TRANSITION TRAINING
MASTER SYLLABUS

GAMA PUBLICATION NO. 5
Version 2.0

General Aviation
Manufacturers Association

MASTER SYLLABUS

To be used in developing

AIRCRAFT SPECIFIC TRANSITION TRAINING GUIDES

For pilots transitioning into High Performance and complex single piston-engine small airplanes, multi piston-engine small airplanes, and single and multiengine turbo propeller small airplanes

GAMA SPECIFICATION NO. 5
Edition 2

Prepared and Published by:
General Aviation Manufacturers Association
1400 K Street NW, Suite 801
Washington, DC 20005
(202) 393-1500
www.GAMA.aero

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1.0 TRANSITION TRAINING GENERAL

1.1 Goal

The goal of Transition Training is to prevent accidents by ensuring pilots have proper training in the specific systems and operating characteristics of every airplane model they fly. Transition Training, therefore, concentrates on those areas where the pilot might encounter something unique to that airplane, whether a normal or an emergency procedure. No attempt is made to review general piloting knowledge or skills that would be the same in any airplane. Instruction in these areas is highly beneficial, but should be accomplished through other, more recurring means.

Version 2.0 of Publication 5 is an updated copy of the 1989 version previously published by GAMA.

1.2 Applicability

The Transition Training described in this Master Syllabus is applicable to pilots in transitioning into:

1. High-performance (more than 200 hp) or complex (controllable pitch propeller, retractable landing gear, and flaps), single piston-engine small airplanes (12,500 lbs. or less).
2. Multi piston-engine small airplanes (12,500 lbs. or less)
3. Single and multiengine turbo propeller small airplanes (12,500 lbs. or less)

Material in this Master Syllabus is not intended for use in developing training programs or guides for pilots transitioning into airplanes for which the Federal Aviation Regulations (FAR's) require type ratings, for airplanes with engines of 200 hp or less that do not have retractable landing gear, flaps, and a controllable propeller, or for amateur built experimental aircraft.

Analysis of general aviation airplane accidents, and the experience of the military and the airlines, indicates that whenever a pilot's total "time-in-type" is low, Transition Training is very beneficial.

1.3 Master Syllabus

This document, the Master Syllabus, is the general outline, published by GAMA, of the items to be included in the ground and flight training of pilots transitioning into specific airplanes. The Master Syllabus is used by companies or individuals to develop a Transition Training Guide for a specific airplane. "A specific airplane" includes airplane models, grouped by the airplane manufacturer, that are sufficiently similar so that a pilot trained or experienced in one airplane model would not normally require Transition Training to operate another model. Specific airplanes are listed by manufacturers in the Appendices to this Master Syllabus.

1.4 Difference Training

In some cases, difference training between models of the same specific airplane may be specified by the manufacturer. Difference training is also required for any airplane that has engine horsepower changes or system differences not of the original manufacturer's design. Differences training should include ground instruction on normal, abnormal, and emergency operation of the system noted, followed by actual operation of that system in flight, in a simulator, or in a training device.

1.5 Transition Guide

A Transition Guide is written for a specific airplane and is based on the Master Syllabus. It may be produced by any person or company, such as a certificated flight instructor (CFI), training organization, manufacturer, or aviation publisher. It can be very specific or may be only an outline that refers to the Pilot's Operating Handbook or Approved Airplane Flight Manual.

Because the sequence of training may need to be altered to accommodate individual progress or special circumstances, the training syllabus should be flexible. As complexity greatly varies from airplane to airplane, those who develop Transition Training Guides may find it necessary to expand upon the information described herein. If the prescribed sequence of training is changed, it is the responsibility of the certificated pilot training school or instructor to make sure that all necessary training is accomplished.

For older or modified airplanes, where information from the manufacturer or modifier may be limited, the instructor, training organization, or other producer of a Transition Training Guide should use judgment in preparing a guide that meets this Master Syllabus.

1.6 Exceptions

The Master Syllabus is a general document encompassing many specific airplanes – from single piston-engine powered through multiengine turbo propeller powered airplanes. Training items that are not applicable to all specific airplanes are annotated and should be omitted from the Transition Training Guide as appropriate.

1.7 IFR Training

Certain maneuvers in the flight section are prescribed as "IFR only." These maneuvers are required only for pilots with an instrument rating. They are included so that instrument rated pilots may practice key IFR maneuvers in an unfamiliar airplane under the supervision of an instructor. Pilots who are instrument rated, but who elect not to perform the IFR maneuvers, or pilots who are not IFR rated, receive a "VFR" endorsement in their logbook when training is satisfactorily completed. This indicates that only the VFR part of the transition was completed. The presence or absence of this endorsement does not affect the pilot's instrument privileges in this or any other airplane.

