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Record of Revision Changes

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Original	June 05, 2011	Original certification of entire TCO	1-85
Revision 1	October 01, 2011	Corrections and updates	1,2,7,9,11,14,16,70, 84,,85
Revision 2	February 15, 2012	Entire Manual Update	1-111
Revision 3	October 15, 2012	Merged Ground & Flight TCO's	1-131
Revision 4	April 30, 2013		1-8,10, 12,14,15,16, 24, 44 45,46,49,50,52,53,55 -133
Revision 5	December 01, 2013	Added flight lesson completion record pg 114, and some typo corrections	1,2,3,6,7,8,10,11,12,13,14,15, 16,19,20,25-45, 48,63,68,76,85, 89, 90,92,96,107,108,111,112, 114-129
Revision 6	November 17, 2014	Chief Flight Instructor change	1,2,3,8,19
Revision 7	December 21, 2015	Rewrite of Flight TCO	1-12,15-21,24,44-133

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Commercial Pilot – Airplane Multi-Engine Land

1. North Star Aviation, Inc. located at Mankato Regional Airport, Mankato, Minnesota is owned and operated as:
North Star Aviation, Inc.
3030 Airport Road North
Mankato, Minnesota 56001

2. **COURSE TITLE:** Commercial Pilot – Airplane Multi-Engine Land

3. This TCO meets all of the curriculum requirements for the Commercial Rating Certification Course contained in appendix D of 14 CFR Part 141. The curriculum contents are intended to parallel the FAA Commercial Rating Airplane Practical Test Standards (PTS).

4. The training syllabus herein contains a separate ground training course and a flight training course which can be taught concurrently or separately. Separately is for the situation where the student is able to only participate in the ground school and is not able to fly. In this situation the student can complete the ground school and successfully pass the FAA knowledge test and that would be then acceptable for 24 calendar months from the time the knowledge test is completed. They may then begin the flight portion anytime and as long as they complete the flight portion prior to the knowledge test expiration credit for the ground school will be given.

5. **COURSE OBJECTIVE:** The student will obtain the knowledge, skill and aeronautical experience necessary to meet the requirements for a Commercial Airplane Category with a Multi-Engine Land Class Rating.

6. **COMPLETION STANDARD:** The student must demonstrate through written tests, practical tests, and through appropriate records that he/she meets the knowledge, skill and experience requirements necessary to obtain a Commercial Rating with an airplane category rating. Each student should satisfactorily complete at least one stage of training within 100 days or the Chief Flight Instructor may terminate you from the program. Students that are inactive for more than 180 days may be terminated from the course.

7. **GROUND INSTRUCTIONAL FACILITIES:** Ground instruction facilities are located at North Star Aviation, Inc. in the Terminal Building at Mankato Regional Airport, and Armstrong Hall at Minnesota State University Mankato Campus.

A. The training space at North Star Aviation Inc. in the terminal building at Mankato Regional Airport consists of the student briefing area is 36' by 46' and consists of instructor cubicles with tables, 36" x 36" dry erase boards, aeronautical charts, including the current FAR AIM. North Star Aviation, Inc. has the following resources available to the students; a Garmin 430/530 computer based simulator, Garmin 500 computer based simulator, Poster of Aircraft Instrument panel, Bicycle wheel, model airplane, instrument gauges, computer, monitor, and keyboard. North Star Aviation, Inc. also has a conference room that is 30' x 24' available for class room training and consists of a VCR player, DVD player, TV, Overhead projector, Grease Board, HP 61-110 projector and extendable projection screen. The room has nine 5 foot tables with each table able to handle two students. The space in the room can handle up to 12 tables and 24 students. (Diagram 1, Appendix A)

B. The training Rooms in Armstrong Hall at Minnesota State University Mankato Campus rooms consists of a Sharp Data Projector, Crestron Control System, Elmo Document Camera, Sony DVD/VCR Combo, Laptop Hookup, and a dry erase board or chalk board. (See Floor Plans in Diagram 2, 3 & 4, Appendix A)The room numbers, square footage and corresponding capacities are listed below:

<u>ROOM</u>	<u>STUDENT CAPACITY</u>	<u>ROOM SQUARE FOOTAGE</u>
Room 302	33	503
Room 303	36	669
Room 304	43	674
Room 305	48	762
Room 306	58	881
Room 308	42	644
Room 309	40	733

North Star Aviation Inc.

Commercial Pilot - Airplane Multi-Engine Land

Room 310	32	501
Room 311	41	653
Room 314	40	764
Room 315	34	671
Room 316	44	664
Room 317	30	501
Room 319	33	500
Room 320	32	665
Room 321	38	671
Room 322	35	765
Room 323	58	881
Room 325	30	502
Room 326	25	502
Room 327	26	528
Room 330	43	882
Room 331	30	740
Room 332	10	673
Room 333	30	669
Room 334	33	501
Room 202	33	504
Room 203	27	665
Room 204	27	670
Room 205	40	761
Room 208	40	650
Room 209	36	741
Room 211	42	650
Room 213	55	882
Room 214	50	761
Room 215	38	581
Room 216	40	763
Room 217	33	503
Room 219	33	505
Room 220	40	761
Room 221	28	581
Room 222	50	770
Room 225	30	522
Room 231	50	762
Room 232	44	668
Room 233	42	668
Room 101	161	1539
Room 102	112	1282
Room 123	42	633

C. The training rooms at both locations are well lighted and the temperature is thermostatically controlled. Each room is well ventilated and conforms to the city of Mankato building, sanitation and health codes. The rooms are designed and located so that students will not be distracted by instruction conducted in the other rooms or by flight and maintenance operations at the airport.

8. AIRPORT: Mankato Regional Airport is the main operations base for training in this course. All flight training originates from this airport. Mankato Regional Airport has hard surfaced runways and meets the requirements of 14 CFR Part 141.38 of the FAR's for day and night flight operations. The airport has fuel services available for North Star Aviation customers from Monday through Friday 0700 – 1800, and Saturday and Sunday 0700 through 1700 local. Maintenance is available Monday through Friday 0700 – 1700. The Waseca airport (KACQ) will be used as an alternative student pilot solo takeoff and landing practice area after an initial solo flight has been accomplished at the Mankato airport (KMKT) as needed. This will be used on an on demand basis with no more than 1 student pilot assigned to the Waseca airport for solo takeoff and landings. The student Pilot will receive a log book endorsement for repeated solo cross country after having flown to and from each airport. Procedures to get to and from Waseca airport in (ALPHA) designated practice area and other practice areas can be reviewed in the KMKT Practice Areas in **Appendix A – Diagram 8**. Private pilot rated students will use the Fairbault airport (KFBL), Owatonna airport (KOWA) and New Ulm airport (KULM) during periods of high student pilot solo takeoff and landing activity.

9. AIRPORT FACILITIES: The Mankato Regional Airport is equipped with two flight briefing areas. These areas are located in the airport's terminal. Both briefing areas are equipped with Televent DTN and a telephone is also available with the number posted on how to dial the Minneapolis Automated Flight Service Station (AFSS). These facilities are used by students and regular customers of North Star Aviation. The student briefing area is 36' by 46' and consists of instructor cubicles with tables, dry erase boards, aeronautical charts, including the current FAR AIM. North Star Aviation, Inc. also has a conference room that is 30' x 24' available for class room training and consists of a VCR player, DVD player, TV, Overhead projector, Grease Board, HP 61-110 projector and extendable projection screen. The room has nine 5 foot tables with each table able to handle two students. The space in the room can handle up to 12 tables and 24 students. The facilities are used exclusively by students, air taxi pilots, aircraft salesmen, transient pilots, and regular customers of North Star Aviation, Inc. The local practice areas are shown and described on a detailed chart posted on the wall in the dispatch area. A safety information board is maintained on the wall next to dispatch and a monitor can be viewed by students at the dispatch area with continuous updated KMKT local airport weather

10. SIMULATION TRAINING: Two **Redbird FMX 1000 Advanced Aviation Training Devices (AATD)** will be used for simulation training. They are both located in one room that is 30' x 24' with two 36' x 36" dry erase boards on the walls. The Redbird FMX 1000 features an electric motion platform, fully enclosed cockpit, wrap around exterior visuals, quick change cockpit configurations for single and multi-engine, traditional and glass cockpit, center and left side control, compatible with headset, defined mission compatible with scenario based training, complete terrain and airport database, instructor station inside cockpit, and standard 110 power source. Each simulator is equipped with a Garmin 430 and a Garmin 530 avionics package. A copy of FAA letter of authorization can be found in **Appendix A – Diagram 5**. The Redbird FMX 1000 AATD may be used on lessons **#4, #10, #38, #43, #48, #51, #52 and #62** and as needed for any repeated aircraft Flight lesson. Flight Trainer lessons **#4, #10, #48, #51, and #52** will not be flown in an aircraft and aircraft flight lessons will not be flown in a Flight Trainer.

11. AIRCRAFT: The PA-28 Fixed gear airplane can be used for training in flight stages 1 and 2. The PA-44-180 can be used for flight training in stage 3. The aircraft will meet the requirements of 14 CFR Part 141.39. Radio equipment will consist of at least one 360 channel transceiver and at least one VOR navigational receiver and a 4096 code transponder with Mode C capability. The PA-28, PA-44-180 airplanes are equipped for day and night VFR and IFR flying as specified in 14 CFR Part 91.205 (a) (b) (c) (d).

12. CHIEF FLIGHT INSTRUCTOR: The Chief Flight Instructor shall meet 14 CFR Part 141.35 requirements and hold at least a Commercial Pilot Certificate in a Single and Multi -Engine Airplane. The Chief Flight Instructor must be the holder of a flight instructor certificate with an airplane category rating with a single-engine and multi-engine class rating and an instrument airplane rating. The Chief Ground Instructor will also hold an Advanced Ground Instructor rating and an Instrument Ground Instructor rating. Duties: Conduct initial and annual qualification checks of flight instructors, document all delegations of duties, certification of training records, graduation certificates, stage and final test reports, stage and final test recommendations as to pass or recommendations for additional training. The Chief Flight Instructor will be available for consultation if not in the office by cell phone, telephone, email and/ or text. The Chief Flight Instructor will maintain overall responsibility to improve and documentation of flight school training program.

13. ASSISTANT CHIEF FLIGHT INSTRUCTOR(S): The Assistant Chief Flight Instructor(s) will meet the 14 CFR Part 141.36 requirements and hold at least a Commercial Pilot Certificate in a single engine and multi-engine airplane. The Assistant Chief Flight Instructor must be the holder of a flight instructor certificate with an airplane category rating with a single-engine and multi-engine class rating and an instrument airplane rating. Delegated Duties: Conduct initial and annual qualification checks of flight instructors, stage and final test recommendations as to pass or recommendations for additional training. The Assistant Chief Instructor will also help review certification of training records, graduation certificates, stage and final test reports. The Assistant Chief Flight Instructors will be available for consultation if not in the office by cell phone, telephone, email and / or text.

14. SENIOR CHECK INSTRUCTORS: Each Senior Check Instructor will meet the requirements of a Check Instructor. Each Senior Check Instructors training file will note the approved courses they may perform student stage checks, end of course tests, and instructor proficiency checks.

15. CHECK INSTRUCTORS: Each Check Instructor under 14 CFR Part 141.37 must be the holder of at least a Commercial Pilot Certificate in a single-engine and multi-engine airplane. The Check Instructor must be the holder of a flight instructor certificate with an airplane category rating with a single-engine and multi-engine class rating and an instrument airplane rating. Each Check Instructors training file will note the approved courses they may perform student stage checks and end of course tests.

16. FLIGHT INSTRUCTORS: Each Flight Instructor assigned to this course must be the holder of at least a commercial pilot certificate in a single-engine and multi-engine airplane. The instructor must be the holder of a flight instructor certificate with an airplane category rating with a single-engine and multi-engine class rating and an instrument airplane rating. Perform course training as specified in Syllabus and document training in student training record.

17. CHIEF GROUND INSTRUCTOR: The Chief Ground Instructor for the Private Pilot Ground School Course, Instrument Pilot Ground School Course, Commercial Pilot Ground School Course will meet the requirements of 14 CFR Part 141.35 (e) .

18. GROUND INSTRUCTORS: The ground instructors for this course will meet the requirements under 14 CFR Part 141.81, holding either an Advanced Ground Instructor or Certified Flight Instructor rating to teach the Private Pilot and Commercial Pilot ground course. For ground instruction for the Instrument rating the ground instructor will hold an Instrument Ground Instructor or Certified Flight Instructor Instrument Airplane rating. Duties: Train according to the course syllabus and document training in each student's ground school training record.

The Minnesota State University ground instructors will document ground instruction of each student attending a class. This will be accomplished electronically or by an attendance roster completed by each faculty ground instructor of each student's attendance in class. Should a student fail to attend a class, the session must be made up by either a Minnesota State University ground instructor or a North Star Aviation, Inc. ground instructor. Each class attendance roster during a week will be emailed, faxed or delivered by the following Monday to the Chief Flight Instructor or the Assistant Chief Flight Instructor for entry into the students ground school training record for the following courses:

- Private Pilot Ground School Course
- Instrument Pilot Ground School Course
- Commercial Pilot Ground School Course

19. **Dispatcher:** A Dispatcher may release training flights. The dispatcher will be given training on how to enter aircraft information, student information, review student flight log books for appropriate endorsements if necessary, review currency, print dispatch release, and required pilot documents. Training will be documented in each dispatchers training file. The dispatcher will understand maintenance due dates and help coordinate with maintenance inspections coming due with aircraft availability. The dispatcher will help document weekly student attendance and flight training records as necessary and directed by the Chief Flight Instructor.

20. **Ground Course Testing:** The following ground training courses:

- o Private Pilot Ground School Course
- o Instrument Pilot Ground School Course
- o Commercial Pilot Ground School Course

Ground Instructor will have at least one Stage exam at the end of each Ground training Stage. The exam will be instructor created and will represent the content that was covered within the stage. The method of testing should represent a method of testing that is currently in practice for the FAA knowledge test, however, it is not limited to that method.

21. **Additional Required Flight Training:** Additional flight training if needed may be performed in the Redbird FMX 1000 Advanced Aviation Training Devices (AATD).

22. **The following reference books and reference materials may be used in this course:**

AIM	Aeronautical Information Manual	AC 60-22	Aeronautical Decision Making
FAR's	Federal Aviation Regulations	AC 61-65E	Certification: Pilots and flight Instructors
FAR's	Federal Aviation Regulations EXPLAINED by Kent Jackson	AC 61-84	Role of Preflight Preparation
NTSB 830	Notification & Reporting of Aircraft Accidents & Incidents	AC 61-107A	Operation of Aircraft at altitudes Above 25,000 feet and/or Mach Numbers (Mmo) Greater than .75
FAA-H-8083-25A	Pilot's Handbook of Aeronautical Knowledge	AC 120-12	Private carriage Versus Common Carriage of Persons or Property.
FAA-H-8083-1A	Aircraft Weight and Balance Handbook	AC 120-51	Crew Resource Management Training
FAA-H 8083-6	Advanced Avionics Handbook	AC 00-54	Pilots Windshear Guide
FAA-H-8083-15A	Instrument Flying Handbook	AC 00-24B	Thunderstorms
FAA-H-8083-19A	Plane Sense	AC 20-73A	Aircraft Ice Protection
FAA-H-8261-1A	Instrument Procedures Handbook	AC 90-48C	Pilot's Role in Collision Avoidance
AC 00-6	Aviation Weather	AC 90-23E	Aircraft Wake Turbulence
AC 00-45G	Aviation Weather Services	AC 61-67	Stall and Spin Awareness Training
AC 90-66A	Recommended Standard Traffic Patterns and Practices for Aeronautical Operations at Airports without Operating Control Towers		
AC 91-51A	Effect of Icing on Aircraft Control and Airplane Deice and Anti-ice Systems		
AC 91-67	Minimum Equipment for General Aviation Operations under FAR Part 91		
POH / AFM	Pilot Operating Handbooks / Aircraft Flight Manuals (Various Manufactures)		
FAA Airport Facility Directory			
Commercial Pilot Practical Test Oral Study Guide instructor version with answers & explanations – by June Bonesteel			
Flight Instructor ASEL Practical Test Oral Study Guide instructor version with answers & explanations – by June Bonesteel			
Volume 1, 2 & 3			
Jeppesen Commercial / Instrument Pilot Book			
Jeppesen Instrument / Commercial DVD Course			
Jeppesen Instrument /Commercial Image CD ROM Software			
Gleim Commercial Pilot Written Test Bank			
FAA Commercial Pilot Practical Test Standards			
North Star Aviation, Inc. Commercial Pilot printed or power point standardized training presentation			
The Garmin GNS 430 A Pilot Friendly Manual by Jon Dittner			
U.S. Terminal Procedures Approach Charts and Enroute Charts			
Jeppesen Terminal Procedures Charts and Enroute Charts			

Everything Explained for Professional Pilots by Richie Lengel

Aircraft Systems For Pilots by Dale De Remer, Phd

ASA Commercial Pilot Oral Exam Guide

North Star Aviation, Inc. Commercial Rating Airplane printed or power point standardized Flight training presentation

North Star Aviation, Inc. Standard Operating Procedures Piper Warrior III PA-28-181

North Star Aviation, Inc. Standard Operating Procedures Piper Aircraft Seminole PA-44-180

VTS, Inc. VTS Training Systems Piper Warrior and Piper Seminole aircraft systems training software

Garmin’s 400 and 500 Series online flight simulator

Garmin’s 400W and 500W Series downloadable flight simulator

Jeppesen’s Garmin 430 and Garmin 530 Training Software

Garmin’s 500 Series downloadable flight simulator

Garmin’s G1000 Downloadable Simulator

Garmin’s G1000 Training program

In addition, at the discretion of the instructor, they may refer to any supplemental source of information (Advisory Circulars and other FAA publications) in order to increase the quality of the training along with NASA training videos, FAA Safety Videos and internet based AOPA Air Safety Foundation web based safety training may be used.

