



Electronics Assembler

On-the-Job Training Guide

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1-877-363-0536
apprenticeship@gov.sk.ca
saskapprenticeship.ca



Online: www.saskapprenticeship.ca

Recognition:

To promote transparency and consistency, this document has been adapted from the 2011 Electronics Assembler Occupational Analysis For Saskatchewan.

A complete version of the Occupational Analysis can be found at [Electronic Assembler Occupational Analysis](#)

STRUCTURE OF THE ON-THE-JOB TRAINING GUIDE

To facilitate understanding of the occupation, this on-the-job training guide contains the following sections:

Description of the Electronics Assembler trade: an overview of the trade's duties and training requirements.

Major Work Activity (MWA): the largest division within the standard that is comprised of a distinct set of trade activities.

Task: distinct actions that describe the activities within a major work activity.

Sub-task: distinct actions that describe the activities within a task.

On-the-Job Training Content for the Auto Body and Collision Technician Trade: a chart which outlines the topics of technical training with on-the-job examples for apprentice to achieve relevant experience at work.

DESCRIPTION OF THE ELECTRONICS ASSEMBLER TRADE

Electronics Assemblers assemble, repair and test circuit boards and other electronic components, primarily at manufacturing facilities.

Training Requirements: 3600 hours (2 years) including: one 2-week and one 1-week training session in the first year and three 1-week training sessions in the second year at SED Systems in Saskatoon. Graduating apprentices may be eligible for both Journeyperson and IP certification.

Journeyperson to apprentice ratio for this trade is: 1:3

The information contained in this pamphlet serves as a guide for employers and apprentices. Apprenticeship training is mutually beneficial to both employer and apprentice. The employer's investment in training apprentices results in skilled and certified workers. The pamphlet summarizes the tasks to be covered by the apprentice during the on-the-job portion of apprenticeship training. An apprentice spends approximately 94% of the apprenticeship term training on-the-job.

It is the employer's or journeyperson's training responsibility to supervise an apprentice's practical skills development until a satisfactory level of proficiency has been reached.

EMPLOYER TRAINING RESPONSIBILITY

- expose the apprentice to all appropriate tools and materials
- provide guided, hands-on practice in the set-up, safe operation, calibration and performance evaluation of tools and equipment
- demonstrate the techniques for all assembly processes, and
- ensure that the apprentice can evaluate the end-product.

Employers should make every effort to expose their apprentices to work experience in as many areas of the trade as possible.

Below, in-school instruction is listed first; suggestions to help employers assist the apprentice to prepare for in-school training are listed next.

The content of the training component is subject to change without notice.

ON-THE JOB AND IN-SCHOOL TRAINING CONTENT FOR THE ELECTRONICS ASSEMBLERS TRADE

This chart outlines on-the-job examples for apprentices to achieve relevant work experience to prepare for the topics of technical training. Topics of technical training are provided with the associated learning outcomes.

Level One

3 weeks

Prepares for Production

- safety procedures
- material and component identification (fasteners, electronic devices and materials, hand and power tools)
- solder theory and solderability for both tin/lead and lead free technology
- interpreting documentation (schematics, wiring lists, engineering assembly drawings)
- IPC Workmanship standards are taught and requirements for **IPC-J-STD-001** and **IPC-A-610 certificates are met and issued**
- theory of inspection and statistical process control; defect definition and disposition
- ESD procedures (using materials and equipment, following specialized instructions)
- introduction to multimeters
- working from a schematic the apprentice will produce a functioning cca with modifications

Mentors can assist the apprentice to prepare for this section of technical training by:

- *providing WHMIS training,*
- *reviewing company-specific safety protocols, and explaining the role of the OH&S committee.*
- *exposing apprentice to standard manufacturing tools, materials and electronic components and*
- *providing hands-on activities to ensure familiarity and safe use.*
- *ensuring the apprentice has seen, reviewed and manufactured to the requirements of a variety of documents*
- *ensuring awareness of the effects of ESD*
- *ensuring the methodology of safe procedures, and knowing the various industry associations.*

Produces circuit cards

- building cards (preparing, populating, secondary assembly)
- hand soldering cards (produces, reworks and repairs cca's with surface mount and through-hole technology)
- machine soldering card theory (demonstrations when available)
- hand cleaning cards
- environmental coatings (spraying, dipping and reworking cards and coatings)