1.8 Instructor Qualifications

The CFI administering the Transition Training should have a minimum of five hours pilot-in-command in the specific airplane. It is strongly recommended that the CFI complete Transition Training for that model before giving training, if such a course is available. Multiengine instruction may be given only by CFIs holding multiengine ratings on both their pilot and flight instructor certificates.

1.9 Documentation

Upon successful completion of Transition Training, the certificated flight instructor who administered the course of instruction endorses the pilot's logbook with the following statement:

(IFR) or (VFR) Transition Training, for (aircraft model) IAW (in accordance with) cite (author or publisher of the Transition Training Guide) satisfactorily completed on (Date) in (simulator or training device name and manufacturer).

For example:

IFR transition training for Cessna T210, IAW Jones Transition Course satisfactorily completed on March 23, 1988 using the Smith Hotstick training device.

If this is the airman's initial transition to a high performance airplane the logbook must also reflect the endorsement required by FAR section 61.31(e) or other applicable requirements. The recommended wording for this endorsement is contained in FAA Advisory Circular 61-65B, paragraph 30(o) or other applicable requirements.

1.10 Simulators and Training Devices

The Flight Training Syllabus (Section 4) details each subject or maneuver that must be accomplished, and specifies whether that item may be done in the specific airplane, an approved phase II or III flight simulator, an approved phase I flight simulator, or an appropriate training device. Criteria for what constitutes an approved flight simulator are contained in FAA Advisory Circular 120-40 or 120-45, as amended or other applicable requirements. The criterion to be used in selecting an appropriate training device is presented in Appendix C of this document.

Although all of the flight portion of Transition Training may be accomplished in an airplane, experience has shown that the use of simulators and training devices often increases the margin of safety for some maneuvers and may provide more productive training than could be obtained in an airplane. It is therefore recommended that maximum use be made of simulators and training devices, especially for maneuvers that are considered abnormal or emergency in nature.

1.11 Avionics

The goal of this document is to provide guidance on transition to aircraft that meet the criteria stated in 1.2 of this document. This document does not provide guidance on transitioning from traditional/steam gauge avionics to technically advanced/glass avionics. Any pilot flying with unfamiliar avionics should take necessary precautions to ensure that they are familiar with the avionics installed in any aircraft they intend to operate.

Several manufacturers provide excellent literature and even simulators for the computer to assist in transitioning. Please utilize all available resources when transitioning to unfamiliar avionics.

2.0 TRANSITION TRAINING OBJECTIVE AND STANDARDS

2.1 Objective

Obtain the skills, proficiency, and the aeronautical knowledge necessary for safe operation of the specific airplane.

2.2 Completion Standards

The pilot should, through written and flight review, demonstrate the knowledge and skill necessary to safely operate the specific airplane. Skills may also be demonstrated in a flight simulator or, for selected items, an appropriate training device. Operations must be accomplished within the tolerances specified in the Practical Test Standards appropriate to the grade of pilot certificate that the pilot holds.

2.3 Discussion of System Description and Limitations

Several training items require a discussion of the Description and Limitations aspects of an airplane component or system. In every airplane system there are limitations based on two factors:

1. The absolute capability of the equipment to perform a particular function and;
2. The individual pilot's ability to use that equipment.

Effective training and experience can enable safe operation of an airplane within its limitations. Some airplane systems are more complex and require a higher level of skill and interpretation. Pilot skills and knowledge vary with a pilot's total flight time, time-in-type, and recency of training or experience. Pilots, therefore, must be trained to recognize their personal limitations as well as the airplane's limitations.

Throughout the ground school and flight curriculum, emphasis should be placed on operating within airplane and pilot limitations. Risk management and decision making skills should be especially emphasized. A discussion of limitations, as they apply to the pilot's experience level, and with reference to potential problem areas, may prevent many accidents. Transition Training Guides, therefore, should include items that Instructors may discuss with transitioning pilots concerning limitations of various systems, flight characteristics or the specific airplane, and how these items may apply to a particular pilot.

3.0 Transition Training Ground Training Syllabus

3.1 Objective

Obtain the necessary knowledge required for safe operation of the specific airplane.

3.2 Completion Standards

Demonstrate, through written and oral review, the knowledge to safely operate the specific airplane, using the Pilot's Operating Handbook or Approved Airplane Flight Manual and airplane checklists. All immediate-action emergency procedures must be committed to memory. The CFI, or CFII, as applicable, will discuss each incorrect response with the pilot to ensure complete understanding.

3.3 General Course Requirements

3.31 Descriptions and Limitations

Whenever the Ground Training Outline specifies a description and discussion of an airplane system or function, the CFI should provide a general overview and identify its basic components. Limitations should be presented, as described in Section 2 of the Pilot's Operating Handbook or Approved Airplane Flight Manual, with emphasis on pilot decision-making and safe operation equipment.

