CIVIL AVIATION AUTHORITY
OF NEW ZEALAND
Te Mana Rererangi Tūmatanui o Aotearoa

Advisory Circular
AC66–2.31

Revision 1

2 October 2023

Aircraft Maintenance Engineer Licence — Avionic Group Ratings

General

Civil Aviation Authority advisory circulars (ACs) contain information about standards, practices, and procedures that the Director has found to be an **Acceptable Means of Compliance** with the associated rule.

Consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices, or procedures are found to be acceptable they will be added to the appropriate AC.

Purpose

This AC describes an acceptable means of compliance with the syllabus content in respect of written examinations for Avionics Group Ratings.

This AC also provides guidance for recommended study material in respect of the examination syllabi in this AC.

Related Rules

This AC relates specifically to Civil Aviation Rule Part 66 Subpart C — Aircraft Maintenance Engineer Licence.

Change Notice

Revision 1 adds a note on the online application process and information about how to apply to sit an exam, under *Eligibility Requirements.* It also corrects formatting and other minor errors and adds a version history.

Version History

The main changes are outlined below:

AC Revision No	Effective Date	Summary of changes
AC66-2.31, Rev 0	1 Dec 2008	Initial issue
AC66-2.31, Rev 1	2 Oct 2023	Adds a note on the online application process and information about how to apply to sit an exam, under *Eligibility Requirements*

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		Corrects formatting and other minor errors Adds a version history

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Eligibility requirements

Rule 66.103(3) requires an applicant for an AME group or type rating to have successfully completed examinations acceptable to the Director or a course of training.

The examinations acceptable to the Director should comply with the syllabi contained in this AC.

An application to sit an examination may be made directly to ASPEQ. Refer to https://caanz.aspeqexams.com/home for examination information.

Knowledge Levels

These syllabi provide for the subject material covered in the Avionic Group Rating examinations.

Each topic within the syllabi has a level number which provides an indication of the degree or level of knowledge required. There are three level numbers and they are defined as follows:

Level 1: General appreciation of principles and a broad understanding of the subject.

Level 2: Comprehension of principles and salient features. Simple relevant calculations may be required.

Level 3: Detailed knowledge of all aspects of the subject including relevant calculations.

***Note**: From October 2023, to add a new rating to your LAME licence, you can apply online for this through **MyAviation**, CAA's online portal for licensing requests, instead of filling in paper forms. Click the 'Online services' button on the CAA home page to get started.*

Subject 90 (Written) & 91 (Oral)

Electrical Group I

Resource Study Material

This resource study guide is produced to show where suitable material may be obtained. CAA is not bound to use these books for examining purposes, nor is CAA liable if these books are unavailable at commercial bookshops. This list is a sample only. Many other titles may be equally as helpful in preparing for this examination.

Scope of the Subject

1.	Civil Aircraft Inspection Procedures UK CAA.
2.	FAA AC43 series.
3.	Piper, Cessna, Beech, Maintenance Manuals.
4.	Relevant test equipment manuals.

Note: *The following books are acceptable alternatives to the A & P Handbooks. EA-ITP-GB General, EA-ITP-AB Airframe, EA-ITP-P Powerplant.*

1.	BATTERIES	2	Installation. Control. Protection. Servicing.
2.	GROUND POWER	2	Interlocks and aircraft protection.
3.	GENERATION	2	DC generators. Starter generators. Alternators. Voltage regulators. Load sharing. Load shedding. Control and protection. Paralleling. System layout. Interlock circuits.
4.	POWER CONVERSION	2	Static invertors. Rotary invertors. Transformer rectifier units.

5.	ELECTRICAL SYSTEMS ASSOCIATED WITH–	2	Engine and propeller systems. Fire Detection and protection. Ice and rain detection and protection. Fuel and hydraulic systems. Landing gear systems. Starting and ignition.
		2	Flight control systems. Lighting and general services. Stall warning systems. Pneumatic systems. Warning and annunciator systems.
6.	SAFETY ASPECTS	3	
7.	TEST EQUIPMENT	2	
8.	MAINTENANCE & TROUBLESHOOTING	3	

Subject 93 (Written) & 94 (Oral)

Instruments Group I

Resource Study Material

This resource study guide is produced to show where suitable material may be obtained. CAA is not bound to use these books for examining purposes, nor is CAA liable if these books are unavailable at commercial bookshops. This list is a sample only. Many other titles may be equally as helpful in preparing for this examination.

