AT25-04, Tools to be deployed/manipulated with Jason
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Please give a brief description of the equipment, its intended purpose, the cruise # it was last used on if any and its deployment method.

Colleagues and I will be fielding several systems for use in servicing subseafloor observatory systems (CORKs) for pressure monitoring, collecting fluids, and monitoring fluid flow from CORK wellheads. Instruments below are listed according to the co-PI group responsible for fielding and use:

I. General Purpose Jason Needs

(1) We request that there be at least two (2) of the standard Jason elevators with fixed floatation. As described below, one of these is to be dedicated for use with the UH fluid/microbial sampling systems. The other large elevator will be used for periodic instrument deployment and recovery, as needed.

(2) We request that a small "Alvin" elevator be made available. This is a roughly 1 m x 1 m elevator that was modified during AT18-07, with a hole cut near the center of the grating, for use in calibration of the electromagnetic flowmeter. We wish to repeat that calibration exercise, as described below, and hope that the small "Alvin" elevator can be made available for this purpose. A photograph of this elevator as configured on AT18-07 is provided.

(3) We will be bringing out a mixture of floatation systems of various buoyancy values, for use with deployment and recovery of equipment. How much of this we end up using will depend on configuration of individual systems for deployment and recovery, which will be determined in consultation with Atlantis and Jason personnel.

(4) We request that a supply of Alvin drop weights (or similar) be provided for use with elevator, instrument, and flotation deployment and recovery. We will work through the particulars of the different deployments with shipboard personnel, to keep these operations as simple as possible, but it will be helpful to have ~500-800 lbs of drop weights available for our use.

II. Instruments provided/used by UCSC: pressure monitoring, flowmeter, heat flow

(1) Communication with CORK pressure loggers using ODI connector, Holes 1027C, 1301A/B, 1362A/B

This connector is same as used with Alvin each year between 2005-2009 and with Jason in 2010-11.
RS422

hard-switchable to power off
1.5 kg in air, 1.1 kg in water
connector will be serviced via pigtails with AWM connector, we will provide
Will be dummied off when not in use.

(2) CORK flowmeter (currently deployed on 1362B, to be deployed on 1362A)

Dimensions:	Inches
Length	47.0
Diameter	6.0

Weight:	Pounds
Dry	55
Wet	49

This autonomous, electromagnetic flowmeter system is currently clamped in place on the wellhead of the CORK in Hole 1362B. A ball valve below the clamp was opened in Summer 2011, allowing ~65 degC fluid to discharge from the wellhead through the flowmeter. The flowmeter the rate of flow with time, once per hour. This instrument will be recovered in Summer 2013.

In addition, we have completed a new version of this tool with IrDA communication capabilities. Depending on the condition of the old tool after it is recovered, we may (a) redeploy that tool, or (b) deploy the new tool.

We would like to be able to calibrate the new tool by lowering and raising it on the hydrowire using a small Alvin elevator that we modified in on AT18-07 for this purpose. The elevator has a hole cut out in the grating that fits an adapter on the lower end of the elevator, so that water moves through the flowmeter with minimial restriction as the elevator is lowered and raised. We will provide photographs of this system, in the hope that it can be located and made available for AT25-05 as well.

Does the equipment require data or a power interface from the vehicle?
Both flowmeter systems are autonomous, but the newer system allows for IrDA communication using a receiver to be carried in the Jason basket. For the latter we will need:
IrDA communication transmit/receive
RS-232, 24 VDC
option to power on/off

Does this equipment require hydraulic inputs from the vehicle? No

(3) Communication with pressure logger in CORK in Hole 1024C
This is a secondary objective, if there is time. To communicate with this system, we will deploy a Seacon connector having these specifications:

RS232, 4-wire
connection including 9 V power (all hard-switchable to no connection)
4.4 kg in air, 3.4 kg in water
can be plugged into same Jason pigtail as O.D. Blue via AWM-8 connector

Note: if there is a dedicated dive at 1024C, this will be only communication required for that dive

(4) We may be bringing out an insertion frame for use with the 66-cm Alvin style heat flow probe. This device is to be deployed using a Jason elevator. The frame is handled separately from the standard heat flow probe, which is carried in the usual way by Jason (in basket and/or in holster). A set of drawings of the insertion frame is available here:

http://es.ucsc.edu/~afisher/post/AT25-05/Prospectus/HeatProbeGuide_120221.pdf

We plan to deploy this device on an elevator, then pick up with Jason. The frame will weigh about 60 lbs in water. Once positioned on the seafloor, the heat flow probe is inserted from the top of the guide tube, then pushed into the seafloor with the handle that extends upward from the probe. After collecting data, the probe is pulled out of the seafloor using the handle.