3.32 Preflight Inspection, Service and Maintenance

Whenever the Ground Training Outline specifies training on these subjects, the CFI should describe what a pilot could normally expect to encounter during a thorough preflight inspection. Training on service and maintenance includes routine service that could be performed or supervised by the pilot. It is not intended that the pilot perform any maintenance operation requiring an appropriately certificated mechanic or repairman. Emphasis is to be placed on determining airworthiness, including compliance with the regulatory requirements relating to aircraft documents, placards, and operation with inoperative equipment.

3.4 Ground Training Outline (for expanded outline see Appendix A)

I. Airplane Familiarization

II. Controls

III. Flight Instruments

IV. Performance

V. Powerplant/Propellers

VI. Electrical

VII. Airplane Fuel System

VIII. Landing Gear System (Fixed and Retractable)

IX. Environmental

X. Oxygen (if applicable)

XI. Ice Protection (if applicable)

XII. Weight and Balance

XIII. Pilot Errors Common to the Specific Airplane

XIV. Avionics/Autopilot/Weather Detection Equipment

4.0 TRANSITION TRAINING FLIGHT TRAINING SYLLABUS

4.1 Objective

Obtain the aeronautical skill and proficiency necessary for safe operation of the specific airplane.

4.2 Completion Standards

Demonstrate, in a training device, flight simulator, in-flight, or an appropriate combination thereof, the necessary aeronautical skill and experience required for the specific airplane. Operations must be accomplished within the tolerances specified in the certification standards appropriate to the grade of pilot certificate that the pilot holds.

In addition, a pilot who holds an instrument rating must demonstrate competency in the instrument maneuvers and procedures identified in the flight syllabus within the tolerances specified in the instrument rating certification standards. If a pilot chooses not to demonstrate competency in instrument flight in the specific airplane, the pilot's logbook endorsement will indicate "VFR only." An IFR rated pilot with a "VFR only" logbook endorsement for Transition Training may accept the entry at a later date by completing the designated IFR maneuvers and training. The presence or absence of this endorsement does not affect the pilot's instrument privileges in this or any other airplane.

4.3 Flight Training Outline (for expanded outline see Appendix B)

I. Preflight Planning

II. Preflight Inspection

III. Avionics and Airplane Modifications

IV. Starting Engine

V. Taxi Procedures

VI. Before Takeoff Checks

VII. Normal Operations

VIII. Airwork

IX. Abnormal (if applicable) and Emergency Procedures

APPENDIX A
GROUND TRAINING OUTLINE

I. AIRPLANE FAMILIARIZATION:

A. Airplane Overview

1. Location of major subsystems and how they relate to each other.
2. Service limitations of the engine and other time limited parts.
3. Modifications to original airplane (where to find information on modifications, if available; pilot should be aware of operational significance of modifications and special equipment).

B. Use of Safety Equipment

1. Emergency exits
2. Seat operations
3. Seat belts and shoulder harnesses
4. Other.

II. CONTROLS:

A. Description and Limitations
B. Inspection, Service, and Maintenance
C. Flight Controls
D. Flaps
E. Trim Controls
F. Abnormal (if applicable) and Emergency Procedures

III. FLIGHT INSTRUMENTS:

A. Description and Limitations
B. Inspection, Service, and Maintenance
C. Instrument Power Systems
D. Abnormal (if applicable) and Emergency Procedures

IV. PERFORMANCE:

A. Description and Limitations
B. Takeoff
C. Cruise and Leaning Procedures (if applicable)
D. Landing

V. POWERPLANT/PROPELLERS:

A. Description and Limitations
B. Inspection, Service, and Maintenance
C. Before Takeoff Checks
D. Powerplant Controls – Engine Fuel Control, Propeller Control, Induction System, Engine Ignition System
E. Abnormal (if applicable) and Emergency Procedures:
    1. Engine securing (flight and ground) (including single engine airplanes)
    2. Engine failure before lift-off
    3. Engine failure after lift-off
    4. Airstart procedures

VI. ELECTRICAL:

A. Description and Limitations
B. Inspection, Service, and Maintenance
C. Sources of Electrical Power
D. Battery Starts
E. External Power Starts
F. Indicators
G. Lighting Systems
H. Abnormal (if applicable) and Emergency Procedures

VII. AIRPLANE FUEL SYSTEM:

A. Description and Limitations
B. Inspection, Service, and Maintenance
C. Control System
D. Airframe Related Components
E. Indicating System
    1. Quantity indication
    2. Warning system
F. Abnormal (if applicable) and Emergency Procedures

VIII. LANDING GEAR SYSTEM (FIXED AND RETRACTABLE):

A. Description and Limitations
B. Inspection, Service, and Maintenance
C. Indicating System (if applicable)
D. Normal Operation (if applicable)
E. Abnormal (if applicable) and Emergency Procedures

IX. ENVIRONMENTAL:

A. Description and Limitations
B. Inspection, Service, and Maintenance
C. Normal Operation of Heating, Ventilation, and Cooling
D. Normal Operation of Pressurization (if applicable)
E. Abnormal (if applicable) and Emergency Procedures

X. OXYGEN: (if applicable)

A. Description and Limitations
B. Inspection, Service, and Maintenance
C. Normal Operation
D. High Altitude Physiology (Turbocharged, Pressurized, and Turbine Airplanes)

XI. ICE PROTECTION: (if applicable)

A. Description and Limitations
B. Inspection, Service, and Maintenance
C. Normal Operation
D. Abnormal (if applicable) and Emergency Procedures

XII. WEIGHT AND BALANCE:

A. Description and Limitations
B. Controllability, Center of Gravity, and Stall Speed

XIII. PILOT ERRORS COMMON TO THE SPECIFIC AIRPLANE:

A. Systems Mismanagement
B. Decision Making
C. Operating Envelope
D. Other

X. AVIONICS/AUTOPILOT/WEATHER DETECTION EQUIPMENT

A. Description and Limitations
B. Inspection, Service, and Maintenance
C. Preflight Procedures
D. Normal Operation
E. Abnormal (if applicable) and Emergency Procedures

APPENDIX B
TRAINING DEVICE CRITERIA

The Flight Training Syllabus (Section 4) specifies those flight training items that may be accomplished using the airplane, an approved phase I, II, or III flight simulator, or an appropriate training device. FAA Advisory Circulars 120-40 and 120-45, as amended, specify the criteria that should be used in determining if a specific flight simulator is approved for the training items required in Transition Training. This Appendix presents the criteria for determining if a specific training device is appropriate for Transition Training.

Although all of the flight portion of Transition Training may be accomplished in an airplane, experience has shown that the use of simulators and training devices often increases the margin of safety for some maneuvers and may actually provide more efficient and productive training than could be obtained in an airplane. It is therefore recommended that maximum use be made of simulators and training devices during Transition Training, especially for maneuvers that are considered abnormal or emergency in nature.

This Appendix was developed to ensure that a training device meets the characteristics and tolerances for those specific training items described herein. To determine which training items may be accomplished in a specific training device, the actual characteristics and tolerances of the training device should be compared with the required characteristics and tolerances of each training item specified in this Appendix.

In many cases, the developer or the provider of Transition Training will be experienced in, and quite familiar with, the airplane for which Transition Training is being offered but may not be as familiar with the capabilities of the available training devices. Furthermore, training devices greatly vary in individual characteristics and capabilities and can often be modified to offer variations in performance. It is therefore impractical to develop and maintain a list of "approved" training devices for any particular airplane model or maneuver. This Appendix provides guidance to the person(s) evaluating the capability of a training device by defining the characteristics and tolerances that have a significant bearing on the ability of the training device to meet the specific objectives to each maneuver. The "Characteristics and Tolerances" column in this Appendix presents qualitative and quantitative criteria and calls for some degree of judgment in order to evaluate the appropriateness of any specific training device. This judgment is normally well within the capability of an experienced flight instructor, chief pilot, or examiner.

APPENDIX C
Flight Training Outline

Where quantitative criteria are specified, the developer or provider of Transition Training will find it necessary to refer to data on airplane characteristics and compare them to the characteristics of the training device. Most of this data is already published but, in a few instances, some elementary data-gathering flights may be necessary. Because there is a wide range of engine and airframe models, with difference configurations and modifications, weights and balance, and varying environmental conditions under which the airplanes may operate, there is likely to be a significant variation in performance from one set of data-gathering flights to another. For this reason, the tolerances permitted for a training device, compared to a single set of performance data for one individual airplane, are purposely large.

The following table of applicable sub-paragraphs from the expanded Flight Training Outline (Appendix B) contains a list of objectives for each training item and the characteristics and tolerances against which a training device is to be evaluated.

MANUEVER	OBJECTIVE	CHARACTERISTICS AND TOLERANCES
STARTING ENGINE		
A. Battery Starts	Become familiar with engine starting procedures.	*Functional power, fuel, electrical and starter controls, and engine instrumentation critical to the successful starting and protection of the engine* – as appropriate.
BEFORE TAKE-OFF CHECKS		
A. VFR Departure	Become familiar with VFR departure procedures.	*Controls, switches and instruments for each item in the airplane checklist*-as appropriate[1].
B. IFR Departure	Become familiar with IFR departure procedures.	*Controls, switches, flight instruments, navigation radios and instruments for each item on the airplane checklist* – as appropriate[1].

[1] Procedural items in the checklists, such as "flight control checks," "seat belts and shoulder harnesses – gastened," "clear active runway" etc. may be simulated.

MANEUVER	OBJECTIVE	CHARACTERISTICS AND TOLERANCES
NORMAL OPERATIONS		
A. Climb	Perform maneuver using proper power settings, airspeeds and configuration to achieve best angle, best rate and recommended cruise climb.	*Power settings*- full range available. Instrumentation – sufficient to evaluate correct use of power. *Airspeeds and climb rate*- vertical speed indication same as airplane +/- 200 FPM at selected airspeeds. *Effects of configurations* – as appropriate.
B. Cruise	Become familiar with recommended power settings and airspeeds.	*Power settings* –full range available. *Airspeed*- same as airplane- 10% at representative power settings.
C. Descent and Arrival Procedure IFR	Become familiar with recommended power settings, airspeeds and configurations.	*Power settings* – full range available. *Airspeed, Configuration* – vertical speed indication same as airplane +/- 200 FPM at appropriate airspeed and configuration.

MANUEVER	OBJECTIVE	CHARACTERISTICS AND TOLERANCES
D. Precison Approaches	Become familiar with expected pitch attitudes, airspeeds, approximate power settings and effects of configurations or recommended or specified conditions. Perform maneuver with sufficient precision to achieve desired outcome (landing or missed approach).	*Power settings*- full range available. Pitch attitudes – same as airplane +/- 2 degrees at selected approach power setting(s) and airspeed(s). *Effects on configurations* – as appropriate. *Maneuvering characteristics* – appropriate pitch and roll responses, and rate of turn at small bank angles used for precision approach maneuvering (2 to 3 degrees). *ILS/LPV course width and sensitivity*- as appropriate. *Navigation instruments and radios* – as appropriate.

MANUEVERS	OBJECTIVE	CHARACTERISTICS AND TOLERANCES
2. Non-Precision Approaches	Become familiar with expected pitch attitudes, airspeeds, approximate power settings and effects of configurations for recommended or specified conditions. Perform maneuver with sufficient precision to achieve desired outcome (landing or missed approach).	*Power settings* – full range available. *Pitch attitudes* – same as airplane +/- 2 degrees at selected approach power setting(s) and airspeed(s). *Effects of configurations* – as appropriate. *Navigation Instruments and radios* – as appropriate.

MANEUVER	OBJECTIVE	CHARACTERISTICS AND TOLERANCES
E. Balked Landings	Perform maneuver using recommended pitch, power, airspeed, and configuration changes, and all checklist items necessary to successfully perform a balked landing without undue loss of altitude, airspeed, and directional control.	*Power settings* – full range available. *Performance* – substantially duplicate the airplane's control characteristics. An appropriate transition from descent to level-off to climb should occur without undue delay when recommended pitch, power, airspeed and configurations are employed. *Controls and functions* – as appropriate to accomplish all significant checklist items. *Visual display/runway depiction* – appropriate to provide flight path guidance and runway proximity cues at decision point and transition to climb.

MANEUVER	OBJECTIVE	CHARACTERISTICS AND TOLERANCES
F. Missed Approach	Perform maneuver using recommended pitch, power, air speed, and configuration changes, and all checklist items necessary to successfully perform a missed approach without descent below MDA/DH.	*Power settings* – full range available. *Instrumentation* – sufficient to evaluate the correct use of power. *Performance* – substantially duplicate the airplane's control characteristics. An appropriate transition from descent to level-off to climb should occur without undue delay when recommended pitch, power, airspeed and configurations are employed. *Controls and functions* – as appropriate to accomplish all significant checklist items. *Navigation instruments and radios* – as appropriate.
G. Holding	Perform Maneuver using recommended airspeeds and power settings.	*Navigation instruments and radios* – as appropriate. *Airspeed(s) at recommended power setting(s)*-same as airplane +/- 10%.

MANEUVER	OBJECTIVE	CHARACTERISTICS AND TOLERANCES
AIRWORK		
A. Constant Altitude Turns	Perform maneuvers at appropriate airspeeds and bank angles, recognizing and apply proper pitch, bank and power control to maintain appropriate performance tolerances. Understand effects of over banking and steep spiral, and the proper recovery techniques.	*Performance*-substantially duplicate the airplane's control characteristics. Pitch, power and airspeed-as appropriate for the airspeed(s) used. Bank angle effects-increased bank angle should require an increased pitch attitude if power remains constant, or increased power if airspeed is maintained. *Bank limits*-no banking limits should be present with overbanking and inverted flight possible. Elevator effect in altitude control should diminish as 90 degree bank is approached, and reverse when banked more than 90 degrees. *Steep spiral*-airspeed should increase rapidly if a steep spiral is allowed to develop.
B. Imminent Stall **1. Power-on**	Become familiar with flight characteristics, stall warning, control and configuration effects, and maneuvering techniques at or near stall speeds.	*Performance*-substantially duplicate the airplane's control characteristics. Pitch, Power and Airspeed-pitch attitude same as airplane +/- 3 degrees at V. +5 kts. And appropriate power setting. *Stall Indications*- stall horn and control loss appropriate for airplane (reduced aileron and rudder effectiveness, and pitch down at stall, if appropriate). *Stall speeds*-same as airplane V and V +/- 5 kts, increase with bank angle for accelerated stall.

MANEUVER	OBJECTIVE	CHARACTERISTICS AND TOLERANCES
2. Power-off	Become familiar with flight characteristics, stall warning, control and configuration effects, and maneuvering techniques at or near stall speeds.	*Performance*-substantially duplicate the airplane's control characteristics. Pitch, power and Airspeed-pitch attitude same as airplane +/- 3 degrees at V + 5 kts. And appropriate power setting. *Stall Indications*-stall horn and control loss appropriate for airplane (reduced aileron and rudder effectiveness, and pitch down at stall, appropriate). *Stall Speeds*- same as airplane V and V +/-5kts., increase with bank angle for accelerated stall.
B. Flight at minimum controllable airspeed	Perform maneuver with positive control of airplane, anticipating power requirements and controlling heading, altitude and airspeed.	*Performance*-substantially duplicate the airplane's control characteristics. Pitch, Power, and Airspeed-a noticeable region of reverse command should exist. Adverse yaw and left turning tendency as appropriate.

MANEUEVER	OBJECTIVE	CHARACTERISTICS AND TOLERANCES
ABNORMAL/ EMERGENCY PROCEDURES		
A. Simulated Engine-out ILS or LPV Approach	Perform maneuver with positive control of airplane, anticipating power requirements and controlling heading, attitude and airspeed. Become familiar with considerations involving gear and flap extension, and missed approach configuration and planning. Perform maneuver with sufficient precision to achieve desired outcome (landing or missed approach).	*Performance*- substantially duplicate the airplane's control characteristics. Engine out yaw, propeller drag and feathering effects –as appropriate. *Effects of configuration* – as appropriate. *Maneuvering characteristics*- appropriate pitch and roll response, and rate of turn at small bank angels used for precision approach maneuvering (2 to 3 degrees). *ILS or LPV course width and sensitivity* –as appropriate. *Navigation instruments and radios* –as appropriate.

MANEUVER	OBJECTIVE	CHARACTERISTICS AND TOLERANCES
B. Simulated engine-out Non-precision approach (multi-engine only)	Perform maneuver with positive control of airplane, anticipating power requirements and controlling heading, altitude and airspeed. Become familiar with considerations involving gear and flap extension, and missed approach configuration and planning. Perform maneuver with sufficient precision to achieve desired outcome (landing or missed approach).	*Performance*-substantially duplicate the airplane's control characteristics. Engine out yaw, propeller drag and feathering effects-as appropriate. *Effects of configuration*-as appropriate. *Navigation instruments and radios*-as appropriate. *Visual display*-runway depiction and accuracy sufficient to evaluate final approach path control at or near MAP.
C. Simulated engine failure after lift-off (multi-engine only)	Perform recommended checklist procedures while maintaining positive control of airplane heading, altitude and airspeed.	*Performance*-substantially duplicate the airplane's control characteristics. Engine out yaw, propeller drag and feathering effects-as appropriate. *Effects of configuration*-as appropriate. *Flight performance*-as appropriate for airplane under similar conditions and recommended configuration(s). *Visual display*-runway depiction for alignment and runway remaining cues.

MANEUVER	OBJECTIVE	CHARACTERISTICS AND TOLERANCES
D. Simulated engine failure before lift-off (multi-engine only)	Perform recommended checklist procedures while maintaining positive control of airplane ground track.	*Performance*-substantially duplicate the airplane's control characteristics. Engine out yaw effect (on ground) –as appropriate. *Ground handling characteristics*-as appropriate. *Visual display*-runway depiction for alignment and runway remaining cues.
E. Emergency Gear Extension	Perform recommended checklist procedures.	*Controls and indicators*-sufficient for each significant item on the checklist
F. Emergency descent (Turbocharged/ Pressurized Airplane)	Perform recommended checklist procedures. Become familiar with pitch and bank attitudes, power settings, configuration effects and control techniques.	*Performance*-substantially duplicate the airplane's control characteristics. Controls and instruments-sufficient for each significant item on checklist. *Altitude capability*-18,000ft. *Flight performance*- descent rate appropriate for pitch, bank, power, airspeeds and configurations used.
G. Use of crew oxygen (pressurized airplane)	Become familiar with use of installed oxygen system	Oxygen systems masks, controls and instruments-as appropriate.