Scope of the Subject

1.	Civil Aviation Inspection Procedures UK CAA
2.	FAA AC43 series
3.	Piper, Cessna, Beech, Embraer Maintenance Manuals
4.	Relevant test equipment manuals

Note: *The following books are acceptable alternatives to the A & P Handbooks: EA-ITP-GB General, EA-ITP-AB Airframe, EA-ITP-P Powerplant.*

1.	PITOT & STATIC SYSTEMS & INSTRUMENTS	2	Airspeed indication. Altimeter. Vertical speed indicator. Machmeter. Pitot probes. Static plates and heaters. Pipelines and flexible hoses. Drain traps and associated equipment. Altitude and airspeed switches. Installation.
2.	ENGINE INSTRUMENTS	2	Manifold pressure. Rotational speed. Pressure and temperature. Cylinder head temperature. Exhaust gas temperature.
3.	GYRO INSTRUMENTS	2	Types: attitude and direction, electrical and vacuum. Testing, handling and installation.
4.	OXYGEN SYSTEMS	2	Storage and distribution. Charging bottle checks.

			Safety precautions. Installation.
5.	INSTRUMENT INSTALLATION	2	Panel and instrument mounting and marking. Power requirements. Range marking. Lighting.
6.	RATE GYRO INSTRUMENT	2	Turn and slip. Rate co-ordinators.
7.	VACUUM SYSTEMS	2	Sources: venturi and pump. Control and adjustment. Indication system.
8.	PRESSURE MEASUREMENT	2	Sensing elements. Transmitters. Indication system.
9.	TEMPERATURE MEASUREMENT	2	Variable resistance. Thermocouples. Compensation. Limits and values. Control system inputs. Indication system.
10.	ROTATIONAL SPEED MEASUREMENT	2	Direct drive indicators. Tachogenerators and pulse-probe systems. Indication system.
11.	POSITION MEASUREMENT	2	DC and AC systems.
12.	QUANTITY MEASUREMENT	2	Direct reading. Electrical and electronics systems. Compensation. Indication system.
13.	SAFETY ASPECTS	3	
14.	TEST EQUIPMENT	3	
15.	MAINTENANCE &	3	

	TROUBLE–SHOOTING		
ADDITIONAL PRIVILEGES ATTACHED TO THIS RATING			
6.	MECHANICAL SYSTEMS	1	Wheel changing and wheel bearing maintenance.
		2	Servicing of landing gear shock struts.
		1	Safety harnesses, belts, and seats. Fuel and oil filter maintenance. Replenishment of fuel, oil, and hydraulic systems.
		3	Duplicate inspection of flying controls.
17.	ELECTRICAL SYSTEMS	2	Understand components and layout of a typical aircraft installation in Group 1 thru 4 Aeroplanes or Group 1 thru 2 rotorcraft.
		3	Interpretation of electrical wiring diagrams.
		2	Maintenance of Group 1 electrical systems.
		3	Defect analysis and troubleshooting of simple electrical systems.
18.	RADIO SYSTEMS	2	Understand components and installation of Group 1 radio systems.
		3	Interpretation of radio wiring diagrams.
		2	Maintenance of Group 1 radio systems.

Subject 95 (Written) & 96 (Oral)

Instruments Group 2

Resource Study Material

This resource study guide is produced to show where suitable material may be obtained. CAA is not bound to use these books for examining purposes, nor is CAA liable if these books are unavailable at commercial bookshops. This list is a sample only. Many other titles may be equally as helpful in preparing for this examination.

Scope of the Subject

1.	Maintenance or service manuals applicable to the following aircraft instrument systems: Cessna 400 series Beech 58 Piper PA31 Embraer 101
2.	Manuals applicable to the following specific equipment: King KFC 200/300 Flight Control System Collins PN 101 Pictorial Navigation System Bendix M4-D Auto Pilot System King KCS55A Pictorial Navigation System EDO-AIR series Flight Control Systems Cessna 400 B series Flight Control Systems

***Note**: The following books are acceptable alternatives to the A & P Handbooks: EA-ITP-GB General, EA-ITP-AB Airframe, EA-ITP-P Powerplant.*

1.	REMOTE READING COMPASSES	2	Magnetic azimuth transmitter. Flux detector. Directional gyro. Slaving accessory unit. Comparator or monitor system. Indication. Compensation method and procedure. Coefficient correction unit. Installation of components and interface with other systems.
2.	AIR DATA COMPUTER	2	Principles of operation. Sensors and inputs.

