLIGHT LESSON 9 OBJECTIVE: To increase proficiency in the operation of precision and non-precision approaches using the autopilot.

CONTENT:

A. Precision approaches using the autopilot
B. Non-precision approaches using the autopilot
C. Missed approaches using the autopilot including the TOGA mode

COMPLETION REQUIREMENTS: At the completion of this lesson, the student will be proficient in executing precision and non-precision approaches using the autopilot.

FLIGHT LESSON 10 OBJECTIVE: To familiarize the student with the Piper Arrow aircraft and to qualify the student for a complex endorsement as required by FAR 61.31(e).

NOTE: This lesson is required prior to using an Arrow for an IFR cross country lesson. It is suggested that this lesson be flown when a Cirrus aircraft is not available.

CONTENT:

A. Discussion of complex airplane systems, including constant speed propellers and retractable landing gear
B. Normal and/or crosswind takeoff and landing
C. Steep turns
D. Power off and power on stalls
E. Slow flight
F. Manual gear extension
G. Simulated engine failure

COMPLETION REQUIREMENTS: At the completion of this lesson, the student will be familiar with the handling characteristics of the Piper Arrow and proficient in the use of constant speed propellers and retractable landing gear. The instructor will sign the complex endorsement in the student's logbook as required by FAR 61.31(e).

*****NOTES for cross country lessons*****

- **At the instructor's discretion, at least one IFR cross country, but no more than two, should be completed in a Piper Arrow**
- **At least one cross country shall be completed without the use of GPS navigation**
  - It is implied that the aircraft be used like a "/A" equipped aircraft. *The "RMI" information box shows GPS derived DME for navaids set in NAV #1 & #2*
  - The GPS flight plan feature shall not be used for the departure, enroute, and approach phases of the flight
  - The PIC must use his/her §91.3 discretion for any atypical situations

FLIGHT LESSON 11 OBJECTIVE: To introduce IFR cross-country. Discussion Lesson 5 must be accomplished prior to this lesson. The cross country should be flown without the use of the autopilot or flight director.

CONTENT:

A. The student will plan a cross-country to MZZ and return, and present the planning to the instructor prior to the flight. This cross country must be planned without the use of flight planning software. The planning and discussion prior to the flight should include the proper weather reports and forecasts to be checked, altitude and route selection, true airspeed computation using performance charts, leaning procedure, computation of estimated time en-route, fuel consumption, and ATC procedures.
B. Discussion of the Garmin 430 GPS if applicable
C. The flight to MZZ and return will be flown, landing at MZZ, conditions permitting
D. Perform VOR accuracy check will and logged by the student using the MZZ VOR ground check point.
E. The return flight will include the RNAV GPS-28 approach to LAF, conditions permitting
F. The student should make all ATC communications.

COMPLETION REQUIREMENTS: This lesson is complete when the flight has been completed.

FLIGHT LESSON 12 OBJECTIVE: To fly an IFR cross-country to CMI and return. The cross country should be flown without the use of the autopilot or flight director.

CONTENT:

A. Discussion of the Garmin 430 GPS if applicable
B. The student will plan all aspects of the cross country and present the planning to the instructor prior to the flight. This cross country must be planned without the use of flight planning software.
C. The flight will be flown under an IFR flight plan with the student making all ATC communications. It is preferred that an ILS approach be made at Lafayette.

COMPLETION REQUIREMENTS: This lesson is complete when the flight has been completed.

FLIGHT LESSON 13 OBJECTIVE: To fly an IFR cross-country to HUF and return. The cross country may be flown with the use of the flight director.

CONTENT:

A. Discussion of the Garmin 430 GPS if applicable
B. The student will plan all aspects of the X-C and present the planning to the instructor prior to the initial departure. This cross country must be planned without the use of flight planning software.
C. Conditions permitting, a LOC BC or an ASR approach will be flown at HUF.
D. Time and conditions permitting, a landing will be made in HUF, and the student will work with ATC to obtain the clearance back to LAF.
E. The approach at LAF will be left to the discretion of the instructor.

COMPLETION REQUIREMENTS: This lesson is complete when the assigned flight has been flown by the student, with a minimum of assistance from the instructor.

FLIGHT LESSON 14 OBJECTIVE: To fly an IFR cross-country to MQJ and return. The cross country may be flown with the use of the autopilot.

CONTENT:

A. Discussion of the Garmin 430 GPS if applicable
B. The student will plan all aspects of the flight and present the planning to the instructor prior to takeoff. This cross country must be planned using **flight planning software**.
C. Conditions permitting, a landing at MQJ will be made and the student will obtain a clearance back to Lafayette from the appropriate ATC facility.
D. The approach at LAF will be left to the discretion of the instructor.

COMPLETION REQUIREMENTS: This lesson is complete when the assigned flight has been flown by the student, with a minimum of assistance from the instructor.

FLIGHT LESSON 15 OBJECTIVE: To meet the minimum requirements of FAR 141 Appendix C (4)(c)(1). The student will plan an IFR cross country of at least 250nm, with at least a straight line distance of 100nm between two airports, with approaches at three different airports. Suggested routes (which may be flown in reverse order) are: LAF-DAY-MIE-LAF; LAF-SPI-CMI-LAF; LAF-PIA-BMI-LAF; or LAF-HFY-SBN-LAF. At the instructor's discretion, a route meeting the above stated criteria by choosing airports off the "Airports of Use List" in section 7 of the Safety & Procedures manual, may be substituted. The flight should not exceed 3.5hrs per student. The cross country must be flown with the use of the autopilot.

CONTENT:

A. The instructor will discuss the possible instrument approaches with the student, after reviewing the student's planning. This cross country must be planned using flight planning software.
    a. An ILS and two non-precision approaches at different airports
B. The assigned flight will be flown with little or no assistance from the instructor on the first two legs and no assistance from the instructor on the last leg
C. If it can be reasonably accomplished, at the instructor's discretion, at least one leg will be planned using GPS navigation and a GPS approach flown at the completion of the leg.

COMPLETION REQUIREMENTS: The lesson is complete when the assigned flight has been flown with little or no assistance from the instructor on the first two legs and no assistance from the instructor on the last leg. Assistance from the instructor should be limited to answering student questions.

FLIGHT LESSON 16 OBJECTIVE: To review and practice maneuvers and procedures necessary for the Instrument Rating Airplane Practical Test.

CONTENT:

A. The instructor will discuss, as needed, the areas to be flown.
B. The following maneuvers or procedures will be hand flown (without the use of autopilot):
    1. IFR departure (direct to a fix or intercept an airway)
    2. VOR intersection holding, including partial panel (no AHRS)
    3. VOR or GPS approaches at a local airport (KCFJ, KFKR, or KMCX), including missed approach procedures, and partial panel (no AHRS or ADC) at the discretion of the instructor
    4. DME arc, at the discretion of the instructor
    5. Unusual attitudes
    6. Appropriate instrument approach at KLAF

COMPLETION REQUIREMENTS: This lesson is complete when the maneuvers have been flown to the satisfaction of the instructor.

FLIGHT LESSON 17 OBJECTIVE: To continue to review maneuvers and procedures necessary for the Instrument Rating Airplane Practical Test.

CONTENT:
A. IFR departure
B. Holding at a VOR or GPS waypoint
C. VOR or GPS approach with the autopilot
D. ILS approach (hand flown)
E. At the discretion of the instructor, an approach may be flown with the PFD dimmed so that the student must select Display Backup to use reversionary mode
F. At least one circle to land approach to a landing

COMPLETION REQUIREMENTS: This lesson is complete when the maneuvers have been flown to the satisfaction of the instructor.

FLIGHT LESSON 18 OBJECTIVE: To continue to review maneuvers and procedures necessary for the Instrument Rating Airplane Practical Test. This lesson is the final review flight before the instrument stage check.

CONTENT:
Any of the following maneuvers and procedures may be flown, at the discretion of the instructor:
A. IFR departure
B. VOR, GPS, and ILS approaches (full or partial panel), utilizing a procedure turn or vectors
C. DME arcs
D. Unusual attitudes
E. Circle to land approach to a landing
F. Straight-in approach to a landing

COMPLETION REQUIREMENTS: This lesson is complete when the student is competent to pass the Instrument Airplane Practical Test and total flight time in AT-253 is at least 25 hours.

DISCUSSION LESSON 9 OBJECTIVE: The student will review and be quizzed on the items for the Instrument Rating Airplane Practical Test oral examination. **This lesson has to be completed prior to the instrument stagecheck.**

CONTENT: The instructor will review with the student all applicable areas for the exam. The review should include all applicable information over the following areas:

A. Single-pilot resource management
B. IFR pilot qualifications
C. Weather information
D. Cross country flight planning
E. Aircraft systems related to IFR operations
F. Aircraft flight instruments and navigation equipment
G. FARs applicable to IFR operations
H. Air traffic control clearances and procedures
I. IFR en route and approach charts
J. Loss of communications
K. Emergency procedures
L. Ensure the IRA written test has been completed

COMPLETION REQUIREMENTS: This lesson is complete when the student has demonstrated satisfactory knowledge of the subject areas.

FLIGHT LESSON 19 OBJECTIVE: To pass the AT-25302 Instrument Stage Check.

CONTENT:

A. Preflight briefing
B. Flight maneuvers and procedures – see figure 2.6
C. Postflight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the maneuvers have been flown to the Instrument Airplane Practical Test Standards or Airmen Certification Standards.

AT-25302 Instrument/Commercial Flight
Instrument Stage Check

All previous lessons in the instrument stage, including the instrument knowledge test, must be completed prior to this lesson.

The purpose of the AT-25302 Instrument Stage Check is to determine that the student is competent to pass the Instrument Rating Airplane Practical Test. The student will demonstrate a high level of competency in IFR cross country planning and flying, in addition to holding and instrument approaches.

The student will plan an IFR cross country to either Rockford, IL or Louisville, KY, as assigned by the stage check instructor. All cross country planning must be complete as per the Purdue IFR planning log, prior to the beginning of the stage check. The stage check instructor will issue an appropriate IFR clearance and the student will comply with departure, en route, and arrival procedures and clearances.

If available, a Cirrus GTS aircraft will be used for the stage check. The student is expected to operate the landing gear retraction handle as though the aircraft has retractable gear; failure to do so, will lower the stage check grade by one letter grade.

A holding pattern must occur at some point during the flight.

The student must accomplish three instrument approaches as follows:

- A precision (ILS or GPS LPV) approach
- A GPS LNAV approach
- A VOR or VOR/DME approach

The GPS LNAV will be flown without the use of WAAS.

A dual AHRS failure will occur on either the GPS LNAV or VOR approach.

The autopilot will be used on either the GPS LNAV or VOR approach (whichever approach does not include the AHRS failure).

The stage check instructor must use the AT-25302 instrument stage check electronic record keeping system to record the detailed results of the stage check.

Stage Check

Item	Points Possible	Points Given	Remarks
Oral			
A. Pilot and aircraft airworthiness for IFR flight	10		
B. Weather	10		
C. IFR Cross Country Flight Planning	10		
D. Aircraft Flight Instruments and Navigation Equipment	10		
E. Approach & Enroute Charts	10		
F. 14 CFRs (FARs) applicable to IFR flight	10		
Ground Operations			
A. Cockpit Organization	5		
B. Copying clearance and readback	5		
C. Radio set up	5		
Departure Procedures			
A. Proper technique relative to power and landing gear	5		
B. Aircraft Control (heading, bank, altitude, etc.)	5		
C. Communications	5		
D. Compliance with the clearance	10		
E. Tracking technique	5		
Holding			
A. Proper Entry	5		
B. Completion of the 5 T's	20		
C. Navigation radio set up	20		
D. Adjustments for wind and time	20		
E. Altitude control	20		
Precision Approach (ILS or GPS LPV)			
A. Navigation radio set up	15		
B. Approach course tracking	20		
C. Approach procedures (5 T's and 4 T's)	20		
D. Altitude	20		
E. Communications/Callouts	15		
F. Adjustments for wind and time	15		
G. Missed approach procedures	10		
Non-precision approach (VOR, VOR/DME or GPS LNAV)			
A. Navigation radio set up	15		
B. Approach course tracking	20		
C. Approach procedures (5 T's and 4 T's)	20		
D. Altitude	20		
E. Communications/Callouts	15		
F. Adjustments for wind and time	15		
G. Missed approach procedures	10		
Non-precision approach (VOR, VOR/DME or GPS LNAV) with dual AHRS failure			
A. Navigation radio set up	15		
B. Approach course tracking	20		
C. Approach procedures (5 T's and 4 T's)	20		
D. Altitude	20		
E. Communications/Callouts	15		
F. Adjustments for wind and time	15		
G. Missed approach procedures	10		
DME Arc (at the discretion of the check pilot)			
A. Navigation radio set up	5		
B. Tracking	5		
C. Altitude	5		

Figure 7.6 Instrument Stage Check Electronic Record

FLIGHT LESSON 20 OBJECTIVE: To pass the Instrument Rating Airplane practical test.

CONTENT: The student will take the IRA practical test.

COMPLETION REQUIREMENTS: The student will pass the IRA practical test given by a FAA Inspector or Designated Pilot Examiner

STAGE TWO: COMMERCIAL TRAINING

DISCUSSION LESSON 10 OBJECTIVE: To ensure that the student has the proper knowledge of Piper Arrow systems and inspections.

CONTENT:

A. Discussion and location of aircraft certificates and operating limitations.
B. Review of aircraft maintenance records, including a discussion of the Purdue University General Flight Technology Progressive Inspection System, transponder/encoder/static system/altimeter checks, ELT battery check, and Airworthiness Directives.
C. Aircraft systems including engine, fuel system, electrical system, vacuum & standby vacuum system, pitot static system including alternate static system, heating and ventilation system, propeller system, avionics, landing gear system and HSI.
D. Discussion and thorough knowledge of the emergency procedures for the Piper Arrow

COMPLETION REQUIREMENTS: This lesson is complete when the instructor determines the student meets all the requirements per the Commercial PTS or ACS.

DISCUSSION LESSON 11 OBJECTIVE: The student will review and be quizzed on the items for the CA oral examination. **This lesson has to be completed prior to the commercial stagecheck.**

CONTENT: The instructor will review with the student all applicable areas for the exam. The review should include all applicable information over the following areas:

A. Certificates and Documents
B. Operations of Systems
C. Airworthiness Requirements
D. Cross Country Flight Planning
E. National Airspace System
F. Performance and Limitations
G. Aeromedical Factors
H. Spin Awareness
I. High Altitude Operations
J. Emergency procedures
K. Commercial Pilot Privileges and Limitations
L. Ensure the CA written test has been completed

COMPLETION REQUIREMENTS: This lesson is complete when the student has demonstrated satisfactory knowledge of the subject areas.

FLIGHT LESSON 22 OBJECTIVE: To student will be introduced to the maneuvers required for the Commercial Pilot Airplane Practical Test. The student will know the procedures for performing all the Commercial maneuvers in the Piper Arrow, PA-28R-201.

CONTENT:

A. Normal and crosswind takeoffs and landings

B. Imminent and full stalls from critical flight situations, including accelerated stalls
C. Steep turns
D. Flight at minimum controllable airspeed
E. Lazy eights
F. Chandelles
G. Steep spirals about a point

COMPLETION REQUIREMENTS: This lesson is complete when the student has performed all the maneuvers listed.

FLIGHT LESSON 23 OBJECTIVE: To continue introduction of the maneuvers necessary for the Commercial Pilot Airplane Flight Test in a PA-28R-201.

CONTENT:
A. Emergency gear extension and activation of alternate static source
B. Simulated Engine Failure (utilize Gliding Spiral maneuver when practical)
C. Other emergency procedures, including emergency descent
D. Eights-on-pylons
E. Short and soft field takeoffs and landings
F. Power off accuracy landings

COMPLETION REQUIREMENTS: This lesson is complete when the student has performed all the maneuvers listed.

FLIGHT LESSON 24 OBJECTIVE: To review and practice the takeoffs and landings necessary for the Commercial Pilot Airplane Flight Test in a PA-28R-201.

CONTENT:
A. Normal and crosswind takeoffs and landings
B. Short and soft field takeoffs and landings
C. Power off accuracy landings

COMPLETION REQUIREMENTS: This lesson is complete when the student has performed all the maneuvers to the satisfaction of the instructor.

FLIGHT LESSON 25 OBJECTIVE: To review and practice any of the maneuvers listed below in preparation for the Commercial Stage Check and Commercial Pilot Practical Test.

CONTENT:
A. Normal and crosswind takeoffs and landings
B. Short and soft field takeoffs and landings
C. Power off accuracy landings
D. Steep turns
E. Steep spirals
F. Chandelles
G. Lazy eights

H. Eights on pylons
I. Slow flight
J. Takeoff stalls
K. Departure stalls
L. Approach to landing stalls
M. Accelerated stalls
N. Emergency procedures, including power loss, equipment malfunctions, and inflight fire
O. Emergency descent
P. Cross country planning and navigation procedures

COMPLETION REQUIREMENTS: This lesson is complete when the instructor is satisfied that the student is competent to pass the flight portion of the Commercial Pilot Airplane Single Engine Land Practical Test. The student must have 36 total hours in AT-253, including at least 9 hours in a Piper Arrow.

FLIGHT LESSON 26 OBJECTIVE: To pass the AT-25302 Commercial stage check. The stage check must be at least 1.0 hour.

CONTENT:
A. Preflight briefing
B. Flight maneuvers and procedures – see figure
C. Post flight briefing

COMPLETION REQUIREMENTS: This lesson is complete when the maneuvers have been demonstrated to Commercial Airplane Practical Test Standards or Airmen Completion Standards, as applicable.

AT-25302 Instrument/Commercial Flight
Commercial Stage Check

All previous lessons in the commercial stage, including the commercial knowledge test, must be completed prior to this lesson.

The purpose of the AT-25302 Commercial Stage Check is to determine that the student is competent to pass the Commercial Pilot Airplane Practical Test. The student will demonstrate a high level of competency in commercial flight maneuvers, in addition to VFR cross country planning and flying.

The student will plan a VFR cross country either to Quincy, IL or Bowling Green, KY as assigned by the stage check instructor. All cross country planning must be completed as per the Purdue VFR planning log, prior to the beginning of the stage check.

A Piper Arrow aircraft will be used for the stage check.

The stage check instructor must use the AT-25302 commercial stage check electronic record keeping system to record the detailed results of the stage check.

Stage Check

Item	Points Possible	Points Given	Remarks
Oral			
A. Pilot and aircraft airworthiness	10		
B. Weather	10		
C. Cross country flight planning	10		
D. National airspace system	10		
E. Aircraft systems/limitations/weight and balance	10		
F. Emergency procedures/spin awareness	10		
Normal Operation			
A. Line inspection (at the discretion of the check pilot)	5		
B. Checklist Usage	10		
C. Radio procedure	5		
Cross Country Procedures (the check pilot shall select at least task A and B)			
A. Maintaining planned course	10		
B. Altitude control	10		
C. Diversion to an alternate	15		
D. Uncontrolled airport operations	15		
Stalls and Slow Flight (the check pilot shall select at least 3 tasks: A and E, and either B, C, or D)			
A. Slow flight	10		
B. Approach to landing stall	10		
C. Takeoff stall	10		
D. Departure stall	10		
E. Accelerated stall	15		
Commercial Maneuvers (the check pilot shall select at least 3 tasks: either A or B, either C or D, and E)			
A. Steep turns	20		
B. Steep spiral	20		
C. Chandelle	20		
D. Lazy Eight	20		
E. Eights on pylons	20		
Emergency Procedures			
A. Emergency descent	15		
B. Emergency approach and landing (simulated)	15		
C. Systems and equipment malfunction, at the discretion of the check pilot	5		
Takeoffs and Landings (the check pilot shall select at least 3 takeoffs and 3 landings)			
A. Normal or crosswind takeoff	20		
B. Normal or crosswind landing	20		
C. Soft field takeoff	20		
D. Soft field landing	20		
E. Short field takeoff	20		
F. Short field landing	20		
G. Accuracy landing	20		
Student Performance			
A. Cockpit organization	5		
B. Vigilance	5		
C. Judgment	5		

Figure 7.7 Commercial Stage Check Electronic Record

FLIGHT LESSON 27 OBJECTIVE: To take the Commercial Pilot Practical Test. Prior to this lesson, the student must have a minimum of 10 hours in the PA-28R-201.

CONTENT: The student will take the Commercial Pilot Practical test.

COMPLETION REQUIREMENTS: This lesson is complete when the student passes the Commercial Pilot Practical Test given by a FAA Inspector or Designated Pilot Examiner.

Brief Lesson Synopsis

Stage One (Instrument Training)

Stage One Discussion Lessons

Discussion Lesson 1: Introduction, Course Objectives, and Policies
Discussion Lesson 2: GPS
Discussion Lesson 3: Performance and Weight and Balance
Discussion Lesson 4: Cirrus Systems and Emergency Procedures
Discussion Lesson 5: IFR Cross Country Planning
Discussion Lesson 6: Sectional Charts and Airspace
Discussion Lesson 7: Weather and NOTAMs
Discussion Lesson 8: PTS/ACS and Single Pilot Resource Management
Discussion Lesson 9: IRA Oral Review

Stage One Flight Lessons

Flight Lesson 1: VFR Orientation and Basic Attitude Instrument Flying
Flight Lesson 2: VOR Tracking & Holding
Flight Lesson 3: VOR Approaches
Flight Lesson 4: GPS LPV and LNAV Approaches and Holding
Flight Lesson 5: ILS Holding and Approaches
Flight Lesson 6: DME Arcs and Review of All Approaches
Flight Lesson 7: Partial Panel Non-Precision Approaches and Review Approaches
Flight Lesson 8: Intro to Autopilot Operations
Flight Lesson 9: Autopilot practice approaches
Flight Lesson 10: Piper Arrow/Complex Aircraft Checkout
Flight Lesson 11: IFR Cross Country to MZZ (Non A/P)
Flight Lesson 12: IFR Cross Country to CMI (Non A/P)
Flight Lesson 13: IFR Cross Country to HUF (F/D if applicable)
Flight Lesson 14: IFR Cross Country to MQJ (A/P if applicable)
Flight Lesson 15: Long IFR Cross Country (A/P)
Flight Lesson 16: Review IFR to a local airport (Non A/P)
Flight Lesson 17: Review IFR (A/P)
Flight Lesson 18: Final IFR Review
Flight Lesson 19: IFR Stage Check
Flight Lesson 20: IRA Practical Test

Stage Two (Commercial Training)

Stage Two Discussion Lessons

Discussion Lesson 10: Piper Arrow Systems and Emergency Procedures
Discussion Lesson 11: CA Oral Review

Stage Two Flight Lessons

Flight Lesson 22: Introduction of Commercial Maneuvers

Flight Lesson 23: Commercial Takeoffs and Landings
Flight Lesson 24: Review of Commercial Maneuvers
Flight Lesson 25: Final Commercial Review
Flight Lesson 26: Commercial Stage Check
Flight Lesson 27: Commercial Pilot Airplane Practical Test

AT-21000 COURSE I SYLLABUS

TABLE OF CONTENTS

GROUND TRAINER COURSE
STUDENT COURSE OUTLINE

The outcomes of this Ground Trainer Course are to establish a firm foundation of the basic instrument approach procedures with a consistent completion of the 5Ts and 4Ts. The first 4 lessons are to teach the student basic attitude instrument flying. The remaining eleven lessons are to teach GPS, VOR, and ILS tracking, holding, and approaches.

THERE ARE ALSO FOUR DISCUSSION LESSONS INCLUDED IN THE COURSE OUTLINE THAT MUST BE SCHEDULED DURING EXTRA PERIOD OTHER THAN THE REGULAR SCHEDULED SIMULATOR TIMES. THESE LESSONS MUST BE LOGGED IN THE STUDENT LOGBOOK.

Time (in minutes) is given, in parenthesis, beside each maneuver to indicate to the instructor how much time be spent on each maneuver. Times are approximate and may be altered to fit individual student needs.

It is intended that this outline be followed as precisely as possible. (Slight deviations in time schedule to meet individual student needs are acceptable). The student or the instructor must immediately report any deviation from this outline to the Chief Flight Instructor or his/her designee.

It is mandatory that the student and instructor begin each session on time. 1.4 hours is the minimum in each session, with a total of 25.0 hours during the course. Each discussion lesson should take approximately 1.0 hours. Any missed sessions MUST be made up. By the end of this course, the student should be able to consistently hold at VORs and VOR intersections, and be able to execute VOR, GPS, and ILS approaches. **Each lesson must be completed to the satisfaction of the instructor.**

The following speeds and configurations will be used throughout the course:

1. APPROACHES – 100 KIAS WITH FLAPS SET AT 50% at the FAF
2. HOLDING – 100 KIAS WITH FLAPS SET AT 0 DEGREES

Common Approximate Power settings for the SR-20:

Phase of Flight	Power Setting
Initial and Enroute Climb	Full Power
Cruise	65%
Descent	% power as required to hold airspeed and rate of descent
Descent at 500fpm	15%
Level Flight, 100 KIAS, Flaps Up	40%
Level Flight, 100 KIAS, 50% Flaps	50%
ILS Approach – glideslope descent	25%

AT-21000 BRIEF LESSON BY LESSON GUIDE

DISCUSSION LESSON 1: Basic Attitude Instrument Flying
DISCUSSION LESSON 2: GPS Operations
DISCUSSION LESSON 3: VOR/DME, RNAV Tracking, Holding, and Approaches
DISCUSSION LESSON 4: Localizer Holding and ILS Approaches
LESSON 1: Basic Attitude Instrument Flying
LESSON 2: Basic Attitude Instrument Flying
LESSON 3: Basic Attitude Instrument Flying
LESSON 4: Basic Attitude Instrument Flying
LESSON 5: VOR Tracking and Holding
LESSON 6: VOR Intersection Holding and VOR Approaches
LESSON 7: VOR Approaches
LESSON 8: DME Arcs and VOR Approaches
LESSON 9: GPS Approaches with LPV and Holding
LESSON 10: GPS Approaches with LNAV
LESSON 11: GPS Approaches with Autopilot
LESSON 12: Localizer Holding and ILS Approaches
LESSON 13: ILS Approaches
LESSON 14: Review all procedures for stage check
LESSON 15: Stage Check Review
LESSON 16: AT-210 Stage Check

DISCUSSION LESSONS

DISCUSSION LESSON 1 – BASIC ATTITUDE INSTRUMENT FLYING

*See Appendix for suggested lesson plans

1. COURSE OVERVIEW AND EXPECTATIONS
    A. Discussion of grading procedures, as well as attendance, including cancellation fee.
2. METHOD – INSTRUMENTS AS THEY RELATE TO CONTROL FUNCTION AND PERFORMANCE

    A. Pitch Instruments:
        1. Altimeter – **primary**
        2. Attitude Indicator
        3. Airspeed Indicator
        4. Vertical Speed Indicator
    B. Bank Instruments:
        1. Heading Indicator – **primary**
        2. Attitude Indicator
        3. Turn Coordinator
        4. Magnetic compass errors
    C. Power Instruments:
        1. Airspeed Indicator – **primary**
        2. % Power
        3. Manifold Pressure Gauge (MP)
    D. Fundamental Skills:
        1. Crosscheck – Fixation, Omission, Emphasis
        2. Instrument Interpretation
        3. Aircraft Control

NOTE: Discussion Lesson 1 has to be completed prior to starting any other lesson.

DISCUSSION LESSON 2 – VOR/DME, VOR, HOLDING AND APPROACHES

*See Appendix for suggested lesson plans

A. Review of VOR operation, types, and service volumes
B. VOR identification – Listen to entire Morse Code
C. VOR Tracking – Discussion of inbound and outbound tracking and DME Arcs
D. VOR Holding – Discussion of the different types of holding (intersection, DME, over the VOR), and different types of entries (direct, parallel, and teardrop)
E. VOR approaches – Discussion of the proper procedures to execute the approach (alt., IAF, FAF, missed approach, callouts)

DISCUSSION LESSON 3 – GPS OPERATIONS

OBJECTIVE: To familiarize the student with the concept of GPS navigation and the use of the G1000 Perspective. The students should be very comfortable with the basic use of the GPS, and be thoroughly briefed on safety issues prior to using the GPS for cross country navigation.

A. Initialization of the GPS (when turned on).
B. Introduction to the various pages (NAV, WPT, AUX, NRST).
C. Demonstrate use of the shortcut buttons to the flight plan (FPL) page and procedures (PROC) for entering flight plans and loading approaches
D. Student should be aware to push the right knob to bring up the cursor.
E. The student should be able to go “direct” to a waypoint and make use of the various NAV pages.
F. Discuss the use of the GCU (Garmin Control Unit) and annunciator lights.
G. Discuss the CDI selection of VLOC and GPS.
H. Discuss the OBS (SUSP) button and its use in intercepting Airways and Holding
I. Discuss the difference between LPV, LNAV/VNAV, LNAV
J. Discuss safety factors related to use of GPS for approaches (RAIM, “approach sequence”, HSI approach annunciations)
K. GPS approaches – Discussion of the proper procedures to execute the approach (IAF – 5Ts, FAF – 4Ts, missed approach, callouts)

DISCUSSION LESSON 4 – LOCALIZER HOLDING AND ILS APPROACHES

A. Localizer Holding – Discussion of different types of holding (marker beacon only, compass locator only, or both), and different types of entries (direct, parallel, and tear drop)
B. ILS Approaches – Discussion of the proper procedures of executing the approach (alt, IAF, FAF, missed approach, altitude callouts)
C. NAV equipment set up when going missed onto an ILS

ATTITUDE INSTRUMENT FLYING LESSONS

Complete Discussion Lesson 1 Prior to Lesson 1.

LESSON 1

OBJECTIVE:

1. 15, 30 DEGREE and STANDARD RATE TURNS
    A. Heading within 15 degrees
2. CONSTANT AIRSPEED CLIMBS and DESCENTS
    A. Airspeed within 10 knots
    B. Altitude within 100 feet upon level off
3. CLIMBING and DESCENDING TURNS
    A. Airspeed within 10 knots
    B. Altitude within 100 feet upon level off
    C. Heading within 15 degrees

NEW ELEMENTS:

1. 15, 30 degree, and standard rate turns
2. Constant airspeed climbs and descents
3. Climbing and descending turns

SCHEDULE:

1. DISCUSSION
    A. Course Outline
    B. Simulator Controls
        i. Electrical
        ii. Engine Controls
        iii. Instruments
        iv. Radios
    C. Retractable gear should be raised and lowered as though it were retractable to mimic SR-20 GTS aircraft
    D. Checklist Usage
    E. Instrument Scanning
        i. Must develop a scan pattern – a solid foundation of Primary and Secondary instruments are vital to the development of a scan.
        ii. No more than 1-2 seconds should be spent on an instrument
        iii. When fixation, omission, and misinterpretation occurs freeze the situation to show the students what happened
        iv. Crosscheck, interpretation, and control – necessary skills
    F. Primary indicators of pitch, bank, and power
    G. Discuss the ground track drawn on the screen for each item
2. TURNS TO HEADINGS
    A. 15, 30 degrees, and standard rate
3. CONSTANT AIRSPEED CLIMBS AND DESCENTS
    A. 100 knots
    B. Change the power settings and observe the results on the VSI

4. CLIMBING AND DESCENDING TURNS
5. INTRODUCTION of 5Ts and 4Ts
    A. Simulate "Crossing IAF"
        i. Time – Note the time and/or start the timer
        ii. Turn – Turn to a heading that will intercept the inbound course
        iii. Throttle – Power as required to maintain proper airspeed
        iv. Tune – Verify that the inbound course is set and you are using the appropriate navaid
        v. Talk – Report to ATC if appropriate
    B. Simulate "Crossing FAF"
        i. Non-Precision:
            1. Time – Start the time if necessary to determine Missed Approach Point
            2. Tires – Extend the simulated gear
            3. Flaps – 50% flaps (not named "Trailing Edge" to distinguish Ts)
            4. Throttle – Set appropriate for descent
            5. Talk – Notify ATC
        ii. Glide Slope Intercept (ILS or LPV)
            1. Time – Don't Need
            2. Tires – Extend the simulated gear
            3. Flaps – 50% flaps (not named "Trailing Edge" to distinguish Ts)
            4. Throttle – set appropriate for descent
            5. Talk – Call ATC once "Outer Marker" inbound

LESSON 2

OBJECTIVE:

1. Improve proficiency in basic attitude instrument flying
2. STANDARD RATE TURNS
    A. Airspeed within 10 knots
    B. Altitude within 100 feet
    C. Bank within 5 degrees
    D. Heading within 10 degrees
3. CONSTANT AIRSPEED CLIMBS AND DESCENTS
    A. Airspeed within 10 knots
    B. Altitude within 100 feet upon level off
    C. Heading within 10 degrees
4. TIMED TURNS (checking for correctness)
    A. Heading within 10 degrees
    B. Time within 5 seconds
5. STEEP TURNS (45 degrees)
    A. Altitude within 150 feet
    B. Bank within 5 degrees
    C. Heading within 15 degrees on rollout
6. RATE CLIMBS and DESCENTS

   A. Constant airspeed within 10 knots
   B. Rate within 100 fpm
7. VERTICAL S (See Safety & Procedures Manual)
   A. Airspeed 100 knots within 10 knots
   B. After each minute: Altitude within 20% of the target rate (100' deviation at 500fpm)
8. LATERAL S (See Safety & Procedures Manual)
   A. Bank within 5 degrees
   B. Maximum rollout
      i. Within 15 degrees at 45 degrees bank
      ii. Within 10 degrees at 30 degrees bank
      iii. Within 5 degrees for remaining bank angles
   C. Lead rollout by half bank angle
9. "A" PATTERN (See Safety & Procedures Manual)
   A. Airspeed within 10 knots
   B. Altitude within 100 feet
   C. Heading within 10 degrees
   D. Time within 5 seconds each leg

NEW ELEMENTS:

1. Timed turns
2. Steep turns
3. Rate climbs and descents
4. Lateral S
5. Vertical S
6. "A" pattern

SCHEDULE:

1. DISCUSSION
   A. New Elements
2. STANDARD RATE TURNS
3. CONSTANT AIRSPEED CLIMBS and DESCENTS
   A. Demonstrate the relation between power and rate of climb
   B. During the straight climbs and descents, consider freezing the heading and bank. This helps the student from becoming frustrated with his performance.
4. TIMED TURNS
   A. Check the turn coordinator for correctness
   B. Continue to help the student develop scan
5. STEEP TURNS
   A. Emphasize the attitude indicator to hold constant pitch
   B. Thereafter watch the VSI for slight deviation in pitch
6. RATE CLIMBS AND DESCENTS
7. VERTICAL S
   A. Constant airspeed of 100 knots within 10 knots
   B. Important to keep the aircraft on schedule after each minute
   C. Altitude within 20% of target rate (100 feet for 500 fpm)

   D. Vertical speed at zero after each minute
   E. Stress climbing and descending with power setting
8. LATERAL S
9. "A" PATTERN
   A. Ground track for evaluation
   B. Proper trim
   C. Student thinking ahead of the aircraft
   D. Introduce five Ts of TIME, TURN, THROTTLE, TUNE, AND TALK

LESSON 3

OBJECTIVE:

1. Increase proficiency in basic attitude instrument flying
2. MAGNETIC COMPASS TURNS
   A. Heading within 20 degrees
3. TIMED TURNS (actual turns to headings)
   A. Time within 5 seconds (20 degrees)
4. STEEP TURNS (45 degrees)
   A. Altitude within 100 feet
   B. Bank within 5 degrees
   C. Heading within 10 degrees
5. RATE CLIMBS and DESCENTS
   A. Rate within 75 fpm at 500 fpm rate
   B. Airspeed within 10 knots
6. VERTICAL S
   A. Airspeed within 10 knots
   After each minute:
   B. Altitude deviation within 20% of climb rate
   C. Heading within 20 degrees
7. VERTICAL CIRCLES (See Safety & Procedures Manual)
   A. Airspeed within 10 knots
   After each minute:
   B. Altitude within 100 feet
   C. Heading within 15 degrees (5 sec)
8. VERTICAL S1 (See Safety & Procedures Manual)
   A. Airspeed within 10 knots
   After each minute:
   B. Altitude within 100 feet
   C. Heading within 15 degrees (5 sec)
9. "A" PATTERN
   A. Airspeed within 10 knots
   B. Altitude within 75 feet
   C. Heading within 10 degrees

NEW ELEMENTS:

1. Magnetic Compass turns

2. Timed Turns
3. Vertical S1
4. Vertical circle

SCHEDULE

1. DISCUSSION
    A. New Elements
2. MAGNETIC COMPASS TURNS
    A. Half standard rate (compass hits at 18 degrees)
    B. Student advised of HSI failure
3. TIMED TURNS (actual turns to headings)
    A. Calibrate turn coordinator
    B. Student advised of HSI failure
4. STEEP TURNS
5. RATE CLIMBS and DESCENTS
    A. Constant airspeed
6. VERTICAL S
7. VERTICAL CIRCLES
8. VERTICAL S1
9. "A" PATTERN
    A. Evaluate ground track

LESSON 4

OBJECTIVE:

1. Continue to improve basic attitude instrument flying by completing more complex maneuvers
2. LATERAL S
    A. Altitude within 10 feet
    B. Heading within 15 degrees for 45 degrees bank, 10 for 30 degrees, and 5 for other bank angles
    C. Bank can be increased up to 60 degrees
3. VERTICAL S
    A. Airspeed within 10 knots
    B. Altitude within 20% of desired climb rate (100 feet for 500 fpm)
    C. Heading within 10 degrees
4. VERTICAL CIRCLES
    A. Airspeed within 10 knots

    After each minute:

    B. Altitude within 20% of rate
    C. Heading within 15 degrees (5 sec)
5. VERTICAL S1
    A. Airspeed within 10 knots

    After each minute:

    B. Altitude within 20% of rate
    C. Heading within 15 degrees (5 sec)

6. "A & B" PATTERN
    A. Airspeed within 10 knots
    B. Altitude within 75 feet
    C. Climb and descent rates within 200 fpm
    D. Heading within 10 degrees

NEW ELEMENTS: "B" pattern

SCHEDULE:
1. DISCUSSION
    A. New Elements
2. LATERAL S
3. VERTICAL S
    A. Freeze no instruments
4. VERTICAL CIRCLES
    A. Important to keep aircraft on schedule
5. VERTICAL S1
    A. Level off altitude and "0" vertical speed after each minute
    B. Use of trim is important
    C. Plan transitions
6. PATTERN "A" AND PATTERN "B"

Beginning with lesson 5, the student will bring a pencil and notepad along with the appropriate charts to each lesson.

The instructor will issue simulated ATC clearances, which must be read back by the student. Wind should not be entered unless in the instructor's opinion, the student can handle wind. Do not enter any wind on localizer or ILS approaches, since this could slow the student's progress in learning the fundamentals. The radios should be set up for the maneuvers/approaches to be flown before starting.

Example:
COMM 1: TWR-DEP
COMM 2: ATIS-GND
NAV: order of approaches or waypoints
OBS: initial radial, all available navaids

VOR & GPS LESSONS

Complete Discussion Lesson 2 Prior to Lesson5.

LESSON 5

NEW ELEMENTS:
1. VOR tracking inbound and outbound
2. VOR intercepts
3. VOR holding

4. VOR approach from the hold

CHARTS:

- KLAF VOR-A
- Low Altitude Enroute Chart

SCHEDULE:

1. DISCUSSION
    A. Holding
        i. Determine holding entry
            1. Purdue's procedures in the Safety & Procedures Manual
        ii. Holding Clearance
            1. Direction from holding fix
            2. Holding fix
            3. Radial/ Bearing/ Airway on which to hold
            4. Direction of turns
            5. EFC time
        iii. Significance of direction from fix
        iv. Importance of EFC time
    B. VOR approaches
        i. Use of gear and power
        ii. Overview of the approach using the approach plate
        iii. Proper callouts

ATIS: Lafayette Purdue University airport information ECHO (time) zulu weather, winds calm, visibility 4 RA, ceiling 009 OVC, temp 17, dewpoint 16, altimeter 29.92, landing and departing runway 28, ILS and VOR approaches in use, advise on initial contact you have information ECHO.

LAF GND: Cleared direct to the BVT VOR, climb and maintain 3000', dep 123.85, squawk 4205.

LAF GND: Read back correct, runway 28 taxi via A, cross runway 23.

LAF TWR: Cleared on course, maintain 3000, cleared for takeoff runway 23. (Explain the difference between being cleared on course and cleared direct).

LAF TWR: Contact Grissom Departure on 123.85.

GRISSOM APP/DEP: Radar contact, 4 miles NW of Lafayette.

2. VOR INTERCEPTS
    A. Track then intercept another radial
3. VOR HOLDING
    A. Each entry, draw a picture if necessary
    B. A direct entry first, reposition for other entries

C. Type entry and initial outbound heading before reaching the fix
D. Checklists outbound in the hold
E. 2-3 times around each hold
F. Set all available navs as a backup
    i. If bot navs are not set, fail to make a point
G. Importance of EFC time
H. Holding entrance reports require time and altitude entering the hold.
I. Suggested holds
    i. Direct – cleared to hold SE of BVT, 160°R, 1min RH turns, EFC 10min, report entering hold
    ii. Parallel – cleared to hold as depicted, 1min RH turns, EFC 10min, report entering hold. (preposition 180°R, 5 miles)
    iii. Teardrop – cleared to hold NW of BVT, 323°R, 1min RH turns, EFC 10min, report entering hold. (Preposition 090°R, 5 miles)

4. 1 LAF VOR-A APPROACH FROM THE HOLD

GRISSOM APP/DEP: Descend and maintain 2,300. Expect the VOR-A approach in 10 minutes.

GRISSOM APP/DEP: Cleared for the VOR-A approach. Report BATLE inbound to the tower 119.6.

[BATLE] **LAF TWR: Report field in sight or missed approach…Cleared to land runway 10.**

5. ADDITIONAL VOR-A APPROACHES IF TIME PERMITS

LESSON 6

NEW ELEMENTS:
1. Intersection holding
2. Single nav holding
3. DME holding

SCHEDULE:
1. DISCUSSION
    A. Intersection holding
        i. Single nav holding
        ii. Reporting of equipment loss
            1. 13 mandatory reports
        iii. DME holding

CHARTS:
- KLAF VOR-A
- Enroute chart (L27/28)

ATIS: Lafayette Purdue University airport information ROMEO, (time) zulu weather, winds calm, visibility 4 RA, ceiling 007 OVC, temp 15, dewpoint 13, altimeter 29.92, aircraft landing and departing runway 23 and 10, ILS 10 and VOR-A approaches in use, on initial contact advise you have ROMEO.

LAF GND: Cleared to the LAF airport via radar vectors to V7, direct POTES, direct, maintain 3000, Dep 123.85, squawk 4232.

LAF GND: Read back correct, runway 23 taxi.

LAF TWR: Climb on course, maintain 3000, Cleared for takeoff runway 23.

LAF TWR: Contact GRISSOM APP/DEP on 123.85.

GRISSOM APP/DEP: Radar contact 4 SW of LAF.

2. INTERSECTION HOLDING
   A. Each entry using DME to identify fix
   B. Fly 1-2 times in the hold
   C. Reposition for next entry
   D. Each entry using crossing radials (fail DME)
   E. Single nav holding on the last hold
   F. Suggested holds (do as many as time permits)

DME:

Direct – after intercepting V7 after takeoff: cleared to hold N of POTES on V7, RH turns 3 DME legs, EFC 10 min, report entering hold.

Parallel – cleared to hold SW of VAGES on V-251, 1 min RH turns, EFC 10 min, report entering hold.
Preposition 234°R from BVT, 5 miles, hdg 234º

Teardrop – cleared to hold SE of POTES on V-24, 1 min LH turns, EFC 10 min, report entering hold.
Preposition 186º R from BVT, 9 miles, hdg 186º

INTERSECTION:

Direct – cleared to hold as published at JAKKS, 1 min legs, EFC 10 min, report entering hold.
Preposition 311º R from VHP, 37 miles, hdg 131º

Parallel – cleared to hold NE of STAKS on V-251, 1 min, RH turns, EFC 10 min, report entering hold.
Preposition 234° R from BVT, 21 miles, hdg 053º

Teardrop – cleared to hold SE of BOSWL on V-24, 1 min, RH turns, EFC 10 min, report entering hold.
Preposition 271 ° R from BVT, 14 miles, hdg 089º

GRISSOM APP/DEP: Cleared to hold (direction) of (fix) on (airway, radial), one minute (RH/LH) turns, report entering hold, EFC ___, time now ____.

3. 1 LAF VOR-A APPROCH. More if time permits or if desired by instructor.

GRISSOM APP/DEP: Cleared direct BVT, expect the VOR A into LAF, report BVT outbound.

GRISSOM APP/DEP: Cleared for the VOR-A approach, report BATLE inbound to the tower 119.6

[BATLE] **LAF TWR: report field in sight or missed approach... Cleared to land Rwy 10.**

LESSON 7

NEW ELEMENTS:

1. Kentland VOR-A approach
2. Kokomo VOR Rwy 23 approach
3. Indianapolis Regional VOR Rwy 34 approach
4. Terre Haute VOR DME Rwy 5 approach

CHARTS:

- 50I VOR-A
- KOKK VOR-23
- KMQJ VOR-34
- KHUF VOR/DME-5
- Enroute chart (L27/28)

SCHEDULE:

1. DISCUSSION
    A. New approaches
        i. Differences between approaches with VOR on and off the field
        ii. Difference between VOR and VOR DME approaches
2. APPROACHES each
    A. Slight crosswinds if any, give winds aloft
    B. All planning and briefing complete before the IAF
    C. IAF
        i. 5 Ts
        ii. Correct entry or intercept
        iii. Corrections for wind
    D. FAF
        i. 4 Ts, and start descent
        ii. Importance of a constant airspeed from the FAF to the MAP, and taking the missed approach time
        iii. MDA 1 mile before the MAP
        iv. Standard callouts as per Safety & Procedures Manual

v. Altitude at the MDA +100 feet. Do not accept lower than MDA

ATIS: Lafayette Purdue University airport information INDIA, (time) zulu weather, wind calm, visibility 2 BR, 008 OVC, temp 12, dewpoint 11, altimeter 29.92, landing and departing Rwy 23, VOR-A approaches in use, on initial contact advise you have INDIA.

LAF GND: Cleared to BVT via direct, climb maintain 3000, dep 123.85, squawk 4213. Advise ready to taxi.

LAF GND: Read back correct. Runway 23 taxi.

LAF TWR: Cleared for takeoff runway 23, turn right direct BVT, maintain 3000.

LAF TWR: Contact GRISSOM APP/DEP 123.85.

