



University  
of Glasgow

JAMES WATT SCHOOL OF ENGINEERING

## TECHNICAL SERVICES

# ELECTRONICS WORKSHOPS CODE OF PRACTICE

Version 3.0  
Updated June 2020

### **ELECTRONICS WORKSHOPS CODE OF PRACTICE**

This document details the Code of Practice that has to be applied to the various Electronics Workshop which are part of the James Watt School of Engineering. The detail of each workshop is provided in the document. (ref Appendix A )

The adoption and practice of good safety procedures is of paramount importance both for the health and safety of fellow workers and for the integrity of the fabric of the electronic workshops.

#### **Generic Workshop Practices**

- 1) This code of practice is intended to give guidance on the safe use of electronic workshop facilities to ensure that technical staff, other staff, students and visitors will not be harmed by any of the processes, materials or tools used in day to day operations.
- 2) Where workshops are located near personal desks with PC facilities these can be seen as two distinct areas, but this code of practice covers both because of the proximity.
- 3) An overriding principle: If you find yourself about to carry out work or deal with equipment or procedures that are new or unfamiliar to you, and you are in any doubt about your experience and knowledge being adequate to safely carry out the work – STOP. Seek expert advice and guidance.
- 4) Only electronic workshop technical staff, or persons approved by the Electronics Services Manager or a senior member of workshop staff, may use a workshop or its facilities.
- 5) All Visitors to any of the workshops MUST have spoken to a member of the electronics technical staff before proceeding with any work while in the workshop
- 6) All users of the electronic workshops should make themselves familiar with all safety documentation applicable to the electronics workshops in general, and any specific safety documentation relating to the tools or process they intend to use. Users should familiarise themselves with emergency exit routes and positions of safety equipment such as mains isolators, fire extinguishers and first aid kits.
- 7) Work outside normal hours (9am - 5pm) should only be undertaken with the agreement of the Electronics Services Manager.
- 8) Use of Personal Protective Equipment (PPE) is mandatory as indicated for each piece of equipment, if the user is unclear about PPE they MUST seek clarification from a member of technical staff before proceeding with any work.

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9) Signage showing Emergency exit routes from Electronics Workshops is beside entrance doors.

10) COVID-19 Social Distancing guidelines and appropriate cleaning practices will be adhered to. (ref Appendix C )

### **General Housekeeping**

1) Work areas, machines, personal desks and surrounding floor space should be kept clean and tidy with no trailing cables. Tools should be stored after use in the appropriate tool cupboards or personal toolboxes. Passages should be kept clear of clutter and combustible materials such as cardboard boxes or delivery crates.

2) All materials and chemicals should be stored safely with reference to specific dangers, hazards or toxicities published in the relevant material safety data sheets. Fridges designated for storage of chemicals or solder pastes should be marked as such and must not be used to store food or drink.

3) Waste materials should be disposed of appropriately, i.e. All electrical items must go through the WEEE (waste electrical and electronic equipment) process, batteries in the marked recycling containers in the Electronics Store, paper, plastic and cans in the local recycling containers. Chemicals must be disposed of in accordance with instructions in the relevant material safety data sheets.

4) Food and drink must not be consumed near or within work or chemical process areas to prevent risk of electric shocks (liquid spillage), poisoning or distraction of others.

### **Electricity**

1) When working on any equipment or process that requires exposed voltages greater than 50V do a risk assessment and only proceed once all hazards have been assessed and controls put in place. A minimum control in this situation is the designation of two additional competent persons to be present to monitor your safety and render assistance or raise the alarm should you be injured. Additionally, if mains supply voltage is involved, this must come from an RCD protected socket or isolation transformer. A simple means of supply disconnection in an emergency must be available.

2) Design, construction, connection, modification, safety assessment and testing of mains powered or high voltage sections of equipment must only be carried out by those who are approved by the Electronics Services Manager as having the relevant competency and experience. This work must still comply with code 1) above.

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3) All electrical equipment that has been designed, manufactured or repaired in the Electronics workshops must be assessed for electrical safety and tested where appropriate and safety labeled before being put into service. It is good practice when assessing the electrical safety of newly built or rewired equipment to get the work validated by a colleague with appropriate competency before releasing the item to staff or students.

