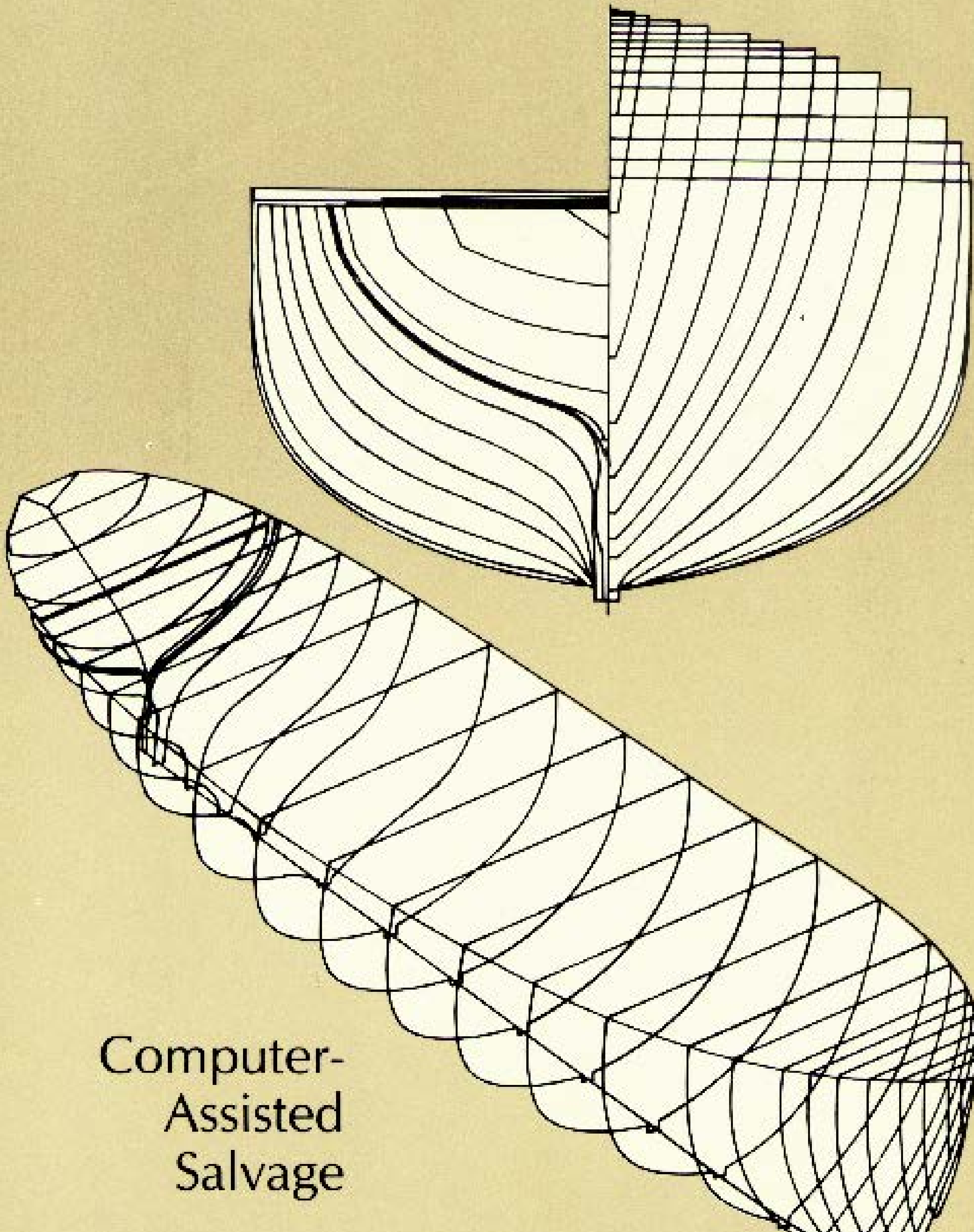
FACEPLATE

THE OFFICIAL MAGAZINE FOR THE DIVERS AND SALVORS OF THE UNITED STATES NAVY



Computer-
Assisted
Salvage

VOLUME 13, NO. 2 □ SUMMER 1982

Wilbur H. Eaton, 1926-1982

Wilbur H. Eaton, one of the U.S. Navy's best known divers and a participant in all three SEALAB projects, died April 27 in Panama City, Florida, after a long illness. He was 56.

Eaton's Navy career spanned 38 years, and he was a pioneer in the Man-in-the-Sea program. A native of Omaha, Nebraska, he entered the Navy during World War II and participated in several Pacific Ocean operations. He retired from the Navy as a Chief Petty Officer in 1971 and went to work at the Naval Coastal Systems Center (NCSC) in Panama City, where he was a specialist in the Diving Tools and Salvage Equipment Division.

CAPT Raymond Bennett, NCSC Commanding Officer, termed Eaton "a valuable employee who will be greatly missed by his colleagues here at NCSC."

An NCSC spokesman issued the following statement:

"Wilbur's reputation for excellence is well known in diving circles – Navy, Air Force, industrial and universities. He has received much recognition for his diving activities, but, much more than that, he earned and maintained the respect and confidence of the entire diving community.

"Renowned for his 'can do' attitude and cooperative spirit, he was the epitome of all that a buddy diver should be. It can be truly said of Wilbur, 'he never met a stranger.' He was loved by everyone who knew him, and those who did not know Wilbur have missed a rewarding experience. He will be sorely missed by us all."

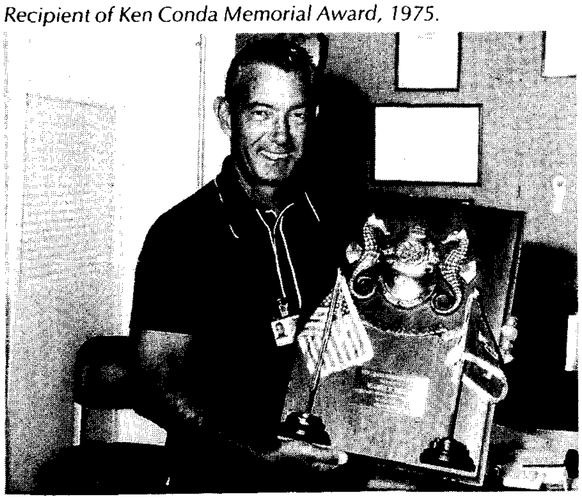
Wilbur H. Eaton was a participant in all three SEALAB experiments and a diver tools specialist at NCSC, Panama City, Florida.

One of Eaton's last diving activities was to help remove SEALAB I from the bottom of the Gulf of Mexico off Panama City (see FACEPLATE, Summer and Winter 1981). The historic craft is now on public display at the Institute of Diving.

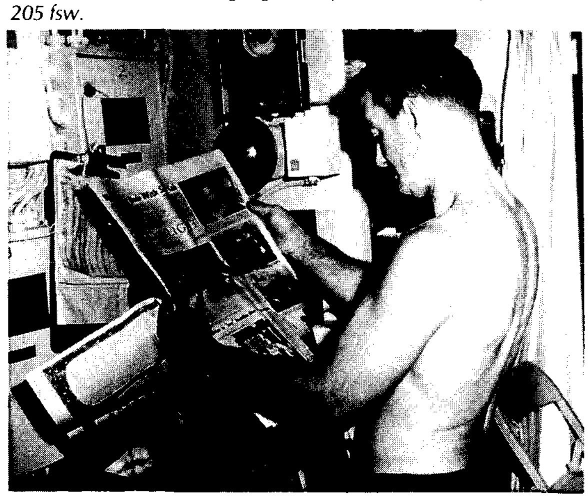
"Wilbur wanted more than anything else to recover SEALAB I and put it on display because he knew its historical significance," said one former diving colleague.

Said another, "Wilbur was the father confessor to all of us on the various SEALAB projects."

Recipient of Ken Conda Memorial Award, 1975.



GMC1(DV) Eaton during eighth day of SEALAB I experiment at 205 fsw.



FACEPLATE

THE OFFICIAL MAGAZINE FOR THE DIVERS AND SALVORS OF THE UNITED STATES NAVY

VOLUME 13, NO. 2

4 **Soundings**

6 **Salvage Symposium '82**
CDR F.D. Meyer, USN

7 **View from the Supervisor of Diving**
LCDR Ray Swanson, USN

8 **USS RECOVERY Captures Golden Anchor Award**
LT J.M. Gibson, USN, and
ENS P.G. Beierl, USN

10 **On Alligator Bayou – Training Divers at NDSTC, Panama City**
QMC(SS)(DV) R.R. Smith, USN

14 **Computer-Assisted Salvage**
LCDR John P. Speer, USN

17 **Sixteen (Thousand) Tons – The Towing of USS INCHON (LPH 12)**
LT Timothy B. Stark, USN

20 **USS PETREL Acrylic Dome Repair**
MRC(DV) T.D. Kerns

22 **Fire and Ice-Land**
JO2 Dave Guise, USN

24 **Inflatable Salvage Pontoon – Eight Tons of Muscle**
LCDR R.J. Gray, USN

27 **The Old Master**

FACEPLATE is published quarterly by the Supervisor of Diving to bring the latest and most informative news available to the Navy diving and salvage community. Articles are presented as information only, and should not be construed as regulations, orders, or directives. Discussions or illustrations of commercial products do not imply endorsement by the Supervisor of Diving or the U.S. Navy.

Requests from U.S. Governmental Agencies and military activities or personnel for distribution copies or for changes in distribution should be directed to FACEPLATE, Supervisor of Diving (SEA OOC-D), Naval Sea Systems Command, Washington, D.C. 20362. Telephone (Area Code 202) OX7-7606 or AUTOVON 227-7386. All other such requests should be directed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

FRONT COVER: Computer-printed displays of the hull configuration of SS SUSAN GAIL. Shipboard micro-computers will assist Navy salvors in the development of salvage plans and computations (see page 14).

BACK COVER: USS PAIUTE (ATF 159) completes a complex tow of the 16,500-ton USS INCHON (LPH 12) (see page 17).

SOUNDINGS

CDR Maclin Relieves CAPT Jones

CDR Charles S. Maclin relieved CAPT Colin M. Jones as Director of Ocean Engineering/Supervisor of Salvage at the Naval Sea Systems Command in Washington, DC, on May 3, 1982.

CDR Maclin was previously Deputy Director of Ocean Engineering/Supervisor of Salvage, and served as Assistant Supervisor of Salvage from 1977 to 1980.

CAPT Jones has reported for duty as Production Officer at Pearl Harbor Naval Shipyard in Hawaii, where he served as Repair Officer from 1975 to 1979.

Chief Gholson Fills Master Diver Billet at SUPDIVE

A Master Diver's billet has been sought at Naval Sea Systems Command for many years and has recently been approved. Master Chief Torpedoman William A. Gholson, Master Diver, has reported to the U.S. Navy Supervisor of Diving as the first Master Diver to fill this billet. He brings many years of practical diving experience and will be a welcome addition to the staff. You can anticipate seeing Chief Gholson at major Naval stations where numerous diving commands and activities are centered. He will be evaluating the effectiveness of new diving equipment issues, listening to any diving problems and, in general, representing this command with the working diver. Fleet inquiries to Master Diver Gholson may be addressed to: Commander Naval Sea Systems Command, Code OOC-DD, Washington, DC 20362, or he may be reached by phone at A/V 227-7606/7607.

Limited CO_2 Absorbent Shelf Life

The Navy Experimental Diving Unit has recently completed a literature survey and investigation concerning the effectiveness of CO_2 absorbent exposed to atmospheric conditions.

In temporary storage for periods up to 24 hours, UBA equipment charged with Sodasorb will retain effectiveness if the rig and canister are maintained air-tight (mouthpiece in surface position). For more lengthy periods of storage, the UBA CO_2 absorbent canister should be removed and double-wrapped in plastic bags, then taped shut. Sealed packets of silica gel may be included to minimize moisture absorption. Unused Sodasorb remaining in original containers should be discarded after seven days, regardless of the quality of the container seal, since air-tightness of re-sealed containers cannot be realistically determined. Unopened Sodasorb containers with the original seal unbroken are generally well protected from moisture intrusion, and contents may retain effectiveness for a year or more after the packaging date.

High storage temperatures have no direct detrimental effect on Sodasorb; however, below-freezing temperatures must be avoided, as freezing of free moisture normally contained in Sodasorb will expand and fragment the granules, thereby changing the absorption characteristics. Material which has been frozen should be discarded.

Sodasorb containers should not be exposed to direct sunlight for any length of time, as uneven temperatures may cause free, contained moisture concentrations to vary throughout the container, resulting in zones of unacceptable moisture levels.

Credit to NMRI's Divers

The article "The Recovery of Air Florida Flight 90" published in the Spring 1982 issue of FACEPLATE regrettably omitted credit to the Naval Medical Research Institute (NMRI), Bethesda, Maryland, whose divers augmented the Joint Services Team during the salvage operation. The six divers representing NMRI demonstrated an equally high degree of professionalism and deserve no less credit for their assistance.

International Diving Museum Opens

The Institute of Diving held the grand opening of the International Diving Museum on March 6, 1982, in Panama City, Florida. Featured was the restored SEALAB I habitat.

For information about the museum, write to Mr. Tom James or Mr. John Quirk, P.O. Box 876, Panama City, FL 32401, or call 904-769-7544.

FACEPLATE welcomes readers' inquiries, comments and input. Articles of interest to the U.S. Navy diving community are also invited. Photographs will be returned upon request. Send materials to:

FACEPLATE
Supervisor of Diving (SEA OOC-D)
Naval Sea Systems Command
Washington, DC 20362

CAPT Fred

CDR Manley

SERVRON EIGHT Change-of-Command

In Change-of-Command Ceremonies on April 6, 1982, CAPT Robert H. Fred was relieved by CDR Jerry B. Manley as Commander Service Squadron EIGHT, Little Creek, Virginia.

