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# Annual Report U.S. Naval Postgraduate School, Monterey, California Fiscal Year 1962

Monterey, California: Naval Postgraduate School

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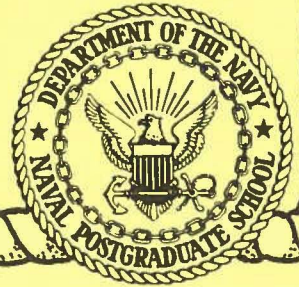
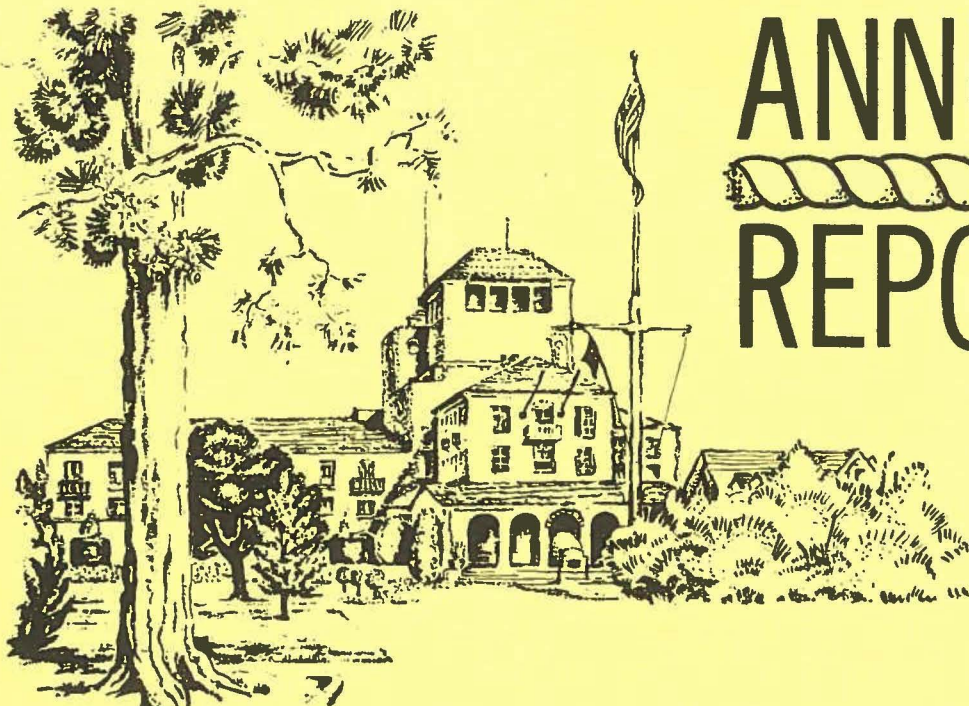
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# ANNUAL REPORT

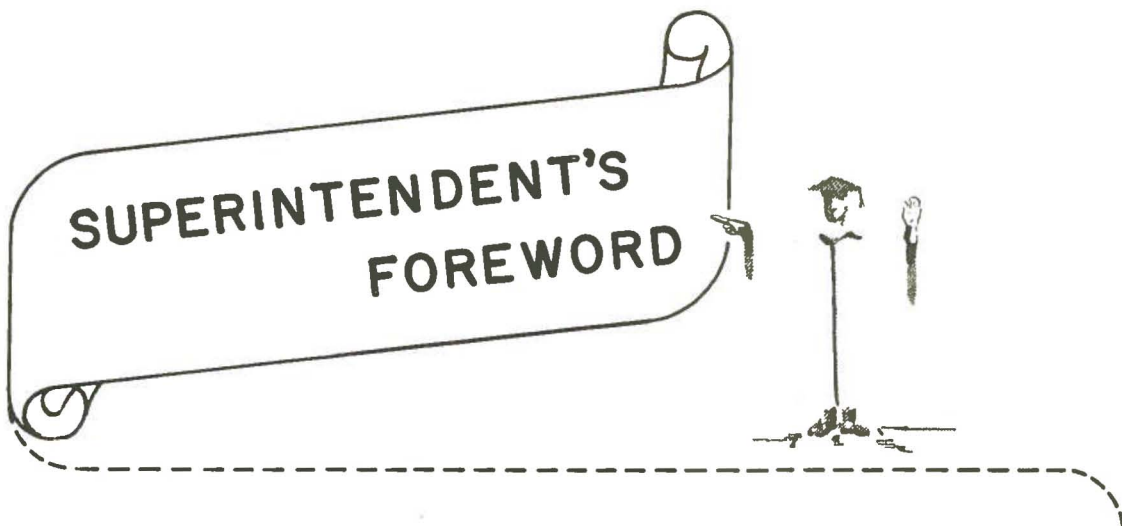


U.S. Naval Postgraduate School  
MONTEREY, CALIFORNIA

FISCAL YEAR 1962

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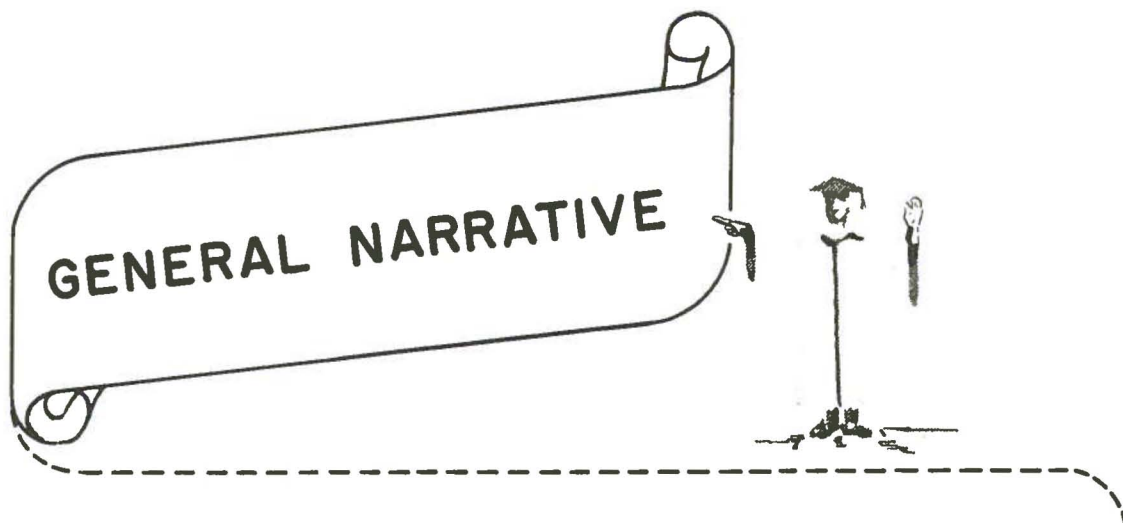


It is a pleasure to send this report to you who have a vital interest in the Naval Postgraduate School and its graduates.

The Postgraduate School is successfully continuing to discharge its unique function of advancing the technical education of naval officers in a manner to best meet the specific needs of the Navy in a time of rapidly expanding technology. The School needs your confidence and your support. We can make our best contribution to the Navy of the future only if you counsel and encourage your young officers of superior ability and motivation to take advantage of the education which is available here.

The following pages will acquaint you with the events of Fiscal Year 1962. Some of the developments of the year and the forward steps which have been taken should make this a memorable year in the history of the School.

*Marshall E. Dornin*  
MARSHALL E. DORNIN  
Rear Admiral, U. S. Navy  
Superintendent



Enrollment at the beginning of the school year in August 1961 was some 1280 students: 760 in engineering or other technical fields, 425 in the General Line and BS and BA programs, and 95 in Management. The total figure shows no appreciable change from that of the previous year; however, there was a continuing shift of numbers into the physical sciences and engineering with a resultant decrease in input into the General Line program. The August 1962 enrollment calls for a total of approximately 100 more students, with an increase in the technical areas of some 150. The long range plans outlined by the Bureau of Naval Personnel are in terms of approximately 2200 by FY 1969. Although realization of these numbers will depend on qualified candidates available and total funds allocated for educational programs, we are making plans to accommodate this total.

This year 331 bachelor's, 209 master's, and 2 doctor's degrees were awarded to those completing curricular requirements, bringing the total since the authorization of our awarding of degrees to some 2500 bachelor's, 1150 master's, and 4 doctor's degrees. The two doctor of philosophy degrees this year were awarded to a lieutenant in the Chinese Navy, whose area of specialization was Electrical Engineering; and to a U. S. Navy lieutenant with an unprecedented record of achievement in education combined with advancement from enlisted recruit to officer status as a communications specialist. The latter's field of study was Electronics Engineering.

In October, Dr. Edward L. Katzenbach, Jr., Deputy Assistant Secretary of Defense (Manpower), sponsored at the school a four-service conference on postgraduate education. His particular interest was to ascertain the plans of the individual services for advanced education

and the areas of interest common to the four services. One of his concerns was whether the services as a group were providing the education required to meet billet requirements for many of the "super-agencies" in intelligence, supply, etc., of the Department of Defense. There proved to be some areas of mutual service interests. It appeared that our Management curriculum might hold the answer to some of the DOD's requirements in the management area.

We were visited by Congressional committee groups whose particular interests were in the utilization of postgraduate educated officers, and in-service versus civilian institutional education of these officers, this latter question having a very direct bearing on our needs for increased facilities. These visits prompted studies which have confirmed and strengthened our convictions that in-service education is not only essential for the Navy but, on the basis of cost comparisons, is economical when cost is compared on a dollar-per-credit-hour basis. Through heavier loading and unique scheduling techniques we are able to save from nine months to a year of an officer's and the Navy's time. Our utilization of civilian institutions for the third year of study in connection with certain of our curricula gives us a fine measure of standards of our own instruction. We have found that the students sent on to civilian institutions are outstanding in their performance there.

Our in-service advanced education programs have additional advantages. We are able to accept highly-motivated officer students whose earlier academic records would have precluded their acceptance by a civilian university, who as "late-starters" are not only able to complete the programs but often end up with outstanding records. Furthermore, we are able to educate for specific Navy needs with carefully tailored curricula, where sponsors' billet requirements, rather than qualification for a degree, are the major consideration. The end result is, by-and-large, a harmonious combination of the two achievements; but we believe that our emphasis has placed the cart and the horse in the proper relative positions.

Of major importance this year from an academic viewpoint was the achievement of full active membership in the Western College Association. The law authorizing the Superintendent to award degrees specifies that this authorization hinges upon "due accreditation . . . . by appropriate professional authority." Therefore the excellence of our academic standards is always in the forefront of our thinking.

A report of an interim visit in the fall of 1961 by representative members of the WCA accreditation committee stated that the U. S. Naval Postgraduate School "is, in real fact, already a great university. Excellent new buildings supplementing the old Hotel Del Monte, libraries, laboratories, classrooms, a highly trained instructional staff both civilian and service - all of these combine to create an institution designed to serve the Navy and the country as Congress has intended." This report led to an inspection by the full accreditation committee and the resultant change from associate to full membership in the Association, accreditation of the new BA curriculum with a major in International Relations, and the renewal of the accreditation of the rest of the school.

Certain recommendations were made concerning centralization of records, necessity for prompt and substantial financial support for the library, and desirability of including some language instruction. The centralization of records is provided under the new school organization to be described later. An increase of 20% in the allocation of school funds to the library permitted the hiring of more librarians and the purchase of more books. It is hoped that one day we will be able to provide the greater amount of space required, either through the new classroom building already in our MCON program or in a building of its own. The foreign language education is presently being provided through arrangements with the Monterey Peninsula College, our neighbor in Monterey.

