UNIVERSITY OF OKLAHOMA TURBINE PILOT (4313)
FLIGHT TRAINING SYLLABUS 2025-AUG-15

PREREQUISITES FOR ENROLLMENT IN THE GROUND AND FLIGHT PORTION OF THE TURBINE TRANSITION PILOT COURSE: There are no prerequisites for enrollment in the ground training part of this course. You must possess an FAA medical certificate that is valid for at least third class privileges. You must possess an FAA commercial pilot certificate with at least airplane multiengine land and Instrument airplane ratings.

COURSE OBJECTIVE: You will obtain the knowledge to understand turbine aircraft systems in general. You will also obtain the knowledge, and skill to operate the BE90.

COURSE POLICY: At the discretion of the instructor, students who progress rapidly within a specific stage, may within reasonable variances, continue to the next lesson with less time than is specified in the specific lesson curriculum, provided all content and completion standards are satisfactorily completed. The time stated in the lesson is the approximate minimum time that a student would need to meet the lesson objectives and completion standards; not absolute required times. The lesson time could be slightly more or slightly less. These reduced hours must be included in other lessons to complete the total ground and/or flight time specified by category in the syllabus to satisfactorily complete the course.

At no time will a student be allowed to continue to the next stage without having successfully completed all of the lessons and the required tests or stage checks related to the completion of the previous stage. Flight training for this course will be done in accordance with the F.A.A approved syllabus. Deviations from the syllabus due to student training requirements, weather related factors, or other items as necessary will be allowed as long as a notation is made in the student training record as to the lesson covered and the reason for the deviation.

- The deviation is approved by the Chief/Asst Chief Flight Instructor.
- A notation will be made in the student's training record as to the lesson covered and the reason for the deviation.
- The student will complete all syllabus requirements before a graduation certificate is issued.

To satisfactorily complete the course of training, the student must meet all course objectives and completion standards.

EXPECTED ACCOMPLISHMENTS & STANDARDS: At the satisfactory completion of ground and flight training you will be able to pass the end of course stage check.

CHECKS & TESTS: The ground training portion of the syllabus contains four stages. Each stage has an end of stage quiz which covers the content of that stage. Ground training must be completed before the completion of flight training. The final lesson of flight training will be an end of course stage check. The contents of the stage check are listed on the lesson plan. This test will be administered by the Chief, Assistant Chief Flight Instructor approved by the FSDO.

GROUND LESSON TIME ALLOCATION TABLE			
Lesson	**Assignments**	**GI**	**EXAM**
STAGE I			
1	• TPFM Chapter 3; KASM, Chapter 7	3.0	
2	• TPFM Chapter 3; KASM, Chapter 7	3.0	
3	• TPFM Chapter 4; KASM, Chapter 2 ;KAPOH, Sections 4 & 5	3.0	
4	• Review & EXAM		1.0
STAGE II			
5	• TPFM Chapter 4; KASM, Chapter 9	1.5	
6	• TPFM Chapter 5; KASM, Chapter 15	1.5	
7	• AIM, Chapter 8; TPFM, Chapter 5; KASM, Chapters 11, 12 & 16; KAPOH, Sections 4 & 5	3.0	
8	• TPFM, Chapter 5; KASM, Chapter 5; KAPOH, Sections 4 & 5	1.5	
9	• Review & EXAM		1.0
STAGE III			
10	• TPFM, Chapter 6; KASM, Chapter 10; KAPOH, Sections 4 & 5	1.5	
11	• TPFM, Chapter 6; KASM, Chapter 4 & 14; KAPOH, Sections 4 & 5	1.5	
12	• TPFM, Chapter 7 & 10; KAPOH, Sections 2 & 5	3.0	
13	• TPFM, Chapter 11; KAPOH, Sections 6	1.5	
14	• Review & EXAM		1.0
STAGE IV			
15	• TPFM, Chapter 14; KASM, Chapter 16; KAPOH, Avionics Supplement	1.5	
16	• TPFM, Chapter 13; KASM, Chapter 16; KAPOH, Avionics Supplement	3.0	
17	• TPFM, Chapter 9; KAPOH, Sections 3 & 4	1.5	
18	• TPFM, Chapter 15	1.5	
19	• TPFM, Chapter 16	1.5	
20	• Review & EXAM		1.0
Totals		33.0	4.0

Note: The readings referred to in this syllabus are based on The Turbine Pilots Flight Manual (TPFM), King Air Systems Manual (KASM), King Air POH (KAPOH) and the Aeronautical Information Manual (AIM). The hours designated for each lesson are suggested guidelines only, and may vary at the instructor's discretion. In no case will the total hours of instruction be less than the total number of hours defined in this syllabus.

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STAGE I

STAGE OBJECTIVE

During this stage, the student will be introduced to the various types of gas generators, turbofans, and turboprops, along with the different types of thrust reversers. Additionally, the student will obtain knowledge of the various propeller systems. The student will also become familiar with the various types of electrical systems. The student will also become knowledgeable about the BE90 engines, propeller system and electrical system.

