

# ALVIN OVERHAUL

## Community Input for ALVIN Upgrade Items

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In 2001 the Deep Submergence Research Vehicle (DSRV) ALVIN will undergo its scheduled overhaul period. Every three years ALVIN is required to be hull inspected and overhauled. This period offers an opportunity to implement improvements and upgrades to ALVIN.

The DEep Submergence Science Committee (DESSC) requested input from the community regarding ALVIN upgrade priorities. A list of ALVIN upgrade items currently under consideration was provided by e-mail to the community. The community was asked to review the list and indicate priorities. Additional suggestions for upgrades or improvements are welcome. Input received from the community will be used by WHOI to prepare their ALVIN overhaul proposal to the funding agencies.

The community was asked to prioritize the list below on a scale of 1 to 5, with **1 = highest priority and 5=low priority**.

### *ALVIN Overhaul - Upgrade Item*

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- Hard mount observer video controls near observer locations
- Modify the bottom of the science rack to improve floor space arrangement
- Modify science basket for better user equipment interface
- Replace external still film cameras with digital cameras
- Develop a fiber-optic penetrator
- Upgrade single chip video cameras
- Replace observer CRT video displays with flat panel LCD displays
- Acoustic modem for data telemetry to the surface.

A summary of the community responses follows.

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## Community Input ALVIN Overhaul Priorities Last posting: 5/12/00

The cells of this table give the number of respondents who gave each upgrade item the given priority.

UPGRADE ITEM	PRIORITY RATING				
	HIGH 1	2	3	4	LOW 5
Hard mount observer video controls near observer locations	3	6	3	1	6
Modify bottom of science rack to improve floor space arrangement	3	2	3	5	6

Modify science basket for better user equipment interface	6	6	4	2	1
Replace external still film cameras with digital cameras	13	3	1	2	0
Develop a fiber-optic penetrator	3	3	3	5	4
Upgrade single chip video cameras	7	5	3	2	2
Replace observer CRT video displays with flat panel LCD displays	3	6	8	1	2
Acoustic modem for data telemetry to the surface	2	3	6	2	5

**Total Number of Surveys Received: 23**

### Other Upgrade Suggestions:

- The very most important "upgrade" to me would be to make video overlay of data optional, and the data items chosen by the observer. i.e. depth, X, Y heading and other basic info should always be available as an overlay. This feature seems to have been deleted in the recent video upgrade, but is essential. Those who don't want it should be able to turn it off. Priority = 1
- Handheld digital cameras with greater memory capacity synced to flash and tested so typical settings can be told to new observers. Present camera only holds 20 shots at good resolution, and outside ambient light is not enough. (based on San Clemente cruise, 4/00) possibly onboard download to a laptop during dive when memory is full. Priority = 1
- Improve gyro heading, and institute heading check before launch and after recovery so that heading data is verified or correctable. This is important to us structural geologists who are looking at orientation of seafloor features. Priority = 2.
- Replace ancient computer system with something simple and reliable i.e. a small Unix box running some stable, supported OS like Solaris, and include a redundant machine for backup. Priority = 1
- Is digital video an option? at least for limited recording time for special uses... It's possible to buy pretty compact DVD drives these days... This would also get a "5" from me if its doable/affordable
- The business of putting man on the bottom is for having his MK ONE Eyeball there. As such, camera upgrades and the acoustic modem (to move that telemetry topside to the support ship seems a higher priority to me.
- In response to your question about ALVIN upgrades, there is one capability that I would like to see improved on the sub - that of sampling particulates and plankton with a pump system. The system currently available, the 'Lazy-Susan Slurp Pump', is not quantitative i.e., there is no measure of volume pumped) and is difficult for the ALVIN group to mount and maintain. The community has asked for a replacement repeatedly; I urge you to give this request a high priority in your planning efforts.
- Set up two parallel lasers that are set apart one meter or some other set distance to provide a scale for digital and video images.
- Set up (or at least plan for) an easy mount for the new GEOCOMPASS being designed and/or built at Harbor Branch for rock orientation measurements - contact Jeff Karson for details if necessary.
- Increased data-flow from the basket into the submersible, and the reverse, is fundamentally controlled by the penetrator. Fiber penetrators exist, and would greatly upgrade the submersible's capabilities, and would best be done during overhaul. The other items are less cost-effective, and/or less critical to be done during this overhaul.

- Convert to recording video in digital format.
- Observer control of camera pan/tilt/zoom (if not already available).

### **Additional Comments Received on Surveys:**

- Hard mount observer video controls near observer locations - no way. A flexible approach is much better for the uncomfortable "seating" in ALVIN where one is adjusting constantly.
- Hard mount observer video controls near observer locations. - I'd rather leave them in flexible control boxes
- Hard mount observer video controls near observer locations - Although I would not hardmount the controls but have them on a cable so observers can position themselves as they see fit to control video while viewing subjects out the viewport. (high priority)
- Acoustic modem for data telemetry to the surface - If this includes a picture (2) if just data (5).
- Replace external still film cameras with digital cameras - I would not replace film cameras but add ESCs to the imaging capabilities. ESC imagery still does not approach the resolution of film. Having high resolution images on film, when needed, enhances the ability to identify small organisms. Further, ESC systems do not have the dynamic range of negative films, hence the ability to resolve details in high contrast scenes are reduced.
- Upgrade single chip video cameras - I assume this means upgrade to 3-chip cameras? There are some very good small 3-chip cameras out there. However, the best mix is to upgrade the cameras, then record images on digital format tape (full or miniDV) (if you are not doing this already). - high priority