Our report last year referred to a "Road Show" which was in preparation. It was the hope at that time to visit all of the major areas where there were concentrated numbers of young officers with this personal presentation by representatives of the school. However, after a presentation in Long Beach, other commitments and more urgent undertakings hindered going forward with the project. In lieu thereof a script for a 20 minute movie has been prepared for filming during the fall of 1962. This very enlightening film is intended for the Training Films library so that it can be shown on deployed ships to make more young officers aware of the postgraduate education programs which are available and what they mean to them as individuals and to the Navy.

There has been vigorous faculty recruitment through the past months. Some 25 new faculty members of the highest scholastic achievement will have been added for the school year beginning in August 1962. Seventy members of our civilian staff have served the school for more

than ten years. The educational and professional standing of the entire group, in degrees earned, research undertaken, books and articles published, and the like, compare favorably with the most outstanding civilian universities of this country. Two of our department chairmen, Professors Giet and Coates, who have given a lifetime of devoted and meritorious service to the school and the Navy, relinquished their chairs at the end of the school year but are remaining in their teaching posts. Appointees to these respective chairs, Professors Rothauge and Bell, who have been on the staff for a dozen years, are men of recognized competence and status in academic circles.

This year saw the establishment of the department of Operations Research, with Professor Oberbeck named as chairman. The Post-graduate School has been a leader in this field since 1951. In 1955 there were 4 students specializing in this area. This past year there were 25 students; next year there will be 45. The increasing need for Navy people who are capable of using the Operations Analysis approach is now widely recognized and has brought about the change to full departmental status.

Changes in concept and emphasis have also brought about a change in designation of our Meteorology curricula. The new designation is that of Environmental Sciences Curricula which is a more fitting term, as the reorientation of our thinking enlarges the milieu of the Navy to include sea, air, and space. This reorientation is already causing us to plan in terms of an environmental science laboratory as an addition to our school facilities.

Realization of such a vision, however, is probably some years away since this year we were still justifying to a staff group from the House Appropriations Committee the need for the Astro-Aeronautical Propulsion Laboratory complex which has been included in our construction plans since the school was moved to Monterey. Approval for release of the funds for this laboratory was finally achieved and the ground breaking ceremonies were accomplished just four days before the close of the fiscal year.

A glance at the Special Events Calendar in this report will disclose the increasing popularity of our school as a site for technical and professional meetings. We are glad to welcome such visitors as the Federal Bar Association, the American Rocket Society, American Chemical Society, and the others listed, because these meetings

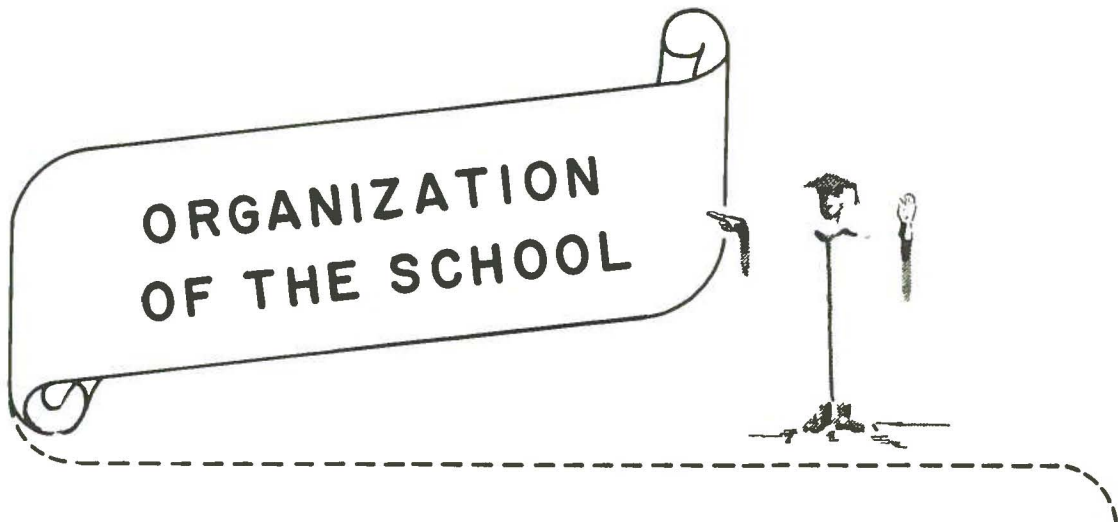


lead to an increased awareness and appreciation of our facilities and programs by many individuals of stature not only within their own groups but nation-wide.

Probably one of the most important developments of the past year was planning for the complete reorganization of the Postgraduate School. The three component schools, Engineering, General Line and Naval Science, and Management had operated somewhat as a federation with each school under a director, employing different methods and procedures. Some of the divergent aspects were not always healthy, particularly in administration. There were barriers which inhibited full exchange of ideas and cross-servicing of instruction among the three schools. It had become increasingly evident that there was a need for centralization of all existing common functions in order to achieve unity. Further, it was vital that the control of all school matters become more immediately and directly responsible to the mission of the school.

A board appointed by the Superintendent in mid-November devoted practically full time to the study of the problem and made its initial report before the year's end. The recommendations were reported to the entire staff on 5 February and shortly thereafter to the Chief of Naval Personnel and his representatives. Approval in principle was given at this level; the final details were worked out, and implementation was begun on 30 March. The Administrative Command, which had been a separately identified command under a Commanding Officer, was ordered disestablished by the Secretary of the Navy, effective 1 July 1962, and its functions of administrative and logistic support were placed directly under the Superintendent where they must be for truly effective command and administration. The organizational changes were to be completely effected concurrently with the beginning of the school's fall term on 6 August 1962.

This new organization, which is outlined briefly on the pages immediately following, should achieve unity of policy, accelerate communications throughout the elements of the school, integrate more closely the naval staff and the civilian faculty, tighten the administration, and give full emphasis to the educational programs required by the sponsors and the Navy as a whole.



The new organization of the Postgraduate School, conceived, analyzed, evaluated, and finally decided upon during the early months of calendar 1962, is portrayed in the attached chart.

The Superintendent, Deputy Superintendent (formerly the Chief of Staff), and the Academic Dean, shown in the top box of the organizational chart represent the policy level - administrative and academic. The position of the Dean here symbolizes the rapport and cooperation between military and faculty, and between administrative and educational functions. The Dean formulates academic policy, maintains relations with the academic community outside, and provides faculty leadership.

The major line of authority then flows down to the educational program area, to the Director of Programs, the senior naval officer below the Deputy Superintendent, and his associate and collaborator, the Dean of Programs, a civilian faculty member holding the rank of Associate Dean. This group also symbolizes that rapport and cooperation between naval and civilian personnel responsible for the implementation of the school's programs, and between the military and academic functions. The Director of Programs is concerned predominantly with military matters and curricular functions. The Dean of Programs is concerned predominantly with academic matters and with the teaching functions of the academic departments.

Under the Director of Programs, and the Dean of Programs, to the left, are the curricular offices, and, to the right, the academic departments, representing a dual line of responsibility down to the officer students.

The eight curricular officers presented on the left are senior naval officers charged with ensuring that the curricula meet the needs of the Navy and the sponsors, and with the administration and counseling of the students. Each curriculum is coordinated with the collaboration of an Academic Associate who is a member of the faculty of the appropriate discipline.

The 12 academic departments on the right of the chart embody the faculty, both civilian and military. Each department is headed by a chairman who may have in his department both civilian and military instructors in varying proportions, from all civilians to all military, the latter in the case of the Naval Warfare Department. The department chairmen are responsible for course development, accomplishing academic objectives, and leadership of the faculty within their department.

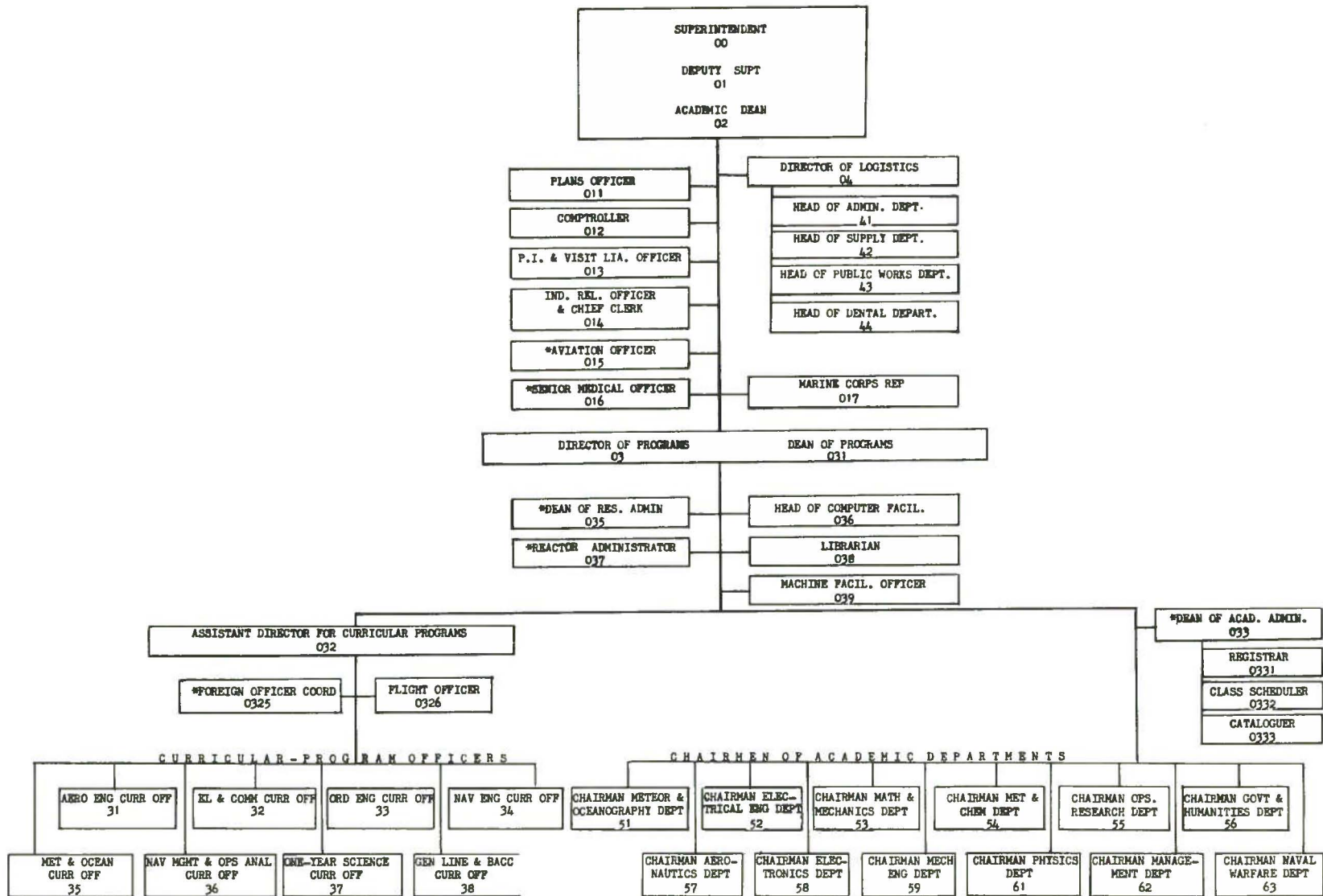
There are certain staff functions which come directly under the Deputy Superintendent. These are shown to the left under the top box of the chart. The new Director of Logistics, now a staff officer (replacing the Commanding Officer, Administrative Command) is shown to the right under the Deputy Superintendent. This Director of Logistics has under him an Administration Department, Supply Department, Public Works Department and Dental Department.