4) Many sources of electricity will give sufficient current under fault conditions to cause overheating and fire. Ensure that any source of electrical energy has current limiting, fuses or similar protection appropriate for the connected equipment. Battery supplies are always live and many can supply sufficient current to cause a fire, even if the voltages involved are considered safe to handle. Where this danger exists the supply from the battery must be fused as close to the terminals as possible or resettable circuit breakers used in the same position.

### **Machine Tools**

Such as pillar drills, sanders, routing/milling machines etc.

1) Familiarise yourself with the location of emergency isolating switches for the machine tools in your area.

2) You must only work with machine tools for which you have had training or can demonstrate that you have the experience and competency to use safely.

3) Only use machine tools for their designed purpose. Do not make modifications or try to load work pieces that are too large or heavy or that cannot be safely clamped into position.

4) Always tie hair and loose clothing/jewelry back, tape or remove rings if there is a risk of catching, wear appropriate eye protection and protective clothing, and use provided safety measures such as chuck guards or covers.

5) Never operate machine tools when alone or defeat safety interlocks.

### **Handheld Power Tools**

1) Mains powered hand tools such as hand drills, hot air guns, orbital sanders, soldering irons etc. must be inspected before use to identify frayed or damaged flexible leads, insecure lead clamping or cracked plugs/casings etc. If any damage is found they must not be used until repaired and safety tested.

2) A regular PAT inspection and testing schedule should be in place for all mains powered hand tools.

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- 3) Always tie hair and loose clothing/jewelry back, tape or remove rings if there is a risk of catching, wear appropriate eye protection and protective clothing.
- 4) Be aware of the torque generated, even by battery powered cordless drills. Take care to have a secure grip and stance. Clamp the work piece where necessary. Take extra care and precautions when working at heights.

### **Hand Tools**

- 1) Only use hand tools for their designed purpose. Modifying them or 'making do' by using the wrong tool for the job can lead to injury.
- 2) Wear appropriate eye protection and protective clothing to prevent injury from wire cuttings, slipping tools etc.
- 3) When soldering use local fume extraction equipment. Tie hair and loose items back to prevent burning. Wash hands after handling solder alloys and fluxes.

### **Computers**

- 1) Refer to <https://www.gla.ac.uk/myglasgow/seps/az/computers/> on the University of Glasgow SEPS website to check and adjust the setup of any desk, seating and PC you use in the electronic workshops.

### **Chemical Processes**

- 1) Where necessary chemical processes used during the manufacture of printed circuit boards should be carried out in accordance with any existing local risk assessment for this work.
- 2) The use, labeling and disposal of chemicals for printed circuit board manufacture must take into account the advice provided in the relevant material safety data sheets.
- 3) Wear suitable eye protection, gloves, face mask, protective clothing and footwear.
- 4) Use local extract ventilation and/or fume-hoods to remove harmful vapor.

### **Lifting, Moving and Working at Heights**

- 1) Use Personal Protective Equipment such as safety shoes, overalls/lab coats, eye protection as applicable to the work being carried out.
- 2) For working at heights use only properly designed step ladders or self-assembly scaffolding that has current safety audit labeling. Loan working is not permitted when working at height within any of the workshops. Where unusual or hazardous circumstances dictate, carry out a risk assessment.
- 3) A risk assessment must be done and consideration given to the need for training, specialist advice/help or equipment if any of the actions under this section are considered beyond common place.

### **Accidents and Injuries**

- 1) All accidents, injuries and dangerous occurrences (a near miss) must be reported promptly to the Electronics Services Manager who will write an incident report for submission to SEPS.



## Appendix A

### Electronics Workshops

- Rankine Room 510 (1 Technician )
- Rankine Room 712A (4 Technicians)
- Rankine Room 723 (2 Technicians , temporary location )
- JWS Room 619 (2 Technicians )
  
- Rankine Room 715 PCB Fabrication Lab

## Appendix B

### **Fire Extinguishers & First Aid Kits**

- Rankine Room 510: in adjacent lab, 509
- Rankine Room 712A: in workshop
- JWS Room 619: in workshop
- Rankine Room 715 PCB Fabrication Lab: in workshop
  
- Remember to use only CO2 extinguishers for electrical fires.
  
