ADVISORY COUNCIL MEETING

Cosmos Club
Washington, D.C.

Minutes of the meeting, May 23, 1982

The meeting was called to order at 0900 by B. Robison, in Room B, Cosmos Club, Washington, D.C. The agenda is attached as Appendix I. The following were present:

Advisory Council	Observers/Invited Participants
Robison, B.H., Chair	Kaulum, K.W., ONR
Corell, R.W.	La Count, R.R., NSF
Curray, J.R.	*Pankonin, V., NSF
Frankenberg, D., *ex-officio*	*Pyle, T.E., NOAA
Gorsline, D.S.	Wall, R.E., NSF
Miller, C.B.	
Rossby, H.T.	
Spencer, D.W., *ex-officio*	*Presented information to the Council.
Van Leer, J.C.	

Barbee, W.D., exec. sec. UNOLS

Advisory Council member, W.M. Sackett was not able to attend.

To accommodate Vernon Pankonin, Electromagnetic Spectrum Manager, National Science Foundation, who was present to provide information and procedural guidance to the Council, discussion of UNOLS radio frequency spectrum management and the satellite communications link was held at the beginning of the meeting.

The discussion centered on whether there is a UNOLS community need for allocated radio communications working frequencies (i.e., frequencies that would be available on UNOLS projects for intership, interinstitutional and interfacility communications, including data transmission). This discussion grew out of continuing funding agency and UNOLS consideration of fleet commuications, especially the satellite communications link.

It was noted that there has been a historic need for a working frequency allocation within the academic ocean community but that previous efforts had not achieved allocations. Satellite communications (wherein the communications system provides the frequencies) to some degree alleviate the need for allocated working frequencies, but there is still a need, particularly outside satellite footprints.

Dr. Pankonin suggested that he and his office could aid in the allocation process if he received a well conceived application reflecting UNOLS needs. It was the sense of the Council that the UNOLS Office should act as the focal point by preparing a solicitation to determine the UNOLS fleet's commuications frequency needs, preliminary to submitting application for frequencies through the Electromagnetic Spectrum Manager, NSF.

The Council recommended:

That the UNOLS Office prepare a solicition to Member (operating) institutions to determine UNOLS fleet needs and use of working radio frequencies; and

That appropriate Advisory Council members advise knowledgeable investigators in the UNOLS community to provide information to the Executive Secretary to support a request for frequency assignment.

A discussion was held concerning the UNOLS satellite communications link (SCL) which the University of Miami has been operating. Derek Spencer, Chairman, UNOLS, presented the results of his solicitation of UNOLS operating institutions concerning the system and existing operating arrangements. In summary, reponses strongly endorsed SCL utility to oceanographic research and commended the Paul Eden operation as responsive and dependable.

The Council considered two alternatives for continued operation of UNOLS SCL (i.e., the center operated by Paul Eden): through a proposal/grant to the University of Miami for that purpose; or as a supplement to the UNOLS grant.

The Advisory Council recommended:

That a Satellite Communications Link proposal be formulated by the UNOLS Office and submitted to the National Science Foundation as a supplement to the existing grant to the University of Washington for UNOLS Office operation.

That the UNOLS Office explore the cost and determine the appropriate contents of a technical users' manual for the Satellite Communications Link.

The minutes of the Advisory Council meeting of February 14, 15, 1982 held in San Antonio, Texas jointly with the Alvin Review Committee were accepted.

The agenda for the May, 1982 UNOLS semiannual meeting was examined. Discussion of most of the items was deferred until later in the Advisory Council meeting so that they could be discussed in conjunction with related Council business.

The executive secretary was asked for a report on the move of the UNOLS Office from Woods Hole, MA to Seattle, WA. The physical move has been completed, and the Office is functioning under terms of the NSF grant to the host institution, the School of Oceanography, University of Washington. Communications between UNOLS institution and the UNOLS Office are not yet adequate. The UNOLS Office will be aggressive in trying to improve these communications. Efforts will be made to improve the timeliness and quality of information distributed by the Office (e.g., minutes of meetings, reports, analyses) as well as to promote timely submission of reports such as cruise assessments and ship utilization forms submitted by institutions to the Office.

The Council directed that minutes of this and future AC meetings be distributed in draft to UNOLS Members and Associate Members. Minutes will include a summary of highlights.

Reports were heard from Advisory Council members on their standing roles. The Reports consisted of status and progress since the February meeting, progress through the year and recommendations for continuation of individual roles.

J. Curray reported that he has made additional tabulations of Cruise Assessment Forms that have been returned to him through the UNOLS Office. Although the Assessments returned contain helpful ifnormation, the rate of return is disappointing. No Assessment forms have been received from some ships or institutions. For these Cruise Assessments to be helpful in evaluating overall UNOLS fleet efficiency and effectiveness, we must have nearly universal participation by UNOLS operating institutions and principal investigators.

The Advisory Council recommended:
That UNOLS operating institutions establish a system whereby Cruise Assessment forms are completed by chief scientists before leaving a ship at the completion of a cruise.

The Council also directed the executive secretary to contact principal investigators who have not returned assessments to find out why not and to encourage returns.

D. Frankenberg noted that the report on UNOLS vessel user manuals is complete, and should be circulated to the assembled membership. Receipt of responses from operating institutions and their incorporation, as appropriate, will allow completion of the final report.

T. Rossby noted that the Winch and Wire report had been circulated to operating institutions for comment but that only one institution had responded. It was noted by the Council that it is difficult to review the report without the appendices which had not been included in the earlier distribution. The UNOLS Office will obtain the appendices and distribute them.

It was the sense of the Council that UNOLS should continue to pursue such efforts toward standardizing wire sizes and winch and wire operating and maintenance procedures. UNOLS should consider endorsing existing efforts from within the community (e.g., handbook on winch and wire use now in preparation; a proposed seminar series on oceanographic winches and wire).

D.Spencer discussed a tentative proposal for a working conference on microprocessors and microelectronics in ocean science and technology. This conference would be to examine the microcomputer-microelectronic revolution from the viewpoint of the ocean scientist, with the purpose of integrating this evolving technology into the planning and programs of the ocean community. The meeting would be held in the fall of 1983 (Appendix III).