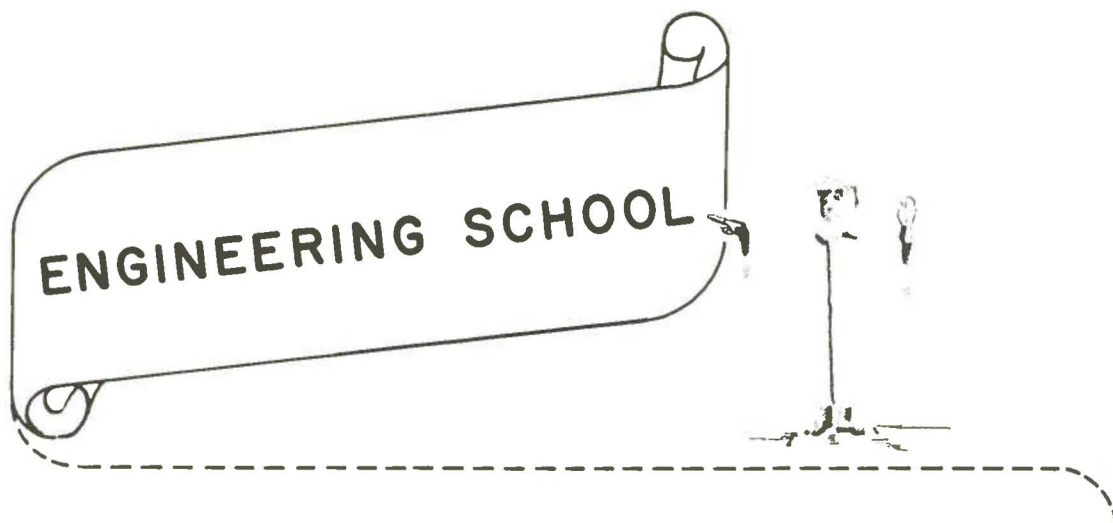
There are also several staff functions which are logically placed under the Director and Dean of Programs because their responsibilities are related directly to instruction and academic support. Here are found the Dean of Research Administration, and the Nuclear Reactor Administrator, both faculty members with compensating reduction in hours of teaching; the Head of the Computer Facility; and the Librarian.

Between the Director of Programs and the eight Curricular Officers is the Assistant Director for Curricular Programs who has general responsibility for curricular matters and for the counseling and administration of the students. He has two staff assistants, a Foreign Officer Coordinator and a Flight Officer to care for the tremendous job of scheduling and other flight matters among our many aviator students.

The Dean of Academic Administration, also a faculty member with compensating reduction of teaching, directs the work of the Registrar, the Scheduler, and the Cataloguer.

Not shown on the chart are three councils of the Postgraduate School. The Postgraduate School Council, composed of the Superintendent, Deputy Superintendent, Academic Dean, Director of Programs, and the Dean of Programs, considers policy matters, reviews administrative and academic progress to ensure high standards and fulfillment of the mission of the school, and recommends candidates for appointments to positions of deans and department chairmen. The Academic Council is composed of the Academic Dean as chairman, the Director of Programs, the Dean of Programs, Assistant Director for Curricular Programs, the chairman of each academic department or his designated representative, the chairman of the faculty scholarship committee, and the Dean of Academic Administration who acts as secretary. This Academic Council considers curricula for degree credit, considers students for degree candidacy, recommends student candidates for degrees, and establishes scholastic standards. The third group not shown is the Research Council which reviews and selects proposals for research projects which are submitted by members of the faculty.





The Engineering School commenced Fiscal Year 1962 at a modest pace. The Selection Board of the preceding winter had fallen considerably short of quotas. During the spring, we canvassed all One-Year Science selectees and when they arrived in late July, we were able to place about one-half of the 120 into regular two-year curricula. Even with this boost, however, first year enrollments in August 1961 totalled only 299 compared to last year's figure of 424.

At the annual Monterey Conference in the fall of 1961, the decision was made to radically increase the number of One-Year Science selectees and to order all of them in the following March (1962). A large number was selected, but detailing problems were such that only 125 reported in March. Although this number is not itself impressive, the reporting date is considered significant. In their first two terms (March to August) these officers had the unprecedented opportunity to refresh themselves and make up undergraduate deficiencies and at the same time to reacquire study habits and attune themselves to academic routines. The school, in the meantime, had an opportunity to evaluate them academically and, to some extent, aid in motivating them towards more rewarding curricula. This scheme holds much promise and we hope that it can be continued for larger numbers in the future.

Another highlight of the year was a faculty recruiting drive in the late winter and spring. In anticipation of increased enrollments in the forthcoming year, almost 30 new members were added to the civilian faculty at the year's end. The academic achievements of this sizable increment are impressive and may be looked upon as a fine indication of our stature in the academic world.

Highlights in specific curricular areas follow below.

### AERONAUTICAL ENGINEERING

The Aeronautical Engineering Curricula continued to develop the basic engineering sciences concerned with the flight vehicle and the force fields in its environment. Aeronautics is used as a sufficient name for this science with no implied limit to air, altitude, speed, or to the kinds of force fields in this space, but with definite concern for the engineering requirements of the vehicle therein.

The most significant development affecting these curricula during the past year has been the start of construction on the Astro/Aeronautical Propulsion Laboratories under a total assigned budget allocation of \$2,463,000. Ground breaking ceremonies and commencement of work by the contractor occurred during the week beginning 18 June 1962, with completion anticipated before the end of Fiscal 1963. Culminating more than 15 years of planning and budget development into MilCon Project S-139, these laboratories will put the Postgraduate School at the forefront of engineering instruction in propulsion systems. The laboratories are a complex of five buildings housing facilities for aerodynamic and thermoelastic investigations of turbines and compressors and test cells for turbojet, turboprop, solid rocket and liquid rocket engines and propellants.

The aeronautical curricular system continues to be based on the flight vehicle and includes sub-systems concerned with guidance, control, structure and propulsion of the vehicle, whether it be an airplane, a missile, or a satellite. Organization of the curricula to the best advantage of the broad potentialities of the new laboratories is now under way. These potentialities extend from applications on operational vehicles of the present to space and astronautical applications of the future. With the development of the laboratories, the capacity for third year education at Monterey will increase, but coordinated programs with top civilian universities will also continue.

The quota of officers entering the Aeronautical Engineering Curricula in August 1961 (41) again failed to meet either the desired numbers or the desired quality of academic records. The arrangement with the USMC, whereby the USNPS will review the transcripts of Marine Corps candidates, should aid in overcoming the quality factor insofar as Marine Corps officers are concerned.

At the June 1962 graduation, 36 officers (33 Navy and 3 Marine Corps) received Bachelor of Science degrees in Aeronautical Engineering. One Marine Corps officer received a certificate of completion. Of the above 36 officers, 18 naval officers will continue their studies for an additional year, 13 at civilian institutions and 5 at the Postgraduate School. In addition, 6 officers (4 Navy and 2 Marine) were continued in a 3-year program at the Postgraduate School as candidates for a Master of Science degree. Also at the June 1962 graduation, 6 officers (5 Navy and 1 Marine) received Master of Science degrees in Electrical Engineering (Avionics) and 4 Navy officers received Master of Science degrees in Aeronautical Engineering.

### ELECTRONICS AND COMMUNICATIONS ENGINEERING

Both the Electronics and Communications Engineering Curricula are based on a common six-term core with a subsequent selection by the student of specialties from the areas of Information and Control Systems, Underwater Acoustics or Advanced Electronics. Those students in each curriculum who qualify academically and who can be made available, are selected by the Chief of Naval Personnel for a third year of studies leading to a Master's degree in Engineering Electronics. This program, in effect since 1959, has proven effective and flexible to the changing needs of the Navy in this time of innumerable technological advances in the field, and no major changes were made in curricular content this year. Students entering with advanced technical background are allowed the privilege of taking accelerated courses of study. Included in this category are specially selected Civil Engineer Corps officers who follow a six-term curriculum leading to a Master's degree in Engineering Electronics.

A notable achievement during the past year has been the completion of the first part of a program to provide better laboratory facilities in the field of analog and digital computers. The Department of Electronic's computer laboratory will, when completed, provide unparalleled facilities (in conjunction with the School's Computer Center) for the study of the technical aspects of modern computer technology.

The student loading remained approximately the same as in FY 61, with approximately 160 students enrolled in the Electronics and Communications Curricula. The direct input of new students was reduced considerably from the previous year, although this was compensated for to some extent by the transfer of 19 students from the One-Year Science Program to the Electronics and Communications Curricula. This



fluctuation of input is detrimental to academic planning, even though the overall load remains level. From results obtained thus far, it appears that One-Year Science transferees to this technical curricula perform about as well as direct input students. Although the two curricula (Electronics and Communications) start off with the same basic core program, officers with academically inferior qualifications continue to be ordered to the Communications Engineering Curriculum.

This fiscal year saw the first PhD in Electronics awarded to a U. S. Naval officer by the Postgraduate School.

It is anticipated that the FY 63 enrollment in the curricula will exceed 200 students, and plans are being formulated to handle this increased on-board load. The number of foreign officer students in the curricula will be increased from 3 (Canadians) for this past year to a total of 11 in FY 63, representing 7 different countries.

#### METEOROLOGY AND OCEANOGRAPHY

During Fiscal Year 1962, it became apparent that there is a growing need in the Navy for meteorological officers who have knowledge of, and facility for, the use of machine computer methods of solving weather forecasting problems. Accordingly, the Advanced Meteorology Curriculum was altered to include such courses which would enable officer students to subspecialize in numerical weather forecasting.

Student loading in the curricula was 68, a decrease of 18 from that of the preceding year. There was a direct input of only 11 students, 3 of whom were foreign students. This small input was augmented by 10 transferees from the One-Year Science Program.

Based on requirements generated by the Antisubmarine Warfare Environmental Prediction System (ASWEPS), it was determined at the BuPers/Postgraduate School conference held on 12-13 October 1961 that an Air-Ocean Environment Curriculum would be added to the courses offered by the Engineering School of the U. S. Naval Postgraduate School. The Meteorology and Oceanography Department, in coordination with representatives of the Hydrographic Office, BuPers and Naval Weather Service, developed the Air-Ocean Environment Curriculum to provide education in oceanography and meteorology with emphasis on the interaction between the atmosphere and oceans. The curriculum, to become effective during Fiscal Year 1963, includes the study of forecasting weather and sea conditions

for submarine operations, anti-submarine warfare, polar operations, surface shipping, and air operations; high speed digital computer operation and techniques are included.

### NAVAL ENGINEERING

Fiscal Year 1962 saw some major changes in the Naval Engineering Curricula. Recognizing the growing importance of nuclear power in the Navy, the two- and three-year Mechanical and Electrical Engineering Curricula were revised to provide an increased emphasis on nuclear power. These curricula now offer courses in Atomic Physics, Nuclear Physics, Reactor Theory, Nuclear Propulsion, and Reactor Instrumentation and Control. To provide an adequate background for studies in the above disciplines, additional modification to courses in the fundamental sciences such as chemistry, heat transfer, mathematics, etc., were required. The Naval Engineering Curriculum in Nuclear Power, as an option in itself, was discontinued.