STAGE COMPLETION STANDARD

This stage is complete when the student has taken the Stage I written exam with a minimum passing score of 70%, and the instructor has reviewed each incorrect response to ensure complete understanding before the student progresses to Stage II.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									3.0

TURBINE GROUND LESSON 1 **LECTURE-IN-CLASS**

TEXT REFERENCE: TPFM Chapter 3; KASM, Chapter 7

LESSON OBJECTIVE:

During this lesson, the student is introduced to gas generators, turbofans, and turboprops, along with the various types of thrust reversers. The student is also introduced to the BE90 turboprop engine.

CONTENT:

Lesson Introduction

- ☐ Gas Turbine Engines
  - ☐ Gas generators
  - ☐ Compressors
  - ☐ Turbines
- ☐ Compressors
  - ☐ Centrifugal flow
  - ☐ Axial flow
- ☐ Multi Stage/Multi Spool Engines
  - ☐ Low pressure turbines
  - ☐ N1 Shaft≅
  - ☐ High pressure turbine
  - ☐ N2 Shaft≅
- ☐ Turbojet Engines
  - ☐ Principles of operations
  - ☐ Advantages
  - ☐ Disadvantages
- ☐ Turbofan Engines
  - ☐ Principles of operations
  - ☐ Advantages
  - ☐ Disadvantages
- ☐ Turboprop Engines
  - ☐ principles of operation
  - ☐ direct-drive turboprop
  - ☐ free-turbine turboprop
- ☐ Engine Operating Parameters
  - ☐ engine pressure ratios (EPR)
  - ☐ exhaust gas temperatures (EGT)
  - ☐ interstage turbine temperatures (ITT)
- ☐ Turbine Engine Starting
  - ☐ hot start
  - ☐ igniters
- ☐ Thrust Reversers
  - ☐ Purpose
  - ☐ types used on jets
  - ☐ Clamshell cascade
  - ☐ petal door
  - ☐ reverse thrust on turboprops
  - ☐ use of reversers
- ☐ BE90 Engines
  - ☐ Gas Generation Module
  - ☐ Power Module
  - ☐ Engine Gauges
  - ☐ Engine Controls
  - ☐ Engine Limitations
  - ☐ Starting Procedures

COMPLETION STANDARDS:

The student will exhibit knowledge of turbine engines in general and BE90 engines in particular through guided discussion before progressing to lesson 2.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									3.0

TURBINE GROUND LESSON 2 **LECTURE-IN-CLASS**

TEXT REFERENCE: TPFM Chapter 3; KASM, Chapter 7

LESSON OBJECTIVE:

During this lesson, the student learns the various types of propeller systems found on turbine aircraft. Additionally, the student will become thoroughly familiar with the propeller system found on the BE90. The student will also review basic multi-engine aerodynamics including critical engine concepts and V-speeds.

CONTENT:

Lesson Introduction

- ☐ Multi-engine Aerodynamics Review
  - ☐ Critical Engine
  - ☐ Vmc and Factors Affecting Vmc
  - ☐ Vyse and Factors Affecting Vyse
  - ☐ Impact on Performance When Shutting Down an Engine
- ☐ Turboprop Propeller Systems
  - ☐ Propeller Controls and Governors
    - ☐ primary governor
    - ☐ overspeed governor
    - ☐ fuel topping governor
    - ☐ Beta governor
  - ☐ Propeller Auto-Feather System
  - ☐ Propeller Synchrophasers
- ☐ BE90 Propeller System
  - ☐ Propeller Controls
  - ☐ Governor Systems
  - ☐ Auto-Feather System
  - ☐ Synchophaser System
  - ☐ Propeller System Checklists

COMPLETION STANDARDS:

The student will exhibit thorough knowledge of multi-engine aerodynamics, the various types of propeller systems and terminology as well as the BE90 propeller system through guided discussion before continuing to the next lesson.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									3.0

TURBINE GROUND LESSON 3 **LECTURE-IN-CLASS**

TEXT REFERENCE: TPFM Chapter 4; KASM, Chapter 2 ;KAPOH, Sections 4 & 5

LESSON OBJECTIVE:

During this lesson, the student will learn the basic principles of powered aircraft systems, basic electrical system concepts and the electrical system of the BE90.

