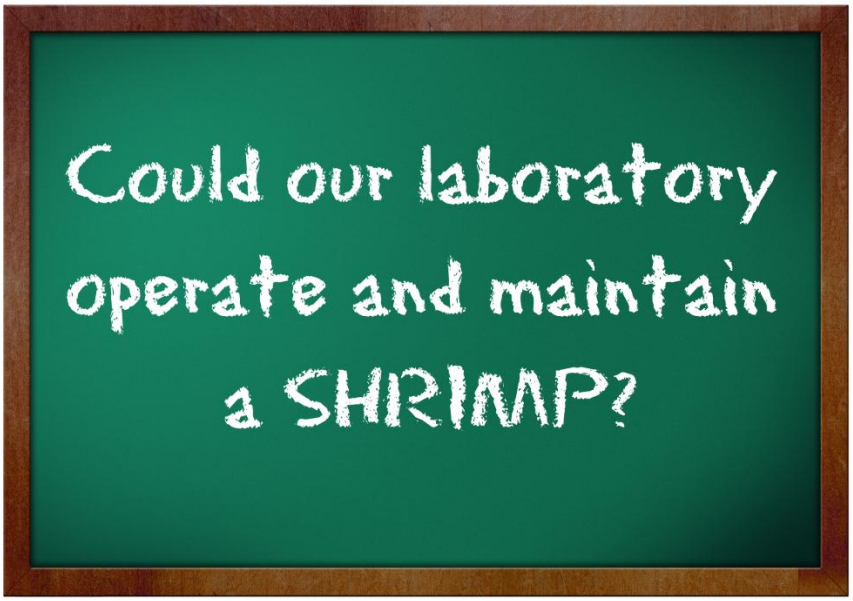
# Pioneering the Technique, Perfecting the Technology




Most prospective purchasers ask this question. The *SHRIMP IIe* is, after all, a very large, apparently complex, and highly specialized scientific instrument. At first glance, the sheer number of chambers, electronic units, vacuum pumps and gauges may seem daunting, but to coin a well-used Australian phrase, with the *SHRIMP IIe,* you'll have "No Worries, Mate!"

Firstly, the elegant simplicity of the design, which may not be apparent to the casual viewer, makes operation and tuning intuitive. In addition, the *SHRIMP IIe* software has been designed from the ground-up to include auto-tuning features, which enables even the least-experienced user to quickly obtain optimum performance.

Secondly, comprehensive training in instrument operation and maintenance is included with every instrument. The training is delivered in Canberra using the customer's own instrument, providing them with an opportunity to put the instrument through its paces first-hand. There is also the option to prepare samples in the laboratories of the Australian National University, Research School of Earth Sciences. Here, new users will meet *SHRIMP* experts and be exposed to the advantages and support structures of the wider *SHRIMP* community.

The training includes;

- Instrument operation
- Techniques for optimum performance
- A thorough demonstration of the software
- The electronics and vacuum systems
- Routine maintenance procedures
- Sample preparation and handling
- Data analysis, including SQUID software
- Instrument diagnostics
- Remote operation
- Use of automation software (option)

It's in our interest to make sure that, each time we ship a *SHRIMP IIe*, you, the users, are going to take good care of it!

# *SHRIMP* Training: Details

## COMPUTING & INSTRUMENT OPERATION

1. Orientation to *SHRIMP IIe/MC* user applications;
2. Guide to the documentation;
3. Review of instrument layout using Solidworks images;
4. Controls, tuning and Sample Loading;
5. Implementation of ASI-originated software modifications;
6. Remote operation, tuning and diagnosis of the instrument;
7. Troubleshooting techniques.

## ELECTRONICS

1. Orientation and philosophy of the electronic design. Apportionment into functional blocks. Commonalities and differences between different rack units;
2. Guide to the documentation;
3. Understanding of the high voltage system design. Differences between ground-referenced and floating hardware. Safety precautions when working on the system, particularly the primary column. Changing the system polarity and its impact on high voltage supplies;
4. Cs and electron gun operation;
5. Identification of spares and rationale behind their choice;
6. System troubleshooting techniques including use of information from the software interface, identification of faulty subsystems, board-level swap-out;
7. In-built diagnostic features at unit level and via the software interface;
8. 'Under-the-covers' tour of the hardware, including use of a fiber-optic hub, interface between the computer and the electronics, means of polarity reversal of the instrument.

## SCIENTIFIC OPERATIONS TRAINING

The training in Canberra will be tailored to the background and interests of customer, but could include;

1. Rock crushing;
2. Mineral separation;
3. Mount preparation and polishing;
4. Sample documentation (SEM, optical microscopy);
5. Mount cleaning and coating procedures;
6. *SHRIMP* sample loading;
7. Tuning of primary column;
8. Tuning of secondary ion extraction;
9. Optimising peak shapes;
10. Changing transmission and resolution;
11. Single collector analytical procedure;
12. Multi-collector setup procedure;
13. Multi-collector analytical procedure.

## VACUUM SYSTEM & MECHANICAL ASSEMBLIES

1. Orientation to the vacuum system. Types of pumps, expected pressures in each stage, expected pump-down times and the inferences from changes to these times;
2. Guide to the documentation;
3. Controls and interlocks. Understanding the intelligent vacuum management system (IVMS), the role of the small uninterruptible power supplies in graceful shutdown. What to do if pressure is lost in the pneumatic control system;
4. Vacuum system troubleshooting. Typical vacuum system problems and their rectification, including leaks at o-ring and copper-gasket seals, leaks at electrical feed-throughs, poor pressure due to out gassing of incompatible materials, problems arising from poor backing pressure;
5. Breaking and restoring vacuum. Understanding the sequence to be followed, and how the IVMS can assist the process. Expected pump down times. Care in spinning-down turbo pumps prior to breaking vacuum;
6. Swapping Cs source with duoplasmatron. Cleaning and re-aligning duoplasmatron. Diagnosing and optimising duoplasmatron brightness and stability;
7. Replacement of Köhler apertures. Cleaning of extraction plates;
8. Mechanical troubleshooting tips. Anticipating wear in backing pumps (diaphragms, bearings) and turbo/molecular drag pumps (bearings). Checking seal integrity after opening the system, importance of chemical and particulate cleanliness;
9. Routine maintenance of the vacuum system, eg replacement of backing pump diaphragms, lubrication of turbo/molecular drag pump bearings;
10. Routine maintenance of the cryocooler, including checking helium gas pressure, replacement of charcoal absorber in compressor, regeneration of the cryocooler;
11. Replacement of electron multipliers in the multi-collector.

For further information please contact:

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