23. Flight Lesson Grading

S	Task accomplished meets lesson completion standards
I	Incomplete needs additional training
PC	Previously Completed.
NP	Not Performed

- For a lesson to be Completed all items on that lesson must be signed off with an “S”
- When a lesson is flown a second or more times to complete, any items that were completed on previous flights of that lesson shall be marked with PC indicating that the item was previously completed.
- In the case where items were not trained or not performed on that flight the instructor will mark those items with “NP” indicating not performed. These “NP” items must be marked with an “S” on Subsequent flights to complete the lesson.
- In the event a student receives a “I” (Incomplete & Needs Additional Training) in a lesson.
 1. For a lesson to be completed all items on the lesson must have been graded with an “S”.
 2. The instructor must give additional ground or flight training in the area an “I” was given, on the next training session for that lesson.
 3. The additional training will be documented by dispatching the lesson again and only the items that were graded with “I” shall be flown on that lesson all other items will be marked PC. Place an “S” in the box if completion standards are met or another “I”. If an “I” is given the lesson will remain open until all items on the lesson meet the completion standards. If the lesson items need to be flown more than 2 times the lesson must reviewed with the Chief Flight Instructor or Assistant Chief Flight Instructor before further flights are conducted. Once an “S” mark is received in all items of the lesson the lesson will then be complete.
 4. Students may not progress to the next lesson until the lesson is completed
 5. If an item on the lesson is marked with and NP the lesson will remain open until all items on the lesson have been graded with an “S”.
 6. Lessons with items that are labeled “if aircraft equipped” may be graded “NP” in the case where the aircraft of Flight trainer are not equipped to perform the procedure. In this case the lesson will be considered complete with only those items graded “NP”.

24. Enrollment

As required in 14 CFR Part 141.93 (a) a copy will be defined as: A written copy, emailed copy, an electronic copy in a PDF format that may be distributed to the student through a central download site or delivered through an electronic means.

25. Graduation

The Chief Flight Instructor may reduce flight training and ground training requirements of this training course outline provided, FAR 141 Appendix D Commercial Rating Course requirements have been complied with, and the exception is documented in the students file. Reductions are only allowed for areas where this Training Course Outline exceeds the requirements of 14 CFR Part 141 Appendix D.

26. Documentation of student flight time

Effective January 1, 2015, all students enrolling in a certification course will have their records maintained electronically in the North Star Aviation electronic training record system. The electronic format will also require an electronic backup file of the training data. All lessons in the electronic system will reflect the TCO presented here and all flights will be tracked to the corresponding lesson flown. Each lesson will be electronically signed by the Student and Instructor who conducted the lesson. Each time a lesson is flown it will be individually dispatched to show exactly what was taught. Each flight will follow the grading system described in item 23 above.

27. Performing Lessons out of order

While flight lessons in this TCO are intended to be conducted in sequence, lesson sets 6-8, 11-13, and 15-17, are allowed to be conducted in any order within each set. It is permissible to perform the solo flights out of order in Stage 2, as long as the dual lesson covering the lesson objective for the solo lesson is completed prior. In Stage 3, all lessons must be conducted in order, however, for those lessons that are combined (per the lesson objective) the lessons may be conducted in any sequence.

28. Training conditions that lessons are conducted under

In Stage 1 or Stage 3 all cross country lessons may be conducted in either Day or Night time conditions unless specifically noted in the lesson of the type of conditions to be flown. The flight lessons that specify conditions and are noted on the flight lesson layout table are: 2, 6, 18, 46, 47, 56, 57 these lessons must be flown as specified in the lesson.

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FLIGHT TRAINING SYLLABUS DESIGN

The flight training syllabus is divided into **three** stages, each providing an important segment of pilot training. Each stage builds on previous learning and, therefore, should be completed in sequence. However, to provide a degree of flexibility for adapting to individual student needs and the training environment, the syllabus lessons may be altered with approval of the chief flight instructor. Any deviation should not disturb the course continuity or objective. The following discussion presents a description of the primary areas of study in each stage.

(a) Flight Stage I

Flight Stage I of the syllabus is designed to provide the student with a basic foundation in normal airplane single-engine land operations to include night flying and VFR Navigation.

In addition, the applicant will increase his/her proficiency by performing IFR dual and solo flights in the airplane single-engine land.

The Chief Flight Instructor, assistant Chief Flight Instructor, Senior Check Instructor or a Check Instructor will check the student's proficiency and knowledge during the Flight Stage Check 1 in Flight lesson # 20, and further review may be pursued as necessary.

(b) Flight Stage II

Flight Stage II of the syllabus builds upon the skill and knowledge acquired in Stage I.

In this stage, the student will learn new commercial maneuvers and increase his/her proficiency to a level, which is appropriate for the Commercial Pilot Certificate.

The Chief Flight Instructor, Assistant Chief Flight Instructor, or Check Instructor will check the student's proficiency and knowledge during Stage 2, flight lesson #37, after completing flight stage 2 training.

(c) Flight Stage III

Stage III of the syllabus provides the skill and knowledge required to operate the multi-engine airplane in both VFR and IFR conditions at a level that meets or even exceeds the proficiency requirements set forth by the current Commercial Pilot Practical Test Standards.

The Chief Flight Instructor or Assistant Chief Flight Instructor or Check Instructor will check the student's proficiency and knowledge during Flight Stage Check 3 in Flight lesson #67, and further review may be pursued as necessary.

The flight training portions of the **Commercial Pilot –Airplane Multi-Engine Land** are completed in Flight Stage III when the student has successfully passed the Final Stage Exam / End-of-Course Check.

(d) Preflight Orientation

Prior to each dual flight, the instructor must provide the student with an overview of the subject matter to be covered during the lesson. It is important that the instructor defines unfamiliar terms, explain the maneuvers and objectives of each lesson, and discuss human factors concepts related to each lesson.

Each Flight Lesson contains Preflight Discussion information, which is intended to provide a basis for the instructor's preflight overview. This overview should be flexible; these are only suggested topics. Every item does not need to be covered. The preflight orientation should be tailored to the specific flight, the local environment, and especially for the benefit of the individual student.

(e) Airplane Practice

Airplane practice must be conducted so that the student obtains the maximum benefit from each flight. Each flight should begin with a review of previously learned maneuvers before any new maneuvers are introduced.

Prior to each flight, the instructor should carefully instruct the student in the maneuvers to be performed during the flight and what is to be accomplished. This guidance will ensure that student receives maximum benefit from the flight.

(f) Post-Flight Evaluation

The post-flight evaluation is at least as important as the preflight orientation. During each post-flight session, the student must be debriefed thoroughly. Noticeable advancement should be apparent and recommendations should be made for improvement, where appropriate. This action is a valuable instructional technique because it increases retention and, to some degree, prepares the student for the next lesson.

As a guide, a minimum amount of ground instruction is recommended for preflight and post-flight briefings combined on each lesson. If necessary, additional time should be allotted.

(g) Student Stage Checks

Stage checks measure the student's accomplishments during each stage of training. The conduct of each stage check is the responsibility of the chief flight instructor. However, the chief flight instructor may delegate authority for conducting stage checks / end-of-course tests to the Assistant Chief Flight Instructor or to the designated Check Instructor. This procedure provides close supervision of training and may provide another opinion on the student's progress. The stage check also gives the Chief Flight Instructor an opportunity to check the effectiveness of the instructors.

An examination of the building-block theory of learning will show that it is extremely important for progress and proficiency to be satisfactory before the student enters a new stage of training. Therefore, the next stage should not begin until the student successfully completes the stage check. Failure to follow this progression may defeat the purpose of the stage check and degrade the overall effectiveness of the course.

FLIGHT LESSON LAYOUT

DUAL	SOLO	CROSS COUNTRY	CROSS COUNTRY NIGHT	FLIGHT TRAINER	DAY	NIGHT	INSTR	ME COMPLEX	SE	PRE/POST
78	42	65	9.0	12	2	13	31.7	38	70	50.7

LESSON	TOTAL TIME	DUAL	SOLO	CROSS COUNTRY	CROSS COUNTRY NIGHT	FLIGHT TRAINER	DAY	NIGHT	INSTR	ME COMPLEX	SE	PRE/POST
1												4.0
2	4.0	4.0		4.0	0.0			2.0			4.0	0.5
3												3.0
4	1.6	1.6				1.6			1.6			0.5
5	3.0	3.0		3.0					2.5		3.0	0.5
6	3.0		3.0	3.0				2.0			3.0	0.3
7	3.0		3.0	3.0					0.0		3.0	0.3
8	3.0		3.0	3.0					0.0		3.0	0.3
9	4.0	4.0		4.0					3.3		4.0	0.5
10	1.6	1.6		0.0		1.6			1.6			0.5
11	3.0		3.0	3.0							3.0	0.3
12	3.0	3.0		3.0					2.0		3.0	0.5
13	3.0		3.0	3.0							3.0	0.3
14	4.0	4.0		4.0					3.0		4.0	0.5
15	3.0		3.0	3.0							3.0	0.3
16	3.0		3.0	3.0							3.0	0.3
17	4.0		4.0	4.0							4.0	0.3
18	2.0		2.0	2.0	2.0			2.0			2.0	0.3
19	3.0	3.0		3.0					2.0		3.0	0.5
20	2.0	2.0							1.0		2.0	1.0
Stage 1 Totals	53.2	26.2	27.0	48.0	2.0	3.2	0.0	6.0	17	0.0	50.0	14.7

FLIGHT LESSON LAYOUT

21												1
22	1.5	1.5									1.5	0.5
23	1.5	1.5									1.5	0.5
24	0		0								0	1
25	1.5	1.5									1.5	0.5
26	1.6		1.6								1.6	0
27	1.5	1.5									1.5	0.5
28	1.5	1.5									1.5	0.5
29	1.6		1.6								1.6	0
30	1.5	1.5	0								1.5	0.5
31	1.8	0	1.8								1.8	0
32	1.5	1.5	0								1.5	0.5
33	1.5	1.5	0								1.5	0.5
34	1.5	1.5									1.5	0.5
35	0		0								0	1
36	1.5	1.5	0								1.5	1
Stage 2 Totals	20	15	5	0	0	0	0	0	0	0	20	8.5
<hr/>												
37	0											2
38	1.5	1.5				1.5			1.5			0.5
39	0	0							0	0		2
40	1.5	1.5								1.5		0.5
41	1.5	1.5				0			0	1.5		0.5
42	0	0								0		2
43	1.5	1.5				1.5		0	0	0		0.5
44	1.5	1.5	0	0			0			1.5		0.5
45	0	0			0			0		0		2
46	2	2		2			2			2		0.5
47	2	2		2	2	0	0	2		2		0.5

FLIGHT LESSON LAYOUT

Commercial Pilot - Airplane Multi-Engine Land

48	1.5	1.5		0	0	1.5		0	1.5	0		0.5
49	0	0		0				0	0	0		2
50	1.5	1.5	0	0					1.3	1.5		0.5
51	1.5	1.5	0			1.5		0	1.5	0		0.5
52	1.5	1.5	0			1.5		0	1.5	0		0.5
53	4	4		4					2	4		0.5
54	4	4		4					2	4		0.5
55	5	0	*5	5						5		0.5
56	2.5	0	*2.5	0	2.5			2.5	0	2.5		0.5
57	2.5	0	*2.5		2.5			2.5	0	2.5		0.5
58	0	0							0	0		2
59	1.5	1.5								1.5		0.5
60	1.5	1.5								1.5		0.5
61	1.5	1.5				0			1.3	1.5		0.5
62	1.3	1.3				1.3			1.3	0		0.5
63	1.5	1.5							0.2	1.5		.5
64												2
65	2	2							0.3	2		0.5
66	2	2							0.3	2		2.5
Stage 3 Totals	46.8	36.8	*10	17	7.0	8.8	2	7	14.7	38	0	27.5
Total	120	78	42	65	9	**12	****2	****13	31.7	38	70	***50.7

*Student performing duties of PIC under the Supervision of authorized instructor.

** (AATD) Flight Trainer credited towards instrument instruction per Redbird FMX 1000 FAA authorization letter in Appendix A - Diagram 5. The maximum allowable flight trainer time in this course per this authorization letter is 24 hours.

***Pre & Post ground briefing in the flight training program are recommended amounts of time and may be less than 51.7 total hours.

****Night vs Day time only the lessons that are required to be accomplished in specified conditions are noted on this table. All other flights are at the Instructor's discretion.

STAGE III

MULTI-ENGINE COMMERCIAL MANEUVERS AND OPERATIONS

46.8 HOURS TOTAL FLIGHT TRAINING:

STAGE OBJECTIVES

Stage III of the syllabus provides the skill and knowledge required to operate the multi-engine airplane in both VFR and IFR conditions at a level that meets or exceeds the proficiency requirements set forth by the current Commercial Pilot Practical Test Standards.

STAGE COMPLETION STANDARDS

The applicant must successfully complete each of the lessons in Stage III, including the Stage III / End-of-Course Check. At the completion of the stage, the applicant will be able to demonstrate each of the listed maneuvers and procedures at a proficiency level that meets those criteria outlined in the current FAA Commercial Pilot Airplane Multi-Engine Land Practical Test Standards.

PRE & POST GROUND LESSON 37

2.0 HOURS TOTAL GROUND INSTRUCTION

LESSON REFERENCES:

Pilot's Operating Handbook / Airplane Flight Manual (POH/AFM)

All Appropriate Sections

Airplane Flying Handbook

Chapter 12, Transition to a Multi-Engine Airplane.

LESSON OBJECTIVES:

- The student will expand knowledge in Multi-engine airplane systems and limitations. The student will review by chart and long, hand weight and balance calculations.
- Review and enhance knowledge about PA-44 systems, limitations, normal procedures, and emergency procedures.

REVIEW

PA-44 Preflight

- Basic components
- Equipment list

COMPLEX AIRCRAFT

- Manifold pressure
- Normally Aspirated vs. Turbo or Super Charged Engine
- Proper Settings for the PA-44-180
 - Climb
 - Cruise
 - Descent

New Vspeeds

- VMC, Vr, , Vmca
- Vxse, Vyse, Vsse

AIRPLANE SYSTEMS

- General Information and Limitations
- Type Certificate Data Sheet
- Cockpit Layout and Instrument Panel
- Primary Flight Controls and Trims
- Pitot-Static System
- Vacuum System & Gyroscopic Instruments
- Fuel System
- Environmental System
- Stall Warning System
- Electrical System
- Engine(s) & Propeller System
- Hydraulic System
- Landing Gear System

WEIGHT AND BALANCE TERMS AND COMPUTATIONS

- Standard Empty Weight
- Basic Empty Weight
- Useable Fuel
- Maximum Ramp Weight
- Maximum Landing Weight
- Zero Fuel Weight

PREFLIGHT ACTIONS – USE OF MULTI ENGINE PERFORMANCE CHARTS

- Normal Takeoff Distance Charts
- Normal Landing Distance Charts
- Accelerate Stop Distance (If available)
- Accelerate Go Distance (If available)
- Wind Component
- Climb Performance – Both Engines Operating
- Climb Performance – One Engine Operation
- Fuel And Power Settings Table
- Cruise Performance
- Descent Charts
- Preflight – Fuel requirements

PREFLIGHT ORIENTATION AND PREPARATION

- Certificates and Documents
- Airworthiness Requirements
- Progressive Maintenance
- Minimum Equipment List (MEL)
- Operation of Systems
- Aircraft Performance and Limitations
- Aircraft V-Speeds

COMPLETION STANDARDS:

The student will demonstrate understanding of the airplane's systems, weight and balance condition, preflight orientation and preparation.

