

Multi Engine Piston Aeroplane Class Rating Training Syllabus

Including Centreline Thrust Variants

CAP 601

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Documents

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Contents

Foreword	5
Background	5
Content	5
Rating Examinations	5
Advanced Twin Piston Aeroplanes	5
Chapter 1	7
Introduction	7
Syllabus	7
Aim	7
Course Structure	7
Pre-Course Entry Requirements	7
Instruction	8
Training Records	8
Theoretical Examination	8
Flight Tests	8
Exemptions from Training	8
Chapter 2	9
Theoretical Training	9
Lesson: TH1 and TH2 - Aeroplane and Engine Systems	11
Lesson: TH3 - Constant Speed Propellers and Feathering	13
Lesson: TH4 - Multi Engine Flight Principles	14
Lesson: TH5 - Minimum Control and Safety Speeds	16
Lesson: TH6 - Mass and Balance, performance and limitations	17
Lesson: TH7 - Effects of Engine Failure on Systems and Performance	18
Flight Training	19
Flight Exercise F1 - Initial Type Conversion	21
Flight Exercise F2 - General Handling and Circuits	23
Flight Exercise F3 - Introduction to Asymmetric Flight	24

Flight Exercise F4 - Critical and Safety Speeds	26
Flight Exercise F5 - Asymmetric Circuits	27
Flight Exercise F6 - Asymmetric Performance and Circuit	28
Chapter 4	29
Multi-engine Piston Aeroplanes with Centreline Thrust	29
Background	29
Theoretical Training	29
Flight Training	30
Theoretical Examination	30
THEORETICAL TRAINING	31
Lesson: TH6C - Effects of Engine Failure on Systems and Performance - Centerline Thrust	31
FLIGHT TRAINING	33
Flight Exercise F3C - Introduction to Engine Failure	33
Flight Exercise F4C - Circuits	34
Chapter 5	35
Examination Paper Preparation	35
Rules for Writing Multiple Choice Questions	36
Example of a good question:	36
Example of a typical poor question:	37
Chapter 6	38
Bibliography	38
CAA- EASA Publications	38
Additional briefing material	38
Appendix A Student Record - MEP Training Course	39
Appendix B MEP Training Record	40

Foreword

Background

JAR-FCL 1 (Aeroplane) was implemented on 1 July 1999. This introduced changes to multi-engine aeroplane training including the introduction of a multi-engine piston (MEP) class rating. CAP601 was drafted to provide guidance to Flight Training Organisations seeking approval to provide courses of training for the JAR-FCL MEP class rating. The requirements for multi-engine training and testing in Commission Regulation (EU) No 1178/2011 (the Aircrew Regulation) are very much the same as the requirements of JAR-FCL. Therefore, this document has been amended to be compliant with the Aircrew Regulation and reissued as a third edition.

This training syllabus is provided by the Civil Aviation Authority as guidance for Approved Training Organisations (ATOs) wishing to conduct training for the multi-engine piston (MEP) class rating in accordance with Part-FCL and specifically FCL.725.A.

Content

Part-ORA requires ATOs seeking approval to conduct courses of training for licences, ratings or certificates to submit a training programme, training manual and operations manual (ORA.ATO.125 and 130) detailing the proposed course of training. CAP601 may be used by ATOs to assist with the development of a training course and training manual in order to satisfy these requirements.

Multi-engine piston aeroplanes having two engines mounted with a common thrust axis do not qualify for the issue of a full MEP class rating as they exhibit no asymmetric properties. Training conducted on such aeroplanes is restricted to centreline thrust aeroplanes only. A suitable syllabus of training has been included in this document for such aircraft, and does not include the three and a half hours asymmetric training.

Rating Examinations

FCL.725 requires ATOs offering training for MEP class and type ratings to provide the aircraft rating written examinations as part of the approval process. Examinations should be based upon the course material, and not be general knowledge quizzes. All questions should be capable of being answered from the aircraft documents, course notes and associated material. Guidance on the formulation of written exam questions is provided in Chapter 5.

Advanced Twin Piston Aeroplanes

Since the first edition of CAP601 a number of advanced technology twin piston aeroplanes have been certified that are equipped with Electronic Flight Instrument System (EFIS)

100

Chapter 1

Introduction

Syllabus

- 1.1 The purpose of this document is to provide an example syllabus of theoretical ground and flight training for applicants undertaking the multi-engine piston (MEP) class rating course in accordance with Part-FCL.

Aim

- 1.2 To give the applicant a sound theoretical knowledge of multi engine piston aircraft operation in accordance with the visual flight rules (VFR), and to teach the skills necessary for the safe and competent operation of such aircraft.

Course Structure

- 1.3 The course shall comprise of a **minimum** of 7 hours theoretical ground training, and a **minimum** of 6 hours flight training. The content of the theoretical ground training is given at Chapter 2; the content of the flight training, which shall include 3.5 hours of asymmetric training, is at Chapter 3. A flight training syllabus designed for centreline thrust aircraft is given in Chapter 4. The ground and flight training shall be integrated and co-ordinated so that the applicant gains the maximum benefit from time spent in the air. On completion of this training, the applicant shall pass a ground examination, set by the ATO and approved by the CAA. Details on examination preparation are contained in Chapter 5. In accordance with FCL.1030, the ATO/person responsible for the training shall certify satisfactory completion of the course of training and recommend the applicant for test. All requirements stated in this syllabus are to be regarded as a minimum. Applicants with Night and IMC qualifications may wish to do additional training in night and instrument flying.

Pre-Course Entry Requirements

- 1.4 Whilst it is theoretically possible to complete a course of PPL training on a MEP aeroplane, an applicant for a first ME class rating is required to have at least 70 hours flight time as pilot in command (PIC) on aeroplanes. It is therefore assumed that the majority of applicants for the MEP class rating will be in possession of at least a valid PPL (A) and have 70 hours experience as PIC before commencing the course. There are no planned solo exercises on the course.

Instruction

- 1.5 Either a Flight Instructor (FI) qualified in accordance with FCL.905.FI (h) or a Class Rating Instructor (CRI) qualified for multi engine instruction, shall conduct flight instruction on the course. The ground instruction shall take the form of lessons and briefings given by the FI, CRI, or an approved ground instructor.

Training Records

- 1.6 A student training record shall be maintained of all ground training conducted and of all flight-training exercises. The record, which must contain limited personal details of the applicant, shall be maintained for a period of 5 years from completion of the training.

Theoretical Examination

- 1.7 Applicants for a MEP class rating shall sit a multiple choice written examination on completion of the course. The examination pass mark is 75%.

Flight Tests

- 1.8 On completion of the course of instruction for the MEP class rating, including passing the theoretical examination, the applicant will be required to pass a Class Rating Skill Test with either a Flight Examiner (FE) or a Class Rating Examiner (CRE) in accordance with Appendix 9 to Part-FCL.
- 1.9 Applicants who complete their training in accordance with the centreline thrust aircraft syllabus will be issued with a MEP class rating limited to centreline thrust aircraft only.

Exemptions from Training

- 1.10 Holders of ICAO pilots licences with multi-engine piston privileges may be credited some or all of the flying and theoretical knowledge training. Further details are in CAP804.

Chapter 2

Theoretical Training

2.1 The MEP class rating course (FCL.725.A and AMC1 FCL.725 (a)) shall comprise of a minimum 7 hours of theoretical ground training on subjects associated with the operation of multi engine piston aircraft. It includes elements, some of which are generic and some of which are specific, to the type of aeroplane to be used on the course. The theoretical ground training shall be integrated with the flight training so that the maximum benefit is gained from time spent in the air.

2.2 The outline syllabus is as follows:

Lesson	Subject	Time
TH1	Aeroplane and Engine Systems	1 hr
TH2	Aeroplane and Engine Systems	1 hr
TH3	Constant Speed Propellers and Feathering	1 hr
TH4	Multi Engine Flight Principles	1 hr
TH5	Minimum Control & Safety Speeds	1 hr
TH6	Mass & Balance, performance and limitations	1 hr
TH7	Effects of Engine Failure on Systems and Performance	1 hr
	Total	7 hrs

2.3 A Flight Instructor (FI) or Class rating Instructor (CRI) qualified to give MEP class rating instruction shall give the theoretical ground-training lectures. Pre flight briefings may be combined with theoretical training in the form of a Long Briefing. Exceptionally; and subject to course approval; a suitably qualified ground instructor may be used to give theoretical ground lectures only; the FI or CRI shall then give additional pre-flight briefings.

2.4 The detailed content of each lesson should be as set out in the following pages. The Bibliography at Chapter 5 should provide the data base for general theory and principles whilst the Flight Manual/Pilot Operating Handbook should be used for information and data which is type specific.

- 2.5 Many multi engine aeroplanes used for training will have been certified in accordance with legacy certification standards (e.g. BCARs for UK Performance Groups C or E). More recent types will have been certified in accordance with CS-23. Any performance calculations and associated examinations should be based upon actual aeroplane performance given in the Aircraft Flight Manual/Pilot Operating handbook with consideration for any additional factors required or recommended for Commercial or non-Commercial Air Transport as appropriate. To that end, EASA Part-NCO, Part-CAT, Aeronautical Information Circulars (AICs) and CAA Safety Sense Leaflets may also be a useful source of course material.

Lesson: TH1 and TH2 - Aeroplane and Engine Systems

Duration: 1 hour

Aim: To understand all systems relevant to the operation of the multi engine piston aeroplane used on the course.

Lesson Content:

1. Aeroplane Systems (normal operation):

- Fuel
- Electrical
- Flight Control (primary and secondary)
- Automated flight control (autopilot)
- Hydraulic
- Pneumatic
- Flight Instruments
- Avionics/communication
- Landing gear and Braking
- Ice and rain protection
- Oxygen
- Emergency equipment location and operation (e.g. ELT, fire extinguisher, first aid kit, life jacket etc)
- Other systems as applicable to type (e.g. pressurisation)

2. Engine Systems (normal operation):

- Fuel
- Oil
- Starter
- Ignition
- Mixture
- Turbochargers
- Fire detection & control

3. Limitations:

- Airframe:
 - Load factors
 - Speeds
- Engine:
 - RPM/MAP
 - Temperatures and Pressures

4. Abnormal Operation & Emergency Procedures:

- Refer to the Aircraft Flight Manual/Pilot Operating handbook for the aeroplane type

Performance Standard: The applicant shall be able to list and describe the aeroplane and engine systems and their operation, under normal and emergency conditions and with reference to the AFM/POH.