GRISSOM APP/DEP: Report BVT outbound, expect the Kentland VOR-A approach.

[BVT] **GRISSOM APP/DEP: Cleared for the VOR-A approach, report missed approach this frequency or cancel on the ground, expect the published missed. No traffic observed between you and the airport. Frequency change approved.**

[Missed] **GRISSOM APP/DEP: Radar contact (distance) NW of Kentland, climb and maintain 3000. Expect no delay for the Kokomo VOR-23 approach.**

(Preposition within 10 miles of OKK)

GRISSOM APP/DEP: Contact GRISSOM APP on 121.05

GRISSOM APP: Radar Contact (distance and direction from OKK). Advise when you have OKK weather.

GRISSOM APP: Cleared for the Kokomo VOR 23 approach, missed approach instruction will be as published. Report missed this frequency, frequency change approved.

[Missed] **GRISSOM APP: Radar contact (distance) SW of Kokomo, report entering the hold. (Student should execute the published missed approach without further prompting).**

[OKK] **GRISSOM APP: Contact IND APP on 127.15.**

(Reposition within 10 nm of SHB VOR on 080º R, hdg 260º)

IND APP: Radar contact (distance and direction from SHB VOR), Indianapolis altimeter 29.92. Expect the VOR Rwy 34 approach into MQJ. Advise when you have MQJ weather.

[5 nm from SHB] **IND APP: Cleared for the MQJ VOR Rwy 34 approach, report SHB.**

[SHB] **IND APP: Report missed approach this frequency or cancel on the ground, expect the published missed. Frequency change approved.**

(Student should execute a straight-in approach, no PT—unless one is specifically requested)

[Missed] **IND APP: Radar contact (distance) east of MQJ. Expect the Terre Haute VOR DME Rwy 5 approach.**

IND APP: Contact HUF Approach on 125.45.

HUF APP: Radar contact (distance and direction from TTH VOR), Hulman altimeter 29.92, advise when you have information TANGO.

ATIS: Terre Haute International Airport-Hulman Field airport information TANGO, (time) zulu weather, wind calm, visibility 2 BR, 006 OVC, temp 11, dewpoint 10, altimeter 29.92, landing and departing Rwy 5, VOR/DME Rwy 5 approach in use, advise on initial contact you have information TANGO.

(Reposition within 10 nm of TTH VOR)

HUF APP: Descend and maintain 2,200. Expect radar vectors for the HUF VOR/DME Rwy 5 approach.

(Instructor should vector student for an intercept of final approach course outside RILLY)

HUF APP: Turn (left/right) heading _____º, intercept the final approach course, cleared for the VOR DME Rwy 5 approach. Contact Tower RILLY inbound.

HUF TWR: Cleared to land Rwy 5, wind _____º at ____ kts.

Following the completion of Lesson 7:

*****If student doesn't consistently complete the "Ts" properly at the IAF and FAF then Discussion lessons 2 item K, 3 item F, and 4 item B must be repeated*****

LESSON 8

NEW ELEMENTS:

1. DME arc
2. Nonstandard holding

SCHEDULE:

1. DISCUSSION

A. DME arcs
    i. Intercepting arc from a radial
    ii. Intercepting and maintaining an arc
B. Nonstandard holding

CHARTS:
- Enroute Chart
- KPKB VOR-21 [changed approach due to DNV VOR-21 deletion]
- KSBN VOR-18, KCMI VOR/DME-22, KMTN VOR/DME-15 (time permitting; approaches are listed in order of difficulty for student practice)

ATIS: Lafayette Purdue University airport information CHARLIE, (time) zulu weather, winds 01010KT, visibility 3, ceiling 006 OVC, temp 1, dewpoint 0, altimeter 29.92, landing and departing runway 10, VOR-A and ILS-10 approaches in use, on initial contact advise you have CHARLIE.

LAF GND: Cleared to BVT via the 7 DME arc to 360° R, climb and maintain 3000', dep 123.85, squawk 4214, advise ready to taxi.

LAF GND: Read back correct. Taxi runway 10 via B, C.

LAF TWR: Maintain 3000, turn right on course, cleared for takeoff runway 10.

LAF TWR: Contact Grissom 123.85.

2. DME arcs
    A. Intercept various arcs (include the inbound course)
    B. Simulated radar vectors to an arc
    C. Suggest 7 DME to 360 R, 8 DME with wind until established

Grissom APP/DEP: Radar contact (nm) north of LAF. Intercept the ___ DME arc from (fix), arc to the ___ radial inbound, report established on the arc

3. NONSTANDARD HOLDING
    A. Intersection and VOR holds
    B. Each entry
    C. At BVT, at BOSWL, V-227

CLEARANCE: Cleared to hold (direction) of (fix) on (radial or airway), 1 minute left hand turns, EFC___, time now ___, report entering the hold

4. VOR APPROACHES (at Parkersburg)
    D. VOR Rwy 21 approach via the 10 DME arc

(Preposition student on the 121° radial from JPU at 15nm)

GRISSOM APP/DEP: Indy Center on 125.55, good day.

ZID: Radar contact 15 miles east-southeast of the PJU VOR, PKB altimeter 29.92. Expect the VOR Rwy 21 approach via the 10 DME arc. Report intercepting the arc; advise when you have weather at PKB.

PKB ATIS: Parkersburg Mid-Ohio Valley Regional airport information DELTA, (time) zulu weather, Wind calm, visibility 1sm, ceiling, 007 OVC, temperature 15, dewpoint 14, altimeter 29.92, landing and departing runway 21, VOR-21 approaches in use, on initial contact advise you have DELTA.

[10 DME] **ZID: Cleared for the VOR RWY 21 approach via the 10 DME arc, report JPU inbound.**

[JPU] **PKB TWR: Roger. Report runway in sight or missed approach. Cleared to land runway 21.**

E. Time permitting, practice approaches listed in the chart section of this lesson.

NOTE: Complete Discussion Lesson 3 prior to Lesson 9

LESSON 9

NEW ELEMENTS:
1. GPS 10 & 28 at KLAF
2. GPS Holding

SCHEDULE:
1. DISCUSSION
   A. GPS Approaches
2. GPS Approaches at KLAF

CHARTS:
- Enroute Chart
- KLAF GPS-10
- KLAF GPS-28

COMPLETION REQUIREMENTS: This lesson is complete when the student can successfully initialize, enter a waypoint, select a direct course to a waypoint, select and execute an approach.

ATIS: Lafayette Purdue University information PAPA, (time) zulu weather, winds calm, visibility 2 RA, ceiling 004 OVC, temp 19, dewpoint 17, altimeter 29.92, GPS and VOR-A approaches in use, aircraft landing and departing Rwy 28, on initial contact advise you have PAPA.

LAF GND: Clearance on request. *(Explain meaning)*

LAF GND: Cleared to KLAF via direct RESAW direct, climb and maintain 3000', dep 123.85, squawk 4215, taxi 28 via A cross runway 23.

LAF TWR: Cleared for takeoff, turn right direct RESAW, maintain 3000'.

LAF TWR: Contact GRISSOM APP/DEP 123.85.

GUS APP/DEP: Cleared for the GPS-10 approach at KLAF, report RESAW outbound

[RESAW] **GUS APP/DEP: Report RESAW inbound to LAF Tower 119.6.**

[RESAW] **LAF TWR: Report ONAMY**

[ONAMY] **LAF TWR: Cleared to land Rwy 10.**

(In the actual IFR world, ATC will clear an aircraft to land when they report FAF inbound. Whether they land or not is dependent on whether they meet the 3 criteria for landing off of an approach)
(Whether or not the instructor lets the student see the runway is their discretion. However, it should vary on each flight and shouldn't become such that the student can anticipate when they will and will not break out of the clouds and see the airport)

[If Missed] **LAF TWR: Contact GRISSOM APP/DEP 123.85.**

GUS APP/DEP: Report entering the hold at OGREY *(Student should ask for an EFC)*

[OGREY] **GUS APP/DEP: Expect the GPS 28 Approach in** *(EFC elapsed time).*

[EFC] **GUS APP/DEP: Cleared for the GPS 28 approach at LAF, report OGREY inbound.**

[OGREY] **GUS APP/DEP: Report ILRAY inbound to LAF Tower 119.6.**

[ILRAY] **LAF TWR: Cleared to land.**

[IF Missed] **LAF TWR: Contact GUS APP/DEP 123.85**

GUS APP: Proceed direct to POTES and I have a holding clearance advise ready to copy
(Student should climb to 2600' without being told by ATC as specified on LAF GPS-28 missed approach procedure)

[Ready to copy]: **Cleared to hold north of POTES on V-7, 2nm legs, EFC in 10 minutes.**

NOTE: MRA of 4000' at POTES does not apply with GPS. It only applies to Ground Based Navigation Signals (FAR 95.1-f)

Remaining time can be spent entering several holds at fixes using the GPS.

LESSON 10

NEW ELEMENTS: GPS approaches with LNAV

COMPLETION REQUIREMENTS: **STUDENT MUST USE GPS ONLY FOR THIS ENTIRE LESSON**.

CHARTS:

- KMCX GPS-36
- KFKR GPS-27
- KCFJ GPS-4
- Enroute Chart

ATIS: Lafayette Purdue University information PAPA, (time) zulu weather, winds calm, visibility 2 RA, ceiling 004 OVC, temp 19, dewpoint 17, altimeter 29.92, GPS and VOR-A approaches in use, aircraft landing and departing Rwy 28, on initial contact advise you have PAPA

LAF GND: Cleared to KMCX via direct, climb and maintain 3000', dep 123.85, squawk 4215.

LAF GND: Read back correct, runway 28 taxi via A, cross runway 23.

LAF TWR: Cleared for takeoff runway 28, turn right on course, maintain 3000'.

LAF TWR: Contact GRISSOM APP/DEP 123.85.

GRISSOM APP/DEP: Cleared for the GPS 36 approach at KMCX via the CEBKA transition, report CEBKA inbound

[CEBKA] **GRISSOM APP/DEP: Change to advisory frequency is approved, report cancellation on the ground or in the air this frequency.**

[If Missed] **GRISSOM APP/DEP: Proceed direct to KFKR airport.**

[Reposition for GPS 27 at KFKR] **GRISSOM APP/DEP: Proceed direct to WONPU, cleared for the GPS 27 approach at KFKR, Report WONPU inbound.**
[Changed ETAGE to WONPU to reflect chart change]
[WONPU] **GRISSOM APP/DEP: Change to advisory frequency is approved, report cancellation on the ground or in the air this frequency.**

[If Missed] **GRISSOM APP/DEP: Proceed direct to KCFJ airport**

[Reposition for GPS 4 at KCFJ] **GRISSOM APP/DEP: Proceed direct to ALLOE, cleared for the GPS 4 approach at KCFJ, Report ALLOE inbound.**

[ALLOE] **GRISSOM APP/DEP: Change to advisory frequency is approved, report cancellation on the ground or in the air this frequency.**

LESSON 11

NEW ELEMENTS: Use of Autopilot to accomplish GPS Approaches

COMPLETION REQUIREMENTS: This lesson is complete when the student can successfully utilize the autopilot from 400' AGL after takeoff (minimum altitude on climbout for autopilot initiation) until Missed Approach Point on respective approaches.

ATIS: Lafayette Purdue University information PAPA, (time) zulu weather, winds calm, visibility 2 RA, ceiling 004 OVC, temp 19, dewpoint 17, altimeter 29.92, GPS and VOR-A approaches in use, aircraft landing and departing Rwy 28, on initial contact advise you have PAPA

CHARTS:

- KLAF GPS-10
- KLAF GPS-28
- KMCX GPS-36
- Enroute chart

LAF GND: Cleared to KLAF via direct RESAW direct, climb and maintain 3000', dep 123.85, squawk 4215.

LAF GND: Read back correct, runway 28 taxi via A, cross runway 23.

LAF TWR: Cleared for takeoff runway 28, turn right direct RESAW, maintain 3000'.

LAF TWR: Contact GRISSOM APP/DEP 123.85.

GRISSOM APP/DEP: Cleared for the GPS-10 approach at KLAF, report RESAW outbound

[RESAW] **GRISSOM APP/DEP: Report RESAW inbound to LAF Tower 119.6.**

[RESAW] **LAF TWR: Report ONAMY**

[ONAMY] **LAF TWR: Cleared to land Rwy 10.**

[If Missed] **LAF TWR: Contact GRISSOM APP/DEP 123.85.**

GRISSOM APP/DEP: Report entering the hold at OGREY *(Student should ask for an EFC)*

[OGREY] **GRISSOM APP/DEP: Expect the GPS 28 Approach in** *(EFC elapsed time).*

[EFC] **GRISSOM APP/DEP: Cleared for the GPS 28 approach at LAF, report OGREY inbound.**

[OGREY] **GRISSOM APP/DEP: Report ILRAY inbound to LAF Tower 119.6.**

[ILRAY] **LAF TWR: Cleared to land.**

[IF Missed] **LAF TWR: Contact GRISSOM APP/DEP 123.85**

GRISSOM APP/DEP: Cleared to KMCX via direct, climb and maintain 3000', dep 123.85, squawk 4215, taxi 28.

LAF TWR: Cleared for takeoff, turn left direct KMCX, maintain 3000'.

LAF TWR: Contact GRISSOM APP/DEP 123.85.

GRISSOM APP/DEP: Cleared for the GPS 36 approach at KMCX via the CEBKA transition, report CEBKA inbound

[MONON] **GRISSOM APP/DEP: Change to advisory frequency is approved, report cancellation on the ground or in the air this frequency.**

LOC/ILS LESSON

Complete Discussion Lesson 4 prior to Lesson 12.

LESSON 12

NEW ELEMENTS:

1. Localizer holding at EARLE
2. ILS approaches

ATIS: Lafayette Purdue University information FOXTROT, (time) zulu weather, winds calm, visibility 1½BR, ceiling 004 OVC, temp 19, dewpoint 17, altimeter 29.92, GPS and VOR-A approaches in use, aircraft landing and departing Rwy 28, on initial contact advise you have PAPA

CHARTS:

- KLAF ILS-10
- Enroute chart

SCHEDULE:

1. DISCUSSION
    A. Localizer holding
        i. Emphasize sensitivity of localizer in comparison to VOR
    B. ILS approaches
        i. Aircraft configuration
        ii. Rate of descent for glideslope
2. LOCALIZER HOLDING at EARLE
    A. Each entry
    B. 1 full pattern for each entry

LAF TWR: Cleared for takeoff runway 10, direct EARLE, maintain 2600, contact approach 123.85 level 2600.

GRISSOM APP/DEP: Cleared to hold (direction) of (fix) on the localizer 1 minute (direction) turns, EFC ___, time now ___, report entering the hold.

3. 1 LAF ILS-10 approach via radar vectors
    A. Preposition away from localizer
    B. Vectors to a 30° intercept 3 miles from EARLE
    C. Missed approach if full scale deflection of localizer minimums

GRISSOM APP/DEP: Fly heading of ___, this will be radar vectors for the ILS 10 approach to LAF... *(Update heading for a 30° intercept at 3 NM from the OM)*

[Last heading] **GRISSOM APP/DEP: Upon intercepting the localizer, you are cleared for the ILS 10 approach. Missed approach instruction will be a right turn direct EARLE maintain 2300. Contact TWR 119.6 EARLE inbound**

[EARLE] **LAF TWR: Cleared to land runway 10.**

[If Missed] **LAF TWR: Contact GRISSOM APP/DEP 123.85**

GRISSOM APP/DEP: Proceed direct EARLE, maintain 2600 report EARLE outbound

[EARLE outbound] **GRISSOM APP/DEP: Cleared for the ILS 10 approach, report EARLE inbound to TWR 119.6.**

[EARLE inbound] **LAF TWR: Cleared to land**

4. LAST LAF ILS-10 approach
    A. Hold on the localizer for an approach from the hold
    B. Can request another lap if not ready

[If Missed] **GRISSOM APP/DEP: Proceed direct EARLE, contact GRISSOM APP/DEP 123.85.**

GRISSOM APP/DEP: Cleared to hold on the localizer 1 minute (direction) turns, EFC ___, time now ___, Expect the ILS 10 approach, Report entering the hold.

[Hold] **GRISSOM APP/DEP: Cleared for the ILS 10 approach, contact TWR 119.6 EARLE inbound.**

[EARLE] **LAF TWR: Cleared to land Rwy 10**

LESSON 13

NEW ELEMENTS: None (can do one ILS w/ autopilot if desired)

ATIS: Lafayette Purdue University information FOXTROT, (time) zulu weather winds calm, visibility 1½BR, ceiling 004 OVC, temp 6, dewpoint 4, altimeter 29.92, landing and departing Rwy 10 ILS 10 approach in use, on initial contact advise you have FOXTROT.

CHARTS:

- KLAF ILS-10

LAF GND: Cleared to KLAF via direct EARLE direct, climb maintain 2600, dep 123.85, squawk 4222.

LAF GND: Read back correct, taxi runway 10 via B C.

LAF TWR: Cleared for takeoff runway 10, right turn direct EARLE, maintain 2600.

LAF TWR: Contact Grissom 123.85.

GRISSOM APP/DEP: Cleared for the ILS 10 approach, report EARLE inbound to TWR 119.6.

[EARLE inbound] **LAF TWR: Cleared to land runway 10.**

[If Missed] **LAF TWR: Contact GRISSOM APP/DEP.**

Repeat as many times as lesson will allow. Instructor may choose to give Vectors for one or two of the ILS approaches.

GRISSOM APP/DEP: Turn (left/right) heading ____ radar vectors ILS runway 10 appraoch. (Vector onto the localizer as necessary)

Review Lessons

LESSON 14

NEW ELEMENTS: None

ATIS: Lafayette Purdue University information CHARLIE (time) zulu weather, winds 03010KT, visibility 2 BR, ceiling 004 OVC, temp 7, dewpoint 5, altimeter 29.92, landing and departing Rwy 5 and Rwy 10, VOR, GPS, and ILS approaches in use, on initial contact advise you have CHARLIE.

CHARTS:

- KLAF ILS-10
- KLAF GPS-28
- Enroute chart

LAF GND: Cleared direct to VAGES intersection, maintain 3000, dep 123.85, squawk 4223.

LAF GND: Read back correct, taxi runway 5 via B, cross runway 10.

SCHEDULE:

1. INTERSECTION HOLDING at VAGES
    A. Start with the use of the GPS
    B. Go to Dual nav with and without DME from GPS

LAF TWR: Cleared for takeoff runway, left turn on course, contact departure level 2600.

[2600] **GRISSOM APP/DEP: Cleared to hold NW of VAGES on V-24 (DME distance) mile legs (direction) turns, EFC ___, time now ___, report entering the hold.**

[Hold] **GRISSOM APP/DEP: Expect the ILS 10 approach to LAF in 10 min.**

2. LAF ILS-10 approach from the hold

[EFC] **GRISSOM APP/DEP: Cleared for the ILS 10 approach via the VAGES transition, contact tower 119.6 EARLE inbound.**

[EARLE] **LAF TWR: Cleared to land**

[If Missed] **LAF TWR: Contact GRISSOM APP/DEP 123.85.**

3. 1 LAF VOR-A approach

GRISSOM APP/DEP: Radar contact (distance and direction from LAF), report BVT. Expect the VOR-A approach.

[BVT] **GRISSOM APP/DEP: Cleared for the VOR-A approach, report BATLE to the TWR 119.6. Current LAF weather OVC005, visibility 3 miles.**

[BATLE] **LAF TWR: Report field in sight or missed approach, missed approach instructions are a left turn to 090º, climb and maintain 3000.**

GRISSOM APP/DEP: Fly heading 090º, maintain 3000, intercept V-51 to OCKEL. Report V-51.

[V-51] **GRISSOM APP/DEP: Cleared to hold SE of OCKEL on V-51, report entering the hold.** *(1 min legs and RH turn implied)*

[Hold] **GRISSOM APP/DEP: EFC in 5 minutes**

4. 1 LAF GPS-28 approach

[EFC] **GRISSOM APP/DEP: Proceed direct JEPFE, expect the GPS 28 approach, report JEPFE inbound.**

[JEPFE] **GRISSOM APP/DEP: Cleared for the GPS 28 approach, report OGREY inbound**

[OGREY] **GRISSOM APP/DEP: Contact TWR 119.6 ILRAY inbound**

[ILRAY] **LAF TWR: Cleared to land runway 28**

[If Missed] **LAF TWR: Contact departure 123.85.**

5. ILS approaches

GRISSOM APP/DEP: Radar contact (distance and direction from LAF), proceed direct to EARLE, report EARLE outbound

[EARLE] **GRISSOM APP/DEP: Cleared for the ILS 10 approach, report EARLE inbound to the TWR 119.6**

[EARLE] **LAF TWR: Cleared to land runway 10** (continue to execute ILS approaches until session is over.)

LESSON 15

OBJECTIVE:

1. Complete a simulated stage check and follow clearances without any help.
2. Complete *at least one* of each of the different types of approaches with a hold included somewhere during the period

ATIS: Lafayette Purdue University information GULF, (time) zulu weather, winds 20010KT, visibility 1 SN, ceiling 004 OVC, temp M03, dewpoint M05, altimeter 29.92, VOR-A approach in use, aircraft landing and departing runway 28.

LAF GND: Cleared to the ___ Airport via ____, climb and maintain 3000, departure frequency, Grissom 123.85, squawk 4323.

LAF GND: Read back correct, runway 28 taxi via A, cross runway 23.

LAF TWR: Proceed on course, cleared for takeoff runway 28, maintain 3000.

LAF TWR: Contact departure

SCHEDULE:

1. GROUND OPERATIONS
2. DEPARTURE PROCEDURES
3. HOLDING
4. VOR-A @ KLAF
5. GPS-4 @ KCFJ
6. GPS-28 @ KLAF
7. ILS-10 @ KLAF via Procedure Turn
8. ILS-10 @ KLAF via Radar Vectors

*SEE AT 210 ELECTRONIC STAGE CHECK FORM
*NO PARTIAL PANEL OR EMERGENCIES
*WIND LESS THAN 10 KNOTS DIRECT CROSSWIND

COMPLETION REQUIREMENTS: This lesson is complete when the student has flown the maneuvers and has a minimum of 24.0 hours in the course.

LESSON 16

STAGE CHECK:

1. GROUND OPERATIONS
2. DEPARTURE PROCEDURES
3. HOLDING
4. VOR APPROACH
5. GPS APPROACH
6. ILS APPROACH

*SEE AT 210 ELECTRONIC STAGE CHECK FORM
*NO PARTIAL PANEL OR EMERGENCIES
*WIND LESS THAN 10 KNOTS DIRECT CROSSWIND

AT-21000 Ground Trainer I Stage Check

The purpose and objective of the AT-21000 stage check is to determine that the student has adequately developed basic attitude instrument skills and can properly hold and execute instrument approaches.

The student shall complete all items to the satisfaction of the check instructor. At the instructor's discretion, he/she may provide remedial training for up to three, non-safety related, items. Providing remedial training will lower the stage check grade by one letter grade.

The stage check instructor will issue an IFR clearance to one of the following navigation facilities or intersections: The Boiler VOR, the OCKEL intersection, the VAGES intersection or the POTES intersection. The student will then be issued holding instructions for the appropriate fix.

The student must accomplish three instrument approaches as follows:

- An ILS approach
- A GPS approach (without LPV)
- A VOR approach

The entire stage check must be completed with all instruments available (no partial panel).

The winds used for the stage check must not exceed 10 knots in velocity.

The stage check instructor must use the AT-21000 Stage Check electronic record keeping system to record detailed results of the stage check.

AT-21000 Stage Check Record

Stage Check

Item	Points Possible	Points Given	Remarks
Ground Operations			
A. Cockpit organization	5		
B. Copying clearance and readback	5		
C. Radio set up	5		
Departure Procedures			
A. Proper technique relative to power and landing gear	10		
B. Aircraft Control (heading, bank, altitude, etc.)	5		
C. Communications	5		
D. Compliance with the clearance	10		
E. Tracking technique	5		
Holding			
A. Proper Entry	15		
B. Completion of the 5 T's	10		
C. Navigation radio set up	15		
D. Adjustments for wind and time	20		
E. Altitude control	15		
GPS Approach			
A. Navigation radio set up (primary and secondary)	10		
B. Approach course tracking	20		
C. Approach procedures (5 T's and 4 T's)	20		
D. Altitude	10		
E. Communications/Callouts	15		
F. Adjustments for wind and time (if applicable)	15		
G. Missed approach procedures (if applicable)	15		
VOR Approach			
A. Navigation radio set up (primary and secondary)	10		
B. Approach course tracking	20		
C. Approach procedures (5 T's and 4 T's)	20		
D. Altitude	10		
E. Communications/Callouts	15		
F. Adjustments for wind and time (if applicable)	15		
G. Missed approach procedures (if applicable)	15		
ILS Approach			
A. Navigation radio set up (primary and secondary)	10		
B. Approach course tracking	20		
C. Approach procedures (5 T's and 4 T's)	20		
D. Altitude/Glideslope	10		
E. Communications/Callouts	15		
F. Adjustments for wind and time (if applicable)	15		
G. Missed approach procedures (if applicable)	15		
Basic Instrument			
A. Altitude	10		
B. Heading	10		
C. Coordination	10		
D. Bank	10		

Figure 7.4 AT-210 Stage Check Electronic Record

APPENDIX

Basic Attitude Instrument Flying

Objective: Maneuvering the aircraft solely by reference to the instruments.

Elements: Crosscheck or scan, instrument interpretation, aircraft control, fixation, omission, emphasis, primary instruments, secondary instruments, pitch control, bank control, power instruments, trim control.

Equipment: Airplane, view limiting device, instrument approach charts, enroute charts.

Instructor Actions:

Instrument Skills

Crosscheck or scan – continuous and logical observation of instruments for attitude and performance information. Star pattern or Oval pattern most common. Triangle pattern necessary when crosschecking bank and pitch.

Common errors in scan

- Fixation: staring at a certain instrument (usually A/I)
- Omission: leaving an instrument out of the scan (usually the turn coordinator, A/S, or VSI)
- Emphasis: placing too much trust in just one instrument and believing it over all others (usually A/I)

Instrument interpretation – simply put, it means reading and understanding what the instruments are trying to tell you.

Aircraft control – maneuvering the airplane to correct for deviations in instruments by means of pitch, bank, power, and trim.

Vertigo

Simply put, vertigo is not knowing which way is up. The most common reason is rapid head movements inside the cockpit, but can be caused to misalignment of cilia inside inner ear. Only cure is to rely on instruments until balance can be regained.

Pitch Instruments

Level Altitude

- Primary: Altimeter
- Secondary: Airspeed, Attitude Indicator, Vertical Speed Indicator

Climbing or Descending

- Primary: Airspeed
- Secondary: Altimeter, Attitude Indicator, Vertical Speed Indicator

Descending on Glide Slope (Either ILS or LPV)

- Primary: Glide Slope
- Secondary: Airspeed, Altimeter, Attitude Indicator, Vertical Speed Indicator

Bank Instruments

Holding Heading

- Primary: Horizontal Situation Indicator
- Secondary: Attitude indicator, Turn Coordinator

Turning

- Primary: Turn Coordinator/Attitude Indicator
- Secondary: Heading Indicator

Power Instruments – % Power, Manifold Pressure, airspeed

Primary Instruments – Instrument which provides the most pertinent and essential information with regard to pitch, bank, and power control. Usually the instrument that remains constant.
Secondary Instruments – Those instruments that confirm the information from the primary and can be used as a crosscheck.

Controlling aircraft – mention techniques for proper control of aircraft with reference to pitch, bank, power, and especially trim.

An emphasis of "flying the airplane with trim" should be emphasized. With access to electric trim a change in attitude should be accomplished by either a trim change alone or a combination of a trim and control deflection change.

Common Errors:

- Holding onto the yoke too firmly
- Misreading the magnetic compass thereby turning the wrong way
- Reacting too quickly and initiating the wrong control input

Completion Standard:

At the end of this lesson, the student should have a basic understanding of attitude instrument flying, all equipment utilized and common errors involved.

Holding

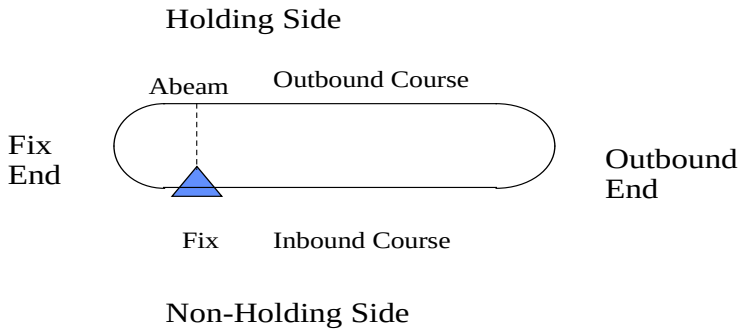
Objective: Predetermined oval shaped maneuver which keeps aircraft within specified airspace while awaiting further clearance from ATC. Usually to account for ATC delays, but can be used for emergencies.

Elements: Components of hold, entering a hold, flying hold, clearance to hold

Components of hold:

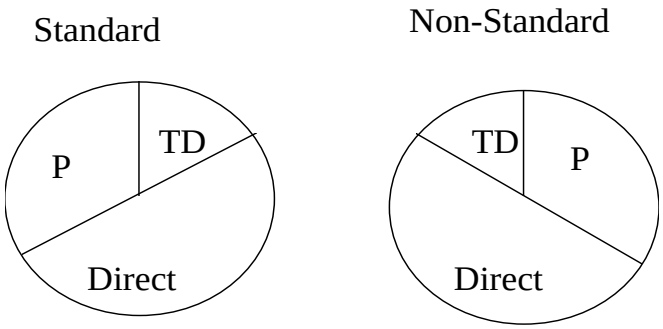
- Fix: Can be located over a VOR, NDB, DME fix, enroute waypoint, or Intersection
- Inbound Course: Always track this course no matter what it may be

- Outbound Course: Just hold a heading. Twice the wind correction of the inbound course. Adjust the distance of outbound course to make inbound desired time
- Abeam Fix: Location where time is started for outbound leg. Can be FROM-TO, DME distance, or wings level
- Fix Turn and Outbound Turn: Those turns located on either end of the hold
- Holding and Non Holding Side: The side of the course that the turns are made on.
- Standard Hold: Inbound leg of 1 minute and right hand turns @ or below 14,000
- Nonstandard Hold: Inbound leg of 1 minute and left hand turns @ or below 14,000. Inbound leg is 1.5 minutes when above 14,000'



Entering a hold:

Three types based on present heading and outbound course. Can choose entry if outbound course lies within 10º of two entry procedures.



Teardrop:

1. When approaching holding fix from front and nonhold side
2. Turn 30º + wind correction to outbound course for 1 minute
3. After 1 minute, turn towards inbound course to reintercept

Parallel:

1. When approaching holding fix from front and holding side
2. Turn to outbound heading + wind to parallel inbound course for 1 minute
3. Turn towards holding side of hold and reintercept inbound course

Direct:

1. Approaching hold from behind
2. After crossing fix, turn to outbound heading and continue hold

5 T's: Time, Turn, Throttle, Tune, Talk

Flying Hold:

Timing: Total is approximately 4 minutes.

1. Inbound one minute
2. Outbound 1 minute + wind correction
3. 2 standard rate turns for one minute
4. Begin time at 1st complete "FROM-TO" reversal or wings level outbound

Discuss procedure when doing DME legs

Wind Correction:

1. Double inbound correction on outbound leg

Draw shape of hold with left and right x-wind

Airspeeds:

Prop: 175 KIAS Jets: ≤14,000' – 230 KIAS
>14,000' – 265 KIAS

Clearance to Hold:

1. Direction in relation to fix (a common reason for checkride failure)
2. Fix
3. Radial, Airway, or Course
4. Leg length if DME
5. Direction of turns (Right turns if none is specified)
6. EFC (Used in case of communication failure)

Common Errors:

- Incorrect setting of Nav equipment (OBS and frequency)
- Incorrect entry
- Improper wind correction
- Forgetting to start outbound time
- Poor positional awareness

AT-21100 COURSE II SYLLABUS

TABLE OF CONTENTS

GROUND TRAINER COURSE II
STUDENT COURSE OUTLINE

In this ground trainer course the student will become operationally proficient at basic attitude instrument flying, VOR approaches, ILS approaches, GPS approaches and cross country flying. There are four cross country flights included in this course.

THERE ARE ALSO TWO DISCUSSION LESSONS (minimum 1.5hrs each) INCLUDED IN THE COURSE OUTLINE THAT MUST BE SCHEDULED DURING EXTRA PERIODS OTHER THAN THE REGULAR SCHEDULED GROUND TRAINER TIMES. THESE LESSONS MUST BE LOGGED IN THE STUDENT LOGBOOK.

The time, in minutes, is given in parentheses beside each maneuver to indicate to the student/instructor how much time should be spent on each maneuver. (Times are approximate and may be altered slightly to fit individual student needs.)

It is intended that this outline be followed as closely as possible. Any deviation from this outline must be immediately reported to the Chief Flight Instructor or his/her designee by the student or the flight instructor.

It is mandatory that the student and the instructor begin each session on time. A minimum of 1.4 hours should be logged in each session. This will give a total of 25.0 hours during the course. Any missed sessions MUST be made up. **All lesson material must be completed to the satisfaction of the instructor.**

AT-21100 BRIEF LESSION BY LESSON GUIDE

DISCUSSION LESSON 1: Review of Course Content
DISCUSSION LESSON 2: IFR Cross-Country Planning Procedures
LESSON 1: Basic Attitude Instrument Flying/ VOR/GPS Holding and Approaches
LESSON 2: Review of VOR, GPS, and ILS approaches
LESSON 3: Localizer Holding and ILS Approaches
LESSON 4: GPS Approaches
LESSON 5: Partial Panel Turns and Partial Panel Approaches
LESSON 6: Partial Panel Approaches
LESSON 7: IFR X-C to OKK and Return
LESSON 8: GPS X-C to FWA and Return
LESSON 9: IFR X-C to DNV and Return
LESSON 10: IFR X-C to IND and Return
LESSON 11: Multiple Instrument Approaches with Abnormalities
LESSON 12: Multiple Instrument Approaches with Abnormalities
LESSON 13: Multiple Instrument Approaches with Abnormalities
LESSON 14: Final Review
LESSON 15: Simulated Stage Check
LESSON 16: AT-211 Stage Check

DISCUSSION LESSONS

DISCUSSION LESSON 1: REVIEW OF COURSE CONTENT (1.5 minimum)

*See the Safety & Procedures Manual for standardized procedures

CONTENT:

1. Course expectations and course overview, and attendance, including cancellation fee.
2. Completion of the descent/approach checklist and planning for the approach
3. 5 Ts at the initial approach fix.
4. Angles for intercepting inbound and outbound courses
5. Times inbound and outbound
6. Headings to correct for wind
7. 4 Ts at the Final approach fix
8. Responsibilities after the FAF
9. Plans for reaching MDAs
10. PTS or ACS, as applicable, Tolerances for approaches
11. Missed approach sequence of events (configuring a/c)
12. Holding Procedures
    A. Pattern Entry
    B. Standard versus non-standard procedures
    C. 5Ts and EFC usage
    D. Wind adjustments for 1 min inbound leg
    E. Wind adjustments for outbound heading
    F. Holding on localizer, VOR, GPS

COMPLETION REQUIREMENTS: At the end of this lesson the student will have a working knowledge of the material in this lesson. **This lesson must be completed prior to starting any other lesson.**

DISCUSSION LESSON 2: IFR CROSS COUNTRIES (1.5 minimum)

CONTENT:

1. Discussion of the material that should be available for planning an IFR cross country
    A. Notepad or clipboard
    B. Pens or pencils (plural)
    C. Current print out of all weather reports appropriate to the flight
    D. Cross country navigation log and flight planning sheet
    E. Enroute charts and approach plates appropriate for the flight (including alternates)
    F. SID and STAR plates for route
    G. VFR sectional chart
    H. Flight Computer
2. Weather Briefing for IFR flight
    A. Obtain an official WX briefing
    B. Know the synoptic weather pattern(s) affecting the flight
    C. Prog. Charts
    D. 500, 700, 850 mb charts

E. Determine areas of IFR, MVFR, and VFR from weather depiction
F. Determine significant weather from radar summary
G. During thunderstorm season, consult stability charts (Lifted/K Index)
H. Review appropriate area forecasts
I. Review terminal forecasts
J. Review sequence reports
K. Determine forecast winds aloft
L. Check NOTAMS and FDC NOTAMS
M. File Flight Plan

3. Route – the following should be checked before determining the filed route
   A. Check the route for airspace restrictions
   B. Check the AFD for low alt. preferred routing
   C. Plan the route of flight from departure airport to an IAF
   D. Assume the transition from the airport to the route to be the most expeditious. Specific departure instruction will be issued by the tower
   E. File the most direct route using airways when possible
   F. When 2 airway routes are provided between airports, use the right hand rule
   G. Off airway direct routing may be filed to VOR, VORTAC, or VOR/DME stations with 25 or 40 mile range (T, L, H)
   H. GPS only in radar environment
4. Altitude
   A. Check MEA, MRA, MCA, MOCA
   B. Check enroute weather and winds
   C. Compare distance traveled versus time to climb
   D. For direct routing, select an altitude which is 1000 feet above the highest obstruction with a horizontal distance of five statute miles from course flown (2000 feet mountainous).
5. Discussion about filing out a flight plan – include alternate requirements and alt. min. – also flight plans are good for two hours after ETD.

INSTRUMENT FLYING LESSONS

LESSON 1

OBJECTIVE

1. Be familiar with course objectives
2. Review basic attitude instrument skills
3. ALL AIRSPEEDS, ALTITUDES, and HEADINGS for AT 211
    A. Airspeeds within 10 knots of desired
    B. Altitudes within 100 feet
    C. Headings within 10 degrees
4. B PATTERN
5. VOR HOLDING
    A. Intersection
    B. Station
    C. Nonstandard
6. VOR APPROACHES
    A. 1 LAF VOR-A
    B. 1 50I VOR-A
    C. 1 LAF GPS-10

NEW ELEMENTS: none

CHARTS:

- KLAF VOR-A
- 50I VOR-A
- KLAF GPS-10
- Enroute Chart

SCHEDULE

1. DISCUSSION
    A. Route of flight
2. ABNORMALS
    A. GPS failure holding at POTES
    B. Hot mag on run-up

ATIS: Lafayette Purdue University information PAPA (time) ZULU weather, wind 28015KT, 3 BR, 005 OVC, temp 12, dewpoint 11, altimeter 29.92, landing and departing runway 28, VOR-A approach in use, on initial contact advise you have PAPA.

LAF GND: Cleared to the POTES intersection via radar vectors, climb and maintain 3000', departure frequency is 123.85, squawk 4112.

LAF GND: Read back correct, taxi runway 28 via A, cross runway 23.

LAF TWR: Turn left heading 270, maintain 3000. Cleared for takeoff runway 28.

3. "B" Pattern

(After "B" Pattern) **GRISSOM APP/DEP: Fly heading ___ to intercept V-7, climb and maintain 3000 feet, report intercepting V-7.**

4. HOLDING at POTES

The primary means of identifying a fix for holding WILL be with the use of GPS. The secondary means will be with VORs. Both methods will be practiced during this exercise. The instructor will have the student enter the hold first with the GPS and then reposition for a hold entry with crossing radials from the VORs.

(V-7) **GRISSOM APP/DEP: I have a holding clearance, advise when ready to copy ... cleared to hold south of POTES on V-7, Left turns, 1 minute legs, EFC 10 min., time now ____.**

(Fail GPS)

(EFC – after both holds) **GRISSOM APP/DEP: Cleared V-7 to BVT, upon reaching BVT, hold as published on the VOR-A approach to LAF, expect the VOR-A approach in 15 minutes, time now ___.***(Preposition 4 NM from BVT on V-7, Restore GPS)*

(BVT) **EFC in 10 minutes ... Cleared for the VOR-A approach report BATLE to the TWR 119.6.**

(BATLE) **LAF TWR: Report field in sight or missed approach, expect the VOR-A approach to Kentland.**

5. VOR and GPS APPROACHES
   A. Kentland VOR-A approach with no DME from GPS
   B. GPS-10 at LAF

(Reposition 5nm from BVT)

(BVT) **GRISSOM APP/DEP: Missed approach will be direct EXSAT, maintain 2600. Frequency change approved, report cancellation on the ground or in the air this frequency.**

(If Missed) **GRISSOM APP/DEP: Current Lafayette winds are 27020KT (change winds). Proceed direct EXSAT. Maintain 2600, Expect the GPS 10 at LAF via the EXSAT transition.**

(Reposition 5nm from EXSAT)

GRISSOM APP/DEP: Radar Contact. Cleared for the GPS 10 Approach to LAF, report EXSAT inbound.

(EXSAT) **GRISSOM APP/DEP: Report RESAW inbound to LAF TWR, 119.6.**

(RESAW) **LAF TWR: Report ONAMY inbound.**

(ONAMY) **LAF TWR: Cleared to Land Rwy 10** *(The student needs to understand that they can only land IF they get the field in sight, have the required visibility, and are in a position to land – LAF TWR assumes all of this will happen)*

LESSON 2

NEW ELEMENTS: none

ATIS: Lafayette Purdue University information PAPA, (time) zulu weather, winds calm, visibility 2RA, ceiling 004 OVC, temp 19, dewpoint 17, altimeter 29.92, GPS and VOR-A approaches in use, aircraft landing and departing Rwy 10, Rwy 28 and Rwy 23, on initial contact advise you have PAPA

CHARTS:

- KLAF GPS-10
- KFKR GPS-27
- KLAF ILS-10
- Enroute Chart

LAF GND: Clearance on request. *(Re-Explain meaning if necessary)*

LAF GND: Cleared to KLAF via direct RESAW direct, climb and maintain 3000', dep 123.85, squawk 4215,

LAF GND: Read back correct, runway 28 taxi via A, cross runway 23.

LAF TWR: Cleared for takeoff runway 28, direct RESAW, maintain 3000'.

LAF TWR: Contact GRISSOM APP/DEP 123.85.

GRISSOM APP/DEP: Cleared for the GPS-10 approach at KLAF, report RESAW outbound

[RESAW] **GRISSOM APP/DEP: Report RESAW inbound to LAF Tower 119.6.**

[RESAW] **LAF TWR: Report ONAMY**

[ONAMY] **LAF TWR: Cleared to land Rwy 10.**

(Again – In the actual IFR world, ATC will clear an aircraft to land when they report FAF inbound on a straight in approach. Whether they land or not is dependent on whether they meet the 3 criteria for landing off of an approach)

(Whether or not the instructor lets the student see the runway is their discretion. However, it should vary on each flight and shouldn't become such that the student can anticipate when they will and will not break out of the clouds and see the airport)

[If Missed] **LAF TWR: Contact GRISSOM APP/DEP 123.85.**

GRISSOM APP/DEP: Proceed direct to KFKR airport.

[Reposition for GPS 27 at KFKR] **GRISSOM APP/DEP: Proceed direct to WONPU, cleared for the GPS 27 approach at KFKR, Report WONPU inbound.**

[WONPU] **GRISSOM APP/DEP: Change to advisory frequency is approved, report cancellation on the ground or in the air this frequency.**

[If Missed] **GRISSOM APP/DEP: Proceed direct to BVT and expect the VOR-A approach to KLAF**

[Reposition for VOR-A at KLAF] **GRISSOM APP/DEP: Cleared for the VOR-A approach. Report BATLE inbound to the tower 119.6.**

[BATLE] **LAF TWR: Report field in sight or missed approach**

[If Missed] **LAF TWR: Contact GRISSOM APP/DEP on 123.85.**

GRISSOM APP/DEP: Proceed direct EARLE, cleared for ILS 10, contact LAF TWR 119.6 EARLE inbound.

(EARLE) **LAF TWR: Cleared to land Rwy 10**

LESSON 3

OBJECTIVE

1. To increase proficiency at localizer and ILS procedures
2. LOCALIZER HOLDING
3. ILS APPROACHES
4. LOCALIZER BACKCOURSE APPROACHES

CHARTS:

- KLAF ILS-10
- KHUF LOC BC-23
- Enroute Chart

NOTE: In this lesson, the Auto Pilot must be used for one of the approaches.

SCHEDULE

1. DISCUSSION
    A. Localizer backcourse approaches
2. ABNORMALS
    A. Fail COM radios during holding if student does not request EFC

ATIS: Lafayette Purdue University Information ECHO, (time) Zulu, winds 17012KT, ¾ FG, measured ceiling 002 OVC, temperature 10, dewpoint 10, altimeter 29.92, aircraft landing and departing Rwy 10, ILS 10 approach in use, on initial contact advise you have ECHO.

LAF GND: Cleared direct EARLE, climb and maintain 3000', departure frequency 123.85, squawk 3123.

LAF TWR: Cleared for takeoff, right turn direct EARLE, climb and maintain 3000'.

LAF TWR: Contact GRISSOM APP/DEP 123.85.

3. LOCALIZER HOLDING at EARLE
    A. Standard and nonstandard

GRISSOM APP/DEP: Radar contact 1 NM west of LAF, holding clearance advise ready to copy

GRISSOM APP/DEP: Cleared to hold west of EARLE on the localizer, report entering the hold. *(2 turns in the hold)*

(The student should request an EFC. If the student does not request an EFC, fail radios)

(After first hold, Preposition 4nm southwest of EARLE for a direct entry to hold)

GRISSOM APP/DEP: Cleared to hold west of EARLE on the localizer, left hand turns, expect the ILS 10 to LAF, report entering the hold. *(2 turns in the hold)*

(The student should request an EFC. If the student does not request an EFC, fail radios)

4. 2 LAF ILS-10 approaches

(EFC) **GRISSOM APP/DEP: Cleared for the ILS 10 approach from the hold, contact LAF TWR 119.6 EARLE inbound.**

(EARLE) **LAF TWR: Cleared to land Rwy 10.**

(If Missed) **LAF TWR: Contact GRISSOM APP/DEP 123.85.**

GRISSOM APP/DEP: Proceed direct EARLE, cleared for ILS 10, contact LAF TWR 119.6 EARLE inbound.

(EARLE) **LAF TWR: Cleared to land Rwy 10.**

(If Missed) **LAF TWR: Contact GRISSOM APP/DEP 123.85.**

GRISSOM APP/DEP: Radar contact proceed direct to KHUF.

