AT18-07, Tools to be deployed/manipulated with Jason for monitoring of pressure conditions in borehole observatories.

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 modifying subseafloor observatory systems (CORKs) for pressure monitoring, and for monitoring of fluid flow from one of the CORK wellheads. The first four of these systems are to be deployed/used during the first dive of the expedition, on order to retrofit one of the CORKs for pressure monitoring with modern instrumentation. If all goes well, these tools will be used only once, during this first dive, and then we will set them aside for the rest of the cruise. The final system is a flowmeter, to be deployed/manipulated during a later dive on a different CORK system.

(1) CORK 1027C electrical connector removal tool

Size	Inches
Diameter	43
Height	26

Weight:	Pounds
Dry	78.0
Wet	67.5

This instrument will be used to separate a brass electrical connector from an old (steel) data logger. At present, the connector is corroded in place, so we are bringing out this instrument to place it on top of the wellhead, rotate a screw mechanism, break the corroded connection between the connector and old data logger, and remove the connector from the wellhead. I will provide a drawing that illustrates key design features of this system.

This tool may need to be deployed on an elevator, or possibly in the Jason basket. The tool should be recovered either by flotation/elevator, or by attaching to the ROV prior to ROV recovery. This is a new tool which has not been deployed previously.

Does the equipment require data or a power interface from the vehicle? No
Does this equipment require hydraulic inputs from the vehicle? No

(2) CORK 1027C Hydrostatic tool for removal of old data logger

Dimensions:	Inches
Diameter	5.5
Height	86.6

Weight:	Pounds
Dry	151.8

Wet	119.9

NB: this is just the hydrostatic tool

Weight:	Pounds
Dry	279.4
Wet	216.7

NB: this is hydrostatic tool attached to old data logger

This tool that will be placed on top of the CORK 1027C wellhead, latch in to the old data logger, and use hydrostatic pressure to drive a piston upward, pulling the old logger part way out of the wellhead. I will provide a drawing that illustrates key design features of this system.

This tool will need to be deployed on an elevator, as it is too large for deployment in the Jason basket. If all goes well, we will recover this tool with the old data logger. Otherwise, we will just recover the tool by itself. The tool/logger should be recovered either by flotation/elevator, or by attaching to the ROV prior to ROV recovery. An earlier version of this tool was deployed and run successfully with Alvin in 1999 and Jason in 2003. It is being modified slightly for the current expedition, to accommodate the geometry of the data logger being recovered.

Does the equipment require data or a power interface from the vehicle?
Yes, we may wish to download data from the old data logger if we are not able to remove it from the wellhead. We are bringing a communications connector for this purpose, has been deployed multiple times with Alvin during 2005-2009.
RS232, 4-wire connection including 9 V power (all hard-switchable to no connection)
15 kg in air, 13.2 kg in water. connector will be serviced via pigtails with AWM connector, we will provide
Will be dummied off when not in use.

Does this equipment require hydraulic inputs from the vehicle? No

(3) CORK 1027C Manifold insert

Dimensions:	Inches
Height	209
Diameter	26

Weight:	Pounds
Dry	313.0
Wet	265.0

This is an insert to be placed inside the top of the CORK in Hole 1027C after the electrical connector and old data logger are removed. This system is being designed along with a deployment "boot" (elevator) to which we can attach floatation and weights.

This tool will be deployed on a custom elevator. Once on the seafloor, it will be lifted from the boot and deployed on the wellhead. This tool will not be recovered, but will remain in place as a manifold for attachment of a pressure monitoring system. This tool has not previously been deployed and does not contain a pressure housing.

Does the equipment require data or a power interface from the vehicle? No
Does this equipment require hydraulic inputs from the vehicle? No

(4) CORK 1027C Data logger and frame to be deployed

Dimensions:	Inches
Length	35.4
Width	15.7
Height	11.8

Weight:	Pounds
Dry	127.6
Wet	96.8

This is a data logger to be deployed on the wellhead platform or adjacent seafloor, and connected to the Manifold insert (item 3) using an umbilical tubing. This tool could be deployed on an elevator or in the Jason basket, depending on space and weight restrictions.

This tool will not be recovered, but will remain in place for pressure monitoring of the observatory system. This specific tool has not previously been deployed, but similar tools were deployed using Alvin in 2006 and 2008. The data logger pressure case was Alvin certified prior to Summer 2010.

Does the equipment require data or a power interface from the vehicle?
Yes, we will wish to communicate with this instrument after it is installed on/near the wellhead. For this purpose, we will use an ODI connector, deployed with Alvin each year between 2005-2009 and with Jason in 2010.
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.

Does this equipment require hydraulic inputs from the vehicle? No

(5) CORK 1362B flowmeter

Dimensions:	Inches
Length	47.0
Diameter	6.0

Weight:	Pounds
Dry	55
Wet	49

This electromagnetic flowmeter system is to be placed on a fitting on the wellhead of the CORK in Hole 1362B. The fitting has a rotating clamp that will be attached to the bottom of the flowmeter assembly. Once the flowmeter is in place, we will open a ball valve below the clamp, allowing ~65 degC fluid to escape from the wellhead, and the flowmeter will determine the rate of flow with time. We are working on two versions of this tool, one without and one with IrDA communication capabilities. When deployed successfully, this tool will remain in place on the 1362B wellhead for the subsequent year, to be recovered in Summer 2012.

This tool may need to be deployed on an elevator, or possibly in the Jason basket. This is a new tool which has not been deployed previously.

Does the equipment require data or a power interface from the vehicle?
One version of this tool will have no communications capability. A second version, which we hope will be ready in time, will use IrDA communications. For this 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

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

This connector is same as to be used for new 1027C logger, was used with Alvin each year between 2005-2009 and with Jason in 2010.
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.

(7) Communication with pressure logger in CORK in Hole 1024C
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: dedicated dive at 1024C, this will be only communication required

Additional Information:

(1) We will be bringing out a mixture of floatation systems of various buoyancy values, but we understand that it should be possible to have some additional glass spheres with hard hats brought out with WHOI supplies. We would appreciate it if 5-6 of these spheres or other floatation materials could be brought from WHOI for our potential use. 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.

(2) 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 ~300 lbs of drop weights available for our use.