CONTENT:

Lesson Introduction

- ☐ Basics of Aircraft Power Systems (Source, Supply, Storage, Transmission, Output Devices, Directional Control and Regulation)
- ☐ Electrical Power Sources
  - ☐ Generator
  - ☐ Direct Current(DC) vs. Alternating Current(AC)
  - ☐ Battery - Ni-cad vs. Lead Acid
- ☐ Transmission and Grounding
- ☐ Control Devices
  - ☐ Generator Control Units (GCU)
  - ☐ Relays
  - ☐ Solenoid
- ☐ Electrical Conversion Devices
  - ☐ Transformer-Rectifier Units (TRU)
  - ☐ Inverters
- ☐ Electrical Faults
- ☐ Shorts
- ☐ Opens
- ☐ Logic
- ☐ Circuit Protection Devices
  - ☐ Circuit Breakers
  - ☐ Current Limiters and Fuses
  - ☐ Diodes
  - ☐ Hall Effect Devices
- ☐ Bus Bar Systems
  - ☐ Battery Bus
  - ☐ Hot Bus
  - ☐ AC and DC Busses
  - ☐ Bus Ties and Bus Isolation
- ☐ BE90 Electrical System
  - ☐ Battery
- ☐ Starter/Generator
- ☐ Bus Bar System
- ☐ Circuit Breakers
- ☐ Controls and Gauges
- ☐ Electrical System Checklists

COMPLETION STANDARDS:

The student will demonstrate thorough knowledge of the basic concepts of aircraft power systems, electrical systems in general and the BE90 electrical system through a guided discussion before progressing to the next lesson.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									1.0

TURBINE GROUND LESSON 4 **EXAM IN-CLASS**

TEXT REFERENCE: TPFM Chapter 4; KASM, Chapter 2 ;KAPOH, Sections 4 & 5

LESSON OBJECTIVE:

This exam evaluates the student's comprehension of the material presented in Stage I

CONTENT:

- ☐ Stage I Exam

COMPLETION STANDARDS:

This lesson and stage are complete when the student has completed the exam with a minimum passing score of 70%, and the instructor has reviewed the exam with the student to ensure complete understanding before progressing to the next stage.

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STAGE II

STAGE OBJECTIVE

During this stage, the student will be introduced to the various hydraulic systems, control inputs, and pressurization and fuel systems found with turbine aircraft. The student will also receive thorough knowledge of the related systems for the BE90.

STAGE COMPLETION STANDARD

This stage is complete when the student has taken the Stage II written exam with a minimum passing score of 70%, and the instructor has reviewed each incorrect response to ensure complete understanding before the student progresses to Stage III.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									1.5

TURBINE GROUND LESSON 5 **LECTURE-IN-CLASS**

TEXT REFERENCE: TPFM Chapter 4; KASM, Chapter 9

LESSON OBJECTIVE:

During this lesson, the student is introduced to turbine aircraft hydraulic systems as well as the various pneumatic systems. The student will also receive a thorough understanding of the related systems in the BE90.

CONTENT:

Lesson Introduction

- ☐ Hydraulic Power Systems
  - ☐ Hydraulic Pumps
  - ☐ Hydraulic Motors
  - ☐ Hydraulic Cylinders
  - ☐ Hydraulic Lines
  - ☐ Valves
  - ☐ Reservoirs
  - ☐ Hydraulic Accumulators
- ☐ Pneumatic Power Systems
  - ☐ High-Pressure Bleed Air
  - ☐ Pressure Regulator
  - ☐ Low-Pressure Air
  - ☐ Equipment that uses low pressure air
- ☐ Auxiliary Power Units
  - ☐ BE90 Hydraulic Systems
  - ☐ Landing Gear
  - ☐ Brakes BE90 Pneumatic System
  - ☐ Bleed Air
  - ☐ Vacuum Ejector
  - ☐ Instruments
  - ☐ Door Seal
  - ☐ Wing Deice
  - ☐ Ruder Boost

COMPLETION STANDARDS:

The student will exhibit knowledge of the hydraulic and pneumatic systems and Auxiliary Power Units as well as the BE90 hydraulic and pneumatic systems through a guided discussion before continuing to the next lesson.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									1.5

TURBINE GROUND LESSON 6 **LECTURE-IN-CLASS**

TEXT REFERENCE: TPFM Chapter 5; KASM, Chapter 15

LESSON OBJECTIVE:

During this lesson, the student will be introduced to the various flight control systems found with turbine aircraft. Additionally, the student will become familiar with the flight control systems in the BE90.

CONTENT:

Lesson Introduction

- ☐ Control Surfaces
  - ☐ Flaps and Leading Edge Devices
  - ☐ Ailerons
  - ☐ Roll Spoilers
  - ☐ Ground Spoilers and Lift Dump Mechanisms
  - ☐ Flight Spoilers and Speed Brakes
  - ☐ Control Tabs Flight Control Redundancy Flight Control Actuation
  - ☐ Manual
  - ☐ Hydraulic
  - ☐ Fly-By-Wire
- ☐ Flight Control Position Indicating Systems
- ☐ Computer Interface
- ☐ BE90 Primary Flight Controls and Actuation
  - ☐ Rudder
  - ☐ Elevator
  - ☐ Ailerons
- ☐ BE90 Secondary Flight Controls and Actuation
  - ☐ Trim (Elevator, Rudder, Ailerons)
  - ☐ Flaps
  - ☐ Rudder Boost

COMPLETION STANDARDS:

The student will exhibit knowledge of the different control surfaces found with turbine aircraft and the flight control systems of the BE90 through a guided discussion before progressing to the next lesson.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									3.0

TURBINE GROUND LESSON 7 **LECTURE-IN-CLASS**

TEXT REFERENCE:
AIM, Chapter 8; TPFM, Chapter 5; KASM, Chapters 11, 12 & 16; KAPOH, Sections 4 & 5

LESSON OBJECTIVE:

In this lesson, the student will be introduced to high altitude physiology, pressurization and environmental systems found with turbine aircraft. In addition, the student will learn the specific pressurization and environmental control systems on the BE90.