HUF ATIS: Terre Haute International Airport-Hulman Field Information TANGO, (time) Zulu, winds 16018KT, ¾ FG, ceiling 003 OVC, temperature 10, dewpoint 10, altimeter 29.92, aircraft landing and departing Rwy 23, LOC BC Runway 23 approach in use, on initial contact advise you have TANGO

(Once proceeding Direct to KHUF) **GRISSOM APP/DEP: Contact Hulman Approach 125.45**

5. HUF LOC BC-23 approach
   A. Winds 16018KT

(Preposition 7 NM from TTH R-030 heading 180)

HUF APP: Radar contact 7 NE of HUF VOR, This will be radar vectors to the LOC BC 23 approach.

(Vector for a 30 degree intercept 3 mi. from HUF)

HUF APP: You are 3 NE of TTH VOR upon intercepting the localizer, cleared for the LOC BC 23 approach contact Hulman TWR, 118.3, TTH inbound.

(TTH inbound) **HUF TWR: Cleared to land Rwy 23.**

(If Missed) **HUF TWR: Maintain 3000', contact APP 125.45.**

HUF APP: Radar contact 1 N of Hulman Regional, this will be vectors for the LOC BC 23 approach.

HUF APP: You are 3 NE of TTH VOR upon intercepting the localizer, cleared for the LOC BC 23 approach contact Hulman TWR, 118.3, TTH inbound.

HUF TWR: Cleared to land Rwy 23.

LESSON 4

OBJECTIVE: GPS Approaches

CHARTS:

- KLAF GPS-28
- KLAF GPS-10
- Enroute Chart

NOTE: In this lesson, the Auto Pilot must be used for one of the approaches. Student should do approaches twice – once without autopilot and once with autopilot.

ATIS: Lafayette Purdue University information PAPA, (time) zulu weather, winds 26020KT, visibility 2 RA, ceiling 004 OVC, temp 19, dewpoint 17, altimeter 29.92, GPS and VOR-A approaches in use, aircraft landing and departing Rwy 28, on initial contact advise you have PAPA.

LAF GND: Cleared to KLAF via direct OGREY direct, climb and maintain 3000', dep 123.85, squawk 4215.

LAF GND: Read back correct, taxi runway 28 via A cross runway 23.

LAF TWR: Cleared for takeoff runway 28, turn right direct OGREY, maintain 3000'.

LAF TWR: Contact GRISSOM APP/DEP 123.85.

GRISSOM APP/DEP: Cleared for the GPS-28 approach at KLAF, report OGREY outbound

[OGREY] **GRISSOM APP/DEP: Report ILRAY inbound to LAF Tower 119.6.**

[ILRAY] **LAF TWR: Cleared to land Rwy 28.**

[If Missed] **LAF TWR: Contact GRISSOM APP/DEP 123.85.**

GRISSOM APP/DEP: Report entering the hold at RESAW *(Student should ask for an EFC)*

[RESAW] **GRISSOM APP/DEP: Expect the GPS 10 approach Circle to land Rwy 28 in** *(EFC elapsed time).*

[EFC] **GRISSOM APP/DEP: Cleared for the GPS 10 approach Circle to land Rwy 28 at KLAF, report RESAW inbound.**

[RESAW] **GRISSOM APP/DEP: Report ONAMY inbound to LAF Tower 119.6.**

[ONAMY] **LAF TWR: Cleared to land.**

[If Missed] **LAF TWR: Contact GRISSOM APP/DEP 123.85**

**Repeat approaches with autopilot usage

LESSON 5

OBJECTIVE

1. PARTIAL PANEL TURNS
2. PARTIAL PANEL HOLDING
3. PARTIAL PANEL APPROACHES
    A. 2 LAF VOR-A
    B. LAF GPS-10 circle to land Rwy 28
    C. LAF GPS-28 circle to land Rwy 10

CHARTS:

- KLAF VOR-A
- KLAF GPS-10
- KLAF GPS-28
- Enroute Chart

ATIS: Lafayette Purdue University information LIMA (time) zulu, winds 11014KT, 2 RA, 004 OVC, temp 4, dewpoint 4, altimeter 29.92, landing and departing Rwy 28, ILS, GPS, NDB and VOR approaches in use, on initial contact advise you have LIMA.

SCHEDULE

1. DISCUSSION
    A. Magnetic compass turns
    B. Using timed turns in coordination with magnetic turns
    C. Route of flight – turns, holding, (2) VOR-A, GPS-10, GPS-28
2. ABNORMALS
    A. Attitude Indicator and Heading Indicator failure after takeoff (Dual AHRS failure)

LAF GND: Cleared to KLAF via BVT. Climb and maintain 3000, departure 123.85, squawk 4475, advise ready to taxi.

LAF GND: Read back correct, taxi runway 10 via B C.

LAF TWR: Cleared for takeoff runway 10.

(Fail AHRS)

3. MAGNETIC COMPASS TURNS
    A. Calibrate turn coordinator for a Std. Rate turn
    B. Have student compute rollout heading and time to turn
4. PARTIAL PANEL HOLDING
    A. VOR holding
        i. As published at BVT

GRISSOM APP/DEP: Cleared direct BVT, holding clearance advise ready to copy

GRISSOM APP/DEP: Cleared to hold as published at BVT expect the VOR-A in 10 minutes.

5. PARTIAL PANEL APPROACHES
   A. (2) LAF VOR-A APPROACH from the hold

(EFC) **GRISSOM APP/DEP: Cleared for the VOR-A approach, contact LAF TWR 119.6 BATLE inbound.**

(BATLE) **LAF TWR: Report field in sight or missed approach.**

(If Missed) **LAF TWR: Contact GRISSOM APP/DEP 123.85.**

GRISSOM APP/DEP: Proceed direct to BVT, Cleared for the VOR-A approach, Report BVT outbound

(BVT) **GRISSOM APP/DEP: Contact LAF TWR 119.6 BATLE inbound.**

(BATLE) **LAF TWR: Missed approach instructions are proceed direct RESAW, 2600 feet, report field in sight or missed approach**

(Missed) **LAF TWR: Contact GRISSOM APP/DEP 123.85.**

GRISSOM APP/DEP: Maintain 2600, report RESAW outbound.

(RESAW) **GRISSOM APP/DEP: Cleared for the GPS 10 approach circle to land Rwy 28, report RESAW inbound.**

(RESAW) **GRISSOM APP/DEP: Contact LAF TWR 119.6 ONAMY inbound.**

(ONAMY) **LAF TWR: Report field in sight or missed approach.**

(If Missed) **LAF TWR: Contact GRISSOM APP/DEP 123.85.**

GRISSOM APP/DEP: Report OGREY outbound.

(OGREY) **GRISSOM APP/DEP: Cleared for the GPS 28 approach circle to land Rwy 10. Contact LAF TWR 119.6 ILRAY inbound.**

(ILRAY) **LAF TWR: Report field in sight or missed approach**

LESSON 6

OBJECTIVE: Partial Panel GPS and VOR approaches

CHARTS:

- KMCX GPS-36
- KFKR GPS-27
- KLAF VOR-A
- Enroute Chart

ATIS: Lafayette Purdue University information PAPA, (time) zulu weather, winds calm, visibility 2RA, ceiling 004 OVC, temp 19, dewpoint 17, altimeter 29.92, GPS and VOR-A approaches in use, aircraft landing and departing Rwy 28, on initial contact advise you have PAPA

LAF GND: Cleared to KMCX via direct, climb and maintain 3000', dep 123.85, squawk 4215.

LAF GND: Read back correct, runway 28 taxi via A, cross runway 23.

LAF TWR: Cleared for takeoff runway 28, turn right direct KMCX, maintain 3000'.

LAF TWR: Contact GRISSOM APP/DEP 123.85.

GRISSOM APP/DEP: Cleared for the GPS 36 approach at KMCX via the CEBKA transition, report CEBKA inbound

[CEBKA] **GRISSOM APP/DEP: Change to advisory frequency is approved, report cancellation on the ground or in the air this frequency.**

[If Missed] **GRISSOM APP/DEP: Proceed direct to KFKR airport.**

[Reposition for GPS 27 at KFKR] **GRISSOM APP/DEP: Proceed direct to WONPU, cleared for the GPS 27 approach at KFKR, Report WONPU inbound.**

[WONPU] **GRISSOM APP/DEP: Change to advisory frequency is approved, report cancellation on the ground or in the air this frequency.**

[If Missed] **GRISSOM APP/DEP: Proceed direct to BVT**

(Reposition for VOR-A at KLAF) **GRISSOM APP/DEP: Cleared for the VOR-A approach, contact LAF TWR 119.6 BATLE inbound.**

(BATLE) **LAF TWR: Report field in sight or missed approach.**

CROSS COUNTRY LESSONS

***Lessons 7 – 10 are the Cross Country lessons. One of the lessons must utilize VOR navigation as the sole method of enroute navigation.

LESSON 7

OBJECTIVE

NOTE: In this lesson, the Auto Pilot must be used for one of the approaches

1. PLAN and FLY IFR CROSS COUNTRY
    A. LAF-OKK-LAF
2. OKK APPROACHES
    A. VOR-23 approach
    B. ILS-23 approach
3. LAF APPROACH
    A. GPS-28 approach

CHARTS:

- KOKK VOR-23
- KOKK ILS-23
- KLAF GPS-28
- Enroute Chart

NEW ELEMENTS: IFR cross country procedures

SCHEDULE

1. DISCUSSION
    A. IFR cross country planning
    B. OKK approaches
2. ABNORMALS
    A. COMM 1 failure switching to GUS DEP approaching OKK
        i. Do not answer transmission
    B. PFD failure returning to LAF
3. IFR CROSS COUNTRY

ATIS: Lafayette Purdue University information ROMEO (time) zulu weather, winds 27010KT, 1 1/2 BR, 003 OVC, temp 11, dewpoint 9, altimeter 29.92, landing and departing Rwy 28, GPS runway 28 approach in use, on initial contact advise you have ROMEO.

LAF GND: Cleared as filed to OKK airport, maintain 4000 feet expect (filed altitude) 10 minutes after departure, departure control 123.85, squawk 2543.

LAF GND: Read back correct, runway 28 taxi via A, cross runway 23.

LAF TWR: Cleared for takeoff, turn right heading 090 until receiving OKK.

LAF TWR: Contact Departure.

GRISSOM APP/DEP: Radar Contact 5 E of LAF, report 4000. When able, proceed direct OKK.

(4000) **GRISSOM APP/DEP: Contact GUS APP 121.05.** (Fail COM 1)

GUS APP: Radar Contact, Altimeter 29.92.

GUS APP: Expect radar vectors for the OKK VOR 23 approach, descend to 4000. Advise when you have the AWOS information at KOKK.

OKK AWOS: Wind 18019KT, visibility 2sm, ceiling 003 OVC, temp 15, dewpoint 14, altimeter 29.92.

(Wait for student to ask for lower than 4000)

(Vector for a 30° intercept to a 5 NM final approach)

GUS APP: Cleared for the OKK VOR 23 approach.

(If Missed) **GUS APP: What are your intentions?**

Talk about options at this point (attempting same approach, attempting approach with lower minimums, attempting approach at another airport, heading to alternate airport)

GUS APP: Expect the ILS 23 approach. Latest OKK wx winds 18020KT, 2 -RA, ceiling OVC005. Change to advisory frequency, report missed approach this frequency or cancel on the ground.

(If Missed) **GUS APP: Fly heading 180 for radar vectors to OKK ILS 23 approach maintain 3000 feet.**

(vector for 30 degree intercept 3 mi. from WOXOG)

GUS APP: You are 3 mi. from WOXOG cleared ILS 23 approach, upon intercepting the localizer, report cancellation on the ground on 120.0, frequency change approved.

(GND) **GUS CLNC: IFR cancellation received, I have your clearance advise when ready to copy ... Cleared as filed to LAF airport at (filed alt.), departure control 121.05, squawk 5213. Clearance void if not off by _____ zulu (give 5 minutes).**

(Airborne) **GUS APP: Radar contact 2 W of OKK airport proceed direct OGREY, expect GPS 28 approach at KLAF**

ATIS: Lafayette Purdue University information GOLF (time) zulu weather, winds 27015KT, visibility 2 BR, 006 OVC, temp 11, dewpoint 9, altimeter 29.92, landing and departing Rwy 28, GPS 28 approach in use, on initial contact advise you have GOLF.

GUS APP: Descend and Maintain 3000', contact GRISSOM APP/DEP 123.85.

GRISSOM APP/DEP: Cleared for the GPS 28 approach, report OGREY inbound.

(OGREY) **GRISSOM APP/DEP: Contact LAF TWR 119.6 ILRAY inbound.**

(ILRAY) **LAF TWR: Cleared to land Rwy 28**

LESSON 8

OBJECTIVE

NOTE: In this lesson, the Auto Pilot must be used for one of the approaches

1. PLAN and FLY IFR CROSS COUNTRY
    A. LAF-FWA-LAF
2. FWA LOCALIZER BC 14 AND 23 APPROACHES
    A. Partial panel at instructor discretion
3. LAF VOR-A approach
    A. Attitude and heading indicator failure prior to BVT inbound.

CHARTS:

- KFWA LOC BC-14
- KFWA GPS-23
- KLAF VOR-A
- Enroute Chart

SCHEDULE

1. DISCUSSION
    A. IFR cross country planning. Suggested route: KLAF OKK V96 FWA KFWA.
    B. FWA approaches
2. ABNORMALS
    A. Partial panel on BC approaches at instructor discretion
    B. ADC failure on one KFWA approach
    C. AHRS failure prior to beginning the VOR-A
3. IFR CROSS COUNTRY

ATIS: LAF information MIKE (time) zulu, wind 23020KT, 2RA, ceiling 004 OVC, temp 9, dewpoint 8, altimeter 29.92, landing and departing Rwy 23 and 28, GPS approaches in use, advise on initial contact you have MIKE.

LAF GND: Cleared to FWA (give route), maintain 3000', expect 5000' 10 minutes after departure, departure frequency 123.85, squawk 3124.

LAF GND: Read back correct, runway 28 taxi.

LAF TWR: Climb on course, maintain 3000', cleared for takeoff.

LAF TWR: Contact departure now 123.85.

GRISSOM APP/DEP: Radar Contact, climb and maintain 5000'.

GRISSOM APP/DEP: Contact FWA APP 127.2.

(Preposition 30 NM from FWA)

FWA ATIS: Fort Wayne Airport information ALPHA (time) zulu weather. Wind 18015KT, 2 BR, ceiling 004 OVC, temp. 8, dewpoint 7, altimeter 29.92, landing and departing Rwy 14 and 23, BC approaches in use, advise you have ALPHA

FWA APP: Radar contact, fly heading 040 radar vectors LOC BC 14. Do you have ALPHA?

(Vector for 30° intercept to final approach course)(Partial panel at instructor discretion one approach at FWA must have an ADC failure)

(LOC BC) **FWA APP: Cleared for the LOC BC 14 approach, report WZARD inbound to the Tower 119.1.**

(WZARD) **FWA TWR: Cleared to land Rwy 14.**

(If Missed) **FWA TWR: Contact departure 127.2.**

FWA DEP: Radar Contact, report entering the hold and expect vectors for the GPS 23 approach. Maintain 2300'.

(After established in the hold Vector for 30° intercept to final approach course)

(LOC BC) **FWA DEP: Cleared for the approach, report AKEWS to the Tower 119.1.**

(AKEWS) **FWA TWR: Cleared to land Rwy 23.**

(If Missed) **FWA TWR: Fly runway heading until able direct LAF. Maintain 3000', Contact Departure 127.2.**

FWA DEP: Radar Contact, climb and maintain 4000' on course to LAF.

FWA DEP: Contact GRISSOM APP/DEP 123.85.

GRISSOM APP/DEP: Radar Contact. Expect the VOR-A approach to LAF. Advise with information OSCAR at LAF.

LAF ATIS: Lafayette Purdue University Airport information OSCAR (time) zulu, wind 23020KT, 2RA, ceiling 004 OVC, temp 9, dewpoint 8, altimeter 29.92, landing and departing Rwy 23 and 28, GPS approaches in use, advise on initial contact you have OSCAR.

(Preposition 10 NM from BVT)

(5 NM from BVT) **GRISSOM APP/DEP: Cleared for the VOR-A approach to LAF. Contact LAF TWR 119.6 BVT inbound.** (Fail AHRS).

(BVT) **LAF TWR: Report BATLE inbound.**

(BATLE) **LAF TWR: Report field in sight or missed approach …Cleared to land Rwy 23.**

LESSON 9

OBJECTIVE

NOTE: In this lesson, the Auto Pilot must be used for one of the approaches

1. PLAN and FLY IFR CROSS COUNTRY
    A. LAF-DNV-LAF. Suggested route: KLAF VAGES V251 DNV KDNV.
2. DNV APPROACHES
    A. VOR/DME-3
    B. ILS-21
3. LAF APPROACHES
    A. LOC-10

CHARTS:

- KDNV VOR/DME-3
- KDNV ILS-21
- KLAF LOC-10
- Enroute Chart

SCHEDULE

1. DISCUSSION
    A. Route of flight. For the enroute portion GPS shall only be used for DME purposes. The HSI shall be in VLOC to track the airways.
    B. DNV approaches
2. ABNORMALS

A. Fail turn coordinator on descent to DNV – leave inoperative remainder of flight
B. Fail alternator 2.
    i. If not noted, keep alternator failed

3. IFR CROSS COUNTRY

ATIS: Lafayette Purdue University information INDIA, (time) zulu weather, winds 04007KT, 2 BR, 004 OVC, temp 21, dewpoint 15, altimeter 29.92, landing and departing Rwy 5, ILS 10 approach in use, on initial contact advise you have INDIA.

LAF GND: Cleared to KDNV airport (direct VAGES, V-251, DNV VOR, direct), maintain 3000, expect (higher) 10 minutes after departure, departure frequency 123.85, squawk 3215.

LAF GND: Read back correct, runway 5 taxi via B, cross runway 10

LAF TWR: Cleared for takeoff runway 5, report level 3000 to GRISSOM APP/DEP 123.85.

GRISSOM APP/DEP: Cleared to (filed alt.), report VAGES.

(VAGES) **GRISSOM APP/DEP: Contact CMI APP on 121.35.**

CMI APP: Radar contact, expect the VOR/DME-03 approach. Advise when you have the AWOS at KDNV.

AWOS: DNV winds 24015KT, 2BR, 004OVC, temp 22, dewpoint 15, altimeter 29.92

(When 4 from STAKS) **CMI APP: Continue on V-251, Cleared for the DNV VOR/DME-03 approach via DNV VOR.**

(Once SOREZ outbound) **CMI APP: No traffic observed between you and the airport, frequency change approved, report cancellation on the ground or in the air this frequency.**

(If Missed) **CMI APP: Climb and maintain 3000', report entering the hold and expect the ILS 21 approach to KDNV.**

(Hold) **CMI APP: Fly heading 360 this will be radar vectors for the ILS 21 approach**

(Vector for a 30 degree intercept 3 nm from JULIP)

(Last Vector): **You are 3nm from JULIP, Fly ____ heading, maintain 3000' until established, cleared for the ILS 21 at KDNV. Report cancellation on the ground frequency, 121.7, frequency change approved.**

(Ground) **CMI CLNC: IFR cancellation received. I have your return clearance to KLAF. Cleared as filed at 5000 feet, departure control CMI 121.35 squawk 5521. Clearance is void if not off by (time), time now ____.**

CMI DEP: Radar contact 2 S of DNV VOR, proceed on course.

(5 DME NE of DNV VOR) **CMI DEP: Contact GRISSOM APP/DEP 123.85.**

GRISSOM APP/DEP: Report STAKS. Advise when you have the ATIS HOTEL at LAF.

ATIS: Lafayette Purdue University information HOTEL, (time) zulu weather, winds 20015KT, 2 BR, 004 OVC, temp 21, dewpoint 15, altimeter 29.92, landing and departing Rwy 5, ILS 10 approach in use, on initial contact advise you have HOTEL. Notice to airman, runway 10 glideslope out of service.

(STAKS) **GRISSOM APP/DEP: Fly heading 070, intercept the localizer. Cleared for the LAF LOC 10 circle to land Rwy 23. Report the Localizer inbound.**

(LOC) **Report EARLE inbound to LAF TWR 119.6.**

(EARLE) **Report field in sight... Circle to land Rwy 23, cleared to land.**

LESSON 10

OBJECTIVE

NOTE: In this lesson, the Auto Pilot must be used for one of the approaches

1. PLAN and FLY IFR CROSS COUNTRY
    A. LAF-IND-LAF. Suggested route: KLAF JAKKS V-399 VHP KIND.
2. IND APPROACHES
    A. 1 ILS-23R via radar vectors
    B. 1 ILS-23L via radar vectors
3. LAF APPROACHES
    A. 1 GPS-28

CHARTS:

- KIND ILS-23R
- KIND ILS-23L
- KLAF GPS-28
- Enroute Chart

SCHEDULE

1. DISCUSSION

A. Route of flight. For the enroute portion GPS shall only be used for DME purposes. The HSI shall be in VLOC to track the airways.
B. ILS approaches

2. ABNORMALS
   A. Fail marker beacons enroute IND
   B. Fail landing gear before glide slope intercept at IND 23R
3. IFR CROSS COUNTRY
   A. ATIS before contacting approach

ATIS: Lafayette Purdue University information ALPHA (time) Zulu wx, winds 28023KT, 5HZ, 006 OVC, temp 14, dewpoint 10, altimeter 30.14, landing and departing Rwy 28, RNAV 28 and ILS 10 circle to land Rwy 28 in use, on initial contact advise you have ALPHA

LAF GND: Cleared to IND airport direct JAKKS, V-399 as filed, maintain 3000' expect (filed alt.) 10 min. after departure, departure control 123.85 squawk 1310, advise when ready to taxi... Read back correct, runway 28 taxi via A, cross runway 23.

LAF TWR: Cleared for takeoff runway 28., report level 3000 to departure.

(3000) **GRISSOM APP/DEP: Report crossing JAKKS, climb and maintain** (filed altitude).

IND ATIS: Indianapolis International Airport, information WHISKEY (time) Zulu wx, winds 27022KT, visibility 2, ceiling 004 OVC, temp 14, dewpoint 10, altimeter 30.12, landing and departing Rwy 23L and 23R, ILS 23L and 23R approaches in use, on initial contact advise you have WHISKEY

(JAKKS) **GRISSOM APP/DEP: Contact IND APP 119.3.**

IND APP: Radar contact __ mi. SE of JAKKS intersection. Expect radar vectors for the IND ILS 23R approach. Advise with information WHISKEY.

(Vector for a 30 degree intercept 3 mi. from the FAF)

IND APP: 3 mi. outside the FAF upon intercepting the localizer you are cleared for the approach, contact IND TWR 127.82 CKERD inbound.

IND TWR: Cleared to land Rwy 23R, missed approach instructions are: runway heading maintain 3100'

(If Missed) **IND TWR: Contact IND APP 119.3.**

IND APP: Radar Contact, Fly heading 080 vectors ILS 23L.

(Vector for 30 degree intercept 3 mi. from the FAF)

IND APP: 3 NM outside PACRR, maintain 3100 until established, cleared for the ILS 23L, contact IND TWR 120.9 PACRR inbound.

(PACRR) **IND TWR: Report missed approach this frequency.**

(Missed) **IND TWR: Contact IND DEP 119.3.**

IND DEP: Radar contact ___ mi. S of IND, clearance to LAF is on request, advise when entering the hold at OZMOE.

(OZMOE): **Give EFC once requested**

(give clearance once established in the hold)
IND DEP: Cleared to LAF via a 360 heading to intercept V-51, climb and maintain 6000 feet, squawk 1312.

(30 DME from BVT) **IND DEP: Contact GRISSOM APP/DEP 123.85, good day.**

GRISSOM APP/DEP: Radar Contact, Altimeter 29.92. Report OCKEL, expect the GPS 28 approach to LAF. ATIS BRAVO is current at LAF.

ATIS: Lafayette information BRAVO, (time) zulu weather. Wind 18018KT, 2R, 006 OVC, temp. 15, dewpoint 11, altimeter 29.92. Landing and departing Rwy 28, advise you have BRAVO.

(OCKEL) **GRISSOM APP/DEP: Proceed direct to JEPFE, cleared for the GPS 28 approach, report JEPFE inbound.**

(JEPFE) **GRISSOM APP/DEP: Report OGREY inbound to LAF TWR 119.6.**

(OGREY) **LAF TWR: Report ILRAY inbound.**

(ILRAY) **Report field in sight or missed approach...cleared to land Rwy 28.**

REVIEW LESSONS

LESSON 11

OBJECTIVE

NOTE: In this lesson, the Auto Pilot must be used for one of the approaches

1. To increase proficiency of instrument procedures
2. HOLDING
    A. JAKKS on V-24

B. OCKEL
3. CFJ GPS-4 APPROACH
4. DME ARC
   A. BVT 30 DME arc to V-97
5. LAF GPS-10 APPROACH

CHARTS:
- KCFJ GPS-4
- KLAF GPS-10
- Enroute Chart

SCHEDULE
1. DISCUSSION
2. ABNORMALS
   A. Fail NAV 2 during holding at JAKKS – leave failed for remainder of flight
   B. Fail GPS while holding at WENGS
3. INTERSECTION HOLDING
   A. JAKKS on V-24

ATIS: Lafayette Purdue University information NOVEMBER, (time) zulu weather, wind 32022KT, 5 BR, 006 BKN 030 BKN, temp 15, dewpoint 13, altimeter 29.92, aircraft landing and departing Rwy 28, expect ILS 10 or GPS 10 approach, on initial contact advise you have NOVEMBER.

LAF GND: Cleared to the JAKKS intersection via radar vectors V-399, maintain 3000', departure 123.85, squawk 4324… Read back correct, runway 28 taxi via A cross 23.

LAF TWR: Cleared for takeoff runway 28 left turn to 180 until intercepting V-399 maintain 3000 feet, contact GRISSOM APP/DEP level 3000 feet.

(3000) **GRISSOM APP/DEP: Report intercepting V-399.**

(V-24) **GRISSOM APP/DEP: I have a holding clearance advise when ready to copy... cleared to hold southeast of JAKKS intersection on V-24, 3 mile legs, left turns, expect approach clearance in 10 minutes.** (Fail NAV 2 holding at JAKKS)

(JAKKS) **GRISSOM APP/DEP: Expect the CFJ GPS 4 approach.**

4. CFJ GPS-4 APPROACH

(EFC) **GRISSOM APP/DEP: Cleared direct ALLOE. Contact IND APP 119.05.**

IND APP: Cleared for the CFJ GPS 4 approach, report ALLOE.

(ALLOE) **IND APP: Report missed approach this frequency or cancel on the ground, frequency change approved.**

5. DME ARC

(If Missed) **IND APP: Proceed direct to BVT, intercept the BVT 25 DME arc, track NW to V-7, V-7 to WENGS. Report established on the arc.**

6. INTERSECTION HOLDING at WENGS

(25 DME arc) **IND APP: Contact GRISSOM APP/DEP 123.85.**

GRISSOM APP/DEP: Radar contact. Upon reaching WENGS intersection hold south of WENGS on V-7, 3 NM legs, left turns, expect the GPS 10 approach in 15 minutes. (Fail GPS)

(Expect student to hold on airway with crossing radials & request a non-DME approach)

(WENGS) **GRISSOM APP/DEP: Expect approach clearance in five minutes.**

7. LAF GPS-10 APPROACH (Restore GPS for approach)

(EFC) **GRISSOM APP/DEP: Cleared for the GPS 10 approach via the MALLA transition, report RESAW inbound**

(RESAW) **GRISSOM APP/DEP: Report ONAMY to LAF TWR 119.6.**

(ONAMY) **LAF TWR: Cleared to land Rwy 10**

LESSON 12

OBJECTIVE

NOTE: In this lesson, the Auto Pilot must be used for one of the approaches

1. CONTINUE TO IMPROVE INSTRUMENT PROCEDURES
2. GPS DEPARTURE TO OCKEL
3. HOLDING
   A. Primary means – GPS
   B. Secondary means – VOR
4. FKR GPS-27 APPROACH
5. LAF GPS-28 APPROACH
6. HOLD AT EARLE ON LOCALIZER
7. LAF ILS-10 APPROACH

CHARTS:

- KFKR GPS-27
- KLAF GPS-28

- Enroute Chart

SCHEDULE

1. DISCUSSION
    A. GPS procedures for route of flight
    B. 3 approaches in conjunction with missed approaches
2. ABNORMALS
    A. Fail landing gear retraction on takeoff – return to normal when student cycles gear
    B. Dual AHRS failure on FKR GPS-27
    C. PFD and ADC failure on GPS-28 approach
3. GPS DEPARTURE to OCKEL

ATIS: Lafayette Purdue University information DELTA (time) zulu wx, wind 20024KT, 2RA, ceiling 005 OVC, temp 4, dewpoint 2, altimeter 29.92, landing and departing Rwy 23, ILS, VOR, and GPS approaches in use, on initial contact advise you have DELTA.

LAF GND: Cleared to the OCKEL intersection via direct, maintain 3000', departure frequency is GRISSOM APP/DEP, 123.85, squawk 5432.

LAF TWR: Turn left direct OCKEL, maintain 3000', cleared for takeoff.

LAF TWR: Contact departure.

(3000) **GRISSOM APP/DEP: Radar Contact, I have a holding clearance, advise when ready to copy.**

4. INTERSECTION HOLDING

GRISSOM APP/DEP: Cleared to hold SE of OCKEL on V-51 (time) (left or right) turns, report entering the hold. *(student must ask for EFC)*

(OCKEL) **GRISSOM APP/DEP: Expect FKR GPS 27 approach in 5 minutes. Advise with the AWOS at KFKR.**

FKR AWOS: Wind 22018KT, visibility 2RA, ceiling 004 OVC, temp 4, dewpoint 4, altimeter 29.92.

5. FKR GPS-27 APPROACH

GRISSOM APP/DEP: Upon reaching OCKEL you are cleared direct CAXEV.

(Once Direct): **You can expect the GPS 27 via CAXEV.**

(Fail AHRS)

(When 5nm from CAXEV) **GRISSOM APP/DEP: Cleared for the FKR GPS 27 approach via CAXEV transition, report missed approach this frequency or cancel on the ground, frequency change approved.**

6. LAF RNAV-28 APPROACH

(If Missed) **GRISSOM APP/DEP: Proceed direct JEPFE, Do you have KLAF information DELTA?**
GISSOM APP/DEP: Cleared for the GPS 28 approach, report JEPFE inbound.

(Fail ADC and PFD)

(JEPFE) **GRISSOM APP/DEP: Contact LAF TWR, 119.6, ILRAY inbound.**

(ILRAY) **LAF TWR: Report field in sight or missed approach. Current wind 20024KT** *(Change wind)***, altimeter 29.92.**

(If Missed) **LAF TWR: Cleared present position direct EARLE. Maintain 3000'. Contact departure 123.85.**

GRISSOM APP/DEP: Radar contact. I have a holding clearance, advise ready to copy.

GRISSOM APP/DEP: Hold west of EARLE on the localizer, one minute right hand turns, report entering the hold. Expect further clearance at (time).

(EARLE) **GRISSOM APP/DEP: Expect the ILS 10 approach in 5 min.**

(EFC) **GRISSOM APP/DEP: Descend and maintain 2300. You are cleared for the ILS 10 approach into Lafayette no procedure turn authorized, report EARLE inbound to LAF TWR, 119.6.**

(EARLE) **LAF TWR: Current wind 18020KT, cleared to land Rwy 10.**

LESSON 13

OBJECTIVE

NOTE: In this lesson, the Auto Pilot must be used for one of the approaches

1. Continue to improve instrument procedures
2. INTERSECTION HOLDING
3. LAF ILS-10 approach via VAGES transition
4. LAF ILS-10 approach
5. LAF VOR-A approach

CHARTS:

- KLAF ILS-10
- KLAF VOR-A
- Enroute Chart

SCHEDULE

1. DISCUSSION
    A. Route of flight
2. ABNORMALS
    A. Glideslope failure at 1200ft MSL
    B. Landing gear failure – will not extend on ILS-10 approach – normal on other approaches
    C. Other abnormalities or failures at instructor discretion
3. DEPARTURE to VAGES

ATIS: Lafayette Purdue University information GOLF, (time) zulu, wind 30022KT, 1 1/2 +RA, ceiling 003 OVC, temp 12 dewpoint 11, altimeter 29.92, aircraft landing and departing Rwy 28, ILS 10 and VOR-A approaches in use, circle to land Rwy 28, on initial contact advise you have GOLF.

LAF GND: Cleared direct to VAGES, maintain 3000', departure 123.85, squawk 4425. … Read back correct, runway 28 taxi via A cross 23.

LAF TWR: Cleared for takeoff runway 28 right turn direct BVT 2600 feet, contact DEP level 2600

(2600) **GRISSOM APP/DEP: Upon reaching 3 DME from BVT turn to heading of 270 to intercept V-251, report established on the airway.**

(V-251) **GRISSOM APP/DEP: Holding clearance, advise when ready to copy.**

4. INTERSECTION HOLDING AT VAGES

GRISSOM APP/DEP: Cleared to hold (direction) of VAGES on (airway), (time, or DME dist) (right or left) turns, report entering the hold *(student must ask for EFC)*

(If EFC not requested by 5 min after VAGES, fail both radios)

(VAGES) **GRISSOM APP/DEP: Expect the ILS 10 approach in 10 min.**

5. ILS-10 APPROACH via VAGES transition

(EFC) **GRISSOM APP/DEP: Upon reaching VAGES, cleared for the LAF ILS 10 approach via the VAGES transition, report intercepting the localizer.**

(LOC) **GRISSOM APP/DEP: Report EARLE inbound to LAF TWR 119.6.** (Set GS to fail at 1200 MSL)

(EARLE) **LAF TWR: Cleared to land Rwy 10.**

(If Missed) **LAF TWR: Contact DEP 123.85.**

6. ILS-10

GRISSOM APP/DEP: Proceed direct to EARLE for the ILS 10 approach, report outbound.

(EARLE Outbound) **GRISSOM APP/DEP: Cleared for the ILS 10 approach, report EARLE inbound to LAF TWR, 119.6.**

(EARLE) **LAF TWR: Cleared to land Rwy 10.**

7. LAF VOR-A APPROACH

(If Missed) **LAF TWR: Contact GRISSOM APP/DEP.**

GRISSOM APP/DEP: Report BVT outbound for the VOR-A.

(BVT) **Cleared for VOR-A approach, report BATLE inbound to TWR 119.6.**

(BATLE) **LAF TWR: Report field in sight or missed approach. Report missed approach to DEP 123.85…. Cleared to land runway 28.**

(If missed) **GRISSOM APP/DEP: Proceed direct to BVT, expect the VOR-A** *(or another approach).*

LESSON 14

OBJECTIVE

This lesson should be a review of any weak areas the student has shown. A minimum of 3 approaches and a hold must be accomplished. This lesson is not intended to be a simulated stage check. It is intended to review student deficiencies in preparation for a simulated stage check.

NOTE: In this lesson, the Auto Pilot must be used for one of the approaches.

ATIS: Lafayette Purdue University information ECHO (time) zulu, wind 36020KT, 1 1/2 BR, ceiling 005 BKN 007 OVC, temp 10, dewpoint 08, altimeter 30.18. Landing and departing Rwy 5, All approaches in use, on initial contact advise you have ECHO.

SCHEDULE

1. DISCUSSION
    A. Route of flight
2. Review Flight

LESSON 15

OBJECTIVE
Student will complete a simulated stage check and follow the clearances without any help. Complete at least three different types of approaches with a hold included somewhere during the period. This procedure must be incorporated with a cross-country.

NOTE: In this lesson, the Auto Pilot must be used for one of the approaches.

ATIS: Lafayette Purdue University information X-RAY (time) zulu, wind (as necessary), 1 1/2 BR, ceiling 004BKN, temp 18, dewpoint 16, altimeter 30.18. Landing and departing Runway (as appropriate), All approaches in use, on initial contact advise you have X-RAY.

Example Flight: Cross-country to KHUF, hold enroute at a fix like POTES, WENGS, or ALLOE. KHUF VOR-23, ILS-5, and GPS-32. Partial panel on either the VOR or GPS approach. Autopilot on the GPS or VOR approach that is not partial panel.

SCHEDULE
1. CROSS-COUNTRY PROCEDURES
    A. Route will be to OKK, DNV, or HUF
2. GROUND OPERATIONS
3. DEPARTURE PROCEDURES
4. HOLDING
5. GPS APPROACH
6. VOR, VOR/DME APPROACH
7. ILS APPROACH

*SEE AT-211 COURSE COMPLETION STAGE CHECK FORM
*PARTIAL PANEL AND EMERGENCIES AT INSTRUCTOR'S DISCRETION
*WIND UP TO 20 KNOTS DIRECT CROSSWIND

LESSON 16

STAGE CHECK
1. CROSS-COUNTRY PROCEDURES
2. GROUND OPERATIONS
3. DEPARTURE PROCEDURES
4. HOLDING
5. GPS APPROACH

6. VOR, VOR/DME APPROACH
7. ILS APPROACH

*SEE AT-211 COURSE COMPLETION STAGE CHECK FORM
*PARTIAL PANEL AND EMERGENCIES AT INSTRUCTOR'S DISCRETION
*WINDS UP TO 20 KNOTS DIRECT CROSSWIND

AT-21100 Ground Trainer II Stage Check

The purpose and objectives of the AT-21100 course completion check is that the student will demonstrate a high level of competency in IFR cross country planning and flying in addition to holding and instrument approaches.

The student shall complete all items to the Instrument Rating Airplane Practical Test Standards or Airmen Certification Standards, as applicable. At the instructor's discretion, (s)he may provide remedial training for up to three, non-safety related, items. Providing remedial training will lower the stage check grade by one letter grade.

The student will plan an IFR cross country to either Danville, IL or Terre Haute, IN as assigned by the stage check instructor. All cross-country planning must be completed as per the Purdue IFR planning log prior to the beginning of the stage check. The stage check instructor will issue the appropriate IFR clearance and the student will fly the assigned cross country.

A holding pattern must occur at some point during the flight.

The student must accomplish three instrument approaches as follows:

- An ILS approach
- A GPS approach (without LPV)
- A VOR approach

The GPS approach must be LNAV only
A Dual AHRS failure will be on either the GPS or VOR approach.
The autopilot will be used on either the GPS or VOR approach.

The winds used for the stage check must not exceed 15 knots in velocity.

The stage check instructor must use the AT-21100 stage check electronic record keeping system to record detailed results of the stage check.

AT-21100 Stage Check Record

Stage Check

Item	Points Possible	Points Given	Remarks
Ground Operations			
A. Cockpit organization	5		
B. Copying clearance and readback	5		
C. Radio set up	5		
Departure Procedures			
A. Proper technique relative to power and landing gear	10		
B. Aircraft Control (heading, bank, altitude, etc.)	5		
C. Communications	5		
D. Compliance with the clearance	10		
E. Tracking technique	5		
Holding			
A. Proper Entry	15		
B. Completion of the 5 T's	10		
C. Navigation radio set up	15		
D. Adjustments for wind and time	20		
E. Altitude control	15		
GPS Approach			
A. Navigation radio set up (primary and secondary)	10		
B. Approach course tracking	20		
C. Approach procedures (5 T's and 4 T's)	20		
D. Altitude	10		
E. Communications/Callouts	15		
F. Adjustments for wind and time (if applicable)	15		
G. Missed approach procedures (if applicable)	15		
VOR Approach			
A. Navigation radio set up (primary and secondary)	10		
B. Approach course tracking	20		
C. Approach procedures (5 T's and 4 T's)	20		
D. Altitude	10		
E. Communications/Callouts	15		
F. Adjustments for wind and time (if applicable)	15		
G. Missed approach procedures (if applicable)	15		
ILS Approach			
A. Navigation radio set up (primary and secondary)	10		
B. Approach course tracking	20		
C. Approach procedures (5 T's and 4 T's)	20		
D. Altitude/Glideslope	10		
E. Communications/Callouts	15		
F. Adjustments for wind and time (if applicable)	15		
G. Missed approach procedures (if applicable)	15		
Basic Instrument			
A. Altitude	10		
B. Heading	10		
C. Coordination	10		
D. Bank	10		

Figure 7.5 AT-21100 Stage Check Electronic Record

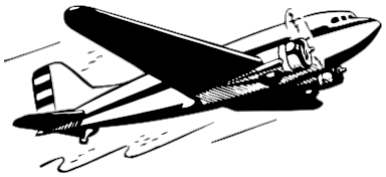
This Page Intentionally Left Blank

PURDUE UNIVERSITY

SCHOOL OF
AVIATION & TRANSPORTATION TECHNOLOGY

SAFETY AND PROCEDURES MANUAL

CONTAINING RULES, PROCEDURES AND
OPERATIONAL LIMITATIONS
FOR FLYING AND INSTRUCTING IN
PURDUE UNIVERSITY AIRCRAFT



Introduction

All flight instructors (Continuing Lecturers and Part Time) are extremely important for the successful operation of the Flight Program at Purdue University. It is a very responsible position and requires a great deal of commitment.

Safety is always the number one consideration for each and every flight. A thorough analysis of the weather must be accomplished before every local and cross country flight.

Instructors must be familiar with and knowledgeable about all of the Purdue rules, regulations and operating procedures contained in this manual. They must also be familiar with and abide by all FAA Federal Aviation Regulations.

Flight instructors are professionals and must conduct themselves accordingly. A proper attitude, demeanor and language use is expected at all times. All instructors must dress in a manner that exemplifies the profession that we are in.

FLIGHT OPERATIONS SAFETY PROGRAM AT PURDUE UNIVERSITY

SAFETY CULTURE COMMITMENT

During our tenure as aviation professionals we will strive to maintain the highest level of safety while operating our aircraft in the air and on the ground. This commitment encompasses individual as well as observed operations conducted by persons regardless of experience. Safety needs to be at the forefront of every operation such that a proactive rather than a reactive approach is taken to eliminate all accidents, incidents, and occurrences.

CORE VALUES

The core values identified are based upon safety conscience aviation professionals in the Purdue Flight Program and are to be observed by faculty, professional and support staff, as well as students.

- Safety Foremost
- Ethical Behavior
- Accountability
- Respect People
- Professionalism
- Lifelong Learning
- Enjoy Aviation

ADMINISTRATION COMMITMENT TO SAFETY

- Safety excellence will be a component of our mission.
- Purdue University School of Aviation & Transportation Technology (SATT) will hold all individuals accountable for safety performance.
- Purdue University SATT will strive towards a continual commitment to safety.

EMPLOYEE & STUDENT COMMITMENT TO SAFETY

- Each one of us will be expected to accept responsibility and accountability for our own behavior.
- Each one of us will have an opportunity to participate in developing safety standards and procedures.
- We will openly communicate information about safety incidents and will share the lessons with others.
- Each of us will be concerned for the safety of others.
- We will recognize and reward flight and ground safety performance.
- We will make everyone aware of the safety rules and processes as well as their personal responsibility to observe them.

THE OBJECTIVE OF THE SAFETY PROCESS

- All levels of the Purdue Flight Program will be clearly committed to safety.
- We will involve everyone in the decision process through a system of open safety communication.
- We will provide the necessary training to build and maintain meaningful ground and flight safety leadership skills.

AVIATION FLIGHT SAFETY PROGRAM AT PURDUE UNIVERSITY

Aviation safety in the flight training program at Purdue University is an attitude and culture that must permeate the entire organization. It is the responsibility of each and every individual including the administration, faculty, Continuing Lecturers, part time flight instructors, maintenance technicians, clerical and support staff and all flight students.

Safety is not a reaction to an incident or accident, but an overall philosophy that is proactive in its approach to strive for complete elimination of incidents, accidents, and occurrences during flight training at Purdue University.

There are numerous components to the overall program that include:

- A safety officer with defined duties and responsibilities
- Initial and recurrent training of all employees
- A reporting and documentation system of all deviations and occurrences
- A policy and procedures manual
- A routine meeting schedule of the various components of the operation
- Support for faculty and staff to attend seminars, conferences, etc. to maintain a high level of competency
- A routine schedule of external safety audits
- An annual assessment process

1. Safety Officer Responsibilities and Duties
   The Aviation Flight Safety Officer(s) will be a member(s) of the flight faculty or staff. The responsibilities and duties are as follows:
   a. Counsel flight students and/or instructors who have been involved in an accident, incident or any other occurrence that effects safe operation of the Flight Program. This also includes referrals from the Lafayette Air Traffic Control Tower.
   b. Responds to safety concerns or suggestions as presented by faculty, staff and students.
   c. Receives, documents and categorizes all accidents, incidents and occurrences into a data base for monitoring purposes.
   d. Recommends change to procedures and practices relative to the operation of the Flight Program.
   e. Organizes Aviation Safety Seminars annually to promote safety to the Purdue Flight Program and to the Greater Lafayette community.
   f. Generate an occurrence and/or safety newsletter

2. Training Program – Initial and Recurrent
   a. Initial training for new employees
      i. Continuing Lecturers
         1. Employee Responsibilities
         2. Employee Benefits
         3. Review of Safety and Procedures Manual

4. Flight Proficiency (amount to be determined)

ii. Part Time flight instructors
1. Review of Safety and Procedures Manual
2. Flight Proficiency (amount to be determined)

iii. Maintenance Technicians

b. Recurrent Training
i. Continuing Lecturers
1. Instrument Competency Check every 6 months
2. Multiengine standardization flight every 12 months

3. Occurrence Reporting and Documentation

Each accident, incident and occurrence will be reported, documented and categorized so as to maintain a data base of information from which to assess possible problem areas in the operation of the flight program and therefore, take steps to rectify the situation.

The categories are as follows:

a. Accident – as defined by the NTSB
b. Incidents – other aircraft damage occurrences
c. Aircraft departing illegally – past an event, AD, etc.
d. Runway/Taxiway incursions
e. Communication errors or failure to follow ATC instructions
f. Errors in judgement or decision making

4. Communication and Interface

For a flight program to operate safely and efficiently, it is imperative that all of the different subgroups communicate effectively with each other.

a. The Chief Flight Instructor, the Director of Maintenance, Director of Quality Control/Chief Inspector and the Flight Maintenance Technician Supervisor will meet weekly.
b. The full time flight instructor staff will meet with Chief Flight Instructor – monthly.
c. Each part time flight instructor will meet with his/her assigned supervising instructor for a one on one meeting – bi-weekly.

5. Support for Continuing Education

A competent, well-trained faculty and staff must have the support of the administration to attend conferences, seminars and training programs in order to continue to maintain a high level of expertise and safety.

6. External Safety Audits

A routine schedule of safety audits by outside sources is important to include in the safety program at Purdue University.