Curricula now offered in Naval Engineering are: 2-year Naval Engineering (Mechanical), 2-year Naval Engineering (Electrical), 3-year Mechanical Engineering (Advanced), and 3-year Electrical Engineering (Advanced). All of the foregoing curricula are given entirely at the Postgraduate School in Monterey.

In August 1961, there was an input of 38 officer students into the Naval Engineering Curricula, a reduction of 15 from the input of the previous year. Twenty-six of the 38 officer students were direct inputs, while 12 were transferred from the One-Year Science Program. Eleven foreign officers are included in the direct input group. The August input of 38 officers gave a total student enrollment in Naval Engineering of 113 at the beginning of the academic year, compared to 140 in the previous year.

Five Naval Engineering students (3 foreign officers and 2 USN) are undertaking PhD studies in Electrical Engineering. One USN officer is pursuing a special Electrical Engineering Curriculum in the Advanced Science Program. In December 1961, LTJG HAN, Kuang-wei, Chinese Navy, was awarded the degree of Doctor of Philosophy in Electrical Engineering. He was the first Naval Engineering officer student to earn a PhD Degree at the School.

In June 1962, 54 officers were graduated from the Naval Engineering Curricula. Of these, 24 received Master of Science Degrees and

30 received Bachelor of Science Degrees .

No changes are foreseen in the Naval Engineering programs during Fiscal Year 1963.

### WEAPONS SYSTEMS ENGINEERING

The Weapons Systems Engineering curricula included the following:

- Weapons Systems (General)
- Advanced Weapons Systems (Chemistry)
- Advanced Weapons Systems (Electrical Engineering)
- Advanced Weapons Systems (Physics)
- Weapons Systems (Special)
- Nuclear Engineering (Effects)
- Operations Analysis
- Naval Academy Instructor (Weapons Systems)
- Naval Academy Instructor (Operations Analysis)

There were no major changes in curricula during the year. Continued experience with the Weapons Systems Curricula which were instituted in FY 1960 has indicated that the curricula were generally sound and properly oriented. The past year marked the graduation of the first class of Advanced Weapons Systems graduates. Competence of the graduates appeared outstanding as evidenced by the calibre of their theses, their academic records and their apparent confidence.

The August 1961 inputs into Weapons Systems Engineering Curricula were: Weapons Systems (General) - 39 USN (of which 13 were transferees from One-Year Science Program) and 2 USMC; Weapons Systems (Special) - 9 foreign officers; Operations Analysis - 23 USN (including 4 transferees from the One-Year Science Program and 1 from General Line and Naval Science School) and 3 USMC; Nuclear Engineering (Effects) - 11 USN, 12 USA, 3 USMC, 2 USAF and 1 USCG; Naval Academy Instructor - 12 USN. These inputs compared to that of August 1960 show a gain of 7 USN in Operations Analysis and a loss of 47 USN in Weapons Systems.

Of the August 1961 input into Weapons Systems, 18 students were recommended for the proposed quota of 30 in the Advanced Weapons Systems Curricula, and 14 of the 18 were approved. Two foreign officers, one Korean and one Chinese, who enrolled in 1960, were recommended and approved for continuation of their program for a third year leading to a Master's degree in physics.

In the Operations Analysis Curriculum, one first-year student was approved for the Advanced Science Program. Two first-year students were approved for the Doctoral Program. Three of the graduating students were nominated and approved by BuPers for a third year of advanced work in Operations Analysis; one of these officers was ordered to Stanford University to continue his education in Operations Research to the doctorate level.

The quality of input into the Nuclear Engineering (Effects) Curriculum continues to be a matter of concern. Of the 1960 input of 29, 3 were disenrolled and only 50% of the remainder received a Master's degree. Four of the class enrolling in 1961 have been disenrolled and it is estimated that less than 50% of the remainder will qualify for a Master's degree. Recommendations for minor curricular changes for the class starting in August 1962 were approved by the Chief, Defense Atomic Support Agency. Approval in principle was obtained for permitting students who do not do research in connection with a thesis (non-M.S. Candidates) to elect one of several optional sequences in related fields.

The following program changes for FY 1963 are under consideration:

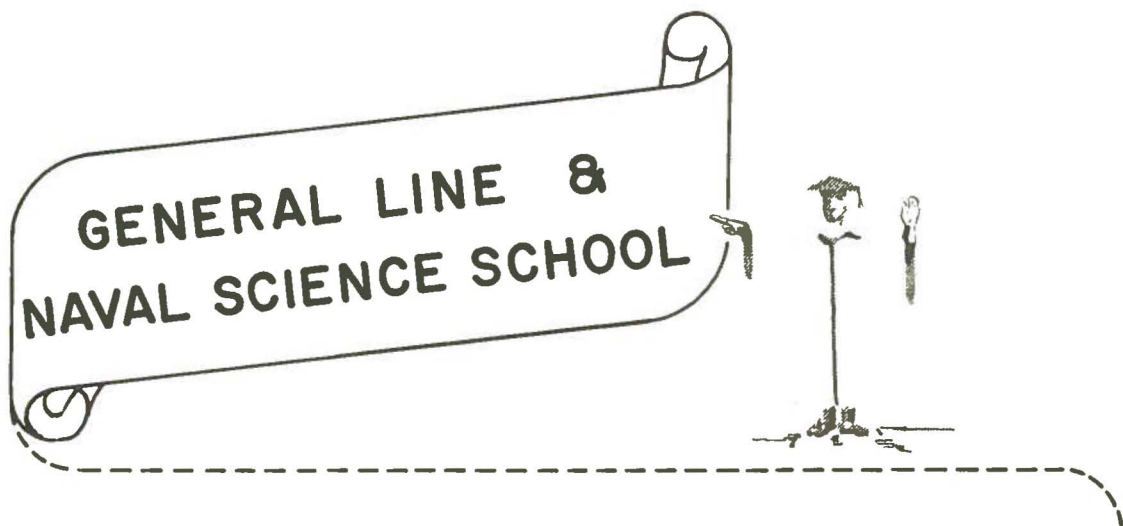
- (1) Revise Advanced Weapons Systems program to include programs in Materials Science, Electronics and Underwater Physics.
- (2) Continuation of the Nuclear Engineering (Effects) Curriculum for a third year in related fields for outstanding students.
- (3) Transfer cognizance of Operations Analysis curricular matters to the Navy Management and Operations Analysis Curricular Officer incident to the reorganization of the Postgraduate School.
- (4) Enrollment of USA and USAF officers in the Operations Analysis Curriculum.

## ONE-YEAR SCIENCE

In August 1961, 103 officer students reported to the One Year Science Curriculum in contrast to the 88 students who reported in the original August 1960 "pilot" group. Since many students possessed fine academic backgrounds and since many were available for postgraduate education for more than one year, 70 officers were immediately enrolled in two-year technical curricula. The remaining group of 33 students continued in the One Year Science Curriculum and were graduated in June of 1962, with 1 officer receiving a BS Degree in Physics, 4 receiving BS Degrees with Majors in Mathematics, and the remaining officers receiving Certificates of Completion.

During the Fall of 1961 a decision was made to take an additional input to the One Year Science Curriculum commencing in March, 1962. With this input, the idea was originated of placing officers with good academic background and more than one year availability into a two term review curriculum with eventual transfer to two-year technical curricula in August 1962. Of the 125 students entering in March 1962, 78 were placed in this two-term review curriculum. In view of past experience with the varied academic backgrounds of the One Year Science inputs, it was decided to offer three curricula instead of placing all students in one curriculum as in the past. In accomplishing this, the first curriculum was tailored for students with high academic backgrounds, the second curriculum for those with average academic backgrounds, and the third for those with poor academic backgrounds.

For FY 1963 it is planned to add additional curricula to the One Year Science Program to better meet the academic backgrounds of students. Those officers entering with exceptionally good academic backgrounds will be individually scheduled to permit increasing their educational level as much as possible in the time available.



The General Line and Naval Science School offered three separate programs during fiscal year 1962: the 9-1/2 month General Line program; the Bachelor of Science program; and the new Bachelor of Arts program. The General Line Curriculum continued to undergo constant review and revision as a means of keeping the course content current with changing methods and material in use in the Fleet.

The General Line curriculum, touching as it does on every phase of naval operations, is included as the Naval Professional area of both the Bachelor of Science and Bachelor of Arts curricula. By this means, every student enrolled in the Baccalaureate programs is given the opportunity to improve himself professionally by completion of the General Line curriculum while at the same time earning a Baccalaureate degree.

In addition to the Naval Professional subjects mentioned above, baccalaureate students also receive those fundamental arts and science subjects which every naval officer should have. The curriculum leading to an undesignated Bachelor of Science degree continues to be divided among the arts, sciences and naval professional areas as follows: Naval Professional - 25%; Science/Engineering - 55%; Government and Humanities - 20%.

The Bachelor of Arts curriculum received its first student input in August 1961 and forms a major addition to the Baccalaureate program. This curriculum reverses the emphasis on science and is divided among the academic areas as follows: Naval Professional - 25%; Government and Humanities - 55%; Science/Engineering - 20%.

This new curriculum leads to a major in Political Science with a strong emphasis on International Relations. The Bachelor of Arts curriculum was formally accredited by the Western College Association for a three year period following an inspection by the accreditation committee.

Enrollment in the General Line curriculum during fiscal year 1962 was 122, as compared with 198 during the previous fiscal year, along with an increased enrollment in the Bachelor of Arts program, which had its first input this year, and to the One Year Science program, which had an increased enrollment during fiscal year 1962. Enrollment of foreign students dropped from a fiscal year 1961 input of 47 to an entering number of 32.

The General Line program also provided a means of qualifying for the Baccalaureate programs those officers of the Navy without any college background. During the 1962 fiscal year, 28 such students were transferred to the Baccalaureate programs under completion of the General Line program. Of these 28, the Bachelor of Science program received 19 and the Bachelor of Arts program 9.

In addition to the transfers mentioned above, a total of 162 officers enrolled in the Baccalaureate programs, including 7 transfers from the One Year Science program. This is a marked increase over the 1961 fiscal year input of 101 students. The Bachelor of Science program received 94 students with the remaining 68 being assigned to the Bachelor of Arts program.

During fiscal year 1962, a total of 91 officer students and 8 staff members enrolled in the Baccalaureate program received Bachelor of Science degrees. Of those completing their undergraduate studies, 11 graduated with distinction, and 6 graduated with a major in Mathematics.