CONTENT:

Lesson Introduction

- ☐ High Altitude Physiology
  - ☐ Environment at High Altitude (Pressure and Temperature)
  - ☐ Respiration
  - ☐ Effects of Prolonged Use of Supplemental Oxygen
  - ☐ Hypoxia (Causes, Symptoms, Effect On the Body, Time Of Useful Consciousness, Corrective Actions)
  - ☐ Trapped Gas (Causes, Symptoms, Effect On the Body, Corrective Actions)
  - ☐ Evolved Gas (Causes, Symptoms, Effect On the Body, Corrective Actions)
- ☐ Pressurization
  - ☐ Components (Pressure Vessel, Air Source, Exhaust Valve, Safety Valve)
  - ☐ Indicators (Cabin Altitude, Cabin Rate of Climb, Pressure Differential)
  - ☐ High Cabin Altitude Warming System and Indicator
  - ☐ Pressure Controller Operation (Altitude and Rate of Climb)
  - ☐ Emergency Situations, Rapid Decompression
- ☐ Environmental Systems
  - ☐ Heat Exchangers
  - ☐ Air Cycle Machines (ACM)
  - ☐ Vapor Cycle Machines (VCM)
- ☐ BE90 Pressurization and Environmental Systems
  - ☐ Air Sources (Bleed Air and Ram Air)
  - ☐ Basic Plumbing (Heat Exchangers, VCM and Electric Heating Unit)
  - ☐ Operation of Pressure Controller
  - ☐ Operation of Environmental Controls (Automatic Mode Control, Manual Mode Control, Bleed Air Control, Vent Blower Control, Pilot/Copilot Air and Defrost Control Knobs)
  - ☐ System Checks
  - ☐ Supplemental Oxygen System

COMPLETION STANDARDS:

The student will exhibit knowledge of high altitude physiology, pressurization and environmental systems of turbine aircraft as well as the pressurization and environmental systems of the BE90 through a guided discussion before continuing to the next lesson.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									1.5

TURBINE GROUND LESSON 8 **LECTURE-IN-CLASS**

TEXT REFERENCE: TPFM, Chapter 5; KASM, Chapter 5; KAPOH, Sections 4 & 5

LESSON OBJECTIVE:

During this lesson, the student will learn the various types of fuel systems found with turbine aircraft. In addition, the student will learn the specific systems found on the BE90.

CONTENT:

Lesson Introduction

- ☐ Fuel Systems
  - ☐ Fuel Tanks and Vents
  - ☐ Fuel Pumps (High Pressure, Low Pressure, Auxiliary
  - ☐ Fuel Controller Unit
  - ☐ Fuel Valves (Check, Selector, Crossfeed, Dump, Firewall Shutoff)
  - ☐ Fuel Heaters
  - ☐ Fuel Management
  - ☐ Fuel Measurement (Pounds vrs. Gallons, Converting Gallons to Pounds)
- ☐ BE90 Fuel System
  - ☐ Tanks (Wing and Nacelle)
  - ☐ Vents
  - ☐ Pumps (Boost, Engine Driven, Transfer and Crossfeed)
  - ☐ Firewall Shutoff Valves
    - ☐ Fuel Controller
  - ☐ Fuel Gauging System
  - ☐ Fuel Pressure, No Fuel Transfer and Crossfeed Annunciator Lights
  - ☐ Boost Pump Failure
  - ☐ System Checks

COMPLETION STANDARDS:

The student will exhibit thorough knowledge on the various types of fuel systems found on turbine aircraft and the fuel system of the BE90through guided discussions before progressing to the next lesson.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									1.0

TURBINE GROUND LESSON 9 **EXAM-IN-CLASS**

LESSON OBJECTIVE:

This exam evaluates the student's comprehension of the material presented in Stage II.

CONTENT:

- ☐ Stage II Exam

COMPLETION STANDARDS:

This lesson and stage are complete when the student has completed the exam with a minimum passing score of 70%, and the instructor has reviewed the exam with the student to ensure complete understanding before progressing to the next stage.

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STAGE III

STAGE OBJECTIVE

During this stage, the student will gain knowledge of various methods of ice and rain protection, landing gear systems, annunciator systems, fire protections systems as well as limitations, determining performance and weight and balance in turbine aircraft.