7. Annual Assessment

An annual review and assessment as to the safety of the flight operation must occur and include the following:

a. Chief Flight Instructor

b. The Director of Maintenance
c. Director of Quality Control / Chief Inspector
d. The Safety Officer
e. Flight Operations Coordinator
f. The Department Head and/or Associate Department Head of Aviation Technology

FIRE SAFETY PRECAUTIONS & PROCEDURES

In the unfortunate event that a fire occurs involving either facilities or aircraft, fire extinguishers are located in each aircraft, as well as throughout Hangars 5, 6, 6W and T-7. The Purdue University Fire Department also has a unit stationed on the airport property.

Fire extinguishers located in the hangars are inspected annually by trained Purdue University Fire Department inspectors.

Fire extinguishers located in the aircraft are inspected monthly by Aviation Technology maintenance technicians.

Aviation Flight Technology Safety Meetings Syllabus

Objective:
During our tenure as aviation professionals we will strive to maintain the highest level of safety while operating our aircraft in the air and on the ground. This commitment encompasses individual as well as observed operations conducted by persons regardless of experience. Safety needs to be at the forefront of every operation such that a proactive rather than a reactive approach is taken to eliminate all accidents, incidents, and occurrences. The purpose of these bi-weekly safety meetings is to promote this very concept throughout the time in training at Purdue University.

Structure:
The meetings will be conducted on a bi-weekly schedule on a date and time to be determined at the beginning of each semester.

Content:
The content of the safety meetings for each semester will vary depending on the specific safety related situations that may arise. The meetings will consist of, but are not limited to, the following topics:
Safety reporting data, organizational topics, periodic updates on the safety status of the flight department, LAF Air Traffic Control Tower concerns, aeronautical knowledge quizzes, training videotapes, and open discussions on topics relating to professional pilots.

Attendance:
Attendance is mandatory for all of the safety meetings. There are situations that may arise which require a meeting to be missed. In these instances, an e-mail will be sent within 2 days after the meeting to the student with the audio and instructions to complete the assignment. The student then has 7 days following the meeting to listen to the audio recording and submit a 750 word report detailing what items were discussed during the meeting and the importance they play in the overall safety culture of the Purdue Flight department. The report should be emailed as an attached word document to the safety officer. Failure to comply with this requirement within 7 days will result in 2 points being deducted from the aeronautical knowledge quiz score of the student's respective flight grade. **If you do not receive an e-mail within two days of missing the meeting, the student must contact the safety officer. There will be no reminder e-mails.**
Attendance will be taken in the first 10 minutes of the meeting. If you are late then you will have to complete the 750 word essay.
Attendance will be taken at the end of the meeting (if someone leaves early) and if you don't sign the ending attendance you will have to complete the 750 word essay for missing the meeting and an additional 750 word essay detailing what was more important than the safety meeting.

OCCURANCE REPORTING FORMS

The online safety reporting form in the flight ops portal may be used instead of the paper forms.

Safety Observance		
Reporting Individual		
Date of Event (MM/DD/YYYY)	Approx. Local Time of Event	Type of Training Activity (Dual/Solo)
Route of Flight	Location of Event	Flight Course
Aircraft Type	Aircraft Registration	
Event Description		
Event Description (including any relative factors such as weather, ATC, airfield facilities, etc.) Use the back if necessary		

Figure 8.1.1 – Safety Observance Form

Aviation Safety Data Report

Flight Instructor			Student		
Date of Event (MM/DD/YYYY)		Approx. Local Time of Event		Type of Training Activity (Dual/Solo)	
Route of Flight		Location of Event		Flight Course	
Aircraft Type		Aircraft Registration			

Phase of Operation

☐ Hangar Movement	☐ Taxi-Out	☐ Cruise	☐ Crosswind	☐ Short Final	☐ Other
☐ Towing Aircraft	☐ Takeoff	☐ Holding	☐ Downwind	☐ Landing	
☐ Parked	☐ Initial Climb	☐ Descent	☐ Base	☐ Rollout	
☐ Ramp	☐ Climb	☐ Pattern Entry	☐ Final	☐ Taxi-In	

Runway Number (if applicable)			Runway Condition (dry, wet, other)		
Inflight/Airfield Weather Factors (Turbulence, Wind shear, etc)			Aircraft Altitude (AGL or MSL)		
Wind	Visibility	WX Phenomena	Ceiling	Temp/Dewpoint /	Altimeter

Error Type

☐ Accident (per NTSB 830)	☐ Aircraft Departing Illegally (Past Event, etc)	☐ Communication Error
☐ Incident (per NTSB 830)	☐ Runway / Taxiway incursions	☐ Judgement / Decision Making

Event Type

☐ Aborted Takeoff	☐ Emergency	☐ Gear System	☐ PAX Illness/Injury	☐ Icing Encounter
☐ Aircraft Damage	☐ Engine Shutdown	☐ Handling Difficulty	☐ Prop Strike	☐ Wake Turbulence
☐ Bird/Wildlife Strike	☐ Engine System	☐ Loss of Braking	☐ Tail Strike	☐ Weather
☐ Comm/Nav Failure	☐ FOD	☐ Lost/Disoriented	☐ Wing Strike	☐ Other Safety Concern
☐ Crew Illness/injury	☐ Fuel Quantity	☐ ATC incident	☐ Property Damage	☐ Other Maintenance Concern
☐ Eletrical System	☐ Fuel System	☐ Runway Excursion	☐ Operating Procedures	

Event Description (including any relative factors such as weather, ATC, airfield facilities, etc.) Use the back if necessary

Figure 8.1.2 – Aviation Safety Data Report

Complete the following questions appropriate to your event	
What went wrong? Why?	
What went right? Why?	
What was learned? (describe)	
What would you do differently if faced with this or a similar situation again?	
Near midair Collision / Air Traffic Control (ATC) Incident	
Mark passage of aircraft relative to you, in place on the left and in elevation on the right. Assume YOU are at the center of each diagram.	
	
Estimate Lateral Distance to Other Aircraft _____ft _____nm	Estimate Lateral Distance to Other Aircraft _____ft _____nm
Severity of Risk? LOW / MEDIUM / HIGH	Avoiding Action Taken? ____YES ____NO
Reported to ATC? _____Facility	Frequency in use?
Heading?	Altitude? _____ft AGL or MSL
Other Aircraft Registration?	Other Aircraft Type?
Other Aircraft Callsign?	Any other information?

CFI Signature _____ Student Signature _____

Date _____ Date _____

Figure 8.1.3 – Aviation Safety Data Report

Form Approved OMB NO. 2120-0045
3/31/2010

U.S. Department of Transportation
Federal Aviation Administration

BIRD / OTHER WILDLIFE STRIKE REPORT

1. Name of Operator	2. Aircraft Make/Model	3. Engine Make/Model
4. Aircraft Registration	5. Date of Incident ____/____/____ Month Day Year	6. Local Time of Incident ☐ Dawn ☐ Dusk ___ HR ___ MIN ☐ Day ☐ Night ☐ AM ☐ PM
7. Airport Name	8. Runway Used	9. Location if En Route (Nearest Town/Reference & State)
10. Height (AGL)	11. Speed (IAS)	

12. Phase of Flight

- ☐ A. Parked
- ☐ B. Taxi
- ☐ C. Take-off Run
- ☐ D. Climb
- ☐ E. En Route
- ☐ F. Descent
- ☐ G. Approach
- ☐ H. Landing Roll

13. Part(s) of Aircraft Struck or Damaged

	Struck	Damaged		Struck	Damaged
A. Radome	☐	☐	H. Propeller	☐	☐
B. Windshield	☐	☐	I. Wing/Rotor	☐	☐
C. Nose	☐	☐	J. Fuselage	☐	☐
D. Engine No. 1	☐	☐	K. Landing Gear	☐	☐
E. Engine No. 2	☐	☐	L. Tail	☐	☐
F. Engine No. 3	☐	☐	M. Lights	☐	☐
G. Engine No. 4	☐	☐	N. Other: (Specify)	☐	☐

14. Effect on Flight

- ☐ None
- ☐ Aborted Take-Off
- ☐ Precautionary Landing
- ☐ Engines Shut Down
- ☐ Other: (Specify)

15. Sky Condition

- ☐ No Cloud
- ☐ Some Cloud
- ☐ Overcast

16. Precipitation

- ☐ Fog
- ☐ Rain
- ☐ Snow
- ☐ None

17. Bird/Other Wildlife Species

18. Number of birds seen and/or struck

Number of Birds	Seen	Struck
1	☐	☐
2-10	☐	☐
11-100	☐	☐
more than 100	☐	☐

19. Size of Bird(s)

- ☐ Small
- ☐ Medium
- ☐ Large

20. Pilot Warned of Birds ☐ Yes ☐ No

21. Remarks *(Describe damage, injuries and other pertinent information)*

DAMAGE / COST INFORMATION

22. Aircraft time out of service:	23. Estimated cost of repairs or replacement (U.S. $):	24. Estimated other Cost *(U.S. $) (e.g. loss of revenue, fuel, hotels):*
_____ hours	$	$

Reported by *(Optional)*	Title	Date

Paperwork Reduction Act Statement: The information collected on this form is necessary to allow the Federal Aviation Administration to assess the magnitude and severity of the wildlife-aircraft strike problem in the U.S. The information is used in determining the best management practices for reducing the hazard to aviation safety caused by wildlife-aircraft strikes. We estimate that it will take approximately 6 minutes to complete the form. The information collected is voluntary. Please note that an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control number associated with this collection is 2120-0045. Comments concerning the accuracy of this burden and suggestions for reducing the burden should be directed to the FAA at: 800 Independence Ave SW, Washington, DC 20591, Attn: Information Collection Clearance Officer, ABA-20

FAA Form 5200-7 (11-97) Supersedes Previous Edition Electronic Version (Adobe) * U.S. GPU:1997-432-349/74201 NSN: 0052-00-651-9005

Figure 8.1.4 – Bird/Wildlife Strike Reporting Form

FOLD AND TAPE HERE

Figure 8.1.5 – Bird/Wildlife Strike Reporting Form

Directions for FAA Form 5200-7
Bird/Other Wildlife Strike Report

1. Name of Operator - This can be an airline (abbreviations okay - UAL, AAL, etc.), business (Coca Cola), government agency (Police Dept., FAA) or if a private pilot, his/her name.
2. Aircraft Make/Model - Abbreviations are okay, but to include the model (e.g. B737-200).
3. Engine Make/Model - Abbreviations are allowed (e.g., PW 4060, GECT7, LYC 580).
4. Aircraft Registration - This means the N# (for USA registered aircraft).
5. Date of Incident - Give the local date, not the ZULU or GMT date.
6. Local Time of Incident - Check the appropriate light conditions and fill in the hour and minute local time and check AM or PM or use the 24 clock and skip AM/PM.
7. Airport Name - Use the airport name or 3 letter code if a US airport. If a foreign airport, use the full name or 3 letter code and location (city/country).
8. Runway used - Self explanatory.
9. Location if En Route - Put the name of the nearest city and state.
10. Height AGL - Put the feet above ground level at the time of the strike (if you don't know, use MSL and indicate this). For take-off run and landing roll, it must be 0.
11. Speed (IAS) - Speed at which the aircraft was traveling when the strike occurred.
12. Phase of Flight - Phase of flight during which the strike occurred. Take-off run and landing roll should both be 0 AGL.
13. Part(s) of Aircraft Struck or Damaged - Check which parts were struck and damaged. If a part was damaged but not struck indicate this with a check on the damaged column only and indicate in comments (#21) why this happened (e.g., the landing gear might be damaged by deer strike, causing the aircraft to flip over and damage parts not struck by deer).
14. Effect on Flight - You can check more than one and if you check (Other", please explain in Comments (#21).
15. Sky condition - Check the one that applies.
16. Precipitation - You may check more than one.
17. Bird/Other Wildlife Species - Try to be accurate. If you don't know, put unknown and some description. Collect feathers or remains for identification for damaging strikes.
18. Number of birds seen and/or struck - check the box in the Seen column with the correct number if you saw the birds/other wildlife before the strike and check the box in the Struck column to show how many were hit. The exact number, can be written next to the box.
19. Size of Bird(s) - Check what you think is the correct size (e.g. sparrow = small, gull = medium and geese = large).
20. Pilot Warned of Birds - Check the correct box (even if it was an ATIS warning or NOTAM).
21. Remarks - Be as specific as you can. Include information about the extent of the damage, injuries, anything you think would be helpful to know. (e.g., number of birds ingested).
22. Aircraft time out of service - Record how many hours the aircraft was out of service.
23. Estimated cost of repairs or replacement - This may not be known immediately, but the data can be sent at a later date or put down a contact name and number for this data.
24. Estimated other cost - Include loss of revenue, fuel, hotels, etc. (see directions for #23).
25. Reported by - Although this is optional, it is helpful if questions arise about the information on the form (a phone number could also be included).
26. Title - This can be Pilot, Tower, Airport Operations, Airline Operations, Flight Safety, etc.
27. Date - Date the form was filled out.

Figure 8.1.6 – Bird/Wildlife Strike Reporting Form

Purdue University Aviation Technology Department
Accident/Incident Response Plan

The SATT is dedicated to providing the safest environment possible for its flight students, TFO passengers and flight faculty/staff. Safety involves a culture and attitude that include everyone associated with the flight operation. All flight students, instructors, faculty, administrators, technicians, clerical and other support personnel are responsible for contributing to the overall safety of the flight operation.

Notwithstanding the concerted efforts of everyone involved, there is the possibility that an accident or incident can occur. In order to reduce confusion in a crisis, fulfill obligations and responsibilities, and provide compassion for affected individuals and family members in the event of serious injury or death, this accident/incident response plan has been developed.

Proper communication from the appropriate personnel is the focal point of the plan. Components of the communication chain include the Federal Aviation Administration, the SATT Head or Associate Head, the Dean of the Purdue Polytechnic Institute, Purdue Police/Fire and Rescue (assuming they have not already been notified), the Dean of Students Office, Purdue Marketing & Media (Purdue News Service), Purdue Risk Management and Purdue Counseling and Psychological Services.

In order to provide accurate information, contact with the media should only be accomplished through the Purdue News Service or the SATT Head or Associate Head.

In the event of a fatality, official notification is to follow the normal University Policy relative to a student or instructor death, which is carried out by the Office of the Dean of Students, the Purdue Police, or the Office of Marketing & Media, as delegated by the County Coroner’s Office.

Telephone or other inquiries from the media, concerned family members, and others must be referred to the appropriate University spokesperson.

Accident/Incident Response Plan Flow Pattern

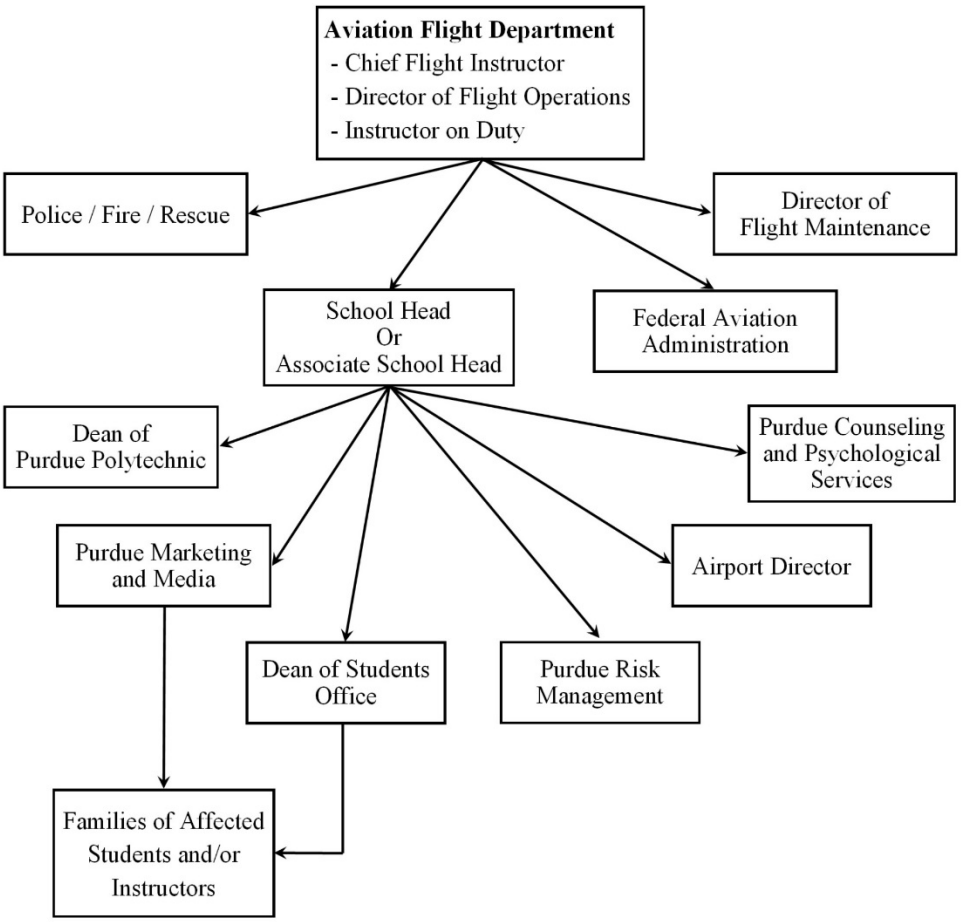


Figure 8.1.7 – Accident/Incident Response Plan Flow

Chronological Flow for the Response Plan

Initial notification to the Aviation Department of an accident/incident could come from one of a number of sources. If the occurrence is at the Purdue University airport during the operating hours of the Lafayette Control Tower, the Tower will notify fire and rescue and contact the Aviation Department. If the occurrence happens when the control tower is not in operation (before 7:00 a.m. or after 9:00 p.m.) the flight instructor in charge should be aware of the accident/incident. If the occurrence is off airport, such as in the local area or on a cross country flight, the Aviation Department will be notified by an outside source.

Upon notification, the Chief Flight Instructor (or his/her designee) will:

1. Contact fire and rescue (if not already accomplished)
2. Contact the Purdue Police Department
3. Contact the SATT Head or the Associate Head in the case of the Head's absence.
4. Contact the Federal Aviation Administration
    a. Indianapolis FSDO if occurrence is Monday/Friday from 7:30 a.m. to 4:00 p.m.
    b. Flight Service Station at all other times
5. Contact the Director of Flight Maintenance

The SATT Head or his/her Associate Head will:

1. Contact the Purdue Office of Marketing & Media
2. Contact the Dean or Associate Dean of the Purdue Polytechnic Institute
3. Contact the Dean of Students Office
4. Contact Purdue Counseling and Psychological Services
5. Contact the Purdue Airport Manager
6. Contact Purdue Risk Management

Purdue Marketing & Media will:

1. Contact the media
2. Coordinate all releases of information with the SATT, the media, the Federal Aviation Administration and the NTSB (if required under NTSB Part 830)

Contact Names and Telephone Numbers

Purdue Fire and Rescue 911
Purdue Police Department 911

Chief Flight Instructor
- Ronda Cassens .....Office 765-494-1532
- .....Home 574-967-3775
- .....Cellular 765-586-0414

Safety Officer
- Andrew Running.....Office 765-496-0495
- .....Cellular 562-607-4209

Federal Aviation Administration
- Indianapolis FSDO (730am to 4pm).....317-837-4400
- FAA Regional Operations Center (4pm to 730am) ...877-222-5006

Director of Flight Maintenance
- Michael Davis .....Office 765-494-8240
- .....Cellular 765-714-5581
- .....Home 765-743-4850

Director of Maintenance Quality Control
- Mark Hopkins .....Office 765-494-2084
- .....Cellular 765-491-1460
- .....Home 765-449-4986

Interim Head, SATT
- John Mott .....Office 765-494-2686
- .....Cellular 205-246-9774
- .....Home 765-421-6114

Dean of the Purdue Polytechnic Institute
- Gary Bertoline.....Office 765-494-2552

Dean of Students Office.....765-494-1747
Purdue Risk Management.....765-494-7695
- Mark Kebert.....Home 765-583-3269
- .....Cellular 765-412-1970
- Tiffany Utermark .....Home 765-447-5203
- .....Cellular 765-414-1496

Purdue Counseling and Psychological Services 765-494-6995

PURDUE UNIVERSITY EXPECTATIONS FOR PART-TIME INSTRUCTORS

1. Must be here for all scheduled flight periods (dual or solo, rain or shine) and all night flights.

2. Must arrive on time.

3. Must complete all flight students (phase check or checkride) within the semester.

4. Must be suitably attired.

5. Must demonstrate professionalism.

6. Must make this your #1 obligation during scheduled flight periods.

7. Must follow FAA and Purdue University regulations and recommended operating procedures.

8. Must maintain good safety practices at all times. (Students learn by example.)

9. Must maintain proper instructor-student relationship.

10. Must notify student and Dispatch if unable to make a flight period.

11. Must maintain confidentiality of student's progress.

12. Come to full-time staff early with any problems. (Little problems can become big problems.)

13. Must attend meetings as scheduled by the assigned supervising instructor.

14. Meetings should include (a) review of student logbook, (b) student's flight progress, (c) discussion of student problem areas, (d) planning for future lessons.

15. Please realize that if an instructor sends a student solo, he/she may leave the airport provided they return to meet and debrief the student after the flight. – *Solo flights are not to be approved from home.*

PART TIME FLIGHT INSTRUCTOR DRESS CODE

As flight instructors, we all need to maintain a sense of professionalism, which includes being properly attired. The following dress code is required while on duty as part time flight instructor at Purdue University.

Shirts –
A collared shirt must be worn whenever performing duties as a flight or simulator instructor.

Pants –
Dress slacks or skirts (women only, please) are acceptable along with Docker style pants or khakis. Women may wear dresses if they want. Shorts* of any kind, jeans, sweatpants, or cutoffs will not be allowed.
**During the summer term (June through August), Bermuda, golf, or dress shorts may be worn if allowed by the chief flight instructor.*

Shoes –
Any nice looking pair of closed-toe, closed-heel shoes will be acceptable. During the winter months when snow and slush are a problem, boots may be worn. No tennis shoes, sandals (Birkenstocks included) or ratty looking shoes will be tolerated.

PURDUE UNIVERSITY FLIGHT PROGRAM REQUIRED ITEMS

For exact type of approved items and/or vendors, please refer to the current list of materials required for students, on the flight ops news & resources site.

Students:

AT Safety & Procedures Manual
Training Course Outline
Purdue Logbook (AT-145 Flight Record)
Personal Logbook (Recommended)
Medical Certificate
Course applicable aircraft manual
Applicable VFR and/or IFR charts
Flight Computer and Plotter
Earplugs (optional)
Practical Test Standards or Airmen Certification Standards, as applicable
Oral Exam Guides (optional)
Headset
View Limiting Device
Notepad and Pencil
Flashlight (for night or early morning flight)
Sunglasses (optional)
Knee Board (optional)

Instructors:

AT Safety & Procedures Manual
Training Course Outline
Appropriate Aircraft Manual
Flashlight
Applicable VFR and/or IFR charts
Earplugs (optional)
Practical Test Standards
Oral Exam Guide (optional)
Headset

PROPER USE OF SOLO PERMISSION SLIPS

Flight instructors are required to meet with their respective students for all regularly scheduled flight periods and night flights regardless of whether it is a dual or solo flight.

For regularly scheduled periods, solo slips may be used if the instructor has a valid conflict (i.e. approved class-related trip, emergency). The solo slip must be specific as to the type of flight, lesson number, date, details as to what the student is to practice if local, and any other limitations the instructor desires to specify.

Students must be informed that they are required to give the solo permission slip, along with an appropriate weather report, to a full time flight instructor who must authorize the flight.
Solo slips are not permitted for night flying.

Solo permission slips must be used for both local and cross country flights on Sundays unless the student's assigned instructor will be present to approve the flight.

STAGE CHECKS IN PURDUE UNIVERSITY FLIGHT COURSES

Periodic checks of a student's progress is a very important part of a quality pilot training program. The stage checks in the curriculum in the Aviation Flight Program at Purdue University are performed by the Chief, Assistant Chief, and Stagecheck Flight Instructors. A brief description of the stage checks follow:

AT 24302 The AT 24302 Stage Check will review cross country planning and procedures. The commercial flight maneuvers will also be emphasized.

AT 24802 The AT 24802 Stage Check is an evaluation of basic attitude instrument flying and commercial maneuvers. Detailed information can be obtained from the stage check evaluation form.

AT 25302 Instrument Stage Check: The purpose of the AT 25302 Instrument Stage Check is to determine that the student is competent to pass the Instrument Rating Airplane Practical Test. The student will demonstrate a high level of competency in IFR cross country planning and flying, in addition to holding and instrument approaches.

Commercial Stage Check: The purpose of the AT 25302 Commercial Stage Check is to determine that the student is competent to pass the Commercial Pilot Airplane Practical Test. The student will demonstrate a high level of competency in commercial flight maneuvers, in addition to VFR cross country planning and flying.

Detailed explanations of each stagecheck is included in the stagecheck section of this manual.

A copy of each of the above stagecheck is included at the end of each course outline.

GUIDELINES FOR CONDUCTING MEETINGS WITH PART TIME FLIGHT INSTRUCTORS

The required meetings between part time flight instructors and Continuing Lecturers (full time instructors) is an extremely important component in maintaining safety and quality flight education at Purdue University. It is imperative that a schedule be determined as early as possible at the beginning of the semester and a copy of the schedule must be submitted to the director of flight training. The meetings are mandatory; therefore, absences must be reported immediately to the director of flight training or chief flight instructor.

At the end of each semester an attendance record will be submitted to the director of flight training or chief flight instructor.

Each meeting is very important and gives an opportunity for the full time instructor to assess the progress of the part time instructor's students. It also establishes an avenue for the inexperienced part time instructors to seek help, advice and other input relative to providing the best flight training possible.

Each meeting must include the following:

1. A review of each page of all of the student's logbooks since the last meeting for that part time instructor. Check for:

    a. Neatness and use of pen, not pencil
    b. Date, lesson number, A/C type, A/C number
    c. Each maneuver graded and an overall grade for the flight
    d. If cross country, the route must be indicated in the remarks area
    e. Accuracy of flight times. Dual plus solo/PIC should equal total time

2. Ensure that the flight course outline is being followed

3. Discuss student strengths, weaknesses, etc.

4. Discuss strategies for improvement and offer other input as needed

5. Discuss plans for the next two weeks as appropriate

RECOMMENDATION PROCEDURES FOR PRIVATE, COMMERCIAL, AND INSTRUMENT RATING PRACTICAL TESTS

The Practical Test Standards, or Airmen Certification Standards (as applicable), is a tool that should be used in preparing an applicant for the appropriate flight test. The recommending instructor must ensure that the applicant is competent in each task in every area of operation in the appropriate Practical Test Standard, or Airmen Certification Standards.

All practical flight tests will be accomplished using IACRA (Integrated Airmen Certification and/or Rating Application), the FAA's web-based airman certification system. All students and instructors are required to register with IACRA and will be assigned a User Name and FAA Tracking Number (FTN) by the system. The User Name and FTN should be recorded on the front information page of the student's Flight Record. On occasion, IACRA may not be available due to system outages, registration issues, etc. In that case, a paper 8710 application and FAA Knowledge Test results will be submitted to the Designated Pilot Examiner at the time of the practical flight test.

To allow sufficient processing time for the IACRA system, the practical flight test must be scheduled at least 48 hours after the student has taken their FAA Written Knowledge Test.

In order to assist the recommending instructor, a requirements checklist is provided and must be submitted to the Pilot Examiner. The checklists are available in the office at Hangar 6.

FAA application instructions for completing the 8710, and a sample completed 8710 for the Private Pilot Certificate are included on the following pages.

Fill out Airman's ID section on bottom of second page.

REMINDER: Your CFI certificate # includes "CFI" at the end of the number. (ie 1234567CFI)

AIRMAN CERTIFICATE AND/OR RATING APPLICATION
INSTRUCTIONS FOR COMPLETING FAA FORM 8710-1

I. APPLICATION INFORMATION. *Mark "X" in all appropriate blocks(s).*

Note: *Please enter all dates in eight digits as MM/DD/YYYY. Use numeric characters, (e.g. 01/01/2014).*

Block A. Name. Enter full legal name (Last, First, Middle). If your full legal name is more than 50 characters, use no more than one middle name for record purposes. Do not change the name on subsequent applications unless it is done in accordance with 14 CFR part 61.25. If you do not have a middle name, enter "NMN." If you have a middle initial only, indicate "Initial only." Indicate if you are a Jr., II, or III.

Block B. Social Security Number. Enter either your 9-digit social security number, "Do Not Use" or "None" if you are not a U.S. citizen. If entering a social security number, only enter a 9-digit U.S. social security number (optional). See supplemental Privacy Act Information.

Block C. Date of Birth. Enter your date of birth in the following format: MM/DD/YYYY. Check for accuracy. Verify that DOB is the same as it is on the medical certificate.

Block D. Place of Birth. If you were born in the USA, enter the city and state where you were born. If the city is unknown, enter the county and state. If you were born outside the USA, enter the name of the city and country where you were born.

Block E1. Residential Address. Enter your complete residential address. This must include street number, city, state, and zip code. If the applicant has a foreign address, the country must be stated. If a residential address does not exist, a map or written directions to the applicant's physical residence must be attached to the application. Verify that the numbers are not transposed.

Block E2. Mailing Address. Enter your mailing address, if different than block E1. This may be a residence, post office box, rural route, flight school address, personal mail box (PMB), commercial address, or other mail drop location, as applicable. The address provided in block E2, if any, will be printed on the permanent airman certificate. If you want your airman certificate mailed to an address other than provided in blocks E1 or E2, you will need to provide instructions on a separate attachment or in the remarks section of the form.

Block F. Citizenship/Nationality. Mark USA if you are a U.S. Citizen or legally naturalized U.S. Citizen. If you are not a U.S. citizen, mark "Other" and enter the country where you are a legal citizen. To claim Dual Citizenship the applicant must present appropriate documentation of citizenship for each country.

Block G. Do you read, speak, write and understand the English language? Mark yes or no. If you answered "No" and it is due to medical reasons, an operating limitation will be placed on the airman certificate.

Block H. Height. Enter your height in inches. Example: 5'8" would be entered as 68 in. No fractions, use whole inches only.

Block I. Weight. Enter your weight in pounds. No fractions, use whole pounds only.

Block J. Hair Color. Spell out the color of your hair. Choose from the following: bald, black, blond, brown, gray, red or white. If you wear a wig or toupee, enter the color of your hair under the wig or toupee.

Block K. Eye Color. Spell out the color of your eyes. Choose from the following: black, blue, brown, gray, green, or hazel.

Block L. Sex. Mark either Male or Female as appropriate.

Block M. Do You Hold or Have You Ever Held An FAA Pilot Certificate? Mark yes or no. (NOTE: A student pilot certificate is a pilot certificate.) If. Yes, complete Blocks M1, M2, and M3.

Block M1. Grade of Certificate. Enter the grade of the FAA pilot certificate you hold (i.e., Student, Recreational, Private, Commercial, or ATP). DO NOT enter flight instructor certificate information.

Block M2. Certificate Number. Enter your current FAA certificate number as it appears on the pilot certificate.

Block M3. Date Issued. Enter the date your pilot certificate was last issued.

Block N. Do You Hold a Medical Certificate? Mark applicable boxes. If yes, complete blocks N1, N2, and N3.

Block N1. Class of Medical Certificate. Enter the class as shown on the medical certificate, (i.e., First, Second, or Third Class).

Block N2. Name of Medical Examiner. Enter the medical examiner's name as shown on your medical certificate.

Block N3. Date Issued. Enter the date your medical certificate was issued.

Block O. Narcotics Drugs. Mark appropriate block. Only mark "Yes" if you have actually been convicted. If you have been charged with a violation which has not been adjudicated, mark "No." Do not include alcohol offenses involving a motor vehicle mode of transportation as those are covered on the FAA Form 8500-8, Medical application.

Block O1. Date of Final Conviction. If block "N" was marked "Yes" provide the date of final conviction.

II. CERTIFICATE OR RATING APPLIED FOR ON BASIS OF:

Block A. Completion of Required Test.

1. Aircraft to be used. (If flight test required) – Enter the make and model of each aircraft used or represented. If a flight simulation training device (FSTD) is used, indicate Level of Device(s).
2. Total time in this aircraft and/or approved full flight simulator (FFS) or flight training device (FTD) (Hrs.) – (2a) Enter the total Flight Time (2b) Enter Pilot-In-Command (PIC) Flight Time.

Block B. U.S. Military Competence Or Experience. Enter your branch of service, date rated as a U.S. military pilot, and your rank or grade. In block 4a and 4b, enter the make and model of each military aircraft used to qualify (as appropriate).

Block C. Graduate of an Approved Course.

1. Name, Location, Certification Number of Training Agency/Center, as shown on the graduation certificate. Indicate if this was a part 142 training center.
2. Curriculum From Which Graduated. Enter name of curriculum and level, category, and/or type rating, as applicable.
3. Date. Date of graduation from indicated course.

Note: *Approved course graduate must also complete block A "Completion of Test or Activity," if the course is not part of an Air Agency or a part 142 Training Center.*

Block D. Holder of Foreign License.

1. Country that Issued the Foreign Pilot License.
2. Grade Of Foreign Pilot License (i.e. private, commercial, etc).
3. Number. Number which appears on the foreign license.
4. Ratings. Enter the FAA equivalent only ratings that appear on the foreign license. Indicate the ratings as they will appear on the FAA Certificate (i.e. ASEL, AMEL, ROTORCRAFT HELICOPTER, CE-500, etc).

Block E. Completion of Air Carrier's Training Program.

1. Name of air carrier.
2. Date program was started.
3. Identify the training program accomplished.

III. RECORD OF PILOT TIME. At a minimum, the applicant should complete the blocks applicable to the certificate or rating sought; however, it is recommended that all pilot time be entered. If decimal points are utilized, ensure that they are legible. Time entered in the "Class Totals" block should reflect time in aircraft class for the certificate or rating sought with this application. The time entered for an FFS, FTD, and/or ATD may be credited towards the total time in the category, class, and instrument time as permitted by the regulations. Add any Flight Engineer time used for ATP in remarks section.

IV. HAVE YOU PREVIOUSLY RECEIVED A NOTICE OF DISAPPROVAL OR BEEN DENIED FOR ANY REASON FOR THE CERTIFICATE AND/OR RATING FOR WHICH YOU ARE APPLYING? Mark "Yes" or "No" as appropriate.

V. APPLICANT'S CERTIFICATION.

A. Signature. Sign your name.
B. Date. The date you signed the application.

FAA Form 8710-1 (04-16) Supersedes Previous Edition NSN: 0052-00-682-5007

iv

Figure 8.2.1 – FAA 8710 Instructions

TYPE OR PRINT ALL ENTRIES IN INK

Form approved OMB No.2120-0021
Exp. 04/30/2018

U.S. Department of Transportation
Federal Aviation Administration

Airman Certificate and/or Rating Application

I. APPLICATION INFORMATION (Mark 'X' in all the blocks applicable to the certificate or rating for which you are applying):

Certificates

Pilot: [ ] Student [ ] Recreational [ ] Flight [X] Private [ ] Commercial [ ] Ground [ ] ATP-Restricted [ ] ATP

Instructor: [ ] Flight [ ] Ground

Ratings

Category and/or Class: [X] ASE [ ] AME [X] Land [ ] Sea [ ] Helicopter [ ] Balloon [ ] Glider [ ] Gyroplane [ ] Airship [ ] Powered-Lift

Type Rating:

Instrument: [ ] Airplane [ ] Helicopter [ ] Powered-Lift

Ground Instructor: [ ] Basic [ ] Advanced [ ] Instrument

[ ] Added Rating

Other Information/Requests

[X] Initial [ ] Reexamination [ ] Instrument Proficiency Check
[ ] Renewal [ ] Reissuance [ ] Medical Flight Test
[ ] Reinstatement [ ] Flight Review [ ] Limitation Removal

Specify other: [ ] IPL

A. Name (Last, First, Middle)	B. SSN (U.S. Only)	C. Date of Birth (MM/DD/YYYY)	D. Place of Birth (City and State) or (City and Country)
Pete, Purdue NMN	DO NOT USE	08/21/1988	West Lafayette, IN

E1. Residential Address (Including City, State, Zip Code, and Country)	E2. Mailing Address (This address will be printed on the permanent airman certificate, if different than block E1.)	F. Citizenship / Nationality	G. Do you read, speak, write, & understand the English language?	H. Height (inches)	I. Weight (pounds)	J. Hair Color	K. Eye Color	L. Sex
401 N Grant Street West Lafayette, IN 47906		[X] USA [ ] Other specify:	[X] Yes [ ] No	78	200	Black	Black	[X] Male [ ] Female

M. Do you hold, or have you ever held an FAA certificate?	M1. Grade of Certificate	M2. Certificate Number	M3. Date Issued
[X] Yes [ ] No	Student	ZZ-123456	07/01/2016

N. Do you hold a Medical Certificate?	N1. Class of Medical Certificate	N2. Name of Medical Examiner	N3. Date Issued
[X] Yes - FAA [ ] Yes - Foreign [ ] Yes-Military [ ] No	First	Dr. Boilermaker, M.D.	07/01/2016

O. Have you ever been convicted for violation of any Federal or State statutes relating to narcotic drugs, marijuana, or depressant or stimulant drugs or substances? Do not include alcohol offenses involving motor vehicle mode of transportation as those offenses are covered on the FAA Form 8500-8, Airman Medical Application Form. [ ] Yes [X] No

O1. Date of Final Conviction

II. CERTIFICATE OR RATING APPLIED FOR ON BASIS OF:

[X] A. Completion of Test or Activity

1. Aircraft to be used (Flight test required)	2. Total time in this aircraft and/or approved FFS or FTD (hours)	a. Flight Time	b. As Pilot-in-Command
SR-20		50.0	10.0

[ ] B. U.S. Military Competence or Experience

1. U.S. Military Service	2. Date Rated in U.S. Military	3. Rank or Grade

4. List Military aircraft for which you have: a. logged pilot time or provided flight instruction (IP) (make and model) | b. passed an Instrument Proficiency Check (Pilot or CFII - (make and model))

[ ] C Graduate of an Approved Course

1. Training Agency or Training Center:	1a. Name	1b. Location (City and State)	1c. Certification Number	1d. Part 142?
				[ ] Yes [ ] No

2. Curriculum From Which Graduated (Level, Category, and Class and/or Type Rating) | 3. Date

[ ] D Holder of Foreign License

1. Country that Issued the Foreign Pilot License	2. Grade of Foreign Pilot License	3. Foreign Pilot License Number

4. Ratings Held on Foreign Pilot License (FAA equivalent only – e.g. ASEL, AMEL, Type rating, etc.)

[ ] E. Air Carrier Training Program

1. Name of Air Carrier	2. Date Training Began	3. Accomplished Training Program
		[ ] Initial [ ] Upgrade [ ] Transition [ ] Recurrent

III. RECORD OF PILOT TIME (Do not write in the shaded areas)

	Total	Instruction Received	Solo	PIC and SIC	Cross Country Instruction Received	Cross Country Solo	Cross Country PIC/SIC	Instrument	Night Instruction Received	Night Take-Off/Landing	Night PIC/SIC	Night Take-Off/Landing PIC/SIC	Class Totals	Number of
Airplanes	50	40	10	PIC 10 SIC	6	5	PIC 5 SIC	3	3	10	PIC SIC	PIC SIC		
Rotorcraft				PIC SIC			PIC SIC				PIC SIC	PIC SIC		
Powered Lift				PIC SIC			PIC SIC				PIC SIC	PIC SIC		
Gliders				PIC SIC										
Lighter-Than-Air				PIC SIC			PIC SIC				PIC SIC	PIC SIC		
FFS														
FTD	3	3						3					3	
ATD														

IV. Have you previously received a Notice of Disapproval or been denied for any reason for the certificate AND/OR rating for which you are applying? [ ] Yes [X] No

V. APPLICANT'S CERTIFICATION: I certify that all statements and answers provided by me on this application form are complete and true to the best of my knowledge and I agree that they are to be considered as part of the basis for issuance of any FAA certificate to me. I have received the Pilot's Bill of Rights Written Notification of Investigation that accompanies this form. I have also read and understand the Privacy Act statement that accompanies this form.

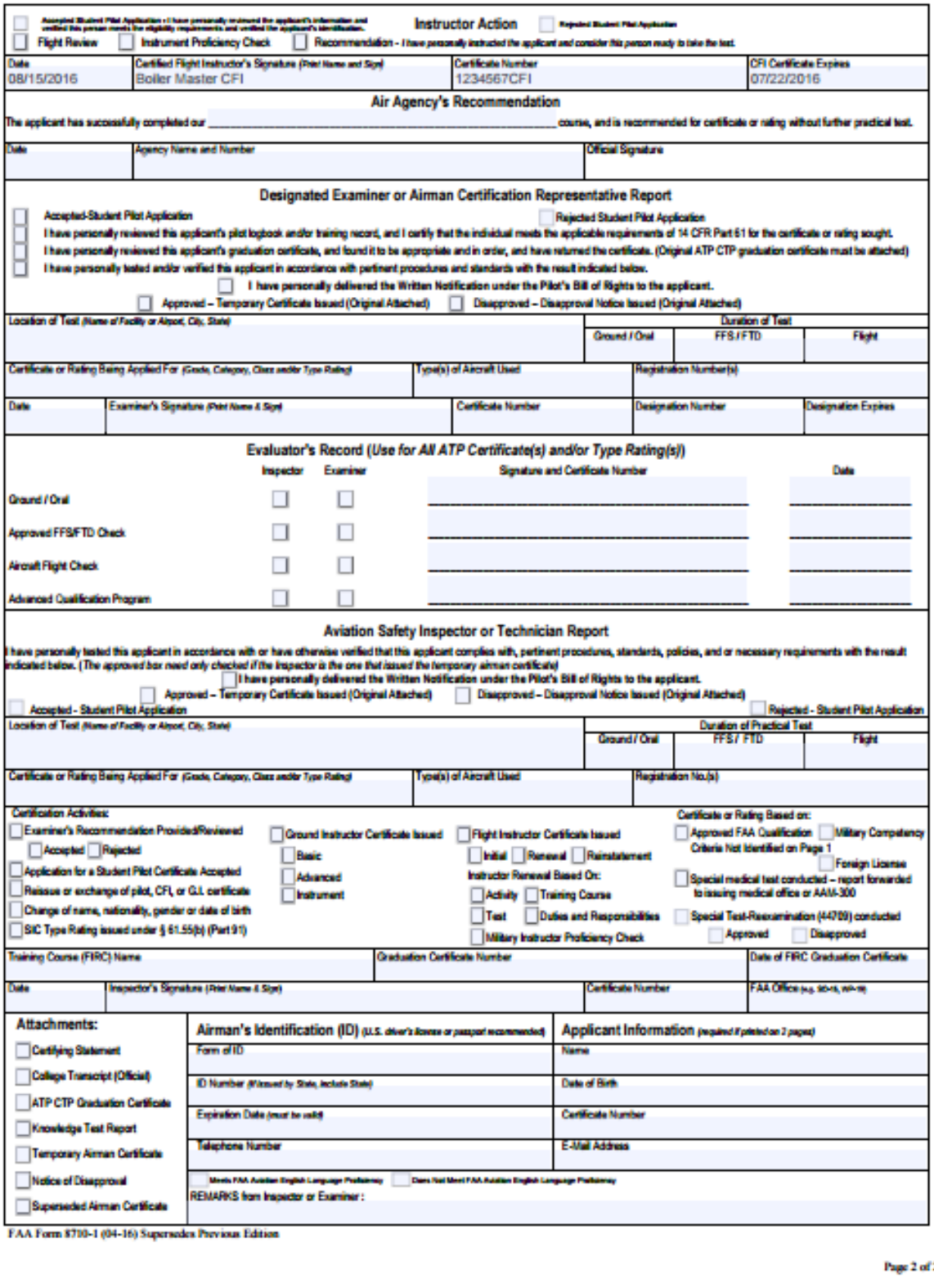
Signature of Applicant	Date (MM/DD/YYYY)
	08/15/2016

FAA Form 8710-1 (04-16) Supersedes Previous Edition

NSN: 0052-00-682-5007

Page 1 of 2

Figure 8.2.2 – FAA 8710 Sample Form



Accepted Student Pilot Application - I have personally reviewed the applicant's information and verified this person meets the eligibility requirements and verified the applicant's identification.

Instructor Action Rejected Student Pilot Application

☐ Flight Review ☐ Instrument Proficiency Check ☐ Recommendation - I have personally instructed the applicant and consider this person ready to take the test.

Date	Certified Flight Instructor's Signature (Print Name and Sign)	Certificate Number	CFI Certificate Expires
08/15/2016	Boiler Master CFI	1234567CFI	07/22/2016

Air Agency's Recommendation

The applicant has successfully completed our _____ course, and is recommended for certificate or rating without further practical test.

Date	Agency Name and Number	Official Signature

Designated Examiner or Airman Certification Representative Report

☐ Accepted-Student Pilot Application ☐ Rejected Student Pilot Application

☐ I have personally reviewed this applicant's pilot logbook and/or training record, and I certify that the individual meets the applicable requirements of 14 CFR Part 61 for the certificate or rating sought.

☐ I have personally reviewed this applicant's graduation certificate, and found it to be appropriate and in order, and have returned the certificate. (Original ATP CTP graduation certificate must be attached)

☐ I have personally tested and/or verified this applicant in accordance with pertinent procedures and standards with the result indicated below.

☐ I have personally delivered the Written Notification under the Pilot's Bill of Rights to the applicant.

☐ Approved – Temporary Certificate Issued (Original Attached) ☐ Disapproved – Disapproval Notice Issued (Original Attached)

Location of Test (Name of Facility or Airport, City, State)	Duration of Test: Ground / Oral	FFS / FTD	Flight

Certificate or Rating Being Applied For (Grade, Category, Class and/or Type Rating)	Type(s) of Aircraft Used	Registration Number(s)

Date	Examiner's Signature (Print Name & Sign)	Certificate Number	Designation Number	Designation Expires

Evaluator's Record (*Use for All ATP Certificate(s) and/or Type Rating(s)*)

	Inspector	Examiner	Signature and Certificate Number	Date
Ground / Oral	☐	☐		
Approved FFS/FTD Check	☐	☐		
Aircraft Flight Check	☐	☐		
Advanced Qualification Program	☐	☐		

Aviation Safety Inspector or Technician Report

I have personally tested this applicant in accordance with or have otherwise verified that this applicant complies with, pertinent procedures, standards, policies, and or necessary requirements with the result indicated below. (*The approved box need only checked if the Inspector is the one that issued the temporary airman certificate*)

☐ I have personally delivered the Written Notification under the Pilot's Bill of Rights to the applicant.