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

SIMULATOR LESSON 38

1.5 HOURS TOTAL FLIGHT TRAINER
OF WHICH:
1.5 HOURS DUAL GIVEN
1.5 HOURS INSTRUMENT
0.5 HOURS PRE/POST

Note: Use Redbird multiengine AATD for this lesson.

LESSON OBJECTIVES:

- This lesson will give the student an opportunity to perform basic flight maneuvers as well as execute general procedures as they relate to Multi engine flying. The student will be able to become familiar with all the verbal calls and memory checklists that are associated with complex aircraft.

INTRODUCE:

MULTI ENGINE/COMPLEX AIRCRAFT

- Climbs & Decants
- Climbing Turns
- Descending Turns
- Climbs to 10,000 ft
- Proper power settings for cruise at Altitude
- Descents from Altitude with proper power and speed adjustments.
- Straight and level
- Airspeed changes
- Establishing a climb from Cruise
- Level off from climb making proper power change settings
- Practice safe gear operation

VERBAL CHECK LISTS AND CALLS

- Verbal BCCGUMPS check
- Verification that Gear is down & related calls
- Procedure for interrupted procedures
- Proper speed for moving prop levers

NAVIGATION

- Situational Awareness
- Aeronautical Decision Making
- Single Pilot Resource Management

COMPLETION STANDARDS:

- The student will have the ability to properly set the power using the throttles and propeller levers in the correct order. The student will further be able to manage power in climbs and descents. Student will demonstrate proper use of gear on takeoff and when in a position to land.
- Student will make the proper calls recognizing the gear is down and verified down before landing

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

PRE & POST GROUND LESSON 39

2.0 HOURS TOTAL GROUND INSTRUCTION

LESSON REFERENCES:

Airplane Flying Handbook

Chapter 12, Transition to a Multi-Engine Airplane.

Pilot's Operating Handbook / Airplane Flight Manual (POH/AFM)

Pilots Handbook of Aeronautical Knowledge Chapter 17

FAA-P-8740-66 – Flying Light Twins Safely

LESSON OBJECTIVES:

- Introduce the basics of Multi Engine Flying including critical factors that must be added to the pilot's decision making process in regards to safe operation.
- Building on current single engine knowledge introduce the aerodynamic effects of a second engine
- Introduce the use of manifold pressure in normally aspirated engines vs turbo or super charged engines
- Initial introduction to technologically advanced aircraft with integrated auto pilot.

INTRODUCE

MULTI-ENGINE AERODYNAMICS

- Centerline Thrust
- Conventional Twin
- Twin With Counter Rotating Propellers
- Critical Engine
- Sideslip And How To Remedy
- Windmilling Propeller
- Feathering Propeller
- Zero Thrust Simulation Feathered Propeller

PA-44 Preflight

- Basic components
- Equipment list

MULTI-ENGINE TURNING TENDENCIES

- Asymmetrical Thrust
- P-Factor
- Torque Effect
- Spiraling Slipstream

PRINCIPLES OF FLIGHT – ENGINE INOPERATIVE

- Meaning of the Term Critical Engine
- Effects of Density Altitude on Vmc
- Effects of Airplane Weight & CG on Control
- Effects of Angle of Bank on Vmc
- Relationship of Vmc to Stall Speed
- Reasons for Loss of Directional Control
- Importance in Maintaining Proper Pitch, Bank Attitude & Coordination of Controls
- Loss of Directional Control Recovery Procedures
- Engine Failure During Takeoff Including Planning, Decisions, and Single-engine Operations.
- Performance Lost with One Engine Inoperative
- Factor to Consider for Single-engine Go Around

TECHNOLOGICALLY ADVANCED AIRCRAFT (TAA)

- TAA Aircraft Avionics suite overview
- Comparison to Avidyne or G500 systems
- auto pilot integrated vs nonintegrated auto pilot
- Benefit and Risk of integrated auto pilot systems

REVIEW

RISK MANAGEMENT

- 4 Fundamentals of risk
- Analyzing Risk for each flight
- Changing conditions makes risk a moving target

COMPLETION STANDARDS:

- The student will become familiar with multi-engine aircraft aerodynamics and factors that make up the critical V speed of Vmc.
- Student to become familiar with the components of the avionics suite installed in NSA's PA-44s.

PREVIEW OF NEXT LESSON

FLIGHT LESSON 40

1.5 HOURS TOTAL FLIGHT TIME
OF WHICH:
1.5 HOURS DUAL GIVEN
0.5 HOURS PRE/POST

LESSON OBJECTIVES:

- This lesson will focus on proper and complete preflight as well as post flight operations. Throughout the lesson the instructor will relate to Risk Management and how to apply the real time scenario using the risk management tools previously studied.
- The flight portion of this lesson will acquaint the student with flying a multi engine aircraft and its controls, during the flight the student will review Straight and level, and normal climbs and descents pitch attitudes, as well as use of trim, and will practice coordinated turns at varied bank angles.

INTRODUCE:

PA-44 Preflight

- Preflight Orientation and Preparation
- Preflight Procedures
- Full walk around and detailed look at the aircraft

PREFLIGHT PROCEDURES

- Preflight Inspection
- Aircraft Servicing
- Cockpit Management
- Equipment Checks
- Engine Starting and Warm Up
- Taxiing and Taxi Procedures
- Before takeoff Checks
- Pre-takeoff Briefing

SLOW FLIGHT AND STALLS

- Maneuvering during slow flight
- Power-Off Stall w/&w/out (Bank up to 20°)
- Power-On Stall w/&w/out (Bank up to 20°)
- Accelerated Stalls
- Spin Awareness (Do Not Spin aircraft)

SAFETY RELATED OPERATIONS AND PROCEDURES

- Use of the Checklist
- Crew Resource Management
- Positive Exchange of the Flight Controls
- Stall/Spin Awareness
- Wake Turbulence Avoidance
- Low Level Wind Shear
- Visual Scanning and Collision Avoidance
- Runway Incursion Avoidance

BASIC & PERFORMANCE MANEUVERS

- Straight-and-Level Flight
- Turns at different Bank Angles
- Climbs and Descents
- Climbing and Descending Turns
- Steep Turns
- Recovery from Unusual Attitudes

TAKEOFFS AND LANDINGS

- Normal / Crosswind Takeoff and Climb
- Normal / Crosswind Approach and Landing
- Go-Around/Rejected Landing(s)

AIRPORT OPERATIONS

- Traffic Pattern
- Pattern Entry
- Determining Distance for Downwind
- Execution of the Memory Check list Items
- Clearing Traffic
- Radio Communications

POST FLIGHT PROCEDURES

- After Landing
- Parking and Securing the Aircraft

COMPLETION STANDARDS:

- Demonstrate knowledge of power setting and configurations to perform listed maneuvers.
- During the flight, the student should maintain altitude ± 100 feet, headings $\pm 10^\circ$, airspeed ± 10 knots.
- The student should demonstrate knowledge of standard operating procedures to perform slow flight, power on, power off and accelerated stalls, steep turns, basic instrument and recovery techniques from unusual attitudes. The student will also have a good understanding of the traffic pattern, radio communication, takeoff and landing procedures.

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

FLIGHT LESSON 41

1.5 HOURS TOTAL FLIGHT TIME
OF WHICH:
1.5 HOURS DUAL GIVEN
0.5 HOURS PRE/POST

LESSON OBJECTIVES:

- Review preflight, safety related operations, Practice Traffic patterns with Normal and Cross wind Takeoff and landings. Introduce and practice Short field Take off and landings and allow student practice.

REVIEW:

PA-44 Preflight

- Preflight Orientation and Preparation
- Preflight Procedures
- Full walk around and detailed look at the aircraft
- Safety-Related Operations and Procedures
- Traffic Pattern
- Proper distance for downwind and Base
- BCCGUMPS from memory
- Verbal Calls at designated points
- Stabilized final approach

INTRODUCE:

TAKEOFFS, LANDINGS AND GO-AROUNDS

- Normal/Crosswind Takeoffs and Climbs
- Normal/Crosswind Approaches and Landings
- Short Field Takeoffs and Maximum Performance Climbs
- Short Field Approaches and Landings

POST FLIGHT PROCEDURES

- After Landing
- Parking and Securing the Aircraft

SAFETY RELATED OPERATIONS AND PROCEDURES

- Use of the Checklist
- Crew Resource Management
- Positive Exchange of the Flight Controls
- Stall/Spin Awareness
- Wake Turbulence Avoidance
- Visual Scanning and Collision Avoidance
- Runway Incursion Avoidance

COMPLETION STANDARDS:

- Student will be able perform normal/crosswind take off and landings with all landings coming from a stabilized approach with a smooth touch down using proper landing techniques. Student should be able to land within 200' of designated point when performing short field landings. Review maintaining altitude ± 100 feet, headings $\pm 10^\circ$, airspeed ± 10 knots, bank angle $\pm 5^\circ$

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

PRE & POST GROUND LESSON 42

2.0 HOURS TOTAL GROUND INSTRUCTION

LESSON REFERENCES:

Airplane Flying Handbook
Chapter 12, Transition to a Multi-Engine
Airplane.

**Pilot's Operating Handbook / Airplane Flight
Manual (POH/AFM)**

LESSON OBJECTIVES:

- Review Single engine operating procedures and practices, as discussed in previous lessons. This will include briefing engine loss in varied flight positions as well as conditions, memory check lists and applying ADM to the situation to insure safe operation under single engine and engine loss situations.
- Introduce additional advanced single engine maneuvers

INTRODUCE:

DRAG DEMONSTRATION (VYSE)

- Induced Drag Effect Slower Than Vyse
Airspeed
- Parasitic Drag Effect Faster Than Vyse
Airspeed
- Gear Down At Vyse
- Flaps Down At Vyse
- Windmilling Propeller At Vyse

MULTI-ENGINE OPERATIONS (ENGINE-OUT PROCEDURES)

- Brief procedures in aircraft for Engine cuts
(in AGL)
- No engine cuts below 500' AGL
- At altitudes lower than 3,000 feet AGL,
engine failure shall be simulated by reducing
throttle to idle and then establishing zero
thrust.
- Engine Failures after rotation to pattern
altitude
- Aborted Takeoff Procedures
- Memory Items – Engine Failure After
Takeoff
- Maneuvering with One Engine Inoperative
- Single Engine Go around
- Committed to land altitude

EMERGENCY IMMEDIATE MEMORY ITEMS

- Engine Failure on takeoff roll
- Engine Failure after lift off
- Engine Fire
- Emergency Descent

AERONAUTICAL DECISION MAKING

- Both Engines Operating Enroute and
Landing
- Single Engine Operation Enroute and
Landing
- Engine Failure On Takeoff Roll
- Engine Failure On Liftoff With Gear Down
- Engine Failure On After Takeoff With Gear
Up
- Single-Engine Go Around
- Takeoff Briefing For Multi-Engine Aircraft

REVIEW

Risk management

Applying risk management tools to the:

- Different flight scenarios involved with single engine operations
- Takeoff briefings and recognizing the human factors of complacency from the frequent briefings with repeated flights of no incidence.

COMPLETION STANDARDS:

- The student will be able to verbalize what to do if an engine failure occurs in different scenario's he/she will be able to express memory items that are required to be performed upon initial engine loss and then express when it is time to move to check list to follow it up.
- Student will be able to present the expected performance of the airplane in different drag configurations and where they are likely to encounter those configurations in flight.

STUDY ASSIGNMENT:

- Assign student to practice rehearsing these initial emergency procedures and have them practice moving their hands to where the controls are. This is to aid them in committing these procedures to memory and develop muscle memory for the procedures.

SIMULATOR LESSON 43

1.5 HOURS SIMULATOR TIME
OF WHICH:
1.5 HOURS DUAL GIVEN
0.5 HOURS PRE/POST

Note: Use Redbird MEL for this lesson this lesson must be in a Simulator.

LESSON OBJECTIVES:

- This lesson will allow practice of single engine operations in a multi engine aircraft. This will be for the procedures for inflight engine loss as well as loss of engine on takeoff or shortly after takeoff.
- The Simulator time will be spent practicing recovering from various engine loss emergencies as well as practice with emergency descents.
- The student will have the opportunity to experience flight situations that would likely be unrecoverable in a real situations.

REVIEW/PRACTICE:

- Vmc Demo
- Drag Demo
- Emergency Descent

MULTI-ENGINE OPERATIONS (ENGINE-OUT PROCEDURES)

- Engine Failures On Takeoff Roll Before Vmc (<50% of VMC)
- Engine Failures after rotation to pattern altitude
- Aborted Takeoff Procedures
- Memory Items – Engine Failure After Takeoff
- Maneuvering with One Engine Inoperative
- Single Engine Go around
- Committed to land altitude (single engine)

EMERGENCY IMMEDIATE MEMORY ITEMS

STUDENT PRACTICE

- Engine Failure before rotation
- Engine cuts right after rotation
- Engine cut before 500 AGL
- Engine loss above 500' AGL below pattern
- Single Engine Go-Around
- Engine Fire at Altitude
- Vmc Roll and Recovery
- Full Shut down Feather and Restart
- Applying risk management tools to different flight scenarios
- Emergency Descent

COMPLETION STANDARDS:

- The student will demonstrate proper control inputs for various engine loss scenarios. Student will further demonstrate good ADM in executing solutions to the single engine situations that occur.
- Student will be able to give a complete pre-takeoff briefing that includes Engine loss in various positions during the early stages of flight.
- Student will be able to demonstrate with instructor assistance the proper inputs if an engine fails in flight
- Student will demonstrate how to avoid a Vmc roll and if one is induced the correct inputs to recover.

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

FLIGHT LESSON 44

1.5 HOURS TOTAL FLIGHT TIME
OF WHICH:
1.5 HOURS DUAL GIVEN
0.5 HOURS PRE/POST

LESSON OBJECTIVES:

- Review preflight, safety related operations, instrument recovery from unusual attitudes, crosswind takeoff and landing, short field takeoff and landing, go around and multi-engine operations.

REVIEW:

PA-44 Preflight

- Preflight Orientation and Preparation
- Preflight Procedures
- Full walk around and detailed look at the aircraft
- Safety-Related Operations and Procedures
- Traffic Pattern
- Proper distance for downwind and Base
- BCCGUMPS from memory
- Verbal Calls at designated points
- Stabilized final approach

TAKEOFFS, LANDINGS AND GO-AROUNDS

- Crosswind Takeoffs and Climbs
- Crosswind Approaches and Landings
- Short Field Takeoffs and Maximum Performance Climbs
- Short Field Approaches and Landings
- Go-Around/Rejected Landing(s)

COMMERCIAL MANEUVERS

- Steep Turns
- Slow Flight
- Power off Stall (with or without bank)
- Power on Stall (with or without bank)

INTRODUCE:

- V_{mc} Demo
- Drag Demo
- Emergency Descent

MULTI-ENGINE OPERATIONS (ENGINE-OUT PROCEDURES) (IR – INSTRUMENT REFERENCE)

- Engine Failure during Takeoff prior to 50% of V_{mc} (Simulated)
- Engine Failure After Liftoff and in the Traffic Pattern (> 500' AGL Simulated)
- Maneuvering with inoperative engine(Simulated)
- Single engine maneuvering in pattern with landing
- Full Engine Shutdown and Air-start
- V_{mc} Demonstration
- Engine Failure in Flight by Reference to Instruments (IR) with an engine out instrument approach

SAFETY RELATED OPERATIONS AND PROCEDURES

- Use of the Checklist
- Crew Resource Management
- Positive Exchange of the Flight Controls
- Stall/Spin Awareness
- Wake Turbulence Avoidance
- Visual Scanning and Collision Avoidance
- Runway Incursion Avoidance

POST FLIGHT PROCEDURES

- After Landing
- Parking and Securing the Aircraft

COMPLETION STANDARDS:

- The student will demonstrate proper control inputs for various engine loss scenarios. Student will further demonstrate good ADM in executing solutions to the single engine situations that occur.
- Student will be able to give a complete pre-takeoff briefing that includes Engine loss in various positions during the early stages of flight.
- The student will demonstrate the ability to fly a traffic pattern and perform normal and cross wind landings without instructor assistance. Short field landings are within +200 feet -0 feet of the designated touch down point. All approaches will be stabilized and if at any time the landing outcome is in doubt the student will execute a go around without prompting from the instructor.
- At the completion of the lesson the student will perform all the maneuvers and procedures listed for review maintaining altitude ± 100 feet, headings $\pm 10^\circ$, airspeed ± 10 knots, bank angle $\pm 5^\circ$

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

PRE & POST GROUND LESSON 45

2.0 HOURS TOTAL GROUND INSTRUCTION

LESSON REFERENCES:



Pilot's Operating Handbook / Airplane Flight Manual (POH/AFM)
AIM Chapter 8
Airplane Flying Handbook
Pilot's Handbook of Aeronautical Knowledge

LESSON OBJECTIVES:

- This lesson is to prepare the student for cross country operations performing a commercial pilot. The instructor will provide a training scenario that will challenge the student to prepare a flight that would take 3 passengers along with some equipment. The discussion should review all aspects of accomplishing this flight using real time weather, fuel stops as well as any other risk analysis that could be a factor. Within the Scenario the instructor should select locations that challenge the student's ability to preflight plan and incorporate CFIT into the Scenario.
- Student to establish their personalized standardized way to approach preflight preparation and briefings for safe operations under both VFR and IFR operations.