The Council in its discussion of the proposal emphasized the need to involve scientists in early stages of organizing and conducting the workshop, the costs involved in adopting on innovative computer approach, and the need for a parallel effort in sensor technology development.

The Advisory Council supports and endorses the concept of a proposal to examine microcomputer/microelectronic revolution and to inform the community of these technological developments.

J. Van Leer noted that the issue of the UNOLS satellite communications link had already been addressed. He emphasized the need to develop standardized formats for data transmission. It was suggested that da ormat development should accommodate to SAIL. K. Kaulum noted that ONR will fund SAIL installation, tentatively on three ships. The ONR support includes documentation and software development.

C. Miller discussed fleet replacement and presented notes (Appendix IV) for updating the UNOLS Advisory Council report On the orderly replacement of the academic research fleet, July, 1978. For revising the 1978 report it should be noted that the basic philosophy and recommendations remain valid but that account must be taken of recent studies by the Ocean Science Board (NAS) and by the National Science Foundation Task Force on Ships. Advisory Council resolutions in February, 1982 urged that UNOLS begin planning immediately for the large-ship replacements that will be needed in the 1990s and that UNOLS encourage Federal support for construction of a polar research vessel.

Because this issue is inextricably interwoven with questions concerning UNOLS fleet management and present fleet needs the Council deferred further consideration of fleet replacement until the later two questions were addressed.

R. Corell presented an outline for the ship management issue (Appendix V). The outline divides the ship management issue into three significant elements: scheduling, allocation and lay ups, and long range planning.

The present model for fleet management, decentralized operation by individual institutions, is remarkably effective and should be preserved. Regional ship scheduling procedures are working well, but perhaps should be enhanced or modified. Perhaps scheduling and planning for the use of the larger vessels should be founded on a national perspective and scheduling process.

A UNOLS position on ship allocation and lay ups must be developed as a basis both for furture ship scheduling and long range planning.

Long range planning efforts of individual institutions, funding agencies and the community would be aided by 3-5 year projections and summaries: of ship operating areas, ship overhauls and refits, ship's equipment, budgets for vessels and equipment maintenance and refurbishment, and allocations and lay-ups.

In discussion, the Council cautioned that ships should be kept in the proper context as an essential facility for ocean research; ships and ship operations should not drive the science program. The Council also moved to poll operators, other institutions and potential investigators to determine the need, interest or conditions for productive piggy-back projects on UNOLS vessels.

D. Gorsline reported only modest interest in potential UNOLS bulk purchasing. A query to all operating institutions elicited responses suggesting that there

is little opportunity beyond the wire rope purchase already implemented. Development of bulk purchasing for UNOLS institutions will require explicit planning for specified items.

(Reports on standing roles were interrupted here to allow presentation by Dr. Tom Pyle on joint use of the SURVEYOR. The final standing role report follows, however, to provide continuity in the minutes.)

T. Rossby's discussion on special facilities centered on the development of aircraft as oceanographic research facilities. If it were to be decided that UNOLS should address this issue, an early element would be in sensor technology necessary to initiate a productive research effort. High start up and development costs were discussed as were current efforts (e.g., Navy, NCAR).

Dr. Thomas E. Pyle, Deputy Director, National Ocean Survey, NOAA, made a presentation on the potential for joint NOAA-UNOLS use of the SURVEYOR. He noted that the Administrator, NOAA, is favorable toward interagency use of NOAA as well as other elements of the Federal oceanographic fleet, encourages those coordinating mechanisms that might result in effective interagency use, and views joint NOAA-UNOLS use of the SURVEYOR as, potentially, such an effective mechanism.

Dr. Pyle described the ship briefly, and distributred a fact sheet Appendix VI). The SURVEYOR is large, 293 ft LOA, 3500 tons displacement, has over 100 berths, ice strengthened hull, helicopter pad, excellent sea keeping ability and a quiet hull. She is equipped with a Seabeam swath sounding system for deep water.

Dr. Pyle suggested that consideration should center on four main issues:

1. Is there a national requirement? Does the SURVEYOR possess special capabilities, equipment that warrant special arrangements? Does the UNOLS community need such a ship?
2. Is there a way to fund joint use?
3. How would the ship be operated and crewed for joint use? Would NOAA be the operator? What is a mutually satisfactory crewing pattern?
4. How would ship time be allocated under joint use? By a review process similar to the ALVIN Review Committee?

Discussion during and after the presentation was colored by the strong possibility of excess ship time in the existing UNOLS fleet.

The sense of the Advisory Council reaction was that because of the over-all fleet management circumstances there is no immediately obvious UNOLS need for use of the SURVEYOR, but that dialog with NOAA should continue.

The Advisory Council discussed briefly a French inquiry on ship use coordination. Through Dr. Neil Anderson, now detailed to CNEXO, the French have asked if NSF and UNOLS would have interest in an arrangement whereby U.S. scientists might conduct their projects using French ships and French scientists use U.S. (UNOLS) ships in situations where such exchange would be cost effective.

The Advisory Council recommended that this inquiry be brought to the attention of UNOLS member institutions.

The Advisory Council's consideration of the issue of UNOLS fleet composition, distribution and management was initiated with discussion of the two issue papers Projected Ship Needs for Ocean Science Research, 1983-1988, and Criteria for Assessing Ship Retention Value. These papers by a Task Group from the National Science Foundation's Division of Ocean Sciences with the Office of Naval Research had previously been distributed to the Advisory Council and UNOLS members by the Chairman, UNOLS.

R.R. La Count, Head, Oceanographic Facilities Support Section provided information on the two issue papers and the fleet management issue. (His remarks were expanded and repeated at the UNOLS semiannual meeting, May 24, 25, 1982, and are appended to the minutes of that meeting.) The objectives of the Task Group were to:

> determine the optimum mix of ships required to conduct viable research programs in Ocean Sciences based on funding forecasts for FY 82, 83 and beyond,
>
> assess the management of the academic fleet and, if required, recommend directions for further study that could increase its effectiveness.

The study is now essentially complete, and although there are some uncertainties concerning funding estimates and class assignments might not always be appropriate, conclusions can be drawn:

> Although the numbers of ships in the larger classes (I, II, and perhaps III) match needs reasonably well, there is an apparent surplus in the smaller classes.
>
> OFS has used $21.5M as a target for 1983 ship operations in earlier planning. Forecasts for science program needs, however, total only $19.3M for ship operations.