CAPT Fred enlisted in the Navy in 1952. In September 1960, CAPT Fred, then an Aviation Machinist Mate First Class, attended OCS through the Integration Program and was commissioned an Ensign in March 1961. Immediately following his commissioning, he attended the Deep Sea Divers School and graduated as a Ship Salvage Officer. He was assigned to USS SHAKORI (ATF 162), his first assignment in SERVRON EIGHT, as Operations, Diving and Salvage Officer. His next tour in SERVRON EIGHT was from February 1966 to November 1967 as Staff Assistant Salvage Officer. CAPT Fred returned to SERVRON EIGHT again in September 1973 as Commanding Officer of USS OPPORTUNE (ARS 41). He returned yet again to SERVRON EIGHT as Chief Staff Officer in September 1979, and finally, assumed command of the Squadron on 11 December 1980.

After completing five tours of duty within Service Squadron EIGHT over the past 20 years, CAPT Fred has been transferred to the Staff of Commander Naval Surface Force, U.S. Atlantic Fleet, where he has assumed duties as Training Coordinator.

CDR Manley was commissioned an Ensign in October 1963. His career has included tours in amphibious, destroyer, and service force type ships, three major staffs, and a one-year tour as an advisor in Vietnam. CDR Manley reports to Service Squadron EIGHT from duty with the Office of the Joint Chiefs of Staff. This is CDR Manley's second tour in Service Squadron EIGHT; his first was as Commanding Officer of USS PRESERVER (ARS 8).

Four Navies Score Bull's-Eye on PRESERVER Target

Eight ships flying the colors of four different countries conducted gunnery exercises with a target sled towed by USS PRESERVER (ARS 8) off the Virginia Capes last April 14 and 15.

Participating with the Standing Naval Force Atlantic were NATO ships HMS VAN NES (F 805) from The Netherlands, FGS AUGSBURG (F 222) from West Germany, and USS SELLERS (DDG 11). Also engaged in a separate exercise was HMS AS-SIDDIQ (PGG 511) of the Royal Saudi Navy. In another exercise utilizing PRESERVER's target sled were PHIBRON FOUR ships USS GUAM (LPH 9), USS HERMITAGE (LSD 34), USS MANITOWOC (LST 1180) and USS SAGINAW (LST 1188).

"It's a privilege to participate with ships of other navies and pleasing to see everyone do so well," said PRESERVER Commanding Officer, LCDR W. T. Bassett.

PRESERVER, a member of Service Squadron EIGHT, often provides this type of service to Atlantic Fleet Ships and Coast Guard vessels. Steaming in designated quadrants of the Virginia Capes Operating Area where all other shipping had been instructed to stand clear, PRESERVER streamed a target sled astern. During the gunnery exercises, PRESERVER provided each vessel with its respective scoring data.

PRESERVER also participated in recent shock testing of USS ARKANSAS (CGN 41) in the Straits of Florida. Providing standby salvage and diving support, PRESERVER was on station during each explosion and screened the test site from non-participating units as well as tending the Yard Derrick used to set the high explosive charges into the water.

ARKANSAS' skipper applauded PRESERVER and stated "the performance and attitude of (her) crew reflected a 100 percent professional organization."

In addition to a letter of commendation to the crew from Commanding Officer Public Works Center Norfolk for outstanding support to the crew of YD-229, PRESERVER crewmembers received a note of thanks from Key West SOPA, COMPHMRON TWO.

Books of Interest

The following U.S. Navy publications are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC, 20402:

- ☐ *Manned Submersibles*, Stock Number 008-042-00063-2. $20.00.
- ☐ *ADM William Veazie Pratt, USN, A Sailor's Life*, Stock Number 008-046-00069-7. $9.50.
- ☐ *U.S. Naval History Sources in the United States*, Stock Number 008-046-00099-9. $6.50

All orders should be accompanied by payment in the form of check or money order made payable to the Superintendent of Documents. Payment may also be made by Superintendent of Documents deposit account number, or VISA or MasterCard account number (furnish expiration date). International orders must be accompanied by payment drawn on a United States or Canadian bank, and they must include an additional 25 percent of the total order for international handling. UNESCO Coupons and international money orders are also acceptable remittances from foreign countries.

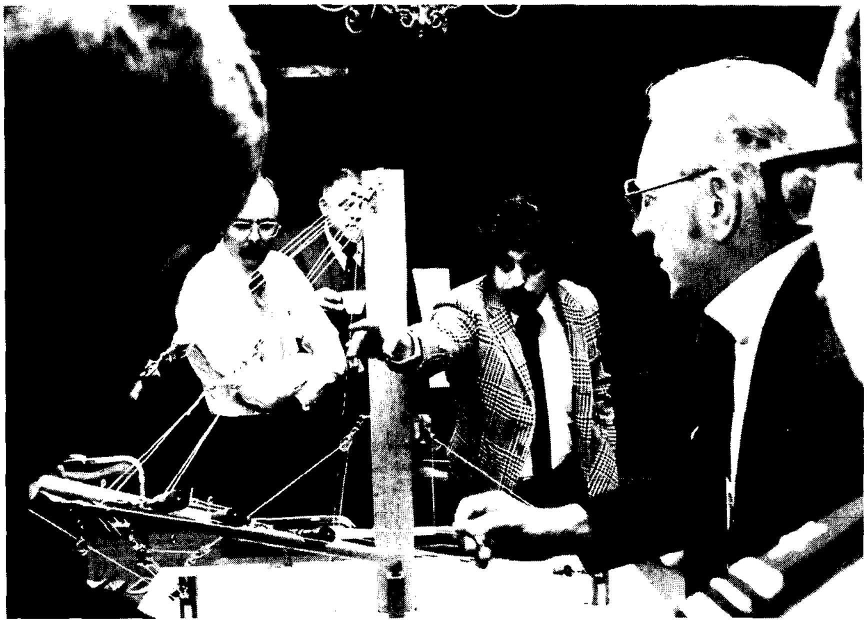
Salvage Symposium '82

CDR F.D. Meyer, USN
COMSERVRON EIGHT

More than 60 individuals representing the diving, salvage and explosive ordnance disposal (EOD) community attended Salvage Symposium '82, hosted by Commander Service Group TWO, RADM J.T. Parker, in Norfolk, Virginia, March 1-5. Representatives came from as far away as Pearl Harbor, Hawaii, where the first Navy-wide salvage symposium was held the year before, as well as from Panama City, Florida, Washington, DC, and from numerous Fleet and shore activities in the Norfolk area.

The symposium was designed to provide the diving, salvage and EOD community with pertinent and timely information concerning the state of the community in many areas of concern, as well as providing a forum for generating new ideas and addressing specific issues of concern to forward up the chain-of-command for comment or action.

The symposium was kicked off by VADM J.D. Johnson, who gave the keynote address on "Diving/ Salvage – Today and Tomorrow." Other presenters included CAPT Colin Jones, Supervisor of Salvage, LCDR Bill Paine (OP-375), and CAPT Jim Roper, then-Supervisor of Diving, as well as representatives from other areas of the community. Presentations covered such diverse topics as the capabilities of the ARS 50, the future of the salvage Navy, the state-of-the-art of Navy diving systems and portable tools, and the status of the 1140 and enlisted diving communities.



Discussion of salvage technique by attendees at Salvage Symposium '82 in Norfolk, Virginia, last March.

LCDR Ray Swanson (left) and CAPT Jim Roper during session at the symposium.

The real work of the symposium was accomplished when the attendees were divided into five work-study groups, which examined in detail the following topics: "Revitalization of Submarine Salvage Training," "Nuclear Ship Salvage," "Diving and Salvage Equipment," "Manpower Requirements to Support a 600-Ship/15-CV Battle Group Navy," and the "Navy Diving and Salvage Training Program." More than 50 action-issues were generated by the work-study groups.

The consensus of opinion from the attendees was that the symposium was a complete success and proved to be very valuable in all respects. It is hoped that future symposiums will continue to provide the much-needed vehicle through which progress can be made by the diving, salvage and EOD community as it moves into the Navy of the 21st Century.

Editor's Note: Anyone wishing to obtain additional information regarding topics discussed during the "Salvage Symposium '82" may contact COMSERVRON EIGHT Chief Staff Officer, CDR F.D. Meyer, at AUTOVON 680-7461/7462, or commercial 804-464-7461/7462. A salvage symposium Proceedings is currently in printing.

View from the Supervisor of Diving

LCDR R.P. Swanson, USN

Since my recent appointment to Supervisor of Diving, I have made several observations which are worthy of comment.

The certification program is viewed by many as an obstacle to diving; but, in reality, it is an integral part of the Navy's diving safety program and has contributed significantly to an excellent overall safety record.

Many of us feel that the Systems Certification Authority (SCA) acts in an arbitrary manner and makes undue demands. If we take the time to put things into perspective, we will find that the SCA only acts to enforce existing criteria called out by various MIL-SPECs, MIL-STDs, and various pertinent instructions, notably, the System Certification Manual (NAVMAT P-9290).

Occasionally, the SCA will permit easing of criteria on systems when conditions indicate that sound engineering principles were employed, and when that easing of a standard will in no way jeopardize the safety or function of the system. In general, when the SCA deviates from a standard, the criteria are eased rather than made more stringent.

A second observation is the wide perception that OOC sets the schedule for initial delivery of equipment/systems to Fleet activities. Sometimes the system does work this way, but predominantly priorities are set at the Fleet or Type Commander level.

The way the system works best is for the diving activity to justify its priority through the chain-of-command. At each level of command, priorities will be evaluated against other units' needs. Finally, Fleet commanders will forward their prioritized lists of needs to the Chief of Naval Operations, who will set the consolidated priorities for the Developing Activity (in this case, OOC).

As you can see, if you feel your needs for initial outfitting of specific equipment deserve a higher priority, make it known through channels, not by a telephone call to OOC.

My last comment concerns a philosophy that is slowly being infused into the diving community; that is, we want all situations to be covered in a manual.

This can be a dangerous philosophy because it takes away the initiative for leadership and flexibility in the performance of our duties. These qualities are essential in any type of work, but especially in diving. There are sufficient directives in existence which provide adequate guidance. Don't let your ability to perform be taken away by a manual.

USS RECOVERY Captures Golden Anchor Award

LT J. M. Gibson, USN
and ENS P. G. Beierl, USN

In competition with all FF, LST, and ARS/ATS class ships in the Atlantic Fleet, USS RECOVERY recently received the Golden Anchor Award for its successful efforts in career retention and motivational programs. Here's how they did it.

When a sailor receives orders to USS RECOVERY (ARS 43), he unwittingly sets into motion a chain of events designed to keep him in the Navy and to keep RECOVERY ready to perform her primary mission in diving and salvage.

First Impressions

Even before reporting on board for duty, he is contacted and told that the Command is looking forward to meeting him, and that preparations have been made to make him and his family feel comfortable at their new duty station. An understanding and appreciation of the role of the Navy wife and of family considerations has made RECOVERY's retention program that much more effective.

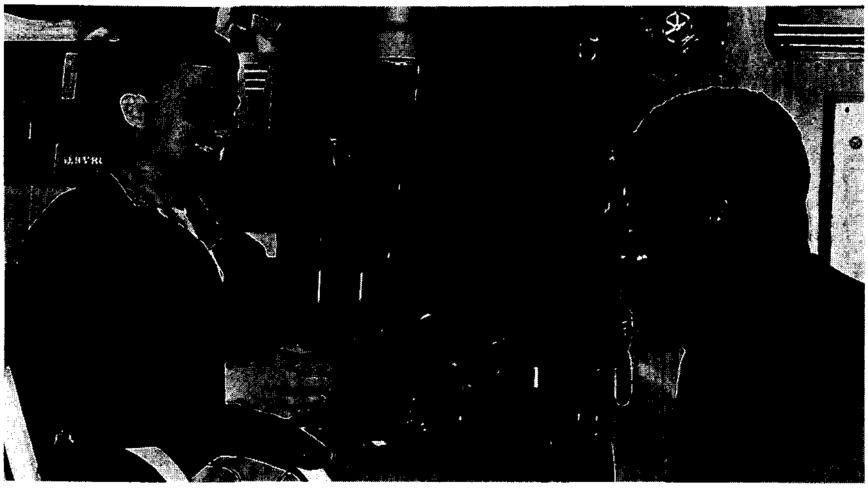
Retention efforts aboard RECOVERY begin with a warm and friendly "welcome aboard" of the serviceman and his family. RECOVERY also invites the participation of the Navy Family Assistance Center, which delivers additional information and welcome materials to the new member. If first impressions are permanent, then RECOVERY has started off her retention program on a positive and enthusiastic note.

Once aboard, the new shipmate embarks on a path of personal and professional development sponsored by the Command. He becomes thoroughly acquainted with the chain-of-command, unit mission, Command goals and policies, and matters affecting his personal life through a "Know Your Ship" PQS Program. His efforts in educational and professional development are officially recognized by the Striker Selection Board. Finally, he is further motivated by the Command's Professional Development Board to increase his professionalism in many areas through such programs as GED training for non-high school graduates and ESWS training for petty officers. He is continually challenged with new goals and rewarded for his accomplishments.