REVIEW

VFR & IFR Cross country flight planning

- Weather information
- Modern Briefing tools on line as well as briefer options
- NEXRAD in cockpit weather/time lags and other risk factors
- XM/ADS-B in weather
- Enroute weather updates
- Reading and applying of available weather information to the flight being conducted
- National Airspace system
- Modern Flight planning tools
- Use of electronic Charts and backups
- Types of Briefings available and the sources
- Use of AFD
- NOTAMs
- Diversion ADM
- Pilotage/Dead reckoning for VFR
- Types of flight plans
- IFR to airports without a published instrument approach
- Alternate airports both VFR & IFR

CONTROLLED FLIGHT INTO TERRAIN (CFIT)

- VFR Night Operations
- VFR Low Visibility
- IFR Operations

AIRCRAFT PERFORMANCE

- Aircraft performance data
- Fuel Consumption/Fuel burn
- Power settings
- Selecting of altitude
- Oxygen requirements
- Aircraft pressurization
- Takeoff distance
- Weight and balance (cg considerations)
- Density Altitude
- Climb gradient

AEROMEDICAL FACTORS

- Hypoxia
- Hyperventilation
- Middle ear and sinus problems.
- Spatial disorientation
- Motion sickness
- Carbon monoxide poisoning
- Stress and fatigue
- Dehydration.

COMPLETION STANDARDS:

- This student will be able to demonstrate through presentation of an instructor provided flight scenario the proper planning to safely conduct the flight showing commercial test standards level of performance Cross-Country flight planning, National Airspace System, Aircraft performance and limitations, Aeromedical Factors.

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

FLIGHT LESSON 46

2.0 HOURS TOTAL FLIGHT TIME
OF WHICH:
2.0 HOURS DUAL GIVEN
2.0 HOURS DUAL CROSS COUNTRY **DAY**
0.5 HOURS PRE/POST

LESSON OBJECTIVES:

- From an instructor provided scenario the student will plan and conduct a day flight. The preflight briefing will include a complete standard weather briefing to include considerations of the 4 fundamentals of risk.
- Meet the eligibility requirements set forth by paragraph 14 CFR 141. Appendix D (4) (b) (2) (iii) involving a cross-country flight of at least 2 hours in a multi-engine airplane in **day** conditions, consisting of one leg a total straight-line distance of more than 100 nautical miles from the original point of departure.
- Expose the student to different in flight situations that will improve their ability to make good decisions in flight.

REVIEW:

- Preflight Preparation
- Preflight Procedures

TAKEOFFS, LANDINGS AND GO-AROUNDS

- Crosswind Takeoff(s) and Climbs(s)
- Crosswind Approach(s) and Landing(s)
- Short Field Takeoff(s) and Maximum Performance Climb(s)
- Short Field Approach(s) and Landing(s)

AIRPORT OPERATIONS

- Traffic Patterns
- Radio Communications & ATC Light Signals
- Airport Signs and Markings
- Runway Incursions

MULTI-ENGINE OPERATIONS (ENGINE-OUT PROCEDURES)

- Engine Failure during Takeoff prior to 50% of V_{MC} (Simulated)
- Engine Failure After Liftoff and in the Traffic Pattern (> 500' AGL Simulated)
- Maneuvering with inoperative engine(Simulated) and Landings

NAVIGATION IN A MULTI-ENGINE AIRCRAFT

- Cross-Country Flight Planning
- Pilotage
- Use of Navigation Systems and Radar Services
- Dead Reckoning
- Diversion
- Lost Procedures
- Situational Awareness
- Aeronautical Decision Making
- Single Pilot Resource Management
- Flight Plan Log

COMPLETION STANDARDS:

- Student can deliver a complete flight plan to include a full briefing of the flight to be conducted to the instructor. The student will also demonstrate the ability to work through instructor provided scenarios during the flight using good ADM skills as well as applying risk management in the decision making process.
- During normal operations maintain altitude ± 100 feet, headings $\pm 10^\circ$, airspeed ± 10 knots, and bank angle $\pm 5^\circ$.
- The lesson is complete when the student has conducted the minimum of **2 hour day** cross country flight that complies with 14 CFR 141. Appendix D (4) (b) (2) (iii), accomplished each task for review.

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

FLIGHT LESSON 47

2.0 HOURS TOTAL FLIGHT TIME
OF WHICH:
2.0 HOURS DUAL GIVEN
2.0 HOURS CROSS COUNTRY **NIGHT**
0.5 HOURS PRE/POST

LESSON OBJECTIVES:

- From an instructor provided scenario the student will plan and conduct a **NIGHT** flight. The preflight briefing will include a complete standard weather briefing to include considerations of the 4 fundamentals of risk.
- Meet the eligibility requirements set forth by paragraph 14 CFR 141. Appendix D (4) (b) (2) (iv) involving a cross-country flight of at least 2 hours in a multi-engine airplane in **Night** conditions, consisting of one leg a total straight-line distance of more than 100 nautical miles from the original point of departure.
- Expose the student to different in flight situations that will improve their ability to make good decisions in flight.

REVIEW:

- Preflight Orientation and Preparation
- Preflight Procedures
- Safety-Related Operations and Procedures

MULTI-ENGINE OPERATIONS (ENGINE-OUT PROCEDURES)

- Engine Failure during Takeoff prior to 50% of V_{MC} (Simulated)
- Engine Failure After Liftoff and in the Traffic Pattern (> 500' AGL Simulated)
- Maneuvering with inoperative engine(Simulated) and Landings

AIRPORT OPERATIONS

- Traffic Patterns
- Radio Communications & ATC Light Signals
- Airport Signs and Markings
- Runway Incursions

NIGHT OPERATION

- Night Preparation
- Night Takeoff and Landings

TAKEOFFS, LANDINGS AND GO-AROUNDS

- Crosswind Takeoff(s) and Landings(s)
- Go-Around / Rejected Landings

NAVIGATION IN A MULTI-ENGINE AIRCRAFT

- Cross-Country Flight Planning
- Pilotage
- Use of Navigation Systems and Radar Services
- Dead Reckoning
- Diversion
- Lost Procedures
- Situational Awareness
- Aeronautical Decision Making
- Crew Resource Management
- Flight Plan Log

COMPLETION STANDARDS:

- Student can deliver a complete flight plan to include a full briefing of the flight to be conducted to the instructor. The student will also demonstrate the ability to work through instructor provided scenarios during the flight using good ADM skills as well as applying risk management in the decision making process..
- During normal operations maintain altitude ± 100 feet, headings $\pm 10^\circ$, airspeed ± 10 knots, and bank angle $\pm 5^\circ$.
- The lesson is complete when the student has conducted the minimum of **2 hour night** cross country flight that complies with 14 CFR 141. Appendix D (4) (b) (2) (iv), accomplished each task for review.

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

SIMULATOR LESSON 48

1.5 HOURS TOTAL FLIGHT TRAINER
OF WHICH:
1.5 HOURS DUAL GIVEN
1.5 HOURS INSTRUMENT
0.5 HOURS PRE/POST

Note: Use Redbird multiengine AATD for this lesson, must be in simulator.

LESSON OBJECTIVES:

- The instructor will assign a flight scenario that incorporates all the preflight planning skills from lesson 45 for an IFR flight and the student will brief the scenario and then they will fly the scenario in the simulator. The instructor will put the student in different circumstances during the flight to build confidence and improve ADM skills.
- Execute IFR operations in a multi engine aircraft flying cross country. Introduce a single engine approach
- The student will continue to develop better aeronautical decision making and cockpit management in the IFR environment while dealing with various simulated emergency procedures.

REVIEW:

PREFLIGHT PREPERATION

- Weather Information
- Cross-Country Flight Planning
- National Airspace System
- Performance and Limitations
- Aeromedical Factors

INSTRUMENT DEPARTURE AND ARRIVAL PROCEDURES

- Low Visibility Taxi (1/8 mile Visibility)
- Instrument takeoff (1/8 mile Visibility)
- Climb Gradients – Aircrafts Ability to meet required climb gradient
- Departure Procedures and Clearances
- Clearance Copying & Read-back
- DP's - Departures Procedures
- STAR's – Standard Terminal Arrival Routes
- Holding Procedures
- Precision Approach
- Non-precision Approach

EMERGENCY OPERATIONS

- Single Engine Approach
- Electrical Failure scenario
- Loss of engine emergencies
- Engine problem scenario
- System failure scenario

CROSS COUNTRY PROCEDURES

- Cross-Country Flight Planning
- Air Traffic Control Clearance
- Clearance Copying and Read Back
- Departure Procedures
- Use of Radar
- Voice Communications
- Enroute Procedures and Clearances

APPROACHES *(EXECUTE A MINIMUM OF 2 APPROACHES 1 DESTINATION, 1 AT ALTERNET)*

- Approach type _____ Airport _____
- Approach type _____ Airport _____
- Approach type _____ Airport _____
- Holding location _____
- Missed approach _____
- Straight in Landing single engine
- Circle to land Single engine
- Instrument Approach—One Engine Inoperative (by Reference to Instruments)

COMPLETION STANDARDS:

- Student will conduct a complete preflight briefing and will then be able to demonstrate application of those skills in the flight scenario given. Student will demonstrate good ADM skills and show the ability to think ahead to what is next while managing the aircraft.
- The student will demonstrate increased proficiency in aeronautical decision making and cockpit management concepts in the IFR environment.
- Student will have procedures for executing a single engine approach and expectation for a straight in to land and circle to land.
- How to adjust the procedures considering aircraft performance and selected airport for landing.

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

PRE & POST GROUND LESSON 49

2.0 HOURS TOTAL GROUND INSTRUCTION

LESSON REFERENCES:

Garmin Pilots Handbook PA44

Pilot's Operating Handbook / Airplane Flight Manual (POH/AFM)

Garmin Pilots Quick Reference guide

LESSON OBJECTIVES:

- This lesson will give the student advanced training on Technologically Advanced Aircraft (TAA) and the use of this avionics with integrated auto pilots.
- The student will also review all the systems found on the MEL aircraft being flown for this course.
-

REVIEW

- Garmin Advanced Avionics training course
- Garmin Integrated Auto pilot
- Auto Pilot limitations
- Components and functions of TAA aircraft
- Backup components
- Backup power sources
- Programing for flight
- Risk management associated with the Auto pilot and the programing of the Nav systems
- Jepp view approach plates with geo fenced plates
- In bound weather data through XM or other source

AIRCRAFT SYSTEMS

- General Information and Limitations
- Primary Flight Controls and Trims
- Pressure System and Gyroscopic Instruments
- Fuel System
- Environmental System
- Stall Warning System
- Electrical System
- Engine(s)
- Propeller System and Feathering Accumulator
- Hydraulic System
- Landing Gear System

AUTO PILOT OPERATIONS

- Coupled approaches
- Single Engine approaches and auto pilot use
- Circling approach and auto pilot use

COMPLETION STANDARDS:

- Student will be able to name all the components of a typical TAA aircraft and will be able to perform basic trouble shooting tasks for suspected failures or abnormalities during flight operations.

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

FLIGHT LESSON 50

1.5 HOURS TOTAL FLIGHT TIME
OF WHICH:
1.5 HOURS DUAL GIVEN
1.3 HOURS INSTRUMENT INSTRUCTION
0.5 HOURS PRE/POST

LESSON OBJECTIVES:

- IFR flight operations Conducting approaches with single engine approaches ending with circling and straight in landings.
- Continue to develop ADM skills by having to make decisions while in flight to changing weather conditions and different mechanical situations that the instructor provides through in flight scenarios.

REVIEW:

- Preflight Orientation and Preparation
- Preflight Procedures
- Safety-Related Operations and Procedures

PREFLIGHT PREPERATION

- Weather Information
- Cross-Country Flight Planning
- National Airspace System
- Performance and Limitations

INSTRUMENT DEPARTURE AND ARRIVAL PROCEDURES

- Departure Procedures and Clearances
- Clearance Copying & Read-back
- Holding Procedures
- Precision Approach
- Non-precision Approach

EMERGENCY OPERATIONS

- Single Engine Approach
- Electrical Failure scenario
- Loss of engine emergencies
- Engine problem scenario
- System failure scenario

CROSS COUNTRY PROCEDURES

- Cross-Country Flight Planning & Programing
- Use of Navigation Systems and Radar Services
- Radio-Communications
- Situational Awareness
- Aeronautical Decision Making
- Single Pilot Resource Management

APPROACHES (EXECUTE A MINIMUM OF 3 APPROACHES 2 SINGLE ENGINE)

- Approach type _____ Airport _____
- Approach type _____ Airport _____
- Approach type _____ Airport _____
- Holding location _____
- Missed approach _____
- Straight in Landing single engine
- Circle to land Single engine
- Instrument Approach—One Engine Inoperative (by Reference to Instruments) Required*****

POST FLIGHT

- Closing of flight plan
- Securing Aircraft

COMPLETION STANDARDS:

- Student will conduct a complete preflight briefing and will then be able to demonstrate application of those skills in the flight scenario given. Student will demonstrate good ADM skills and show the ability to think ahead to what is next while managing the aircraft.
- The student will demonstrate increased proficiency in aeronautical decision making and cockpit management concepts in the IFR environment.
- Student will have procedures for executing a single engine approach and expectation for a straight in to land and circle to land.
- How to adjust the procedures considering aircraft performance and selected airport for landing.
- Follow all actual or simulated IFR clearances during the flight maintaining altitude to the current acceptable instrument test standards.

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

SIMULATOR LESSON 51

1.5 HOURS TOTAL FLIGHT TRAINER
OF WHICH:
1.5 HOURS DUAL GIVEN
1.5 HOURS INSTRUMENT
0.5 HOURS PRE/POST

Note: Use Redbird multiengine AATD for this lesson, must be in simulator.

LESSON OBJECTIVES:

- The instructor will assign a flight scenario that incorporates all the preflight planning skills from lesson 45 for an IFR flight and the student will brief the scenario and then they will fly the scenario in the simulator. The instructor will put the student in different circumstances during the flight to build confidence and improve ADM skills.
- Execute IFR operations in a multi engine aircraft flying cross country.
- The student will continue to develop better aeronautical decision making and cockpit management in the IFR environment while dealing with various simulated emergency procedures.

NOTE: This scenario needs to be about flying into adverse weather conditions and have the student make decisions that will determine a safe outcome to the flight. Example: The forecasted weather was for MVFR conditions along the route and at the destination the forecast was for 2500 OVC, while in route the wx came down to 800 OVC, you are just above the tops at 8000 and the temperature is -10° C and it is -4° C at the surface. Set the simulator up for severe icing with these deteriorating wx conditions and see what options the student come up with. Another example would be flying into a line of developing thunderstorms with a real need to get to the destination airport just ahead of the storms. Be creative picking challenging airports with interesting departures and make the clearances challenging for the student.

REVIEW:

PREFLIGHT PREPERATION

- Weather Information
- Cross-Country Flight Planning
- National Airspace System
- Performance and Limitations
- Aeromedical Factors

EMERGENCY OPERATIONS

- Single Engine Approach
- Electrical Failure scenario
- Loss of engine emergencies
- Engine problem scenario
- System failure scenario

CROSS COUNTRY PROCEDURES

- Cross-Country Flight Planning
- Use of Navigation Systems and Radar Services
- Radio-Communications
- Situational Awareness
- Aeronautical Decision Making
- Single Pilot Resource Management

APPROACHES *Instructor discretion*

- Approach type _____ Airport _____
- Approach type _____ Airport _____
- Approach type _____ Airport _____
- Holding location _____
- Missed approach _____
- Straight in Landing single engine
- Circle to land Single engine
- Instrument Approach—One Engine Inoperative (by Reference to Instruments) Required*****

COMPLETION STANDARDS:

- Student will conduct a complete preflight briefing and will then be able to demonstrate application of those skills in the flight scenario given. Student will demonstrate good ADM skills and show the ability to think ahead to what is next while managing the aircraft.
- The student will demonstrate increased proficiency in aeronautical decision making and cockpit management concepts in the IFR environment.
- Student will have procedures for executing a single engine approach and expectation for a straight in to land and circle to land.
- How to adjust the procedures considering aircraft performance and selected airport for landing.

