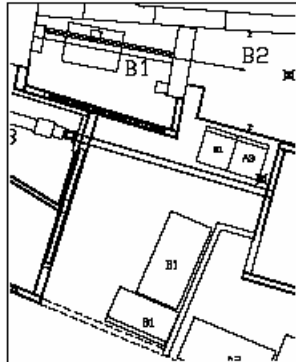


## High pressure facility report

Keith Brister

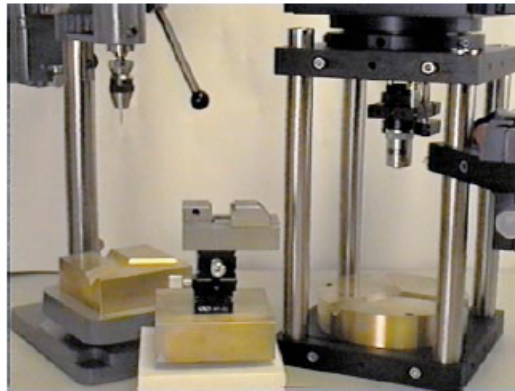
The past year has seen several advances in the instrumentation at the high pressure facility. The most obvious is the new space for the computer and equipment racks between the A3 and A2 hutches just outside the B1 door. This is a great improvement over the old arrangement near the R.F. area. Although the amount of table space is not greatly changed, the microscope now has its own table and there are shelves to keep the clutter down.



Floor plan of user space around the B1 hutch.

Another practical change is the addition of a micro-drill press with an alignment microscope for drilling gasket holes (see photo). A pre-indent gasket is clamped in a precision vise and centered in a special microscope. The vise, which is attached to a kinematic mount, is then placed on the drill press where the

(Right) Schematic of multichannel analyzer electronics modified for taking data from a sample with fluctuating temperature. Light from the PIN diode is amplified by the current to voltage amplifier. This signal is digitized by a flash ADC in the Temperature Grouping Unit and used to control the upper bits of the ADC. The user may choose what mapping to use between the digitized PIN signal and the bits manipulated. The system operates at 100 kHz, a value which is only limited by the rise time of the current to voltage amplifier.



(Left) The micro-drill press (left), a vise mounted on an x-y stage (center), and the alignment microscope (right). The kinematic mounts on both stages assure that the specimen hole is drilled in the exact center of the diamond anvil cell gasket.

sample chamber is drilled. The total time spent drilling gasket holes is minimized since the most time consuming part, centering the gasket in the drill press, is done under the microscope while looking straight into the indentation made by the diamonds.

The laser heating system is now equipped with instrumentation to allow spectra (x-ray and optical) to be collected while the temperature of the sample is fluctuating. Incandescent light from the heated sample is focused on both a PIN diode as well

as the entrance slit of a spectrometer equipped with a diode array detector (see below). The current from the PIN diode is digitized and used to control the upper bits of the output from the ADC feeding the x-ray multichannel analyzer. The effect is to have up to 64 multichannel analyzer (MCA) groups each of which are at a different temperature. A trigger signal is also sent to the diode array gate for pyrometry measurements to calibrate the temperature of each MCA group. (See page 47 for an example of the MCA interface.)

