



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **MEA221C Inspect, test and troubleshoot aircraft secondary radar systems and components**

Release: 2

## **MEA221C Inspect, test and troubleshoot aircraft secondary radar systems and components**

### **Modification History**

Minor formatting and editorial changes made.

### **Unit Descriptor**

This unit of competency is part of the Avionic Certificate IV (Aircraft Maintenance Stream) training pathway. It covers the competencies required to inspect, test and troubleshoot secondary radar systems and components of fixed and rotary wing aircraft. The unit is used in workplaces that operate under the airworthiness regulatory systems of the ADF and CASA.

Where a CASA licensing outcome is sought this unit forms part of the CASA requirement for the granting of the chosen Aircraft Maintenance Engineer Licence under CASR Part 66, in accordance with the licensing provisions in Section 3, Assessment Guidelines.

### **Application of the Unit**

This unit 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.

Applications include fixed and rotary wing aircraft that have secondary radar systems.

### **Licensing/Regulatory Information**

Not applicable.

### **Pre-Requisites**

MEA207C            Remove and install aircraft electronic system components

MEA246C            Fabricate and/or repair aircraft electrical components or parts

## Employability Skills Information

This unit contains employability skills.

### Elements and Performance Criteria Pre-Content

<p>Elements describe the essential outcomes of a unit of competency.</p>	<p>Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.</p>
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### Elements and Performance Criteria

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| <p>1. Inspect secondary radar systems and components</p>     | <p>1.1. Relevant maintenance documentation and modification status, including sy where relevant, are used to identify specific inspection requirements</p> <p>1.2. Isolation tags are checked and aircraft configured for safe system inspection accordance with the applicable maintenance manual</p> <p>1.3. Secondary radar system components are visually or physically checked for defects in accordance with applicable maintenance manual</p> <p>1.4. Defects are correctly identified and reported</p>  |
| <p>2. Test/adjust secondary radar systems and components</p> | <p>2.1. Aircraft and system are prepared in accordance with applicable maintenance application of power/system operation</p> <p>2.2. <b><i>Secondary radar system</i></b> is functionally tested, in accordance with maintenance evidence of serviceability or malfunction</p> <p>2.3. System calibration or adjustments are performed in accordance with maintenance appropriate</p>   |
| <p>3. Troubleshoot secondary radar systems</p>               | <p>3.1. Available information from maintenance documentation, inspection and test where necessary, to assist in fault determination</p> <p>3.2. Maintenance manual fault diagnosis guides and logic processes are used to accurate <b><i>troubleshooting</i></b></p> <p>3.3. Specialist advice is obtained, where required, to assist with the troubleshooting</p> <p>3.4. Secondary radar system faults are located and the causes of the faults are correctly recorded in maintenance documentation, where required</p> <p>3.5. Rectification requirements are determined</p> |

## Required Skills and Knowledge

### Required skills

Look for evidence that confirms skills in:

- applying relevant OHS 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
- 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

### Required knowledge

Look for evidence that confirms 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
- basic principles/functions, relating to the above-listed systems and associated with:
  - basic AC and DC circuit theory
  - digital fundamentals
  - analogue fundamentals
  - radar fundamentals
  - transmission lines, waveguide and antenna characteristics
- pulse system maintenance requirements and troubleshooting procedures
- relevant OHS practices
- relevant maintenance manuals
- relevant regulatory requirements and standard procedures

## Evidence Guide

The Evidence Guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

<p><b>Overview of assessment</b></p>	<p>A person who demonstrates competency in this unit must be able to inspect, test and troubleshoot secondary radar systems and components while observing all relevant safety precautions.</p>
<p><b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b></p>	<p>The underlying skills inherent in this unit should be transferable across a range of inspection, testing and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with secondary radar systems and components. It is essential that system testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Ability to interpret inspection procedures and specifications (allowable limits) and apply them in practice is critical.</p> <p>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 Range Statement. 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.</p> <p>A person cannot be assessed as competent until it can be demonstrated to the satisfaction of the workplace assessor that the relevant elements of the unit of competency are being achieved under routine supervision on at least one of the secondary radar systems in Groups 1 to 5 in the Range Statement and its major system components/LRU. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry Evidence Guide.</p>
<p><b>Context of and specific resources for assessment</b></p>	<p>Competency should be assessed in the workplace or simulated workplace using tools and equipment specified in the maintenance manuals. It is also expected that</p>

	general and special purpose tools, test and ground support equipment would be used where appropriate.
<b>Method of assessment</b>	
<b>Guidance information for assessment</b>	

## Range Statement

<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
<b>Note</b>	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
<b>Secondary radar systems</b>	<p>Secondary radar systems include:</p> <ol style="list-style-type: none"> <li>1. ATC transponder</li> <li>2. Radio altimeter</li> <li>3. DME</li> <li>4. Doppler navigation system</li> <li>5. ACAS</li> </ol>
<b>Troubleshooting</b>	Troubleshooting involves the use of fault-finding charts or similar, to line replacement level
<b>Application</b>	<p>Application of this unit may relate to:</p> <ul style="list-style-type: none"> <li>• scheduled or unscheduled maintenance activities</li> <li>• individual or team-related activities</li> </ul>
<b>Procedures and requirements</b>	Refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

## Unit Sector(s)

Aviation maintenance

## **Competency field**

## **Co-requisite units**

Not applicable