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

SIMULATOR LESSON 52

1.5 HOURS TOTAL FLIGHT TRAINER
OF WHICH:
1.5 HOURS DUAL GIVEN
1.5 HOURS INSTRUMENT
0.5 HOURS PRE/POST

Note: Use Redbird multiengine AATD for this lesson, must be in simulator.

LESSON OBJECTIVES:

- The instructor will assign a flight scenario that incorporates all the preflight planning skills from lesson 45 for an IFR flight and the student will brief the scenario and then they will fly the scenario in the simulator. The instructor will put the student in different circumstances during the flight to build confidence and improve ADM skills.
- Execute IFR operations in a multi engine aircraft flying cross country.
- The student will continue to develop better aeronautical decision making and cockpit management in the IFR environment while dealing with various simulated emergency procedures.

NOTE: This scenario needs to be about flying into adverse weather conditions and have the student make decisions that will determine a safe outcome to the flight. On this lesson make sure to create a challenging flight with weather and system failures. At the same time. Low fuel and stronger than forecasted headwind, add in night and icing conditions on the descent, make it challenging. Be creative picking challenging airports with interesting departures and make the clearances challenging for the student.

REVIEW:

PREFLIGHT PREPERATION

- Weather Information
- Cross-Country Flight Planning
- National Airspace System
- Performance and Limitations
- Aeromedical Factors

EMERGENCY OPERATIONS

- Single Engine Approach
- Electrical Failure scenario
- Loss of engine emergencies
- Engine problem scenario
- System failure scenario

CROSS COUNTRY PROCEDURES

- Cross-Country Flight Planning
- Use of Navigation Systems and Radar Services
- Radio-Communications
- Situational Awareness
- Aeronautical Decision Making
- Single Pilot Resource Management

APPROACHES *Instructor discretion*

- Approach type _____ Airport _____
- Approach type _____ Airport _____
- Approach type _____ Airport _____
- Holding location _____
- Missed approach _____
- Straight in Landing single engine
- Circle to land Single engine
- Instrument Approach—One Engine Inoperative (by Reference to Instruments)

COMPLETION STANDARDS:

- Student will conduct a complete preflight briefing and will then be able to demonstrate application of those skills in the flight scenario given. Student will demonstrate good ADM skills and show the ability to think ahead to what is next while managing the aircraft.
- The student will demonstrate increased proficiency in aeronautical decision making and cockpit management concepts in the IFR environment.
- Student will have procedures for executing a single engine approach and expectation for a straight in to land and circle to land.
- How to adjust the procedures considering aircraft performance and selected airport for landing.

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

FLIGHT LESSON 53

4.0 HOURS TOTAL FLIGHT TIME
OF WHICH:
4.0 HOURS DUAL CROSS COUNTRY
2.0 HOURS INSTRUMENT INSTRUCTION
0.5 HOURS PRE/POST

LESSON OBJECTIVES:

- From an instructor provided scenario the student will plan and conduct cross country flight that will challenge the student to operate using ATC as much as possible throughout the flight.
- Should challenge them to go into both towered and non-towered airports under an IFR clearance. Each leg should come to a full stop and shut down allowing the student to update weather and refile for next leg of the trip.
- Instructor should strive to have the scenario challenge the student to act as a commercial pilot as much as possible.
- This lesson may be combined with lesson 54 if desired.
- The preflight briefing will include a complete standard weather briefing to include considerations of the 4 fundamentals of risk.
- There must be one leg that is more than 50 NM from original point of departure.
- Every effort shall be made to perform approaches working with ATC for clearances as much as possible.

REVIEW:

PREFLIGHT PREPERATION

- Weather Information
- Cross-Country Flight Planning
- National Airspace System
- Performance and Limitations
- Aeromedical Factors

INSTRUMENT PROCEDURES

- Weather for an IFR Flights & IFR flight planning
- Aircraft Performance, Limitations, & Systems related to IFR Cross-Country
- Air Traffic Control Clearance
- Clearance Copying & Read-back
- Simulated Instrument Takeoff ¼ visibility
- Enroute Procedures and Clearances
- Calculating ETEs and ETAs
- Precision Approach or Non-precision Approach
- Intercepting and Tracking DME Arc
- Circling Approach
- Holding procedures
- Partial Panel Instrument Approach
- Missed approach

EMERGENCY OPERATIONS

- Loss of Communications
- Systems Malfunctions
- Single Pilot Resource Management (SRM)
- Aeronautical Decision Making (ADM) & Judgment

MULTI-ENGINE OPERATIONS (ENGINE-OUT PROCEDURES) (IR – INSTRUMENT REFERENCE)

- Engine Failure during Takeoff prior to 50% of V_{MC} (Simulated)
- Engine Failure After Liftoff and in the Traffic Pattern (> 500' AGL Simulated)
- Maneuvering with inoperative engine(Simulated)
- Single engine maneuvering in pattern with landing
- Full Engine Shutdown and Air-start
- V_{MC} Demonstration
- Engine Failure in Flight by Reference to Instruments (IR) with an engine out instrument approach

APPROACHES *1 partial panel, 1 precision, 1 non-precision 1 must be Single engine approach to landing*

- Approach type _____ Airport _____
- Approach type _____ Airport _____
- Approach type _____ Airport _____
- Holding location _____
- Missed approach _____
- Straight in Landing single engine
- Circle to land Single engine
- Instrument Approach—One Engine Inoperative (by Reference to Instruments)

COMPLETION STANDARDS:

- Student can deliver a complete flight plan to include a full briefing of the flight being conducted to the instructor. The student will also demonstrate the ability to work through instructor provided scenarios during the flight using good ADM skills as well as applying risk management in the decision making process..
- During normal operations maintain altitude ± 100 feet, headings $\pm 10^\circ$, airspeed ± 10 knots, and bank angle $\pm 5^\circ$.
- All Instrument procedures will meet the current FAA Published instrument proficiency Standards

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

FLIGHT LESSON 54

4.0 HOURS TOTAL FLIGHT TIME
OF WHICH:
4.0 HOURS DUAL CROSS COUNTRY
2.0 HOURS INSTRUMENT INSTRUCTION
0.5 HOURS PRE/POST

LESSON OBJECTIVES:

- From an instructor provided scenario the student will plan and conduct cross country flight that will challenge the student to operate using ATC as much as possible throughout the flight.
- Should challenge them to go into both towered and non-towered airports under an IFR clearance. Each leg should come to a full stop and shut down allowing the student to update weather and refile for next leg of the trip.
- Instructor should strive to have the scenario challenge the student to act as a commercial pilot as much as possible.
- This lesson may be combined with lesson 53 if desired.
- The preflight briefing will include a complete standard weather briefing to include considerations of the 4 fundamentals of risk.
- There must be one leg that is more than 50 NM from original point of departure.
- Every effort shall be made to perform approaches working with ATC for clearances as much as possible.

REVIEW:

PREFLIGHT PREPERATION

- Weather Information
- Cross-Country Flight Planning
- National Airspace System
- Performance and Limitations
- Aeromedical Factors

INSTRUMENT PROCEDURES

- Weather for an IFR Flights & IFR flight planning
- Aircraft Performance, Limitations, & Systems related to IFR Cross-Country
- Air Traffic Control Clearance
- Clearance Copying & Read-back
- Simulated Instrument Takeoff ¼ visibility
- Enroute Procedures and Clearances
- Calculating ETEs and ETAs
- Precision Approach or Non-precision Approach
- Intercepting and Tracking DME Arc
- Circling Approach
- Holding procedures
- Partial Panel Instrument Approach
- Missed approach

EMERGENCY OPERATIONS

- Loss of Communications
- Systems Malfunctions
- Single Pilot Resource Management (SRM)
- Aeronautical Decision Making (ADM) & Judgment

MULTI-ENGINE OPERATIONS (ENGINE-OUT PROCEDURES) (IR – INSTRUMENT REFERENCE)

- Engine Failure during Takeoff prior to 50% of V_{MC} (Simulated)
- Engine Failure After Liftoff and in the Traffic Pattern (> 500' AGL Simulated)
- Maneuvering with inoperative engine(Simulated)
- Single engine maneuvering in pattern with landing
- Full Engine Shutdown and Air-start
- Engine Failure in Flight by Reference to Instruments (IR) with an engine out instrument approach

APPROACHES *1 partial panel, 1 precision, 1 non-precision 1 approach must be single engine to landing.*

- Approach type _____ Airport _____
- Approach type _____ Airport _____
- Approach type _____ Airport _____
- Holding location _____
- Missed approach _____
- Straight in Landing single engine
- Circle to land Single engine
- Coupled Approach (if AP equipped)
- Instrument Approach—One Engine Inoperative (by Reference to Instruments) Required*****

COMPLETION STANDARDS:

- Student can deliver a complete flight plan to include a full briefing of the flight being conducted to the instructor. The student will also demonstrate the ability to work through instructor provided scenarios during the flight using good ADM skills as well as applying risk management in the decision making process.
- During normal operations maintain altitude ± 100 feet, headings $\pm 10^\circ$, airspeed ± 10 knots, and bank angle $\pm 5^\circ$.
- All Instrument procedures will meet the current FAA Published instrument proficiency Standards

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

FLIGHT LESSON 55

5.0 HOURS TOTAL FLIGHT TIME
OF WHICH:
* 5.0 HOURS SOLO
5.0 HOURS CROSS COUNTRY
0.5 HOURS PRE/POST

*** STUDENT PERFORMING DUTIES OF PIC UNDER THE SUPERVISION OF AN AUTHORIZED INSTRUCTOR. THIS STATEMENT WILL BE PLACED IN THE STUDENTS LOG BOOK IN THE REMARKS SECTION!**

LESSON OBJECTIVES:

- To provide the student the opportunity to review and practice navigation during a long cross-country flight to gain added proficiency while performing duties of PIC under the direct supervision of an authorized instructor.
- The student will meet the eligibility requirements set forth in 14 CFR 141 Appendix D (5) (b) 2 by performing one cross-country flight with landings at a minimum of three points and one segment distance of the flight consisting of a straight line distance of at least 250 nautical miles.

Segment means airport to airport

REVIEW:

- Preflight Procedures and preparation
- Manually Complete Flight Plan Log
- Safety-Related Operations and Procedures

AIRPORT OPERATIONS

- Traffic Patterns
- Radio Communications
- Airport Signs and Markings

TAKEOFFS, LANDINGS AND GO-AROUNDS

- Normal and/or Crosswind Takeoff(s) and Climbs(s)
- Traffic Patterns
- Normal and/or Crosswind Approach(s) and Landing(s)

NAVIGATION

- Cross-Country Flight Planning
- Pilotage
- Use of Navigation Systems and Radar Services
- Dead Reckoning
- Diversion
- Situational Awareness
- Aeronautical Decision Making
- Single Pilot Resource Management

COMPLETION STANDARDS:

- This lesson is complete when the student has demonstrated he can fly the assigned cross country flight while performing duties of PIC under the supervision of an authorized instructor that meets the eligibility requirements of 14 CFR 141 Appendix D (5) (b) 2
- The student will be able to maintain altitude ± 100 feet, headings $\pm 10^\circ$, airspeed ± 10 knots on the cross country flight and orally be able to answer questions about airport operations, navigation, navigation log and preflight procedures.

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

FLIGHT LESSON 56

2.5 HOURS TOTAL FLIGHT TIME
OF WHICH:
* 2.5 HOURS SOLO
2.5 HOURS **NIGHT** VFR
0.5 HOURS PRE/POST

*** STUDENT PERFORMING DUTIES OF PIC UNDER THE SUPERVISION OF AN AUTHORIZED INSTRUCTOR. THIS STATEMENT WILL BE PLACED IN THE STUDENTS LOG BOOK IN THE REMARKS SECTION!**

LESSON OBJECTIVES:

- To provide the student the opportunity to review and practice navigation during a long cross-country flight to gain added proficiency while performing duties of PIC under the direct supervision of an authorized instructor.
- Additionally, the student will complete some of the eligibility requirements set forth in 14 CFR 141 Appendix D (5) b (3) by performing 2.5 hours in night VFR conditions with 5 takeoffs and 5 landings (each involving a complete traffic pattern) at an airport with an operating control tower.

Note: Lesson #56 and Lesson #57 combined **must** meet 14 CFR 141 Appendix D (5) b (3) by performing 5 hours in night VFR conditions with 10 takeoffs and 10 landings (each involving a complete traffic pattern) at an airport with an operating control tower while performing the duties of PIC under the supervision of an authorized instructor.

REVIEW:

- Preflight Preparation & Procedures
- Safety-Related Operations and Procedures
- Post Flight Procedures

NIGHT OPERATION

- Night Preparation and Preflight

TAKEOFFS, LANDINGS AND GO-AROUNDS

- Normal & Crosswind Takeoff(s) and Climbs(s)
- Traffic Patterns
- Normal & Crosswind Approach(s) and Landing(s)
- Radio Communications

COMPLETION STANDARDS:

- This lesson is complete when the student has demonstrated he can fly a night flight while performing the duties of PIC under the supervision of an authorized instructor and completed 5 takeoff and 5 landings (each involving a complete traffic pattern) at an airport with an operating control tower.
- The student will be able to maintain altitude ± 100 feet, headings $\pm 10^\circ$, airspeed ± 10 knots on the night flight while performing night preflight, post flight, takeoff and landing and go around required in this lesson.

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

FLIGHT LESSON 57

2.5 HOURS TOTAL FLIGHT TIME
OF WHICH:
* 2.5 HOURS SOLO
2.5 HOURS NIGHT VFR
0.5 HOURS PRE/POST

*** STUDENT PERFORMING DUTIES OF PIC UNDER THE SUPERVISION OF AN AUTHORIZED INSTRUCTOR. THIS STATEMENT WILL BE PLACED IN THE STUDENTS LOG BOOK IN THE REMARKS SECTION!**

LESSON OBJECTIVES:

- To provide the student the opportunity to review and practice, preflight, postflight, performance maneuvers, stalls, slow flight, steep turns, multi-engine out operations at night to gain added proficiency while performing duties of PIC under the direct supervision of an authorized instructor.
- Additionally, the student will complete the eligibility requirements set forth in 14 CFR 141 Appendix D (5) b (3) by performing an additional 2.5 hours in night VFR conditions with 5 takeoffs and 5 landings (each involving a complete traffic pattern) at an airport with an operating control tower.

Note: Lesson #56 and Lesson #57 combined **must** meet 14 CFR 141 Appendix D (5) b (3) by performing 5 hours in night VFR conditions with 10 takeoffs and 10 landings (each involving a complete traffic pattern) at an airport with an operating control tower while performing the duties of PIC under the supervision of an authorized instructor.

REVIEW NIGHT:

- Preflight Preparation & Procedures
- Safety-Related Operations and Procedures
- Post Flight Procedures

NIGHT OPERATION

- Night Preparation and Preflight

TAKEOFFS, LANDINGS AND GO-AROUNDS

- Normal and/or Crosswind Takeoff(s) and Climbs(s)
- Traffic Patterns
- Normal and/or Crosswind Approach(s) and Landing(s)
- Radio Communications

COMPLETION STANDARDS:

- This lesson is complete when the student has demonstrated he can fly a night flight while performing the duties of PIC under the supervision of an authorized instructor and completed 5 takeoff and 5 landings (each involving a complete traffic pattern) at an airport with an operating control tower.
- The student will have completed the eligibility requirements of 14 CFR 141 Appendix D (5) (b) 3
- The student will be able to maintain altitude ± 100 feet, headings $\pm 10^\circ$, airspeed ± 10 knots on the night flight while performing night preflight, post flight, takeoff and landings,

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

PRE & POST GROUND LESSON 58

2.0 HOURS TOTAL GROUND INSTRUCTION

LESSON REFERENCES:

Airplane Flying Handbook

Chapter 12, Transition to a Multi-Engine Airplane.

Pilot's Operating Handbook / Airplane Flight Manual (POH/AFM)

Pilots Book of Aeronautical Knowledge

LESSON OBJECTIVES:

- The student will review from ground school drag demonstration and the TAA avionics package that applies to the airplane used during their training.
- The student will review emergency immediate memory items after an engine failure, VMC, multi-engine aerodynamics, POH limitations and emergency procedures, aircraft systems and preflight of the Seminole.