A summary of input by programs for fiscal year 1960 through 1962 follows:

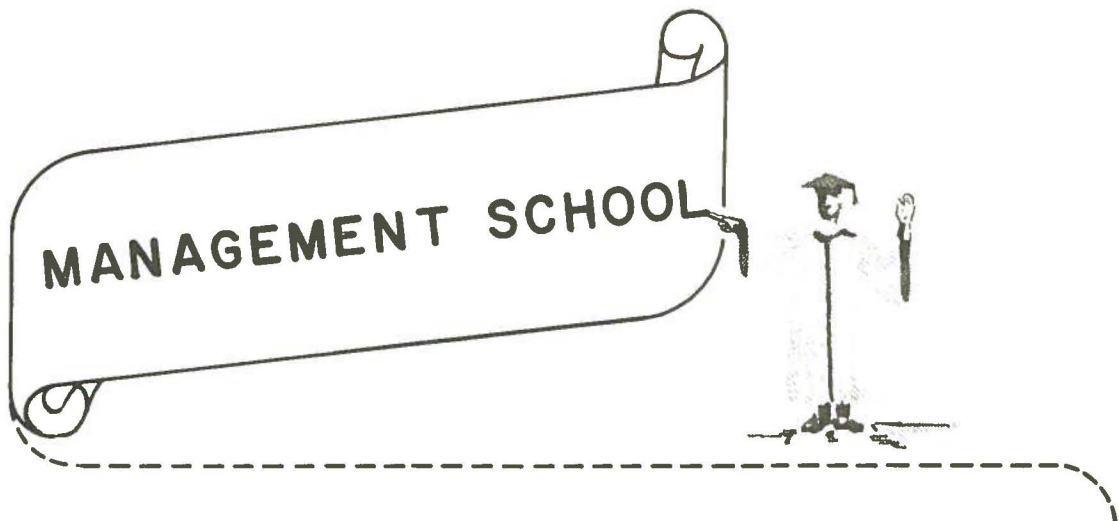
BACCALAUREATE PROGRAMS

	<u>FY1962</u>		<u>FY1961</u>	<u>FY1960</u>
	<u>BS</u>	<u>BA</u>	<u>BS</u>	<u>BS</u>
Input from BuPers	88	67	86	100 (approx)
Input from General Line Prog	19	9	15	
Input from One Year Science Prog	<u>6</u>	<u>1</u>	—	—
	113	77		
Grand Total	<u>190</u>	—	<u>101</u>	<u>100 (approx)</u>

GENERAL LINE PROGRAM

Input from BuPers	90	151	265
Foreign Officers	<u>32</u>	<u>47</u>	<u>44</u>
	122	198	309





With the close of the 1962 fiscal year, the Navy Management School completed its sixth full year of operation, the second in which it has conferred the Master of Science in Management degree. Graduates of the School now total 481, 301 of them in the five-month courses given prior to FY 1961.

The ten-month curriculum inaugurated in FY 1961 integrated the functional fields of Management into "core" courses and "elective" courses. The "core" of required courses comprises about 80% of the total curriculum credit hours. Elective courses stem from the "core" courses and provide flexibility to adapt to individual interests of the students, as well as offering limited specialization in fields of interest to various supporting agencies. This year a new elective course, *Military Planning*, was incorporated into the curriculum. This course concerns itself with the planning functions of the Department of the Navy at the seat of government.

In the second class of the 10-month curriculum, 87 Master of Science degrees, 3 Bachelor of Science degrees and 4 Certificates of Completion, were awarded. The following officer designators were included in the class of 1962: 1100 - 21; 1310 - 26; 1610 - 1; 2300 - 3; 2900 - 2; 3100 - 29; 5100 - 5; USMC - 5; USCG - 3; Total - 95. In August 1962, the enrollment in Navy Management will number 95 officers of the Navy, Marine Corps and Coast Guard.

The faculty of the Navy Management School continues to provide instruction in Economics for the students of the Bachelor of Science and Bachelor of Arts curricula of the General Line and Naval Science School

and in Economics and Organization and Management for students of the One-Year Science curriculum in the Engineering School.

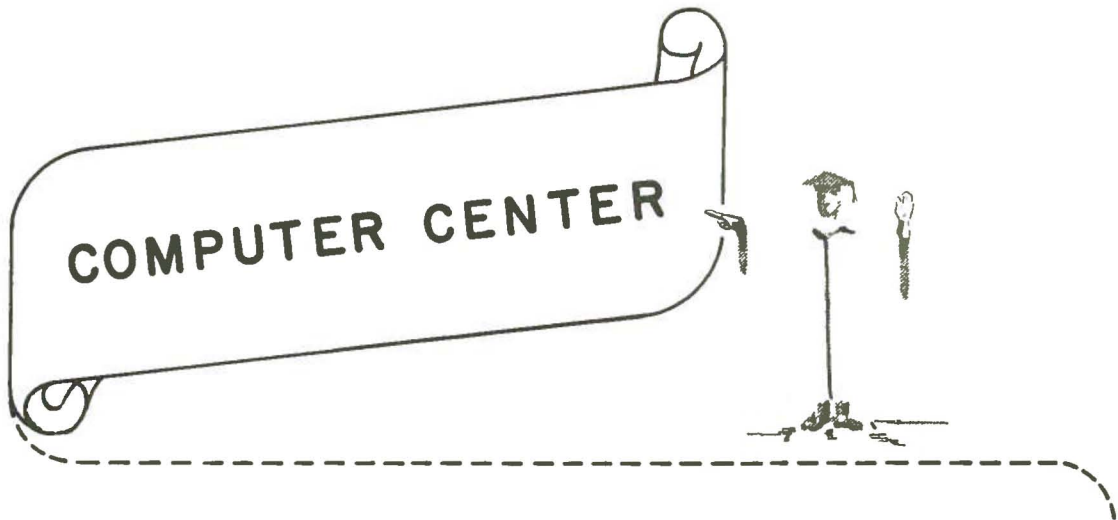
Steps were taken during FY 1962 to strengthen the faculty by the addition of one professor holding a DBA degree from the University of Washington, and two associate professors, an MBA degree from the University of Chicago working on his doctorate and a PhD from Massachusetts Institute of Technology. Two military instructors were also added to the faculty, both with the rank of Commander, one holding an MS from George Washington University and the other, an MEA and an MBA from the same institution.

The course "Elements of Management" was conducted for 4 weeks during the summer period. It was attended by 153 officers from the Engineering School, 11 from the General Line and Naval Science School and 42 on TAD from various Naval activities. The course consisted of classroom instruction and daily seminars. As of the close of Fiscal Year 1962, 604 officers from the Engineering School, 11 from the General Line and Naval Science School and 232 officers on TAD have completed the summer sessions.

The practice of directing a periodic letter to graduates to enable us to evaluate their progress and the service value of our curriculum, and the requirement introduced in 1958 for research projects by individual students on problems of moment facing naval executives, have been continued. Fifteen of the papers submitted this year were considered of such quality that they merited forwarding to other naval activities for which they would hold particular interest.

During the academic year the staff and student body visited, on field trips, International Business Machines of San Jose, California; Henry J. Kaiser Company, Oakland, California; Lockheed Missile and Space Division, Sunnyvale, California; and Standard Oil Company of California, San Francisco. The companies gave generously of their time and hospitality, and this program proved very beneficial in furtherance of our educational goals.

Additionally, the school was host to many speakers from the military services, as well as from the fields of education and industry, in lecture and seminar sessions throughout the academic year. The school has been most fortunate to receive the generous assistance and good-will of the many people and activities who contributed their services over the year.

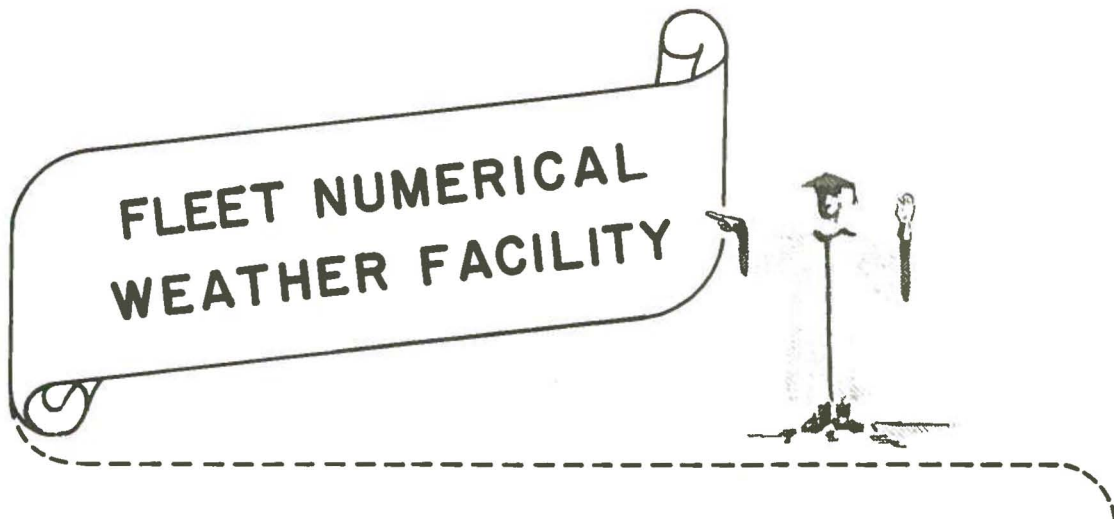


The School owns, or has access to, the following digital computers: CDC 1604, IBM 1401, two CDC 160's, and an NCR102A. These machines, excluding one CDC 160 in the Electronics Department, are all situated in the Computer Center. The CDC 1604 was made available to School users on a full-time basis in October 1961 when Fleet Numerical Weather Facility (FNWF) transferred operations to their newly acquired computer. Use of the IBM 1401 system by the School was made possible through the generosity of FNWF until July 1962 when the rental was assumed by the School. Negotiations have been started for its purchase in FY 63.

The Computer Center, thus equipped, is the focal point of computer activity for the entire School. There is widespread and increasing interest in the various academic departments in the use of computers as research and instructional tools. In many curricula great emphasis is placed on the role of the digital computer in solving problems in the areas of science and engineering, simulation (including war gaming) and real-time control. Both CDC 160 computers are connected to the CDC 1604 in a satellite mode thus providing an environment in which to study and develop experience in machine-machine relationships such as encountered in the NTDS and the operational control centers. The School offers many courses covering the operation, programming and applications of digital computers using the excellent facilities of the Center. Most students are exposed to computers at some time during their degree program.

The year saw a great increase in the utilization of the computers largely because of the introduction of key-punching and computer

operating services. The Center schedules operational runs during the day to facilitate student and faculty use of the CDC 1604, particularly. It is interesting to note that 45 of the 101 Master's theses in the Engineering School made heavy use of the CDC 1604. The staff of the Center continue to provide a consulting service to students and faculty in programming and problem formulation. In addition, their efforts are concentrated towards developing and maintaining a good library of programs and subroutines, improving the existing programming systems and generally creating a suitable laboratory environment for computer users. Significant changes of a programming nature were (1) the introduction of SCRAP--developed at the School--as an assembly language, (2) the extensive use of FORTRAN, approximately 65-70 percent, and (3) the availability of NELIAC. The staff, all civilian, reached the maximum number of twelve during the year.



Activities of the Fleet Numerical Weather Facility have expanded greatly in the past year, particularly since the purchase of a CDC 1604 Computer in October 1961 for exclusive use of the activity. Prior to that time, the CDC 1604 belonging to the Naval Postgraduate School was shared on an equal time basis between Fleet Numerical Weather Facility and the Naval Postgraduate School. The arrival of the new CDC 1604 permitted rapid expansion of both research effort and the production of an increased volume of products for the operating forces. In addition, the presence of two computers provided 100 per cent reliability in meeting operational commitments.

#### NEW FACILITIES

Two additional remote installations enable high-speed data transmission to be made on an operational basis to the Fleet Weather Central, Suitland, Maryland, and to CINCLANTFLT Headquarters in Norfolk. These installations, and also the installation at the Pacific Missile Range, are now equipped with line drawing devices which permit complete hemispheric charts of weather and oceanographic analyses and forecasts to be transmitted via dial telephone line in less than 5 minutes.