MANEUVER	OBJECTIVE	CHARACTERISTICS AND TOLERANCES
H. Partial Panel	Become familiar with partial panel flight techniques appropriate for the airplane[1].	*Flight performance*-unlimited bank, proper elevator effect in steep banked and inverted flight.
I. Recovery from unusual attitudes by instrument reference	Perform recoveries from unusual attitudes while maintaining positive control of airplane without exceeding limitations.	*Performance*-substantially duplicate the airplane's control characteristics. Controls and instruments-as appropriate.
J. 180 degree turn by reference to instruments and at least 3 minutes of straight and level flight	Perform basic instrument flight maneuvers to avoid or escape deteriorating weather.	*Flight performance*-unlimited bank, proper elevator effect in steep banked and inverted flight, gear drag effect to reduce abnormally high airspeeds. *Controls and instruments*-as appropriate.
K. Fire-Electrical and Engine	Perform recommended checklist procedures.	*Controls and switches*-sufficient for each significant item on checklist.
L. Smoke Removal	Perform recommended checklist procedures.	*Controls and indicators*-sufficient for each significant item on the checklist.
M. Emergency Exits	Become familiar with location and operation of emergency exits.	*Aircraft*-entire cockpit and cabin area, showing location of all exits and allowing operation of doors.

[1] When using a training device or simulator, it is recommended that the attitude indicator be failed rather than covered, forcing the pilot to recognize the onset of the situation, as well as to control it after recognition.

MANEUVER	OBJECTIVE	CHARACTERISTICS AND TOLERANCES
N. Simulated Loss of Pressurization	Perform recommended checklist procedures.	Performance-substantially duplicate the airplane's control characteristics. Controls and indicators –sufficient for each significant item on the checklist.
O. Any other emergency or abnormal procedure required.	Perform recommended checklist procedures.	Controls and indicators-sufficient for each significant item on the checklist.

APPENDIX D

AEROSPATIALE AIRCRAFT MODEL GROUPS

1. Model TB10

2. Model TB20

   Model TB21

Note: Difference training for changes in horsepower or significant system changes (including induction systems) is required within all model groups.

If the airplane has been modified so as to substantially affect gross weight, aerodynamics or handling qualities, for the purposes of Transition Training, the airplane is a separate model group.

APPENDIX E

BEECH AIRCRAFT MODEL GROUPS

1. Model 17 Series
2. Model 18 Series
   Difference training for nosewheel or tailwheel airplane is required.
3. Model 24R Series
4. Model 35-M35
5. Model N35-V35B
6. Model V35TC-V35BTC
7. Model 36-A36
8. Model A36TC-B36TC
9. Model 33 Series
10. Model 50 Series
11. Model 55 Series
12. Model 56TC
    Model A56TC
13. Model 58 (prior to 1984 model year)
14. Model 58 (1984 model year and after)
15. Model 58P (prior to 1984 model year)
    Model 58TC (prior to 1984 model year)
16. Model 58P (1984 year and after)
    Model 58TC (1984 model year and after)
17. Model 60-B60
18. Model 65 Series
19. Model 65-80 Series
20. Model 65-88
21. Model 76
22. Model T34A
    Model T34B
    (Beech designation 45, A45, D45)
23. Model 65-90 Series
24. Model 100 Series
25. Model B200 Series
26. Model MU-2 Series

Note: Difference training for changes in horsepower or significant system changes (including induction systems) is required within all model groups.

If the airplane has been modified so as to substantially affect gross weight, aerodynamics or handling qualities, for the purposes of Transition Training, the airplane is a separate model group.

APPENDIX F

CESSNA AIRCRAFT MODEL GROUPS

1. Model 172XP
   Model 172RG
   Model 177RG
   Difference training for handling characteristics and system orientation is required.

2. Model 180
   Model 185

3. Model 188

4. Model 182
   Model R182
   Difference training for retractable

5. Model 190
   Model 195

6. Model 205
   Model 206
   Model 207

7. Model 210
   Model T210
   Model P210
   Difference training for pressurization or turbocharging is required.

8. Model 208

9. Model 303

10. Model 310
    Model 320
    Difference training for turbocharging is required.

11. Model 335
    Model 340
    Difference training for pressurization is required.

12. Model 336
    Model 337
    Difference training for retractable gear, turbocharging and pressurization is required.

13. Model 401
    Model 402

14. Model 414
    Model 421

15. Model 411

16. Model 404

17. Model 406

18. Model 425

19. Model 441

20. Model TTx
    Difference training is required.

Note: Difference training for changes in horsepower or significant system changes (including induction systems) is required within all model groups.
If the airplane has been modified so as to substantially affect gross weight, aerodynamics or handling qualities, for the purposes of Transition Training, the airplane is a separate model group.