			Signal output and displays. Signal processors.
3.	SERVO INSTRUMENTS	2	Principles of operation. Inputs, displays. Power supplies.
4.	AUTO FLIGHT CONTROL SYSTEMS		• Radio coupled autopilots • non-radio coupled autopilots • two- and three-axis autopilots • yaw damper systems • flight director systems
		In the above autoflight systems, understand the following:	
		2	Modes of operation. Mode selection. Radio coupling. Control and display. Disconnects. Mode annunciators. Failure and discount indication and aural warning systems.
		2	Interlocks. IAS, Mach, and altitude hold capability. Power supplies. Control cable installation and adjustment. Capstan installation and interconnection with controls. Servo motor construction installation and operation. Signal inputs and outputs. Heading and altitude reference. Amplifiers computers. Component installation.
5.	SAFETY ASPECTS	3	
6.	TEST EQUIPMENT	2	
7.	MAINTENANCE & TROUBLESHOOTING	2	

ADDITIONAL PRIVILEGES ATTACHED TO THIS RATING:			
8.	MECHANICAL SYSTEMS	1	Wheel changing and wheel bearing maintenance.
		2	Servicing of landing gear shock struts.
		1	Safety harnesses, belts, and seats. Fuel and oil filter maintenance. Replenishment of fuel, oil, and hydraulic systems.
		3	Duplicate inspection of flying controls.
9.	ELECTRICAL SYSTEMS	2	Understand components and layout of a typical aircraft installation in Group 1 thru 4 Aeroplanes or Group 1 thru 2 rotorcraft.
		3	Interpretation of electrical wiring diagrams.
		2	Maintenance of Group 1 electrical systems.
		3	Defect analysis and troubleshooting of simple electrical systems.
10.	RADIO SYSTEMS	2	Understand components and installation of Group 1 radio systems.
		3	Interpretation of radio wiring diagrams.
		2	Maintenance of Group 1 radio systems.

Subject 101 (Written) & 102 (Oral)

Radio Group 1

Resource Study Material

This resource study guide is produced to show where suitable material may be obtained. CAA is not bound to use these books for examining purposes, nor is CAA liable if these books are unavailable at commercial bookshops. This list is a sample only. Many other titles may be equally as helpful in preparing for this examination.

Scope of the Subject

1.	Civil Aircraft Inspection Procedures UK CAA
2.	FAA AC43 series
3.	Piper, Cessna, Beech, Embraer Maintenance Manuals
4.	King, Collins, Narco, Bendix, Cessna Equipment Manuals

Note: *The following books are acceptable alternatives to the A & P Handbooks: EA-ITP-GB General, EA-ITP-AB Airframe, EA-ITP-P Powerplant.*

1.	AUDIO SYSTEMS	2	Intercommunication audio selector panels. Audio mixing and distribution systems. Public address and entertainment systems. Headsets and microphone installation.
2.	VHF	2	Antenna and feeder. Voltage-standing-wave ratio transmitter-receiver. Installation. System interface. Control panel.
3.	HF	2	Antenna and feeder. Voltage standing wave ratio. Transmitter-receiver. Control panel. Antenna coupler. Lightning arrestor. Installation. System interface.
4.	SELCAL	2	Selcal decoder. System interface.

			Installation
5.	COCKPIT VOICE RECORDER	2	Voice recorder. System interface. Installation.
6.	EMERGENCY LOCATOR BEACON	2	Locator beacon. Batteries. Antenna. Installation.
7.	SAFETY ASPECTS	3	
8.	TEST EQUIPMENT	3	
9.	MAINTENANCE & TROUBLESHOOTING	3	
ADDITIONAL PRIVILEGES ATTACHED TO THIS RATING:			
10.	ELECTRICAL SYSTEMS	2	Understand components and layout of a typical aircraft installation in Group 1 thru 4 Aeroplanes or Group 1 thru 2 rotorcraft. Interpretation of electrical wiring diagrams.
		3	Electrical storage batteries.
		2	Defect analysis and troubleshooting of simple electrical systems.
11.	INSTRUMENT SYSTEMS	2	Basic flight instruments. Simple auto pilot system. Pitot static system. General aircraft instruments. Maintenance of instrument systems.
		3	Defect analysis and troubleshooting of aircraft instrument systems.
12.	MECHANICAL	1	Wheel changing and wheel bearing maintenance.
		2	Servicing of landing gear shock struts.
		1	Safety harness belts and seats. Fuel and oil filter maintenance. Replenishment of fuel, oil, and hydraulic systems.
		3	Duplicate inspection of flying controls.

Subject 103 (Written) & 104 (Oral)

Radio Group 2

Resource Study Material

This resource study guide is produced to show where suitable material may be obtained. CAA is not bound to use these books for examining purposes, nor is CAA liable if these books are unavailable at commercial bookshops. This list is a sample only. Many other titles may be equally as helpful in preparing for this examination.

