

**Replacement HOV (RHOV)
Planned Available Scientific (or combination vehicle/scientific) Sensors**

The following sensors are to be incorporated into the RHOV

Navigation Sensors

1. Depth transducers (2) - Paroscientific units similar to those currently in use on ALVIN shall be used.

2. Inertial Navigation System (INS) - This will be an upgrade to the OCTANS fiber optic gyro currently installed on ALVIN. The additional inertial measuring unit along with a doppler velocity log will allow for increased accuracy when used in conjunction with long baseline (LBL) navigation systems or in cases where LBL is not available. The actual sensor may be an OCTANS PhINS or equivalent. We anticipate installing a PhINS on ALVIN during the present overhaul as part of an ongoing evaluation process.

3. Doppler Velocity Log (DVL) - a unit similar to the current RD Instruments unit with altitude and current profiling capability will be used. The frequency will be selected based on operational requirements as well as the total acoustic spectrum of all RHOV equipment.

4. Search Sonar - A unit similar to the current Continuous Transmission Frequency Modulated (CTFM) model with a range of up to 800 meters will be used.

5. Altimeter - A model appropriate to the operational requirements of the RHOV shall be selected. The DVL can be used as a backup source of altitude.

Environmental Sensors

1. Seawater Conductivity and Temperature Probe - This unit will be used to measure the spatial variability of conductivity and temperature while transiting horizontally in any given depth regime as well as vertically during ascent and descent. Sensor specifications and location have yet to be determined.

2. Portable Temperature Probes - New RTD based temperature probes capable of being held by the manipulators in water with temperatures up to those found in hot water vents shall be built to replace current temperature probes.

3. Sound Velocity Profile - A sound velocity/temperature probe similar to that currently used on ALVIN shall be installed.

Image Sensors

1. Pan and Tilt (P&T) Mounted, Observer Operated Color Video Cameras (2) - The current plan is to use the 3-chip cameras that will be installed on ALVIN during this overhaul. When the size and price of HDTV cameras are appropriate these will replace the 3-chip cameras. Recording media to be determined.

2. External Digital Still Camera (DSC) - A camera similar to the current ALVIN camera will be used. As high quality stills will be able to be obtained from HDTV cameras this camera's function will be replaced by the HDTV cameras on the P&T's when they are available.

3. Bottom Mounted Photo Mosaicing DSC - A yet to be determined DSC and strobe will be mounted on the lower portion of the vehicle in order to obtain digital still images for use in mosaicing of the seafloor.

4. Handheld DSC - Cameras used in ALVIN will be transferred to the RHOV.

5. Handheld Video Camera - Camera used in ALVIN will be transferred to the RHOV.

6. Lasers - Red lasers (2 per camera) used to provide scale in video images will be incorporated onto the pan and tilt mounted video cameras.

7. Bathymetric Profiling Sonar - A multibeam profiling sonar, similar to an EM2000, will be mounted in the lower portion of the vehicle for bathymetric mapping.