



Electronics Assembler

Practical Examination Information

This information is current as of April 29, 2015

There is a written and a practical component to the Journeyperson examination. With the exception of apprentices attending the final level of technical training, the written examination must be completed successfully before applying for the practical examination.

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All communication and/or imaging devices are prohibited from use at all times during the practical examination.

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Candidate Information

This examination consists of two projects:

- a circuit card assembly
- a chassis / harness assembly.

Candidates will work from industry-standard parts lists and assembly drawings. Except as noted below, all materials are included. See the enclosed marking sheet for specifications.

The recommended time limit for completion is five (5) hours.

Materials Provided:

- see parts lists for each project.

Candidate to Provide:

- temperature controlled soldering iron
- solder wire: SN-63 w RMA flux core, or equivalent.
- liquid flux, RMA.
- solder wick.
- cleaning solvent: IPA, or equivalent.
- personal hand tools and safety equipment.
- electric drill, c/w various drill bits (.150", .250", etc.)
- 12 feet of 22 gauge stranded insulated wire

General Instructions:

1. Candidates must follow the instructions of the examiners.
2. Rework of soldered connections is permitted.
3. Remove flux residues from all soldered connections.
4. All components and materials must be returned along with finished projects.
5. Examination results will be mailed to you in four to six weeks.
6. Tests are marked in the absence of the candidates.
7. There are no "partial" retests in this examination.
8. Workmanship per IPC-A-610 (to the latest rev), Class 3.

Detailed description – CCA Project

This project consists of a double-sided, mixed technology (SMT and Thru-hole) pwb, and approx. 80 components (42ea x 2 sides of board). Candidate will first install all components on both sides of the board; to demonstrate proficiency in component removal, candidate will then remove specific components.

Parts List for CCA

Ref Desig.	Description	Qty (side 1)	Qty (side 2)	Total Qty
N/A	PWB	-	-	1
Q101-105	SOT-23	5	5	10
R100-109	Chip resistor	5	5	10
R110-117	Axial leaded resistor	8	0	8
U101-105	SOIC, 14pin	2	2	4
U106, U107	DIP IC, 8pin	2	0	2
U108, U109	DIP IC, 28pin	2	0	2
U110, U111	PLCC, 44pin	2	2	4
U112	QFP, 44pin	1	1	2
U113, U114	SOIC, 20pin	2	2	4
W1-W12	22 AWG wire	12	-	12

Steps:

1. Solder all the components onto the PWB as per the parts list. Trim the leads (as required) before soldering;
 - R110-R117 (through-hole resistors): form a right angle bend in the leads; orient such that the resistor values can all be read from the same direction.
 - All thru-hole components: solder only from the secondary (solder) side of the board.
 - All IC's: observe correct polarity/component orientation (pin 1).
 - W1-W12: cut wires to 12" lengths; strip and pre-tin one end; pre-form with right-angle bend and solder into place.
 - show the completed board to the examination invigilator to confirm full component installation, **BEFORE** proceeding to step 2.
2. Remove all components from Side 2. In addition, remove the following components from Side 1:
 - R110 to R113: remove the component without trimming the leads; remove any remaining solder from the PTH's.
 - IC108: cut the leads off the component body, then remove each lead; remove any remaining solder from the PTH's. **Return these components along with the finished project.**
3. Clean the board of all flux residue and remaining/excess solder.

Detailed description – Chassis/Harness Project

This project consists of a chassis base (sheet of 7.5"x11" aluminum stock), and approximately 50 components. The candidate will drill holes into the chassis and install the CCA and other components using various hardware; candidate will also assemble and route a simple harness to various termination points on the chassis.

Parts List for Chassis/Harness

- reference integrated PL on assembly drawing.

Steps:

1. Drill holes into the panel per the assembly drawing; locations must be within tolerances specified on the assembly drawing; debur all holes.
2. Install items 2, 4, 7, 8, & 9 using the mounting hardware as per the assembly drawing.
3. Build the harness:
 - Route approximately as shown in assembly drawing.
 - Tie-wrap into place as required.
 - Terminations per assembly drawing wire list; solder leads into place; clean all solder connections.

Attachments will be included with this exam package:

Panel assembly drawing detailing hole locations
Chassis assembly drawing showing component placement and wiring details