- Emergency Eye Irrigation bottles:
  - Rankine 712A: in workshop and in PCB room (Rankine 715)
  
- First Aid kit:
  - Rankine 510: in adjacent lab, Rankine 509
  - Rankine 712A: in workshop
  - JWS 619: in JWS 620 (Teaching Office)



## Appendix C

### **COVID-19 Special Measures**

As part of the James Watt School of Engineering we are governed by the University of Glasgow overall policy in applying social distancing and cleaning measures to be in place as a result of the 2020 COVID-19 Pandemic.

1) Guidance from the HSE, UK Government and Scottish Government to manage the risk related to Covid-19 pandemic must be applied to the Electronics Workshops. These include physical distancing, frequent hand washing and hygiene measures, cough etiquettes and face covering in enclosed public space. Considerations for codes of practice and risk assessment for the James Watt School of Engineering can be found here.

<https://www.gla.ac.uk/schools/engineering/informationforstaff/safety/>

2) Physical distancing within the Electronics Workshops based on a 2 metre social distancing rule means the following maximum capacities as follows

- Rankine Room 510 (1 Technician )
- Rankine Room 712A (4 Technicians)
- Rankine Room 723 (2 Technicians , temporary location )
- JWS Room 619 (2 Technicians )
  
- Rankine Room 715 PCB Fabrication Lab (1 Technician )

Proposed workshop layout plans to adhere to social distancing are available on Appendix D

3) Requests to access the workshops will be managed by the Lab Guardian with support from the technicians. Collaboration with students, academic and research staff will be required, the lab guardian will establish a rota where necessary. Impact on the overall capacity of the James Watt South and Rankine building will be reviewed by the Technical Services Manager.

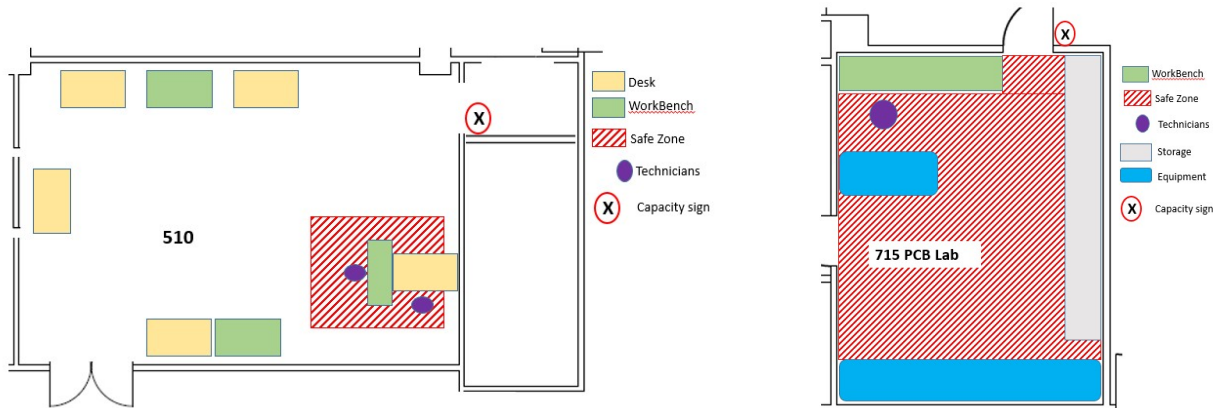
4) Workshop users must wash their hands regularly and wipe workstation surfaces, materials, and equipment at the start of their work and before leaving. Working zones will be allocated per user to reduce movement and assist with more local cleaning protocols.

5) Emergency support (First Aiders and Fire Area Officer) might be constrained due to Covid-19 restriction on building capacity. Task risk assessments need to be reviewed to include the above measures and to review with personnel through the risk assessment, which work can be safely undertaken with reduced access to emergency support. A Covid-19 risk assessment template can be found here ([https://www.gla.ac.uk/media/Media\\_723618\\_smxx.docx](https://www.gla.ac.uk/media/Media_723618_smxx.docx)).

6) A sign will be mounted at the entrance to the workshop advising about the user capacity of the Workshop. This will be based on the current social distancing guidelines and will be managed by the Lab guardian.