NSF and ONR must achieve a balance between ocean science program funding and ship operation costs. All of ships in the present NSF-supported academic fleet or in the UNOLS fleet will not be required in that balanced program.

There is need for an overall plan that considers lay ups, or limits them, that defines the best mix of ships for the research program, that provides effective geographical and institutional balance for the fleet.

Mr. La Count, together with K. Kaulum delivered a charge to the Advisory Council:

> to develop specific recommendations on a ship-by-ship basis for the composition, distribution, and management of the UNOLS fleet in the 1983-88 time frame.

This charge is formalized in R. La Count's letter of June 4, 1983 (Appendix VII).

The Council discussed the NSF-ONR study, the charge and various means of providing a response. The discussion led to an Advisory motion and its acceptance:

> *that the Advisory Council accept a specific charge from the National Science Foundation, Division of Ocean Sciences and the Office of Naval Research that the Council develop specific recommendations on a ship-by-ship basis for composition, distribution and management of the UNOLS fleet in the 1983-88 time frame. These recommendations to be based on an assessment of existing data, studies and projections for the UNOLS fleet and projections for its future funding. The report will be drafted by September 1, 1982, distributed to the membership for comment and the report and membership comments will be delivered to the National Science Foundation and Office of Naval Research by October 1, 1982.*

The Council developed a procedure for the study, together with a list of materials to consider in the study (both in Appendix VIII).

Summary discussions of the UNOLS fleet management issue emphasized Advisory Council views:

> *that while it is imperative to achieve a balance within available funding between ocean science program funds and ship operations costs, the basic problem is too little overall funding for ocean science;*
>
> *that there is an urgent need to generate longer lead time in ship scheduling and effective long range planning. Consideration should be given to scheduling on a national facility basis, perhaps beginning with the larger ships and for extensive, remote programs.*

The Advisory Council moved to express its appreciation to Mr. Thomas Stetson for his long, effective support to the Council as Executive Secretary, UNOLS.

The meeting was adjourned at 1845.

William D. Barbee
Executive Secretary,
UNOLS

UNOLS ADVISORY COUNCIL

AGENDA FOR MEETING

23 May 1982

Cosmos Club, Room B
Washington, D.C.

. Accept minutes of 13, 14 February meeting, San Antonio

. Satellite communications for UNOLS Vessels--Advisory Council recommendations. (Tentative: R. La Count may invite an NSF representative on radio frequency spectrum management with information for the Council.)

. Examine agenda for May 1982 Semiannual meeting (Pertinent items may include: the panel discussion, telemail, SCL, NASULGC, Issue papers on projected ship needs and criteria for assessing ship retention.)

. Discussion of the potential for joint NOAA-UNOLS use of SURVEYOR- (Dr. Tom Pyle, Deputy Director, NOS, NOAA)

. Development of a polar research vessel

. Report on FOFCC - Spencer

. Report on standing roles and input to the A/C annual report - A/C members

· Discussion of Ship Management (and response to NSF-ONR)

· Other Business

PI/SIC	Inst.	Type of Work	Date Work	Days Work	Success	Problems, Comments, and Disposition
Terry, V. J.	Skidaway	Geology	15-19 Feb	5	Fully	
anson, Roger B.	Skidaway	Collection of scalps	23-24 Feb	2	Fully	
ffenhofer	Skidaway	Collect zooplankton	3/3/82 3/15/82	2	Fully Partially	no explanation
inger, James J.	SAI	Current Meter Mooring	18-23 April	6 total 2 Survey 4 Transit	Partially	Some of his equipment not there. For diving had to provide own AVON as one on ship beyond repair. Regular cook not available. Crew performed well.

CAPE HENLOPEN

PI/SIC	Inst.	Type of Work	Date Work	Days Work	Success	Problems, Comments, and Disposition
Hunkins, K.	LDGO	Moorings CTD Plankton Tows	23 Feb — 14 March 82	18 total 1 transit 17 station	Partially	1 day loss due to weather 2 " s " " " scientific equipment. Ship + crew performed admirably. Failure of acoustic releases. Lost 2 1/2 of 8 moorings because of Trawler damage or battery failures.

PI/SIC	Inst.	Type of Work	Date Work	Days Work	Success	Problems, Comments, and Disposition
Young, Richard		Bioluminescence in living midwater squids	3-12 Dec 1981	10 Efetivo	Partially	Animals uncooperative Ship support crew extremely helpful

THOMAS G. THOMPSON

PI/SIC	Inst.	Type of Work	Date Work	Days Work	Success	Problems, Comments, and Disposition
Richman, James	OSU	Recover deploy subsurface moorings, Hydrographic Stations; Acoustically Track dropsondes	31 Jan – 1 March 82	29 total 12 Transit 12 station 5 Survey	Partially	3 days loss due To scientific equipment Release failure of moorings
Lorenzen, Carl	U. Wash.	Deploy + recover floating arrays. Repetitive CTD's + hydrocasts	5-29 March	26 Station	Fully	CTD fell off wire. No other problems Successful. Completed 5 of 6 proj. L. He has an "excellent working relationship with the crew."

PI/SIC	Inst.	Type of Work	Date Work	Days Work	Success	Problems, Comments, and Disposition
Worsline, D.S.	USC	Plankton Tows Box cores	8-12 Mar.	1½ Transit 3½ Station	Fully	Successful because "Captain & crew work very hard to accomodate the members of the scientific party."
Worsline D.S	USC	Water stations Airgun, 3 strings Magnetometer	?	4 Total ½ station 3 Survey	?	1 day loss due to weather ½ " " " " scientific equipment. Thanks to Captain & Crew for "cheerful dedication to keeping the work going under very adverse conditions." Equipment failures — airgun system should be studied.