STAGE COMPLETION STANDARD

This stage is completed when the student has taken the Stage III written exam with a minimum passing score of 70%, and the instructor has reviewed each incorrect response to ensure complete understanding before the student progresses to Stage IV.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									1.5

TURBINE GROUND LESSON 10 **LECTURE-IN-CLASS**

TEXT REFERENCE:
TPFM, Chapter 6; KASM, Chapter 10; KAPOH, Sections 4 & 5

LESSON OBJECTIVE:

During this lesson the student will review environmental factors leading to the formation of structural icing, type of structure icing, impact of structural icing on control and performance and danger of using the autopilot during flight in icing conditions. The student learns the methods of ice and rain protection with turbine aircraft as well as the ice and rain protection systems in the BE90

CONTENT:

Lesson Introduction

- ☐ Icing Review
  - ☐ Types of Structural Icing and Environmental Factors Causing Its Formation
  - ☐ Impact of Structural Icing on Control and Performance
  - ☐ Dangers of Autopilot Usage During Icing Conditions
  - ☐ Ice Protection
  - ☐ De-Ice vs. Anti-Ice
    - ☐ Ground Icing (Type I, II and IV)
    - ☐ Structural (Boots, Bleed Air Thermal, Liquid
    - ☐ Weeping Wing)
    - ☐ Propeller (Electric Boots)
    - ☐ Engine (Inlet and Inertial Separators)
    - ☐ Fuel System (Additives, Heat Exchangers, electric vent heaters)
    - ☐ Windshield (Electric, Heated Air-Defrost, Liquid)
    - ☐ Pitot/Static and Stall Warning
  - ☐ Rain Protection
    - ☐ Windshield (Wipers and Chemical Treatment)
    - ☐ Engine (Auto-Igniters)
  - ☐ Pilot's Role in Operations of De-Ice/Anti-Ice Systems
  - ☐ BE90 Ice/Rain Protection Systems (Including Controls, Annunciators, Gauges)
    - ☐ Engines (Ice Vanes, Auto-Ignition, Engine Air Inlet Lip Heat)
    - ☐ Structure (Boots and Wing Ice Lights
    - ☐ Fuel System (Prist, oil-to-fuel heat exchanger – fuel controller, electric fuel vent heat)
    - ☐ Propellers (electric boots)
    - ☐ Windshield (electric heat, defrost and wipers)
    - ☐ Pitot/Static and Stall Warning

COMPLETION STANDARDS:

The student will exhibit adequate knowledge of structural icing dangers, systems available for ice and rain protection and ice and rain protection systems on the BE90 through a guided discussion before continuing to the next lesson.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									1.5

TURBINE GROUND LESSON 11 **LECTURE-IN-CLASS**

TEXT REFERENCE:
TPFM, Chapter 6; KASM, Chapter 4 & 14; KAPOH, Sections 4 & 5

LESSON OBJECTIVE:

During this lesson, the student learns about the landing gear systems, annunciator and warning systems, and about fire protection systems. The student will become familiar with the related subjects dealing with the BE90.

CONTENT:

Lesson Introduction

- ☐ Landing Gear Systems
  - ☐ Gear Squat Switches
  - ☐ Emergency Gear Extensions
  - ☐ Brakes and Anti-skid System
  - ☐ Nosewheel Steering
- ☐ Annunciator and Warning Systems
  - ☐ Annunciator or Advisory Panels (Warning, Caution and Status Lights)
- ☐ Fire Protection Systems
  - ☐ Fire Detection and Extinguishing Systems
  - ☐ Cockpit Controls
  - ☐ Cabin and Cockpit Protection
  - ☐ Fuel Tank
  - ☐ Cargo Hold
- ☐ BE90 Landing Gear, Steering and Brake Systems
  - ☐
  - ☐ Gear Operation and Controls (Status Lights, Unsafe Light/Horn, Hydraulic Fluid Light/Test
  - ☐ Steering (Operation, Use of Control Lock)
  - ☐ Brakes (Operation, Parking Brake)
- ☐ BE90 Annunciator Panel

COMPLETION STANDARDS:

The student will exhibit adequate knowledge of the landing gear systems, annunciator and warning systems, fire detection and extinguishing systems found with turbine aircraft as well as these systems on the BE90 through guided discussion before continuing to the next lesson.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									3.0

TURBINE GROUND LESSON 12 **LECTURE-IN-CLASS**

TEXT REFERENCE: TPFM, Chapter 7 & 10; KAPOH, Sections 2 & 5

LESSON OBJECTIVE:

This lesson introduces the student to Limitations and performance factors dealing with turbine aircraft. The student will also learn the limitations and how to determine performance for the BE90.