☐ Approved – Temporary Certificate Issued (Original Attached) ☐ Disapproved – Disapproval Notice Issued (Original Attached)

☐ Accepted - Student Pilot Application ☐ Rejected - Student Pilot Application

Location of Test (Name of Facility or Airport, City, State)	Duration of Practical Test: Ground / Oral	FFS / FTD	Flight

Certificate or Rating Being Applied For (Grade, Category, Class and/or Type Rating)	Type(s) of Aircraft Used	Registration No.(s)

Certification Activities:

☐ Examiner's Recommendation Provided/Reviewed ☐ Accepted ☐ Rejected

☐ Application for a Student Pilot Certificate Accepted

☐ Reissue or exchange of pilot, CFI, or G.I. certificate

☐ Change of name, nationality, gender or date of birth

☐ SIC Type Rating issued under § 61.55(b) (Part 91)

☐ Ground Instructor Certificate Issued ☐ Basic ☐ Advanced ☐ Instrument

☐ Flight Instructor Certificate Issued ☐ Initial ☐ Renewal ☐ Reinstatement

Instructor Renewal Based On:

☐ Activity ☐ Training Course ☐ Test ☐ Duties and Responsibilities ☐ Military Instructor Proficiency Check

Certificate or Rating Based on:

☐ Approved FAA Qualification ☐ Military Competency Criteria Not Identified on Page 1 ☐ Foreign License

☐ Special medical test conducted – report forwarded to issuing medical office or AAM-300

☐ Special Test-Reexamination (44709) conducted ☐ Approved ☐ Disapproved

Training Course (FIRC) Name	Graduation Certificate Number	Date of FIRC Graduation Certificate

Date	Inspector's Signature (Print Name & Sign)	Certificate Number	FAA Office (e.g. SEA-5, WP-19)

Attachments:

☐ Certifying Statement
☐ College Transcript (Official)
☐ ATP CTP Graduation Certificate
☐ Knowledge Test Report
☐ Temporary Airman Certificate
☐ Notice of Disapproval
☐ Superseded Airman Certificate

Airman's Identification (ID) (U.S. driver's license or passport recommended)

Form of ID	
ID Number (If issued by State, include State)	
Expiration Date (must be valid)	
Telephone Number	

Applicant Information (required if printed on 2 pages)

Name	
Date of Birth	
Certificate Number	
E-Mail Address	

☐ Meets FAA Aviation English Language Proficiency ☐ Does Not Meet FAA Aviation English Language Proficiency

REMARKS from Inspector or Examiner:

FAA Form 8710-1 (04-16) Supersedes Previous Edition

Page 2 of 2

Figure 8.2.3 – FAA 8710 Sample Form

PURDUE UNIVERSITY EXPECTATIONS FOR FLIGHT AND AATD STUDENTS

1. Must attend all scheduled flight sessions and all previously-arranged extra sessions (rain or shine). Only exceptions – illness or death in the family or Purdue football games (if flight can be made up during the previous week).

2. Must notify his/her flight instructor if unable to attend class.

3. Must arrive on time (no later than bus arrival, if applicable).

4. Must complete all reading assignments.

5. Must complete course by end of semester.

6. Must follow FAA and Purdue regulations and operating procedures.

7. Must exhibit proper handling and servicing of aircraft (fuel, oil, windshields, preflight, hangaring).

SCHOOL OF AVIATION AND TRANSPORTATION TECHNOLOGY
DRUG AND ALCOHOL POLICY

The SATT at Purdue University, as well as the aviation industry, views substance abuse as a very serious issue. It is absolutely essential that a pilot's skills, thinking ability and judgment not be impaired while exercising their privilege as pilot-in- command of an aircraft. Therefore, the Aviation Department has a zero tolerance policy and the following applies to aviation flight students and instructors at Purdue University:

1. Use of or possession of illegal narcotic drugs will result in immediate loss of flight status in Purdue University aircraft. A flight review board will determine whether the student/instructor will be removed from the flight program.

2. There must be a minimum of 12 hours from the last consumption of any alcoholic beverage and the student or instructor flying in any Purdue University aircraft. Violation will result in immediate loss of flight status. A flight review board will determine whether the student will be removed from the flight course and if so, whether the student will be allowed to re-enter the flight course at a later date.

Policy Statement Regarding Suspected Chemically or Behaviorally Impaired AT Professional Flight Students

Purdue students enrolled in the Professional Flight plan of study utilize a variety of aviation laboratories - aircraft, flight training devices, and full flight simulators. Federal Aviation Regulations and Purdue memoranda generally state that chemical impairment is illegal, contrary to good judgment, and may impact the probability of future employment particularly in security sensitive positions because of mandatory background investigations and/or drug testing. Moreover, the SATT has an implied responsibility in the interest of public safety to defer or refuse licensing or training to students who are chemically or behaviorally impaired. Students must remain free from chemical or behavioral impairment during flight, flight training device, or full flight simulator training. The purpose of this memorandum is to improve faculty and student awareness of chemical/behavioral impairment, the consequences of suspected impairment, and the administrative process for responding to it.

The SATT defines a **chemically impaired student** as a person who while receiving or preparing for aircraft flight training, flight training device training, or full flight simulator training appears under the influence of, or has abused, either separately or in combination, alcohol, over-the-counter medications, illegal drugs, prescribed medications, inhalants, or synthetic designer drugs.

Further, the SATT defines a **behaviorally impaired student** as a person whose perceived mental state suggests a potentially serious, emotionally destabilizing, unresolved personal conflict. Chemical or behavioral impairment are activities that may pose a threat to others, usually from imprudent decisions or actions.

While it is not the intent of the SATT to dictate or monitor student personal lives, restrict individual liberties, or publicly embarrass students, it is the responsibility of the School to address impairment issues that may jeopardize the safety of any person or interfere with the highest quality of instruction. Admittedly, errors in identifying suspected impairment may occur, yet it is the Departmental goal to err on the side of caution.

Consequently, discussions between students and faculty involving suspected impairment will be conducted discreetly with restraint and courtesy. It is entirely possible that the suspected behavior has resulted from illness and is not true chemical or behavioral impairment. If the behavior observed has resulted from ordinary illness, the instructor of record should use reasonable judgment in assigning a daily grade for any missed class work.

Flight faculty or staff members may upon consultation with at least one other flight faculty or staff member intervene in instances of suspected impairment. Intervention will consist of questioning and counseling. The Director of Flight Training, Lead Faculty member for the junior or senior level simulation training, and School Head should be informed as appropriate. Students will have a reasonable opportunity to provide an explanation for their behavior.

If the evidence of impairment appears compelling as defined below, students will be immediately suspended from aircraft flight training, flight training device training and, where applicable, full flight simulator training by the Director of Flight Training, Lead Faculty for the Junior or Senior level simulation training, or School Head.

Before being allowed to return to aircraft flight, flight training device, or full flight simulator status, the student must appear before the SATT Flight Board* with convincing documentation from a licensed healthcare professional that the student is free from impairment. Severe forms of chemical dependency may require continued random testing and continuing recertification. Severe forms of behavioral impairment may require a continuing program of personal counseling or therapy. Return to training status after chemical or behavioral impairment is not guaranteed, but rather depends upon the student meeting the terms for readmittance as determined by the Flight Board.

*Note: The SATT Flight Board is a group of tenure track flight faculty, flight instructors, and Academic Advisors that convenes as necessary to address student problems on an individual basis.

Policy Statement Regarding Chemically or Behaviorally Impaired Flight Instructors

The guidelines stated in above and on the following page also apply to any flight instructors, whether fulltime or part-time, employed by SATT. Additionally, the procedures outlined Purdue University's "Alcohol and Drug Information", published by the Human Resources department, will be used for any investigative and punitive actions.

Impaired Student Behavior Cues

1. Odor of alcohol.
2. Unsteady or staggering gait.
3. Rapid or slurred speech.
4. Pinpoint or dilated pupils.
5. Marginal responsiveness or unresponsive to directions or conversation.
6. Fine motor tremors.
7. Bloodshot eyes.
8. Difficulty completing calculations.
9. Nausea, vomiting, sweating.
10. Inconsistent, grossly erratic or irregular mannerisms.
11. Enduring behavior suggesting depression.
12. Suicidal statements.
13. Uncharacteristic verbal or physical outbursts.

If one or more of these cues are observed:

1. Observing faculty member should consult with another flight faculty member.
2. Assuming both faculty members agree that there is a possibility of impairment, the student with observed behavior should be discretely questioned in a private setting.
3. Depending on the circumstances and when deemed appropriate, the suspected impaired student may be referred to Counseling and Psychological Services (CAPS) through PUSH or another mental health agency for evaluation. During the evaluation by CAPS, the student will be suspended from aircraft, flight training device, and simulator training. The student will authorize that a copy of the evaluation be sent to the SATT School Head and Flight Board.
4. The School Head and Flight Board members will be notified immediately of the suspected occurrence and initial action.
5. The Dean of Students Office will be notified immediately of the suspected occurrence and initial action.
6. Within 72 hours, the reporting faculty member and student will independently submit a brief detailed report to the SATT School Head with copies to the Lead junior or Senior simulator faculty member, or Director of Flight Training as appropriate, outlining what occurred and what course of action prevailed.
7. A meeting between the reporting faculty member, student, and Flight Board within 1 week of the incident will be scheduled to review facts, determine remedies, and establish a compliance timeline. The Flight Board will provide the student with a letter detailing these requirements.
8. The Flight Board may recommend dropping the student from the Professional Flight program for non-compliance with required Flight Board remedial action or subsequent impairment.

ATTENDANCE IN FLIGHT AND SIM COURSES

All flight students are required to report in person to dispatch for every regular scheduled flight and simulator slots. The only acceptable reasons for a student to cancel their slot are:

- Illness
- Emergency
- Purdue home football games
- Extra slot
- Course is complete and the student is waiting for a stage check or checkride

If the student cannot attend their slot for the above reasons, they must call dispatch to cancel that slot at least 15 minutes prior to the slot. Cancellations and no-shows will be recorded in the dispatch system's attendance record. It is the responsibility of the student to cancel their slot.

The following actions are considered a "no show":

- Failure to cancel within the 15 minutes prior to the start of the regular or extra slot.
- Cancellation for reasons other than those stated above.
- Failure to report to the regular or scheduled extra slot.
- Cancellation for weather more than 30 minutes prior to the beginning of an extra slot.

Each no-show will result in a 0.2 point reduction off the final course grade. For the no show fee, the first no-show will receive a warning. For each no-show beyond the first, the student will be assessed a $103 no show fee. The student will be notified by e-mail that a no-show has been recorded. If it is the second no-show, the student will have 48 hours from the receipt of the e-mail to provide documentation that the no-show was in error. Appropriate documentation can include but is not limited to:

- Doctor's note
- Football ticket
- Letter from the Office of the Dean of Students

If the student wishes to appeal the no show after received the bill, proper documentation must be provided to the Chief CFI, who will then pass the documentation to the Assistant Department Head for final determination. Questions about this policy or appeals should be directed to Ronda Cassens at rcassens@purdue.edu and 765-494-1532.

COURSE COMPLETION

1. Each student and instructor should pace themselves during the progress of a flight course so that not more than 5 hours of flight time remains, three weeks before the last day of a semester, or 10 consecutive days before the end of a summer session.
2. Extra flying approved by a student's own flight instructor is desirable.
3. Any Student who does not complete within a given semester or summer session the requisite flight time, or discussion lessons for a particular flight course, cannot receive a satisfactory grade in that course. In such instances, the flight time remaining is forfeited. If a student anticipates such a problem, he/she should contact the Director of Flight Training immediately.

CONDUCT IN FLIGHT ROOMS AND VICINITY OF HANGAR 6

1. The flight planning area is a classroom. Students making it into a social club will be asked to leave.

2. No loitering is allowed in the instructional offices. Because of limited space, please remain only during preflight and postflight briefing, or when you consult with an instructor.

3. All parking at the airport is by permit only. AT students are eligible to purchase "C" permits from Parking Control. Students are not allowed to park in the "Visitor" spaces. Violators may receive parking citations from University Parking Control. Further, students shall not park in the spots in the alley between Hangars 5 & 6.

4. Briefing/debriefing is not to be accomplished in Hangar 6 sign-out area. Suggested areas are Hangar 5 or in the aircraft.

AIRCRAFT PRIORITY POLICY

The following list establishes, in order of priority, the aircraft priority policy:

1. Flight tests for certification.
2. Standardization flights by the Chief Flight Instructor.
3. Stage checks
4. Local dual and solo flights which are to be accomplished during the regularly scheduled flight period.
5. Dual and solo flights which have been reserved on the reservation sheet.
6. Proficiency flights of the flight staff.
7. Other flights approved by the Chief Flight Instructor.

A lottery drawing will be conducted at 5:30 PM each day for extra flight periods two days in advance. The full time instructor in charge of lottery can draw for the student if a class or university commitment prohibits them from attending lottery, otherwise, there shall be only one number drawn per person, and only one slot chosen per number.

Should a conflict arise, the student or instructor having the highest priority according to the aforementioned list will have priority. In the event that a conflict occurs between two parties having the same priority, the priority goes to the first person to sign out the aircraft. In AT253 the priority among parties scheduled during a flight slot should rotate.

Sunday priority will be based upon the following criteria:

1. No aircraft can be signed out until the x-c planning is fully completed.
2. If multiple students have their planning completed then the student PRINTED on the top of the sheet has the highest priority down to the last student printed on the sheet.
3. Students with their names hand written have priority from the top to the bottom.
4. Aircraft are "free-game" 15 minutes after the flight slot is supposed to begin

SOLO FLIGHTS

1. All local solo flights must be specifically approved by the instructor to whom the student is assigned, or the instructor in charge, when a solo permission slip is on file – IMMEDIATELY PRIOR to the flight.

2. The Purdue minimum runway length for solo is 3000 feet.

3. Except for weather or aircraft emergencies, solo landings will be made only at Purdue Airport or airports on the approved list for solo cross country (except for weather or aircraft emergencies).

4. In the event a solo cross country flight is interrupted by a RON (Remain Over Night) at another airport, the flight may not be continued without authorization of the Chief Flight Instructor or his/her designee. Such authorization may be given by telephone immediately prior to departure.

5. All solo cross country flights must be endorsed in accordance with FAR 61.93 (c), (2).

6. The Seminoles and the Arrows will not be soloed by students, unless specifically authorized by the Chief Flight Instructor.

7. Crosswind takeoffs and landings, on other than the active runway, will be practiced by students only with the permission of the instructor in charge.

8. Simulated emergency operations will not be practiced while solo.

9. If an emergency landing occurs, the pilot must notify the school immediately (call collect 765-494-8163) and MAKE NO ATTEMPT TO FLY THE AIRCRAFT until specific approval is given.

10. All students must carry their student or pilot certificate, current medical, government-issued picture ID and Purdue logbook while flying.

11. Students are not to carry passengers on any flights.

12. All students will monitor Lafayette Tower when operating solo, in the local area.

13. On all local and cross country solo flights, all AT-145 students must add the phrase “student pilot” when contacting Air Traffic Control.

14. AT-145 students on solo flights are not allowed to accept Land and Hold Short instructions from the control tower.

15. The autopilot shall not be used, except for emergencies

OPERATIONAL LIMITATIONS

GENERAL LIMITATIONS

1. Current Federal Aviation Regulations are to be observed, except formation flying, which is expressly prohibited in Purdue University aircraft.

2. The traffic and taxi procedures for Purdue Airport are to be observed at all times.

3. Clearance to taxi, takeoff, or land at Purdue Airport must be obtained from Lafayette Ground (121.9 MHz) or Tower (119.6 MHz).

4. Pilots of Purdue University aircraft are urged to report to “Lafayette Traffic” 119.6 MHz when a) leaving the Purdue Airport traffic pattern, b) entering the Purdue pattern, c) turning base leg in the Purdue Airport pattern when Lafayette Tower is not operating.

5. Aircraft without a Pulselite system installed shall operate with the landing light on when within 10 nm of an airport.

6. No flying is to be conducted at an altitude below 1000 feet AGL except for takeoff and landing.

7. No IFR flights within clouds when icing has been reported except when flying at temperatures above freezing.

8. Intentional spins are prohibited in the PA-28R-201, the Cirrus SR-20, and the Seminole.

9. Each pilot is responsible for the preflight inspection including determination of the proper loading of the aircraft and the takeoff, rate of climb, landing, and fuel requirements for each flight.

10. The Chief Flight Instructor or one of the Assistant Chief Flight Instructors will be available by either radio or telephone anytime a Purdue training aircraft is flying.

11. The cities of Lafayette and West Lafayette and the Purdue University Campus are considered prohibited areas for Purdue University aircraft except when taking off or landing or when crossed by the course of an authorized cross country flight.

12. All flights must land with a minimum of 6 gallons of fuel in each tank.

13. Checklists should be used for all operations.

14. When using runway 23, turns to base should be made so as to remain south of State Street. If traffic does not permit this, an altitude of 1200 feet MSL minimum, must be maintained until south of State Street.

15. SMOKING, EATING, AND DRINKING IS PROHIBITED IN PURDUE AIRCRAFT.

16. Students/Instructors are not allowed to wear sandals and “flip flops” in Purdue University aircraft.

17. Students should monitor appropriate ATC frequency during flights. Students are not allowed to communicate with each other over the radio during any flight operations.

18. Except for emergencies and demonstration of the “blue level button”, the autopilot shall not be used in Private Pilot, Commercial Flight I and Commercial Flight II.

19. Purdue vetted electronic VFR charts may be used in Commercial Flight II and Instrument/Commercial Flight, at the student’s discretion.

20. At no time will any form of video be recorded while in flight in a Purdue airplane.

NIGHT FLIGHTS

The following additional limitations shall apply to all night flights:

1. No night solo cross-country will be flown.

2. Aircraft must be equipped with an operative landing light, navigation lights, and rotating beacon and/or wing tip strobe lights.

3. No training flights will be scheduled to take place between 01:30 a.m. and 5:30 a.m.

4. Fuel tanks must be full before beginning any night flight.

5. Solo slips are not permitted for night flight.

This Page Intentionally Left Blank

VISUAL FLIGHT RULES (VFR)

CEILING AND VISIBILITY LIMITS

Type of Flight	A/C Type	Course	Minimum Ceiling	Minimum Visibility
Dual (Local or pattern)	ALL	All except IFR	1500	3
Dual (Day Cross Country)	ALL	All except IFR	2000	5
Dual (Night Cross Country)	ALL	All except IFR	3000	7
Solo (Local or Pattern)	ALL	AT-145, AT-243, AT-248	1500	5
Solo (Cross Country)	ALL	AT-145, AT-243, AT-248	2500	7

Additional minimums for Solo Cross country:

- No precipitation, fog or thunderstorms are reported or forecasted

WIND AND CROSSWIND COMPONENTS

Maximum Wind Limits & Indicated Peakgusts in Knots

Type of Flight	Course	A/C	0°	20°	30°	50°	60°	80°	90°
Dual	ALL	Cirrus SR-20 PA-28R-201 PA-44-180	30	27	26	23	22	19	17
Solo	AT-145 – 243	Cirrus SR-20	20	17	16	13	12	9	7
Solo	AT-248	Cirrus SR-20	25	20	16	14	12	10	9

While monitoring tower, if winds begin to go out of limits, return to the airport and land full stop as soon as practical.

TEMPERATURE LIMITS

Day – All Aircraft

Minimum reported temperature of -23°C

Night – All Aircraft

Minimum reported temperature of -18°C

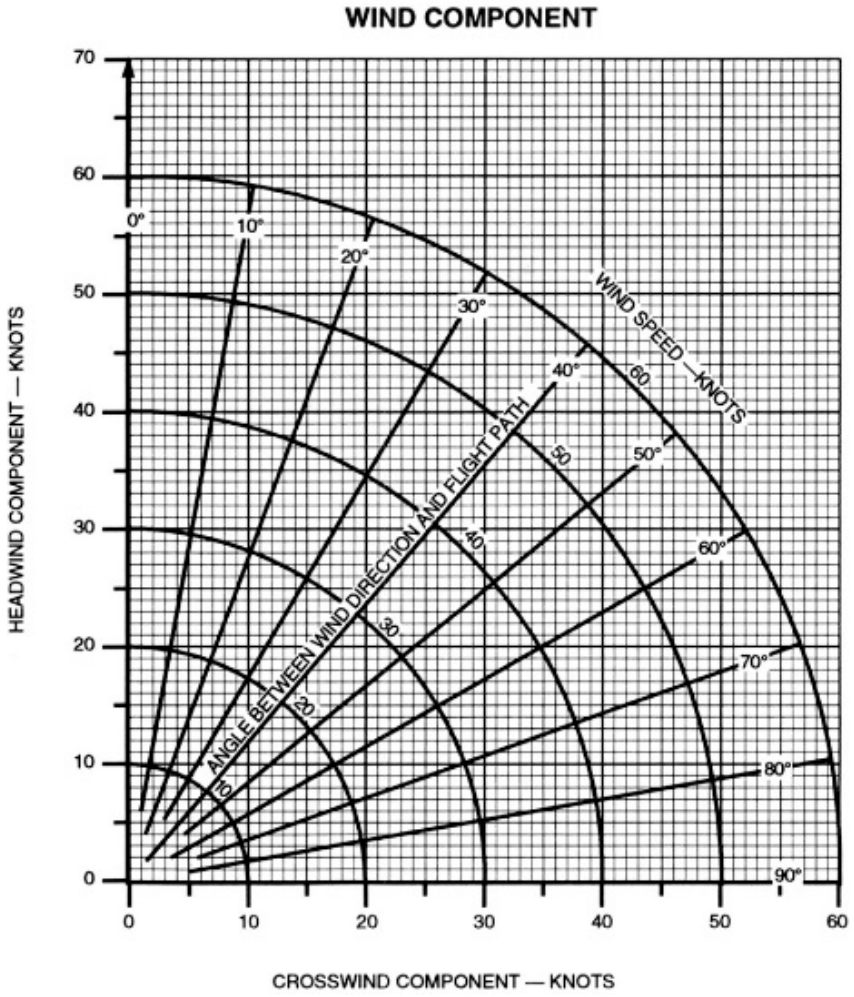
INSTRUMENT FLIGHT RULES (IFR)

CEILING AND VISIBILITY FOR LOCAL OR CROSS COUNTRY

	Minimum Ceiling (ft)	Minimum Visibility (sm)
Day – Senior Instructors	500	1
Day – Junior Instructors*	1000	1
*With Chief CFI direct approval	500	1
Night – All Instructors	1000	1

Flight into known or forecast icing conditions is prohibited.
Flight in or in the vicinity of thunderstorms is prohibited

*Junior Instructors include all part-time instructors, as well as full-time instructors who have worked for Hangar 6 less than 1 year.



Procedure for Approving Solo Cross Country Flights

All solo cross countries in Purdue University aircraft must be approved and signed off by the student's flight instructor or an instructor in charge in the front of the Purdue flight logbook.

The procedure is as follows:

1. The instructor must ask for and view the student's:
    a. Pilot certificate
    b. Medical certificate
    c. Picture ID (i.e. driver's license)
    d. Current VFR Charts

2. The Student must arrive with all of the planning completed. This includes the front and the back of the Purdue cross country planning logsheet.
3. The student must provide a printed copy (when possible) of the weather for the route of flight.
    a. Ceilings (2500' min)
    b. Visibility (7sm min)
    c. Winds – Surface & Aloft
    d. Precipitation (None reported or forecast)
    e. Temperatures
    f. NOTAMs

4. Review all aspects of the cross country planning to ensure completeness and accuracy:

    <u>Pre-flight Procedures:</u>
    a. True Course
    b. Distance
    c. Obstacles
    d. Appropriate Altitude
    e. True Heading (Verify WCA)
    f. Magnetic Heading
    g. Ground Speed
    h. Time (ETA 1hr. before sunset)
    i. Fuel Used (6gal. remaining in each tank)
    j. Appropriate Checkpoints
    k. Proper Communication Frequencies
    l. Performance Data
    m. Weight & Balance Data
    n. Check for airport diagram & runway lengths
    o. Fuel Management Procedures
    p. Fueling Procedures as appropriate
    q. Full stop or Touch-and-go
    r. Opening and closing flight plans
    s. Special use airspace & TFRs
    t. Sign-out cross country kit

    <u>Post-flight Procedures:</u>
    a. Close VFR flight plan
    b. Turn in aircraft checkout materials (keys, credit card, etc.)
    c. Place fuel slips in holder

5. The instructor must complete and sign the cross country authorization in the front of the Purdue logbook.

CROSS COUNTRY

DUAL CROSS COUNTRY FLIGHTS

1. Dual cross country routes are indicated in each course outline.

2. All dual cross country flights must abide by the weather limitations as described in the weather section.

3. In the event it is necessary for a NON-IFR dual cross country flight to proceed under IFR, the instructor concerned shall make a written report of the circumstances to the Chief Flight Instructor within 24 hours.

SOLO CROSS COUNTRY FLIGHTS

1. All solo cross country flights must abide by the weather limitations as described in the weather section.

2. Sunday morning departures are to occur no later than 0830 with arrivals accomplished no later than 1200.

3. Sunday afternoon departures are to occur no later than 1300, with arrivals accomplished no later than 1730.

4. All cross country flights are required to return to the Purdue Airport one hour before sunset.

5. Students who have been assigned a three leg, 250 nautical miles long leg cross country flight must arrive at Hangar 6 no later than 0930 and depart no later than 1030. They must return by 1700 or one hour before sunset, whichever is earlier.

6. If conditions become less than the required weather minimums, perform the most practical alternative:
    a. return to Lafayette.
    b. return to the last point of departure and call flight operations.
    c. land at the nearest suitable airport and call flight operations.

7. Fuel credit cards are found in the flight kit for each airplane. YOU MUST RETURN THE CREDIT CARD RECEIPT FOR THE FUEL PURCHASED OR BE HELD LIABLE FOR THE FUEL PURCHASED.

8. The route of the flight must be one of the approved routes.

9. A separate flight plan is to be filed, activated, and canceled at the appropriate times for each leg of the flight.

10. Each student must have the following materials:
    a. Current sectional charts for route, computer, flight log, and weather data.
    b. Purdue University Flight Record (logbook).
    c. Pilot certificate, medical and government-issued picture ID.

11. A student may have the Flight Record signed by an airport attendant at each point of landing, but this is not required.

12. If a student becomes lost – if weather and fuel permits, climb to 7000 to 8000 feet and contact the nearest Flight Service Station.

13. If it is necessary to remain overnight, the following procedures are to be followed:
    a. Secure the aircraft, preferably in a hangar.
    b. Close flight plan.
    c. Call contacts in the dispatch kit in the order listed.
    d. Credit card must be used for the aircraft expenses.
    e. Prior to re-dispatch, the student must call the Flight office and obtain approval for takeoff from the Chief Flight Instructor or his/her designee. This applies to all RON's or landings made at airports which were not approved for that flight.

14. All solo cross country flights must have a written log book endorsement, approving the flight, before departure from Lafayette. This applies to Private Pilots as well as Student Pilots. The student will present a hard copy of the METARS, TAFs, and NOTAMS to the flight instructor checking the cross country planning.

15. Solo cross countries may not be taken to a student's hometown.

16. Minimum runway length for solo cross country is 3000 feet.

17. All solo X-C flights are to leave Lafayette with full fuel and land with a minimum of six gallons in each tank.

18. While on cross country flights, students are not permitted to leave the destination airport(s) for any reason, except in the case of an emergency. Students should not make arrangements to be picked up by family or friends. The use of the FBO's crew car is not permitted. On the long cross country, students are encouraged to take a snack/lunch with them and eat at the FBO. Fueling stops should take no more than one hour to ensure a prompt return to KLAF.

APPROVED VFR SOLO CROSS COUNTRY ROUTES

All Purdue University flight students in AT-24302 and AT-24802 must fly their solo cross countries from the routes listed on pages 8-5-5 and 8-5-6.

Page 8-5-5 lists the airports that can be used for out and back cross countries. No more than three out and back cross countries can be flown in AT-24302 or AT-24802.

Page 8-5-6 lists the approved cross country routes for AT-24302, AT-24800 and AT-24802 students. The five cross countries listed at the top of the page satisfy the long commercial cross country requirement. At least one of these five must be accomplished in AT-24302. All routes also may be flown in the reverse order.

On flights of less than 400 NM, fuel purchases away from Lafayette should not be necessary, unless required by unforeseen delays enroute. On flights of over 400 NM, fuel purchase should be made at a dealer that will accept the Master Card in the dispatch kit.

It is preferred that a student not go to an airport more than one time during all his/her solo cross country flights. There are occasions when this is necessary. However, a student will not go to an airport more than twice on solo X-C’s except in an emergency.

The following airports may be used for out and back solo cross countries by students in AT-24302 and AT-24802

Identifier	City, State	NM (Round Trip)	Approx. Flight Time
AID	Anderson, Indiana	142	1.7
ASW	Warsaw, Indiana	142	1.7
BEH	Benton Harbor, Michigan	208	2.4
BFR	Bedford, Indiana	194	2.3
BMG	Bloomington, Indiana	154	1.8
BMI	Bloomington, Illinois	180	2.1
CMI	Champaign, Illinois	130	1.5
DEC	Decatur, Illinois	190	2.2
EKM	Elkhart, Indiana	178	2.1
FWA	Fort Wayne, Indiana	172	2.0
HHG	Huntington, Indiana	142	1.7
HUF	Terre Haute, Indiana	120	1.4
IKK	Kankakee, Illinois	114	1.4
IRS	Sturgis, Michigan	214	2.5
IWH	Wabash, Indiana	110	1.3
LWV	Lawrenceville, Illinois	208	2.4
MIE	Muncie, Indiana	142	1.7
MTO	Mattoon, Illinois	166	1.9
MQJ	Mount Comfort, Indiana	118	1.4
MZZ	Marion, Indiana	114	1.4
OXI	Knox, Indiana	112	1.4
RID	Richmond, Indiana	208	2.4
SBN	South Bend, Indiana	164	1.9
SER	Seymour, Indiana	202	2.3
VPZ	Valparaiso, Indiana	124	1.5
3TR	Niles, Michigan	182	2.1

Approximate flight time does not include time on the ground if fuel is purchased.

APPROVED SOLO CROSS COUNTRY ROUTES

AT-24302 and AT-24802 Students Only

250 NM Long Commercial Cross Countries

								Total Distance	Approx. Flight Time
LAF	-	LSE (281)	-	RFD (137)	-	LAF (147)	=	565	5.1
LAF**	-	TVC (270)	-	MKG (99)	-	LAF (172)	=	541	4.9
LAF	-	MQY (265)	-	OWB (109)	-	LAF (161)	=	535	4.8
LAF*	-	PKB (260)	-	DAY (132)	-	LAF (129)	=	521	4.7
LAF	-	OTM (254)	-	BRL (63)	-	LAF (192)	=	509	5.0

* Requires 3 sectional charts

** May not fly over Lake Michigan

__ Underlined stations indicate where fuel is to be purchased.

Other Cross Countries – Unless otherwise specified in a lesson, the routes may be flown in reverse.

LAF	-	MLI (174)	-	ALN (156)	-	LAF (172)	=	502	4.6
LAF	-	EVV (144)	-	LEX (137)	-	LAF (178)	=	459	4.4
LAF	-	BRL (192)	-	RFD (127)	-	LAF (147)	=	466	4.4
LAF	-	TOL (159)	-	OSU (97)	-	LAF (176)	=	432	4.2
LAF	-	AZO (128)	-	DAY (155)	-	LAF (129)	=	412	4.2
LAF	-	BEH (104)	-	FDY (140)	-	LAF (151)	=	395	3.8
LAF	-	AZO (128)	-	FDY (111)	-	LAF (151)	=	390	3.8
LAF	-	LOU (145)	-	EVV (88)	-	LAF (144)	=	377	3.7
LAF	-	TOL (159)	-	BTL (78)	-	LAF (137)	=	373	3.7
LAF	-	GBG (162)	-	ARR (102)	-	LAF (108)	=	372	3.6
LAF	-	SPI (130)	-	ARR (128)	-	LAF (108)	=	366	3.6
LAF	-	PIA (126)	-	VLA (104)	-	LAF (134)	=	364	3.6
LAF	-	VLA (134)	-	BFR (127)	-	LAF (97)	=	358	3.6
LAF	-	RID (104)	-	LWV (via SHB & OOM) (104)	-	LAF (134)	=	353	3.6
LAF	-	SPI (130)	-	LWV (116)	-	LAF (104)	=	350	3.5
LAF	-	IRS (107)	-	RID (125)	-	LAF (104)	=	336	3.2
LAF	-	AZO (126)	-	AID (128)	-	LAF (63)	=	312	3.0
LAF	-	FWA (86)	-	FDY (67)	-	LAF (152)	=	307	3.0
LAF	-	FWA (86)	-	BTL (80)	-	LAF (137)	=	303	3.2
LAF	-	BTL (137)	-	VPZ (94)	-	LAF (63)	=	293	3.2
LAF	-	AZO (126)	-	MZZ (105)	-	LAF (57)	=	288	2.8
LAF	-	BMG (77)	-	DEC (112)	-	LAF (95)	=	284	3.1
LAF	-	SBN (83)	-	BTL (60)	-	LAF (137)	=	280	2.9
LAF	-	BTL (137)	-	ASW (67)	-	LAF (72)	=	276	2.9
LAF	-	MIE (71)	-	SBN (96)	-	LAF (82)	=	249	2.5
LAF	-	BMI (90)	-	HUF (97)	-	LAF (60)	=	247	2.7
LAF	-	3TR (91)	-	FWA (69)	-	LAF (86)	=	246	2.7
LAF	-	BMG (77)	-	MTO (80)	-	LAF (83)	=	240	2.7
LAF	-	BMI (90)	-	MTO (67)	-	LAF (83)	=	240	2.7
LAF	-	FWA (86)	-	SBN (66)	-	LAF (82)	=	234	2.6
LAF	-	DEC (95)	-	HUF (76)	-	LAF (60)	=	231	2.6
LAF	-	EKM (89)	-	MZZ (74)	-	LAF (57)	=	220	2.4
LAF	-	MZZ (57)	-	SBN (78)	-	LAF (82)	=	217	2.4
LAF	-	BMI (90)	-	IKK (60)	-	LAF (57)	=	207	2.2
LAF	-	AID (71)	-	FWA (55)	-	LAF (86)	=	204	2.3
LAF	-	CMI (65)	-	IKK (64)	-	LAF (57)	=	186	2.1
LAF	-	CMI (65)	-	HUF (57)	-	LAF (60)	=	182	2.0

Approximate flight time does not include time on the ground if fuel is purchased.

VFR X-C PLANNING

Prior to starting the VFR cross country planning, the student pilot should have the following items: current sectional charts, plotter, flight computer, pencil/black ball point pen, Airport/ Facility Directory (AFD), Purdue VFR X-C planning sheet.

1. Draw a straight line from center of airport to center of airport, with doglegs as necessary for restricted areas, etc. NOTE: Straight line distance must be more than 50 NM, 100 NM, or 250 NM, as the case may be, for FAR 61 cross country requirements. It is suggested to use a large pencil to draw the line for the X-C. This way the line can be erased when the trip is finished and the chart will not become cluttered with unnecessary and often confusing course lines.

2. Measure the true course (TC) with the plotter.

3. Determine the magnetic course (MC) by adding or subtracting the magnetic variation to the TC.

4. Measure the distance (DIST) in nautical miles. Be sure to use the correct side of the plotter and check the scale of the plotter with the scale on the chart.

5. Determine the highest obstacle (OBSTR.) 4 NM either side of course.

6. Determine checkpoints. Record the checkpoints in the bottom left of the planning sheet. Measure the distance between each checkpoint (DIST) and calculate the distance remaining on that leg (DIST REMAIN). Some advice concerning the determination of checkpoints: everything a pilot sees on the ground and is also on the sectional chart, is a checkpoint. Checkpoints used for the determination of groundspeed estimates should normally be prominent landmarks, such as 4 lane highways, large lakes, larger cities, roads, and railroads running together, etc. Whether using paper sectionals or electronic VFR charts, the student shall “mark” the selected checkpoints. An initial groundspeed check should be made within approximately 25 NM of the departure point. This check should be made after reaching cruise altitude. After this, a groundspeed check should be made approximately every 50 NM.

7. Consult the Sectional Chart Bulletin in the Airport/Facility Directory for any chart changes.

8. Obtain all frequencies from the Airport/Facility Directory and record them in the Radio Frequencies section on the bottom right of the planning sheet. Be sure to include approach control, tower, ground control, ATIS, clearance delivery, FSS, Unicom, and VOR frequencies for the entire flight.

9. Obtain runway diagrams from the Airport/Facility Directory and draw them on the back of your planning sheet, including runway lengths and numbering. There are also

resources on the internet that will allow you to print out airport diagrams for free (http://www.aopa.org/asf/publications/taxi/).
NOTE: Steps 1 through 9 may be done in advance of the day of the flight.

10. Obtain current weather for the entire route of flight. Inspect the surface analysis chart, weather depiction chart, radar summary chart, and the low level prog. chart. Also get all enroute METARs, NOTAMs, TAFs, area forecasts, winds aloft forecasts, airmets, sigmets, convective sigmets, and the latest radar weather information. Pilots are reminded of the requirement to obtain a "legal" brief from either FSS or equivalent services.

11. Using the information from the route brief, determine if the weather will permit the flight.

12. If the weather will permit the flight, determine cruising altitude (ALT).

13. Calculate the cruise pressure altitude and temperature (CRUISE PA/C°) using the current altimeter setting for the nearest station and find the temperature on the winds aloft forecast.

14. Using the aircraft performance Chart for 65% Power, Best Power and the CRUISE PA/C°, determine true airspeed (TAS), fuel flow (GPH), and RPM.

15. Find the wind speed and direction (WIND) on the winds aloft forecast. Determine the groundspeed (GS) and true heading (TH) with the flight computer using the TAS, TC, and WIND. Find the magnetic heading (MH) by adding or subtracting the magnetic variation from the TH. Compass heading (CH) is MH corrected with the compass correction card in the airplane.

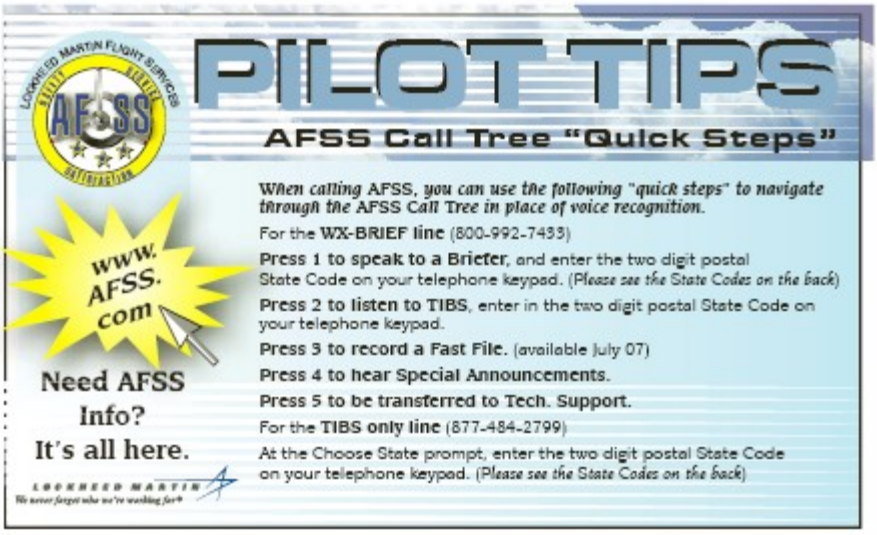
16. Determine the time enroute (ETE) for each leg using GS and DIST on the flight computer. It is suggested that cruise GS be used for the entire distance, adding one minute for each 1000 feet of climb and five minutes for each approach and landing to determine estimated time in route.

17. Determine total fuel used (FUEL) for each leg using ETE and GPH on the flight computer. Subtract this from the starting fuel amount to get fuel remaining (FUEL REMAIN). All solo cross countries must depart Lafayette with full fuel and land with a minimum of 6 gallons of fuel in each tank.

18. Calculate the weight and balance data.

19. Determine takeoff and landing distances using the Cirrus performance charts. Calculate takeoff and landing pressure altitude using the airport's altimeter setting. The minimum runway length for solo operation is 3000 feet.

20. Fill out the flight plan log and file a separate flight plan for each leg.



State/ Possession	Abbrev.	Two Digit Code	Third Digit	State/ Possession	Abbrev.	Two Digit Code	Third Digit
ALABAMA	AL	25	2	MONTANA	MT	68	1
ALASKA	AK	25	1	NEBRASKA	NE	63	3
ARIZONA	AZ	29		NEVADA, North	NV	68	2
ARKANSAS	AR	27		NEVADA, South	NV	68	3
CALIFORNIA	CA	22		NEW HAMPSHIRE	NH	64	2
COLORADO	CO	26		NEW JERSEY	NJ	65	1
CONNECTICUT	CT	28		NEW MEXICO	NM	66	3
DELAWARE	DE	33		NEW YORK	NY	69	
DISTRICT OF COLUMBIA	DC	32		NORTH CAROLINA	NC	62	2
				NORTH DAKOTA	ND	63	4
FLORIDA	FL	35		OHIO	OH	64	3
GEORGIA	GA	42	1	OKLAHOMA	OK	65	2
HAWAII	HI	44		OREGON	OR	67	2
IDAHO	ID	43		PENNSYLVANIA	PA	72	1
ILLINOIS	IL	45		PUERTO RICO	PR	77	
INDIANA	IN	46		RHODE ISLAND	RI	74	
IOWA	IA	42	2	SOUTH CAROLINA	SC	72	2
KANSAS	KS	57		SOUTH DAKOTA	SD	73	
KENTUCKY	KY	59		TENNESSEE	TN	86	
LOUISIANA	LA	52		TEXAS	TX	89	
MAINE	ME	63	1	UTAH	UT	88	1
MARYLAND	MD	63	2	VERMONT	VT	88	2
MASSACHUSETTS	MA	62	1	VIRGIN ISLANDS	VI	84	
MICHIGAN	MI	64	1	VIRGINIA	VA	82	
MINNESOTA	MN	66	1	WASHINGTON	WA	92	
MISSISSIPPI	MS	67	1	WEST VIRGINIA	WV	98	
MISSOURI	MO	66	2	WISCONSIN	WI	94	
				WYOMING	WY	99	

Figure 8.5.1 – Flight Service Contact Info

This Page Intentionally Left Blank

FUEL MANAGEMENT

Proper fuel management is one of the most important responsibilities of being the pilot in command of an airplane. Over the years, there have been several accidents in large and small aircraft because of the pilot's poor fuel management procedures.

The systems in our training aircraft are designed in such a way that the pilot must select either the right fuel tank or the left fuel tank. It is not possible to use fuel from both fuel tanks at the same time. Therefore, it is possible to experience an engine failure due to fuel starvation even though the other fuel tank may have adequate fuel.

Flight instructors must aggressively teach proper fuel management procedures to their flight students and check lists must be followed.

Aviation Technology fuel management Policies and Procedures:

- The absolute minimum fuel that the aircraft must have when landing full stop is six (6) gallons in each fuel tank.

- The minimum fuel for departure is:
    a. Cross country flights – both fuel tanks full
    b. All night flights – both fuel tanks full
    c. Local day flights – minimum of 30 gallons total

- The before start checklist states – Fuel Selector . . . . . On fullest tank and the before take-off checklist states – Fuel Selector . . . . . On proper tank. This does not mean that the pilot should switch fuel tanks just prior to take off. If the fuel selector were to malfunction, there might be just enough fuel in the fuel lines to become airborne and then the engine could fail. Therefore, if the fuel selector was placed on the fullest tank prior to engine start, leave it on that tank for takeoff.

- Proper fuel management means to monitor the fuel system during the flight and to switch fuel tanks appropriately. During extended local or cross country flights the fuel selector must be switched at least once every (1) hour of flight time.

- It is normally best not to switch fuel tanks while doing take offs and landings. If the fuel selector must be switched while executing touch and goes, it must be accomplished at the beginning of the downwind leg of the traffic pattern.

- When approaching any airport to land, the descent/approach checklist must be completed prior to listening to ATIS and calling the Control Tower. The descent/approach checklist states – Fuel selector . . . on proper tank. This checklist must be completed on all cross country flights even if a touch and go is accomplished.

- In the Cirrus, the fuel pump must be on "Boost" for maneuvers

FUEL CONSERVATION AND MIXTURE LEANING PROCEDURES

The price of aviation fuel continues to increase; since the cost of fuel represents a sizable portion of the flight fee all pilots must attempt to minimize fuel usage. To achieve a maximum fuel reduction and maximum engine life the following procedures are effective immediately.

a. Cruise power in the practice area for the Cirrus will be 55% power. Additional power may be used, as necessary, where training maneuvers dictate. This applies to local only.

b. For cross country in the Cirrus cruise power will be 65% and the mixture will be leaned to 75% rich of peak EGT.

c. For local flight in the PA-28R-201 and the Seminole, 21" and 2300 RPM will be used for cruise. Additional power may be used, as necessary, where training maneuvers dictate.

d. For cross country in the PA-28R-201, 65% power will be used with the mixture leaned to peak EGT. Holding and approach airspeed will normally be 90 KIAS. Higher airspeeds will be used in terminal environments, per ATC request, or in the training environments to simulate ATC requests for higher airspeeds.

e. Since fuel is less expensive at Purdue, and for safety reasons, all solo cross countries will depart Lafayette with full fuel tanks. Loading limitations permitting, all dual cross countries should also depart with full fuel. Fuel purchases on cross countries should be limited to those that are necessary.

Cirrus Airframe Parachute System (CAPS)

The Cirrus Airframe Parachute System (CAPS) is designed to lower the aircraft and its passengers to the ground in the event of a life-threatening emergency. However, because CAPS deployment is expected to result in damage to the airframe and, depending upon adverse external factors such as high deployment speed, low altitude, rough terrain or high wind conditions, may result in severe injury or death to the aircraft occupants, its use should not be taken lightly. Instead, possible CAPS activation scenarios should be well thought out and mentally practiced by every pilot.

The following discussion is meant to guide your thinking about CAPS activation. It is intended to be informative, not directive. It is the responsibility of you, the pilot, to determine when and how the CAPS will be used.

Deployment Scenarios

This section describes possible scenarios in which the activation of the CAPS might be appropriate. This list is not intended to be exclusive, but merely illustrative of the type of circumstances when CAPS deployment could be the only means of saving the occupants of the aircraft.

Mid-Air Collision
A mid-air collision may render the airplane un-flyable by damaging the control system or primary structure. If a mid-air collision occurs, immediately determine if the airplane is controllable and structurally capable of continued safe flight and landing. If it is not, CAPS activation should be considered.