ACADEMIC CONTENT:

REVIEW

DRAG DEMONSTRATION (VYSE)

- Induced Drag Effect Slower Than Vyse Airspeed
- Parasitic Drag Effect Faster Than Vyse Airspeed
- Gear Down At Vyse
- Flaps Down At Vyse
- Windmilling Propeller At Vyse

PILOT OPERATING HANDBOOK – SUPPLEMENT SECTION

- Review TAA systems and proper operation

EMERGENCY IMMEDIATE MEMORY ITEMS

- Engine Failure on takeoff roll
- Engine Failure after lift off
- Engine Fire
- Emergency Descent

VMC (MINIMUM CONTROL SPEED)

- Definition Of Vmc
- Multi-Engine Markings On Airspeed Indicator
- 13 Factors of VMC explained (14 CFR 23.149)

MULTI-ENGINE AERODYNAMICS

- Centerline Thrust
- Conventional Twin
- Twin With Counter Rotating Propellers
- Critical Engine
- Sideslip
- Windmilling Propeller
- Feathered Propeller
- Zero Thrust Simulation

POH Limitations & Emergency Procedures Section

- Engine Failure on Takeoff
- Engine Failure in Flight
- Air Start Procedures
- Engine Fire
- Electrical Fire
- Fuel Management During Engine Failure
- Landing Gear Emergencies

AIRCRAFT SYSTEMS

- General Information and Limitations
- Primary Flight Controls and Trims
- Pressure System and Gyroscopic Instruments
- Fuel System
- Environmental System
- Stall Warning System
- Electrical System
- Engine(s)
- Propeller System and Feathering Accumulator
- Hydraulic System
- Landing Gear System

HIGH ALTITUDE OPERATIONS

- Supplemental Oxygen
- Pressurization Systems

PREFLIGHT

- Exterior PA-44-180 Seminole Preflight
- Progressive Maintenance Program
- MELs and how they are different
- Aircraft Maintenance Logbooks Review

COMPLETION STANDARDS:

- The student will demonstrate through oral quizzing complete knowledge of the aircraft systems, aerodynamics as related to multi engine aircraft, memory items required for all emergency check lists. And the general components and what they do on TAA equipped aircraft.

FLIGHT LESSON 59

1.5 HOURS TOTAL FLIGHT TIME
OF WHICH:
1.5 HOURS DUAL GIVEN
0.5 HOURS PRE/POST

LESSON OBJECTIVES:

- This is a review lesson in preparation for the end of course stage check. This lesson will focus on reviewing all commercial performance maneuvers and in flight emergency procedures. This is a VFR review

REVIEW:

- Preflight Preparation and Procedures
- Safety-Related Operations and Procedures

PERFORMANCE MANEUVER

- Steep Turns

SLOW FLIGHT AND STALLS

- Maneuvering during slow flight
- Power-Off Stall (Bank up to 20°)
- Power-On Stall (Bank up to 20°)
- Accelerated Stall
- Spin Awareness

TAKEOFFS, LANDINGS AND GO-AROUNDS

- Short Field Takeoffs and Maximum Performance Climbs
- Traffic Patterns
- Short Field Takeoffs and Maximum Performance Climbs
- Short Field Approaches and Landings
- Go-Around/Rejected Landing(s)

EMERGENCY OPERATIONS

- Emergency Descent
- Engine Fire or Smoke in the Cockpit
- Systems & Equipment Malfunctions
- Emergency Equipment and Survival Gear
- Emergency Gear Extension

MULTI-ENGINE OPERATIONS (ENGINE-OUT PROCEDURES) (IR – INSTRUMENT REFERENCE)

- Engine Failure during Takeoff prior to 50% of V_{MC} (Simulated)
- Engine Failure After Ltoff and in the Traffic Pattern (> 500' AGL Simulated)
- Maneuvering with inoperative engine(Simulated)
- Single engine maneuvering in pattern with landing
- Full Engine Shutdown and Air-start
- V_{MC} Demonstration
- Engine Failure in Flight by Reference to Instruments (IR) with an engine out instrument approach

DRAG DEMONSTRATION (VYSE)

- Induced Drag Effect Slower Than Vyse Airspeed
- Parasitic Drag Effect Faster Than Vyse Airspeed
- Gear Down At Vyse
- Flaps Down At Vyse
- Windmilling Propeller At Vyse

COMPLETION STANDARDS:

- At the completion of the lesson, the student will perform all the maneuvers and procedures listed for review at a proficiency level that meets criteria set forth in the multi-engine land sections of the current FAA commercial pilot test standards.

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

FLIGHT LESSON 60

1.5 HOURS TOTAL FLIGHT TIME
OF WHICH:
1.5 HOURS DUAL GIVEN
0.5 HOURS PRE/POST

LESSON OBJECTIVES:

- From an instructor provided scenario the student will plan and conduct a day flight. The preflight briefing will include a complete standard weather briefing to include considerations of the 4 fundamentals of risk.
- Review VFR cross country procedures and establish the flight and then continue with a scenario that will allow for a diversion to an airport other than where the flight was originated and review operations into that airport that was not intended to be the destination.

REVIEW:

- Preflight Preparation
- Preflight Procedures

TAKEOFFS, LANDINGS AND GO-AROUNDS

- Crosswind Takeoff(s) and Climbs(s)
- Crosswind Approach(s) and Landing(s)
- Short Field Takeoff(s) and Maximum Performance Climb(s)
- Short Field Approach(s) and Landing(s)

AIRPORT OPERATIONS

- Traffic Patterns
- Use of electronic charts and airport information
- Radio Communications & ATC Light Signals
- Airport Signs and Markings
- Runway Incursions

MULTI-ENGINE OPERATIONS (ENGINE-OUT PROCEDURES) (IR – INSTRUMENT REFERENCE)

- Engine Failure during Takeoff prior to 50% of V_{MC} (Simulated)
- Engine Failure After Liftoff and in the Traffic Pattern (> 500' AGL Simulated)
- Maneuvering with inoperative engine(Simulated)
- Single engine maneuvering in pattern with landing
- Full Engine Shutdown and Air-start

NAVIGATION IN A MULTI-ENGINE AIRCRAFT

- Cross-Country Flight Planning
- Pilotage
- Use of Navigation Systems and Radar Services
- Dead Reckoning
- Diversion
- Lost Procedures
- Situational Awareness
- Aeronautical Decision Making
- Single Pilot Resource Management
- Flight Plan Log

COMPLETION STANDARDS:

- Student can deliver a complete flight plan to include a full briefing of the flight to be conducted to the instructor. The student will also demonstrate the ability to work through instructor provided scenarios during the flight using good ADM skills as well as applying risk management in the decision making process.
- During normal operations maintain altitude ± 100 feet, headings $\pm 10^\circ$, airspeed ± 10 knots, and bank angle $\pm 5^\circ$. All landings will be to the published FAA test standard requirement.

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

FLIGHT LESSON 61

1.5 HOURS TOTAL FLIGHT TIME
OF WHICH:
1.5 HOURS DUAL GIVEN
1.3 HOURS INSTRUMENT INSTRUCTION
0.5 HOURS PRE/POST

LESSON OBJECTIVES:

- This lesson is to review all commercial multi engine flight maneuvers that are required for the end of course test. The instructor will insure the student has commercial pilot skills when performing all required maneuvers.

REVIEW:

MULTI-ENGINE OPERATIONS (ENGINE-OUT PROCEDURES)(IR – INSTRUMENT REFERENCE)

- Engine Failure during Takeoff prior to 50% of V_{MC} (Simulated)
- Engine Failure After Liftoff and in the Traffic Pattern (> 500' AGL Simulated)
- Maneuvering with inoperative engine(Simulated)
- Single engine maneuvering in pattern with landing
- Engine Failure in Flight by Reference to Instruments (IR) with an engine out instrument approach

INSTRUMENT PROCEDURES

- Holding Procedures
- Intercepting and Tracking DME Arc (If airplane so equipped)

BASIC INSTRUMENT MANEUVERS

- Straight-and-Level Flight
- Constant Airspeed Climbs
- Turns to Headings
- Recovery from Unusual Attitudes

APPROACHES 1 must be coupled if AP equipped, 1 must be circle to land, & 1 must be non-precision 1 must be single engine.

- Approach type _____ Airport _____
- Approach type _____ Airport _____
- Approach type _____ Airport _____
- Holding location _____
- Missed approach _____
- Straight in Landing single engine
- Circle to land Single engine
- Coupled Approach (if AP equipped)
- Instrument Approach—One Engine Inoperative (by Reference to Instruments)

EMERGENCY OPERATIONS

- EFIS Failure **OR** Vacuum Failure on Approach(IR)
- Electrical Malfunction
- Systems & Equipment Malfunctions
- Emergency Gear Extension (Simulated)

COMPLETION STANDARDS:

- During simulated engine failures, the applicant will be able to identify promptly the inoperative engine and demonstrate the correct shutdown, feathering and restart procedures.
- During emergency operation the student will identify the failure, perform the required checklist and decide the course of action required.
- The student will be able to maintain altitude ± 100 feet, headings $\pm 10^\circ$, airspeed ± 10 knots on the night flight while performing engine failure.

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

SIMULATOR LESSON 62

1.3 HOURS TOTAL FLIGHT TRAINER
OF WHICH:
1.3 HOURS DUAL GIVEN
1.3 HOURS INSTRUMENT
0.5 HOURS PRE/POST

Note: Use Redbird MEL for this lesson this lesson must be in a Simulator.

LESSON OBJECTIVES:

- This lesson will provide review and practice of single engine operations in a multi engine aircraft. This will be for the procedures for inflight engine loss as well as loss of engine on takeoff or shortly after takeoff.
- The Simulator time will be spent practicing recovering from various engine loss emergencies as well as practice with emergency descents.
- The student will review all memory checklist items and general operating procedures as it relates to multi engine flying.
- Reinforce sound aeronautical decision making and cockpit management in the IFR environment while dealing with various simulated emergency procedures.

REVIEW:

PREFLIGHT PREPERATION

- Weather Information
- Cross-Country Flight Planning
- Performance and Limitations
- Aeromedical Factors
- Risk Management
- CFIT Awareness
- Runway Incursion Awareness

EMERGENCY IMMEDIATE MEMORY ITEMS

STUDENT PRACTICE

- Engine Failure before rotation
- Engine cuts right after rotation
- Engine cut before 500 AGL
- Engine loss above 500' AGL below pattern
- Single Engine Go-Around
- Engine Fire at Altitude
- Full Shut down Feather and Restart
- Applying risk management tools to different flight scenarios
- Emergency Descent

EMERGENCY OPERATIONS

- Single Engine Approach
- Electrical Failure scenario
- Loss of engine emergencies
- Engine problem scenario
- System failure scenario

MULTI-ENGINE OPERATIONS (ENGINE-OUT

PROCEDURES)(IR – INSTRUMENT REFERENCE)

- Engine Failure during Takeoff prior to 50% of V_{MC} (Simulated)
- Engine Failure After Liftoff and in the Traffic Pattern (> 500' AGL Simulated)
- Maneuvering with inoperative engine(Simulated)
- Engine Failure in Flight by Reference to Instruments (IR) with an engine out instrument approach

NAVIGATION

- Situational Awareness
- Aeronautical Decision Making
- Single Pilot Resource Management

APPROACHES *Instructor discretion*

- Approach type _____ Airport _____
- Approach type _____ Airport _____
- Approach type _____ Airport _____
- Holding location _____
- Missed approach _____
- Instrument Approach—One Engine Inoperative (by Reference to Instruments) Required*****
- Straight in Landing single engine
- Circle to land Single engine

COMPLETION STANDARDS:

- Student will conduct a complete preflight briefing and will then be able to demonstrate application of those skills in the flight scenario given. Student will demonstrate good ADM skills and show the ability to think ahead to what is next while managing the aircraft.
- The student will demonstrate increased proficiency in aeronautical decision making and cockpit management concepts in the IFR environment.
- Student will have procedures for executing a single engine approach and expectation for a straight in to land and circle to land.
- How to adjust the procedures considering aircraft performance and selected airport for landing.

POST FLIGHT DISCUSSION AND PREVIEW OF NEXT LESSON

FLIGHT LESSON 63

1.5 HOURS TOTAL FLIGHT TIME
OF WHICH:
1.5 HOURS DUAL GIVEN
0.2 INSTRUMENT INSTRUCTION
0.5 HOURS PRE/POST

LESSON OBJECTIVES:

- This lesson is for the instructor to review any items that he/she determines needs further review prior to moving to end of course test. The instructor may pick any items at their discretion that need further review.

REVIEW:

- Preflight Preparation and Procedures
- Safety-Related Operations and Procedures
- Cross Country Flight Planning
- Post Flight Procedures

PERFORMANCE MANEUVER

- Steep Turns

SLOW FLIGHT AND STALLS

- Maneuvering during slow flight
- Power-Off Stall (Bank up to 20°)
- Power-On Stall (Bank up to 20°)
- Accelerated Stall
- Spin Awareness

TAKEOFFS, LANDINGS AND GO-AROUNDS

- Normal and/or Crosswind Takeoffs and Climbs
- Normal and/or Crosswind Approaches and Landings
- Short Field Takeoffs and Maximum Performance Climbs
- Short Field Approaches and Landings
- Go-Around/Rejected Landing(s)

EMERGENCY OPERATIONS

- Emergency Descent
- Engine Fire or Smoke in the Cockpit
- Systems & Equipment Malfunctions
- Emergency Equipment and Survival Gear
- Emergency Gear Extension
- EFIS Failure OR Vacuum Failure on Approach(IR)

MULTI-ENGINE OPERATIONS (ENGINE-OUT PROCEDURES)(IR – INSTRUMENT REFERENCE)

- Engine Failure during Takeoff prior to 50% of V_{MC} (Simulated)
- Engine Failure After Liftoff and in the Traffic Pattern (> 500' AGL Simulated)
- Maneuvering with inoperative engine(Simulated)
- Single engine maneuvering in pattern with landing
- V_{MC} Demonstration
- Engine Failure in Flight by Reference to Instruments (IR) with an engine out instrument approach

AIRPORT OPERATIONS

- Traffic Patterns
- Radio Communications & ATC Light Signals
- Airport Signs and Markings

BASIC INSTRUMENT MANEUVERS (IR – INSTRUMENT REFERENCE)

- Straight-and-Level Flight (IR)
- Constant Airspeed Climbs (IR)
- Constant Airspeed Descents (IR)
- Turns to Headings (IR)
- Recovery from Unusual Attitudes (IR)

NAVIGATION

- Pilotage and Dead Reckoning
- Diversion

INSTRUMENT APPROACHES (WITH ONE ENGINE INOPERATIVE)

- Precision or non-precision Approach

COMPLETION STANDARDS:

- At the completion of this lesson, the student will perform all the maneuvers and procedures listed for review at a proficiency level that meets criteria set forth in the multi-engine land sections of the current FAA Commercial Pilot Test Standards.
- By completing this lesson, the instructor believes the student is ready for end of course testing.

POST FLIGHT DISCUSSION AND PREPARATION FOR CHECK RIDE

PRE & POST GROUND LESSON 64

2.0 HOURS TOTAL GROUND INSTRUCTION

LESSON REFERENCES:

Pilot's Operating Handbook / Airplane Flight Manual (POH/AFM)

All Appropriate Sections

Aeronautical Information Manual

Chapter 3, Chapter 7, Chapter 8

LESSON OBJECTIVES:

- The Chief/Assistant Chief Flight Instructor shall assign the student to another instructor other than the students current instructor for this Stage to conduct lessons 64 and lesson 65 in preparation for the end of course Stage check. This lesson is a comprehensive review of all flight requirements for the end of course test. The instructor shall give the student a flight scenario that will challenge the student to create a VFR cross country to a location with a Commercial pilot operation simulation. The student will then execute the scenario taking in account the 4 fundamentals of risk Elements.

ACADEMIC CONTENT:

REVIEW:

PREFLIGHT PREPARATION

- Risk Management
- Runway Incursion Avoidance
- CFIT
- Certificates and Documents
- Airworthiness Requirements
- Weather Information
- Cross-Country Flight Planning
- National Airspace System
- Performance and Limitations
- Operation of Systems
- Principles of Flight—Engine Inoperative
- Aeromedical Factors

HIGH ALTITUDE OPERATIONS

- Supplemental Oxygen
- Pressurization

COMPLETION STANDARDS:

- The student will demonstrate commercial pilot knowledge and ability on all tasks and meet the commercial pilot Multi Engine Land FAA current test standards in the related tasks.

FLIGHT LESSON 65

2.0 HOURS TOTAL FLIGHT TIME
OF WHICH:
2.0 HOURS DUAL GIVEN
0.3 INSTRUMENT INSTRUCTION
0.5 HOURS PRE/POST

LESSON OBJECTIVES:

- This lesson is a Comprehensive review of all flight requirements for the end of course test. The instructor shall give the student a flight scenario that will challenge the student to create a VFR cross country to a location with a Commercial pilot operation simulation. The student will then execute the scenario taking in account the 4 fundamentals of risk.
- The student will end the flight with an instrument approach single engine which the instructor must work into their plan of action so it becomes part of the scenario given.