CONTENT:

Lesson Introduction

- ☐ Limitations
  - ☐ Airspeeds
  - ☐ Engines
  - ☐ Other Systems
- ☐ Takeoff and Climb Performance
  - ☐ V1 (Takeoff Decision Speed)
  - ☐ VR (Rotation Speed)
  - ☐ V2 (Minimum Takeoff Safety Speed)
  - ☐ Engine Out Climb
- ☐ En route Engine Out Performance
- ☐ Landing Performance
  - ☐ VREF (Landing Reference Speed)
  - ☐ Braking Performance
- ☐ Routine Performance Planning
  - ☐ TOLD Cards
  - ☐ Airport Analysis Tables
- ☐ Cruise Performance
  - ☐ Fuel Planning
- ☐ BE90 Limitations
  - ☐ Airspeeds
  - ☐ Engines
  - ☐ Other Systems
- ☐ BE90 Performance
  - ☐ Takeoff
  - ☐ Climb
  - ☐ Enroute
  - ☐ Descent
  - ☐ Landing
  - ☐ Single-Engine

COMPLETION STANDARDS:

The student will exhibit thorough knowledge of limitations and performance factors dealing with turbine aircraft as well as limitations and computation of performance in the BE90 through guided discussion before continuing to the next lesson.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									1.5

TURBINE GROUND LESSON 13 **LECTURE-IN-CLASS**

TEXT REFERENCE: TPFM, Chapter 11; KAPOH, Sections 6

LESSON OBJECTIVE:

During this lesson, the student learns the various weight and balance considerations with turbine aircraft. The student will also learn how to compute the weight and balance for the BE90.

CONTENT:

Lesson Introduction

- ☐ Weight and Balance Terminology
  - ☐ Maximum Ramp Weight
  - ☐ Maximum Zero-Fuel Weight (MZFW)
  - ☐ Maximum Takeoff Weight (MTOW)
  - ☐ Maximum Landing Weight (MLW)
  - ☐ Fuel Dump Valves
  - ☐ Aircraft Weight Categories
  - ☐ Percent MAC
- ☐ Weight and Balance Considerations
  - ☐ CG as Percent MAC
  - ☐ Aft CG Advantages
  - ☐ In-flight CG Shift
- ☐ Determining Weight and Balance in the BE90

COMPLETION STANDARDS:

The student will exhibit adequate knowledge of weight and balance terminology and the considerations dealing with turbine aircraft and how to determine weight and balance in the BE90 through guided discussions.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									1.0

TURBINE GROUND LESSON 14 **EXAM-IN-CLASS**

LESSON OBJECTIVE:

This exam evaluates the student's comprehension of the material presented in Stage III

CONTENT:

- ☐ Stage III Exam

COMPLETION STANDARDS:

This lesson and stage are complete when the student has completed the exam with a minimum passing score of 70%, and the instructor has reviewed the exam with the student to ensure complete understanding before progressing to the next stage.

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STAGE IV

STAGE OBJECTIVE

During this stage, the student will be introduced to the performance factors, weight and balance, and the advanced weather and navigation equipment found on turbine aircraft.

STAGE COMPLETION STANDARD

This stage is complete when the student has taken the Stage IV written exam with a minimum passing score of 70%, and the instructor has reviewed each incorrect response to ensure complete understanding.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									1.5

TURBINE GROUND LESSON 15 **LECTURE-IN-CLASS**

TEXT REFERENCE:
TPFM, Chapter 14; KASM, Chapter 16; KAPOH, Avionics Supplement

LESSON OBJECTIVE:

During this lesson, the student is introduced to the various types of weather, terrain and traffic hazard warning systems found on turbine aircraft. In addition the student will learn the hazard avoidance systems on the BE90.

CONTENT:

Lesson Introduction

- ☐ Weather Avoidance Systems
  - ☐ Airborne Weather Radar
  - ☐ Storm scopes
  - ☐ Satellite Weather Downlink
- ☐ Traffic Warning and Avoidance Systems
  - ☐ TCAS
- ☐ Ground Proximity Warning Systems
- ☐ BE90 Hazard Avoidance Systems
  - ☐ Airborne Radar
  - ☐ Satellite Weather Downlink (Text and Radar)
  - ☐ TCAS
  - ☐ GPWS

COMPLETION STANDARDS:

The student will exhibit thorough knowledge of hazard avoidance systems in general and the systems on the BE90 through a guided discussion prior to proceeding to the next lesson.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									3.0

TURBINE GROUND LESSON 16 **LECTURE-IN-CLASS**

TEXT REFERENCE:
TPFM, Chapter 13; KASM, Chapter 16; KAPOH, Avionics Supplement

LESSON OBJECTIVE:

During this lesson the student will be introduced to advanced GPS concepts and Flight Management Systems. Students will also learn the avionics, autopilot and flight directors system of the BE90.

