



## EASA Part 66 - Module 4 - Electronic Fundamentals - 2 Days

### INTRODUCTION

Module 4 covers Electronic Fundamentals including Semiconductors, Diodes, Transistors, IC, Printed Circuit Boards PCB, Servomechanisms, Principles of Synchronic Operation, Inductance & Capacitance Transmitters. Construction operation and use of the following synchronic system components

On completion of the module you will be able to sit a multi choice exam and on passing will receive a completion certificate.

All Part 66 training courses are provided under the direct control, oversight and guidance of European Aviation Institute (EAI).

European Aviation Institute (EAI) is an EASA Part 147 approved Maintenance Training Organization (MTO) with Certificate of Approval No RO.147.0003. Providing Part 147 and other specialized "non EASA Part 147" training courses. Providing both integrated and modular packaged quality training solutions from our center in Bucharest or at other preferred location.

European Aviation Institute was established with the goal of raising the standards of aeronautical training, with access to skilled instructors, the focus is on delivering best in class skills to existing and new generations of aviation technicians and engineers.

### Detailed Content / Topics - The following Subjects will be addressed

#### 1. Semiconductors

##### 1.1. Diodes

- Diode symbols;
- Diode characteristics and properties;
- Diodes in series and parallel;
- Main characteristics and use of silicon controlled rectifiers (thyristors), light emitting diode, photo conductive diode, varistor, rectifier diodes;
- Functional testing of diodes;
- Materials, electron configuration, electrical properties;
- P and N type materials: effects of impurities on conduction, majority and minority characters;
- PN junction in a semiconductor, development of a potential across a PN junction in unbiased, forward biased and reverse biased conditions;

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## Detailed Content / Topics - The following Subjects will be addressed

### 1.1. Diodes

- Diode parameters: peak inverse voltage, maximum forward current, temperature, frequency, leakage current, power dissipation;
- Operation and function of diodes in the following circuits: clippers, clampers, full and half wave rectifiers, bridge rectifiers, voltage doublers and triplers;
- Detailed operation and characteristics of the following devices: silicon controlled rectifier (thyristor), light emitting diode, Schottky diode, photoconductive diode, varactor diode, varistor, rectifier diodes, Zener diode.

### 1.2. Transistors

- Transistor symbols;
- Component description and orientation;
- Transistor characteristics and properties;
- Construction and operation of PNP and NPN transistors;
- Base, collector and emitter configurations;
- Testing of transistors;
- Basic appreciation of other transistor types and their uses;
- Application of transistors: classes of amplifier (A, B, C);
- Simple circuits including: bias, decoupling, feedback and stabilisation;
- Multistage circuit principles: cascades, push-pull, oscillators, multivibrators, flip-flop circuits.

### 1.3. Integrated Circuits

- Description and operation of logic circuits and linear circuits and operational amplifiers;
- Description and operation of logic circuits and linear circuits;
- Introduction to operation and function of an operational amplifier used as: integrator, differentiator, voltage follower, comparator;
- Operation and amplifier stages connecting methods: resistive capacitive, inductive (transformer), inductive resistive (IR), direct;
- Advantages and disadvantages of positive and negative feedback.

## 2. Printed Circuit Boards

- Description and use of printed circuit boards.

## 3. Servomechanisms

- Understanding of the following terms: open and closed loop systems, feedback, follow up, analogue transducers;
- Principles of operation and use of the following synchro system components and features: resolvers, differential, control and torque, transformers, inductance and capacitance transmitters;

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## Detailed Content / Topics - The following Subjects will be addressed

### 3. Servomechanisms

- Understanding of the following terms: open and closed loop, follow up, servomechanism, analogue, transducer, null, damping, feedback, dead band;
- Construction operation and use of the following synchro system components: resolvers, differential, control and torque, E and I transformers, inductance transmitters, capacitance transmitters, synchronous transmitters; Servo mechanism defects, reversal of synchro leads, hunting.

## Target groups

Mechanics & Technicians wishing to develop a detailed understanding of subject material in preparation for the sitting of EASA Part 147 Module examination.

## Pre-requisites

This is a review course so it is important that you spend time studying the material in preparation for your examination – see also [www.easaonline.com Part 66](http://www.easaonline.com/Part%2066) where you can enroll to review the material and practice the examination.

## Learning Objectives

To support the achievement of gaining a credit in the EASA Part 66 Basic Licence Module Exam

## Duration

2 days - Each training day will commence at 09.00 and finish at 17.00, with appropriate refreshment breaks.

Each day consists of 6 hours training.

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