



Australian Government

MEA221 Inspect, test and troubleshoot aircraft secondary radar systems and components

Release: 2

MEA221 Inspect, test and troubleshoot aircraft secondary radar systems and components

Modification History

Release 2. Equivalent to MEA221 Inspect, test and troubleshoot aircraft secondary radar systems and components with amended prerequisite codes.

Application

This unit of competency requires application of hand skills and the use of system/component knowledge and applicable maintenance publications and test equipment to inspect, test and troubleshoot secondary radar systems and components of fixed and rotary wing aircraft during scheduled or unscheduled maintenance. Work may be performed individually or as part of a team.

The unit is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway.

The unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation safety Authority (CASA).

Where a 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 hardware or parts
MEA293	Remove and install aircraft electronic system components

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.
1. Inspect secondary radar systems and	1.1 Relevant maintenance documentation and modification status, including system defect reports, where relevant,

components		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	Secondary radar system components 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 secondary radar systems and components	2.1	Aircraft and system are prepared in accordance with applicable maintenance manual for the application of power/system operation
	2.2	Secondary radar system is functionally tested in accordance with maintenance manual for evidence of serviceability or malfunction while observing WHS requirements relating to ground testing
	2.3	System calibration or adjustments are performed in accordance with maintenance manual, as appropriate
3. Troubleshoot secondary radar systems	3.1	Available information from maintenance documentation, 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 to line replacement level
	3.3	Specialist advice is obtained, where required, to assist with the troubleshooting process
	3.4	Secondary radar system faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required
	3.5	Rectification requirements are determined

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.

Secondary radar systems include:

- Air traffic control (ATC) transponder
- Radio altimeter
- Distance measuring equipment (DME)
- Doppler navigation system
- Airborne collision avoidance system (ACAS)
- Automatic dependent surveillance-broadcast (ADS-B)
- Industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Procedures and requirements include:

Unit Mapping Information

Release 2. Equivalent to MEA221 Inspect, test and troubleshoot aircraft secondary radar 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 MEA221 Inspect, test and troubleshoot aircraft secondary radar systems and components

Modification History

Release 2. Equivalent to MEA221 Inspect, test and troubleshoot aircraft secondary radar systems and components with amended prerequisite codes.

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 pulse system being maintained
- recognition of system and component defects/external damage, correct installation, connection of plugs, terminations, attaching hardware (including cabling/harnesses/transmission lines) and security in:
 - DME components and interface
 - radio altimeters
 - ATC transponders
 - doppler navigation system
 - ACAS
 - ADS-B
- applying logic processes, taking and interpreting system measurements to accurately and effectively isolate malfunctions within the systems
- testing systems to isolate system malfunctions and assess post-maintenance serviceability.

It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the electrical 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 is essential. This is to be demonstrated through application across secondary radar systems and components listed 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
- the basic layout (block diagram level), function and operation of:

- DME, including components and interface
- radio altimeters
- ATC transponders
- doppler navigation system
- ACAS
- ADS-B
- basic principles/functions, relating to the listed systems and associated with:
 - basic alternating current (AC) and direct current (DC) circuit theory
 - digital fundamentals
 - analogue fundamentals
 - radar fundamentals
 - transmission lines, waveguide and antenna characteristics
- pulse system maintenance requirements and troubleshooting procedures
- relevant WHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures.

Assessment Conditions

- Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that applicable general and special purpose tools, and test and ground support equipment 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 at least one (1) of the following secondary radar systems and its major system components/line replaceable units (LRU):
 - ATC transponder
 - radio altimeter
 - DME
 - doppler navigation system
 - ACAS
 - ADS-B.

- 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.
-

Links

Companion Volume implementation guides are found in VETNet -

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