Structural Failure
Structural failure may result from many situations, such as: encountering severe gusts at speeds above the airplane's structural cruising speed, inadvertent full control movements above the airplane's maneuvering speed, or exceeding the design load factor while maneuvering. If a structural failure occurs, immediately determine if the airplane is controllable and structurally capable of continued safe flight and landing. If it is not, CAPS activation should be considered.

Loss of Control
Loss of control may result from many situations, such as: a control system failure (disconnected or jammed controls); severe wake turbulence, severe turbulence causing upset, severe airframe icing, or sustained pilot disorientation caused by vertigo or panic; or a spiral/spin. If loss of control occurs, determine if the airplane can be recovered. If control cannot be regained, the CAPS should be activated. This decision should be made prior to your pre-determined decision altitude (2,000' AGL, as discussed below).

Landing Required in Terrain not Permitting a Safe Landing
If a forced landing is required because of engine failure, fuel exhaustion, excessive structural icing, or any other condition CAPS activation is only warranted if a landing cannot be made that ensures little or no risk to the aircraft occupants. However, if the condition occurs over terrain

thought not to permit such a landing, such as: over extremely rough or mountainous terrain, over water out of gliding distance to land, over widespread ground fog or at night, CAPS activation should be considered.

Pilot Incapacitation
Pilot incapacitation may be the result of anything from a pilot's medical condition to a bird strike that injures the pilot. If this occurs and the passengers cannot reasonably accomplish a safe landing, CAPS activation by the passengers should be considered. This possibility should be explained to the passengers prior to the flight and all appropriate passengers should be briefed on CAPS operation so they could effectively deploy CAPS if required.

General Deployment Information

Deployment Speed
The maximum speed at which deployment has been demonstrated is 133 KIAS. Deployment at higher speeds could subject the parachute and aircraft to excessive loads that could result in structural failure. Once a decision has been made to deploy the CAPS, make all reasonable efforts to slow to the minimum possible airspeed. However, if time and altitude are critical, and/or ground impact is imminent, the CAPS should be activated regardless of airspeed.

Deployment Altitude
No minimum altitude for deployment has been set. This is because the actual altitude loss during a particular deployment depends upon the airplane's airspeed, altitude and attitude at deployment as well as other environmental factors. In all cases, however, the chances of a successful deployment increase with altitude. As a guideline, the demonstrated altitude loss from entry into a one-turn spin until under a stabilized parachute is 920 feet. Altitude loss from level flight deployments has been demonstrated at less than 400 feet. With these numbers in mind, it might be useful to keep 2,000 feet AGL in mind as a cut-off decision altitude. Above 2,000 feet, there would normally be time to systematically assess and address the aircraft emergency. Below 2,000 feet, the decision to activate the CAPS has to come almost immediately in order to maximize the possibility of successful deployment. At any altitude, once the CAPS is determined to be the only alternative available for saving the aircraft occupants, deploy the system without delay.

Deployment Attitude
The CAPS has been tested in all flap configurations at speeds ranging from V_{SO} to V_A. Most CAPS testing was accomplished from a level attitude. Deployment from a spin was also tested. From these tests, it was found that as long as the parachute was introduced to the free air by the rocket, it would successfully recover the aircraft into its level descent attitude under parachute. However, it can be assumed that to minimize the changes of parachute entanglement and reduce aircraft oscillations under the parachute, the CAPS should be activated from a wings-level, upright attitude if at all possible.

Description and Procedures for Operating the Garmin GFC 700 Autopilot Control System

The GFC 700 is an Automatic Flight Control System integrated within the Cirrus Perspective G-1000 Avionics System.

The Autopilot can be utilized by the pilot to operate the aircraft in several different modes, some of which are:

- Heading and Altitude Mode Only
- Navigation Mode (NAV)
- Approach Mode (APR)
- Level Mode (LVL)

A. If the Autopilot is engaged without any other mode button selected, the autopilot will maintain the pitch attitude and the bank angle that the aircraft is currently in. This is NOT the normal way to operate the system.

B. If the pilot desires to operate the autopilot in heading and altitude hold only, complete the following steps:
   a. Select the desired heading with the heading bug.
   b. Select the desired altitude.
   c. Press the HDG mode button
   d. Press the ALT mode button
   e. Press the AP engage button to engage the autopilot

   The Autopilot will control the aircraft and will maintain the heading and the altitude.

   a. To turn to a new heading, rotate the heading bug to the new desired heading.
   b. To climb or descend to a new altitude:
      i. Select the desired altitude
      ii. Decide whether you want to climb/descend in the VS (vertical speed mode) or in the IAS (indicated airspeed mode) and push the appropriate button. The autopilot will maintain the current vertical speed or indicated airspeed. Use the up/down wheel to increase/decrease the vertical speed or increase/decrease the airspeed. The power will also need to be adjusted to attain the desired rate of climb/descent or indicated airspeed.
      iii. The autopilot will level off at the selected altitude.

C. To have the autopilot navigate to a desired location:
   a. Program into the navigation system the navigation source, i.e. GPS, LOC, VOR, etc. that the autopilot is to navigate to.
   b. Press the NAV mode button.
   c. If the CDI (Course Deviation Indicator) is within 10°, the autopilot will navigate to the selected source.

D. For approach mode:
   a. The appropriate approach must be loaded into the flight plan.
   b. When cleared for the approach or upon arrival over the initial approach fix, whichever comes first, select APR mode. The autopilot will fly the approach.
      i. On VOR approaches, APR mode will give a “VAPP” annunciator. The gain in VAPP is much more sensitive and the autopilot uses shallower turns for course corrections. This makes course tracking in high-wind conditions more challenging and the pilot may elect to remain in NAV mode.
   c. For each descent on the approach without vertical guidance:
      i. Select the new altitude
      ii. Select VS mode
      iii. Use the up/down wheel to adjust the vertical speed
      iv. Adjust power to maintain the desired airspeed
      v. The autopilot will level off at the selected altitude

   d. On approaches with vertical guidance, the autopilot will capture the glide path and follow it.
   e. On all approaches the DA/MDA should be set in the minimums window
   f. On all approaches when past the glide slope intercept or final approach fix inbound, the altitude should be selected to the missed approach altitude with one exception: On the autopilot non precision approach, set the altitude to the MDA to avoid descending below the MDA.
   g. MFD (Multifunction Display) View – For approaches, the normal view for the MFD will be to have the active flight plan displayed on the right side of the screen. If the map view of the approach is not sufficient, the range can be adjusted to expand the view.

E. The Level (LVL) mode
   a. Pressing the LVL (Level) mode button engages the auto pilot if not already engaged.
   b. The auto pilot will roll the wings level and will maintain a level flight attitude. The autopilot will not track a specific heading or altitude.
   c. In LVL mode, all other modes are AVAILABLE by pressing the appropriate mode button.

F. Except for emergencies and demonstration of the “blue level button”, the autopilot shall not be used in Private Pilot, Commercial I and Commercial II.

V-SPEEDS

	CIRRUS (KIAS)	**ARROW** (KIAS)	**SEMINOLE** (KIAS)
V_R	66	55-65 (25°F)	75
V_{APP}	77	61-72	62-75
V_{CLB}	96	90	100-105
$V_{50'}$	77	55-65 (25°F)	82
V_{GLD}	99	79	95
V_X	83	78	82
V_Y	96	90	88
V_{XSE}			82
V_{YSE}			88
V_{SO}	61	55	55
V_{S1}	69	60	57
V_{FE}	104 100%, 119 50%	103	111
V_{NO}	163	146	169
V_A	130	96-118	112-135
V_{LO}		107-129	109-140
V_{LE}		129	140
V_{NE}	200	183	202
V_{MCA}			56
V_{SSE}			82
V_{WIN}		164	
V_{AP}			180
MTW (lbs)	3050	2750	3800

SR-20 Phase Inspection Program

	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
	*	P1	*	P2	*	P3	*	P2	*	P4	*	P2	*	P5	*	P2
Detailed		Wing		Engine Propeller		Landing Gear		Engine Propeller		Fuselage Empennage		Engine Propeller		Cabin Radio		Engine Propeller
Routine		Engine Landing Gear		Landing Gear		Engine		Landing Gear		Landing Gear Cabin Engine		Landing Gear		Engine Landing Gear		Landing Gear

***50 HR**
Oil Change
Oil Filter Inspection & Replace
Engine Compartment Visual Inspection
Ignition Harness Visual Inspection
Exhaust System Visual Inspection
Gascolator Clean & Inspection
Brake Lining Visual Inspection (with mirror)
Brake Reservoir Check
Lubricate IAW Lube Schedule
Tire Pressure

300 HR Supplemental Inspection
Seats & Restraints
Control Surface Rigging
Wheels & Brakes
Water Traps
Transit & Voltage Suppressors (TVs)

700 HR Supplemental Inspection
Wheels & Brakes
Landing Gear

PA-28R-201 Progressive Inspection Program

50	100	150	200	250	300	350	400
Routine	Event 1	Routine	Event 2	Routine	Event 3	Routine	Event 4
Oil Change with Filter Interior/Exterior Check Lights Tires and Brakes Air Box Pitot Heat Stall Warning	Fuselage and Tail Routine Inspection	Oil Change with Filter Interior/Exterior Check Lights Tires and Brakes Air Box Pitot Heat Stall Warning	Engine and Propeller Routine Inspection	Oil Change with Filter Interior/Exterior Check Lights Tires and Brakes Air Box Pitot Heat Stall Warning	Wings and Gear Routine Inspection	Oil Change with Filter Interior/Exterior Check Lights Tires and Brakes Air Box Pitot Heat Stall Warning	Engine and Propeller Routine Inspection

WEIGHT AND BALANCE DATA FOR PURDUE AIRCRAFT

Current weight and balance data for all Purdue aircraft is available in the maintenance records located at Hangar 6.

CHECKLIST USAGE

During the first two years of the flight program at Purdue University, the check lists must be accomplished using the challenge and response technique. This means that the student pilot audibly calls out the item, accomplishes the task and then audibly calls out the response using the exact words as printed on the check list. The pilot also verbally calls out the beginning and completion of each section of the check list:

EXAMPLE:

Pilot: "Beginning the Before Starting Engine Check List"

"Brakes"	"Set"
"Chocks"	"Removed"
"Seat/Belts/Harness"	"Adjust/Fasten"
"Carb Heat"	"Off"
"All Electrical"	"Off"
"Fuel Selector"	"On Fullest Tank"
"Circuit Breakers"	"In"

"Before Starting Engine Check List Complete"

"Beginning the Engine Start Check List"…

Checklists must not be read while taxiing the airplane. Therefore, the "While Taxiing" check list items, which are:

"Brakes"	"Check"
"Directional Gyro"	"Check"
"Turn Coordinator"	"Check"

must be accomplished while taxiing without looking at the check list.

Both the "After Landing" and the "Shutdown" check lists must be accomplished at the parking position on the ramp. This does not prevent the pilot from accomplishing the items using a flow pattern if done safely while taxiing.

The Descent/Approach check list must be accomplished before listening to ATIS and calling the Control Tower.

AIRPORTS OF USE

The following airports meet the requirements of FAR §141.38. AT-145 through AT-253 students and instructors still must follow the directions given in the particular lesson when choosing a route:

Code	City	State	Code	City	State
2K0	Monticello	IL	HUF	Terre Haute	IN
3TR	Niles	MI	IKK	Kankakee	IL
4I7	Greencastle	IN	ILN	Wilmington	OH
50I	Kentland	IN	IND	Indianapolis	IN
5I4	Sheridan	IN	IRS	Sturgis	MI
AID	Anderson	IN	IWH	Wabash	IN
ALN	Alton	IL	JXN	Jackson	MI
ARR	Aurora	IL	LAF	West Lafayette	IN
ASW	Warsaw	IN	LEX	Lexington	KY
AZO	Kalamazoo	MI	LOU	Louisville	KY
BAK	Columbus	IN	LSE	LaCrosse	WI
BEH	Benton Harbor	MI	LUK	Cincinnati	OH
BFR	Bedford	IN	LWV	Lawrenceville	IL
BMG	Bloomington	IN	MCX	Monticello	IN
BMI	Bloomington	IL	MDH	Murphysboro	IL
BRL	Burlington	IA	MFD	Mansfield	OH
BTL	Battle Creek	MI	MIE	Muncie	IN
CFJ	Crawfordsville	IN	MKG	Muskegon	MI
CMI	Champaign	IL	MLI	Moline	IL
CPS	St. Louis	MO	MQJ	Greenfield	IN
CVG	Covington	KY	MQY	Smyrna	TN
DAY	Dayton	OH	MTO	Mattoon	IL
DEC	Decatur	IL	MZZ	Marion	IN
DNV	Danville	IL	OSH	Oshkosh	WI
EKM	Elkhart	IN	MZZ	Marion	IN
EVV	Evansville	IN	OSU	Columbus	OH
EYE	Indianapolis	IN	OTM	Ottumwa	IA
FDY	Findlay	OH	OWB	Owensboro	KY
FKR	Frankfort	IN	OXI	Knox	IN
FWA	Fort Wayne	IN	PCW	Port Clinton	OH
GBG	Galesburg	IL	PIA	Peoria	IL
CGI	Cape Girardeau	MO	PKB	Parkersburg	WV
GGP	Logansport	IN	RCR	Rochester	IN
GRB	Greenbay	WI	RFD	Rockford	IL
GRR	Grand Rapids	MI	RID	Richmond	IN
GUS	Peru	IN	RWN	Winamac	IN
GYY	Gary	IN	RZL	Rensselaer	IN
HFY	Greenwood	IN	SBN	South Bend	IN
HHG	Huntington	IN	SDF	Louisville	KY

Code	City	State
SER	Seymour	IN
SIK	Sikeston	MO
SPI	Springfield	IL
TIP	Rantoul	IL
TOL	Toledo	OH
TVC	Traverse City	MI
TYQ	Zionsville	IN
UMP	Fishers	IN
UWL	New Castle	IN
VLA	Vandalia	IL
VPZ	Valparaiso	IN

GENERAL OPERATING PROCEDURES

SIGN-OUT PROCEDURES

Upon arrival at Hangar 6 for a scheduled flight slot, either the student or instructor will check in with the dispatch desk to receive their logbook, aircraft assignment, aircraft keys and dispatch kit. They must show the dispatcher their pilot certificate, medical and government-issued picture ID before an aircraft will be dispatched to them. The kit will include a dispatch sheet, credit card for cross country fuel purchases, inspection compliance data, and tax exempt status documentation.

All pre-flight and post-flight briefings are to be conducted in the briefing areas provided in Hangar 5. Briefings can also occur in the aircraft, however, they should not delay the return of the aircraft keys/dispatch kit to dispatch personnel for the next flight period.

Upon return from the flight lesson, the student will record the "in" flight meter and hour meter times on the sign-out form. The dispatch kit is to be returned to the dispatch counter immediately following the flight. After the post-flight debrief, the completed logbook is to be returned to dispatch personnel for filing. The dispatch clerk will ensure that the logbook has been properly completed.

PROCEDURE FOR DETERMINING AIRCRAFT AIRWORTHINESS

Prior to every flight, students/instructors are required to determine that the aircraft they have been assigned is airworthy. Every aircraft contains a checklist, which includes pre-takeoff and pre-landing items, as well as aircraft registration, airworthiness certificate and manufacturer-issued POH. These items are verified to be on the aircraft by the pilot prior to every flight, as well as phase inspection/cycle due times, system inspections (i.e. pitot/static, transponder, ELT and ELT battery replacement) and any applicable AD(s) compliance.

MAINTENANCE PROCESS

Reporting Discrepancies at LAF

When returning from a flight in which a mechanical problem has occurred, the student should consult their instructor or a full-time instructor if their instructor is not available. If the instructor confirms that the problem is pilot-related, no discrepancy report is necessary. However, if it appears to be mechanical, or there is any doubt at all, the student must complete a "Flight Discrepancy Report" located in the pocket of the aircraft checkout clipboard and turn it in to Dispatch. Either maintenance or dispatch personnel will ground the aircraft through the AT Dispatch program making it unavailable for dispatching. Once the discrepancy has been cleared by maintenance, the maintenance technician shall remove the grounding restriction from the AT Dispatch software program, which will then allow the aircraft to be dispatched.

Reporting Discrepancies Away from LAF

In the event that a maintenance discrepancy occurs while the aircraft is away from LAF, the student or instructor shall report maintenance discrepancies by completing a "Flight Discrepancy Report" form (FDR-4/2013), which is provided with the dispatch paperwork for each aircraft. A copy of the Flight Discrepancy Report may then be sent by fax, emailed or verbally transferred back to the Dispatch Office, who will forward the report to maintenance staff. The student or

instructor shall also contact the Dispatch Office, who will then relay the information to the Chief Flight Instructor or his/her designee. The maintenance personnel will then be contacted and will determine the appropriate course of action. The student and instructor are not permitted to operate the aircraft in question until a written description of the corrective action is recorded on the lower section of the Flight Discrepancy Report by the maintenance technician approving the aircraft for return to service. After the aircraft is returned to service, the maintenance technician shall notify the Dispatch Office and the Chief Flight Instructor (or his/her designee) that the aircraft has been approved for return to service. The student or instructor will be notified that the aircraft is approved for return to service and the Chief Flight Instructor or his/her designee will then provide re-dispatch approval to the student/instructor.

LOTTERY / EXTRA SLOT PROCEDURES

Students and instructors may request extra slots via the lottery system provided by the AT Dispatch Program – https://purdue.edu/flightops. The lottery system works by randomly selecting completed lottery requests and awarding the best available request per the student's preferences. When selected, the student and instructor will be notified via email of the slot awarded and they will be able to view their position on the list.

To Fly On	Lottery Opens	Lottery Closes	Extra Slots Open	Extra Slots Close
Monday	Friday 5:30PM	Saturday 5:30PM	Saturday 6PM	Monday 7AM
Tuesday	Saturday 5:30PM	Sunday 5:30PM	Sunday 6PM	Tuesday 7AM
Wednesday	Sunday 5:30PM	Monday 5:30PM	Monday 6PM	Wednesday 7AM
Thursday	Monday 5:30PM	Tuesday 5:30PM	Tuesday 6PM	Thursday 7AM
Friday	Tuesday 5:30PM	Wednesday 5:30PM	Wednesday 6PM	Friday 7AM
Saturday	Wednesday. 5:30PM	Thursday 5:30PM	Thursday 6PM	Saturday 7AM

TIEDOWN PROCEDURES

1. All aircraft are to be parked so that their nose spinners are aligned with the yellow ramp line and their propellers are set in a vertical position.

2. The Arrows are to be parked on the west ramp, south of the hangar. The south parking spaces will be used by the basic Cirrus aircraft. The three Cirrus GTS aircraft will be parked just south of Hangar 5 heading East.

3. All aircraft are to be chocked. After removal, the chocks should be placed at the tie down rings.

4. If severe weather has been forecast all aircraft are to be hangared.

5. Close and latch all doors and windows on the aircraft upon deplaning.

PURDUE AIRPORT TAXI PROCEDURES

1. No person shall taxi an aircraft until he/she has ascertained that there will be no danger of collision with any person or object in the immediate area.

2. All aircraft shall taxi at a safe and reasonable speed with due regard for other aircraft, persons, and property. **On the Purdue ramp, which includes the area from the T-hangars to the east side of Hangar 5, the taxi speed will not exceed 5 kts.**

3. Aircraft awaiting takeoff shall stop just short of the yellow hold short lines of the runway in use and in a position so as to have a direct view of aircraft approaching for landing.

4. All aircraft shall be taxied in the center of the taxiways.

5. Aircraft taxiing prior to takeoff shall not taxi onto the active runway until it is clear of all traffic.

6. Instructions from ATC shall have priority over all of the above.

7. All aircraft (Cirrus, Seminoles and Arrows) shall depart the Purdue ramp to the northeast and return from the south entryway to the ramp using Taxiway D (Delta), unless otherwise instructed by ATC.

8. There will be no taxiing on the sod near the tiedown areas.

9. After clearing the runway, obtain taxi clearance from ATC as soon as possible. Complete the after-landing flow during the taxi.

PURDUE AIRPORT TRAFFIC PROCEDURES

1. Landings and takeoffs shall be made directly into the wind or the runway or landing strip most nearly aligned with the wind or when the wind is light or calm in a direction designated by the Airport Manager. The calm wind runway is designated as Runway 23.

2. When landings or takeoffs are made in a direction other than as described in Rule No. 1, the pilot is solely responsible for determining that the operation can be completed with safety and without interference with, or disruption of, other traffic in the area. Such landings or takeoffs are not authorized for convenience and shall be made only for bona fide reasons, such as crosswind takeoff and landing instruction, use of a longer runway for heavily loaded or large aircraft, etc.

3. No turns shall be made until the airport boundary has been reached and the aircraft has attained an altitude of at least 300’ below Traffic Pattern Altitude (1300’ MSL @ LAF) and it has been ascertained there will be no danger of collision with other aircraft.

4. Light or slow aircraft intending to remain in the traffic pattern shall climb to traffic altitude of 1000 feet AGL after initial turn.

5. Large or fast aircraft intending to remain in the traffic pattern shall continue to climb to traffic altitude of 1500 feet after the initial turn.

6. Aircraft entering the traffic pattern shall exercise caution and courtesy so as not to cause aircraft already in the pattern to deviate from their course.

7. Landing traffic shall not land until the active runway is clear of all traffic.

8. These rules supersede all previous traffic patterns and instruction. They do not eliminate or affect in any way the requirement of the Federal Aviation Regulations for securing an air traffic clearance for any flight conducted within the Class D airspace at any time when the ceiling or visibility conditions are below those required for visual flight.

9. Instructions from ATC take priority over all of the above.

PURDUE UNIVERSITY PRACTICE AREA

The practice area for local flights of Purdue University aircraft lies within a 25 nautical mile radius of the geographic center of Purdue University Airport.

All pilots-in-command are responsible for collision avoidance. The area must be clear of other aircraft prior to initiating any training maneuver. To do this, be certain to clear the area thoroughly before beginning a maneuver.

Except for purposes of takeoff or landing the practice area extends from 1000 feet above the surface or 1000 feet above the highest obstruction within a city, town, village, or settlement. Moreover, pilots are to practice all flight maneuvers except those maneuvers associated with takeoffs and landings, at least 5 statute miles from Purdue University Airport. Purdue aircraft flying within the northeast quadrant of this area are to remain clear of the active MOA. Otherwise Purdue aircraft may fly up to 12,500 feet MSL within the practice area.

In order to help improve collision avoidance, N580PU, N581PU, N582PU, N583PU and N584PU should use the northeast practice area; N585PU, N586PU, N587PU, N588PU, N540PU and N542PU will use the southwest practice area and N589PU, N590PU, N591PU, N592PU, N593PU, N594PU, N595PU, N541PU and N543PU are assigned to the southeast practice area. In addition, unless receiving instrument instruction, pilots should avoid the instrument approach courses and centerlines of VOR airways.

Figure 8.8.1 depicts the division of the practice area. The north practice area is bound by the Wabash (north to Delphi), IN-25 (north from Delphi), US-24, and I-65. The southwest practice area is bound by the Wabash, US-41, I-74, and US-231. The southeast practice area is bound by US-52, IN-32, and US-231.

When practicing VOR tracking in the vicinity of Boiler (BVT), caution must be used regarding the instrument training traffic. A minimum altitude of 3,500’MSL must be maintained. Additionally, a courtesy call shall be made to Lafayette Tower. Due to traffic congestion around BVT, other VORs surrounding the practice area shall be used as much as feasible.

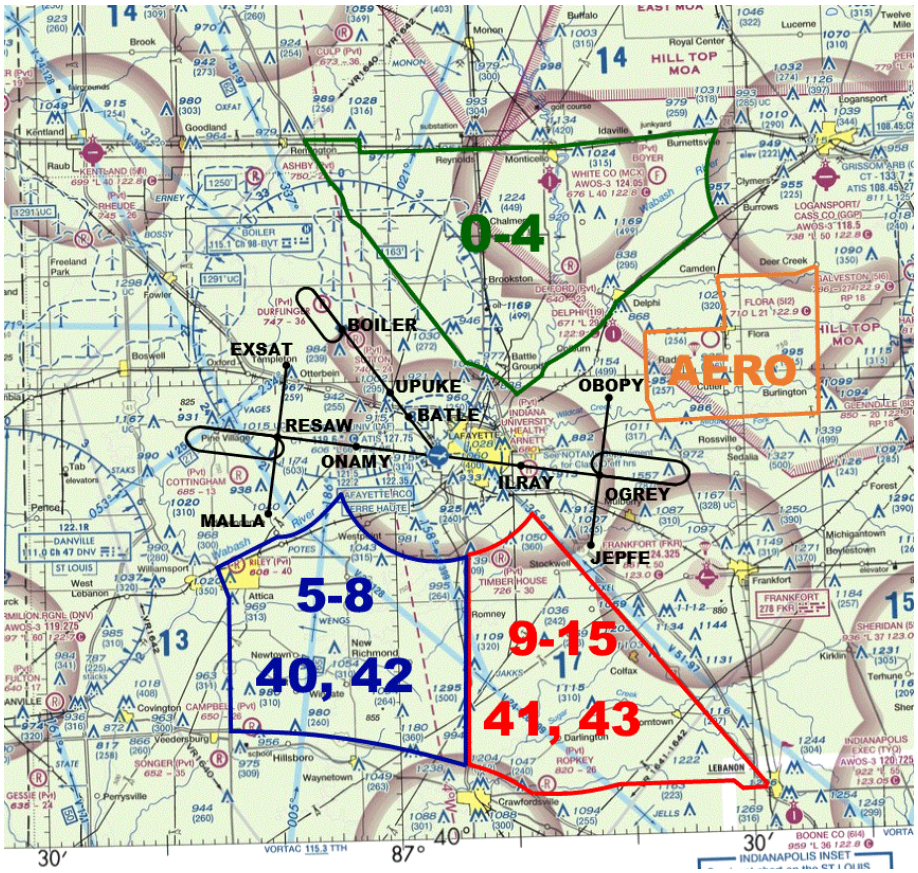


Figure 8.8.1 – LAF Practice Area

There are several airports which lie within the Purdue University practice area. Unless taking off or landing, pilots will remain at least 2000 feet above or 5 statute miles from these airports.

PROCEDURES FOR HANGARING AND DEHANGARING AIRCRAFT

In order to prevent damaging aircraft while hangaring or dehangaring, the following procedures apply:

A. If feasible, a minimum of three individuals is recommended to hangar or dehangar any aircraft.
B. When taxiing to the T-Hangars, the aircraft must be taxied and shut down parallel to the buildings as indicated below in Figure 8.8.2.
C. The airplane should then be maneuvered and positioned directly in front of the opening and perpendicular to the building before being pushed into the building. This may require multiple attempts.
D. There is only a minimal clearance on each side of tail and wings. The tail must be closely monitored to assure that it is not pushed into a beam.
E. When hangaring or dehangaring from Hangars 6 or 6 West:
    a. Coordinate with maintenance
    b. Open hangar doors all the way.
    c. Care should be taken to have the doors open for a minimal amount of time. (this may require maneuvering the plane close to the doors before opening).

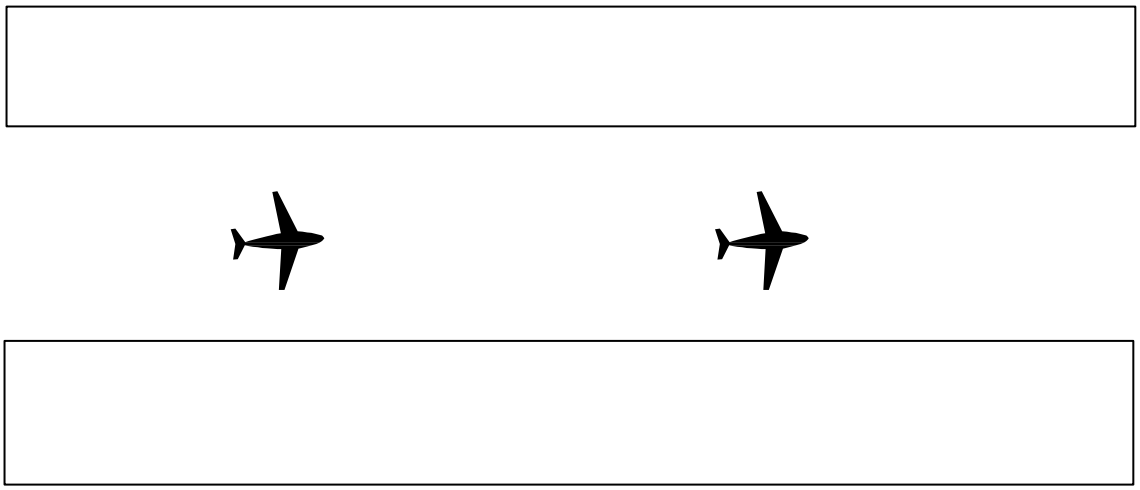


Figure 8.8.2 – Parking at T-Hangars

INSTRUMENT APPROACH PROCEDURES (AT-ALL FLIGHT AND GROUND TRAINER)

1. Completion of the descent/approach checklist and planning for the approach (frequency, procedure, altitudes, time, minimums and missed approach procedure) should normally be accomplished prior to reaching the initial approach fix.

2. At the initial approach fix.
   A. Time - Note the time and/or start the timer.
   B. Turn - Turn to a heading that will intercept the outbound course.
   C. Throttle – Set power to a setting that will reduce the airspeed to the recommended approach speed.
   D. Tune - Set the OBS to the inbound course
   E. Talk - Report if requested by ATC.
   F. Descend to initial approach altitude (if appropriate).
   G. Report the means by which the missed approach is to be identified (i.e. minutes and seconds or DME or station passage or decision height.)

3. Use a 45° intercept angle to get established on the approach course outbound unless making a straight-in approach.

4. Fly one minute outbound (adjustments to this time must be made if there is a headwind or tailwind component.) Two minutes outbound if making a terminal approach.

5. Turn to the procedure turn outbound heading. Fly for one minute (Adjustments to this time and heading must be made for wind. It is suggested that this wind correction angle be applied only in a direction away from the FAF. This will reduce the probability of intersecting the final approach course inside the FAF or the glide slope intercept point.

6. Turn to and fly the procedure turn inbound heading (corrected for wind) until intercepting the approach course allowing appropriate lead time for completion of the turn.

7. At the final approach fix inbound; or when intercepting the glide slope:

<u>Non-Precision</u>
   A. Time
   B. Tires
   C. Trailing Edge
   D. Throttle
   E. Talk

<u>Precision Glide Slope Intercept</u>
   A. Tires
   B. Trailing Edge
   C. Throttle

<u>Outer Marker or FAF</u>
   A. Time
   B. Talk

8. After intercepting the glide slope or reaching the final approach fix, the pilot's primary responsibility is to fly the airplane. Distractions such as looking at the checklist, approach plate, determining the missed approach procedure, etc., should not be done. These items should be completed prior to the FAF/GS intercept point.

9. On approaches where there is no final approach fix, careful study of the approach plate must be made to determine the proper plan of action. Typically the gear is lowered and the descent is begun upon re-intercepting the inbound approach course at the completion of the procedure turn.

10. On a non-precision approach, plan to reach the MDA at approximately 1 mile from the runway or airport.

11. On non-precision approaches, maintain the MDA. You will be allowed to fly as much as 100' above the MDA but descent below the MDA any time during the approach or missed approach will be unacceptable before final descent. The missed approach point on non-precision approaches will normally be determined by time, DME distance or station passage. You must be within one mile (or whatever the minimum visibility is for that procedure) when you declare yourself to be at the missed approach point.

12. On precision approaches descend on the glide slope to the DA. Upon reaching the DA, if the runway environment is in sight and if the airplane is in a position to make a normal landing – LAND. If the runway environment is NOT in sight or if the airplane is NOT in a position to make a normal landing – execute the missed approach. It is normal to go slightly below the DH when initiating the missed approach procedure. This is legal.

13. At the missed approach point:
    A. Power Up
    B. Pitch Up
    C. Gear Up
    D. Flaps Up
    E. Begin missed approach procedure
    F. Report

14. If a missed approach is initiated any time before the missed approach point the pilot should, unless otherwise authorized by ATC, fly the instrument approach procedure as specified on the approach plate to the missed approach point at or above the MDA or DA before executing a turning maneuver.

HOLDING PROCEDURES

1. Determine the holding pattern entry and procedures prior to reaching the holding fix by using the following procedure.
   A. Determine what the outbound heading of the assigned holding pattern will be.
   B. Look at the directional gyro and find the number representing the outbound heading of the holding pattern. You must be tracking towards the holding fix at the time this step is accomplished.
   C. From having memorized the patterns below determine the type of entry.

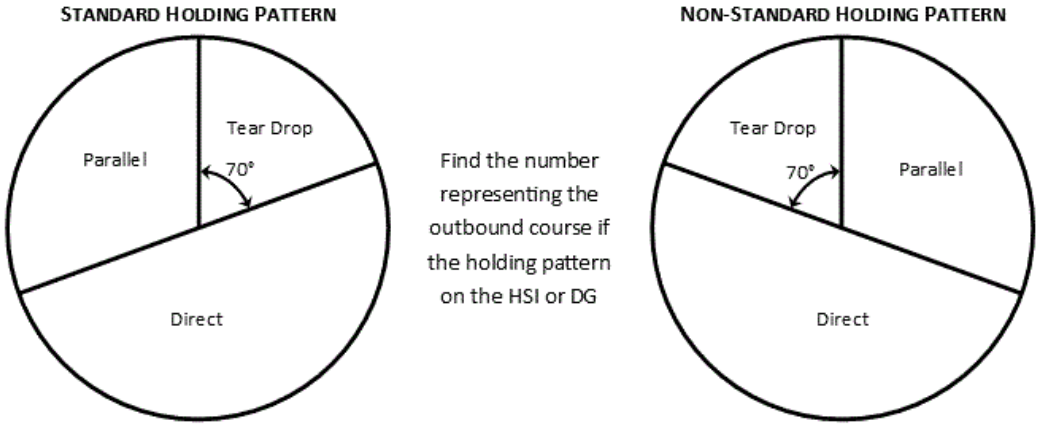


Figure 8.8.3 – Holding entry on HSI

   D. By either drawing a picture or by looking at the enroute chart or approach plate, visualize the holding pattern entry.

2. Upon reaching the holding fix.
   A. Time – Note the time and/or start the timer and fly outbound for one minute. Adjustments must be made if there is a headwind or tailwind component.
   B. Turn – Turn to the entry heading.
   C. Throttle – Set power to a setting that will reduce the airspeed to the recommended approach speed.
   D. Tune – If using VOR set the OBS to the inbound course.
   E. Talk – Report entering the holding pattern

3. Make adjustments on the time of the outbound leg so that the inbound leg will be 1 minute.

4. Make adjustments on the outbound heading as needed so that a standard rate turn will bring you on the holding course when you turn inbound.
   A. Rule of thumb: double the inbound correction on the outbound leg

5. When holding on a VOR course or Localizer course and while turning from the outbound heading to intercept the inbound course.
   A. If the CDI starts to move rapidly or prematurely increase the bank angle to 30° maximum.
   B. If the CDI does not start moving in when the aircraft heading gets to with 30° of the inbound course, roll out in a 30° intercept angle.

PURDUE STANDARDIZATION PROCEDURES

A. CHECKLIST USAGE

Verbal Challenge and Response should be used when accomplishing the Checklists on all dual and solo flights. The student first reads the Challenge – then accomplishes the task – then reads the Response.

B. DEPARTURE AND APPROACH BRIEFS

1. Departure Brief – verbally brief the Instructor (or self brief if solo) the following prior to contacting the tower:
    a. Runway departing
    b. Crosswind analysis
    c. Initial heading and altitude after takeoff
    d. Type of takeoff and aircraft configuration
    e. Engine abnormality actions, including CAPS scenarios

    NOTAMs, aircraft performance, weight and balance, and runway distances should be covered during the lesson brief prior to getting into the airplane.

2. VFR Arrival Brief – verbally brief the Instructor if dual (or self brief if solo) the following prior to entering Terminal airspace:
    a. Traffic pattern entry
    b. Pattern altitude
    c. Type of landing
    d. Crosswind analysis

3. IFR Arrival Brief – verbally brief the Instructor prior to reaching the initial approach fix as follows:
    a. Name and Type of approach
    b. Frequency of Navigation Aid used for the approach
    c. Analysis of the plan view
    d. Analysis of the profile view
    e. The missed approach procedure
    f. The MDA or DH value
    g. The minimum visibility required
    h. How the missed approach point will be determined (time, DME or station passage)

C. CALLOUTS DURING IFR OPERATIONS

1. With autopilot in use: “Course/Altitude Captured” when the appropriate annunciator starts flashing green.
2. “LPV or LNAV Active” when HSI GPS mode changes to approach mode
3. “Localizer/Course Alive” when intercepting the Localizer/Final Approach Course
4. “Glide Slope Alive” when intercepting the Glide Slope
5. “1000 feet” when 1000’ to climb or descend
6. “1000' above field elevation”

Callouts continued on next page

7. “200' above” minimums (do not say “minimums” out loud)
8. “100' above” minimums (do not say “minimums” out loud)
9. “Minimums” on Non-Precision approaches or “DH” when on a Full ILS approach
10. “Lights in Sight” or “Runway in Sight” as appropriate
11. “Missed Approach” when executing a missed approach

PURDUE UNIVERSITY COMMUNICATION PROCEDURES

A. DEPARTURE:

Prior to Taxi

1. Listen to ATIS on 127.75
2. When ready to Taxi - Call Ground Control on 121.9:

"Lafayette Ground Purdue 5 Hangar 6 (or T Hangars) Taxi with Bravo."

After Ground Control responds, the pilot should acknowledge: **"Purdue 5 Taxi 23"**

Prior to Takeoff:

1. Taxi up to, but hold short of, the holding lines. Then contact the Control Tower on 119.6:

"Lafayette Tower Purdue 5...

a. **Ready for takeoff Runway 23 Southbound" or**
b. **Ready for takeoff Runway 23, remaining in the pattern for the Option."**

The Control Tower will respond with one of the following:

a. **"Hold short"**
b. **"Line up and wait"**
c. **"Cleared for Takeoff"**
d. **"Cleared for immediate Takeoff"**

After the Tower responds, the pilot should acknowledge:

a. **"Purdue 5 hold short"** or
b. **"Purdue 5 line up and wait"** or
c. **"Purdue 5 cleared for takeoff"**

After Takeoff do not request to leave the Tower frequency unless you wish to do so while still in the Class D surface area.

B. ARRIVAL:

1. Listen to ATIS on 127.75
2. Contact the Control Tower 7 to 10 miles from the airport:

“Lafayette Tower, Purdue 5, 8 miles South, inbound for...

a. **Full stop landing with Bravo”** or

b. **The option with Bravo."**

After the Tower responds, acknowledge: **"Purdue 5 report one mile South of Evonik."**

The Tower will give instructions to report at or near Traffic Pattern entry. During this report, restate your intention to either Land Full Stop, or request the Option.

"Lafayette Tower Purdue 5 entering downwind...
a. **Landing Full Stop"** or
b. **For the Option"**

After the Tower responds, acknowledge: **"Purdue 5"**

On Full Stop Landing, if you do not receive instructions from the Tower, exit the runway at the first available Taxiway. Do not turn onto a runway unless instructed to do so. After crossing the holding line, stop and contact Ground Control.

"Lafayette Ground, Purdue 5 clear of Runway 23 Taxi to Hangar 6"

After the Tower responds acknowledge: **"Purdue 5"**

C. THE OPTION MEANS THAT YOU ARE:
1. Cleared to Land Full Stop
2. Cleared for Touch and Go
3. Cleared for Stop and Go
4. Cleared for a Go-Around

PURDUE UNIVERSITY WINTER OPERATIONS PROCEDURES

1. All engines must be preheated prior to initial starting if the temperature is below +20°F(-6°C). If the airplane Tanis preheater system has been plugged in all night, this is sufficient. If aircraft has been sitting outside for an extended time (two flight periods) with temp below +20°F (-6°C), move the aircraft inside hangar to warm and/or use Tanis preheater system to preheat engine.

2. When draining fuel, make sure there are no floating ice crystals in the fuel.

3. All piston aircraft use Phillips 20W50SC multigrade oil for all season operations and during engine break in after overhauls. No need for mineral oil use.

4. For the Piper aircraft and Decathalon be sure the oil winterization plate is installed if the temperature is below +50°F(+10°C).

5. **All persons flying in Purdue University airplanes must have a hat, gloves and a warm coat.**

6. Do not try and start any aircraft with external power or hand prop, contact maintenance for assistance.

7. Do not beat on plastic/glass covers when something doesn't work. Plastic/glass will shatter easily in very cold temperatures.

8. Use caution when flying in big, heavy boots when you have been previously flying with tennis shoes.

9. Taxi slowly on icy surfaces. Snow banks often are higher than the wing tips. If you are going to slide off the hard surface, mixture to idle cutoff.

10. Find a dry area for the run-up.

11. If the temperature on the surface (from ATIS) is at or below +20°F(-6°C), do not use or check carburetor heat. Do not use carburetor heat when airborne if the IOAT is at or below +20°F(-6°C).

12. Touch and goes are not allowed when snow removal is in progress. Don't ask!

13. Check NOTAMS for runway conditions prior to departure. Solo X-C flights will not be allowed to airports where the runway conditions are not known. Be very hesitant to send X-C flights to uncontrolled airports in Michigan during the winter months.

14. All landings must be in the first third of the runway, down the centerline, with approach speeds of not over 80 KIAS (allowing for wind gusts).

15. Crosswinds tend to be stronger and slick runways reduce your ability to cope with the winds.

16. Leave flaps down for aerodynamic braking on slick runways. Retract flaps for taxi so that snow and slush does not get trapped in the gaps.

17. If the temperature is forecast to go below 35°F(+2°C), be sure to plug in aircraft with Tanis preheater system when hangaring them.

18. Be hesitant to set the parking brake, especially after taxiing through slush. The brakes may freeze. During preflight, check wheel fairings openings for ice/snow buildup that can rub tires.

19. Minimum temperature for day flights is -23°C (-9°F), -18°C (0°F) for night flights.

20. No prolonged (more than 30 seconds) power-off maneuvers. The engine should be cleared during power-off maneuvers, which means increasing the throttle to 25% power, not full throttle. If feasible, keep the cylinder head temperatures above 200°F.

21. For removing frost, ice or snow from aircraft surfaces, use only washing towels from Hangar 6 West to avoid damage to aircraft surface and paint. Use only “WypAll” towels for cleaning windows to avoid scratches. Do not use plastic or metal scrapers. Be cautious of using clothing (i.e. sleeve of a coat or jacket) as these often have zippers or snaps that can damage the aircraft surface and paint. Place aircraft in Hangar 6 or Hangar 6 West to defrost if required, coordinate with maintenance staff.

22. Be careful when operating aircraft in and out of the T-Hangars due to possible ice on the ground. If needed, ask maintenance to help with the tractor.

PRIVATE PILOT / COMMERCIAL PILOT MANEUVERS

Notes for maneuvers:

- Students must read the most current revisions of the FAA Airplane Flying Handbook, the aircraft Pilot Operating Handbook (POH), manufacturer recommended publications, and the applicable Practical Test Standards (PTS) or Airmen Certification Standards (ACS) for a better understanding of these maneuvers.
- Other than specifically listed in a lesson's completion requirements, the PTS or ACS shall be referenced for all maneuver tolerances
- The fuel pump must be on "Boost" for all maneuvers in the SR-20.

Takeoffs and Landings

VFR STABILIZED APPROACH CRITERIA

Must be established by 500' AGL. If not established, a Go-Around must be considered.

- Proper airspeed
- Correct flight patch
- Aircraft properly configured
- Appropriate power setting for configuration and phase of flight
- Normal angle and rate of descent
- Only minor corrections are required to correct deviations

NORMAL TAKEOFF

A. Flaps set to 50%
B. Apply full power
C. Rotate for lift off at 65 KIAS
D. Initial climb at 85 KIAS
E. At 200' AGL retract the flaps
F. Allow the aircraft to accelerate to 96 KIAS
G. When leaving the traffic pattern, cruise climb at 100-105 KIAS

NORMAL LANDING

A. Abeam the touchdown point, reduce the power to 25%
B. Below 119 KIAS set the flaps to 50%
C. Establish a descent at 100 KIAS
D. On base below 104 KIAS set flaps to 100% and reduce the speed to 90 KIAS
E. On final reduce the approach speed to 77 KIAS
F. On short final reduce the airspeed to 70 KIAS
G. After touchdown apply brakes as needed and keep the control yoke fully aft
H. On gusty wind conditions, the final approach speed should be increased by ½ of the gust factor.

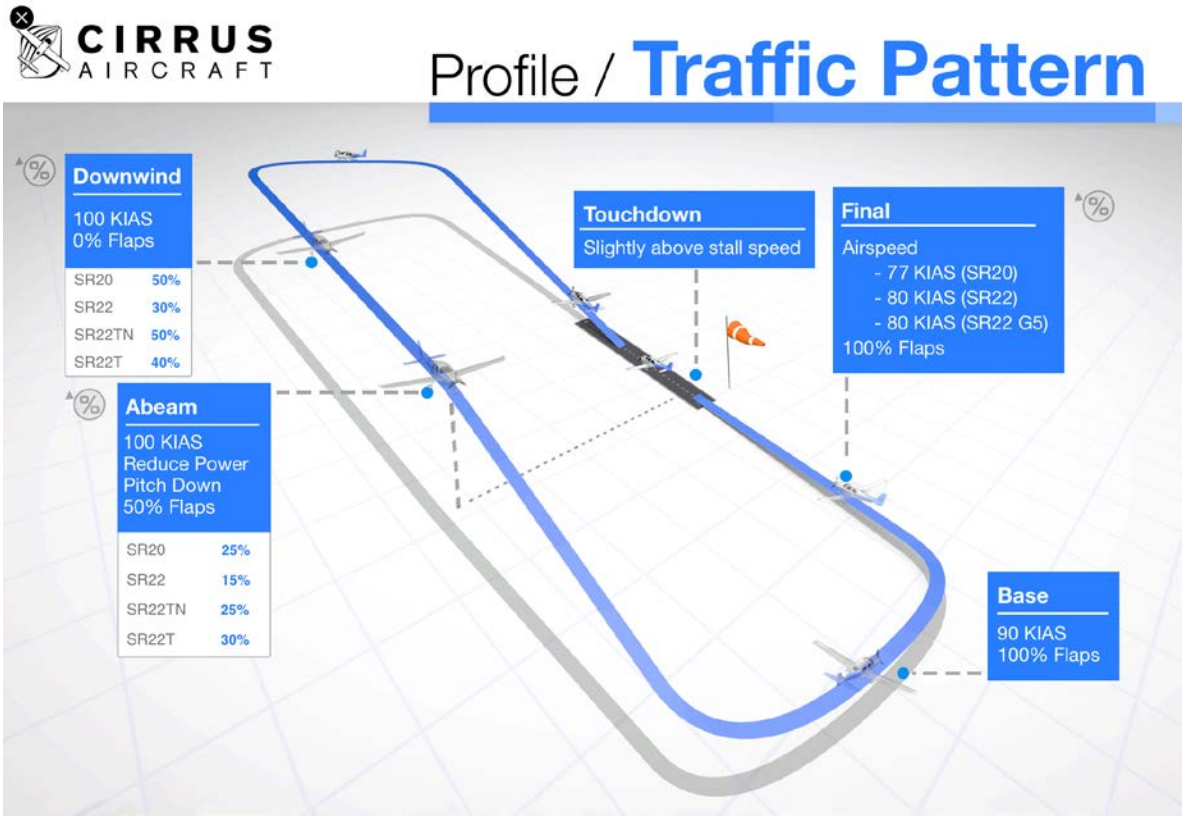


Figure 8.9.1 – Normal Traffic Pattern *Source: Cirrus iFOM*

X-WIND TAKEOFF

A. Flaps set to 50%
B. Place control yoke fully into the wind.
C. Add full power.
D. As speed increases release some of the aileron deflection to maintain wings level
E. Rotate for liftoff at 65 KIAS
F. Initial climb at 85 KIAS.
G. After liftoff establish a slight crab angle to maintain the desired track.
H. At 200’ AGL retract the flaps
I. Allow the aircraft to accelerate to 96 KIAS
J. When leaving the traffic pattern, cruise climb at 100-105 KIAS

X-WIND LANDING

A. Abeam the touchdown point reduce the power to 25%
B. Below 119 KIAS set the flaps to 50%
C. Establish a descent at 100 KIAS
D. On base below 104 KIAS set flaps to 100% and reduce the speed to 90 KIAS
E. On final reduce the approach speed to 77 KIAS
F. On short final slow to 70 KIAS
G. Use the crab technique for desired track on initial final.
H. At approximately ½ mile final establish the slip technique until touchdown.

I. After touchdown gradually apply full aileron into the wind and keep the control yoke fully aft.
J. On gusty wind conditions the final approach speed should be increased by ½ of the gust factor.

SOFT-FIELD TAKEOFF

A. Flaps set to 50%
B. Control yoke full aft prior to taking the runway
C. Apply full power.
D. After the nose wheel lifts off, release back pressure slightly to keep the nosewheel just clear of the runway.
E. Lift off at lowest possible airspeed
F. After liftoff lower the pitch slightly and allow the aircraft to accelerate to 75 KIAS while level in ground effect approximately 3-5ft above the runway surface.
G. Gradually accelerate to 85 KIAS and start climbing.
H. At 200’ AGL retract the flaps.
I. Allow the aircraft to accelerate to 96 KIAS.
J. When leaving the traffic pattern, cruise climb at 100-105 KIAS.

SOFT-FIELD LANDING

A. Abeam the touchdown point reduce the power to 25%.
B. Below 119 KIAS set the flaps to 50%.
C. Establish a descent at 100 KIAS.
D. On base below 104 KIAS set flaps to 100% and reduce the speed to 90 KIAS.
E. On final reduce the approach speed to 77 KIAS.
F. On short final reduce the airspeed to 72 KIAS.
G. Touch down softly on the main gear.
H. Keep the nose wheel clear of the runway as long as possible by gradually applying full aft back pressure on the control yoke. Apply brakes as needed.
I. On gusty wind conditions, the final approach speed should be increased by ½ of the gust factor.

SHORT-FIELD TAKEOFF

A. Flaps set to 50%.
B. Use all available runway
C. Hold brakes, apply full power, then release the brakes
D. Rotate for lift off at 65 KIAS
E. Initial climb at 75 KIAS until over the obstacle
F. At 200’ AGL accelerate to 85 KIAS, then retract the flaps.
G. Allow the aircraft to accelerate to 96 KIAS
H. When leaving the traffic pattern, cruise climb at 100-105 KIAS

SHORT-FIELD LANDING

A. Abeam the touchdown point reduce the power to 25%
B. Below 104 KIAS set the flaps to 50%
C. Establish a descent at 100 KIAS

D. On base below 104 KIAS set flaps to 100% and reduce the speed to 90 KIAS
E. On final reduce the approach speed to 77 KIAS
F. On short final slow to 70 KIAS
G. After touchdown apply brakes as needed and keep the control yoke fully aft
H. On gusty wind conditions, the final approach speed should be increased by ½ the gust factor.

POWER-OFF ACCURACY LANDING

A. Select a touchdown point
B. Abeam the touchdown point reduce power to idle
C. Establish appropriate glide speed, 85 KIAS on final
D. Apply flaps and adjust traffic pattern as needed
E. Must touchdown at or within 200 feet beyond the specified touchdown point
F. NOTE: If it becomes evident that the aircraft will not reach the point, add power as needed to avoid landing short of the runway

FULL FLAP GO-AROUND

A. Apply full power, flaps to 50%, and pitch for and maintain 83 KIAS until 100' AGL or obstacles are cleared and remain slightly to the right of the runway, unless advised by ATC. Try to keep traffic in sight.
B. Accelerate to 85 KIAS, and retract flaps.
C. Maintain proper climb speed as required
D. Level off at pattern altitude at 100 KIAS and power as required.

LANDINGS REMINDER: The PTS, or ACS as applicable, require the pilot to designate a point of touchdown prior to beginning the landing. This should be done from the beginning of flight training. In other words, all landings are accuracy or "spot" landings.

Slow Flight and Stalls

SLOW FLIGHT AT MINIMUM CONTROLLABLE AIRSPEED

Entry:

A. Clearing turns
B. Reduce power to approximately 20%.
C. Use backpressure on the control yoke until the airspeed reaches approximately 65 KIAS. Altitude loss, or gain during this time is unacceptable.
D. Add flaps as desired.
E. Add power to 50% or as required
F. Increase or reduce power or pitch, or both, so that airspeed is maintained at 5-10 knots above the 1G stall speed and altitude is held. The stall warning horn should not be on. Keep ball centered with rudder.
G. To turn the aircraft, LOOK BEFORE TURNING. You must add some power to compensate for loss of vertical lift.
H. Practice turns to a maximum of 30° bank angle.

I. To climb or descend, add or reduce power accordingly and make slight adjustments in pitch.
J. This maneuver may also be done at other speeds with flaps up or with flaps down as per the PTS, or ACS as applicable.

Recovery:

A. Smoothly apply full power.
B. Maintain level flight.
C. Retract flaps to 50%.
D. Allow the aircraft to continue to accelerate
E. Retract remaining flaps above 85 KIAS.
F. Reduce power to 55% after reaching cruise airspeed.

APPROACH TO A LANDING STALL (full stall, power off)

Entry:

A. Clearing turns
B. Reduce power to 25%
C. Add flaps 50% below 119 KIAS without losing/gaining any altitude
D. When below 104 KIAS, add full flaps without losing/gaining any altitude
E. Establish a glide at 80 KIAS
F. Enter a 20° to 30° banked turn or maintain heading as specified
G. Maintain altitude with backpressure until stall occurs or descent at 80 KIAS and apply gradual backpressure until stall occurs. The glide should be continuous with no altitude gain. Generally the nose should not be above the horizon when the stall occurs. Altitude loss should not exceed 400 feet from the time the maneuver began.

Recovery:

A. Release sufficient backpressure to break the stall then smoothly apply full power.
B. Minimize altitude loss (pitch to climb attitude).
C. Retract flaps to 50%.
D. After assumed obstacles/terrain are cleared, accelerate to 85 KIAS and with positive rate of climb retract remaining flaps.
E. Reduce power to 55% after reaching cruise airspeed.

Figure 8.9.2 – Power Off Stall *Source: Cirrus iFOM*

TAKEOFF STALL

Entry:

A. Clearing turns
B. Reduce power to approximately 20%
C. Maintain altitude with backpressure as airspeed decreases
D. Add 50% flaps below 119 KIAS
E. At 65 KIAS, apply 65% power, keep backpressure on the control yoke and note the altitude at which power is added. Going below this altitude during any portion of the remainder of the maneuver is unsatisfactory.
F. Immediately after adding power, enter a 30° banked turn or maintain heading, as specified.
G. Continue applying gradual backpressure until the stall occurs with the least practicable pitch change and within 45° of turn.

Recovery:

A. Reduce the angle of attack to recover from the stall, add full power. If simulating a high altitude, more power than previously set will not be allowed.
B. Minimize the altitude loss
C. Gradually accelerate to 75 KIAS, show a positive climb
D. Accelerate to 85 KIAS and retract flaps
E. Level off and reduce power to 55% after reaching cruise airspeed

DEPARTURE STALL

Entry:

A. Clearing turns
B. Reduce power to approximately 20%
C. Maintain altitude with backpressure as airspeed decreases to approximately 75 KIAS

D. Increase power to 65% power
E. Enter a 20°- 30° banked turn or maintain heading as specified
F. Increase backpressure until stall occurs with the least practicable pitch change and within 45° of turn.

Recovery:

A. Reduce the angle of attack to recover from the stall, add full power. If simulating a high altitude, more power than previously set will not be allowed.
B. Minimize altitude loss
C. Gradually accelerate to 75 KIAS, show a positive climb
D. Accelerate to 85 KIAS.
E. Level off and return to 55% power when cruise airspeed is established.

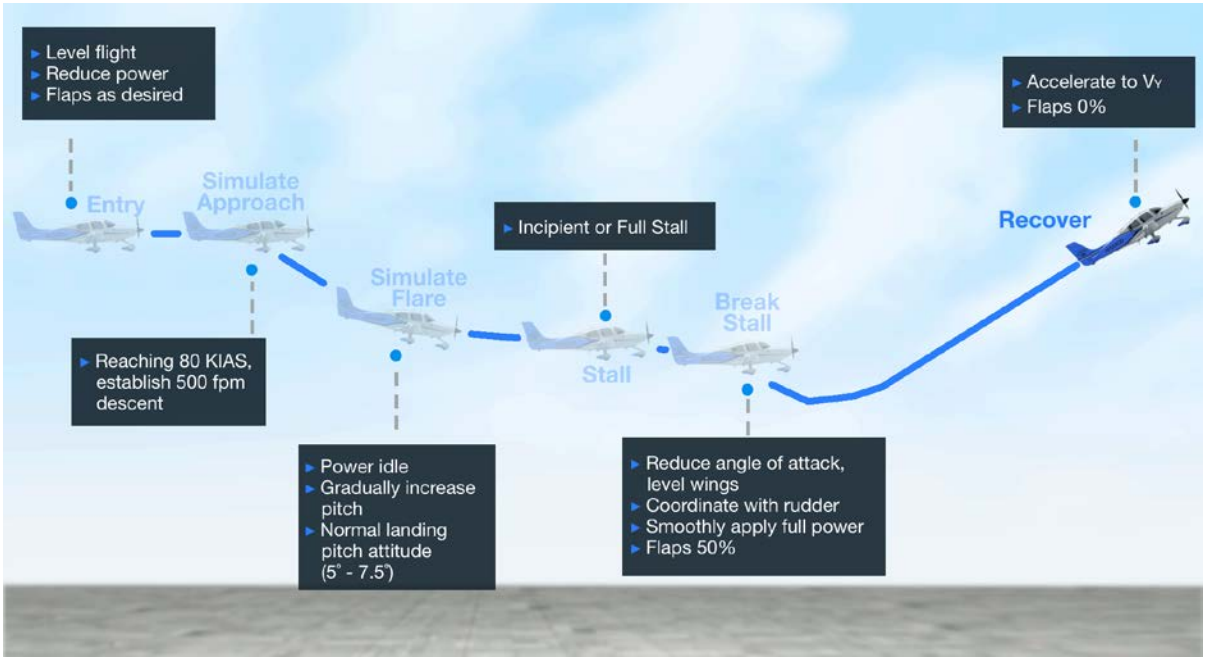


Figure 8.9.3 – Power On Stall *Source: Cirrus iFOM*

ACCELERATED STALL

Entry:

A. Clearing turns
B. Reduce power to approximately 20%
C. Below 100 KIAS enter and maintain a 45°- 60° banked turn
D. Positively increase backpressure until stall occurs. Altitude loss before the stall is unsatisfactory. The stall should occur within 90° of turn. The bank should be established by the time the airspeed has slowed to 90 KIAS (NOTE: A slight altitude gain before the stall is acceptable.)

Recovery:

A. Reduce angle of attack to recover from the stall and simultaneously apply full power
B. Return to wings level and entry altitude
C. Reduce power to 55% after reaching cruise airspeed

ELEVATOR TRIM STALL (Instructor Demonstration Only)

Entry:

A. Clearing turns
B. Reduce power to 20%
C. Maintain altitude with backpressure
D. Apply full flaps below 104 KIAS
E. Pull power to idle
F. Establish glide at 80 KIAS and TRIM to maintain speed
G. Apply full power (simulated go-around) and allow the pitch to increase until the first indication of a stall.

Recovery:

A. Forward pressure to reduce the angle of attack and recover from the stall
B. Confirm full power
C. Retract flaps to 50%
D. Minimize altitude loss (pitch to climb attitude) and accelerate to 75 KIAS
E. Accelerate to 85 KIAS and retract flaps
F. Reduce power to 55% after reaching cruise airspeed

SECONDARY STALL (Instructor Demonstration Only)

Entry:

A. Clearing turns
B. Reduce power to approximately 20%
C. Maintain altitude with backpressure as airspeed decreases
D. Add 50% flaps below 119 KIAS
E. At 65 KIAS, apply 65% power minimum, keep backpressure on the control stick and note the altitude at which power is added. Going below the altitude during any portion of the remainder of the maneuver is unsatisfactory.
F. Continue applying gradual backpressure until the buffet occurs
G. Reduce the angle of attack to recover from the stall and add full power
H. Increase pitch (to avoid an obstacle) until the secondary stall occurs (horn)

Recovery:

A. Reduce the angle of attack to recover from the stall
B. Confirm full power
C. Minimize altitude loss (pitch to climb attitude) and accelerate to 75 KIAS
D. Accelerate to 85 KIAS and retract flaps
E. Reduce power to 55% after reaching cruise airspeed

CROSS CONTROL STALL (Instructor Demonstration Only)

Entry:

A. Clearing turns
B. Reduce power to approximately 20%
C. Establish a glide at 80 KIAS
D. Enter a 20° to 30° bank turn

E. After the bank is established, apply inside rudder and opposite aileron to maintain the bank angle
F. Apply back pressure until imminent stall occurs

Recovery:

A. Release sufficient back pressure to stop the buffet, then smoothly apply full power
B. Coordinate the flight controls
C. Minimize the altitude loss, accelerate to 75 KIAS
D. Accelerate to 85 KIAS
E. Reduce power to 55% after reaching cruise airspeed.

Ground Reference Maneuvers

RECTANGULAR COURSE

A. Descend to 1,800’ MSL
B. Set power to 55%
C. Clearing turns, keep a field in mind in case of an emergency
D. Pick a prominent rectangle away from significant obstacles with long sides aligned with the wind as best as possible
E. Enter the maneuver downwind at a 45° angle approximately ¼ - ½ mile from the side
F. The ground track must parallel the downwind side while maintaining the entry altitude
G. Reaching the end, turn to parallel the crosswind side at the same distance as the downwind side. A constant radius over the ground must be maintained during the turn.
H. Repeat with each side and turn until the entry point is reached
I. Climb to desired altitude

Figure 8.9.4 – Rectangular Course *Source: Cirrus iFOM*

TURNS AROUND A POINT ON THE GROUND

Prior to introducing this maneuver the pilot should be reasonably proficient at 45° banked turns at altitude

A. Pick a prominent point away from buildings, people and animals
B. Clearing turns and reduce power to 55%, keep a field in mind in case of an emergency
C. Enter the maneuver downwind at 1000’ AGL
D. A constant radius should be maintained, with the steepest bank at or near 45°
E. Go around the point twice and roll out on the entry heading
F. A constant altitude should be maintained throughout the maneuver

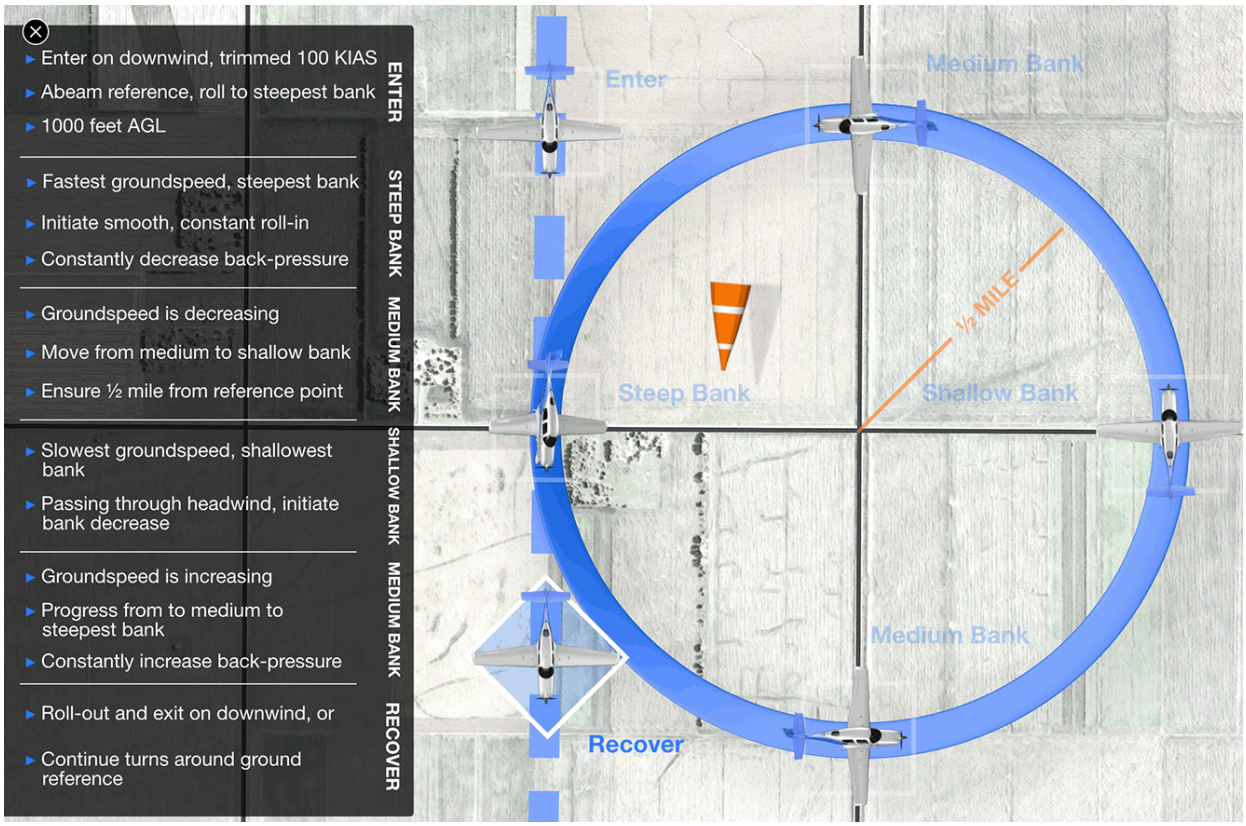


Figure 8.9.5 – Turns Around a Point *Source: Cirrus iFOM*

S-TURNS ACROSS A ROAD

Prior to introducing this maneuver the pilot should be reasonably proficient at 45° banked turns at altitude

A. Find a road or long fence row that is perpendicular to the wind at altitude
B. Clearing turns and reduce power to 55%, keep a field in mind in case of emergency
C. Enter the maneuver downwind, perpendicular to the road at 1000' AGL
D. Begin a coordinated turn to the left or right and complete ½ of a circle. The objective is to fly a ground track of ½ a circle on each side of the road and cross the road with the wings level and the longitudinal axis perpendicular to the road.
E. Each ½ of the "S" is identical to ½ of a turn around a point on the ground
F. Be aware of the rapid rate of roll required when changing directions when going downwind
G. A constant altitude should be maintained throughout the maneuver

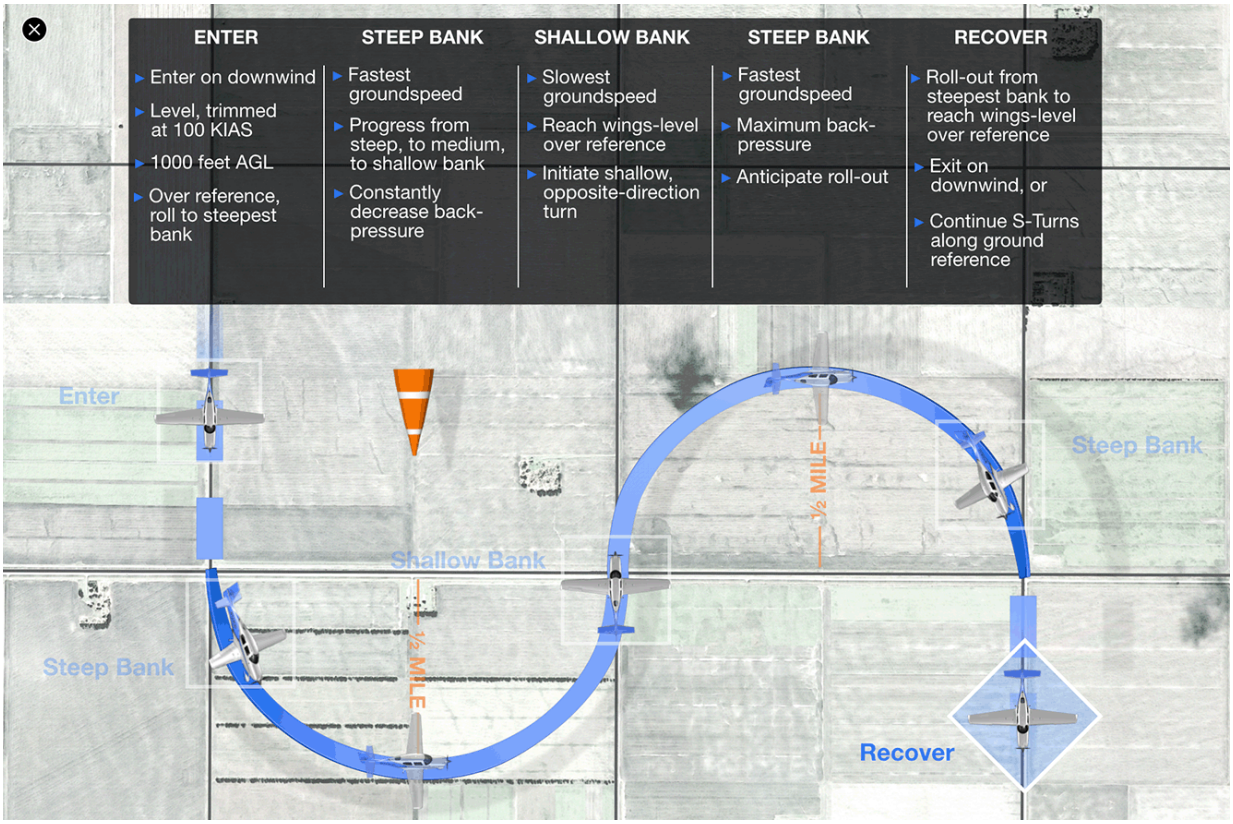


Figure 8.9.6 – S-Turns Across A Road *Source: Cirrus iFOM*

EIGHTS-ON-PYLONS

The student shall use a pivotal altitude table to expedite the maneuver. Pivotal altitude in feet AGL shall be calculated according to the following formula:

$$Pivotal\ Altitude = \frac{(Ground\ Speed)^2}{11.3}$$

A. Perform clearing turns
B. Turn downwind
C. Descend to approximately 1400' AGL
D. Set power to 55%
E. Determine ground speed and pivotal altitude, adjust altitude if necessary. If the groundspeed is such that any portion of the maneuver will be below the minimum maneuvering altitude stated in the Purdue General Operating Rules, sufficient power must be added to raise the pivotal altitude
F. Select a pylon each to the left and right, approximately ¾ mile apart. A straight line between the two pylons must be perpendicular to the wind direction.
G. Enter downwind midpoint between the pylons
H. Abeam the first pylon establish 30°-40° of bank
I. As the airplane drifts closer to the pylon, the angle of bank must be increased to hold the reference line on the pylon. If the reference line appears to move ahead of the pylon, the pilot should increase altitude. If the reference line appears to move behind the pylon, the pilot should decrease altitude.
J. Reaching abeam the second pylon, establish 30°-40° of bank in the opposite direction. The maneuver may also be done with no straight and level between the pylons.
K. Exit the maneuver on downwind
L. Establish normal training cruise at 55% power

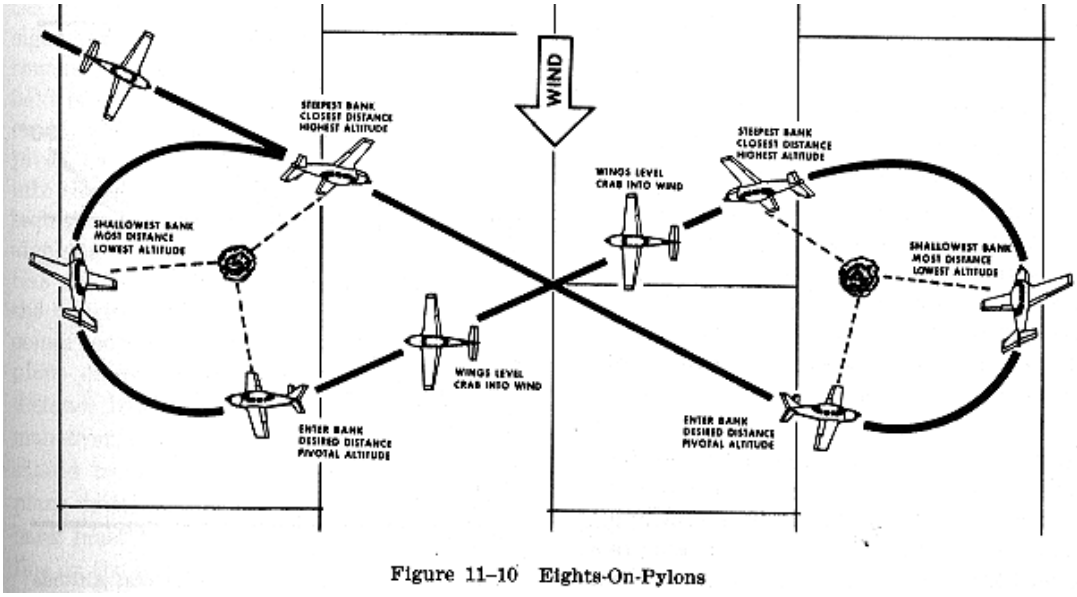


Figure 11–10 Eights-On-Pylons

Figure 8.9.7 – Eights on Pylons *Source: FAA Aircraft Flying Handbook*
This diagram is not to scale and might be somewhat misleading due to the amount of straight and level flight shown between the pylons. Also, the entry should be completed straight from downwind, as a 45° entry would change the required pivotal altitude.

Performance Maneuvers

360° STEEP POWER TURNS

A. Clearing turns
B. Set the power to 60%, or as required to maintain 120 KIAS
C. Smoothly roll into a bank of 45°(Private)/50°(Commercial), Trim as required
D. Maintain assigned altitude
E. Turns must be done 360° in each direction
F. Approaching the entry heading, smoothly roll directly from one direction to the opposite direction without stopping at straight and level.
G. Approaching the entry heading, smoothly roll wings to level and maintain the entry heading and assigned altitude
H. Set power to 55%

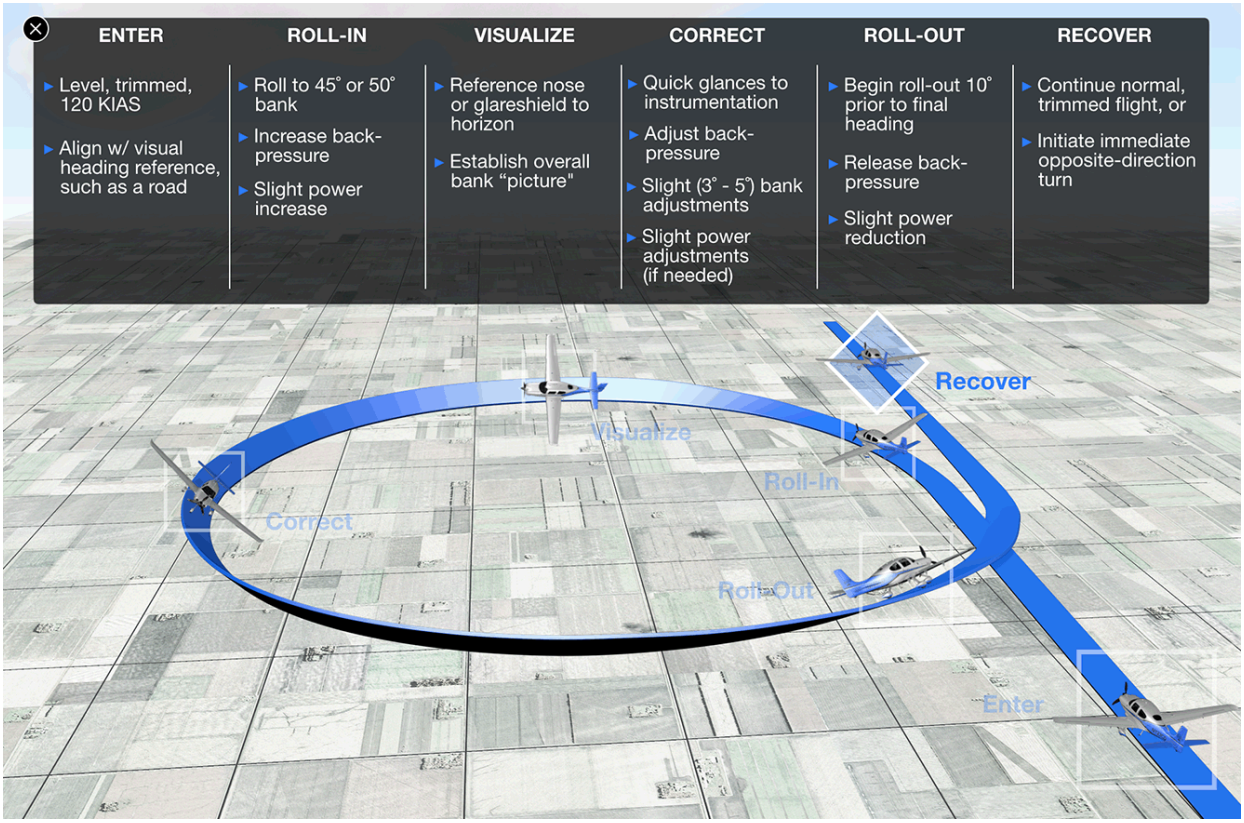


Figure 8.9.8 – Steep Turns *Source: Cirrus iFOM*

1080° STEEP SPIRALS ABOUT A POINT

A. Climb to an altitude that will allow for three turns to be completed before reaching the Purdue minimum altitude
B. Clearing turns
C. Pick an intersection or other prominent point on the ground
D. When abeam of the point, reduce power to idle and smoothly roll into a bank (55° maximum)
E. Establish a glide at 100 KIAS
F. Vary the bank in order to maintain a constant radius
G. Clear the engine each 360° of turn
H. Roll out on the appropriate heading. Keep in mind a field in case of engine failure.
I. Set power to 55%

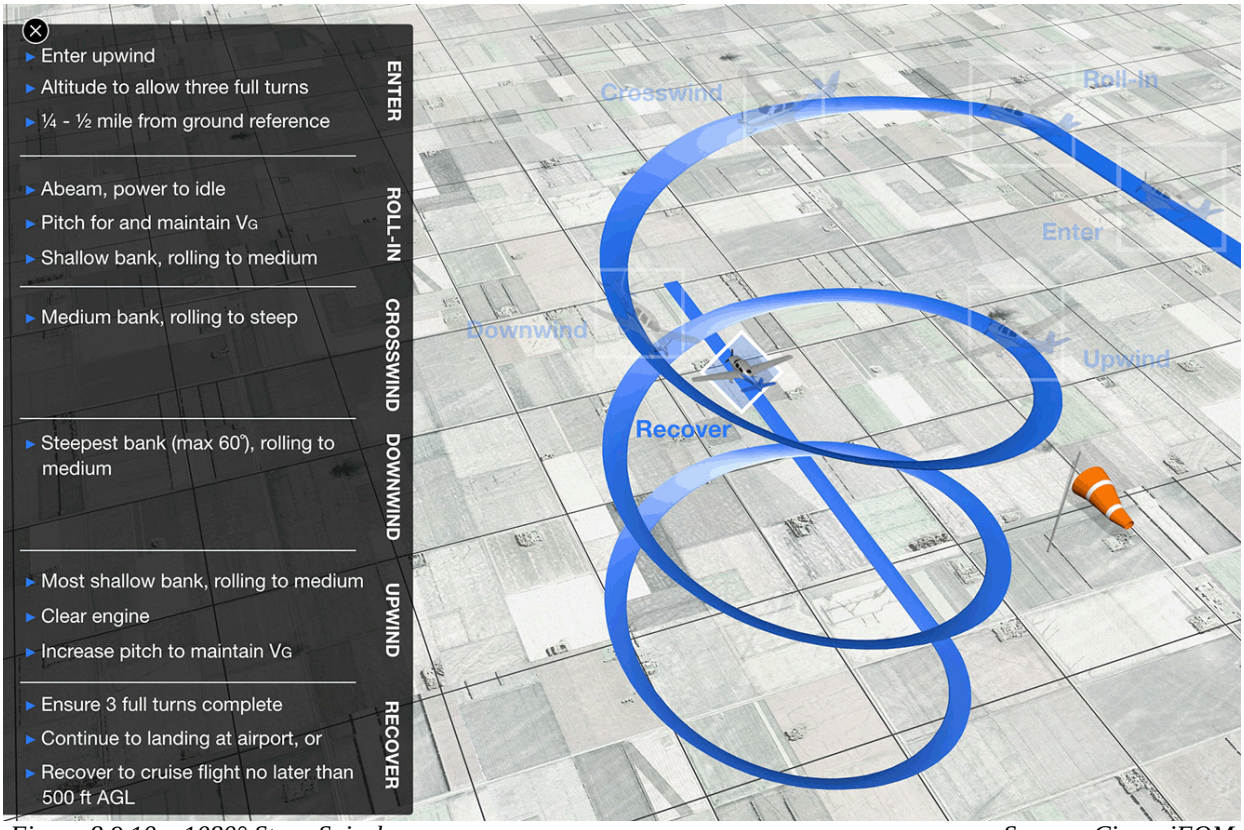


Figure 8.9.10 – 1080° Steep Spiral *Source: Cirrus iFOM*

CHANDELLES

A. Clearing turns
B. Set power to 55%, or as required to maintain 115-120 KIAS
C. Roll into a 30° bank with a minimum of heading change. Maintain 30° bank for the first 90° turn
D. Gradually increase the pitch at a constant rate for the first 90° turn. Maintain coordination with rudder.
E. As the airspeed starts to decrease, smoothly apply full power by 45° point
F. Upon reaching the 90° point, smoothly begin to roll out the bank at a constant rate, so that the wings are leveled just as the 180° point is reached
G. While turning the last 90°, maintain a constant pitch attitude. The airspeed should be just above the stall at the 180° point
H. Slowly lower the pitch and return to straight and level
I. Set 55% power and maintain new altitude

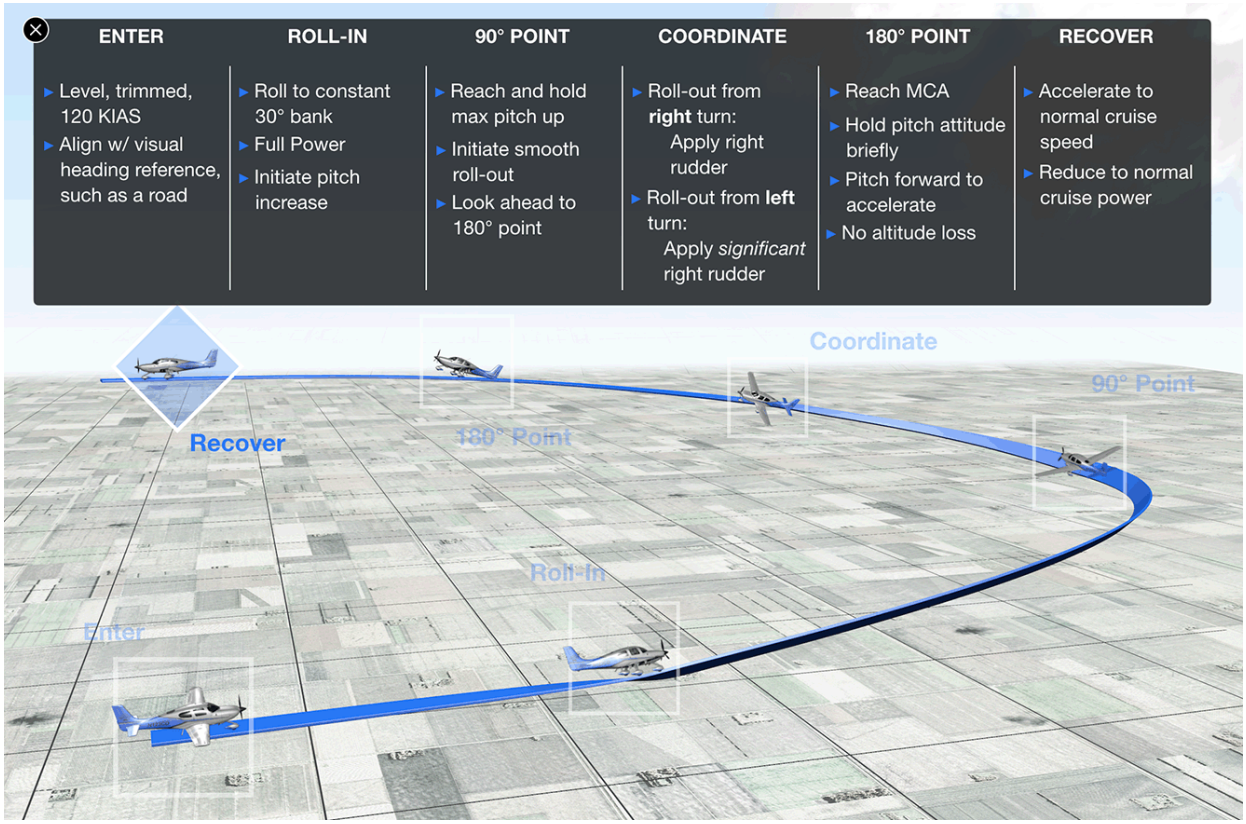


Figure 8.9.11 – Chandelle *Source: Cirrus iFOM*

LAZY EIGHTS

A. Clearing turns
B. Set power to 50%, or as required to maintain slightly slower than training cruise speed
C. Enter the maneuver from straight and level cruise flight
D. Simultaneously increase both the pitch and the bank for the first 45° of turn. The bank should be approximately 15° at this point.
E. The pitch will be at its highest point at the 45° of turn
F. During the second 45° of turn, the pitch decreases, while the bank increases, the altitude continues to increase, and the airspeed continues to decrease
G. At the 90° point, the pitch should be passing through the level flight attitude for that airspeed, altitude is a maximum, bank should be 30°, and airspeed is a minimum, approximately 5-10 KIAS above a stall.
H. During the third 45° of turn, the pitch continues to decrease to its lowest point at the 135° point, the bank continues to decrease, and the airspeed continues to increase.
I. During the last 45° of turn, the pitch continues to increase back to the level flight attitude, bank decrease to zero at the 180° point, altitude continues to descend back to the entry altitude, and airspeed continues to increase, until reaching the 180° point.
J. Upon reaching the 180° point, the procedure is immediately performed in the opposite direction. One complete lazy 8 consists of two 180° turns.
K. Set power to 55%

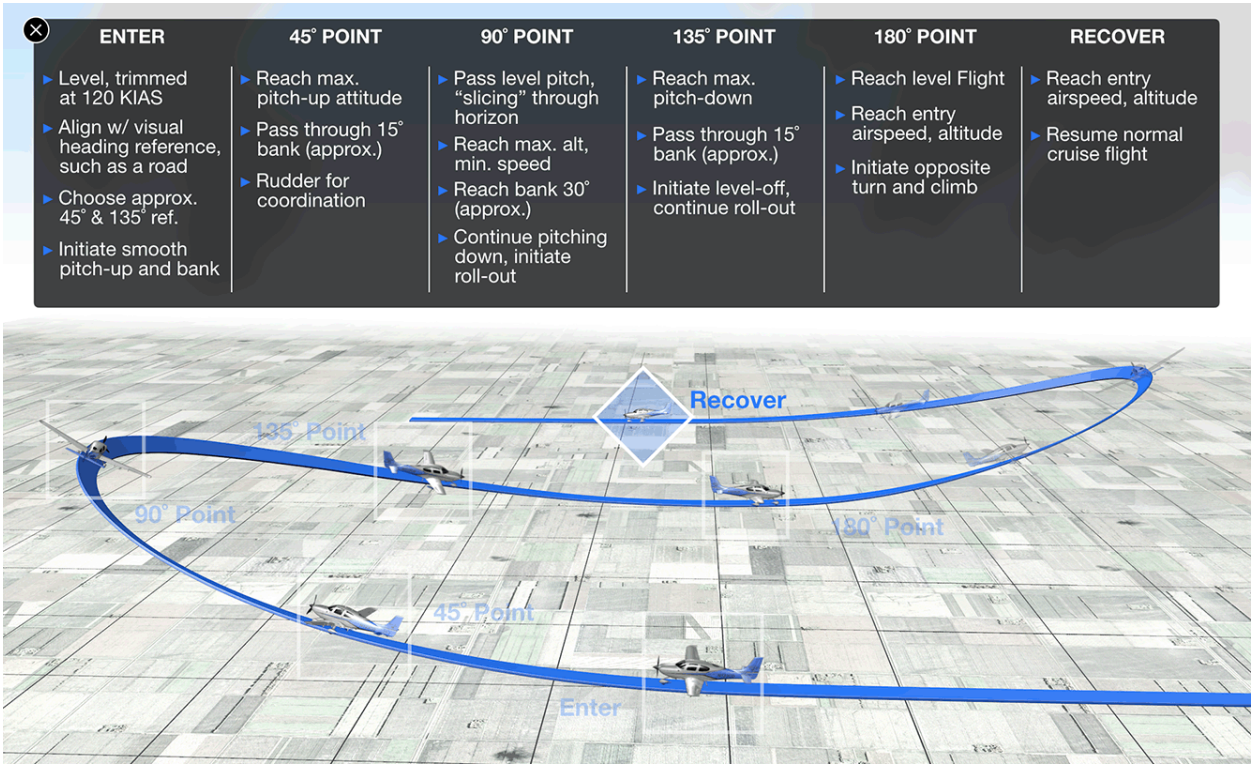


Figure 8.9.12 – Lazy Eight *Source: Cirrus iFOM*

Emergency Maneuvers

NOTE: This listing is not intended to be an exhaustive reference for all the aircraft's emergency procedures. For a complete listing of the manufacturer's recommended procedures, reference the appropriate publications. The pilot in command is expected to be familiar will all the manufacturer's recommendations in order to make a competent decision to meet the extent of the emergency.

SIMULATED/ACTUAL COMPLETE ENGINE FAILURE

Airspeed ..... Trim for 99 KIAS
Electric fuel boost pump ..... On
Fuel selector ..... Switch fuel tanks
SELECT A SUITABLE LANDING AREA AND FLY TO IT
Mixture ..... Rich
Alternate air ..... On
Master switch ..... On
Magnetos ..... Checked
IF ENGINE DOES NOT RESTART
Transponder ..... Squawk 7700
Contact ATC 121.5
Ignition ..... Off
Battery Switch ..... Off
Alternator Switch ..... Off
Fuel Selector ..... Off
Mixture ..... Idle cut-off
Seat belt and harness ..... Tight
Door ..... As Required
CAPS Deployment ..... Consider as required

SIMULATED EMERGENCY DESCENT

To meet the PTS or ACS requirements, this will be the preferred method.

Entry:

A. Clearing turns
B. Throttle idle
C. Flaps full below 104 KIAS
D. Bank 45°-60° and maintain 104 KIAS

Recovery:

A. Approaching the assigned altitude, no lower than 1000 ft. AGL, add full power
B. Establish the pitch attitude to maintain level altitude
C. Retract flaps to 50%
D. Verify airspeed above 85 KIAS and retract flaps
E. Establish a positive rate of climb at V_Y in clean configuration

EMERGENCY DESCENT

Entry:

A. Throttle idle
B. Maintain clean configuration
C. Establish forward slip at V_{NE}

Recovery:

A. Neutral flight controls
B. Gradually level off
C. Set power as required

COMMERCIAL PILOT MANEUVERS

Notes for maneuvers:

- Students must read the most current revisions of the FAA Airplane Flying Handbook, the aircraft Pilot Operating Handbook (POH), manufacturer recommended publications, and the applicable Practical Test Standards (PTS) or Airmen Certification Standards (ACS) for a better understanding of these maneuvers.
- Other than specifically listed in a lesson's completion requirements, the PTS or ACS shall be referenced for all maneuver tolerances

NORMAL LANDING

A. Maintain 90 KIAS on downwind
B. Abeam the touchdown point, reduce power to 15"MAP, or as required. Lower the landing gear when ready to begin final descent. Extend 1st notch of flaps.
C. Continue descending at 90 KIAS
D. When gear is locked down call out "three green lights"
E. On base, slow to 80 KIAS, extend 2nd notch of flaps, use power as required
F. On final, slow to 72 KIAS, extend full flaps, use power as required
G. Complete GUMPS check
H. After touchdown apply brakes as needed and the control yoke fully aft until leaving the runway
I. On gusty wind conditions, the final approach speed should be increased by ½ of the gust factor

SHORT-FIELD TAKE-OFF – Obstacle clearance

A. Use all available runway
B. Flaps 25°
C. Apply full power prior to brake release
D. Begin rotation so as to lift off at 51 to 59 KIAS
E. Accelerate to 54-62 KIAS
F. Gear up when obstacle cleared
G. Accelerate to V_X (78) and retract flaps at 200'AGL
H. Accelerate to V_Y (90) and climb out as normal

SHORT-FIELD LANDING – Obstacle clearance

A. The touchdown point must be specified by the pilot prior to starting the landing
B. Make a normal pattern
C. Final descent should be at a constant airspeed/pitch/glide angle (this is a powered approach)
D. Full flaps on final
E. Reduce airspeed to 70 KIAS for average training weight
F. Complete GUMPS check
G. Close throttle slowly during flare for touchdown (not immediately after obstacle clearance) as there is little or no floating at this airspeed. Touch down at Minimum Controllable Airspeed.