#### NEW PRODUCTS

A variety of new meteorological and oceanographic analyses and forecasts have become operational within the past year, including the first computer produced forecasts of oceanographic mixed layer depth and sea surface temperature. The mixed layer depth forecasts have been used operationally by fleet units since August 1961.

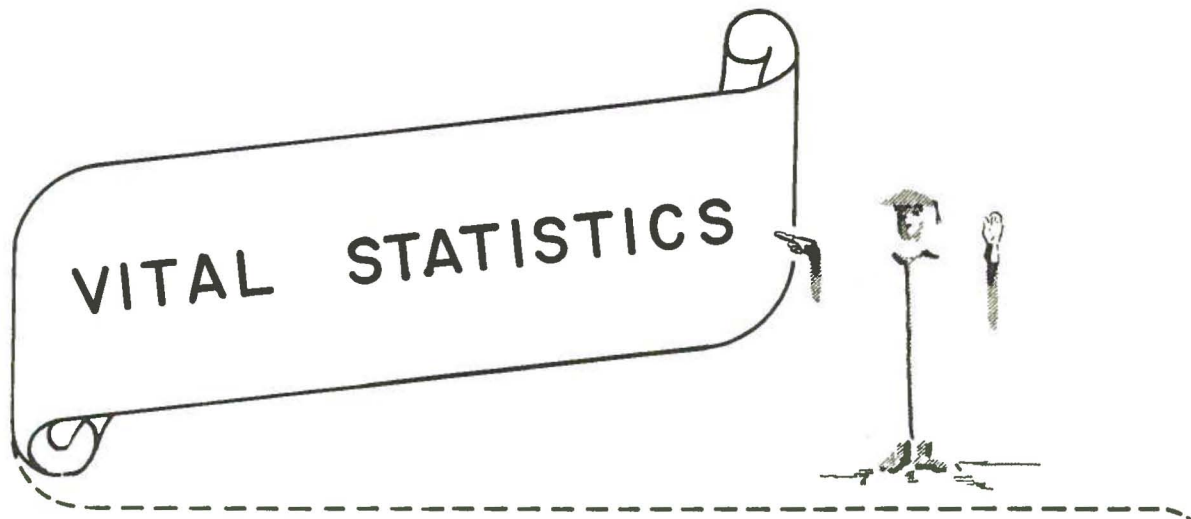
On the premise that a product is of greatest value to a consumer when it is tailored to his direct needs, a rapidly increasing volume of analyses and forecasts is being sent to various fleet and shore activities in a variety of forms. A total of 400 specialized messages are currently transmitted daily.

### SPECIAL PROJECTS

Fleet Numerical Weather Facility supported several special projects during the past year, including (1) ocean wave forecasts for Project Mercury, (2) ocean wave, mixed layer depth and sea surface temperature forecasts for JTF 8, (3) oceanographic and meteorological forecasts for Operation Swordfish and (4) hourly forecasts of ocean wave conditions at specific missile impact areas for the Pacific Missile Range.

### AWARD

The Fleet Numerical Weather Facility won the Naval Weather Service Outstanding Contribution Award for 1961.



POPULATION

<u>STUDENTS</u>	<u>FY'60</u>	<u>FY'61</u>	<u>FY'62</u>	<u>FY'63</u>	<u>FY'64</u>
				--(Planned)--	
<u>MONTEREY</u>					
Technical Curricula	685	767	706*	730/	1088/
One-Year Science		20	161**	288	205
USNA Instructors		12	12	25	35
General Line	360(1)	254(1)	150(1)	90***	90**
BS and BA	192****(1)	196****(1)	262(1)	254	225
Management	79	88	94	101	120
Totals	1316	1337	1385	1488	1763

- / 562 Navy; 168 other sources; X numbers from 1-yr. Science to be reassigned to
- // 920 Navy; 168 other sources. fill technical quotas when possible.
- \* Includes 553 Navy; 97 other U. S. officers; 56 Foreign
- \*\* 2 attrition; figure includes 125 entering March 1962
- \*\*\* Includes 40 officers of foreign navies
- \*\*\*\* BS program only
- (1) These figures represent average population on a 10 month basis.

<u>CIVILIAN UNIVERSITIES</u>	260	246	295	310	357
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<u>STAFF AND FACULTY</u>					
Officers	120	128	135	128	
Civilian Faculty	133	146	160*	176**	187**
Enlisted	266	280	284	296	
Civil Service(graded and ungraded)	290	290(312)/	316	351	
			(334)/		

- \* 149 on board; figure printed is allowance
- \*\* Allows 11 for research
- \*\*\* Allows 12 for research
- / First figure is on board count; figure in parentheses is allowance.

CERTIFICATES AND DEGREES AWARDED

	<u>Cert</u>	<u>BS</u>	<u>MS</u>	<u>PHD</u>	<u>Total</u>
Engineering School	56(1)	236(2)	121(3)	2(4)	415
General Line & Naval Science School	160(5)	92(6)			252
Management School	<u>4(7)</u> 220	<u>3(8)</u> 331	<u>87(9)</u> 208	<u>2</u>	<u>94</u> 761

- (1) 52 USN(includes 12 special 1-year students prior to reporting to USNA as instructors);  
1 USMC, 3 Foreign.
- (2) 14 undesignated (13 USN; 1 USMC)  
36 Aeronautical Engineering (33 USN; 3 USMC)  
44 Engineering Electronics (36 USN; 6 USMC; 2 USCG)  
13 Communications Engineering (9 USN; 1 USMC; 3 USCG)  
30 Meteorology (26 USN; 2 USMC; 2 Foreign)  
60 Electrical Engineering (56 USN; 4 Foreign)  
14 Mechanical Engineering (10 USN; 4 Foreign)  
3 Nuclear Science (USN)  
22 Physics (14 USN; 2 USMC; 5 USA; 1 USCG)
- (3) 4 Aeronautical Engineering (USN)  
18 Electrical Engineering (15 USN; 1 USMC; 2 Foreign)  
23 Engineering Electronics (18 USN; 4 USMC; 1 Foreign)  
14 Meteorology (11 USN; 1 USMC; 2 Foreign)  
28 Physics (19 USN; 7 USA; 1 USAF; 1 Foreign)  
14 Mechanical Engineering (11 USN; 3 Foreign)  
20 Undesignated (18 USN; 2 USMC)
- (4) 1 Electrical Engineering (Foreign)  
1 Communications Engineering (USN)
- (5) 118 USN; 42 Foreign
- (6) All USN; 86 undesignated, 6 Mathematics; all officers receiving these degrees also  
receive certificates of completion of the General Line curriculum.
- (7) USN (1SC; 1NC; 1 MSC; 1 Line)
- (8) USN (2 Line; 1 SC)
- (9) 79 USN (46 Line; 25 SC; 5 CEC; 2 MSC; 1 NC); 5 USMC; 3 USCG



CIVILIAN UNIVERSITIES

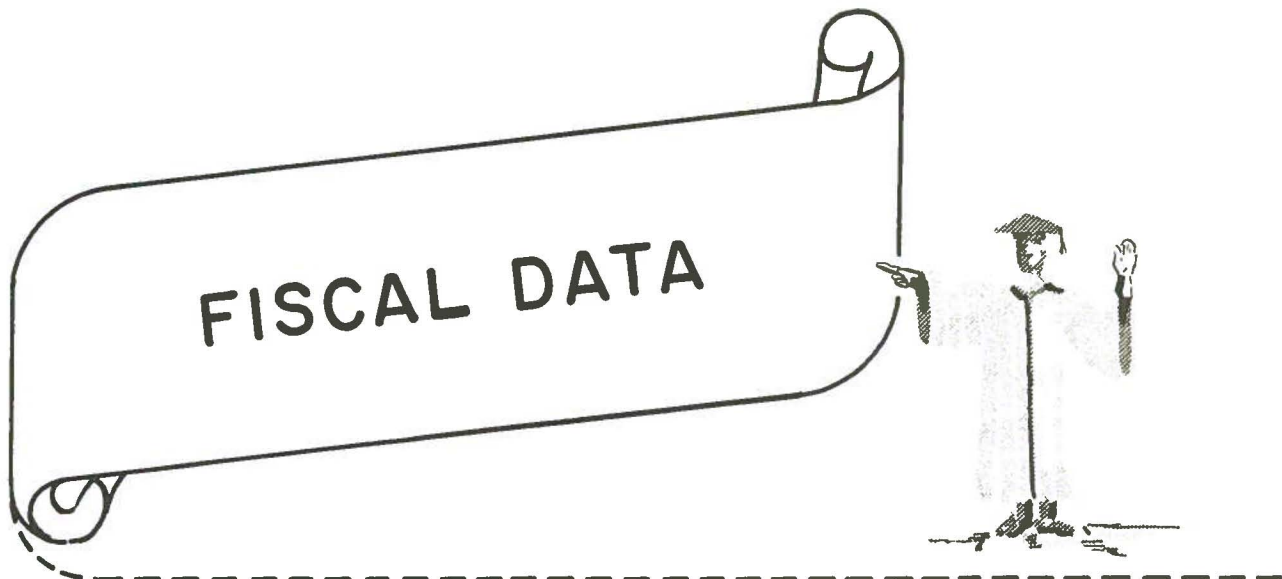
<u>INSTITUTION AND AREA OF STUDY</u>	<u>Continuing FY 63</u>	<u>Completed FY 62</u>	<u>Degree</u>
American U. - International Relations	13 USN		
Brown U. - International Relations	1 USN		
California Institute of Technology JLOASEP Aeronautical Engineering	1 USN 1 USN	2 USN	Aero Eng
University of California (Berkeley) JLOASEP Advanced Science (Hydrodynamics) International Relations Naval Architecture	1 USN 6 USN	2 USN 3 USN 1 USN	MA
University of California (LA) Advanced Science (General Physics)	1 USN	1 USN	
University of California (San Diego) Nuclear Physics Weapons (Physics) JLOASEP	1 USN 1 USN 1 USN		
Case - Operations Research	1 USN		
University of Colorado		1 USN	
Catholic University - Religion		1 USN	
Cornell U. - JLOASEP	2 USN		
Cranfield, England - Aeronautical Engr.		2 USN	
Duke University JLOASEP	2 USN		
Florida State University - Adv. Oceanography	1 USN		
George Washington University USNA Instructors Financial Management	10 USN	18 USN 2 USMC	MBA
Harvard University Business Administration International Relations  Religion	3 USN 1 USN (MPA 1962)	3 USN 3 USN 5 USN	MBA MPA (Pub Adm) 1 MPA