CONTENT:

Lesson Introduction

- ☐ Advanced GPS Concepts
  - ☐ Wide Area Augmentation System (WAAS)
  - ☐ Local Area Augmentation System (LAAS)
- ☐ Flight Management Systems (FMS)
  - ☐ Basic Components (Flight Management Computer, Control Display Unit)
  - ☐ Basic Operation (Identification, Alignment, Route and Performance Pages)
- ☐ BE90 Avionics
  - ☐ Radios
  - ☐ Electronic ADI and HSI
  - ☐ Flight Director System
  - ☐ Autopilot System
  - ☐ Navigation equipment (GPS, VOR, ADF)
  - ☐ Multi-Function Display (MFD)

COMPLETION STANDARDS:

The student will demonstrate thorough knowledge of GPS WAAS and LAAS, FMS concepts as well as the avionics, autopilot and flight director systems of the BE90 through a guided discussion prior to proceeding to the next lesson.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									1.5

TURBINE GROUND LESSON 17 **LECTURE-IN-CLASS**

TEXT REFERENCE: TPFM, Chapter 9; KAPOH, Sections 3 & 4

LESSON OBJECTIVE:

The student will learn checklist design and execution for abnormal and emergency situations in turbine aircraft as well as the abnormal and emergency checklists for the BE90.

CONTENT:

Lesson Introduction

- ☐ Checklist Execution
  - ☐ Memorized Items (Boldface)
  - ☐ Cleanup
- ☐ BE90 Abnormal and Emergency Procedures
  - ☐ Abnormal (Air Start, Oil System, Nacelle Tank Switch Failure, Electrical Abnormalities Avionics Switch Failure, Landing Gear, Ice Protection, Static Air, Cracked Windshield)
  - ☐ Emergency (Airspeeds, Engine Failures, Fuel System, Smoke/Fumes, Electrical Fire, Emergency Descent, Flight Controls, Pressurization, Emergency Exit)

COMPLETION STANDARDS:

The student will demonstrate thorough knowledge of the philosophy behind abnormal and emergency checklist design and execution. The student will also demonstrate understanding of the abnormal and emergency procedures of the BE90 through a guided discussion.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									1.5

TURBINE GROUND LESSON 18 **LECTURE-IN-CLASS**

TEXT REFERENCE: TPFM, Chapter 15

LESSON OBJECTIVE:

The student will learn high altitude aerodynamics and IFR considerations for high altitude operations.

CONTENT:

Lesson Introduction

- ☐ Aerodynamics of High-Speed/High Altitude Aircraft
  - ☐ High-Speed and the Sound Barrier
  - ☐ Swept Wing Aerodynamics
  - ☐ Dutch Roll
  - ☐ Winglets
  - ☐ Stalls
- ☐ High Altitude IFR Operations
  - ☐ Profile Descents
  - ☐ Jet Routes
  - ☐ Altimetry
  - ☐ Reduced Vertical Separation Minimums (RVSM)

COMPLETION STANDARDS:

The student will demonstrate thorough knowledge of high altitude aerodynamics and IFR operations through a guided discussion prior to proceeding to the next lesson.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									1.5

TURBINE GROUND LESSON 19 **LECTURE-IN-CLASS**

TEXT REFERENCE: TPFM, Chapter 16

LESSON OBJECTIVE:

The student will learn high altitude weather and its impact on turbine operations.

CONTENT:

Lesson Introduction

- ☐ The Tropopause
- ☐ The Jet Stream
- ☐ Cirrus Clouds
- ☐ Clear Air Turbulence
- ☐ Condensation Trails
- ☐ Thunderstorms

COMPLETION STANDARDS:

The student will demonstrate thorough knowledge of high altitude weather and its impact on turbine operations through a guided discussion.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	AATD	Pre Post	GI
									1.0

TURBINE GROUND LESSON 20 **EXAM-IN-CLASS**

LESSON OBJECTIVE:

This exam evaluates the student's comprehension of the material presented in Stage IV

CONTENT:

- ☐ Stage IV Exam

COMPLETION STANDARDS:

This lesson and stage are complete when the student has completed the exam with a minimum passing score of 70%, and the instructor has reviewed the exam with the student to ensure complete understanding.

FLIGHT LESSON TIME ALLOCATION TABLE					
Lesson	**Dual**	**Dual XC**	**Dual INST.**	**TAA**	**Pre/Post**
1	**1.5**			**1.5**	**1.0**
2	**2.0**	**1.0**	**1.0**	**2.0**	**1.0**
3	**1.5**		**1.0**	**1.5**	**1.0**
Totals	**5.0**	**1.0**	**2.0**	**5.0**	**3.0**

*The individual lesson times shown on this table are for instructor/student guidance only, they are not mandatory for a given lesson. However, by the end of lesson 3, the total hour requirements in each category will be met.

During each lesson the instructor will also assume the role of non-flying pilot and will assist the student with execution of checklists, radios and navigation.

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	TAA	Pre Post	GI
1.5							1.5	1.0	

TURBINE FLIGHT LESSON 1 <u>DUAL</u>

LESSON OBJECTIVE:

To develop the student's skill in basic aircraft operations. The student will perform normal checklists including normal starts and ground operations, as well as, basic air work. The student will also be introduced to emergency descents and single engine landings.