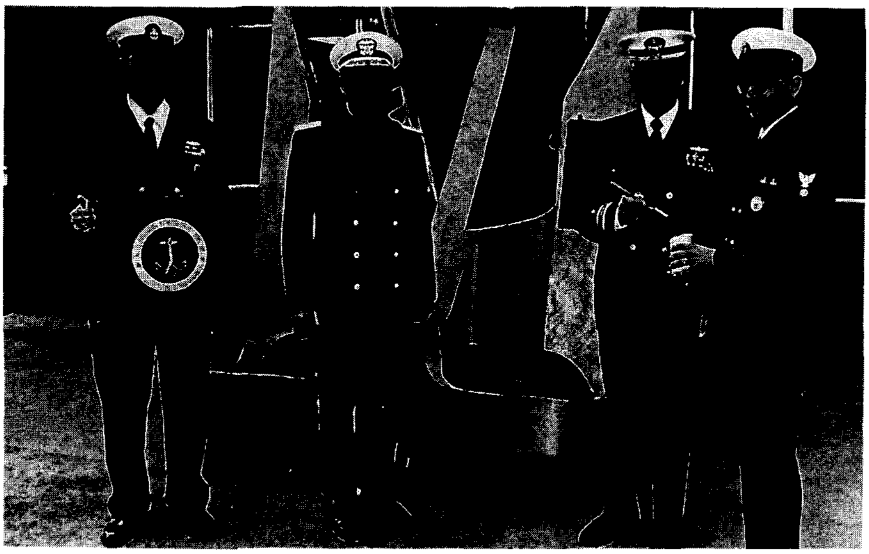
In summary, the new RECOVERY team member is beginning his tour aboard in a responsible and challenging fashion. But retention efforts do not stop here. Throughout his tour aboard RECOVERY, the individual is encouraged to undertake continued education and training. The benefits and requirements for advancement are also reemphasized as a means of ensuring that the individual does not stagnate professionally and is challenged to his level of potential.

The Ties that Bind

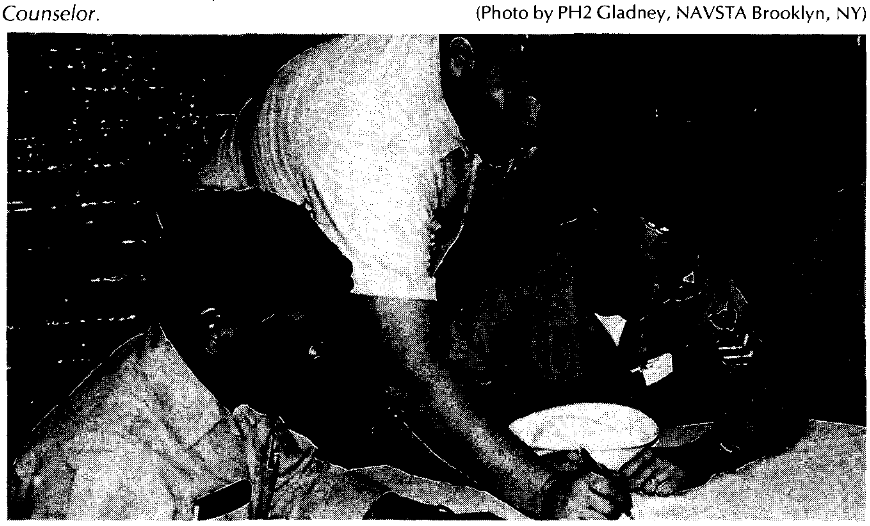
Given the past, present and projected future operational tempo that is expected aboard RECOVERY, there remains a necessary and strong allegiance to the welfare and concern of the RECOVERY "family." As a means of keeping lines of communications open and improving morale aboard ship and



Newly-reporting crewman, SN Kenneth Everett, is welcomed aboard by RECOVERY's Executive Officer, LT James Gibson.



RADM J. T. Parker, Commander Service Group TWO, recently presented the Golden Anchor Award to USS RECOVERY. L-r: HTC George Hamer, the command Master Chief; RADM Parker; LCDR Herb Stephen, Commanding Officer; and QM1 Frederick W. Hammond, Career Counselor. (Photo by PH2 Gladney, NAVSTA Brooklyn, NY)



MS1 Pricelo Pablo (left) and QM1 Frederick Hammond receive instruction in the Enlisted Surface Weapon Specialist (ESWS) Program aboard RECOVERY. Standing is QM1 Harry Donovan, ESWS instructor.

at home, RECOVERY has historically sponsored a dependent's deployment briefing and supper aboard prior to each significant deployment.

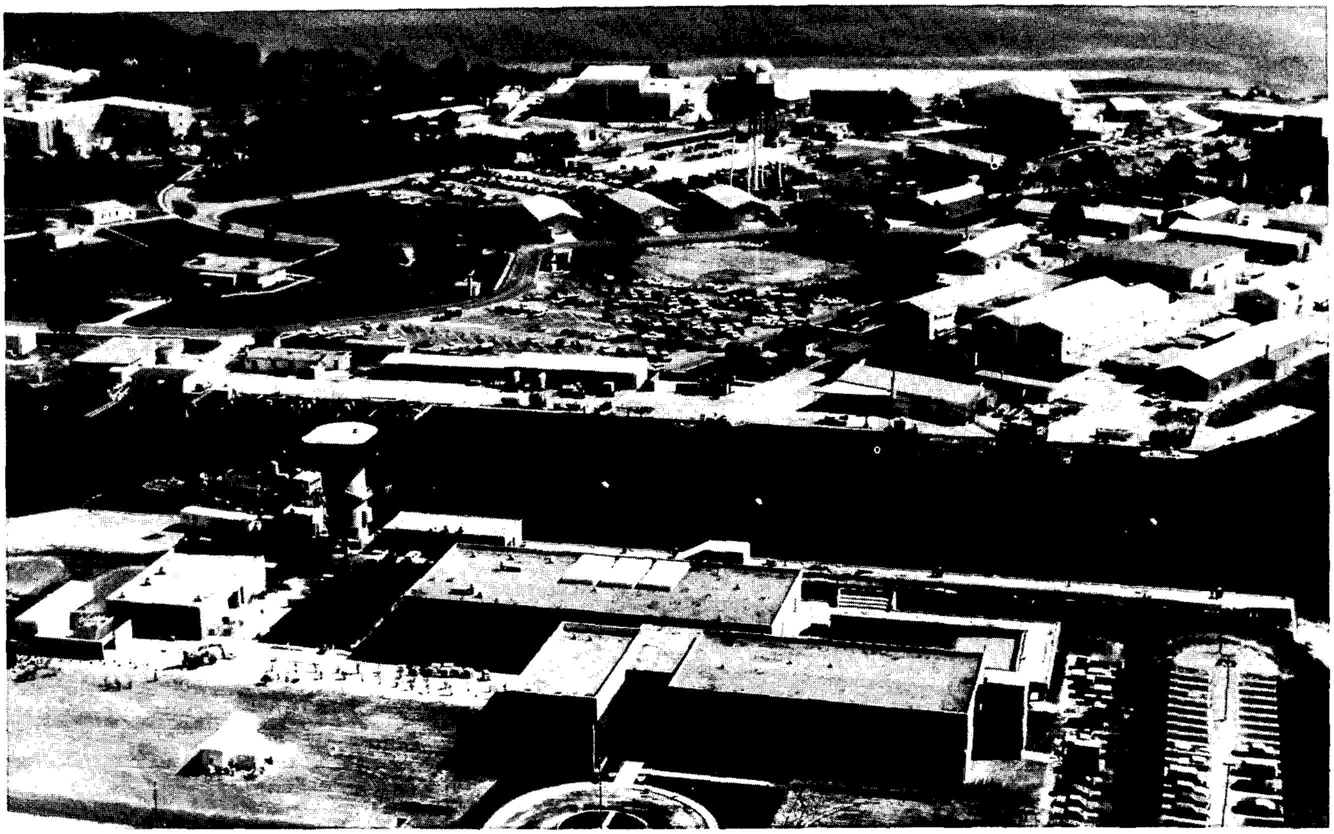
These briefings have been a tremendous success, alleviating many potential family separation problems normally experienced during a deployment. Family members are introduced to representatives of the American Red Cross, Chaplain's Office, Navy Relief, and the Family Services Center. The exchange of information has been tremendously well received by all participants. To keep family members informed, RECOVERY issues "family-grams" periodically during the cruise.

Dynamic Process

Behind RECOVERY's retention program is the Command Retention Team composed of the Commanding Officer, LCDR Herbert A. Stephan; Executive Officer, LT Jim Gibson; the ship's respective department heads; Command Master Chief, HTC George Hamer; Command Career Counselor, QM1 Frederick Hammond; and the departmental career counselors. The success of this team can be attributed to its awareness and sensitivity to factors which impact on retention, and its ability to devise a program which strives to eliminate the negative factors while promoting those that are positive.

RECOVERY is not basking in the spotlight of success, but constantly reevaluating her retention program with an emphasis on feedback from crew members. She is determined to continue her success in the area of mission readiness through retention of qualified personnel.

The true success of RECOVERY's retention program is therefore the result of a combination of many factors: Sponsorship, indoctrination, professional development, training, family awareness, program evaluation, and dynamic Command involvement. Each, in its own special way, has contributed to the remarkable success of RECOVERY's retention program.



ON ALLIGATOR BAYOU

Training Divers at NDSTC, Panama City

QMC(SS)(DV) R. R. Smith, USN
NDSTC
(Photos by Bernie Campoli and Rob Cole, NCSC)

In 1980, the Naval Diving and Salvage Training Center (NDSTC) moved from the Washington Navy Yard and is now operating on the banks of Alligator Bayou, just off St. Andrew Bay in Panama City, Florida, an area which has become a center for U.S. Navy diving training, research, and testing. Also located in Panama City are the Naval Coastal Systems Center and the Navy Experimental Diving Unit (see aerial photograph).

NDSTC trains selected candidates from the U.S. and allied navies in diving, ship salvage, submarine rescue, and additional tasks assigned by the Chief of Naval Education and Training.

The training center houses approximately 56,000 square feet and is capable of training over 200 students at a time.

To successfully accomplish its goals, the command has many specialized assets, including:

- ☐ The largest above-ground heated training pool in the State of Florida.
- ☐ A training "salvage hulk," with all the necessary salvage machinery staged on the adjoining pier.
- ☐ A gas storage farm containing 347,000 cubic feet of gas in support of the hyperbaric complex and divers' breathing gas systems.
- ☐ A complete medical facility which includes a laboratory and an emergency operating room.
- ☐ Three 15-foot-deep open training tanks to conduct orientation dives and other closely-supervised training exercises.
- ☐ Three hyperbaric complexes, each with a working depth of 600 feet. These complexes are capable of supporting diving operations to diver qualification depths using any of the diving rigs taught at the training center.
- ☐ Two surface craft, each equipped with helium/oxygen and air surface-supported diving systems, plus recompression chambers for use during open-sea diving operations.

Physical conditioning, an integral part of diver training, is designed to achieve and maintain in each student a level of stamina sufficient to allow his or her participation in diving activities without undue physical stress. In addition, exercises are aimed at strengthening those muscles required to handle the heavy and often cumbersome diving outfits.

Students receive classroom in-

Opposite page: The Naval Diving and Salvage Training Center, Panama City, Florida, with the Naval Coastal Systems Center (background), and Navy Experimental Diving Unit (top, right). Above: MK 12 SSDS training (swimmer mode). Below: MK 12 SSDS training (air mode).

struction covering U.S. Navy diving rigs and support equipment, along with thorough indoctrination in the use of air and helium/oxygen decompression tables, and the physical laws and properties unique to diving. Trainees are also taught to recognize, diagnose, and properly treat diving diseases, and to perform neurological examinations.

Scuba diving is the first in-water diving instruction a trainee receives. The proper reaction to all underwater equipment-related emergencies is practiced, stressing the importance of the buddy system. At the completion of scuba training the student is able to plan, perform, and supervise scuba-diving operations to a depth of 130 feet.

The Navy's MK 12 surface-supported diving system (SSDS) is one of four surface-supported diving systems taught at the training center. In each of the MK 12's

Above: Trainees learn to recognize, diagnose, and treat diving diseases, and to perform neurological examinations. Below: Trainees receive instruction in underwater hydraulic tools, and in several specialized underwater cutting and welding techniques.

three modes of operation, trainees are required to demonstrate their ability to complete various projects and perform pre- and post-dive procedures.

Training for the Navy's array of underwater hydraulic tools is conducted in the open tanks with the MK 1 lightweight diving system. Underwater cutting and welding techniques are also performed in the open tanks. The trainees construct various projects using oxygen arc, MAPP gas, and shielded metal arc welding techniques.

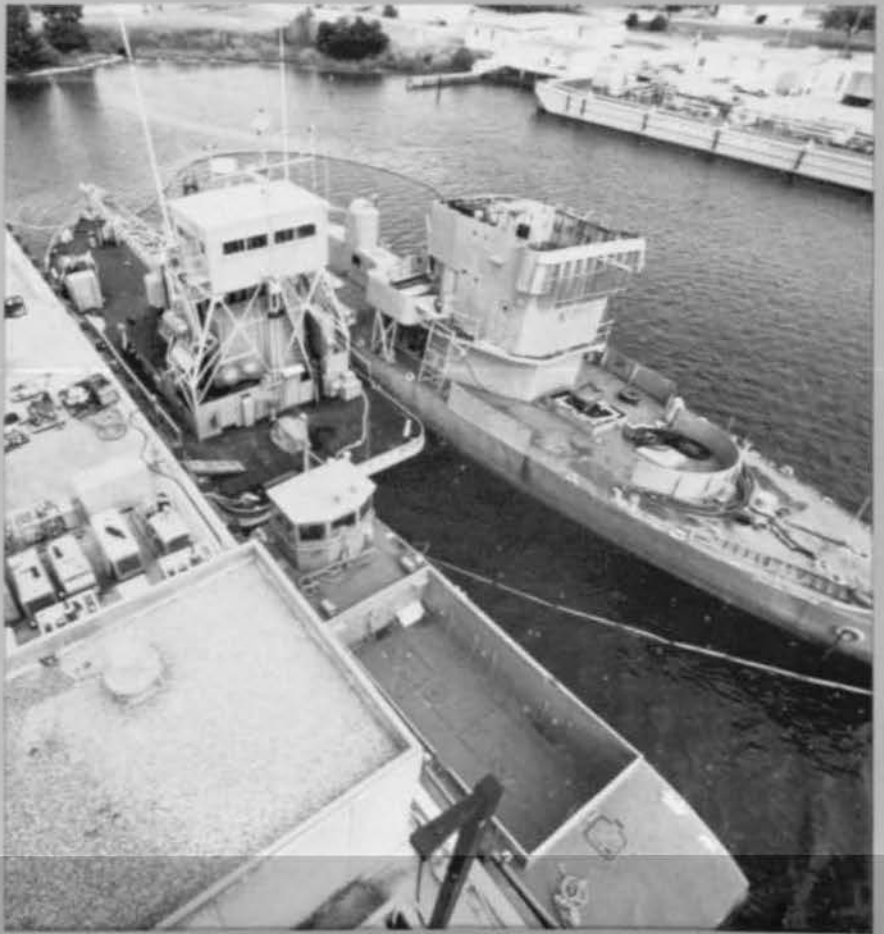
Actual salvage operations are carried out on the salvage training hulk. Students are required to perform internal and external surveys, patching, shoring, and dewatering, in addition to calculating stability and structural strength. Salvage demolition is also taught and practiced at the center, along with instruction in the operation of hyperbaric chambers. Emphasis is placed on operating procedures in support of diving disease treatment tables. Preventive and corrective maintenance procedures are taught on each diving apparatus in use by the Navy.

Above: Practical training at the hyperbaric chamber console. Students are thoroughly indoctrinated in all support equipment and the use of air and helium/oxygen decompression tables. Below: The "salvage hulk," used for practical salvage training.

Before engaging in open-sea diving operations, students must demonstrate their ability to function as a member of a dive station. This training is conducted in conjunction with qualification dives to depths of 285 FSW on air and 300 FSW on helium/oxygen in a hyperbaric complex.

For dives in the hyperbaric complex, the divers are dressed in the upper dry complex and lowered by stage into the water-filled wet pot, which is pressurized to simulate various ocean depths. Diving instruction culminates with two weeks of open-sea diving in the Gulf of Mexico from the center's diving craft. During this time, trainees are required to demonstrate their ability to supervise and man a diving station utilizing MK 5, MK 12 and MK 1 diving systems in both air and helium/oxygen modes.

Upon graduation, the newly qualified divers are assigned to various Fleet units to commence their diving career. Many later return to the training center for requalification courses or to receive advanced diving instruction.



COMPUTER-ASSISTED SALVAGE

Introducing Shipboard Micro-Computers as a Tool for Information Retrieval and Performance of Complex Salvage Computations

LCDR John P. Speer, USN
Commanding Officer
USS BOLSTER (ARS 38)

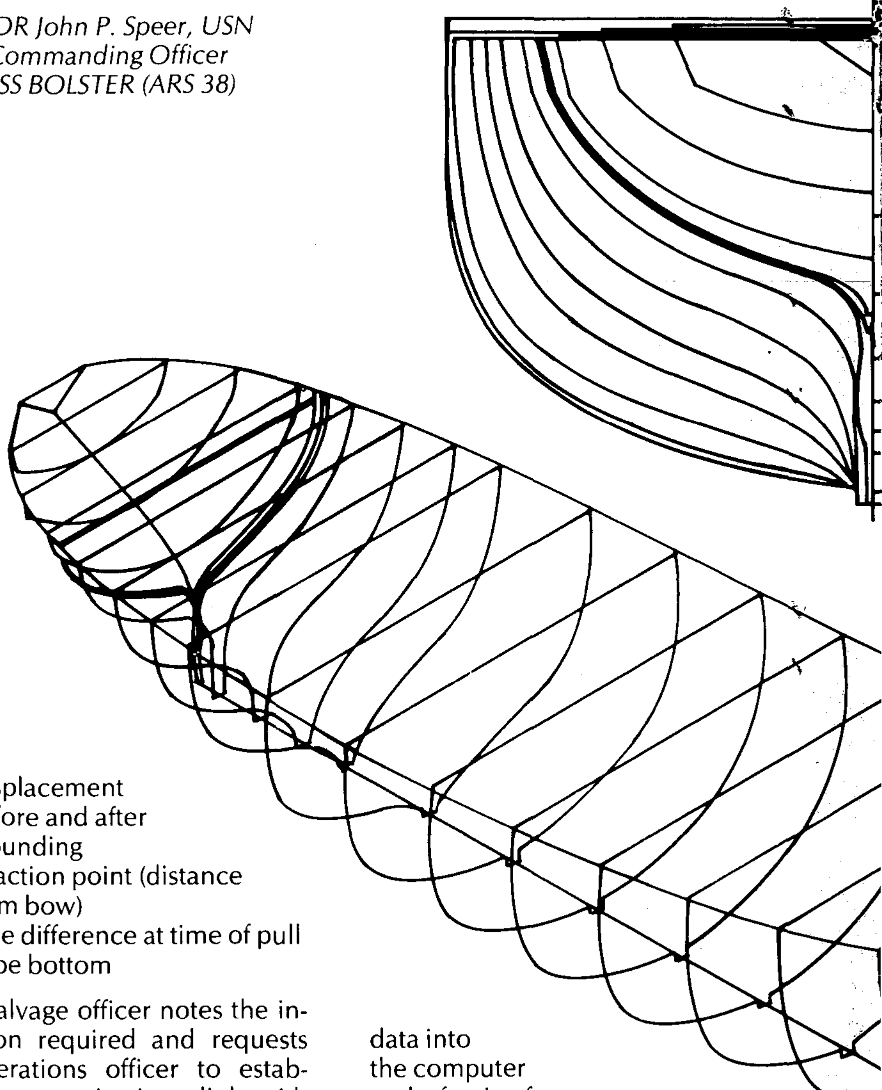
USS SALVOR is steaming along in the Pacific in transit to Pearl Harbor, when an immediate message is received that USS HOH, a CIMMARON-class oiler, has run aground on the island of East Fayu, an uninhabited, low coral island in the Eastern Carolines of Micronesia. SALVOR is ordered to proceed immediately to the scene at best speed.

East Fayu Island is three days distant at a speed of 13 knots. In preparation for the shipboard salvage planning conference, the salvage officer draws a 5¼" floppy disk marked "USS HOH" from his information retrieval library. He energizes the on-board micro-computer, inserts the Ship's Hull Characteristics Program (SHCP), followed by the floppy disk marked "USS HOH." The green-on-black TV monitor blips to life, and an isometric section display of the oiler is presented on the screen.

The salvage officer enters a code on the keyboard and the display changes to alpha-numeric specifications indicating the ship's length, beam, and displacement.

The salvage officer next requests a subroutine entitled "Required Freeing Force." The computer display requests all information to compute freeing force three different ways:

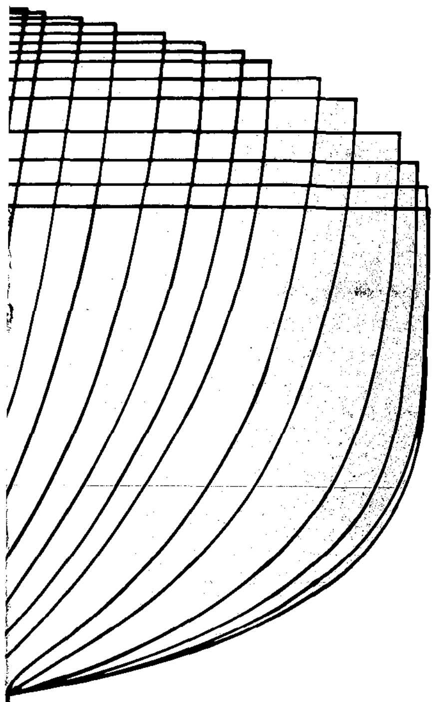
- ☐ Forward draft before and after grounding
- ☐ After draft before and after grounding
- ☐ Displacement before and after grounding
- ☐ Reaction point (distance from bow)
- ☐ Tide difference at time of pull
- ☐ Type bottom



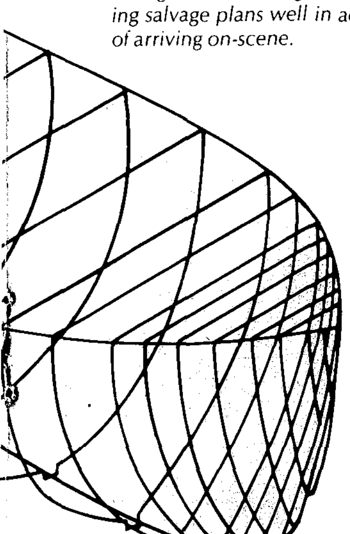
The salvage officer notes the information required and requests the operations officer to establish a communications link with USS HOH to obtain as much of the required information as possible.

Upon receipt of the information, the salvage officer keys the data into the computer and a freeing force of 263 tons is calculated. The salvage officer is now prepared to make recommendations and propose a plan of action days before arriving at the scene.

"... COMSERVRON FIVE has initiated a study to determine how to further use the potential offered by micro-computers to enhance salvage calculations in both a peacetime and wartime environment."



Shipboard computers may be programmed to provide specifications and isometric displays of almost any given vessel, thus enabling salvors to begin formulating salvage plans well in advance of arriving on-scene.



Science Fiction?

Although the above account is of a fictional operation, the technology described is not. The impact of a fast-growing computer industry has already touched the salvage Navy. True, computers have been with us for a long time in the research and development and experimental diving level, but it is only recently that the micro-computers have been put within reach of the salvor's fingertips. The Pacific Salvage Fleet has, for example, received commercial satellite navigation systems, a form of special application computer. Also, navigators in the Fleet are using Hewlett-Packard HP-67 programmable calculators to perform such tasks as reducing star sights.

With recent availability of powerful, low-cost, desk-top computers, also referred to as micro-computers, COMSERVRON FIVE has initiated a study to determine how to further use the potential offered by the micro-computers to enhance salvage plan development and salvage calculations in both a peacetime and wartime environment. During World War II, many damaged ships could have been saved if the salvors had had more in-depth knowledge of the specifics of a particular hull configuration, or faster and more accurate answers to specific engineering problems.

Need for Speed

In a major conflict today, the primary mission of the salvor will be to arrive on-scene as quickly as possible, and provide the most aid while doing as little damage as possible, resulting in faster repair, turnaround time, and subsequent return to the front line. To accomplish this mission, the on-scene salvage commander needs a vast amount of information on a real-time basis in a usable format.

The salvage Navy has traditionally approached a salvage scene relying on experience of old salts and information gleaned from the on-scene survey. Where the situation required marine engineering expertise, Engineering Duty Officers were assigned on-scene to advise on salvage procedures based on sound engineering doctrine. Since World War II, there has been a reduced number of major salvage incidents requiring Navy salvage participation. The pool of salvors with extensive experience have all but left the Navy. Although the concepts behind the Special Operations Officer Community include building salvage expertise among the 1140 salvage officers, this, too, is a process depending on on-scene experience at major salvage projects.

To further complicate the situation, in-depth knowledge of new ship hulls, or a library of plans of at least high-priority combatants and support ships suitable for salvage or rescue at sea, are virtually nonexistent on-board modern salvage ships. Engineering Duty Officers with salvage experience and naval architecture education will not be readily available on-scene, especially in a wartime situation. The micro-computer can provide a real-time salvage information retrieval and salvage computation ability for the on-scene salvor.

Current Inroads

Based on a study of the myriad hardware and software equipment available, SERVRON FIVE has determined that the use of the micro-computer as a tool to assist the salvor is feasible. The probable implementation of this plan will include a larger, more sophisticated micro-computer based at COMSERVRON FIVE headquarters. This computer would provide information retrieval and salvage calculation capability with a real-time communications link to shipboard computers.

A current procurement program is placing XEROX 860E micro-computers on all Pacific Fleet ships, including ARS's and ATS's. Although this computer is targeted for word processing and administrative use, it could be given software that would allow it to receive salvage information directly from the headquarters computer.

Software

The software, usually high in cost compared to the hardware, is a program tailored for a specific use. Such a program is the SHCP. It can perform all required stability and strength computations, and is already available from NAVSEA. This program, written by Michael E. Augley in 1964, has been in general use by both civilian and military shipbuilders since 1968. The program has a proven track record. An abbreviated version of the program, using FORTRAN IV as the computer language, is presently being used by Pearl Harbor Naval Shipyard design department using a Digital PDP 11/70 mini-computer and Heathkit H-89 micro-computers as terminals.

The SHCP consists of a set of sub-programs which perform the following naval architectural calculations:

- ☐ Hydrostatics (Curves of Form and Bonjean's Curves)
- ☐ Trim Lines
- ☐ Longitudinal Strength
- ☐ Floodable Length
- ☐ Limiting Drafts
- ☐ Intact Stability
- ☐ Damaged Stability Cross Curves
- ☐ Damaged Statical Stability
- ☐ Intact Statical Stability on Waves

Input for the SHCP program can be manually keyed as requested by the computer. Items such as name of ship, length, beam, displacement and offset points along sections may be inserted manually if the damaged ship's hull information is not available on a tape or disk. In the case of all U.S. Navy ship hulls, hull input information is available from NAVSEA, and, if carried on-board, can be inserted in a matter of minutes. Additional calculations may be added as subroutines.

The SHCP program will print or display both an isometric view and plan view of sections of the hull input (see illustrations). Possible additions to the graphic display may include overlays of high-priority spaces, such as ordnance magazines, high-value electronic equipment spaces, and engineering spaces. Overlays displaying tanks and voids, or firemain and drainage system, could also be very useful.

Here to Stay

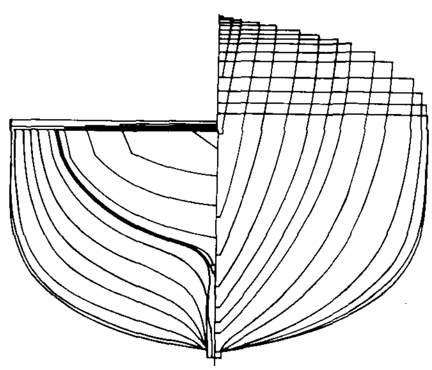
At the Pacific Fleet Salvage Symposium, two papers of note were presented. One, presented by LT P. M. Miniclier, recommended a consolidated Salvage Survey Form which could "provide the salvor with a comprehensive single source reference for the formulation of salvage plans of a similar hull type or operation."

A second proposal, presented by LT J. J. Jeffries, recommended an analysis of new hull types from the salvage point of interest. This survey was to be completed on a standardized "Salvage Analysis Format" emphasizing vital information such as loading plan, location of portable pumps, damage control equipment, boarding accesses, and drain sizes on-board, to mention a few. The information obtained by these proposals could be transferred onto disks or magnetic tapes and be available to further assist the salvor through micro-computer information retrieval.

COMSERVRON FIVE is continuing to research the possible uses of the SHCP with various available micro-computers. One possible arrangement may include a micro-computer at COMSERVRON FIVE headquarters used as a terminal to the mini-computer at Philadelphia Naval Shipyard. A telecommunications link to relay information to the salvage commander on-scene may be another possibility.

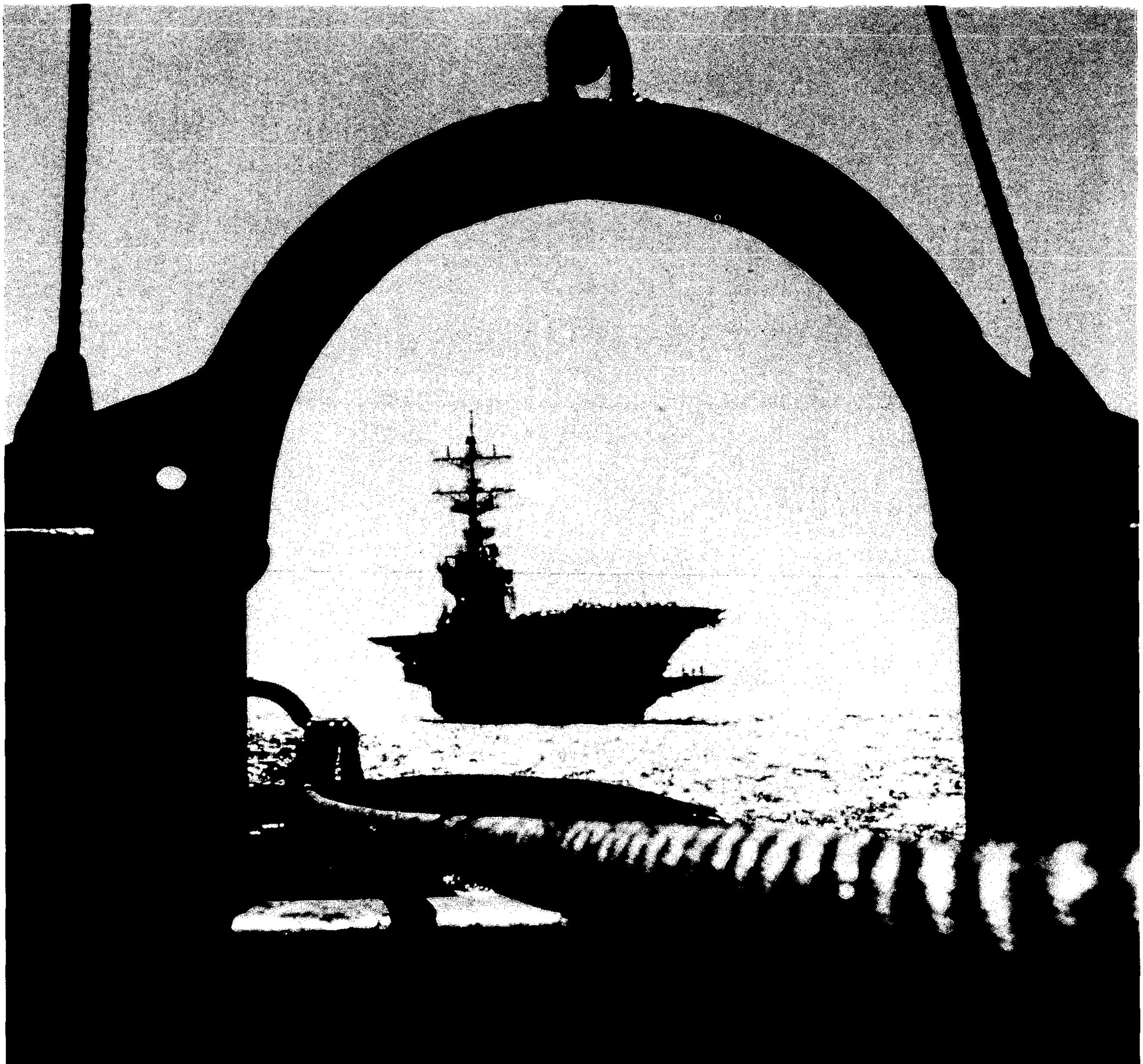
The feasibility of the use of a micro-computer to assist in salvage is promising. There are problems that still have to be resolved. For example, how to use a micro-computer programmed specifically for word-processing to crunch out engineering programs using FORTRAN language? Or, who should operate the computers and what level of training will be required?

Micro-computers are here to stay. They have an infinite potential as an information retrieval and complex computation tool for the salvor. With such a system, information pertinent to salvaging a damaged ship will be readily available to the salvor.



For more information about the Navy's work in computer-assisted salvage, contact the Operations Department of Service Squadron FIVE, Pearl Harbor, Hawaii, telephone 808-471-9984.

SIXTEEN (THOUSAND) TONS



LT Timothy B. Stark, USN
Commanding Officer
USS PAIUTE (ATF 159)

THE TOWING OF USS INCHON (LPH 12)

During the morning hours of October 20, 1981, USS PAIUTE (ATF 159) proceeded to sea from Hampton Roads, Virginia, via the Thimble Shoals Channel in the lower reaches of Chesapeake Bay. Approximately two hundred feet astern rode USS INCHON (LPH 12), in harness with PAIUTE's

(continued) ►

two-inch tow wire. PAIUTE's sailing orders directed delivery of INCHON to the Naval Shipyard at Philadelphia, PA, by 1700 hours on October 22.

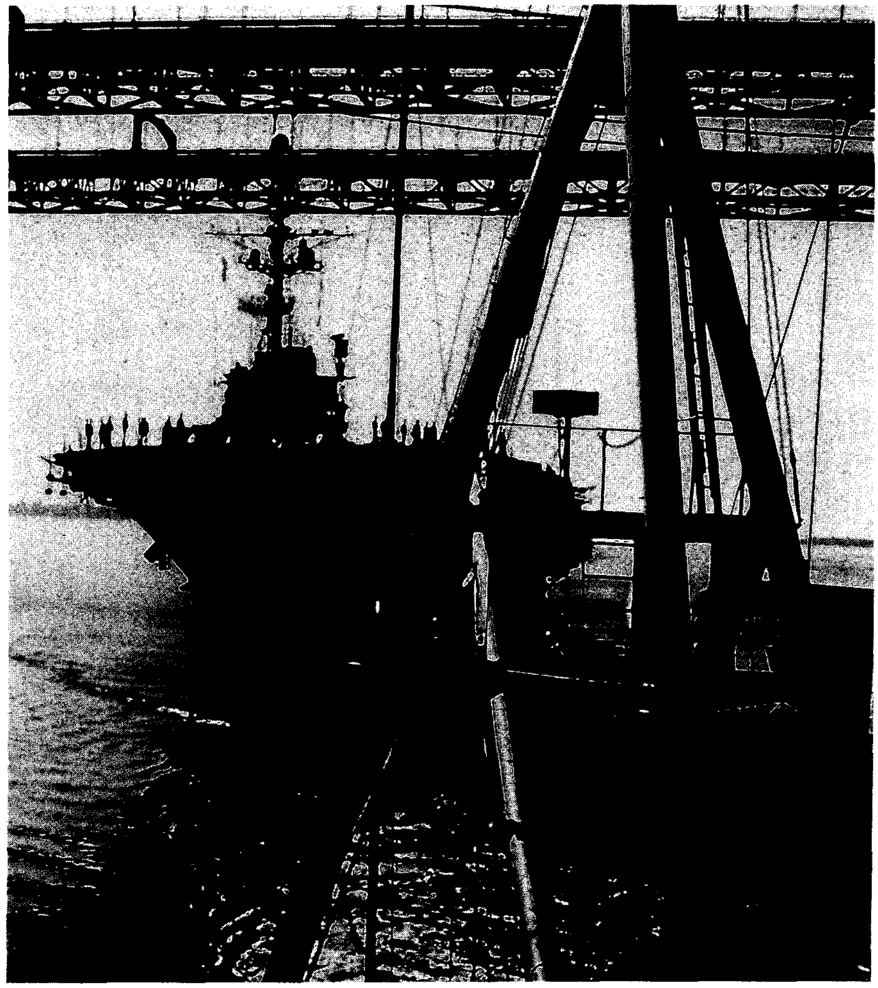
During the hundreds of years in which ships have put to sea, the capability for one ship to tow another has existed as a paramount requirement. The principles of towing seamanship have been developed through the years and have been passed on by word-of-mouth and through written documentation.

To conduct an open-ocean tow of such magnitude as that presented by INCHON, considerable planning and material preparation was required in several areas:

- ☐ Pilots and tugs were indispensable for the transit of both Hampton Roads and the Delaware Bay and River;
- ☐ Coordination with the Coast Guard was essential to ensure ample notice would be given to all shipping to avoid congestion difficulties during the one-hundred-mile transit of the Delaware Bay and River;
- ☐ Adequate logistics provisioning and the availability of hotel services aboard INCHON were necessary for the entire transit period.

These were but a few of the myriad requirements which were considered and planned for prior to the actual commencement of the tow. All planning was meticulously coordinated by the Staff of COMSERVRON EIGHT and INCHON's Commanding Officer.

In addition to the aforementioned considerations, critical environmental factors were examined and questioned both prior to and during the actual tow of INCHON: How would INCHON react to wind, current, and seas while under tow? What would be the effect of restricted waters and open sea-lanes on the maneuverability of INCHON? In the event of deteriorating weather, at what maximum speed could INCHON safely be towed?



PAIUTE's tow of the 16,500-ton INCHON through the open ocean off Virginia and the restricted waters of Delaware Bay and River was a feat of seamanship and meticulous planning.

High Winds

INCHON's large sail area (30,000 sq ft) posed a significant problem, particularly through the restricted waters at Hampton Roads and the Delaware Bay and River. Lateral beam forces were calculated for forecast and possible wind velocities, and it was determined that a maximum wind speed of 20 knots would be used as a limiting factor. Thus, the tow would not commence if the winds in Hampton Roads were over 20 knots; and should the wind velocity at the entrance to the Delaware Bay and River exceed 20 knots, transit of these restricted waters would be delayed.

On the scheduled departure day, October 19, wind speeds reached 30 knots. The tow was therefore postponed until winds abated the following day.

Currents

Also critical to the tow were the river and tidal currents in Thimble Shoals and the Delaware Bay and River. All currents were calculated and it was decided that arrival at various critical check points would have to occur within extremely narrow time windows. The most critical of these check points were determined to be Ship John Shoal in the Delaware Bay (0700-0730 on October 22) and the Philadelphia Naval Shipyard (1600-1700 on October 22). As a result of the extensive planning and the timely arrival at all check points, river and tidal currents did not greatly impact on the transits.

INCHON's 30,000-square-foot sail area necessitated careful monitoring of winds. Despite environmental and logistical complexities, INCHON was delivered to Philadelphia on time and without mishap.

Interestingly, ocean currents did have a minor impact on INCHON's towing characteristics in that these currents tended to overcome the forces generated by the light winds of approximately 10 knots.

Maneuverability

Maneuvering INCHON in the restricted waters of Hampton Roads and the Delaware Bay and River did not present a great problem in view of the light winds encountered. Utilization of INCHON's steering system, to steer on PAIUTE's fantail, was most beneficial in controlling her heading and reducing the strain on the tow wire. All course changes were relayed to INCHON by radio. INCHON tracked almost dead astern of PAIUTE during the transit up the Delaware, and swaying out to the side was minimal during turns. Initially, while in the open ocean, INCHON's rudder was kept amidships; however, excessive strains and oscillations on the tow wire were encountered and it was decided to have INCHON steer on PAIUTE's fantail for the remainder of the tow.

INCHON's rudder control of her head was minimal at speeds of less than 4.5 knots. In view of this, it was determined that a speed over ground (SOG) of 5.5 knots or greater must be maintained during restricted-water transits. The average SOG in the Delaware Bay and River was 6.5 knots.

During the various restricted-water transits, and when excessive maneuvering of INCHON was required, the tow wire was allowed to sweep the fantail from the H-bitts aft. This procedure kept the point of tow well forward of PAIUTE's rudder, thus allowing PAIUTE maximum maneuverability. While in the open sea, the tow wire was kept in the stern roller to reduce chafe on the tow wire.*

Tow Speed

The maximum speed at which INCHON could be towed safely, in the event of deteriorating weather, was a question from the onset of the operation. Upon clearing the Chesapeake Bay approaches, PAIUTE slowly built up speed. An SOG of 8.4 knots was attained with the following main engine status: four main engines in the propulsion loop; 129 shaft RPMs; 1,100 electrical propulsion loop amps; and 725 main engine RPMs. The strain on the towing machine was 52,000 pounds. Environmental conditions placed the wind and seas off the port bow at 10 knots at one or two feet. INCHON displaced 16,500 tons and presented a sail plane of 51 by 602 feet. As previously mentioned, environmental conditions were excellent and permitted a high SOG.

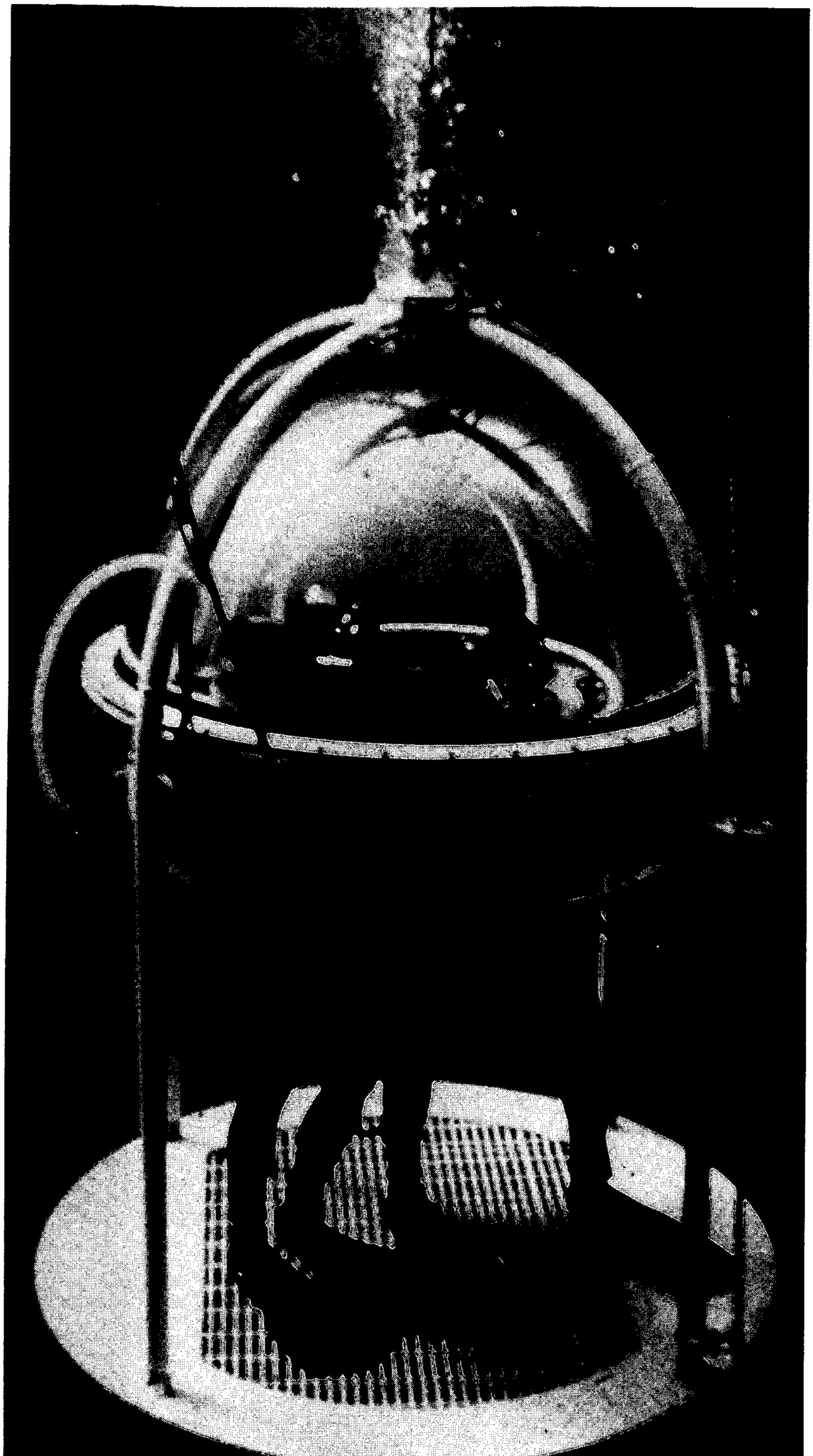
The successful execution of the INCHON tow by a 36-year-old ATF reiterates the excellent design of the ATF-96/148 class tow ship. The fine lines of the underwater hull, the variable combinations of the propulsion plant, and the large propeller and rudder, make it one of the finest platforms for open-ocean towing.

Our Fleet's towing and salvage assets are rapidly dwindling through deactivation or sale to other navies. This situation is bringing a "steady bearing, decreasing range" to a pre-WW II salvage Navy.

We who proudly sail, or have sailed, in these outstanding ships strongly voice our desire for their continued use and activation.

**Editor's Note:* Use of chafing gear on the bull rope is the preferred method of reducing chafing to the tow wire using good seamanship, rather than trapping the tow wire within the stern roller. The latter practice risks putting the ship "in irons" as a consequence.

USS PETREL ACRYLIC DOME REPAIR



Two-man, open diving bell. Acrylic dome of PETREL's bell exhibited deep scratches and distortion, seriously affecting divers' visibility.

Some Creative Thinking – and Dogged Persistence – Achieves Dramatic Results in Restoring Clarity to USS PETREL's Diving Bell Acrylic Dome

MRC(DV) T. D. Kerns
USS PETREL (ASR 14)

During a recent NAVSEA precertification survey, it was noted that the acrylic dome of USS PETREL's two-man open diving bell was heavily scratched in one area and that the scratches appeared to be fairly deep. The scratches were of a serious enough nature to warrant a category I-B deficiency card.

The bell manufacturer's maintenance manual was consulted to determine the proper repair procedure. It was the manufacturer's recommendation that a commercially available auto polish (Du Pont #7 Auto Polishing Compound) be used in conjunction with a portable electric buffer. It was further recommended that, "if the scratch is deep and cannot be removed by buffing, do not attempt to sand it out, replace the dome."

The recommended polishing compound was purchased and the repair procedure was begun on board by the salvage department personnel. Initial results were unsatisfactory and the process was repeated. Some improvement was noted, but scratches were still noticeable and the area exhibited some visual distortion.

Problem Insight

The project was reevaluated and it was concluded that, while the damage to the acrylic dome was not of a serious nature, it was beyond the scope of established repair techniques. Some research revealed that the material used in the fabrication of the open bell dome was very similar to the hard plastics utilized in the construction of military and commercial jet aircraft canopies. They are of a tough, flexible nature and virtually shatter-proof; however, they are quite susceptible to scratches and hazing due to the constant exposure to the elements.

A local aircraft repair facility was contacted and queried regarding a refinishing process that could be utilized. Reference was made to Microsurface Finishing Products, Inc., who manufacture restoration process kits used frequently by both the military and commercial air carriers. The kits are sold under the brand name Micromesh, and contain easy-to-follow, step-by-step instruction about the restoration process.

A kit was purchased—kit KR-70. This kit was recommended by the manufacturer for aircraft use where the restoration of critical vision areas is required. It contains all the required materials to finish a 20- to 30-square-foot area, plus concise procedures specifically geared to military applications.

The application of the process to the acrylic dome was done on board, following the military version of the instructions. All restoration work was done by hand, thereby ensuring minimum removal of material.

Perfection

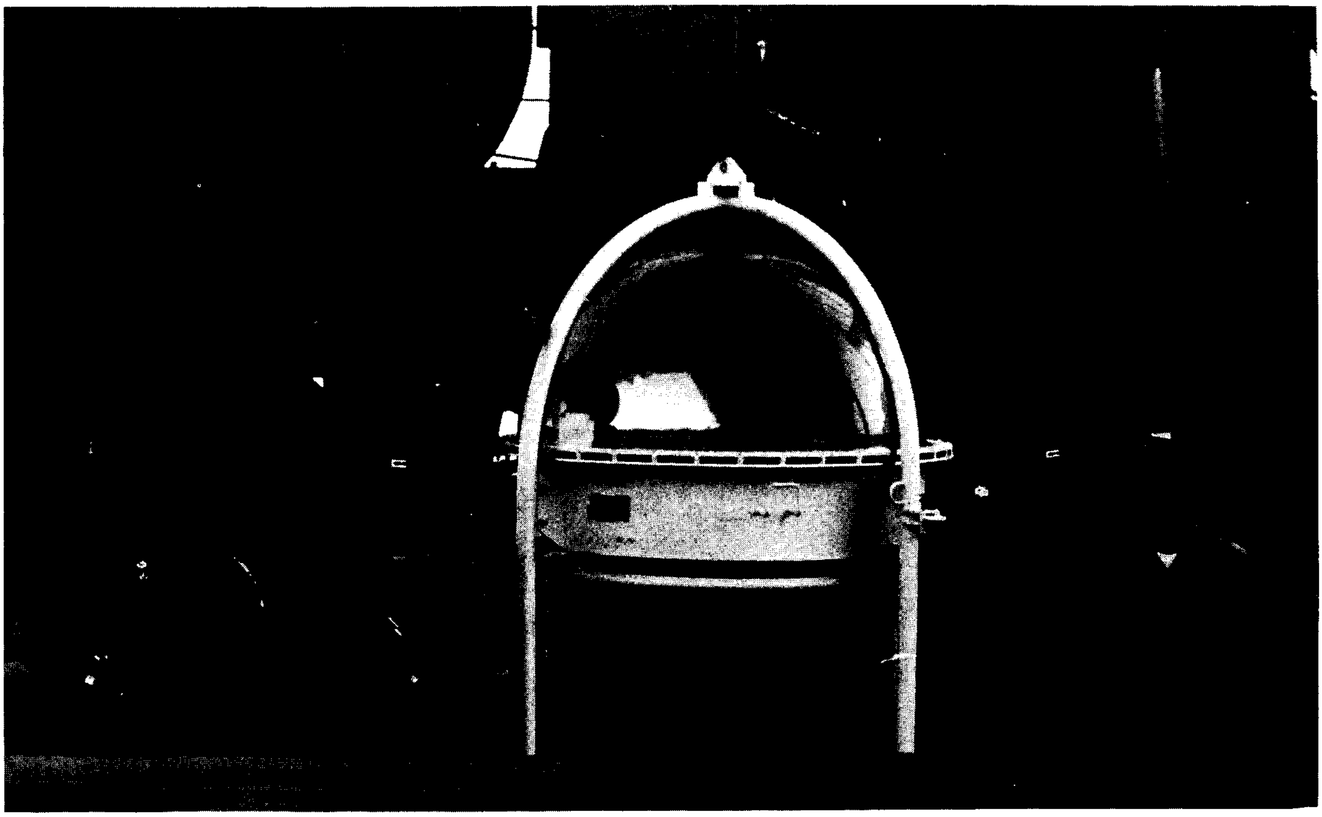
The results were excellent: 99 percent of the damage was removed with no distortion whatsoever. The process was repeated a second time, resulting in 100 percent removal of damage and maximum clarity. The restoration was so complete that identification of the previously damaged area was possible only by locating the area that now displayed the most visual clarity.

Restoration of the acrylic dome was completed by a light refinishing of the dome's exterior. Its deficiency corrected, the two-man, open bell was recertified, and at a large savings to the Navy both in dollars and man-hours. While this product was only applied to the acrylic dome of the two-man bell, it has potential use on the Lexan viewports of the MK 12 SSDS helmet as well.

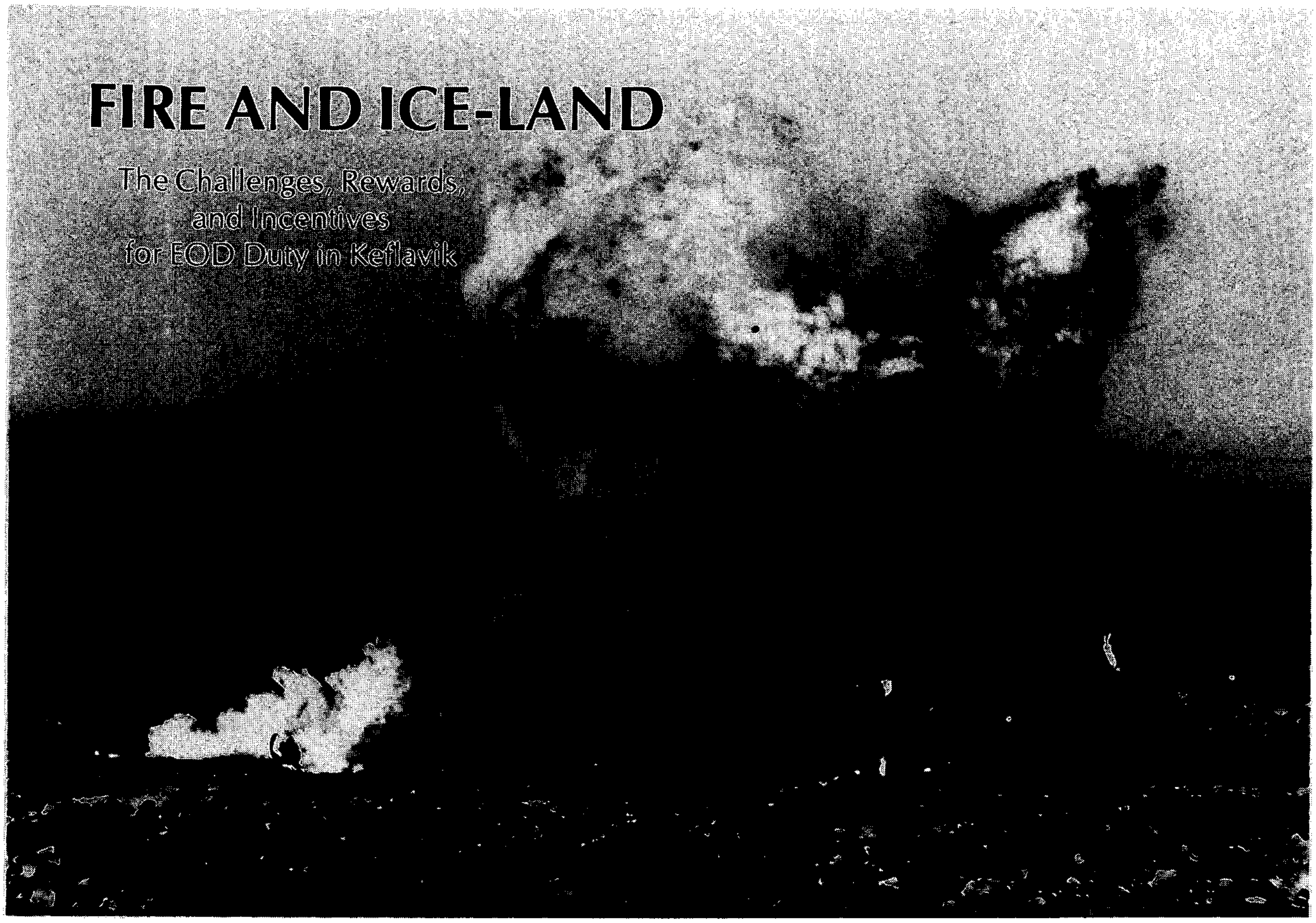
Project Participants

The following people contributed to the success of the acrylic dome restoration project aboard PETREL:

- LCDR Malloch, Commanding Officer
- LCDR Evans, Executive Officer
- QMCS(MDV) Williams
- MRC(DV) Kerns
- SMC(DV) Griebe, Ret.
- TMC(DV) Witunsky
- BM1(DV) Temple
- HT2(DV) Skelding
- HM2(DV) Roa



After restoration, with scratches fully removed and clarity restored. L-r: MRC(DV) Kerns, QMCS(MDV) Williams, TMC(DV) Witunsky, BM1(DV) Temple, HT2(DV) Skelding, and HM2(DV) Roa.



FIRE AND ICE-LAND

The Challenges, Rewards, and Incentives for EOD Duty in Keflavik

Story and Photos by
JO2 Dave Guise, USN
Public Affairs Office,
COMICEDEFOR

Four men in Keflavik, Iceland, make up the smallest Navy detachment on the NATO Base there. Although small in numbers, the men of the Explosive Ordnance Disposal (EOD) Detachment perform one of the biggest and most important jobs of any command in Iceland. The safety of some 5,000 military personnel and dependents could, at any moment, rest in their hands.

The detachment in Keflavik is comprised of LT Michael Hinman, Officer-in-Charge, MMC Eugene Richardson, SK1 Mark Favor, and PRAN Raymond Adams. These four men are directly responsible for rendering safe any hazardous ordnance on the NATO Base. This could include damaged weapons on the 57th Fighter Interceptor Squadron's F-4s, unexploded ordnance found in Iceland or in the water surrounding it, or improvised explosive devices typically associated with bomb threats. The EOD detachment is also prepared to assist Icelandic communities, if necessary.

Response Time

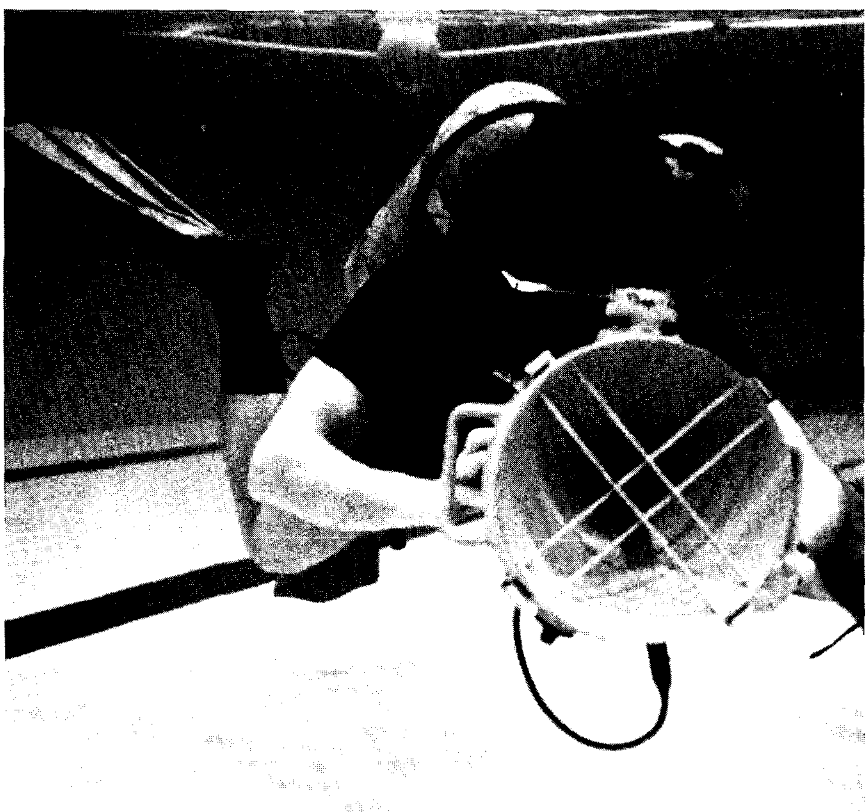
In no other organization is teamwork as important as it is to the EOD detachments. They work, train, and exercise together. Every individual move on an actual job is choreographed to mesh with the group's common goal – to neutralize the explosive device. Any letdown in the team concept could lead to a tragic mishap. PRAN Adams, the youngest member of Keflavik's EOD detachment says, "We're a small group and we do work together as a team, and as friends. We have to stick together."

Besides occasional bomb threats and demolition, the EOD men spend the majority of their time training. Included in their training are daily workouts at the base gymnasium, and familiarizing themselves with their equipment and publications. The EOD publications outline procedures and detailed steps for various situations. Knowing what publications to consult on a specific job, and where to find them, is extremely important because, as SK1 Favor says, "the key to our success is response time."

Respect vs. Fear

The procedures and instructions that govern EOD personnel today were written, to a great extent, by the pioneers of Navy EOD. Their experiences, both good and bad, enable EOD technicians today to complete a job in a safe, tried-and-true sequence. "The older EOD technicians worked when there weren't any set procedures," Chief Richardson says. "Their experiences help all EOD technicians. Unfortunately, a lot of the older

Opposite page: A defective rocket launcher is demolished with explosives at Keflavik, Iceland. Above, left: LT Michael Hinman (left) and SK1 Mark Favor inspect the launcher after demolition. Above, right: SK1 Favor attaches explosives to the launcher for demolition. Below: MMC Eugene Richardson trains with underwater sonar.



guys need two hands to order four beers."

SK1 Favor says the learning process is never complete. "We learn something new with each job. We look at explosives from a respect rather than a fear standpoint, because we understand what makes them work."

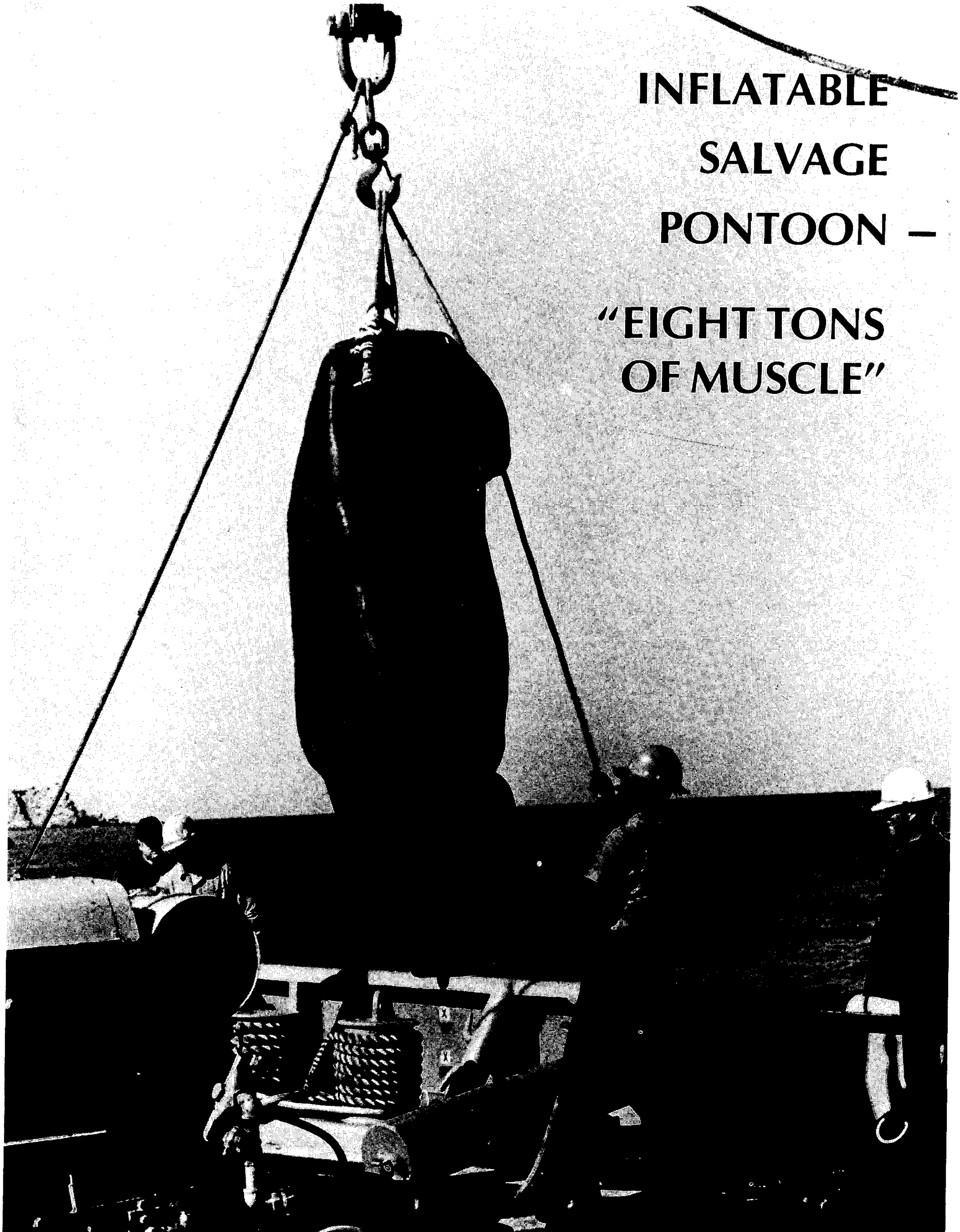
EOD technicians come from all Navy ratings and are assigned in small units on most major weapons stations and ships. Navy EOD is divided into two operational commands: EOD Group ONE in Hawaii and EOD Group TWO at Fort Story, Virginia. The commanders of these two groups coordinate all EOD operations within the Pacific and Atlantic fleets, and are the administrative commanders of permanent detachments located throughout the world. There are approximately 350 to 400 officer and enlisted EOD technicians within the Navy, or about 200 short of actual manning requirements.

EOD Duty Incentives

Prospective EOD technicians begin their training in Huntsville, Alabama, at the Army Missile Ammunition School where they attend classes on chemical and biological warfare. From there, the class moves to Indian Head, Maryland, for 39 weeks of intensive instruction in all aspects of explosive disposal. "It's not an easy school," Chief Richardson says. "You have to apply yourself. The attrition rate is pretty high. Thirty-two people started out in my class and only 11 graduated. But if you hit the books and really want it, you can make it."

The incentives to "really want" EOD duty are the best the Navy has to offer. EOD personnel receive maximum re-enlistment bonuses and can average as much as $75 per month for shortage specialty pay (proficiency pay), plus $110 per month diving duty pay. And, while EOD personnel retain their previous Navy rating, Chief Richardson says, the possibilities for advancement are much better when an individual is in the EOD program.

INFLATABLE SALVAGE PONTOON – "EIGHT TONS OF MUSCLE"



Inflatable pontoon, minus the lashings that would hold it fully deflated, is lowered over the side of USS OPPORTUNE (ARS 41).

Story and photos by
LCDR R. J. Gray, USN
USS OPPORTUNE (ARS 41)

Lost: the 35-ton lower sterngate from USS RALEIGH (LPD 1) in the Mediterranean Sea off Cape Seratt, Tunisia. The sterngate sank in 65 feet of water during amphibious exercises recently, when high winds and heavy seas caused the lifting arms to fail and the hinge pins to shear.

As the salvage plan was being worked out aboard USS OPPORTUNE (ARS 41), it became clear that the major obstacle would be in lifting the sterngate off the bottom. Due to the remote location, a floating crane of adequate capacity was not available. A bow lift was considered, but rejected due to the limitations it would have on transporting the gate once lifted.

Vital Statistics

Fortunately, OPPORTUNE was close to the Emergency Ship Salvage Material (ESSM) pool in Livorno, Italy, so the decision was made to embark six inflatable salvage pontoons, each having a lifting capacity of over eight tons.

No one on board had ever worked with the pontoons before, so the characteristics were of particular interest. The pontoons come packed in a wooden crate; the total weight is about 900 pounds. The pontoon itself weighs 750 pounds. Some of the other characteristics are:

- ☐ Inflated diameter – 7 feet
- ☐ Inflated length – 10 feet
- ☐ Net buoyancy (s.w.) – 18,180 pounds (8.4 long tons)
- ☐ Inflation fitting – 1¼-inch, quick-disconnect

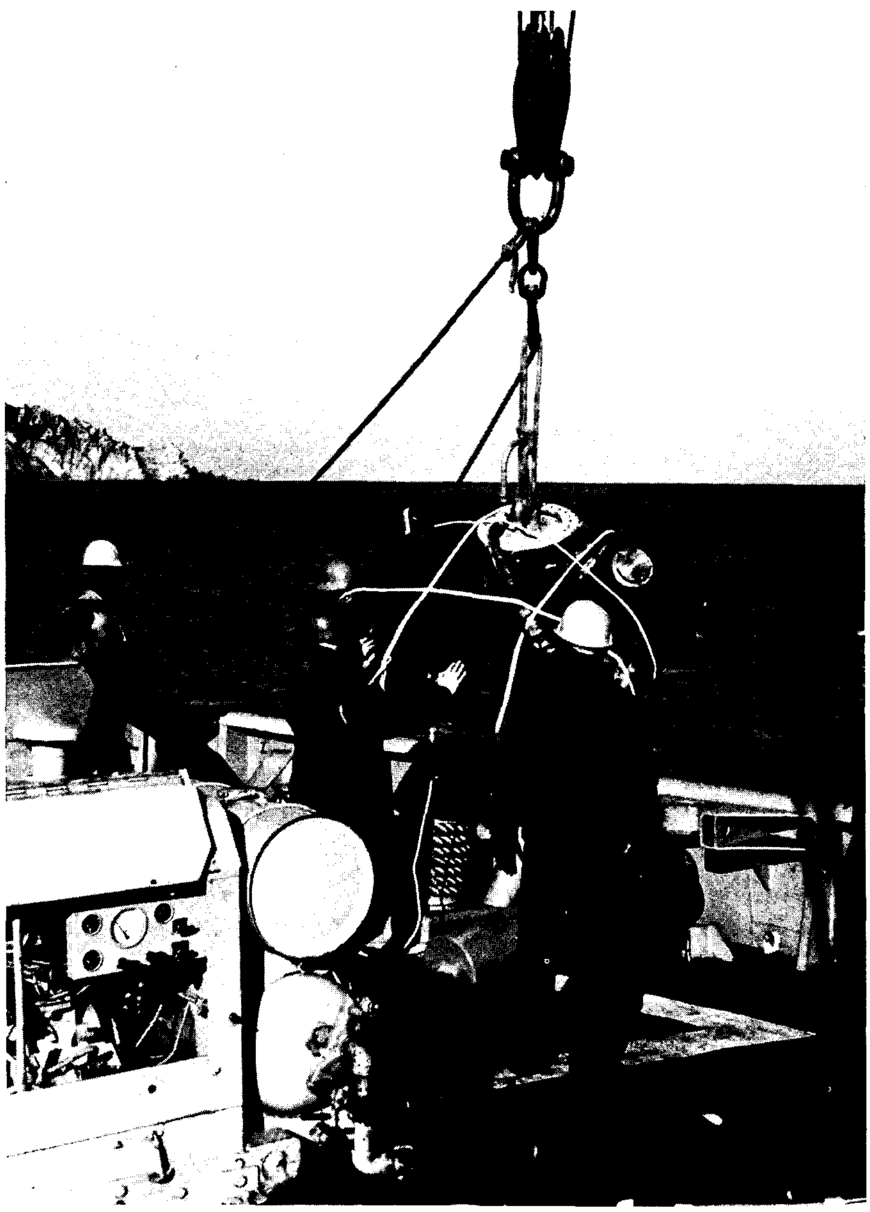
NAVSEA 0994-011-2010 is the reference manual for use and maintenance, and one comes packed with each pontoon.

The pontoon is equipped with a steel plate and ⅞-inch lifting eye at each end. The plates are connected internally with 1-inch stud link chain, allowing up to three pontoons to be connected in series. Relief valves are fitted at each end to prevent overinflation, and bleed off excess pressure as the pontoon rises.

The inflation hose is three feet long and fitted with a ball valve and a Roylon 1¼-inch, quick-disconnect nipple. This fitting proved to be a problem, as there were no female connectors provided with the pontoon. Several rolls of 2-inch salvage hose were also requisitioned from the ESSM pool, but the hose did not have any connectors either. As a result, the nipples were removed, and adapters made to connect the inflation hoses to standard MK 5 diving hose.

Successful Lift

With OPPORTUNE moored over the sterngate, the pontoons were lowered over the side with the after boom. They proved to have several hundred pounds of positive buoyancy, even with the securing lashings firmly in place to ensure full deflation. One pontoon that had not been lashed before packing had even more buoyancy. To get the pontoons down to the bottom, a hauling line was led through a snatch block at each attachment point, the end of the line tied to a pontoon, and the ship's capstan used to haul the



Inflation hose, relief valve, and lashings hold the pontoon deflated.

pontoon down. It was found that a fully deflated pontoon would become negatively buoyant at about 40 feet, and was easily handled on the bottom by one diver. Although the manual recommends a test inflation on the surface, this was not done, as the lack of ability to fully deflate the pontoon would have resulted in greatly increased surface buoyancy.

Prior to entering the water, each pontoon was identified with a different number of seizings on the inflation hose, to insure positive identification by the divers.

With all pontoons in place, the air supply hoses were run from a 125-cfm salvage compressor to the pontoons. Due to a lack of adapters, only two pontoons were filled at a time. At 65 feet, it took about 20 minutes to inflate a pontoon. Full inflation was signalled by an impressive quantity of bubbles as the relief valves opened.

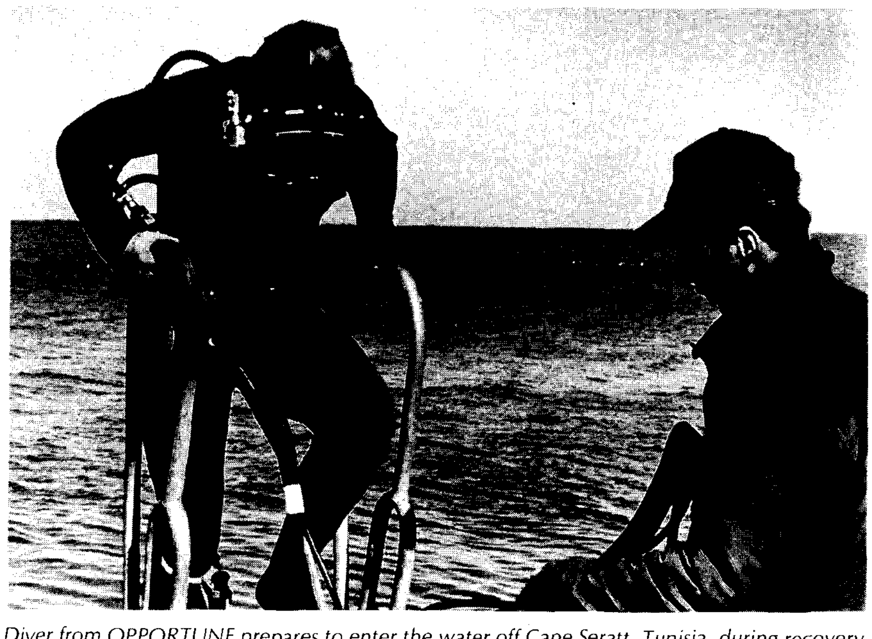
The pontoons were blown in a sequence designed to bring the sterngate up in a level attitude. Once on the surface, the inflation hoses were lashed down, and the inflation valve handles removed to prevent accidental opening.

Unhappy Ending

Unfortunately, this up-to-now successful salvage job has an unhappy ending. As there was no floating crane available to pick up the sterngate, the decision was made to tow the sterngate to Palermo, Sicily, where RALEIGH was undergoing temporary repairs. During the tow, the motion of the pontoons caused one of the ¾-inch attachment chains to chafe on the sterngate and part, and the gate was lost in deep water.

Despite the loss of the sterngate, the salvage pontoons proved to be a very satisfactory method of recovering this heavy object. All of them functioned without a problem, and the salvors of OPPORTUNE gained some valuable experience. So, the next time you're faced with a similar situation, count on the inflatable salvage pontoon to add some "muscle" to the job.

Inflatable pontoon, minus the normal securing lashings, is rigged for lowering over the side of USS OPPORTUNE.



Diver from OPPORTUNE prepares to enter the water off Cape Seratt, Tunisia, during recovery operations for the sterngate of USS RALEIGH (LPD 1).

The Old Master

Bring Back Jack Browne and MK 5?

How often have we as divers been guilty of condemning the effectiveness of new equipment such as the MK 1, MK 12, or the MK 15?

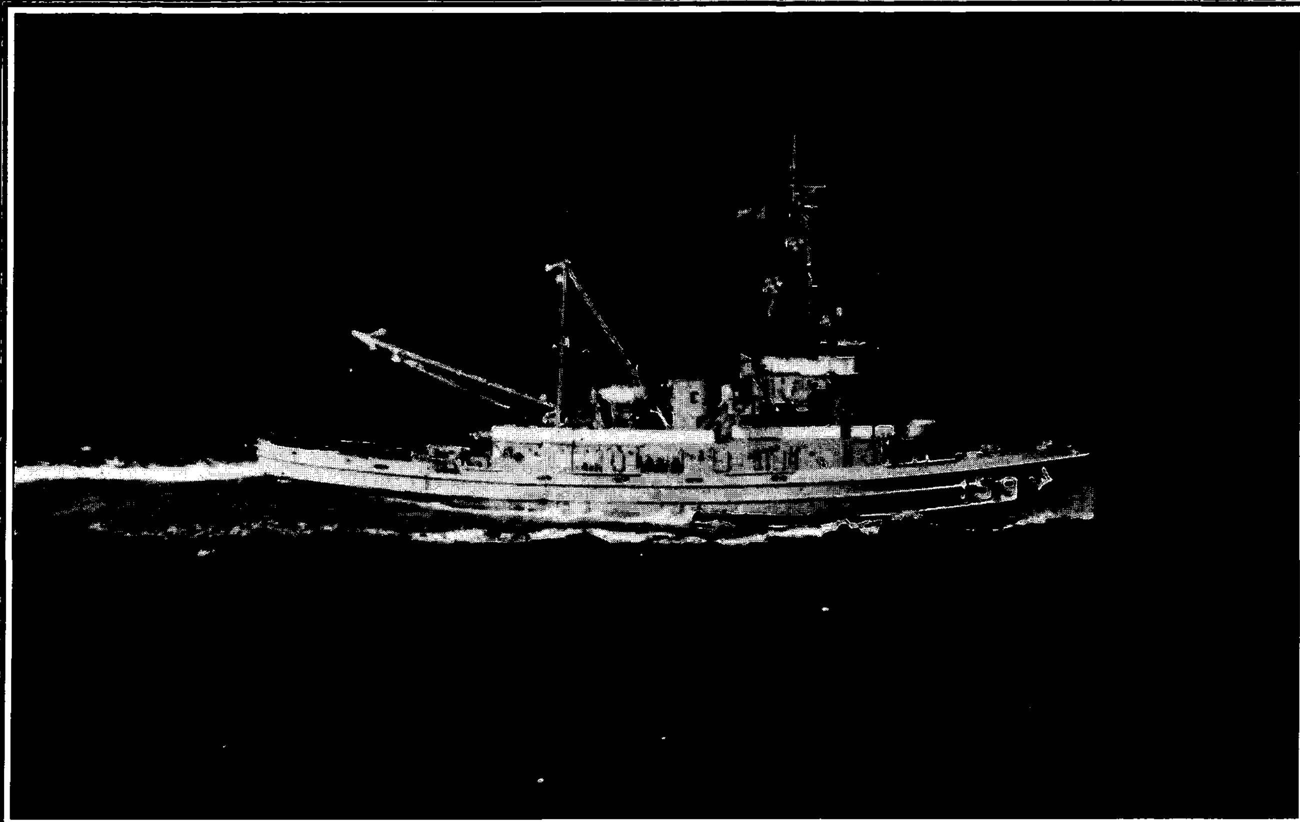
All too often, we consider the less desirable or negative characteristics of our new diving equipment when comparing them with the attributes of the older, time-proven rigs, overlooking the benefits provided by the newer rigs which have expanded the undersea capabilities of the working diver and combat swimmer.

While the new equipment typically requires more extensive maintenance procedures, and in some cases can be more complicated to support and operate, these characteristics have been the direct consequence of improved diver safety requirements and of expanded system capability. The continuing diversification and complexity of work relegated to today's diving organization has necessitated the development of diving systems with a wide range of functions and capabilities. On the other hand, funding and logistic support restrictions imposed upon us have at the same time required minimizing the diversity of different types of diving equipment with which to perform the many tasks. Consequently, we must seek and expect to use a few types of diving systems which are designed to perform an ever increasing variety of tasks. As the mission requirements of Navy diving evolve and expand, we may expect to see a proportionate evolution of the functional capabilities of our diving equipment.

The "track record" of our new equipment may not yet be as extensive as that of the older rigs, such as the MK 5 and the Jack Browne; but, given time, and as we gain experience in their use, the new rigs are certain to prove their value and find widespread acceptance within the diving community.

Critical to the successful implementation of new diving equipment is the proper performance of routine and unscheduled maintenance. Many perceived problems with new equipment can be traced directly to failure of performing the required maintenance. Deficiencies in design or manufacture are also possible, however, and may be referred to NAVSEA OOC (see FACEPLATE, Winter 1981, Quality Deficiency Reporting).

I honestly believe that if we took the time we use complaining to ourselves and to our shipmates while standing around the "diving side," and used it instead to perform the proper maintenance and on-the-job training, that our new gear will support us safely through any mission task we are assigned better and more efficiently than ever before!



DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
WASHINGTON, DC 20362

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

THIRD-CLASS MAIL
POSTAGE & FEES PAID
USN
PERMIT No. G-9

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402
Subscription Price: $12.00 per year, domestic ($3.50 single copy)
$15.00 per year, foreign ($4.40 single copy).