APPENDIX G

COMMANDER AIRCRAFT MODEL GROUPS

1. Model 112
   Model 112A
   Model 112B
   Model 114
   Model 114A

2. Model 112TC
   Model 112TCA
   Difference training for turbocharging is required.

Note: Difference training for changes in horsepower or significant system changes (including induction systems) is required within all model groups.

If the airplane has been modified so as to substantially affect gross weight, aerodynamics or handling qualities, for the purposes of Transition Training, the airplane is a separate model group.

APPENDIX H

FAIRCHILD AIRCRAFT MODEL GROUPS

1. SA-26-T
   SA-26-AT
   Difference training for engine operation is required

2. SA-226-5
   SA-226-T(B)
   SA-226-AT
   SA-226-TC
   Difference training for flight controls and handling characteristics is required.

Note: Difference training for changes in horsepower or significant system changes (including induction systems) is required within all model groups.

If the airplane has been modified so as to substantially affect gross weight, aerodynamics or handling qualities, for the purposes of Transition Training, the airplane is a separate model group.

APPENDIX I

GULFSTREAM AEROSPACE AIRCRAFT MODEL GROUPS

1. Model 700

2. Model 680

3. Model 560F
   Model 680E
   Model 680F
   Model 720
   Difference training for handling and systems required

4. Model 680FL
   Model 680FLP
   Difference training for pressurization is required

5. Model 685

6. Model 520

7. Model 560
   Model 650A
   Model 560E
   Difference for training systems is required

8. Model 500

9. Model 500A

10. Model 500B
    Model 500U
    Model 500S

11. Model 680T
    Model 680W
    Model 680V

12. Model 691

13. Model 690
    Model 690A
    Model 690B

14. Model 690C
    Model 690D
    Model 695
    Model 695A
    Model 695B
    Difference training for handling characteristics, high altitude operation, and systems is required.

Note: Difference training for changes in horsepower or significant system changes (including induction systems) is required within all model groups.

If the airplane has been modified so as to substantially affect gross weight, aerodynamics or handling qualities, for the purposes of Transition Training, the airplane is a separate model group.

APPENDIX J

PIPER AIRCRAFT MODEL GROUPS

1. Model PA-28/180R
   Model PA-28/200R
   Model PA-28/201R
   Model PA-28/235
   Difference training for retractable gear is required

2. Model PA-28/201RT

3. Model PA-32/300
   Model PA-32/260

4. Model PA-32R/300
   Model PA-32R/301T
   Difference training for turbocharging is required

5. Model PA-34/200
   Model PA-34/200T
   Model PA-34/220T
   Difference training for turbocharging is required

6. Model PA-44/180
   Model PA-44/180T
   Difference Training for turbocharging is required

7. Model PA-46/301P

8. Model PA-60/600
   Model PA-60/601B
   Model PA-60/601P
   Model PA-60/602P
   Model PA-60/700P
   Difference training for turbocharging or pressurization is required

9. Model PA-23/150
   Model PA-23/160
   Model PA-23/235

10. Model PA-23/250

11. Model PA-24/180
    Model PA-24/250
    Model PA-24/260
    Model PA-24/400

12. Model PA-30/160
    Model PA-39/160

13. Model PA-31/310
    Model PA-31 C/R/325
    Model PA-31/350

14. Model PA-31P/350
    Model PA-31P/425

Note: Difference training for changes in horsepower or significant system changes (including induction systems) is required within all model groups.

If the airplane has been modified so as to substantially affect gross weight, aerodynamics or handling qualities, for the purposes of Transition Training, the airplane is a separate model group.

APPENDIX K

TBM AIRCRAFT MODEL GROUP

1. TBM 700
2. TBM 850

Note: Difference training for changes in horsepower or significant system changes (including induction systems) is required within all model groups.

If the airplane has been modified so as to substantially affect gross weight, aerodynamics or handling qualities, for the purposes of Transition Training, the airplane is a separate model group.

APPENDIX L

CIRRUS AIRCRAFT MODEL GROUP

1. SR20
2. SR22
3 SR22T

Note: Difference training for changes in horsepower or significant system changes (including induction systems) is required within all model groups.

If the airplane has been modified so as to substantially affect gross weight, aerodynamics or handling qualities, for the purposes of Transition Training, the airplane is a separate model group.

APPENDIX M

DIAMOND AIRCRAFT MODEL GROUP

1. HK 36

2. DA 20
   DV 20
3. DA 40
   DA 40
   DA 40
4. DA 42
   DA 42
   DA 42

Note: Difference training for changes in horsepower or significant system changes (including induction systems) is required within all model groups.

If the airplane has been modified so as to substantially affect gross weight, aerodynamics or handling qualities, for the purposes of Transition Training, the airplane is a separate model group.