

<b>Title</b>	<b>Diagnose and repair faulty electronic equipment to component level</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>40</b>

<b>Purpose</b>	<p>This unit standard is intended for electronics technicians who are responsible for the diagnosis and repair of consumer electronic equipment, industrial electronic equipment, or electronic telecommunications equipment, all to component level.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> <li>- prepare to diagnose and repair electronic equipment;</li> <li>- diagnose faults;</li> <li>- repair and test electronic equipment; and</li> <li>- complete post-repair procedures.</li> </ul>
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<b>Classification</b>	Electronic Engineering > Electronic Installation and Maintenance
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<b>Available grade</b>	Achieved
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**Guidance Information**

- 1 This unit standard has been developed for learning and assessment on-job and/or off-job using realistic simulation.
- 2 It is recommended that competency in Unit 26725, *Demonstrate and apply knowledge of electronic product reliability and advanced electronic measurement and diagnosis*, be achieved before assessment against this unit standard is attempted, or equivalent knowledge and skills demonstrated.
- 3 **References**  
 Electricity Act 1992;  
 Electricity (Safety) Regulations 2010;  
 Health and Safety in Employment Act 1992 and associated regulations;  
 IPC-7711/7721 B *Rework, Modification and Repair of Electronic Assemblies*. (November 2007);  
 and all subsequent amendments and replacements.
- 4 **Definitions**  
*Consumer electronic equipment* – may include but is not limited to – audio equipment, video equipment, and personal computer equipment.  
*Industrial electronic equipment* – includes equipment used in the operation and control of industrial processes.

*Enterprise practice* – those practices and procedures that have been promulgated by the company or enterprise for use by their employees.

*Industry practice* – those practices that competent practitioners within the industry recognise as current industry best practice.

*PCB* – printed circuit board.

*Telecommunications equipment* – may include but is not limited to – telephones, radio telephones, mobile phones.

- 5 For diagnosis and repair of more specific systems refer to the following unit standards:

computing equipment;

electronic office equipment – standard 6066;

marine electronic systems – standards 11795 and 11796;

radar – standard 6061;

communications equipment – standard 26724.

- 6 Range

a The type of diagnosis and repair work required to achieve this unit standard must include:

i diagnosis and repair of equipment to component level;

ii use of test instruments to identify faults, measure and adjust equipment, and confirm proper performance. Typical instruments include multimeters, oscilloscopes, signal generators, and signal tracers. More specialised instruments may be required depending on the nature of the equipment.

b All diagnostic and repair work must be completed within an *industry acceptable timeframe*, that is, the length of time within which a competent person at this level could reasonably be expected to perform the task. In the electronics service industry, time is a significant factor in judging competence. Assessors must therefore ensure that the time taken is representative of industry expectations for the type of work.

c Candidates are expected to meet the outcomes of this unit standard without direct technical supervision, and with complete responsibility for the quality and quantity of output.

d Electrical, radiation, and workshop or laboratory safety practices are to be observed at all times.

e Measurements may be expressed in Système Internationale (SI) or Imperial units, and, where required, converted from Imperial units to SI units and vice versa.

f Recognised industrial standards are to be used for calculations.

g All activities and evidence presented for all outcomes and evidence requirements in this unit standard must be in accordance with legislation, policies, procedures, ethical codes, Standards, applicable site and enterprise practice, and industry practice; and, where appropriate, manufacturers' instructions, specifications, and data sheets.

h Evidence for the number and type of equipment chosen is left to the discretion of the assessor, but must be sufficient to assess competence in all outcomes of the unit standard.

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## Outcomes and performance criteria

### Outcome 1

Prepare to diagnose and repair electronic equipment.

#### Performance criteria

- 1.1 Fault symptoms are identified, and verified against the detailed fault description, and recorded.
- 1.2 Agreed expenditure and repair turn around time expectations are identified.
- 1.3 All site occupational safety and health implications for self and others are identified, and hazard control measures are put in place.
- 1.4 Service information, where appropriate, is made available before the commencement of fault diagnosis or repair.  
  
Range may include but is not limited to – manuals, schematic diagrams, modification sheets, fault and service guides.  
Evidence of three is required.
- 1.5 Accessories are handled in a manner that prevents loss or damage.

### Outcome 2

Diagnose faults.

#### Performance criteria

- 2.1 Cause of fault and faulty components are identified using efficient diagnostic techniques, tools, test instruments, and servicing data.
- 2.2 Repair feasibility is established with respect to agreed expenditure and repair reliability.
- 2.3 Anti-static precautions are observed to protect components from static damage as appropriate.  
  
Range includes but is not limited to – packaging, storage, transport, handling.
- 2.4 Diagnostic processes do not damage the equipment.
- 2.5 Diagnostic report is in accordance with enterprise practice.

### Outcome 3

Repair and test electronic equipment.

**Performance criteria**

- 3.1 Faulty components are replaced with components of equivalent or better performance ratings.
- 3.2 PCB repairs are made.  
  
Range may include but is not limited to – components, conductors, solder.
- 3.3 Products or equipment are reassembled in a manner that prevents damage and conforms to the manufacturers' layout and maintain form fit and function of equipment.  
  
Range layout – lead dress, screw location, shields and screens, board positioning and securing, cover positioning and fastening.
- 3.4 Testing confirms electrical safety.
- 3.5 Testing confirms that the repaired equipment is ready for service.

**Outcome 4**

Complete post-repair procedures.

**Performance criteria**

- 4.1 Repaired products or equipment are stored in a manner that prevents damage and complies with enterprise practice.
- 4.2 Fault repair documentation is in accordance with enterprise practice.  
  
Range may include but is not limited to – workshop register, job card, invoice, order forms, warranty forms, fault manuals, fault database, instructions to customer or front line technician. Evidence of two is required.

**This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.**

**Status information and last date for assessment for superseded versions**

Process	Version	Date	Last Date for Assessment
Registration	1	21 July 2011	31 December 2024
Review	2	24 August 2023	31 December 2024

<b>Consent and Moderation Requirements (CMR) reference</b>	0003
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.