Scope of the Subject

1.	Civil Aircraft Inspection Procedures UK CAA
2.	FAA AC43 series
3.	Piper, Cessna, Beech, Embraer Maintenance Manuals
4.	King, Collins, Narco, Bendix, Cessna Equipment Manuals

Note: *The following books are acceptable alternatives to the A & P Handbooks: EA-ITP-GB General, EA-ITP-AB Airframe, EA-ITP-P Powerplant.*

1.	ADF	2	Sense antenna. Loop antenna. Receiver. Controller. Installation. Indication. Power supply. System interface.
2.	ILS	2	Localiser antenna. Glideslope antenna. Receiver. Controller. Installation. Indication. System interface.

3.	VOR	2	Antenna. Receiver. Controller. Installation. Indication. Radio magnetic int. System interface.
4.	MARKER	2	Antenna. Receiver. Installation. System interface. Controller.
5.	OMEGA-VLF	2	Antenna. Receiver. Controller. Installation. System interface.
6.	SAFETY ASPECTS	3	
7.	TEST EQUIPMENT	3	
8.	MAINTENANCE & TROUBLE–SHOOTING	3	
9.	ELECTRICAL SYSTEMS	2	Understand components and layout of a typical aircraft installation in Group 1 thru 4 Aeroplanes or Group 1 thru 2 rotorcraft.
		3	Interpretation of electrical wiring diagrams.
		2	Electrical storage batteries.
		3	Defect analysis and troubleshooting of simple electrical systems.

10.	INSTRUMENT SYSTEMS	2	Basic flight instruments. Simple auto pilot system. Pitot static system. General aircraft instruments. Maintenance of instrument systems.
		3	Defect analysis and troubleshooting of aircraft instrument systems.
11.	MECHANICAL SYSTEMS	1	Wheel changing and wheel bearing maintenance.
		2	Servicing of landing gear shock struts.
		1	Safety harnesses, belts and seats. Fuel and oil filter maintenance. Replenishment of fuel, oil, and hydraulic systems.
		3	Duplicate inspection of flying controls.

Subject 105 (Written) & 106 (Oral)

Radio Group 3

Resource Study Material

This resource study guide is produced to show where suitable material may be obtained. CAA is not bound to use these books for examining purposes, nor is CAA liable if these books are unavailable at commercial bookshops. This list is a sample only. Many other titles may be equally as helpful in preparing for this examination.

Scope of the Subject

1.	Civil Aircraft Inspection Procedures UK CAA
2.	FAA AC43 series
3.	Piper, Cessna, Beech, Embraer Maintenance Manuals
4.	King, Collins, Narco, Bendix, Cessna Equipment Manuals

Note: *The following books are acceptable alternatives to the A & P Handbooks: EA-ITP-GB General, EA-ITP-AB Airframe, EA-ITP-P Powerplant.*

1.	RADIO ALTIMETER	2	Antenna and Feeder Transmitter-Receiver Indication Installation System Interface
2.	ATC TRANSPONDER	2	Antenna and Feeder Transponder Altitude Encoder Controller Installation System Interface
3.	DME INTERROGATOR	2	Antenna and Feeder Interrogator Indication Control Panel Installation System Interface

4.	WEATHER RADAR	2	Antenna and Waveguide Radome Transmitter-Receiver Indicator Control Panel Stabilisation Installation System Interface
5.	SAFETY ASPECTS	3	
6.	TEST EQUIPMENT	3	
7.	MAINTENANCE & TROUBLESHOOTING	3	
8.	ELECTRICAL SYSTEMS	2	Understand components and layout of a typical aircraft installation in Group 1 thru 4 Aeroplanes or Group 1 thru 2 rotorcraft.
		3	Interpretation of electrical wiring diagrams.
		2	Electrical storage batteries.
		3	Defect analysis and troubleshooting of simple electrical systems.
9.	INSTRUMENT SYSTEMS	2	Basic flight instruments. Simple auto pilot system. Pitot & static system. General aircraft instruments. Maintenance of instrument systems.
		3	Defect analysis and troubleshooting of aircraft instrument systems.
10.	MECHANICAL SYSTEMS	1	Wheel changing and wheel bearing maintenance.
		2	Servicing of landing gear shock struts.
		1	Safety harness belts and seats. Fuel and oil filter maintenance. Replenishment of fuel, oil, and hydraulic systems.
		3	Duplicate inspection of flying controls.