H. Apply brakes as needed with control yoke full aft. Keep flaps down for maximum aerodynamic braking on contaminated or icy runways.

SOFT-FIELD TAKE-OFF

A. Apply desired flap setting-two notches (25°)
B. Use the entire runway
C. Apply full power with control yoke full aft
D. As nose rises and lifts off, reduce backpressure just enough to keep it from continuing to rise.
E. Lift off at lowest possible airspeed and stay level in ground effect approximately 3-5 feet above the runway surface
F. While in ground effect, lower the pitch and accelerate to 55-65 KIAS
G. Gear up when obstacle cleared/landing no longer possible on the runway remaining
H. Accelerate to V_Y (90 KIAS) retract flaps when 200’ AGL

SOFT-FIELD LANDING

A. Fly a normal pattern
B. Full flaps on final
C. Reduce airspeed to 61 to 72 KIAS
D. Complete GUMPS check
E. The touchdown must be made at minimum descent rate and minimum airspeed slightly above the stall, with no drifting. A slight addition of power during and immediately after touchdown may be used to aid in gently lowering the nose wheel.
F. For maximum aerodynamic braking, keep the flaps down. However, retract the flaps if the surface is very soft and/or mud, gravel, etc., will be thrown against the flap surface.
G. Apply brakes as necessary with control yoke full aft.
H. Full nose-up elevator must be held until clear of the runway.

GO AROUND – gear down, full flap configuration

A. Prop full forward
B. Full power
C. Establish climb attitude
D. Retract flaps to 25°
E. Maintain V_X (72 KIAS) or V_Y (78 KIAS) as required
F. Gear up with a positive rate of climb
G. Maintain V_X (78 KIAS) or V_Y (90 KIAS) as required
H. Retract remaining flaps when obstacles cleared or 200’ AGL as required
I. Continue with normal climb to desired altitude

POWER OFF ACCURACY LANDING

A. Select a touchdown point
B. Abeam the touchdown point, reduce power to idle
C. Establish appropriate glide speed
D. Apply flaps, lower the landing gear and adjust the pattern as needed
E. Complete GUMPS check
F. Must touchdown at or within 200 feet beyond the specified touchdown point

NOTE: If it becomes evident that the aircraft will not reach the point, add power as needed to avoid landing short of the runway

Slow Flight and Stalls

SLOW FLIGHT

Any gear and flap configuration could be specified. Gear down and full flaps for flight at minimum controllable airspeed is the normal condition.

Entry:

A. Clearing turns
B. Retard throttle to approximately 15" MP
C. Maintain altitude with backpressure as airspeed decreases
D. Gear down below 129 KIAS
E. Slowly add full flaps below 103 KIAS
F. Prop control full forward
G. Add power as necessary to maintain altitude and airspeed at the minimum controllable airspeed with full flaps. Keep the ball centered with rudder.

Recovery:

A. Smoothly apply full power
B. Maintain level flight
C. Retract flaps to 25°
D. Gear up
E. Retract remaining flaps
F. Maintain assigned altitude

APPROACH TO A LANDING STALL

Entry:

A. Clearing turns
B. Retard throttle to approximately 15" MP
C. Maintain altitude with backpressure as airspeed decreases
D. Gear down below 129 KIAS
E. Slowly add full flaps below 103 KIAS
F. Prop full increase
G. Close throttle and establish a glide at 72 KIAS
H. Enter 15°-20° bank or maintain heading as specified
I. Maintain altitude with backpressure until stall occurs or descend at 72 KIAS and apply gradual back-pressure until stall occurs. Generally, the nose should not be much above the horizon when the stall occurs.

Recovery:

A. Release backpressure to recover from stall, while simultaneously applying full power to minimize altitude loss.
B. Establish the pitch attitude for a climb at V_X (72 KIAS)

C. Retract flaps to 25°
D. Gear up at positive climb and when clear of obstacle
E. Accelerate to V_X (78 KIAS) or V_Y (90 KIAS) as required
F. Retract remaining flaps
G. Establish a positive rate of climb at V_Y (90 KIAS)
H. Level off at desired altitude
I. Set cruise power to 21”MP / 2300RPM

TAKE-OFF STALL – full power, gear down configuration

Entry:

A. Clearing turns
B. Retard throttle to approximately 15” MP
C. Maintain altitude with backpressure as airspeed decreases
D. Gear down below 129 KIAS
E. Add flaps 25° below 103 KIAS
F. Prop full increase
G. Continue maintaining altitude with backpressure as airspeed decreases
H. At minimum controllable airspeed apply full power
I. Enter 30°-45° bank or maintain heading as specified
J. Increase backpressure until stall occurs

NOTE: Less than full power may be used to simulate higher density altitudes. In this case, additional power may NOT be added on recovery.

Recovery:

A. Release backpressure to recover from stall, minimize altitude loss by establishing the pitch attitude for a climb at V_X (72 KIAS)
B. Gear up with a positive rate of climb
C. Establish a positive rate of climb while accelerating to V_X (78 KIAS) or V_Y (90 KIAS) as required
D. Retract flaps to zero
E. Level off at desired altitude
F. Set cruise power to 21”MP / 2300RPM

DEPARTURE STALL - climb power, clean configuration

Entry:

A. Clearing turns
B. Retard throttle to approximately 15” MP
C. Maintain altitude with backpressue as airspeed decreases
D. At 70 KIAS, prop full forward and increase power to full power
E. Enter 15°-20° bank or maintain heading as specified
F. Increase backpressure until stall occurs

NOTE: Less than full throttle may be used to simulate higher density altitudes. In this case, additional power may NOT be added on recovery.

Recovery:

A. Release backpressure to recover from stall

B. Minimize altitude loss by establishing the pitch attitude for a climb at V_X (78 KIAS) or V_Y (90 KIAS) as required
C. Level off at desired altitude
D. Set cruise power to 21”MP / 2300RPM

ACCELERATED STALL

Entry:

A. Clearing turns
B. Retard throttle to approximately 15” MP
C. Below 100 KIAS enter and maintain a 45°-60° bank
D. Rapidly but not abruptly, increase backpressure until stall occurs. Altitude loss before stall is unsatisfactory. Altitude gain is acceptable.

Recovery:

A. Release backpressure
B. Propeller full forward
C. Full power
D. Recover to straight and level attitude
E. Set cruise power to 21”MP / 2300RPM

Commercial Maneuvers

360° STEEP POWER TURNS

A. Clearing turns
B. Set power to 23” MP / 2300RPM or as required for 110 KIAS
C. Smoothly roll into a bank of 50° increasing backpressure as the bank is increased
D. Maintain assigned altitude
E. Turns must be done 360° in each direction
F. Approaching the entry heading, smoothly roll directly from one direction to the opposite direction without stopping at straight and level.
G. Approaching the entry heading, smoothly roll wings to level and maintain the entry heading and assigned altitude
H. Set cruise power to 21”MP / 2300RPM

1080° STEEP SPIRALS ABOUT A POINT

A. Climb to an altitude that will allow for three turns to be completed before reaching the Purdue minimum altitude of 1000’ AGL
B. Clearing turns
C. Pick an intersection or other prominent point on the ground
D. When abeam of the point, reduce power to idle with prop control full decrease
E. Smoothly roll into a bank (55° maximum)
F. Establish a glide at 90 KIAS
G. Vary the bank in order to maintain a constant radius
H. Clear the engine each 360° of turn

I. Roll out on the appropriate heading. Keep in mind a field in case of engine failure.
J. Set cruise power to 21”MP / 2300RPM

CHANDELLES

A. Clearing turns
B. Set power to 21”MP / 2300RPM. Airspeed should be approximately 110 KIAS
C. Roll into a 30° bank with a minimum of heading change. Maintain 30° bank for the first 90° turn
D. Gradually increase the pitch at a constant rate for the first 90° turn
E. As the airspeed starts to decrease, smoothly apply full power by 45° point
F. Upon reaching the 90° point, smoothly begin to roll out the bank at a constant rate, so that the wings are leveled just as the 180° point is reached
G. While turning the last 90°, maintain a constant pitch attitude. The airspeed should be just above the stall at the 180° point
H. Slowly lower the pitch and return to straight and level
I. Set cruise power to 21”MP / 2300RPM and maintain new altitude

LAZY EIGHTS

A. Clearing turns
B. Reduce power to 18”MP / 2300RPM, or as required to maintain slightly slower than training cruise speed
C. Enter the maneuver from straight and level cruise flight
D. Simultaneously increase both the pitch and the bank for the first 45° of turn. The bank should be approximately 15° at this point.
E. The pitch will be at its highest point at the 45° of turn
F. During the second 45° of turn, the pitch decreases, while the bank increases, the altitude continues to increase, and the airspeed continues to decrease
G. At the 90° point, the pitch should be passing through the level flight attitude for that airspeed, altitude is a maximum, bank should be 30°, and airspeed is a minimum, approximately 5-10 KIAS above a stall.
H. During the third 45° of turn, the pitch continues to decrease to its lowest point at the 135° point, the bank continues to decrease, and the airspeed continues to increase.
I. During the last 45° of turn, the pitch continues to increase back to the level flight attitude, bank decrease to zero at the 180° point, altitude continues to descend back to the entry altitude, and airspeed continues to increase, until reaching the 180° point.
J. Upon reaching the 180° point, the procedure is immediately performed in the opposite direction. One complete lazy 8 consists of two 180° turns.
K. Set cruise power to 21”MP / 2300RPM

EIGHTS-ON-PYLONS

The student shall use a pivotal altitude table to expedite the maneuver. Pivotal altitude in feet AGL shall be calculated according to the following formula:

$$Pivotal\ Altitude = \frac{(Ground\ Speed)^2}{11.3}$$

A. Perform clearing turns

B. Turn downwind
C. Descend to approximately 1400’ AGL
D. Set power to 21”MP / 2300RPM
E. Fine tune pivotal altitude. If the groundspeed is such that any portion of the maneuver will be below the minimum maneuvering altitude stated in the Purdue General Operating Rules, sufficient power must be added to raise the pivotal altitude
F. Select a pylon each to the left and right, approximately ¾ mile apart. A straight line between the two pylons must be perpendicular to the wind direction.
G. Enter downwind midpoint between the pylons
H. Abeam the first pylon establish 30°-40° of bank
I. As the airplane drifts closer to the pylon, the angle of bank must be increased to hold the reference line on the pylon. If the reference line appears to move ahead of the pylon, the pilot should increase altitude. If the reference line appears to move behind the pylon, the pilot should decrease altitude.
J. Reaching abeam the second pylon, establish 30°-40° of bank in the opposite direction. The maneuver may also be done with no straight and level between the pylons.
K. Exit the maneuver on downwind
L. Establish normal training cruise at 21”MP / 2300RPM

Emergency Maneuvers

NOTE: This listing is not intended to be an exhaustive reference for all the aircraft’s emergency procedure. For a complete listing of the manufacturer’s recommended procedures, reference the appropriate publications. The pilot in command is expected to be familiar will all the manufacturer’s recommendations in order to make a competent decision to meet the extent of the emergency.

SIMULATED/ACTUAL COMPLETE ENGINE FAILURE

Airspeed ..... Trim for 79 KIAS
Electric fuel boost pump ..... On
Fuel selector ..... Switch fuel tanks
SELECT A SUITABLE LANDING AREA AND FLY TO IT
Mixture ..... Rich
Alternate air ..... Open
Master switch ..... On
Magnetos ..... Checked
IF ENGINE DOES NOT RESTART
Transponder ..... Squawk 7700
Contact ATC 121.5
Landing Gear ..... Down, when landing assured
Ignition ..... Off
Battery Switch ..... Off
Alternator Switch ..... Off
Fuel Selector ..... Off

Mixture..... Idle cut-off
Throttle..... Close
Seat belt and harness.....Tight
Door .....Unlatched

SIMULATED EMERGENCY DESCENT

Entry:

A. Clearing turns
B. Throttle idle
C. Propeller control full increase (monitor RPM)
D. Landing gear extend below 129 KIAS
E. Flaps full below 103 KIAS
F. Bank 45°-60° and maintain 103 KIAS

Recovery:

A. Approaching the assigned altitude, no lower than 1000 ft. AGL, add full power
B. Establish the pitch attitude to maintain level altitude
C. Retract flaps to 25°
D. Gear up
E. Verify airspeed above 78 KIAS and gradually retract flaps
F. Establish a positive rate of climb at V_Y in clean configuration

a. lower the nose to break the stall, and then rapidly (but not abruptly) raise the nose (as if trying to avoid an obstacle) until the secondary stall occurs

Demonstration Stalls

CROSSED-CONTROL STALL

ENTRY

a. Clearing turns
b. Choose a road to simulate a runway. The road (runway) must be situated so an aircraft on final approach would experience a left crosswind. The aircraft should then be positioned on a (simulated) left base (with a tailwind).
c. Declare a simulated ground altitude (usually 500 feet below entry altitude). The aircraft must not go below this altitude during entry or recovery.
d. Retard throttle to 15" MP
e. Gear down below 129 KIAS
f. Prop full increase below
g. Establish glide at 72 KIAS
h. Start a left turn. The turn should be timed appropriately so that using 30° of bank or less, the aircraft will overshoot final.
i. After establishing the bank, apply inside rudder to increase the rate of turn and opposite aileron to maintain the bank angle.
j. Apply back pressure until imminent stall occurs.

RECOVERY

a. Release back pressure, then smoothly apply full power

b. Coordinate the flight controls
c. Establish the pitch attitude for a climb at Vx
d. Gear up when positive rate of climb is established
e. Accelerate to Vx (78 KIAS) or Vy (90 KIAS)
f. Establish a positive rate of climb at Vy in clean configuration
g. Level off
h. Return to cruise power setting 21" MP 2300 RPM when cruise airspeed is established

ELEVATOR TRIM STALL

ENTRY

a. Clearing turns
b. Declare a simulated ground altitude (usually 400 feet below entry altitude). The aircraft must not go below this altitude during entry or recovery.
c. Retard throttle to 15" MP
d. Maintain altitude with backpressure as airspeed decreases
e. Gear down below 129 KIAS
f. Slowly add full flaps below 103 KIAS
g. Prop full increase
h. Establish a glide at 72 KIAS
i. Apply full nose up elevator trim
j. Apply full power and allow the pitch to increase until stall occurs

RECOVERY

a. Exert forward pressure to recover from the stall, minimize (i.e. STOP) altitude loss by establishing the pitch attitude for a climb at Vx
b. Retract flaps to 25°
c. Gear up when a positive rate of climb is established
d. Accelerate to Vx (78 KIAS) or Vy (90 KIAS)
e. Retract remaining flaps
f. Establish a positive rate of climb at Vy in clean configuration
g. Level off and establish cruise airspeed
h. Set cruise power to 21"MP / 2300 RPM

SECONDARY STALL

ENTRY

b. Clearing turns
c. Retard throttle to 15"MP
d. Gear down (Vlo 129 KIAS)
e. Flaps 25°
f. Prop full increase
g. Maintain altitude with backpressure as airspeed decreases
h. At minimum controllable airspeed, apply full power and note altitude – this altitude is now simulate ground altitude and the aircraft must not go below it for the rest of the maneuver (NOTE: for best results, full power should be used for the primary stall, not 65% power.)

i. Increase backpressure until stall occurs lower the nose to break the stall, and then rapidly (but not abruptly) raise the nose (as if trying to avoid an obstacle) until the secondary stall occurs

RECOVERY

a. Release backpressure to recover from stall, minimize (i.e. STOP) altitude loss by establishing the pitch attitude for a climb at Vx
b. Gear up with positive rate of climb
c. Accelerate to Vx (78 KIAS) or Vy (90 KIAS)
d. Retract flaps
e. Level off
f. Return to cruise power setting (21”MP 2300 RPM) when cruise airspeed established

IFR MANEUVERS

Basic Attitude Instrument Training Maneuvers

LATERAL "S"

A. Clearing Turns
B. Slow to and maintain 100 KIAS (SR-20) / 90 KIAS (PA-28R)
C. Maintain assigned altitude
D. Smoothly but briskly roll in to 45° of bank
E. At 90° of turn reverse directions to end up original heading
F. Without returning to level flight, roll into 30° of bank to 60° or turn and reverse.
G. Repeat for 40° of turn at 20° of bank, 30° of turn at 15° of bank, 20° of turn at 10° of bank, and 10° of turn at 5° of bank
H. Roll out on starting heading and resume normal training cruise

VERTICAL "S"

A. Clearing Turns
B. Slow to and maintain 100 KIAS (SR-20) / 90 KIAS (PA-28R) while maintaining assigned altitude and heading
C. Start climb at 500 ft/min for 1 min.
D. After 1 min., descend at 500 ft/min for 1 min.
E. Repeat at 400 ft/min, 300 ft/min, and 200 ft/min
F. Resume normal training cruise

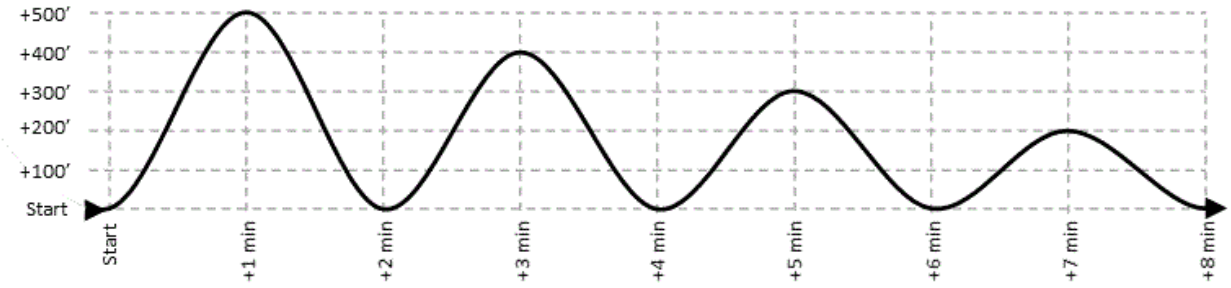


Figure 8.9.13 – Lateral "S"

VERTICAL CIRCLES

A. Clearing Turns
B. Slow to and maintain 100 KIAS (SR-20) / 90 KIAS (PA-28R) while maintaining assigned altitude
C. Start climb or descend at 500 ft/min while establishing a standard rate turn
D. Continue for 2 min. total
E. Roll out on starting heading
F. Resume normal training cruise at new altitude

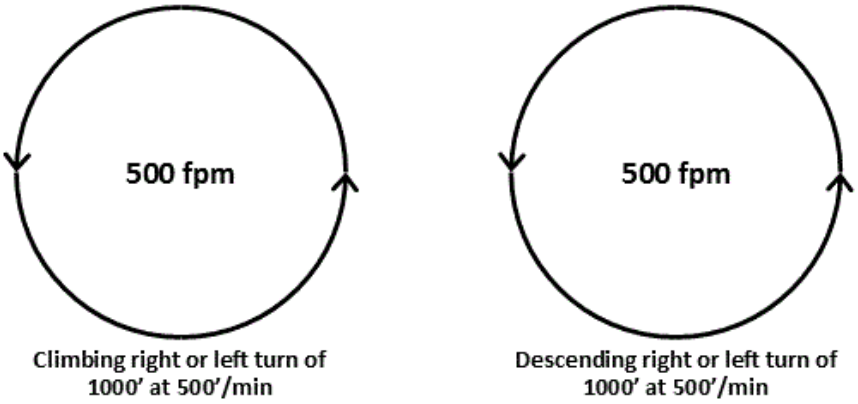


Figure 8.9.14 – Vertical Circles

VERTICAL "S1"

The vertical "S1" is a combination of the vertical "S" and 360° standard rate turns.

A. Clearing Turns
B. Slow to and maintain 100 KIAS (SR-20) / 90 KIAS (PA-28R) while maintaining assigned altitude
C. Start climb at 500 ft/min while establishing a standard rate turn
D. After 1 min., descend at 500 ft/min for 1 min. while continuing the turn
E. Repeat at 400 ft/min, 300 ft/min, and 200 ft/min, reversing the direction of turn after each complete 360° turn.
F. Roll out on starting heading and altitude
G. Resume normal training cruise

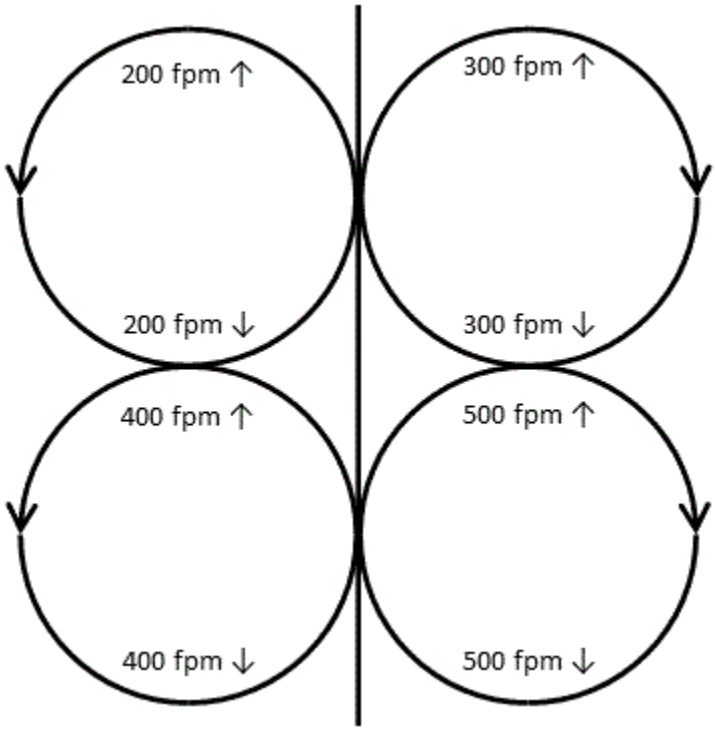


Figure 8.9.15 – Vertical S1

VERTICAL "S2"

The vertical "S2" is a vertical "S1" with directions of turn reversed at the top of climb

A. Clearing Turns
B. Slow to and maintain 100 KIAS (SR-20) / 90 KIAS (PA-28R) while maintaining assigned altitude
C. Start climb at 500 ft/min while establishing a standard rate turn
D. After 1 min., descend at 500 ft/min for 1 min. while reversing the turn
E. After another minute, reverse the turn again and establish a standard rate turn while establishing a 400 ft/min climb
F. After another minute, descend at 400 ft/min for 1 min. while reversing the turn
G. Repeat at 300 ft/min, and 200 ft/min.
H. Roll out on starting heading and altitude
I. Resume normal training cruise

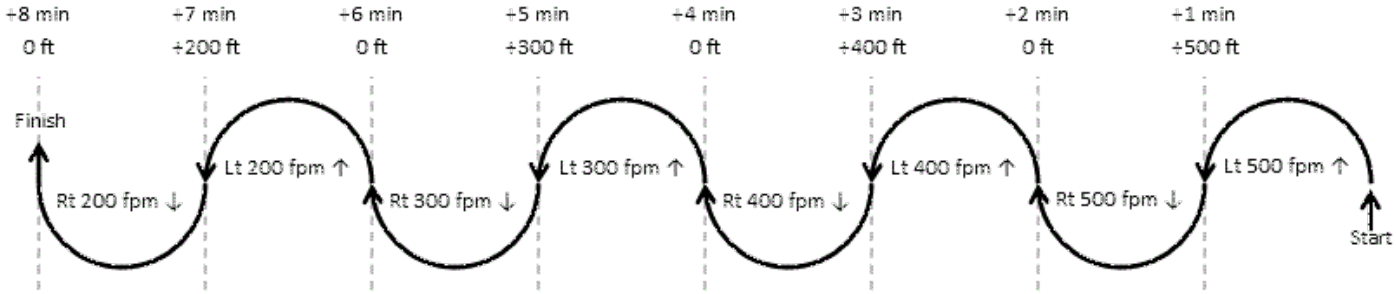


Figure 8.9.16 – Vertical "S2", top view

PATTERNS A & B

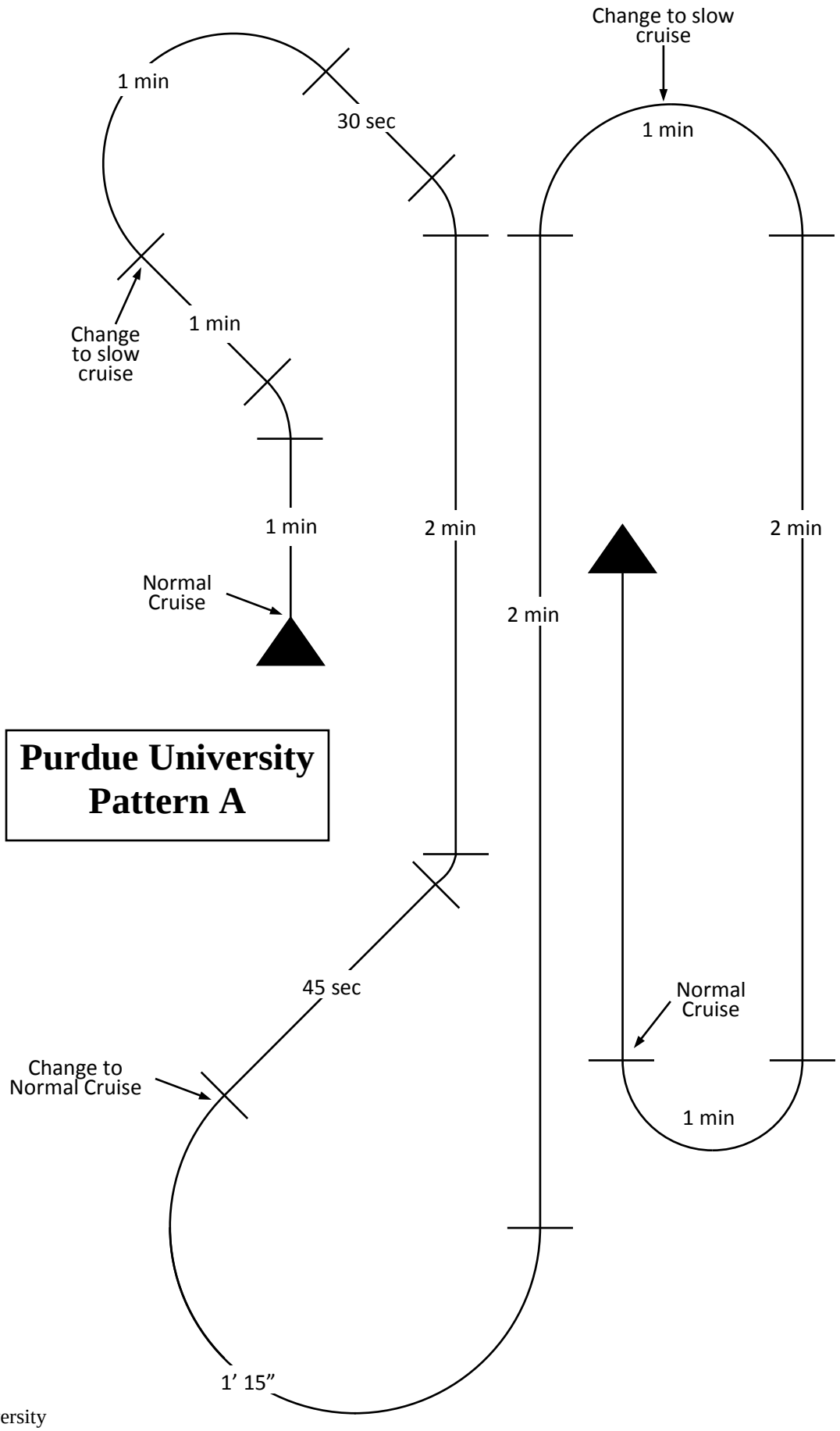
See illustrations on following pages.

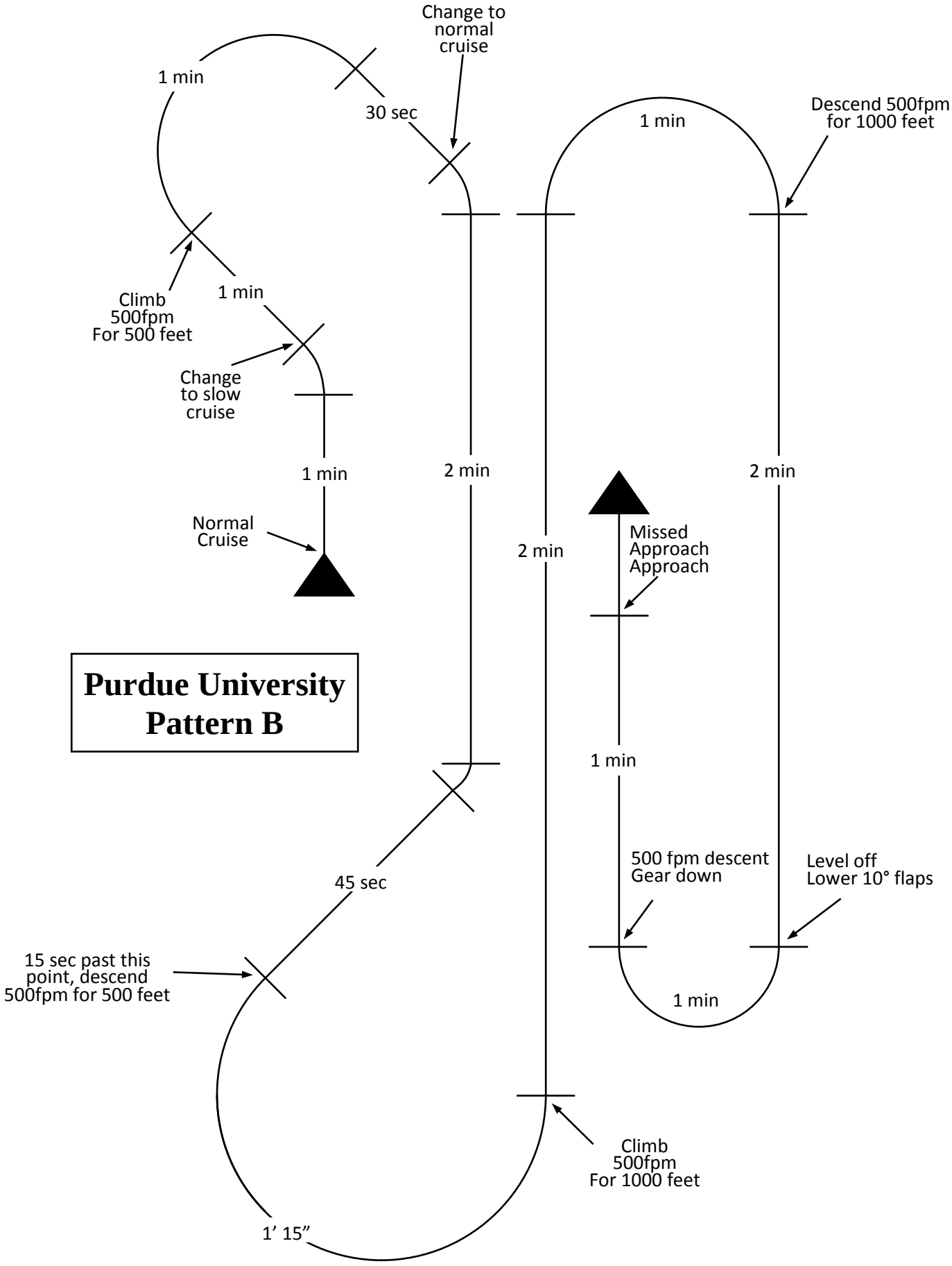
SR-20

- Normal Cruise: 55% power
- Slow Cruise: 100 KIAS

PA-28R-201

- Normal Cruise: 21"MP / 2300RPMs
- Slow Cruise: 90 KIAS


Change to slow cruise
1 min
30 sec
1 min
1 min
Change to slow cruise
1 min
2 min
2 min
Normal Cruise
2 min
Purdue University Pattern A
45 sec
Normal Cruise
Change to Normal Cruise
1 min
1' 15"


Change to normal cruise
1 min
30 sec
1 min
Descend 500fpm for 1000 feet
Climb 500fpm For 500 feet
1 min
Change to slow cruise
1 min
2 min
2 min
Normal Cruise
2 min
Missed Approach Approach
Purdue University Pattern B
1 min
500 fpm descent Gear down
Level off Lower 10° flaps
45 sec
15 sec past this point, descend 500fpm for 500 feet
1 min
Climb 500fpm For 1000 feet
1' 15"

IFR Profiles

HOLDING

SR-20: 100 KIAS, clean configuration
PA-28R-201: 90 KIAS clean configuration

PRECISION APPROACHES

SR-20:

A. Cleared to IAF or Vectors: within 3-5min. maintain cruise (training cruise) or slow to 120 KIAS (65% power cruise). Verify the approach in the GPS had been activated. The descent/approach checklist should have been completed. If already cleared and using autopilot, verify the approach mode is active.
B. When turning onto the final approach course inbound, slow to 100 KIAS and verify the HSI is set in the proper mode.
C. When ½ dot below the glideslope/glidepath, extend the simulated gear and set flaps to 50%.
D. Intercept and maintain glideslope/glidepath. Use power as required to maintain 100 KIAS while continuing to maintain the localizer/final approach path.
E. At the FAF inbound, start timer and contact ATC as required.
F. Reaching the DA, continue with a stabilized descent to a landing or begin the missed approach as required.

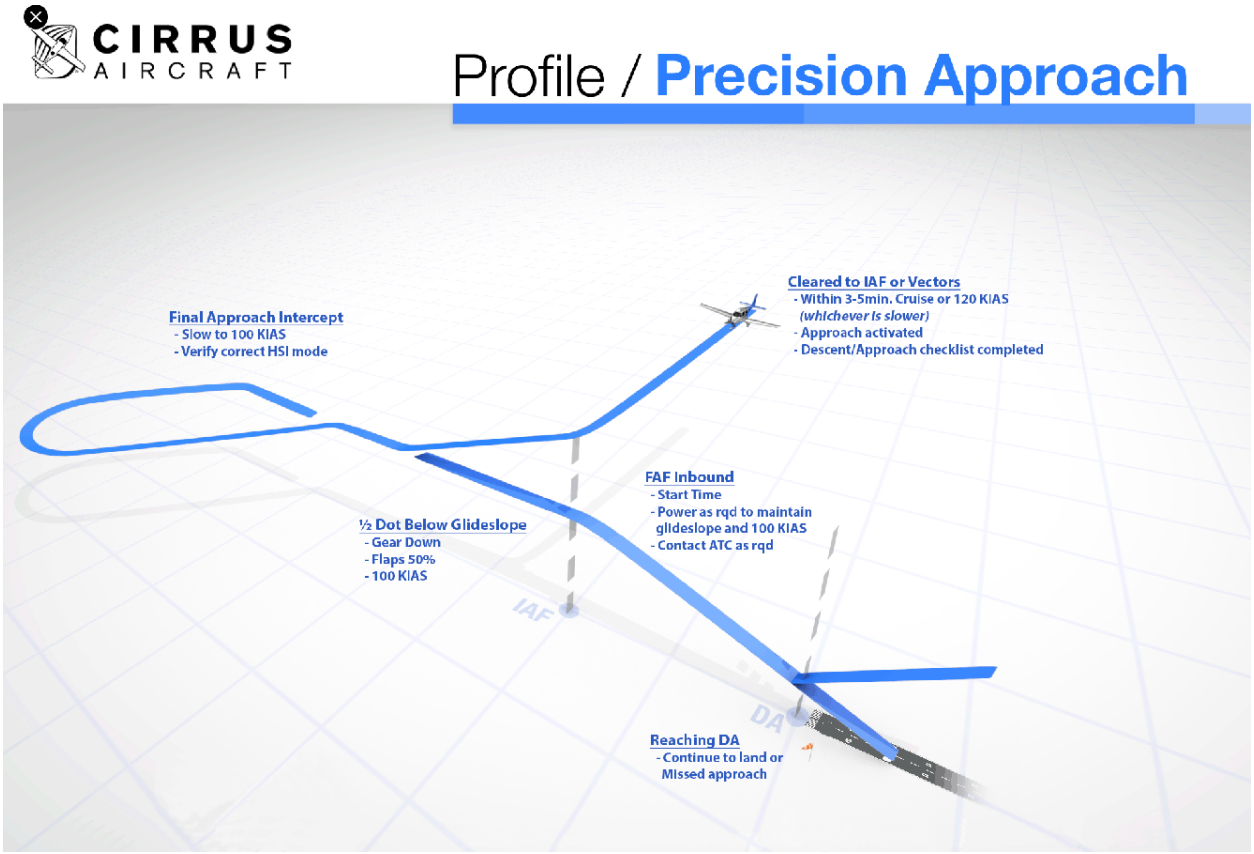


Figure 8.9.19 – SR-20 Precision Approach Profile *Source: Cirrus iFOM, edited for Purdue procedures*

SR-20 – high speed:

A. Cleared to IAF or Vectors: maintain cruise power in descent. Verify the approach in the GPS had been activated. The descent/approach checklist should have been completed. If already cleared and using autopilot, verify the approach mode is active.
B. When turning onto the final approach course inbound, maintain 140-150 KIAS and verify the HSI is set in the proper mode.
C. Intercept and maintain glideslope/glidepath in clean configuration. Use power as required to maintain 140-150 KIAS while continuing to maintain the localizer/final approach path.
D. At the FAF inbound, start timer and contact ATC as required.
E. At 1.5-2 nm from the runway, smoothly pull power to idle
F. Maintain glideslope/glidepath with pitch
G. Deploy 50% and 100% flaps on max speed schedule
H. Maintain normal final approach speed
I. Reaching the DA, continue with a stabilized descent to a landing or begin the missed approach as required.

PA-28R-201:

A. Cleared to IAF or Vectors: maintain cruise. Verify the approach in the GPS had been activated. The descent/approach checklist should have been completed.
B. When turning onto the final approach course inbound, slow to 90 KIAS and verify the HSI is set in the proper mode.
C. At glideslope/glidepath intercept, extend the gear and the first notch of flaps.
D. Maintain the glideslope/glidepath. Use power as required to maintain 90 KIAS while continuing to maintain the localizer/final approach path.
E. At the FAF inbound, start timer and contact ATC as required.
F. Reaching the DA, continue with a stabilized descent to a landing or begin the missed approach as required.

NON-PRECISION APPROACHES

SR-20:

A. Cleared to IAF or Vectors: within 3-5min. maintain cruise (training cruise) or slow to 120 KIAS (65% power cruise). Verify the approach in the GPS had been activated. The descent/approach checklist should have been completed. If already cleared and using autopilot, verify the approach mode is active.
B. When turning onto the final approach course inbound, slow to 100 KIAS and verify the HSI is set in the proper mode.
C. At the FAF inbound, start timer, extend simulated gear and 50% flaps, begin stabilized descent to MDA at 100 KIAS, and contact ATC as required. Maintain the final approach course.
D. Reaching the MDA, level off and use power as required to maintain 100 KIAS
E. If runway in sight and past the VDP (if applicable) continue a stabilized descent to a landing or start a circle as required.
F. If runway not in sight, continue to the MAP and begin the missed approach

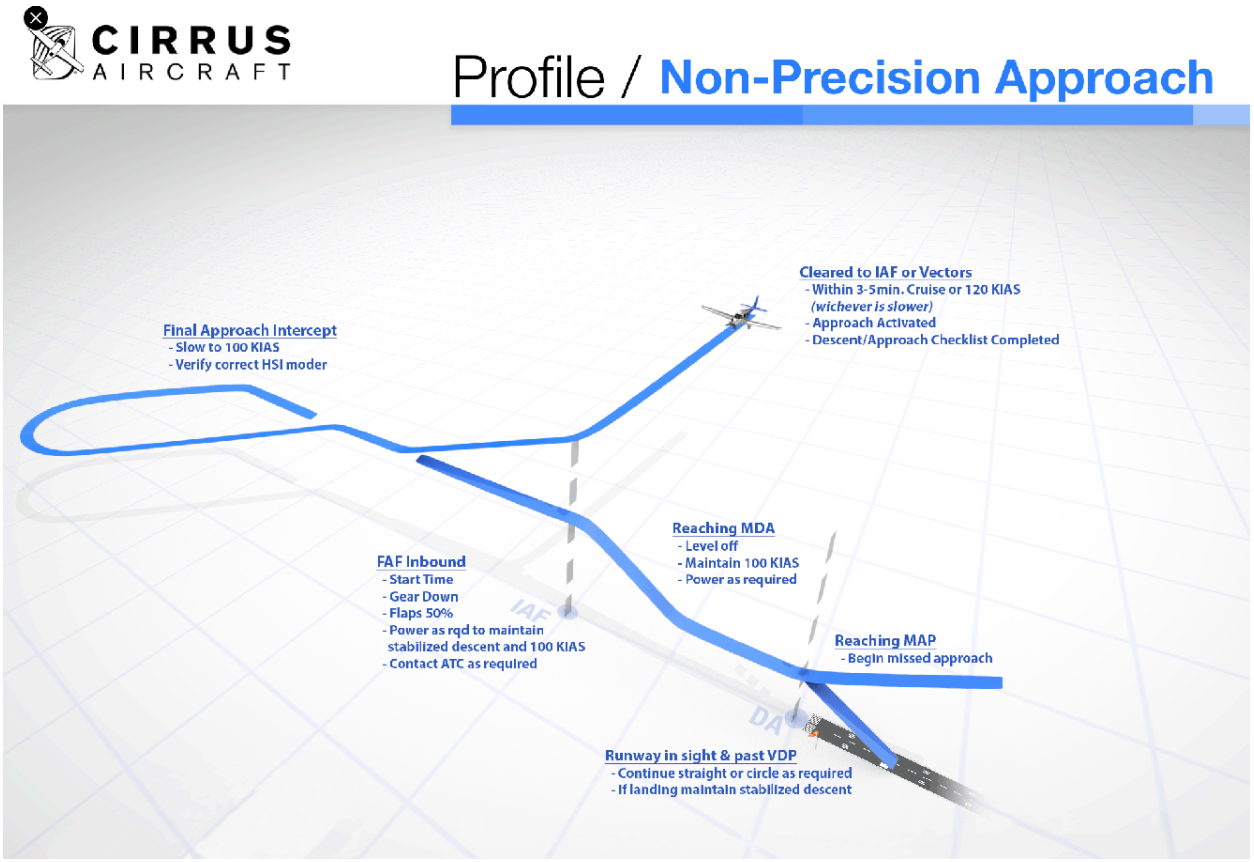


Figure 8.9.20 – SR-20 Non-Precision Approach Profile *Source: Cirrus iFOM, edited for Purdue procedures*

PA-28R-201:

A. Cleared to IAF or Vectors: maintain cruise. Verify the approach in the GPS had been activated. The descent/approach checklist should have been completed.
B. When turning onto the final approach course inbound, slow to 90 KIAS and verify the HSI is set in the proper mode.
C. At the FAF inbound, start timer, extend gear and 1 notch of flaps, begin a stabilized descent to the MDA, and contact ATC as required. Maintain the final approach course.
D. Reaching the MDA, level off and use power as required to maintain 90 KIAS.
E. If runway in sight and past the VDP (if applicable) continue a stabilized descent to a landing or start a circle as required.
F. If runway not in sight, continue to the MAP and begin the missed approach.

MISSED APPROACH / BALKED LANDING

SR-20:

A. Smoothly Apply full power, hit TOGA button (if available), pitch for and maintain 83 or 96 KIAS, as required. Verify flaps at 50%. Keep autopilot engaged or disconnect as required.
B. Turn as required.
C. Retract remaining flaps when obstacles cleared or 200’ AGL as required.

D. Set and prioritize navigational equipment, and follow ATC instructions as required.
    a. If following published missed, verify GPS FPL cycled to missed approach guidance.
    b. If proceeding to next IAF, activate procedure in GPS
E. Maintain proper climb speed as required to assigned altitude.

PA-28R-201:

A. Prop full forward and smoothly apply full power
B. Establish climb attitude at V_X (72 KIAS) or V_Y (78 KIAS) as required
C. Verify flaps at 25°
D. Turn as required
E. Gear up with a positive rate of climb
F. Maintain V_X (78 KIAS) or V_Y (90 KIAS) as required
G. Retract remaining flaps when obstacles cleared or 200’ AGL as required
H. Set and prioritize navigational equipment, and follow ATC instructions as required.
    a. If following published missed, verify GPS cycled to missed approach guidance.
    b. If proceeding to next IAF, activate procedure in GPS
I. Maintain proper climb speed as required to assigned altitude.

Weekly Quizzes

Objective:
The goal of the Aviation Technology department is to develop Aviation Professionals in every sense of the word. This includes, but is not limited to, instilling the knowledge required to succeed in the aviation industry. Therefore the flight department is requiring each flight student to complete a series of weekly quizzes covering various subject matter throughout the semester.

Format:
The quizzes will be delivered utilizing Blackboard. To access Blackboard, go to www.purdue.edu and click on the Blackboard link on the bottom of the page. Use your career account information to log in. Each quiz will consist of 10 questions selected from the Purdue University Study Guide, which can be found in the Student Flight Handbook. There are 13 total quizzes and the total quiz score will be transferred to the Aeronautical Knowledge portion for the flight grade in the respective flight course (Highest grade possible is a 5.0). The quizzes will be available each week from midnight on Monday until 2359 on Sunday. Failure to take a quiz due to any reason will result in a score of 0 for that particular quiz. **No opportunity to make-up the quiz will be given except in extreme extenuating circumstances.** However, the lowest quiz score will be dropped.

The quizzes are as follows:

Quiz 1. Operations Manual
Quiz 2. Weather
Quiz 3. Aircraft Limitations
Quiz 4. NOTAMS
Quiz 5. Emergency Procedures / Light Gun Signals
Quiz 6. Aircraft Systems / Instruments
Quiz 7. Weight and Balance / Performance
Quiz 8. Pilot Airworthiness
Quiz 9. Aircraft Airworthiness
Quiz 10. National Airspace System
Quiz 11. Aeromedical Factors
Quiz 12. Aerodynamics
Quiz 13. Cross Country Planning

This Page Intentionally Left Blank