<u>INSTITUTION AND AREA OF STUDY</u>	<u>Continuing FY 63</u>	<u>Completed FY 62</u>	<u>Degree</u>
University of Illinois			
Adv. Civil Engineering (Structures)	3 USN	2 USN	MSCE
Applied Mathematics	1 USN		
State Univ. of Iowa - Adv. Sci. (General Physics)		1 USN	MS
Iowa State University			
JLOASEP	1 USN		
Aeronautical Engineering		2 USN	MS (NucE)
Johns Hopkins University - Adv. Sci. (NucPhys)	1 USN	1 USN	MS
U. of Kansas - Petroleum Management	3 USN		
University of Maryland			
Adv. Sci. (Applied Math)		1 USN	MA (Math)
General Physics	1 USN		
Adv. Sci. (Physics)	1 USN		
MIT			
JLOASEP	2 USN	1 USN	DSci (Phy)
Naval Const. & Engineering	29 USN 2 USCG	11 USN 3 USCG	MS (NavE & NavEn)
Aeronautical Engineering	4 USN 1 USMC		
Adv. Sci. (NucPhys)		1 USN	PhD
Nuclear Engineering Advanced	1 USN		
University of Michigan			
JLOASEP	1 USN	1 USN	MS
Business Administration		3 USN	MBA
Adv. Civ. Eng. (Sanitary Engineering)		2 USN	MSE
Adv. Sci. (Mathematics)	1 USN	1 USN	MS
Aeronautical Engineering	4 USN		
New York University - Adv. Sci. (Applied Math)		1 USN	MS
Northwestern University			
JLOASEP	1 USN		
Transportation Mgt		4 USN	MBA
Ohio State University - Hydrographic Engr.		3 USN	
Pennsylvania State University			
Adv. Sci. (NucPhys)		1 USN	MS
Naval Engineering (Chemistry)		1 USN	
U. of Pennsylvania - Adv. Sci. (Metallurgy)		1 USN	MS (MetE)

<u>INSTITUTION AND AREA OF STUDY</u>	<u>Continuing FY 63</u>	<u>Completed FY 62</u>	<u>Degree</u>
U. of Pittsburgh - Retailing		2 USN	
Princeton University			
JLOASEP	1 USN		
Adv.Civ.Eng (Waterfront Fac)		4 USN	3 MSE 1 BSE
Aeronautical Engineering	1 USN	2 USN 4 USMC	MSE
Purdue U. - Industrial Management		2 USN	
Rensselaer Polytechnic Institute			
Management & Industrial Engr.		4 USN 2 USMC	MS(Mgt)
CivEng (Qualifying)	19 USN 8 USCG	21 USN 2 USCG	BSCE
AdvCivEng(EE)	19 USN 8 USCG	1 USN	MCE
Adv CivEng(ME)		1 USN	MS(ME)
Stanford University			
JLOASEP	1 USN		
Business Administration		6 USN	MBA
Personnel Adm. & Training		1 USMC	MA
International Relations		1 USN	
Social Science	1 USN	3 USN	MA
AdvSci(General Physics)	1 USN		
AdvSci(Applied Math)	1 USN		
Aeronautical Engineering	4 USN	3 USN 1 USMC	Aero Eng (1 USMC)
Civ Eng (Advanced Construction)		2 USN	MSCE
San Diego State University - Math & Science		7 USN	
Southern Methodist - Petroleum Adm. & Mgt.		1 USN	
U. of Tennessee - Nuclear Physics	1 USN		
U. of Texas			
Petroleum Engineering		1 USN	
AdvSci(Applied Math)		1 USN	MA(NucP)
Tufts University - Social Science	3 USN	2 USN	MA
Union Theological Seminary - Religion		2 USN	
U. of Utah - JLOASEP	1 USN		
University of Washington			
JLOASEP	3 USN		
Oceanography	5 USN	1 USN	BS
General Physics	1 USN		

INSTITUTION AND AREA OF STUDY

<u>INSTITUTION AND AREA OF STUDY</u>	<u>Continuing FY 63</u>	<u>Completed FY 62</u>	<u>Degree</u>
Webb Institute - Naval Const & Engr.	4 USN	5 USN	MS (NavArc
	148 USN	152 USN	
	10 USCG	5 USCG	
	<u>1</u> USMC	<u>10</u> USMC	
	159	167	



	62.4%	<b>LABOR</b>	<b>\$3,496,002</b>
	2.5%	<b>TRAVEL</b>	137,051
	3.4%	<b>Contracts</b>	
		<b>Printing</b>	190,601
		<b>Rental</b>	
	6.2%	<b>UTILITIES</b>	349,117
	6.7%	<b>SUPPLIES</b>	374,177
	10.7%	<b>EQUIPMENT</b>	602,192
		<b>CIVILIAN</b>	
	7.6%	<b>UNIVERSITIES</b>	424,638
	.5%	<b>Unexpended</b>	29,672
		<b>TOTAL</b>	<b>\$5,603,450</b>

## DIRECT TRAINING COSTS

	<b>LABOR</b>	<b>Faculty</b>	\$ 1,530,584	
		<b>Graded</b>	334,813	
		<b>Ungraded</b>	123,605	\$1,989,002
	<b>LABOR BENEFITS</b>			
		<b>Retirement</b>	125,132	
		<b>Pension</b>	5,412	
		<b>Health</b>	13,695	
		<b>ELIF</b>	6,403	
		<b>FICA</b>	1,346	151,988
			2,140,990	
<ul style="list-style-type: none"> <li>■ 4.2%</li> <li>■ 1.3%</li> <li>■ .5%</li> <li>■ 1.6%</li> <li>■ 5.9%</li> <li>■ 2.1%</li> <li>■ 4.0%</li> </ul>	<b>TRAVEL</b>		110,485	
	<b>RENTALS</b>		34,327	
	<b>PRINTING</b>		13,941	
	<b>CONTRACTS</b>		43,906	
	<b>SUPPLIES</b>		156,920	
	<b>BOOKS</b>		56,483	
	<b>EQUIPMENT</b>		106,418	
	<b>TOTAL</b>		2,663,477	

## CIVILIAN UNIVERSITIES

Travel	\$ 12,920
Tuition	380,350
Miscellaneous	16,037
Books	15,331
<b>TOTAL</b>	<b>\$ 424,638</b>

## OPERATION & MAINTENANCE COSTS

	<b>LABOR</b>	<i>GRADED</i>	374,633	
72.0%		<i>UNGRADED</i>	616,929	991,559
	<b>LABOR</b>	<i>RETIREMENT</i>	68,155	
	<b>BENEFITS</b>	<i>HEALTH</i>	11,155	
		<i>ELIF</i>	3,862	
		<i>UNIFORMS</i>	1,586	
		<i>FICA</i>	610	85,368
			<u>1,076,927</u>	
	<b>TRAVEL</b> (Includes movement of H.H.G)		7,738	
	<b>UTILITIES</b>		176,167	
	<b>PRINTING</b>		1,697	
	<b>CONTRACTS</b>		67,946	
	<b>SUPPLIES</b>		112,820	
	<b>EQUIPMENT</b>		<u>54,082</u>	
		<b>TOTAL</b>	<u>1,497,380</u>	

- █ 0.5%
- █ 11.8%
- █ 0.1%
- █ 4.5%
- █ 7.5%
- █ 3.6%

## BUDOCKS – FAMILY HOUSING

	<b>LABOR &amp; BENEFITS</b>	127,418
	<b>MOVEMENT OF H.H.G.</b>	13,735
	<b>UTILITIES</b>	199,295
	<b>CONTRACTS</b>	7,796
	<b>SUPPLIES</b>	36,102
	<b>EQUIPMENT</b>	<u>60,417</u>
	<b>TOTAL</b>	<u>364,763</u>

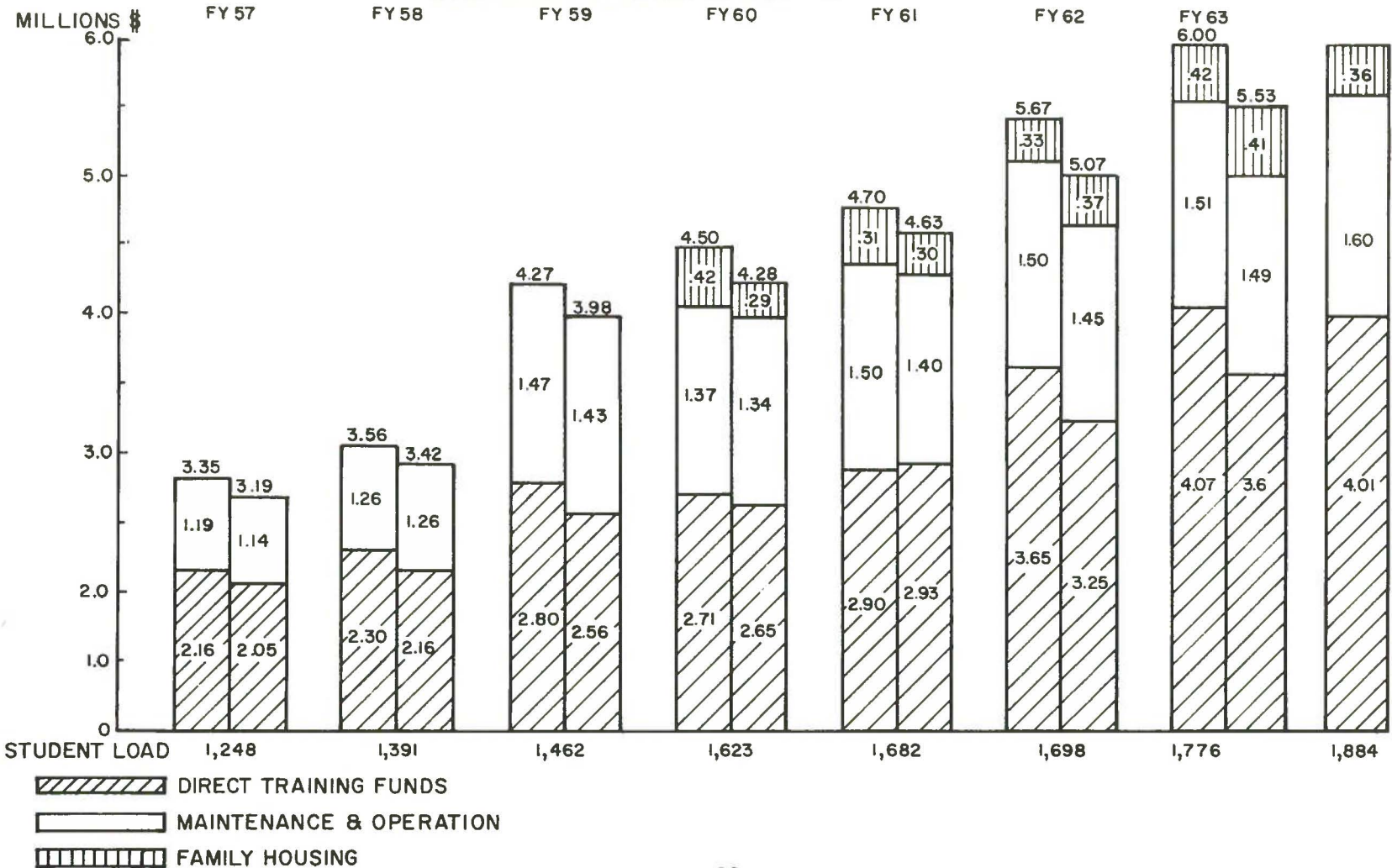
- █ 35.0%
- █ 3.7%
- █ 32.7%
- █ 2.1%
- █ 9.9%
- █ 16.6%

