Title	**Assemble through-hole printed circuit boards manually**		
Level	**3**	**Credits**	**10**

Purpose	This unit standard covers the manual assembly of through-hole printed circuit boards in electronic manufacturing. People credited with this unit standard are able to: –set up manual assembly environment; –load through-hole components on printed circuits manually; and –check assembled printed circuit boards.

Classification	Electronic Engineering > Electronic Manufacturing

Available grade	Achieved

Guidance Information

1 This unit standard may be assessed in conjunction with Unit 12579, *Perform hand soldering in electronic manufacturing.*

2 Definitions
loading or *stuffing* – the process of inserting through-hole components into the holes of a printed circuit, and associated assembly operations excluding soldering.
through-hole (or *leaded*) *components* – components that use leads or wires for their connection to a printed circuit board.

3 Range
Competence may be demonstrated on one or more of the following printed circuit board types – single sided, double sided, plated through-hole, multi-layer boards.

4 References
Health and Safety in Employment Act 1992;
IPC-A-610D, *Acceptability of Electronic Assemblies,* 2005*,* published by IPC – Association Connecting Electronics Industries.

5 The following apply to all outcomes of this unit standard:
a all activities are to be completed and reported within agreed timeframes;
b all work practices must meet worksite's documented quality management requirements. These include but are not limited to documentation of activities, results, and decisions;
c all activities must comply with policies, procedures, and requirements of the enterprises involved; any relevant legislative and/or regulatory requirements, which include, but are not limited to, the Health and Safety in Employment Act 1992.

6 People who are registered as physically disabled may achieve this unit standard with exemption from the requirements of outcome 1 only.

Outcomes and performance criteria

Outcome 1

Set up manual assembly environment.

Performance criteria

1.1 The preparation of equipment and the selection of components match the job instructions.

1.2 The workplace layout conforms to enterprise safety standards and presents no uncontrolled hazards to any person.

Outcome 2

Load through-hole components on printed circuits manually.

Performance criteria

2.1 Component loading complies with the job instructions.

2.2 Component and board integrity are not affected by loading operations.

Range integrity includes – fit, finish, electrostatic discharge (ESD), other specified build requirements.

2.3 Loading operations are completed to enterprise quality standards, and may include use of specified jigs, tools, and equipment.

2.4 Completed boards meet industry quality standards.

Range IPC standards, or equivalent, for component selection, component positioning, component mounting, lead treatment.

Outcome 3

Check assembled printed circuit boards.

Performance criteria

3.1 Checking confirms that assembled printed circuit boards meet enterprise quality standards.

Range component placement, fixture, visual appearance.

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	24 February 1998	31 December 2021
Review	2	28 June 1999	31 December 2021
Revision	3	3 April 2001	31 December 2021
Review	4	23 November 2003	31 December 2021
Rollover and Revision	5	19 March 2010	31 December 2021
Review	6	26 July 2018	31 December 2021

Consent and Moderation Requirements (CMR) reference	0003

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.