



Australian Government

MEA289 Maintain basic light aircraft avionic systems and components

Release: 1

MEA289 Maintain basic light aircraft avionic systems and components

Modification History

Release 1 - New unit of competency

Application

This unit of competency requires application of hand skills and the use of maintenance documentation/publications in the maintenance of basic aircraft avionic systems and components involving inspection, testing and troubleshooting and component removal and installation.

Applications include basic fixed wing and rotary wing aircraft where the avionic systems are limited to very high frequency (VHF) communications, basic audio system, automatic direction finding (ADF) and very high frequency omni-range (VOR) radio navigation systems, stand-alone global navigation systems (GNS), air traffic control (ATC) transponder and automatic dependent surveillance-broadcast (ADS-B) during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the small aircraft maintenance Certificate IV Mechatronics training pathway.

Where a Civil Aviation Safety Authority (CASA) licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen maintenance certification licence under Civil Aviation Safety Regulation (CASR) Part 66, in accordance with the licensing provisions in the Companion Volume Implementation Guide.

Pre-requisite Unit

MEA246 Fabricate and/or repair aircraft electrical components or parts

Competency Field

Aviation maintenance

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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| 1. | Inspect basic aircraft avionic systems and components | 1.1 | Relevant maintenance documentation and modification status, including system defect reports, where relevant, are used to identify specific inspection requirements |
| | | 1.2 | Isolation tags are checked and aircraft configured for safe system inspection and operation in accordance with the applicable maintenance manual |
| | | 1.3 | Avionic systems are visually or physically checked for external signs of defects in accordance with applicable maintenance manual while observing all relevant work health and safety (WHS) requirements |
| | | 1.4 | Defects are correctly identified and reported |
| 2. | Test/adjust basic aircraft avionic systems | 2.1 | Aircraft and systems are prepared in accordance with applicable maintenance manual for the application of power/system operation |
| | | 2.2 | Avionic systems are functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction |
| | | 2.3 | System calibration or adjustments are performed in accordance with maintenance manual, as appropriate |
| 3. | Troubleshoot basic aircraft avionic systems | 3.1 | Available information from maintenance documentation and inspection and test results is used, where necessary, to assist in fault determination |
| | | 3.2 | Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting using test sets, maintenance data and fault-finding charts or similar, to line replacement level |
| | | 3.3 | Specialist advice is obtained, where required, to assist with the troubleshooting process |
| | | 3.4 | System faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required and in accordance with standard enterprise procedures |
| | | 3.5 | Rectification requirements are determined |
| 4. | Remove and install basic aircraft avionic system components | 4.1 | System is rendered safe and prepared in accordance with the applicable maintenance manual and isolation tags are fitted where necessary to ensure personnel safety |

- 4.2 Avionic component removal is carried out in accordance with the applicable maintenance manual while observing all relevant WHS requirements
- 4.3 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures
- 4.4 Removed components are tagged and packaged in accordance with specified procedures
- 4.5 Avionic components to be installed are checked to confirm correct part numbers, modification status, serviceability and shelf life
- 4.6 Physical installation of avionic components is performed in accordance with the applicable maintenance manual
- 4.7 System is reinstated to correct operational condition in preparation for testing and calibration or adjustment, as necessary
- 4.8 Required maintenance documentation is completed and processed in accordance with standard enterprise procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

- Avionic systems include:**
- VHF communication
 - Basic audio systems, such as intercom and audio selection
 - ADF
 - VOR
 - Stand-alone GNS
 - ATC transponder

Avionic components include:

- ADS-B
- ELT
- Transmitters and receivers
- Antennas and antenna cables
- Control boxes and frequency selectors
- Speakers
- Switches

Procedures and requirements include:

- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Mapping Information

Release 1 – equivalent to MEA289A Maintain basic light aircraft avionic systems and components

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>

Assessment Requirements for MEA289 Maintain basic light aircraft avionic systems and components

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Performance Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:

- applying relevant WHS practices
- using approved maintenance documentation and aircraft publications relating to the avionic system being maintained
- locating and identifying avionic system components comprising:
 - VHF communications systems
 - VOR and ADF navigation systems
 - basic audio systems
 - stand-alone GNS systems
 - ATC transponders
 - ADS-B
 - ELT systems
- locating and identifying applicable antennas
- recognising system and component defects/external damage, correct installation, attaching hardware (including cabling/harnesses/transmission lines) and security in the systems listed above
- applying logic processes, taking and interpreting system measurements to accurately and effectively isolate malfunctions within the above systems
- testing listed systems to isolate system faults and assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the avionic system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) is critical.

Evidence of transferability of skills and knowledge related to inspection, testing and troubleshooting and component removal and installation is essential. This is to be demonstrated through application across a range of avionic systems and components as specified in the Assessment Conditions.

Knowledge Evidence

Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- component attachment methods
- connection of hardware, and plugs
- handling precautions for electrostatic sensitive devices
- the basic layout (block diagram level), function and operation of:
 - VHF communications systems
 - VOR and ADF navigation systems
 - basic audio systems
 - stand-alone GPS systems
 - ATC transponders
 - ADS-B
 - ELT systems
- basic principles/functions, relating to the above systems and associated with:
 - electromagnetic radiation and propagation
 - basic AC and DC circuit theory
 - printed circuit boards
 - digital fundamentals
 - analogue fundamentals
 - transmitter and receiver principles
 - pulse
 - antenna characteristics
 - transmission line characteristics
 - fibre optic communications
- maintenance requirements and troubleshooting procedures
- applicable maintenance data and manuals
- relevant WHS practices
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the work environment or simulated work environment using tools and equipment specified in maintenance documentation. It is also expected that applicable general-purpose tools and test equipment found in most routine situations would be used where appropriate.
- The application of testing procedures should clearly indicate knowledge of system operation, the relationship of individual components and the links with other systems (if applicable) within the limits of the aircraft/system fault-finding guide before undertaking any action. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards.

- The following conditions of assessment represent the requirements of the Regulators (ADF and CASA) and maintenance stakeholders and must be rigorously observed.
- A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements and performance criteria of the unit of competency are being achieved under routine supervision on each of the following systems and on at least one (1) major component/line replaceable unit (LRU) in each case:
 - VHF communication
 - basic audio systems, such as intercom and audio selection
 - ADF
 - VOR
 - stand-alone GPS
 - ATC transponder
 - ADS-B
 - ELT.
- Component removal and installation competencies are to be demonstrated on at least one (1) component from each of:
 - transmitters and receivers
 - antennas and antenna cables
 - control boxes and frequency selectors
 - speakers
 - switches.
- This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide (for details refer to the Companion Volume Assessment Guidelines).
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).
- Where the unit is to be used for CASA licensing purposes the Assessor must also meet the criteria specified in the CASR Part 147 Manual of Standards.
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