The heat flow probe is a standard Alvin/Jason heat probe (designed and build by Lane Abrams), operated using a RS-232 connection with approx. 26 V DC provided by the vehicle. We will bring two with us, along with associated cables. We will also bring our own operating software for the probe, and will plan to leave this software with Jason personnel for use during later expeditions, if desired.

III. Instruments provided/used by UH: Fluid and microbiological sampling

(1) A GeoMICROBE sled will be recovered from 1362B; it was deployed by Jason in summer of 2011 in AT18-07. The recovery operation will consist of disconnecting the "Jannasch" connector from the CORK wellhead, moving the sled away from the CORK and releasing the drop weights. We will not need to communicate with this sled prior to recovery.

(2) Short-term Modified GeoMICROBE (MGM) sampling using a decidated Jason elevator. This should allow us to obtain large volume filtrations while minimizing ROV time. A large Jason elevator will be configured with essential GeoMICROBE components (controller, primary pump, some sensors, fluid samplers, batteries). This sampling system will be deployed and connected to CORK fluid lines via "Jannasch" connectors for 24-48 hours of near continuous sampling. The system will be recovered (disconnect, release drop weights) and refit for redeployment. We hope for a minimum of three (3) deployments of this short-term time-series sampling system (CORK in Hole 1362A: deep bioline, deep stainless steal line, shallow stainless steal line), but will be prepared for additional deployments if time and opportunity permits (e.g., 1362B bioline).

We will communicate with the MGM via an ODI connector; we will use the same connector and cable system as in past years with JASON. These connectors/cables are described in the accompanying document: **UH_Penetrators_AT25-05_wiring.doc**

(3) Mobile Pumping System: We will use the MPV for real time sampling from CORKs in Holes 1362A, 1362B and 1301A. Primary use of MPV will be to rapidly fill large and medium sized "bag" samplers. Operations will entail connecting MPS to the CORK fluids lines via either the "Jannasch" (Holes 1362A and 1362B) or "Aeroquip" connectors (Hole 1301A), using the MPS pump to flush the fluid lines and then fill the bags. Some in situ filters will be collected (e.g., 1301A). The MPS is then disconnected from the CORK.

Physically, the MPS resides in a large milk crate, secured to the right side of the JASON's forward science basket. The associated Medium Volume Bag System (MVBS) resides in the aft science bay; the MPS and MVBS are connected by a continuous run of 0.250" (ID) PVDF tubing. The MVBS consists of two integrated components: the 6-bag sampler system and the McLane Multisampler.

Electrical connections between the MPS and the JASON and between the MVBS and the JASON will be as in previous years, described in the accompanying document: **UH_Penetrators_AT25-05_wiring.doc**

(4) Large Volume Bag Sampler: If the opportunity arises we will secure a LVBS to the forward Science basket, next to the MPS, as in years past. This will be connected to the MPS via plastic tubing. This will allow the rapid collection of a large volume of pristine basement fluids. Procedures are similar to those used for the MPS, described above.

Figure 1. Small ("Alvin") elevator used over the side during Atlantis/Jason expedition AT18-07 in Summer 2011. The elevator is figured in this photo for calibration of an electromagnetic flowmeter. The grating on this elevator was cut near the center, to make room for a plastic adapter that extends through the grating and holds the flowmeter securely in place, allowing water to move freely up/down through the flowmeter. We lowered and raised the flowmeter on the hydrowire, as an over-the-side night operation, to calibrate the flowmeter. After this, the flowmeter was deployed on a CORK wellhead, where it currently resides. This flowmeter will be recovered in Summer 2013, and may be redeployed on a different wellhead. We would like to calibrate a second flowmeter, and may wish to recalibrate this flowmeter, depending on the nature of data recovered in Summer 2013.