Australian Government

Department of Education, Employment and Workplace Relations

MEA285A Repair or overhaul aircraft radio frequency communication and navigation system components

Release: 1

MEA285A Repair or overhaul aircraft radio frequency communication and navigation system components

Modification History

Not applicable.

Unit Descriptor

Unit descriptor	This unit of competency is part of the MEA40610 Certificate IV in Aeroskills (Avionics) workshop training pathway. It covers the competencies required to repair or overhaul components of aircraft radio frequency communication and navigation systems. Repair of circuit boards is covered by MEA262B Modify/repair aircraft component single layer printed circuit boards and MEA263B Modify/repair aircraft component multi-layer printed circuit boards.

Application of the Unit

Application of the unit	This unit requires application of hand skills, test equipment and knowledge of analogue and digital theory to repair or overhaul radio frequency components from aircraft communication and navigation systems. Applications include radio frequency communications and navigation system components from fixed and rotary wing aircraft that are repaired or overhauled in aviation maintenance workshops.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units		

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	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.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine requirements	1.1. ***Communication and navigation system*** component defect reports (removal tags) or customer order are correctly interpreted and matched by part and serial numbers 1.2. Circuitry is correctly prepared and connected to the applicable test equipment and is functionally tested or cycled through the prescribed test procedures in accordance with the maintenance documentation for evidence of serviceability or malfunction 1.3. Modification status is clearly established to assist in determining the overhaul requirements for the components 1.4. Extent of overhaul or repair is correctly identified and documented
2. Troubleshoot radio frequency communication and navigation system components	2.1. Available information from maintenance records and inspection and test results is used, where necessary, to assist in fault determination 2.2. Maintenance manual fault diagnosis guides and logic processes are used to ensure efficient and accurate troubleshooting 2.3. Faults are located and the causes of the faults are clearly identified and correctly recorded in maintenance documentation, where required 2.4. Fault rectification requirements are determined
3. Dismantle and inspect radio frequency communication and navigation system components	3.1. Component parts are dismantled in accordance with maintenance manuals 3.2. Component parts are assessed for serviceability in accordance with the relevant maintenance documentation 3.3. Parts requiring specialist repair are tagged and repair instructions are accurately specified 3.4. Parts lists are compiled and processed in accordance with standard enterprise procedures
4. Repair and/or modify radio frequency communication and navigation system components	4.1. Component parts are repaired or replaced in accordance with the relevant maintenance documentation 4.2. Modification of components or parts is undertaken, where required, by relevant manufacturers' bulletins or procedures
5. Assemble, test and adjust radio frequency	5.1. Assembly of component parts is carried out in accordance with specified tolerances and the applicable maintenance documents

ELEMENT	PERFORMANCE CRITERIA
communication and navigation system components	5.2. Assembled components are tested and adjusted/aligned in accordance with the applicable maintenance documentation using the appropriate test equipment 5.3. Required maintenance documentation and modification records are completed and processed in accordance with standard enterprise procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- applying relevant occupational health and safety (OHS) practices
- using approved repair/overhaul manuals, procedures and processes relating to analogue circuitry
- recognising the serviceability state and repair or overhaul requirements for aircraft radio frequency communication and navigation system components
- applying logic processes, and using test equipment and appropriate wiring diagrams and manuals to isolate component faults
- performing component testing to isolate/confirm component fault and assess post repair/overhaul serviceability
- correctly aligning components listed above to operate within prescribed specifications

Required knowledge

Look for evidence that confirms knowledge of:

- component and system operation
- explaining the basic function and operation of components of radio frequency communication and navigation systems to enable testing for fault isolation/confirmation, to determine repair or overhaul requirements, and serviceability status post repair or overhaul
- explaining basic principles/functions relating to radio frequency communication and navigation system components and associated with:
  - advanced analogue fundamentals
  - digital fundamentals
  - AC and DC electrical systems
  - electromagnetic radiation
  - antenna and transmission line (including waveguide) characteristics
  - radio transmission/signal propagation and frequency modulation
  - global positioning systems (GPS)
  - satellite communications (industry specific)

Evidence Guide

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.	
Overview of assessment	A person who demonstrates competency in this unit must be able to inspect, test, troubleshoot and align/adjust circuitry of components from aircraft radio frequency communication and navigation systems in accordance with maintenance manuals and regulatory/industry procedures while observing all relevant safety precautions.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	The underlying skills inherent in this unit should be transferable across a range of testing, aligning and troubleshooting applications (including the timely involvement of supervisors or other trades) associated with aircraft radio frequency communication and navigation system component repair and overhaul. Ability to interpret inspection and testing procedures and specifications (allowable limits) and apply them in practice is critical. It is essential that testing procedures, cleanliness requirements and safety precautions applicable to the system being maintained are fully observed, understood and complied with. Evidence of transferability of skills and knowledge related to testing, aligning and troubleshooting is essential. This may be demonstrated through application across a representative range of the components listed in Groups 1 to 11 in the Range Statement. The application of testing procedures should also clearly indicate knowledge of system operation before undertaking any action. Knowledge of system operation and the relationship of individual components will be necessary to supplement evidence of ability to troubleshoot component faults. The work plan should take account of applicable safety and quality requirements in accordance with the industry and regulatory standards. Use of high precision, high reliability soldering techniques and handling of components, including application of anti-static equipment, must be demonstrated. 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

EVIDENCE GUIDE	
	on a representative range of components from systems listed in Groups 1 to 11 in the Range Statement that are applicable to the enterprise. This shall be established via the records in the Log of Industrial Experience and Achievement or, where appropriate, an equivalent Industry .
Context of and specific resources for assessment	Competency should be assessed in the work environment, using tools and equipment specified in maintenance documentation. It is also expected that general and special purpose tools and test equipment would be used where appropriate.
Method of assessment	Assessment should be made across a sufficient number of components to establish the ability to apply attained skills and knowledge across the full range of radio frequency components with the aid of applicable maintenance manuals and data.
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
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.	
Note	Range statements listed below are numbered to facilitate specification of the assessment requirements included in the Evidence Guide
Communication and navigation system components	Communication and navigation system components may be from the following aircraft systems: 1. VHF communications 2. HF communications 3. UHF communications 4. Satellite communications 5. Emergency location transmitter (ELT) 6. ARINC Communication Addressing and Reporting System 7. Intercommunication and public address 8. Aerial direction finding (ADF) navigation 9. Very high frequency omni range (VOR) navigation 10. Instrument landing system (ILS) 11. GPS
Application	Application of this unit may relate to: • scheduled or unscheduled maintenance • individual or team-related activities • complex testing and adjusting of components, and where this is undertaken, may be carried out under supervision at the appropriate level
Procedures and requirements	Procedures and requirements refer to industry standard procedures specified by manufacturers, regulatory authorities or the enterprise

Unit Sector(s)

Unit sector	Component repair and overhaul

Competency field

Competency field	Aviation maintenance

Co-requisite units

Co-requisite units		
	MEA260B	Use electrical test equipment
	MEA261C	Use electronic test equipment