UNIVERSITY OF OKLAHOMA

TURBINE TRANSITION

AIRPORT: Max Westheimer Airport is the operations base for training in this course. Max Westheimer Airport has a hard surface runway and meets the requirements of Section 141.38 of FAR's for day and night operation. Fuel is available from 7:00 A.M. to 10:00 P.M. daily. Maintenance is available from 6:30 A.M. to 3:00 P.M. Monday through Friday and at other times on call. Training will originate at Max Westheimer Airport.

AIRCRAFT: The aircraft used in this course of training are the BE 90, King Air Model C90/B. It meets the requirements of 14 CFR, Section 141.39.

CHIEF FLIGHT INSTRUCTOR: The Chief Flight Instructor will meet the requirements of 14 CFR, Section 141.35. He/she must be the holder of at least a Commercial Pilot certificate with an airplane category multiengine land class rating, airplane multiengine instrument rating and be endorsed to fly high performance, and pressurized aircraft. In addition, (s)he must be the holder of a Flight Instructor certificate with an airplane category rating and a multiengine class rating and instrument airplane rating and have a medical certificate valid for at least second class privileges. See Appendix A for Chief Flight Instructor designation.

ASSISTANT CHIEF FLIGHT INSTRUCTOR: The Assistant Chief Flight Instructor will meet the requirements of 14 CFR, Section 141.36. He/she must be the holder of at least a Commercial Pilot certificate with an airplane category multiengine land class rating, airplane multiengine instrument rating and be endorsed to fly high performance, and pressurized aircraft. In addition, (s)he must be the holder of a Flight Instructor certificate with an airplane category rating and a multiengine class rating and instrument airplane rating and have a medical certificate valid for at least second class privileges. See Appendix A for Assistant Chief Flight Instructor designation.

FLIGHT INSTRUCTORS: Each flight instructor must be the holder of at least a Commercial Pilot certificate with an airplane category, multiengine land class rating, airplane multiengine instrument rating and be endorsed to fly high performance and pressurized aircraft. In addition, (s)he must be the holder of a Flight Instructor certificate with an airplane category rating and multiengine class ratings and instrument airplane rating and have a medical certificate valid for at least second class privileges.

GROUND INSTRUCTORS: Each instructor used for ground training must meet the requirements to be a Flight Instructor or hold an Advanced Ground Instructor Certificate and an Instrument Ground Instructor Certificate.
UNIVERSITY OF OKLAHOMA

FACILITIES USED FOR AVIATION STUDENTS: Ground training and pilot briefing areas, audiovisual aids and training aids are described below. Additional Training aids used in this course: Turbine Pilots Flight Manual, King Air POH, King Air Systems Manual and the Aeronautical Information Manual.

Rooms Used for Ground Training

<table>
<thead>
<tr>
<th>Location</th>
<th>Size</th>
<th>Student Capacity</th>
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<tbody>
<tr>
<td>Building 1700, Room 205</td>
<td>35’ x 36’ 1260 sq. ft.</td>
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<tr>
<td>Building 1928, Room 107</td>
<td>24’ x 24’ 576 sq. ft.</td>
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<tr>
<td>Building 1928, Room 114</td>
<td>45’ x 25’ 1125 sq. ft.</td>
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<tr>
<td>Building 2113</td>
<td>13’ x 35’ 455 sq. ft.</td>
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Training Aids: Each classroom contains a computer system with video monitor presentation capability.

Pilot Briefing Areas

Location
Building 1700, Rooms 120, 121, 123, 125 (6 stations)
Building 1630, Room 115 (6 stations)

Additional Facilities

Location
Building 1700, Administrative Offices
Building 1630, Instructor offices, Student Study Area, and Aircraft Storage
Building 1620, Maintenance Facility and Aircraft Storage
Building 1928, Administrative Offices, Student Library
Building 1205, Flight Simulation Area
PREREQUISITES FOR ENROLLMENT IN GROUND TRAINING: There are no prerequisites for enrollment in the ground training part of this course.

PREREQUISITES FOR ENROLLMENT IN FLIGHT TRAINING: 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.

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

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

CHECKS AND 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.
### UNIVERSITY OF OKLAHOMA
### TURBINE TRANSITION
### GROUND TRAINING AND READING ASSIGNMENTS

<table>
<thead>
<tr>
<th>STAGE</th>
<th>LESSON</th>
<th>ASSIGNMENTS</th>
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**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.
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.
STAGE I, GROUND LESSON 1

TEXT REFERENCE: See Ground Training and Reading Assignments

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:
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.
STAGE I, GROUND LESSON 2

TEXT REFERENCE: See Ground Training and Reading Assignments

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:
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.
STAGE I, GROUND LESSON 3

TEXT REFERENCE: See Ground Training and Reading Assignments

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:
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.
STAGE I, GROUND LESSON 4 STAGE I EXAM

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.
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

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.
STAGE II, GROUND LESSON 1

TEXT REFERENCE: See Ground Training and Reading Assignments

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:
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.
STAGE II, GROUND LESSON 2

TEXT REFERENCE: See Ground Training and Reading Assignments

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:
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.
STAGE II, GROUND LESSON 3

TEXT REFERENCE: See Ground Training and Reading Assignments

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:
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.
STAGE II, GROUND LESSON 4

TEXT REFERENCE: See Ground Training and Reading Assignments

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:
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 BE90 through guided discussions before progressing to the next lesson.
STAGE II, GROUND LESSON 5 STAGE II EXAM

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.
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 STANDARDS

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 progressed to Stage IV.
STAGE III, GROUND LESSON 1

TEXT REFERENCE: See Ground Training and Reading Assignments

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:
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 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.
STAGE III GROUND LESSON 2

TEXT REFERENCE: See Ground Training and Reading Assignments

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:
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.
STAGE III, GROUND LESSON 3

TEXT REFERENCE: See Ground Training and Reading Assignments

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:
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.
STAGE III, GROUND LESSON 4

TEXT REFERENCE: See Ground Training and Reading Assignments

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:
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.
STAGE III, GROUND LESSON 5 STAGE III EXAM

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.
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.
STAGE IV, GROUND LESSON 1

TEXT REFERENCE: See Ground Training and Reading Assignments

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:
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.
STAGE IV, GROUND LESSON 2

TEST REFERENCE: See Ground Training and Reading Assignments

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:
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.
STAGE IV, GROUND LESSON 3

TEXT REFERENCE: See Ground Training and Reading Assignments

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:
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

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.
STAGE IV, GROUND LESSON 4

TEXT REFERENCE: See Ground Training and Reading Assignments

LESSON OBJECTIVE: The student will learn high altitude aerodynamics and IFR considerations for high altitude operations

CONTENT:
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.
STAGE IV, GROUND LESSON 5

TEXT REFERENCE: See Ground Training and Reading Assignments

LESSON OBJECTIVE: The student will learn high altitude weather and its impact on turbine operations.
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.
STAGE IV, GROUND LESSON 6 STAGE IV EXAM

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 TRAINING

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*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.
FLIGHT LESSON 1

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:

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.
FLIGHT LESSON 2

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 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 non-precision approach and a single engine non-precision approach. The student will maintain altitude +/- 100 feet and headings +/-100 feet and airspeeds within +/- 10 knots.
FLIGHT LESSON 3 FINAL STAGE CHECK

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 an phase of the flight in which the autopilot is engaged the student will be responsible to set up and brief instrument approaches.

CONTENT:
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 proscribed by the Instrument (Airplane) Practical Test Standards. The student will demonstrate proficiency in use of the flight director and autopilot systems.