REVIEW:

PREFLIGHT PROCEDURES

- Preflight Inspection
- Cockpit Management
- Engine Starting
- Taxiing
- Before Takeoff Check

AIRPORT OPERATIONS

- Radio Communications and ATC Light Signals
- Traffic Patterns
- Airport Runway, and Taxiway Signs, Markings, and Lighting

TAKEOFFS, LANDINGS, AND GO-AROUNDS

- Normal and Crosswind Takeoff and Climb
- Normal and Crosswind Approach and Landing
- Short-Field Takeoff
- Maximum Performance Climb
- Short-Field Approach and Landing
- Go-Around/Rejected Landing

NAVIGATION

- Pilotage and Dead Reckoning
- Navigation Systems and Radar Services
- Diversion
- Lost Procedures

PERFORMANCE MANEUVER

- Steep Turns

SLOW FLIGHT AND STALLS

- Maneuvering During Slow Flight
- Power-Off Stalls
- Power-On Stalls
- Accelerated Stalls
- Spin Awareness

EMERGENCY OPERATIONS

- Emergency Descent
- Engine Failure During Takeoff Before V_{MC} (Simulated)
- Engine Failure After Lift-Off (Simulated)
- Approach and Landing with an Inoperative Engine (Simulated)
- Systems and Equipment Malfunctions
- Emergency Equipment and Survival Gear

MULTI-ENGINE OPERATIONS (ENGINE-OUT PROCEDURES)(IR – INSTRUMENT REFERENCE)

- Engine Failure during Takeoff prior to 50% of V_{MC} (Simulated)
- Engine Failure After Liftoff and in the Traffic Pattern (> 500' AGL Simulated)
- Maneuvering with inoperative engine(Simulated) with Landing
- Full Engine Shutdown and Air-start
- V_{MC} Demonstration
- Engine Failure in Flight by Reference to Instruments (IR) with an engine out instrument approach

POSTFLIGHT PROCEDURES

- After Landing, Parking, and Securing

COMPLETION STANDARDS:

- At the completion of this lesson, the student will perform all the maneuvers and procedures listed for review at a proficiency level that meets criteria set forth in the multi-engine land sections of the current FAA Commercial Pilot Test Standards.

POST FLIGHT DISCUSSION AND PREPARATION FOR CHECK RIDE

STAGE CHECK - FLIGHT 66

STAGE CHECK 3

2.0 HOURS TOTAL FLIGHT TIME
OF WHICH:
2.0 HOURS DUAL GIVEN
0.3 INSTRUMENT INSTRUCTION
2.5 HOURS PRE/POST

LESSON OBJECTIVES:

- The Chief Flight Instructor, Assistant Chief Flight Instructor or a Check Instructor authorized to perform end of course exams will evaluate the student's proficiency in the proper execution of the maneuvers and procedures listed below. This will be conducted using a flight scenario and following the practices of the current FAA Test guide for Commercial Multi Engine land pilot exams.

PREFLIGHT PREPARATION

- Risk Management
- Runway Incursion Avoidance
- CFIT
- Certificates and Documents
- Airworthiness Requirements
- Weather Information
- Cross-Country Flight Planning
- National Airspace System
- Performance and Limitations
- Operation of Systems
- Principles of Flight—Engine Inoperative
- Aeromedical Factors

HIGH ALTITUDE OPERATIONS

- Supplemental Oxygen
- Pressurization

PREFLIGHT PROCEDURES

- Preflight Inspection
- Cockpit Management
- Engine Starting
- Taxiing
- Before Takeoff Check

AIRPORT OPERATIONS

- Radio Communications and ATC Light Signals
- Traffic Patterns
- Airport Runway, and Taxiway Signs, Markings, and Lighting

TAKEOFFS, LANDINGS, AND GO-AROUNDS

- Normal and Crosswind Takeoff and Climb
- Normal and Crosswind Approach and Landing
- Short-Field Takeoff
- Maximum Performance Climb
- Short-Field Approach and Landing
- Go-Around/Rejected Landing

NAVIGATION

- Pilotage and Dead Reckoning
- Navigation Systems and Radar Services
- Diversion
- Lost Procedures

PERFORMANCE MANEUVER

- Steep Turns

SLOW FLIGHT AND STALLS

- Maneuvering During Slow Flight
- Power-Off Stalls
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- Spin Awareness

EMERGENCY OPERATIONS

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MULTI-ENGINE OPERATIONS (ENGINE-OUT PROCEDURES)_(IR – INSTRUMENT REFERENCE)

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- Engine Failure After Liftoff and in the Traffic Pattern (> 500' AGL Simulated)
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- Full Engine Shutdown and Air-start
- V_{MC} Demonstration
- Engine Failure in Flight by Reference to Instruments (IR) with an engine out instrument approach

POSTFLIGHT PROCEDURES

- After Landing, Parking, and Securing

COMPLETION STANDARDS:

- At the completion of this lesson, the student will perform all the maneuvers and procedures listed for review at a proficiency level that meets the criteria set forth in the multi-engine land sections of the current FAA Commercial Pilot Test Standards.

POST FLIGHT DISCUSSION

FLIGHT LESSONS COMPLETION RECORD

RECORD OF FLIGHT TIME:

	TOTAL TIME	SOLO	DUAL	ME COMPLEX	Single Engine	Flight Trainer	FLIGHT CONDITIONS			LANDINGS		
							X-C	DAY	NIGHT	INST.	DAY	NIGHT
TOTAL TIME												
TOTAL TIME REQUIREMENTS	120.0	42	**78	38	70	*12.00	#65	2.0	13.0	31		10

Total time must be >= 120 hours at the end of the final stage check. Total Time = ME complex + SE + FT

* Flight trainer may be reduced to zero hours provided an aircraft is substituted in the place of the flight trainer.

**Dual may be reduced to no less than 64.0 hours provided solo flight time increases the same amount so DUAL + SOLO = at least 120 hours.

Cross country flight time may be reduced to no less than 44 hours provided "specific course requirements" are met below.

SPECIFIC COURSE REQUIREMENTS:

- Cross-Country Flight Requirements:
 14 CFR Part 141, Appendix D, Section 4(2)(iii) and (iv) and 14 CFR Part 141, Appendix D, Section 5 (2)

FLIGHT LESSON	DATE	ROUTE OF FLIGHT	Distance	REQUIREMENTS	Instructor's Signature
46				Dual Cross-country flight of at least 2-hour duration, a total straight line distance of 100 nautical miles from the original point of departure, and occurring in day conditions.	
47				Dual Cross-country flight of at least 2-hour duration, a total straight line distance of 100 nautical miles from the original point of departure, and occurring in night conditions.	
55				Student performing duties of PIC Cross-country flight with landings at a minimum of three points and one segment distance of the flight consisting of a straight line distance of at least 250 nautical miles.	

- Student performing duties of PIC under the supervision of an authorized instructor on board:
 14 CFR Part 141, Appendix D, Section 5(b)

FLIGHT LESSON	DATE	ROUTE OF FLIGHT		PERFORM DUTIES OF PIC ME	FLIGHT CONDITIONS			LANDINGS		Instructor's Signature
		from	to		X-C	DAY	NIGHT	DAY	NIGHT	
55										
56										
57										
TOTAL TIME										
TOTAL TIME REQUIREMENTS				10.0	5.0	-	5.0	-	10	

END OF COURSE STAGE CHECK OR FAA Practical Test

Date

Examiner

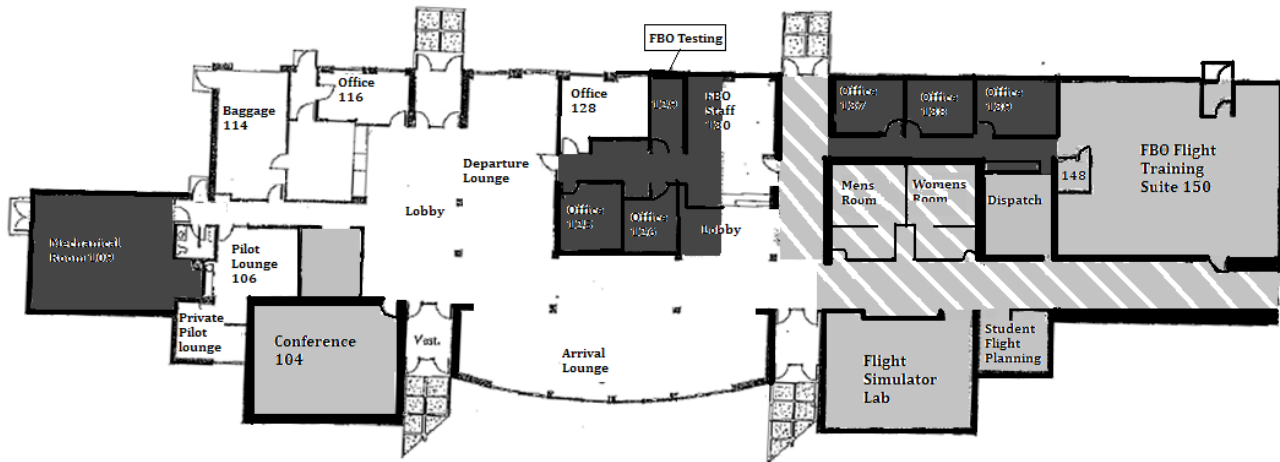
Result (1st Attempt)

Remarks: _____

APPENDIX A

<u>ITEM</u>	<u>Labels</u>	<u>PAGE</u>
Diagram 1	North Star Aviation Training Facility	123
Diagram 2	Minnesota State University Armstrong Hall 3 rd Floor Diagram	124
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DIAGRAM - 1



Legend

- City of Mankato and public Area
- North Star Aviation Area
- Shared Area
- Flight Training Area



Area configurations:

The Corridors, washrooms, and the mechanical room divided up equally between the City of Mankato and North Star Aviation. Each space was calculated by three area configuration options.

- area calculated from outside of exterior wall to outside of exterior wall.
- area calculated from outside of exterior wall to center line of interior wall.
- area calculated from center line of interior wall to center line of interior wall.

City of Mankato and public space including shared Areas with North Star Aviation =	8,703 Sq Ft
North Star Aviation areas including Areas shared with City of Mankato and the public =	6,597 Sq Ft
Total building area =	15,300 Sq Ft