Wire terminations

- wire preparation
- wire terminations (pierce, hook, turret, and gold cup)

Mentors can assist the apprentice to prepare for this section of technical training by:

- *ensuring apprentice has assisted in preparing a card for soldering by using the appropriate preforming tools to install components and hardware*
- *allowing apprentice to have considerable practice in soldering as many different types of components as possible to a variety of circuit cards*
- *ensuring apprentice is aware of the company's cleaning methodology and have hands-on experience where possible*
- *ensuring apprentice is aware of the company's environmental coating methodology and have hands-on experience where possible*

Level Two

3 weeks

Rework and Repair of Circuit Cards

- non-destructive component removal and installation
- preheating and auxiliary heating methods
- cca modifications and laminate repair
- replacement of conductors, lands, and eyelets
- IPC Workmanship standards are taught and requirements for **IPC-7711/7721** certificates met and issued

Produces cables, wires and harnesses

- prepares cables (cutting, stripping, tinning and labeling)
- terminates cables (solder and crimp connectors, reflow connectors and mechanical terminations)
- assembles harnesses (routing and bundling wires and cables)
- rework procedures and wiring splices
- IPC workmanship standards are taught and requirements for **IPC/WHMA-A-620** certificates are met and issued

Assembles chassis and racks

- preparing chassis, subassemblies and racks (assembling, modifying and repairing)
- installing components (installing by mechanical and adhesives; applying labels and markings; installing harnesses)

Product testing

- use of the multimeter
- use of computer-automated test equipment / programs

Material Handling

- packaging assemblies
- use of material handling equipment

Mentors can assist the apprentice to prepare for this section of technical training by:

- *allowing the apprentice to set up, calibrate and use the appropriate hand and power tools on a variety of different cable and wire types*
- *ensuring apprentice is able to determine if the equipment and component processing meets the required standard.*
- *ensuring apprentice has installed as many termination types as possible*
- *demonstrating techniques in routing and bundling, and using tools such as harness boards.*
- *ensuring apprentice has participated in the final assembly of racks and chassis*
- *assisting in the installation of components and harnesses in racks and chassis*
- *ensuring apprentice can measure continuity and voltage in a circuit without assistance*

Additional On-the-Job Skills – these skills are not included in the in-school training of apprentices

Reads Engineering Assembly Drawings and Work Instructions

The employer can assist the apprentice to prepare for this section of technical training by:

- *exposing them to the company's internal drawings, and*
- *ensuring they can interpret relevant information.*

Interprets Workmanship Standards

The employer can assist the apprentice to prepare for this section of technical training by:

- *ensuring they have had the opportunity to review the relevant sections of the IPC-610*
- *ensuring they have had the opportunity to review the relevant sections of the J-STD-001*
- *ensuring they have performed inspections to identify and non-conformances and process indicators*

Operates Computer Applications

Where companies use computerized systems, the employer can assist the apprentice to prepare for this section of technical training by:

- *ensuring they can download any required information to perform the work, such as*
- *inventory searches,*
- *revision information, or*
- *other communication needs.*

Wave Solders Circuit Cards

Where the equipment is available, the employer can assist the apprentice to prepare for this section of technical training by:

- *ensuring they have operated wave soldering equipment*

Reflow Solders Circuit Cards

Where a reflow oven is available, the employer can assist the apprentice to prepare for this section of technical training by:

- *ensuring they have operated the pick and place and reflow oven*

Operates Miniwave Machine

Where the equipment is available, the employer can assist the apprentice to prepare for this section of technical training by:

- *ensuring they have operated the equipment*

Programs Devices

The employer can assist the apprentice to prepare for this section of technical training by:

- *training them to use an IC programmer*

Selects Handling Materials

The employer can assist the apprentice to prepare for this section of technical training by:

- *having them match the appropriate material to the item being packaged on handled*

Builds Shipping containers

The employer can assist the apprentice to prepare for this section of technical training by:

- *having them participate in the construction of a suitable shipping container*

Lift/Carry Material

The employer can assist the apprentice to prepare for this section of technical training by:

- *ensuring they are trained to lift properly, and*
- *ensuring they understand limitations.*

Machine Cleaning Cards

Where equipment is available, the employer can assist the apprentice to prepare for this section of technical training by:

- *assisting them to use the equipment*