CONTENT:

Lesson Introduction

- ☐ **PREFLIGHT PREPARATION**
  - ☐ Preflight
  - ☐ Performance Figures and Limitations
- ☐ **GROUND OPERATIONS**
  - ☐ Before Engine Start
  - ☐ Engine Starting
  - ☐ Before Taxi
  - ☐ Taxi
  - ☐ Before Takeoff
  - ☐ After Landing
  - ☐ Shutdown and Securing
- ☐ **AIR OPERATIONS**
  - ☐ Normal Takeoff and Climb
  - ☐ Turns
  - ☐ Minimum Controllable Airspeed
  - ☐ Imminent Stalls
  - ☐ Steep Turns
  - ☐ Single Engine Maneuvering
  - ☐ Emergency Descent
  - ☐ Normal Approach and Landing
  - ☐ Engine Failure During Takeoff, Climb, Cruise and Approach to Landing
  - ☐ Single Engine Approach and Landing

COMPLETION STANDARDS:

At the completion of this lesson the student will be able to perform all normal checklists and engine failure checklists. During takeoff and landing the student will demonstrate good directional control. Liftoff, climb, approach, and touchdown speeds will be within 10KIAS of that desired. All other maneuvers will be done with +/- 150 feet of altitude, 10 degrees of heading, +/- 10KIAS of that desired.

INSTRUCTOR NOTES:

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	TAA	Pre Post	GI
2.0			1.0		1.0		2.0	1.0	

TURBINE FLIGHT LESSON 2 <u>DUAL</u>

LESSON OBJECTIVE:

To develop the student's skill with cross country preparation and planning, high altitude operations, and flying precision and non-precision approaches. The student will plan a cross country flight of at least one hour duration. The remainder of this 2 hour flight will then be available for instrument approaches. The student will be able to identify abnormal and emergency situations presented by the instructor and call for the appropriate checklist.

CONTENT:

Lesson Introduction

- ☐ **LESSON REVIEW**
  - ☐ Execution of checklists
  - ☐ Taxiing
  - ☐ Normal takeoff and climb
  - ☐ Normal Landings
- ☐ **CROSS COUNTRY PROCEDURES**
  - ☐ Enroute Climb and Cruise (VR and IR)
  - ☐ Use of autopilot and flight director
  - ☐ Use of pressurization system
  - ☐ Use of flight director and autopilot
  - ☐ Use of De-Ice and Anti-Ice Systems
  - ☐ Use of Radar
  - ☐ Use of Multi-Function Display, Including Receipt of Weather Information
  - ☐ Descent
- ☐ **TERMINAL PROCEDURES**
  - ☐ Precision Approach – coupled (IR)
  - ☐ Non-Precision Approach (IR)
  - ☐ Single Engine Instrument Approach, Non-Precision (IR)
  - ☐ Normal Landing
  - ☐ Engine Shutdown and Secure

COMPLETION STANDARDS:

The student will demonstrate knowledge of BE90 performance and limitations in preflight planning. The student will perform the aircraft preflight without assistance. The appropriate checklists will be called for and executed correctly. The student will demonstrate proper usage of aircraft systems and will correctly execute one precision and one nonprecision approach and a single engine non-precision approach. The student will maintain altitude +/- 100 feet and headings +/-100 feet and airspeeds within +/- 10 knots.

INSTRUCTOR NOTES:

Dual	Solo	Dual Night	Dual XC	Solo XC	Dual Inst.	Night LD.	TAA	Pre Post	GI
1.5					1.0		1.5	1.0	

TURBINE FLIGHT LESSON 3 <u>DUAL-FINAL STAGE-CHECK</u>

LESSON OBJECTIVE:

During this stage check the student will demonstrate knowledge of BE90 systems, normal procedures, precision and non-precision approaches as well as abnormal and emergency procedures as selected by the evaluator. The evaluator will also perform the duties of an FO to assist the student with execution of checklists, set up and brief instrument approaches* and handle radio communications. The student will demonstrate proficiency at flying the aircraft, executing approaches and using the flight director and autopilot. * For a phase of the flight in which the autopilot is engaged the student will be responsible to set up and brief instrument approaches.

CONTENT:

Lesson Introduction

- ☐ Preflight
- ☐ Taxiing
- ☐ Takeoff and Climb
- ☐ Precision Instrument Approaches (Coupled and Non-Coupled) (IR)
- ☐ Non-Precision Approaches (IR)
- ☐ Simulated Engine Failure During Takeoff, Climb, Approach and Landing (VR/IR)
- ☐ Normal Landing
- ☐ Engine Shutdown and Secure

COMPLETION STANDARDS:

The student will demonstrate knowledge of the BE90 systems, performance and limitations. During flight, altitudes will be maintained +/- 100 feet and headings +/- 10 degrees and airspeeds within +/- 10 knots. Instrument approach procedures will be performed to the standards prescribed by the Instrument (Airplane) Practical Test Standards. The student will demonstrate proficiency in use of the flight director and autopilot systems.

EXAMINER NOTES: