

Pioneering the Technique, Perfecting the Technology

SHRIMP II Productivity

Since its completion in 1980, the original *SHRIMP I* instrument has developed a reputation as a reliable workhorse. The instrument is a favourite among RSES staff, who enjoy taking visitors along to the *SHRIMP I* laboratory, now something of a local landmark. Now more than twenty five years old and adapted for fully automated analysis, it continues to produce excellent data.

The ANU *SHRIMP II*, commissioned in 1992, has proven to be just as reliable. RSES scientists and engineers used their experience with the original instrument to incorporate many modifications. The elegant simplicity of the original concept was carried forward into the second generation instrument, and this, in combination with input from the many *SHRIMP I* users, resulted in an instrument that offered - and still offers - unrivalled ease of use, supreme reliability and excellent sample throughput.



The *SHRIMP* was designed specifically to operate in a teaching environment, where relatively inexperienced users have access to the instrument, so it was vital to ensure that unnecessary complexity was avoided, systems and electronics were robust and operation as straightforward as possible. Also, the design team recognised the need for easy access during maintenance and to make routine operations as simple as possible.

The end result is an amazing combination of performance, ease of use and reliability. This is evidenced by the sheer volume of publications to come out of the ANU's Ion Probe Group - more than **900** so far – and this figure does not take into account the collaborative work undertaken under commercial in confidence arrangements and work published elsewhere.

SHRIMP IIe customers around the World echo this experience; high productivity with very low down-time, (eg. >300 24 hour days per year, year-on-year) backed by the experienced staff at ASI.

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No other instrument of comparable performance comes close to *SHRIMP* for low downtime, low running costs and high productivity

Estimated Annual Running Costs – SHRIMP IIe/MC

The following figures are based on the approximate costs incurred in running the ANU RSES *SHRIMP II* for a calendar year. The costs of Instrument Operators are not included. This table was originally generated for a single-collector instrument; the requirement to periodically change CDEM multipliers is also identified in this update, and an extra 100 hours is budgeted for the time to replace these multipliers (which can be replaced by the user, in a straight-forward manner).

NB. This information is based on Australian prices and Australian conditions and is only an indication of the expected running cost.

Table showing estimated annual running cost for a *SHRIMP IIe/MC*, based on the experience of the ANU *SHRIMP II/MC*.

EXPENDABLE RESEARCH MATERIALS	\$AUD
600 x 36 exposure films and film processing (or equivalent colour laser printer consumables)	10,900
750mm x 1mm dia. 99.999% pure gold wire for coating of samples	4,350
Helium line oil filter for cryocooler	1500
Computer paper and disks	1,050
5 Tantalum Köhler apertures and 2 Nickel cathodes	5,000
2 ETP electron multipliers (for on-axis detection)	3,600
10 Sjets continuous dynode electron multipliers for multi-collector heads	15000
1000 pairs disposable gloves, 50 boxes tissue, 200 litres Petroleum Spirit, 52 litres ethyl alcohol	3,420
1 G size bottle high purity Helium, 6 G size bottle Nitrogen, 1 G size bottle medical grade Oxygen	1,050
Electrical power 135,000 kWhrs @ \$0.12/kWhr	16,200
Labour costs in addition to those of an Operator	20,000
400 man hours @ \$50.00/hr	
TOTAL ESTIMATED ANNUAL RUNNING COST	\$82,070
TOTAL NON-LABOUR EXPENDABLES	\$62,070



The Minister for Resources, Energy and Tourism, the Hon Martin Ferguson at the opening of the Geoscience Australia *SHRIMP*

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