DIAGRAM -2

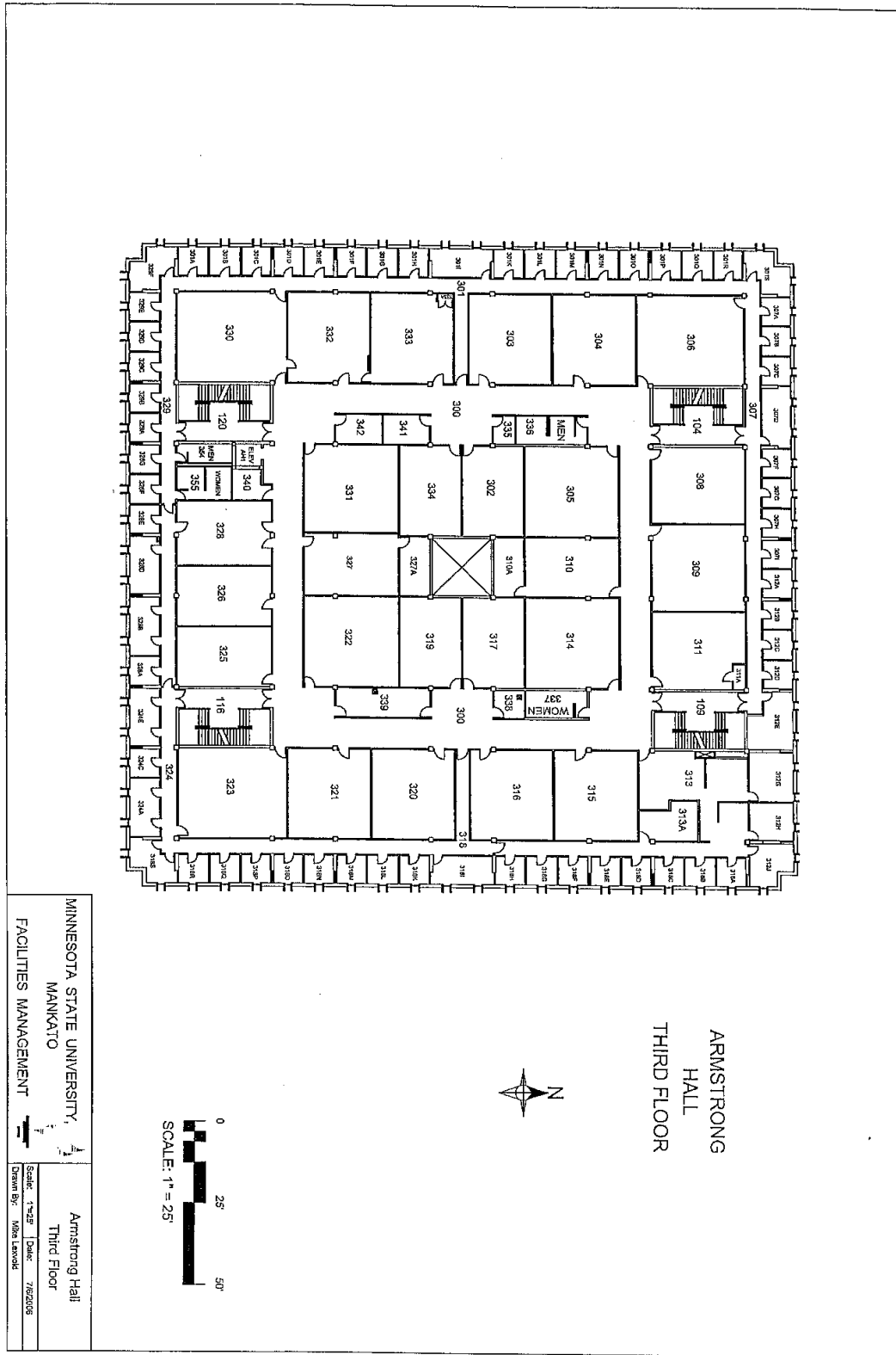


Diagram 2

DIAGRAM-3

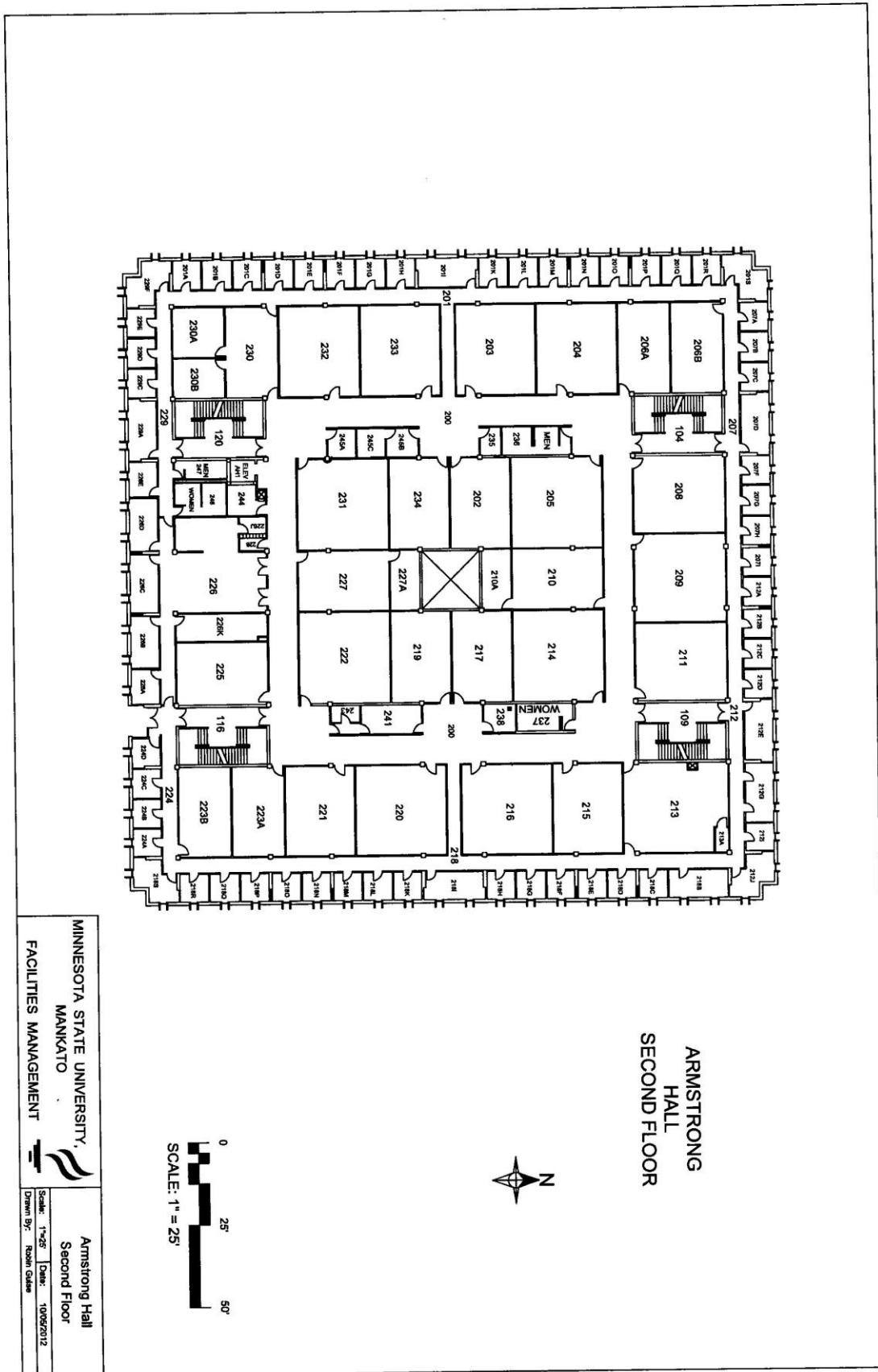


DIAGRAM-4

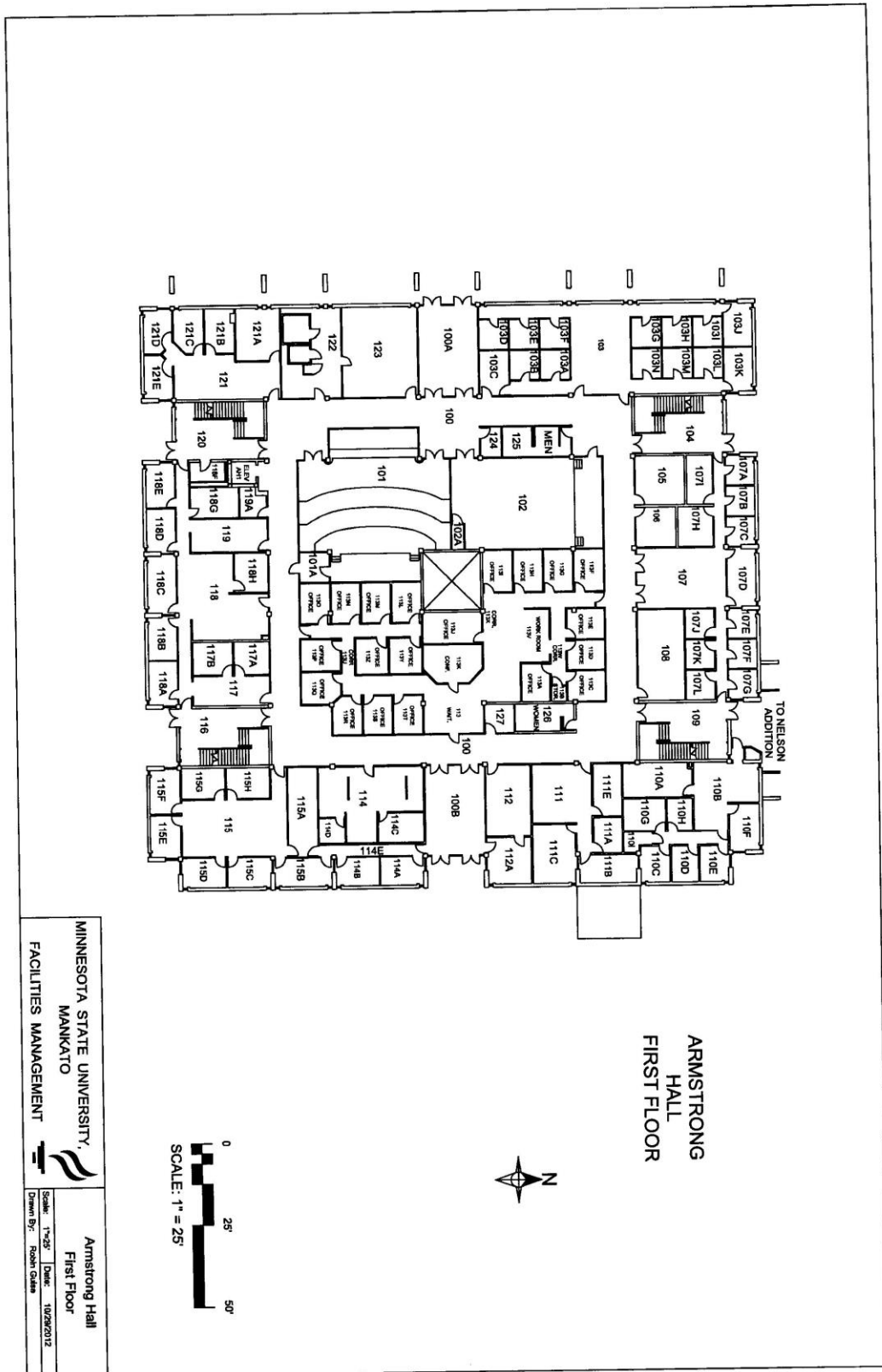


DIAGRAM – 5



U.S. Department
of Transportation
**Federal Aviation
Administration**

800 Independence Ave., SW
Washington DC 20591

DEC 19 2014

Mr. Jerome N. Gregoire
Redbird Flight Simulations
2301 East St. Elmo Rd., Suite 100
Austin, Texas 78744

Dear Mr. Gregoire:

The Federal Aviation Administration (FAA) last qualified and approved your airplane LD, SD, FMX, and MCX device as an Advanced Aviation Training Device (AATD) on February 14, 2013 in accordance with Title 14 Code of Federal Regulations (14 CFR) section (§) 61.4(c). This training device was found to meet the criteria for an AATD as described in FAA Advisory Circular AC 61-136.

Starting January 1, 2015, the FAA requires all Letters of Authorization (LOA) to contain the correct training allowances to remain valid. Based on the previous approval and review of the qualification and approval guide dated February 7, 2013, the FAA has determined that this device continues to meet the current standards for approval. The Redbird model LD, SD, FMX, and MCX is authorized for use in satisfying the following sections of Title 14 of the Code of Federal Regulations parts 61 and 141:

**Redbird Model LD, SD, FMX, MCX version 4.4
Airplane Single and Multi-Engine Land
Advanced Aviation Training Device (AATD)**

- § 61.51(b)(3) – Logbook entries;
- § 61.51 (h) – Logging training time;
- § 61.57(c) – Instrument experience;
- § 61.57(c)(4)(iii) – Instrument experience;
- § 61.57(c)(5)(ii) – Instrument experience;
- § 61.57(d)(1)(ii) – Instrument proficiency check, per the Instrument PTS;
- § 61.65(i) – Instrument rating;
- § 61.109(k)(1) – Private Pilot Certificate Aeronautical experience: up to 2.5 hours;
- § 61.129(i)(1)(i) – Commercial Pilot Certificate: up to 50 hours;
- § 61.159(a)(3)(i) – Airline Transport Pilot Certificate: up to 25 hours; and
- § 141.41(b) – Approved for use under the part 141 appendices as follows:
 - *Appendix B* – Up to 15% toward the total Private Pilot flight training time requirements;

- *Appendix C* – As allowed under 4(b) toward the total instrument flight training time requirements;
- *Appendix D* – Up to 20% toward the total Commercial Pilot flight training time requirements;
- *Appendix E* – Up to 25% toward the total Airline Transport Pilot flight training time requirements;
- *Appendix F* – Up to 5% toward the total Flight Instructor flight training time requirements;
- *Appendix G* – Up to 5% toward the total Flight Instructor instrument flight training time requirements;
- *Appendix I, Private Pilot Airplane Single Engine or Multiengine Class Rating Course* – Up to 3 hours toward the flight training time requirements;
- *Appendix I, Commercial Pilot Airplane Single Engine or Multiengine Class Rating Course* – Up to 11 hours toward the required flight training time requirements;
- *Appendix I, Airline Transport Pilot Airplane Multiengine Class Rating Course* – Up to 6.25 hours toward the flight training time; and
- *Appendix M, Combined Private Pilot Certification and Instrument Rating* – Up to 25% toward the total flight training time requirements

Note: Training or experience requirements such as cross country, night, solo, takeoffs and landings, or the 3 hours of training within 2 calendar months of the practical test must be accomplished in an aircraft. Private Pilot Airplane applicants must also complete the requirement for 3 hours of control and maneuvering of an airplane solely by reference to instruments specified in §61.109 in an airplane. Additionally, practical tests cannot be conducted in an AATD.

Exemption Notice: This device qualifies for the exemption from 14 CFR section 61.65(i) and part 141 Appendix C under the terms and conditions described in the FAA Notice of Policy Change for the Use of FAA Approved Training Devices in the Federal Register (Docket No.: FAA-2013-0809). This exemption allows pilots applying for an instrument rating to credit up to 20 hours of time obtained in this device toward the aeronautical experience requirements in § 61.65(d)(2). In addition, this exemption allows training providers with a training course outline approved under part 141 Appendix C, to continue to train under that program with up to a 40% credit of the training time requirement obtained in this device. This exemption will expire as noted in the Federal Register policy notice.

This approval is contingent upon the following:

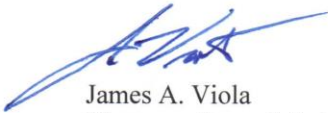
- 1) This aviation training device must continue to maintain its performance and function without degradation. The minimum instrument requirements specified under 14 CFR part 91, § 91.205 for day visual flights rules (VFR) and instrument flight rules (IFR) must be functional during the training session;

- 2) Only the configurations that are in the FAA approved Qualification and Approval Guide are utilized during training;
- 3) A copy of this authorization and approval letter must be readily available in a location near the device when in use. Additionally, a copy of this authorization must be provided to the person using the above credits for pilot certification or ratings;
- 4) An authorized instructor must provide and certify the above instructional use;
- 5) Any changes or modifications to this aviation training device which have not been reviewed, evaluated, and approved by AFS-800 will terminate this letter of approval; and
- 6) The FAA reserves the right to revoke this authorization at any time if the Administrator determines that this training device is used contrary to FAA regulation, guidance, or safety.

This approval is valid for sixty (60) calendar months from the date of this letter and supersedes any previous approvals for this training device. Renewal requests should be made prior to the expiration (90 days in advance) by letter to AFS-800 and the above contingencies (1) through (6) must remain valid. At the time of application AFS-800 will conduct (at a minimum) a review of the QAG, to verify compliance with the current AC 61-136 for their approval and use, before a new Letter of Authorization (LOA) can be provided.

This authorization expires on 11/30/2019

Sincerely,



James A. Viola
Manager, General Aviation and Commercial Division
Flight Standards Service

DIAGRAM – 6 Enrollment Certificate

This is to certify that

is enrolled in the Federal Aviation Administration approved Commercial Pilot
Airplane Multi-Engine Land conducted by North Star Aviation Inc.

Date of Enrollment

X _____
Chief Flight Instructor

Revision: Original

DIAGRAM – 7 GRADUATION CERTIFICATE


DEPARTMENT OF AVIATION
MINNESOTA STATE UNIVERSITY, MANKATO


NORTH STAR
AVIATION

Commercial Pilot Airplane Multi Engine Land Graduation Certificate

I certify that the above named candidate has successfully completed all the Federal Aviation Administration stage checks, tests, course requirements and has completed the cross country training specified in FAR 141 Appendix D, Paragraph 4 (2) and cross country training while performing the duties of the pilot in command in a multi-engine airplane with an authorized instructor on board specified in FAR 141 Appendix D, Paragraph 5 (b) (2). I certify that North Star Aviation Inc. has trained the individual in accordance with our approved Flight Training School Syllabus for the Commercial Pilot Airplane Multi Engine Land course and I certify this information to be true and correct.

Chief Flight Instructor

NUTS21L
Flight School Certificate

Date of Graduation

DIAGRAM - 8

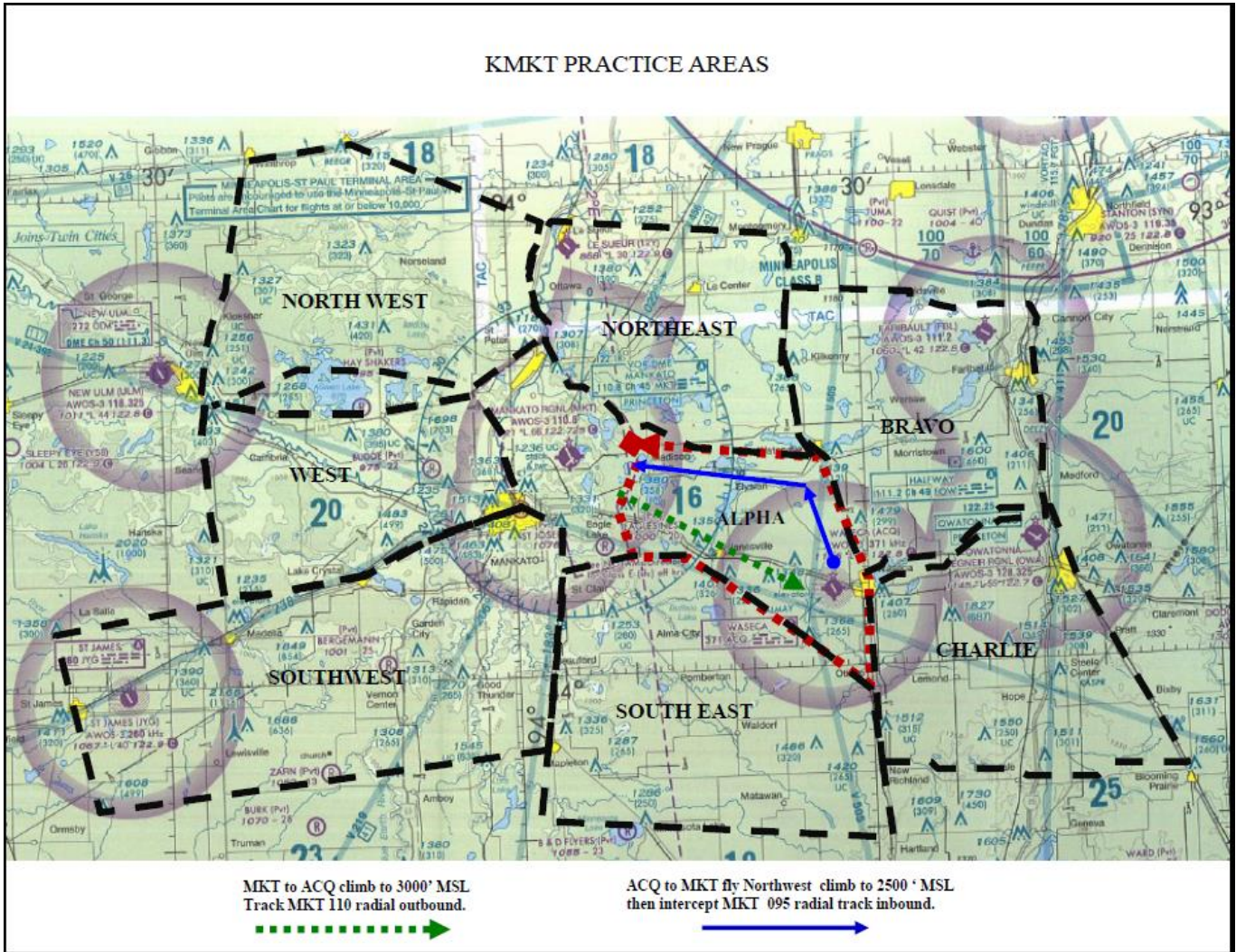


DIAGRAM – 9 Sample Dispatch Release



Dispatch Ticket
 generated by Jeppesen SkyManager for
 North Star Aviation

Date/Time	12/13/2013 10:00 AM	Aircraft	PA28 N281MK
Student	smsupport	Instructor	Robbie Johnson
Hobbs Out	104.0	Fuel	
Hobbs In		Oil	
Tach Out	123.0	Landings	
Tach In			

Comments

Squawks

Student Signature and Date

Instructor Signature, Number, Date

Annual		Pitot/Static	
ELT		Transponder	
50 Hour		100 Hour	

METAR (unofficial) KMKT 131555Z AUTO 08012KT 10SM CLR
 M09/M12 A3013 RMK AO1

TAF (unofficial) KMSP 131422Z 1314/1418 05011KT P6SM BKN025
 OVC040 FM140400 04007KT 3SM -SN SCT015 OVC025
 FM141400 36005KT 5SM -SN SCT012 OVC020

	No Instr App	No Ldg	Alrplane SEL	Alrplane MEL	Cross Country	Day	Night
Previous	1234.0	9.0					23.0

	Actual Instrument	Simulated Instrument	Simulator	Dual Received	Dual Given	Pilot In Command	Total Duration
Current							
Total							
Previous	3.0	2.0	1.0		234.0		9.0
Current							
Total							