KINGSLEY WARFIELD

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PI/SIC	Inst.	Type of Work	Date Work	Days Work	Success	Problems, Comments, and Disposition
Heinbokel, J.	JHU/ CBI	Physical, chemical, biological sampling along grids.	2-5 March	4 Station	Fully	Some lost time because of scientific equipment - flowmeter/digital meter
Coats, W.	JHU/ CBI	Sediment analysis for dinoflagellate cyst types.	8-10 March	4 Station	Fully	no lost time.
Heinbokel, J.	JHU/ CBI	as above	12-16 April	5	Fully	no problems

PI/SIC	Inst.	Type of Work	Date Work	Days Work	Success	Problems, Comments, and Disposition
Huyer, A.	OSU.	Physical hydrography	3-5 April	2½ total 2 Transit ½ station	Fully	No problems

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MAY 21, 1982

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A PROPOSAL FOR A WORKING CONFERENCE ON MICROPROCESSORS AND MICROELECTRONICS IN OCEAN SCIENCE AND TECHNOLOGY

THE EVENTS OF THE PAST FIVE YEARS HAVE SEEN A BLURRING OF THE FUNCTIONS OF THE LARGE MAIN FRAME COMPUTER, AS WELL AS THE MINICOMPUTER, WITH THE GROWING ACCEPTANCE OF THE MICROCOMPUTER AND MICROPROCESSING SYSTEMS. THE POTENTIAL FOR INCREASED FUNCTION FROM THESE MICROELECTRONIC SYSTEMS IS NOW BEING REALIZED, AT GREATLY DECREASED PRICE, AND WITH POTENTIAL FOR NETWORKING AND TELECOMMUNICATION AND RETURNS TO COMMON DATA BANKS. THESE AND MANY OTHER SUCH DEVELOPMENTS POSE REAL OPPORTUNITIES FOR THE OCEANOGRAPHIC COMMUNITY AT A TIME OF OBSOLETING SHIPBOARD AND SHORE BASED COMPUTER FACILITIES, DECREASED BUDGETS, AND INCREASED OBLIGATIONS.

A WORKING CONFERENCE IS PROPOSED THAT EXAMINES THE MICROCOMPUTER/MICROELECTRONIC REVOLUTION FROM THE VIEWPOINT OF THE OCEAN SCIENTIST AND TECHNOLOGIST. IT IS PROPOSED THAT SUCH A CONFERENCE BE ORGANIZED FOR A MEETING IN THE FALL OF 1983 FOR THE PURPOSE OF INTEGRATING THIS EVOLVING TECHNOLOGY INTO THE PLANNING AND PROGRAMS OF THE OCEAN COMMUNITY.

A PROPOSAL

THE ADVISORY COUNCIL OF UNOLS HAS BEEN DEEPLY CONCERNED WITH THE ISSUE OUTLINED ABOVE, AND PROPOSES A WORKING CONFERENCE ON MICROPROCESSORS AND MICROELECTRONICS FOR OCEAN SCIENCE AND TECHNOLOGY.

It is suggested that the data collection and computer processing systems of the oceanographic research fleet often employ systems and technologies that have been in place for well over a decade. The explosive growth of microcomputers and microelectronics in this period may have obsoleted many of these systems; systems which may need to be replaced or expanded. This working conference would discuss key aspects of that problem that affect the scientist; engineer; technologist; and program manager.

It is increasingly clear; that the extraordinary computer power is now available in exceptionally small packages which permits the scientist a wide range of new options for the design of his experiments and for shipboard and on-shore processing of data. Intelligent instruments may process in situ the desired information rather than just collect data; and may do so in nearly real time; permitting assessments immediately. Telecommunication links are now available; permitting instruments to rely on remote data banks for processing and interpreting collected data.

It is suggested that the benefits of these remarkable advances should be made available to those in the community who may not have had the available time to assess their potential. A pertinent representation of this development; as it relates to ocean science; may be achieved in a three day meeting. Since the problem is not only that of the scientist; but also of the engineer; the technologist; the operational specialist and the manager; the conference must be at once broad and yet specifically detailed.

A. Pre-Conference Planning

It is proposed to assemble a small; but select; group of knowledgable persons who have a standing connection with ocean problems; and a demonstrated success in solving key technical problems through the use of microcomputers and microelectronic systems. They would be drawn from the ranks of ocean scientists; engineers; and technologists; and would assemble for a short intensive planning meeting aimed at establishing an appropriate thrust for the proposed working conference. This step would make certain that the conference serves adequately the wide diversity of interests that will be concerned with this subject.

This initial meeting; proposed for fall 1982; would be tasked with assuring that the conference addressed all the key areas of microcomputer/electronic technology that impact the ocean community; and would develop the list of invitees for the conference. The invited attendees would attempt to define the generic questions faced by a scientist or engineer as he applies microcomputer technology to a range of ocean applications; and would establish a balance between concept; theory; science; engineeing and application. An agenda would evolve from the pre-conference planning group that would serve as guideline for the ensuing working conference.

B. The Conference Format

The conference has the difficult task of communicating a complex and rapidly evolving technology to a clearly talented group with a wide range of skills; a group concerned more with assessing and applying that technology than developing it. We must proceed to generate a broad base of shared understandings; with a common vocabulary. We must then communicate the problems and experience of those programs that are making progress in the area of microcomputers and microprocessors/electronics and we must provide a means for individual problems to be exposed to accumulated experience. Three days should be adequate for such a meeting.

The program will form around a group of invited speakers who have specific background and experience to offer. A call for papers will be issued early in the planning process to attract speakers and papers on additional related subjects. Emphasis; of course; will be on the expert invited speaker; although room will be left for a limited number of interesting unsolicted papers each day.

A draft three day program is envisioned with a format as follows; subject to the advice of the advisory group.

1. First Day

   Subject: The Status of the Technology

   Five one-hour lectures by invited specialists on key topics. Subjects to be covered may include:

   -Comparisons: mainframe; mini and microcomputers; microprocessors; and microelectronic systems performance and cost.

   -Current developments in microcomponents and systems; and ongoing trends.

   -Developments in software. Status of higher level languages. Interaction of scientist and the machine. The availability of software development tools.

   -Networking and its protocols.

   -Operating systems; including UNIX.

   -Operational questions: reliability; service; peripherals; and environmental constraints.

Several related short unsolicited papers pertinent to this theme would be added.

At the end of the day; and in the evening; the speakers would be available for ongoing discussion.

2. Second Day

Subject: Insights Gained from On-going Programs

There are a range of ocean programs now in process that are gaining critical experience in the use of microcomputers. Among the type of programs that should be described by invited speakers are:

-Oceanographic research vessel computation systems.

-The physical oceanographer, and experiment design.

-Developments in intelligent systems and automatons.

-Multitasking, database access, distributed computing.

To these will be added a series of short papers derived from the call for papers, and presenting a diverse range of related experiences.

Time will be allocated at the end of the day for full and unstructured interactions between participants.

3. Morning of the Third Day

Subject: Potentials for Systems and Applications

There are a huge number of important, yet applied issues that relate to the use of the advanced microprocessor. They are derived from the workings of the various programs, yet can relate to all. Among the short focused papers, dealing with ocean related topics, that could be made available are:

-The use of color displays.

-Choosing a microprocesor.

-The place for bubble memory.

-Use of satellite communication links.

-Parallel processing with micros.

-Image processing using microcomputers.

There are countless more.

4. Afternoon of the Third Day

Subject: Summary, Insights and Discussions

Each potential user faces a unique set of problems, with differing client needs, scientific goals, facilities and budgets. The intent of the first phase of the conference is to establish a matrix of information that bounds as well as possible the potentials of the new developments in computers. The second phase discusses how key users have employed the microcomputer in current programs.

In the third phase we attempt to help users define their problems in terms of the available new technology. Enough time will be made available to assist attendees to relate the

UNOLS Advisory Council Activities Relating to Fleet Replacement

The sole activity here has been to repeatedly point out the importance of moving forward with some new design programs. This is urgent because most of the fleet is middle-aged, and will be approaching retirement together between 1990 and 1999. We need to begin design preparation and dollar sequestration now in order to meet this distant crisis with wisdom and economy.

Lines for a revision of the UNOLS AC report on "Orderly Replacement of the Fleet" are given in the attached pages.

The AC passed resolutions to UNOLS urging that it proceed with new designs and especially with promotion of the fabrication of the polar vessel already designed. Those resolutions will come before UNOLS at the present May meeting.

There has been a tendency for this future gazing to be inhibited by the apparently dire financial straits that oceanography, particularly NSF-funded oceanography, finds itself in at present. It is difficult to plan construction when the apparent budgetary situation requires that we cut back the present fleet rather than build. However, the ships we do retain will be getting older. It will not be possible to build new ones that are scientifically efficient and fuel-efficient in the terms of the 1990's without some careful planning. That will take time. Let's stay at it.

Notes for a Revision of the UNOLS Advisory Council Report of 1978:
"On the Orderly Replacement of the Academic Research Fleet"

The basic philosophy of the original report was that we need and will continue to need a fleet of research ships for use by academic oceanographers. That remains true. A number of studies were cited to support the conclusion that a fleet much like the present one with respect to numbers and sizes would be required. All of those studies and the report suggest that upgraded capabilities are much needed. There are two newer studies to add to this list. The study of the Ocean Science Board (NAS) is remarkably unimaginative in its projections of possible fleets and probable fleet needs. The most divergent projections look like the present fleet plus or minus one large ship or a few smaller ones. The consensus remains that the scale of the present fleet is about right. A report from an NSF "Task Force on Ships" is titled "Projected Ship Needs for Ocean Science Research, 1983-1988." Its summaries of project demand and time available show the following:

a) Excellent balance for the larger ships (over 200 ft). There is a discrepancy of only 22 days for six ships in 1983. Unless 1983 is utterly atypical, we need six large ships at present. There appears to be more use for the three AGORS than for the three largest ships (Melville, Knorr, and Atlantis-II). The plan to use Atlantis-II as an Alvin tender will actually leave a shortage of available days for ships over 200 ft. That is not a serious problem since much of that work can be handled by ships of 170 to 200 ft.

b) Substantial excess days available for ships under 200 ft. These arise partly by guessing the effects of budget decreases of various sizes. The report notes a trend toward requests for larger vessels from most disciplines, except physical oceanography. Together with less funding overall, there is low relative demand for the smaller vessels. We appear by the analysis to be about 3 ships overstocked in each of the 100-150 and under 100 ft classes.

The heart of the original report was a set of tables which projected the remaining life spans of the ships in the fleet, and proposed a replacement schedule. That schedule has not been followed, and some late life refits force revision of the longevity projections. A draft set of revised tables is attached. The dollar figures for replacement have been inflated from those projected in 1978 constant dollars to 1982 constant dollars by an annual factor of 112%.

The important changes are as follows:

-Vema, Acona, Eastward, Maury, Gillis, and Moana Wave are no longer in the fleet.

- We have two new coastal vessels. They do not solve the most pressing problem identified in the report: replacement of HOH and Onar in Puget Sound. A proposal for replacement of HOH is under review by OFS at present. One coastal vessel effectively replaces Eastward.

- Conrad has been refitted, and its projected life must be extended.

- $3 million (1978) is now $ 4.7 million.

Changes to the original report text would reflect the changes listed above. There are few important changes in the scientific outlook, except that there are apparent reductions in the overall funding of oceanography coming into effect. There will be less oceanography. That will, if the NSF Task Force is correct, leave us an excess of smaller ships. Perhaps some wise sales and moves of smaller vessels could right that excess at minimal cost, even at a savings.

The new versions of the tables show dramatically enough the importance of beginning the design phase for new major vessels now. We clearly will need replacements for all of the major ships over 200 ft by 2,000AD, and we will need some new ships in that class within a decade. The Advisory Council has already passed resolutions urging UNOLS to get on with this work promptly. All we can do beside is volunteer to do the work when it is assigned us.

Table 1.