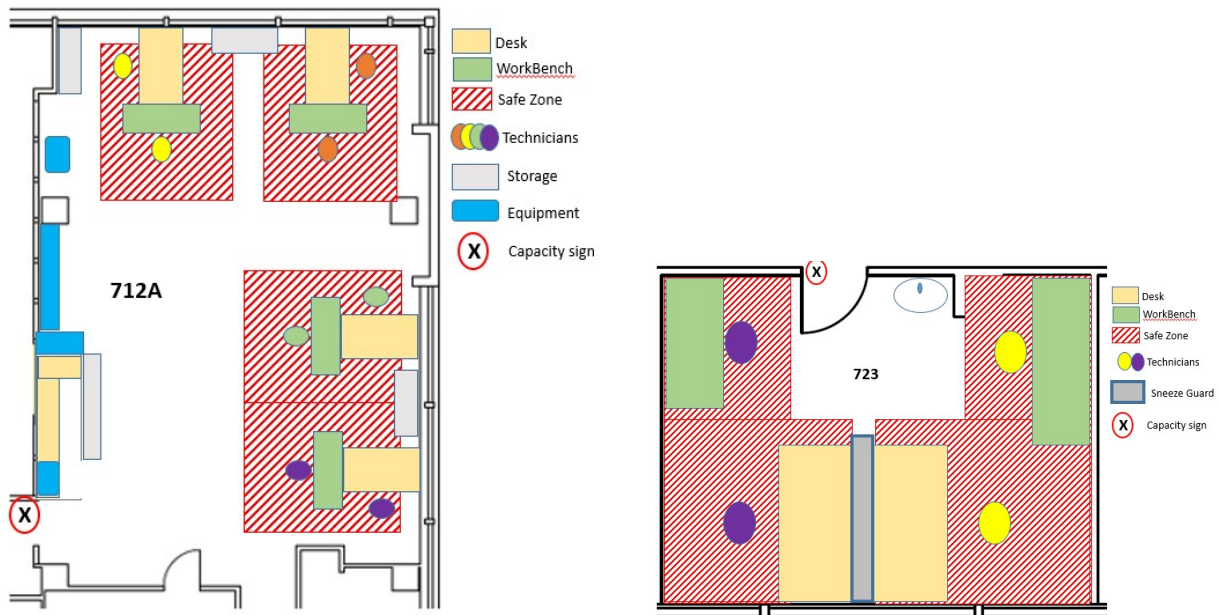
## Appendix D

### Workshop Proposed Social Distancing Layouts



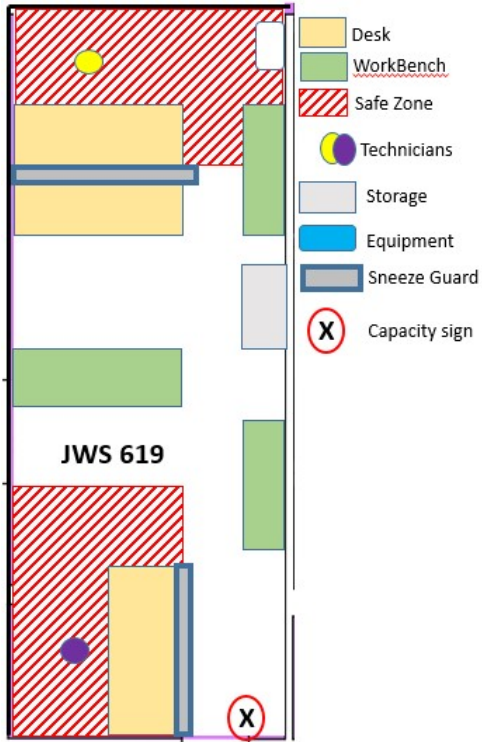
Rankine Workshop 510

Rankine 715 PCB Lab



Rankine Workshop 712A

Rankine Workshop 723



JWS Workshop 619



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### Document Revision Control Sheet

Author	Date	Comment	Revision
Bruce Robertson	May 2020	Document reworked layout from 2014 version. To include COVID-19	1.0
Bruce Robertson	June 2020	Added in standard sections on COVID-19 including capacity numbers and proposed workshop layouts	2.0
Bruce Robertson	June 2020	Updated sections as identified in reviewer comments, added in capacity sign locations	3.0