Current Status and Distribution of Academic Fleet

Region Ship Name	LOA (FT)	Condition 1982	Year Built	Expected Longevity	Projected Removal from Fleet
Great Lakes					
Laurentian	80		74	26	2000
Northeast					
Knorr	245		69	29?	1998
Atlantis-II	210		63	30	1993
Conrad	208		62	21+	1990?
Oceanus	177		75	27	2002
Endeavor	177		76	27	2003
Warfield	120		67	25	1992
Southeast and Gulf					
Gyre	172		73	27	2000
Iselin	170		71	27	1998
Longhorn	80		70	23	1993
Blue Fin	72		72	23	1995
Calanus	64		70	23	1993
Cape Hatteras	135		80	25	2005
Cape Florida	135		80	25	2005
Northwest and Alaska					
T. Thompson	209		65	27	1992
Wecoma	177		76	27	2003
Alpha Helix	133		65	25	1990
HOH	65		43	27	immediate
Onar	65		54	27	immediate
Southwest and Hawaii					
Melville	245		70	29	1999
T. Washington	209		65	27	1992
Kana Keoki	156		67	18	1985
New Horizon	170		78	27	2005
Velero IV	110		48	23	1988
Cayuse	80		68	23	1991
E. B. Scripps	95		65	23	1988

All estimates of Expected Longevity require updating depending upon current condition of vessel. Basic longevity estimate in original table was based upon size: 200+ft - 29 years
150-199 - 27
100-149 - 25
100-ft - 23

Table 2

Profile of Academic Fleet by Age and Size (1982)

Size	10 years and less	11-20	21-30	30+	Total
over 200 ft.	None	Knorr Melville Atlantis-II (19) Thompson Washington	Conrad	None	6
150-199 ft	Oceanus Wecoma Endeavor New Horizon Gyre (9)	Kana Keoki Iselin	None	None	7
100-149 ft	Cape Florida Cape Hatteras	Alpha Helix Warfield		Velero IV	5
65-99 ft	Laurentian	Blue Fin Calanus Cayuse Longhorn E. B. Scripps	Onar	HOH	8
Totals	8	14	2	2	26

The principal change in this table is that a number of ships have moved to the right. The paths of glory lead but to the grave.

Tables 3 and 4 were various replacement schedules. At present we face a general replacement of the fleet by the year 2000, with the exception of the bulk of our 150-199 ft ships. The earlier tables showed replacements of the fleet in the order given at left below. A suggested new schedule is given at right.

1978 Report

Replace in 1980-1989

- HOH
- Onar
- Conrad
- Kana Keoki
- Scripps
- Velero IV

Replace in 1990-1999

- Alpha Helix
- Cayuse
- Thompson
- Washington
- Warfield
- Atlantis II
- Longhorn
- Calanus

Present Suggestion

Replace Immediately

- HOH/Onar

Develop plans for Replacements Starting Immediately

- Thompson/Washington
- Melville/Knorr
- Conrad/Atlantis-II
- Kana Keoki
- Velero IV/Scripps

Plan for Replacement by 1999

- Alpha Helix
- Iselin
- Warfield
- Blue Fin
- Cayuse
- Calanus
- Longhorn

Leave for Posterity to Worry Over

- Oceanus
- Endeavor
- Wecoma
- New Horizon
- Gyre
- Laurentian
- Cape types

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UNIVERSITY OF NEW HAMPSHIRE
DURHAM, NEW HAMPSHIRE 03824

UNH Marine Program
Marine Program Building
(603) 862-2994

University National Oceanographic Laboratory System

Advisory Council Meeting

May 23, 1982

Washington, D. C.

An Outline of Issues for Ship Management

Vessels are incredibly vital to the U. S. ocean science posture, the very essence of our scientific understandings depends on these ships. We have been and will continue to be "resource limited" in our oceanographic operations.

Much of the success of the U. S. oceanographic fleet has been due, in my opinion, to a decentralized model for operations of oceanographic vessels. Enlightened institutional self-interest has given us a remarkable level of operational effectiveness. Such an optimistic view, however, does not leave us without problems. Strategically, any future adaptations to improve fleet management should enhance and build upon the decentralized operations concept.

1. SCHEDULING OF UNOLS SHIPS

(a) The regional ship scheduling procedure is working well, I believe. We should continue to enhance this idea. All enhancements or changes should build upon this concept.

(b) The NSF has placed all UNOLS ships in five categories. Following the discussions Derek and I have had, maybe now is the time to consider several classes of vessels (possibly classes I, II & III) for a national level scheduling processing. This item is on the agenda elsewhere. The ARC is one of several models to consider. The most important concepts behind such an idea are to:

(i) Attempt to assure the widest possible participation of the "best of science" in our most expensive and longest range vessels. These are unique resources, and we should be sure that all marine scientists who can will participate.

(ii) Provide community-wide notice of large ship operation schedules and long-range plans--possibly five years out into the future.

(iii) Provide for community-wide opportunity to formally submit letters of intent for scientific course needs--three to five years out into the future.

(iv) Provide for a review mechanism that builds the highest level of credibility into ship operation schedule and plan decisions.

(v) Assure the federal agencies that public funds are being extraordinarily well managed.

2. SHIP ALLOCATIONS AND LAY-UPS

We are clearly operating under severe financial constraints. I feel it would be better to have more community-~~wise~~ wide control, driven by the "best of science".

I am increasingly coming to believe that UNOLS must "bite the bullet" with regard to ship allocations and lay-ups. Recommendations for UNOLS, I believe, is vital. Careful planning and projections into the future will measurably assist the ocean science community. This item is also on the agenda elsewhere.

3. LONG RANGE PLANNING (Facilitating)

There is much we can do to assist in long range planning, including:

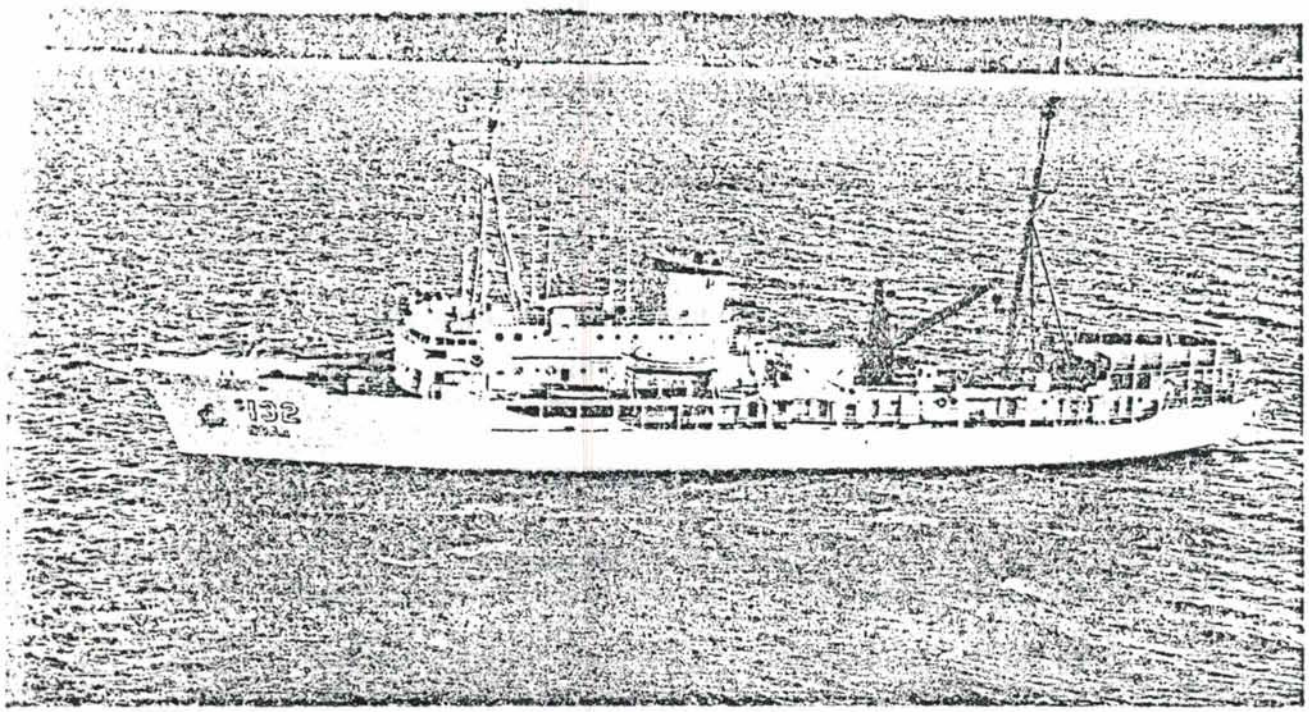
(a) Schedule ship operating area projections several years ahead.

(b) Scheduling, on a fleet-wide basis, overhauls and refits well into the future (3-5 years).

(c) Scheduling, on a fleet-wide basis, maintenance, refurbishment and replacement of ships' equipment, again well into the future.

(d) Projecting and anticipating costs based on schedules, overhauls, refits, ship equipment replacement, etc.

(e) When possible, projecting allocations and lay-ups, several years ahead.



SURVEYOR ^{S}132

LAUNCHED: April 1959
DELIVERED: April 1960
COMMISSIONED: April 1960

DESIGNER: Maritime Administration
BUILDER: National Steel & Shipbuilding Co., San Diego, Calif.

CALL LETTERS: WTES

HOME PORT: Seattle, Wash.

Complement:
COMMISSIONED OFFICERS: 12
LICENSED OFFICERS: 6
CREW: 58
SCIENTISTS: 16

HULL: Welded steel/ice strengthened
DISPLACEMENT: 3,440 tons
GROSS TONNAGE: 2,653
NET TONNAGE: 682

LENGTH (LOA): 292.2 ft (89.0 m)
BREADTH (moulded): 46.0 ft (14.0 m)
DRAFT, MAXIMUM:: 19.5 ft (5.9 m)

CRUISING SPEED: 15 kn
RANGE: 13,680 nmi
POWER: 3,200 SHP

FUEL TYPE: NSFO or Bunker C
FUEL CAPACITY: 241,000 gal
FUEL CONSUMPTION: 224 gal/h (normal cruising speed)
ENDURANCE: 38 d
ENDURANCE CONSTRAINT: Fuel

~15 ft.

Operational Commitments:

The SURVEYOR conducts worldwide oceanographic research and is also capable of conducting hydrographic surveys for nautical charting. The SURVEYOR normally operates in the Pacific Ocean and Alaska waters.

HABITABILITY

Berthing
Single staterooms: 15
Double staterooms: 21
Four-bunk rooms: 16
Total bunks aboard: 121

Food-Service Seating Capacity
Captain's cabin: 4
Wardroom: 24
Ship officer's mess: 11
Crew's mess: 52

MEDICAL FACILITIES

The ship has a complete sickbay with four beds administered by a trained medical technician.

SCIENTIFIC LABORATORY FACILITIES

Dry oceanographic lab: 105 ft²
Wet oceanographic lab: 120 ft²
Photographic lab: 102 ft²
Gravity lab: 60 ft²

DECK MACHINERY

Winches
Quantity: 1
Type: Deep sea winch w/traction unit
Manufacturer: Western Gear
Drive: Electrohydraulic
Line speed: 460 ft/min-133 ft/min
Maximum pull: 8,800 lb-30,000 lb
Drum capacity: 30,000 ft of 5/8-in wire rope

Quantity: 1
Type: Trawl winch
Manufacturer: Rowe
Drive: Electrohydraulic
Line speed: 150 ft/min
Maximum pull: 2,000 lb
Drum capacity: 6,000 ft of 3/8-in wire rope

Quantity: 1
Type: Oceanographic winch
Manufacturer: Jered
Drive: Electrohydraulic
Line speed: 350 ft/min
Maximum pull: 2,000 lb
Drum capacity: 9,000 ft of 3/8-in wire rope

Quantity: 1
Type: Oceanographic/hydrographic
Manufacturer: Wheeler
Drive: Electrohydraulic
Line speed: 350 ft/min
Maximum pull: 960-1,200 lb
Drum capacity: 30,000 ft of 5/32-in wire rope

Cranes and Booms
Quantity: 2
Type: Telescoping boom
Manufacturer: Austin Western
Boom length: 24 ft
Lifting capacity: 1,400 lb
(boom extended) 1,000
Location(s): Foredeck

Quantity: 1
Type: Fixed length boom
Manufacturer: Western Gear
Boom length: 36 ft
Lifting capacity: 25,000 lb
(boom extended)
Location(s): Aft

A-Frames
Quantity: 1
Type: Movable
Clearance over side: 4 ft over bow
Location(s): Bow (deep-sea anchoring)

Quantity: 1
Type: Movable
Clearance over side: 6 ft
Location(s): Stbd side

Quantity: 1
Type: Movable boom
Clearance over side: 6 ft
Location(s): Stern

Ground Tackle

Bower Anchor(s)
Quantity: 2
Type: Stockless
Weight (each): 5,100 lb

Anchor Chain(s)
Quantity: 2
Size and type: 1-11/16-in stud link chain
Length (each): 150 fm — port
135 fm — starboard

Deep-Sea Cable
Size and type: 5/8-in wire rope
Length: 30,000 ft

ELECTRONICS

Communications
VHF/FM transceivers
HF transceivers
Teletype capability
MF transmitters
Emergency radio auto alarm
Portable emergency transceiver
EPIRB's
VHF/AM aircraft transceiver

Navigation
Radar
Gyrocompass
Loran
Satnav
RDF
Precision positioning equipment

Acoustics
Deepwater echo sounder
Shallow-water echo sounders
Narrow beam stabilized transducer system

Scientific Equipment
CTD system
XBT system
Rosette water sampling system

Data Acquisition and Processing System:
The vessel has the National Ocean Survey's Hydroplot Data Processing System for nautical charting surveys.

ENGINEERING

Propulsion Plant
Type: Steam turbine

Main Propulsion Boilers
Quantity: 2
Type: Water tube
Manufacturer: Combustion Engr.
Design pressure: 465 psi
Superheat temp: 750°

Propulsion Turbines
Quantity: 2
Type: Cross compound
Manufacturer: DeLaval
Power rating: 3,200 SHP

Auxiliary Propulsion
Type: Stern-mounted auxiliary
Manufacturer: Harbormaster
Drive: Electric
Rated power: 200 hp

Propeller(s)
Quantity: 1
Type: Fixed pitch
Blades: 4
Diameter: 13 ft

Electrical System

Ship's Service Generators
Quantity: 2
Type: Steam turbine
Manufacturer: Worthington/GE
Output voltage: 450 a.c.
Power rating: 400 kW (each)

Emergency Generator
Quantity: 1
Type: Diesel
Manufacturer: Detroit Diesel/Delco
Output voltage: 450 a.c.
Power rating: 100 kW

Electrical Service
450 Va.c. three phase
110 Va.c. single phase

Power isolation protection available for sensitive equipment.

FRESHWATER SYSTEM

System Capacities
Storage capacity: 27,000 gal
Normal consumption: 5,000 gal/d
Maximum production: 7,000 gal/d

Evaporators
Quantity: 1
Type: Steam-heat generated
Manufacturer: Cleaver-Brooks

POLLUTION CONTROL

Sewage Waste Control
Type of treatment: Collecting tanks
Holding capacity: 400 gal

LAUNCHES AND SMALL BOATS

Utility/Rescue Boats
Hull type: Fiberglass motor whaleboat
Quantity: 2
Manufacturer: U.S. Navy
Length: 26 ft
Propulsion: Diesel

Survey Launches
Hull type: Wooden survey launch
Quantity: 3
Length: 36 ft
Propulsion: Diesel

Utility Boats
Hull type: LCVP — wood
Quantity: 1
Manufacturer: U.S. Navy
Length: 36 ft
Propulsion: Diesel

Hull type: Fiberglass open boat
Quantity: 2
Manufacturer: Boston Whaler
Length: 16 ft
Propulsion: Gasoline outboard

SPECIAL FEATURES

Helicopter flight deck
Seismic reflection profile compressors

NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

DIVISION OF OCEAN SCIENCES
OCEANOGRAPHIC FACILITIES SUPPORT SECTION

June 4, 1982

Dr. Bruce Robison
Marine Science Institute
University of California, Santa Barbara
Santa Barbara, CA 93106

Dear Dr. Robison:

This is to follow up on my statements to the UNOLS Advisory Council on May 23, 1982. At that time I specifically charged the UNOLS Advisory Council to:

> "Develop specific recommendations on a ship-by-ship basis for composition, distribution, and management of the UNOLS fleet in the 1983-88 time frame. These recommendations are to be based on assessments of existing data, studies and projections for the UNOLS fleet and projections for its future funding. This report will be drafted by September 1, 1982, distributed to the membership for comment, and the report and membership comments to be delivered to NSF and ONR by October 1, 1982."

I am pleased that the Advisory Council accepted the charge.

Sincerely yours,

Ronald R. La Count
Head

Copy to:
Dr. Derek Spencer, Chairman, UNOLS
Dr. Dirk Frankenberg, Vice-Chairman, UNOLS
Capt. William D. Barbee, Executive Secretary, UNOLS
UNOLS Advisory Council
ONR

Procedures for Advisory Council 1983-1988 Fleet Recommendations

1. Obtain materials, distribute to Advisory Council
2. Workshop - July 8-9, 1982 - Boulder, Colorado
   a. Assess 1984 boundary conditions - input 1983 schedules, NSF projections trends
   b. Develop criteria for assessing ship retention value based on NSF criteria
   c. Develop scenarios that meet these boundary conditions based upon materials distributed
   d. critique each scenario
3. Seek UNOLS Member/Association Member response to scenarios and critiques developed in steps 2c and 2d above.
4. Workshop - August 19-20, 1982 - Boulder, Colorado
   a. Assess responses to scenarios
   b. Select one scenario for recommendation to NSF
   c. Write report
5. Send report to UNOLS Member/Associate Members
6. Members respond with comments directly to NSF/ONR

Raw Materials for UNOLS Advisory Council 1983-1988 Fleet Recommendations

1. Material solicited from all UNOLS Members and Associate Members on ship and port facilities
2. Material solicited from Federal Funding agencies on ship and funding projections
3. UNOLS Advisory Council report on the Orderly replacement of the Academic Research Fleet (July, 1978) as updated to the existing 1982 fleet.
4. Ocean Science Board Fleet Study 1982
5. The Submersible Science Study 1982

6. National Science Foundation Division of Ocean Science, "Projected Ship Needs for Ocean Science Research, 1983-1988" and "Criteria for Assessing Ship Retention Value and the data upon which it was based."

7. UNOLS Advisory Council report "An Outline of Issues for Ship Management"

8. The most recent ship condition reports for all federally funded UNOLS vessels

9. UNOLS ship utilization data 1973-1982

10. And other reports and data germane to 1983-1988 fleet recommendations.