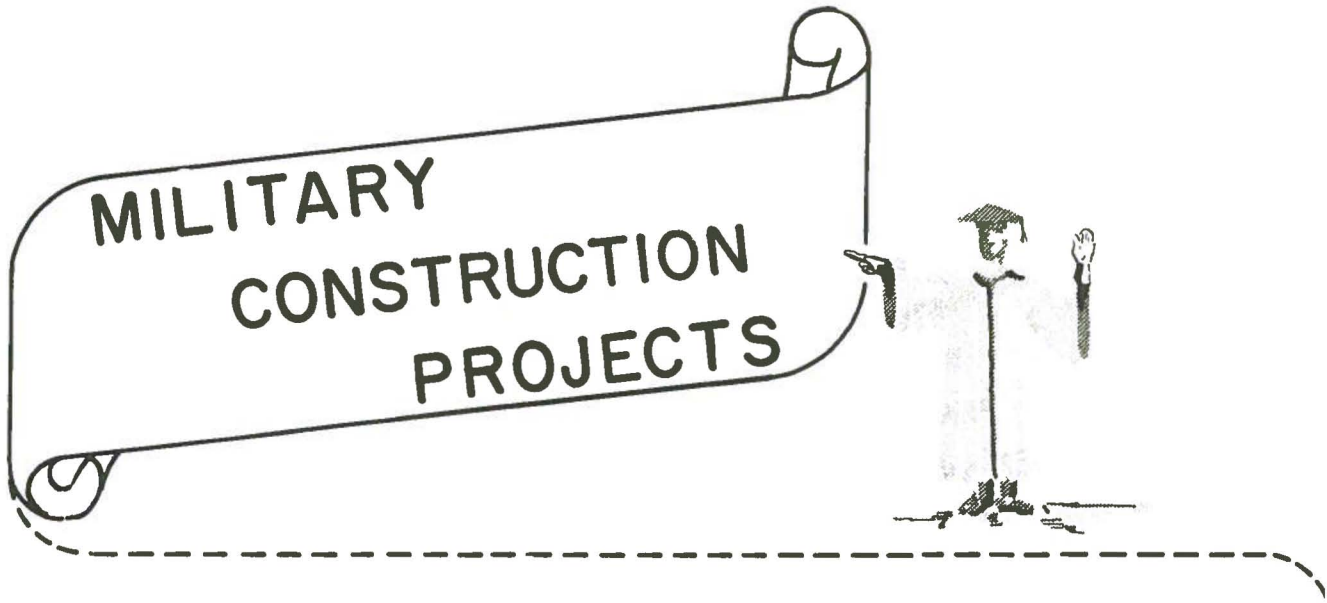
SOURCES OF FUNDS

<u>BUREAU</u>	<u>BUDGET PROJECT</u>	<u>DESCRIPTION</u>	<u>ALLOTTED THRU FY62</u>	<u>EXPENDED THRU FY62</u>
(a) <u>Major Sources of Funds of a continuing nature</u>				
BuPers	11046	Officer Training	\$ 2,932,350	\$ 2,914,615
		Coast Guard & DASA Reimb.	173,500	173,500
BuPers	36046	Operation & Maintenance	1,502,200	1,497,380
		Miscellaneous Reimbursement	79,050	79,050
BuPers	42046	Nonrecurring repairs	56,642	56,588
(b) <u>Funds for equipment</u>				
BuPers	110460PN	Training Equipment	82,500	82,498
BuShips	64257	Non-electronic repairs	2,450	2,397
(c) <u>Funds for Family Housing</u>				
BuDocks	19680	Collateral Equipment	38,000	37,296
BuDocks	26680	Movement of Household Goods	15,200	13,735
BuDocks	34680	Opr. & Maint. Family Housing	309,800	306,677
BuDocks	99680	Coast Guard Reimbursement	8,150	7,055
(d) <u>Research</u>				
ONR	10504	Foundation Research	300,000	300,000
		Warfare Analysis	25,000	25,000
BuShips	50257	Glendora	25,000	25,000
		Electronic Data Processing	50,000	50,000
BuWeps	10580	Weapons Sys. & Support	3,608	2,987



TOTAL OPERATING FUNDS  
REQUESTED VERSUS RECEIVED





Project for the Astro/Aeronautical Propulsion Laboratories (Estimated Cost \$2,463,000) was funded in FY 1961. Construction was started under Contract NBy-39189 on 26 June 1962.

The following projects for the U. S. Naval Postgraduate School are included on the Military Construction Plan FY 1964-1968 of the Chief of Naval Personnel as approved by the Chief of Naval Operations in support of the Operating Forces of the Navy:

	<u>Est. Cost</u>	<u>FY Planned for Sponsorship</u>
Additional School Facilities	\$ 3,293,000	64
Compressible Flow Laboratory	2,227,000	65
Gymnasium	200,000	66
Chapel & Chapel Educational Wing	457,000	66



1961

- |           |       |  |
|-----------|-------|--|
| July      | 25    | Captain A. L. Gurney, USN, relieved Captain J. E. Hart, USN, as Director, General Line and Naval Science School.   |
| August    | 4     | Graduation of Bachelor of Science curriculum students, General Line and Naval Science School.<br>Speaker - RADM M. E. Dornin, USN.   |
|           | 16-18 | American Rocket Society Meeting.   |
| September | 20-21 | House Armed Services Committee visit - investigation of PG officer utilization.  |
|           | 23    | American Chemical Society meeting.   |
| October   | 5-6   | Federal Bar Association - Western Briefing Conference.   |
|           | 12    | Joint Physics, Chemistry-Metallurgy and Electrical Engineering Seminar<br>Speaker: Dr. L. F. Bates, Professor of Physics, Nottingham University, England, "New Experiments on Domain Studies". |
|           | 12-16 | BUPERS - Postgraduate Education Conference.  |
|           | 17-19 | Department of Defense Postgraduate Degree Requirements - Dr. Katzenbach's meeting.   |
|           | 20    | American Meteorological Society (California Branch) meeting.   |
|           | 24-26 | Allied Officers Personnel Management Orientation.  |

November	1	Department of Operations Research established as an Academic Department of the U. S. Naval Postgraduate School. Professor T. E. Oberbeck appointed chairman of the department.
	13	ASW Demonstration, "Challenge from Below" - presented by representatives of the Commander, Training Command, Pacific Fleet.
December	13	Captain Merle F. Bowman, USN, relieved Captain Ralph Arndt, USN, as Chief of Staff.
	19	LTJG Kwang W. Han, Chinese Navy, awarded degree of Doctor of Philosophy in Electrical Engineering.
	20	Graduation of General Line Class 1961B, General Line and Naval Science School. Speaker: RADM M. E. Dornin, USN.
<u>1962</u>		
January	4	Professor G. F. Kinney appointed Chairman of Metallurgy and Chemistry Department to fill vacancy created by Professor F. L. Coonan's death.
	23-25	Western College Association Accreditation visit.
	25	Final completion and acceptance of 150 Capehart Public Quarters at La Mesa Village.
March	15	Graduation of Bachelor of Science curriculum students, General Line and Naval Science School. Speaker: VADM H. H. Goodwin, USN (Ret).
April	13	American Meteorological Society Meeting (California Chapters).
	28	American Mathematical Society Meeting.
May	1	Petroleum Institute of America (Tankship Group) visit.
	2-5	United States Air Force Systems Command Symposium.
	5	American Institute of Electrical Engineers, District 12 Meeting and Paper Contest - first place won by Professor G. J. Thaler and LTJG K. W. Han, Chinese Navy, of the U. S. Naval Postgraduate School.
	11-12	Institute of Radio Engineers - Bay Area Reliability Symposium.
	31	Combined Graduation - Engineering, Management, General Line and Naval Science Schools. Speaker: VADM Robert Taylor Scott Keith, Commander First Fleet.
June	1	Professor R. W. Bell appointed Chairman, Department of Aeronautics.

- 5-8 Nuclear Weapons Orientation Course presented by team of instructors from Nuclear Weapons Training Center, Pacific.
- 26 Ground breaking ceremonies for the four-building Astro-Aeronautical Propulsion Laboratory.
- 27-29 Space and Astronautics Orientation Course presented by a team from U. S. Naval Missile Center, Pt. Mugu.
- July 1 Disestablishment by direction of the Secretary of the Navy of the Administrative Command, U. S. Naval Postgraduate School.



GENERAL ATTENDANCE

- 17 Jan      Professor Julian Towster  
Department of Political Science, University of California  
"The Emerging Pattern of Khrushchev's Politics"
- 24 Jan      Professor Edwin Lieuwen  
Department of History, University of New Mexico  
"Castro's Cuba and Hemisphere Security"
- 14 Feb      Professor Claude Buss  
Department of History, Stanford University  
"Communist China's International Political Strategy in the Present Crisis"
- 23 Feb      Mr. J. L. Powell  
Department of Defense  
"Muscles to Missiles"
- 28 Feb      Professor Leslie Lipson  
Department of Political Science, University of California  
"France's Perpetual Crisis"
- 7 Mar        Professor Robert Scalapino  
Department of Political Science, University of California  
"Neutralism in an Era of Crisis"
- 14 Mar      Professor Gordon A. Craig  
Department of History, Stanford University  
"The Role of Diplomacy in the East-West Conflict"

- 20 Mar RADM P. D. Stroop, USN, Bureau of Naval Weapons  
"The Role of BUWEPS in Delivering a Major Weapon System to the Fleet"
- 28 Mar Captain M. W. Munk, USN, Bureau of Naval Weapons  
"Responsibilities and Functions of Aircraft Project Officers in BUWEPS and Current Aircraft Weapon Projects" - (Secret)
- 4 Apr Captain G. G. Halverson, USN, Bureau of Naval Weapons  
"Role of the Technically Trained Officer in the Navy's Missile Program" - (Conf)
- 11 Apr VADM R. B. Pirie, USN, Deputy Chief of Naval Operations (Air)  
"Importance of a Technical Education to the Naval Officer"
- 18 Apr Mr. John W. Dixon, Deputy Comptroller, Director of Systems Planning,  
Office of Assistant Secretary of Defense (Comptroller)  
"OSD Programming - Procedures and Philosophy"
- 25 Apr Captain J. H. McQuilkin, USN, Bureau of Ships  
"New Construction Underway, Plans and Trends of the Future" (Confidential)
- 2 May RADM E. J. Fahy, USN, Commander Naval Shipyard, Mare Island  
"Research on Hull, Power Plant, Sonar and Radar Detection Systems"
- 9 May LCDR Lucien Capone, Jr., Office of Naval Communications  
"Current Developments in Naval Communications"
- 16 May Captain V. P. Healey, USN, Bureau of Naval Weapons  
"The Influence of the Postgraduate Officer on ASW Research, Development,  
Test and Evaluation" - (Secret)
- 23 May RADM L. D. Coates, USN, Office of Naval Research

#### NAVY MANAGEMENT SCHOOL

- 15 Sep 1961 CAPT Emory D. Stanley, SC, USN, Commanding Officer, Naval Supply Depot,  
Seattle, Washington  
"Concepts of Future Trends in Supply Management"
- 5 Oct 1961 RADM Herschel Goldberg, SC, USN, Office of Naval Materiel  
"Navy Procurement Operations"
- 3 Nov 1961 RADM John W. Crumpacker, SC, USN, Chief, Bureau of Supplies and Accounts  
"New Developments in Supply Management"
- 8 Nov 1961 CAPT E. R. Kingman, SC, USN, Office of the Comptroller, Navy Department  
"Comptrollership and Professionalism in Financial Management"
- 17 Nov 1961 Dr. George Kozmetsky, Vice President, Amelco Incorporated  
"Managements' Role in Decision Making"

- 27 Nov 1961 CDR J. J. S. Daniel, USN Head, Programs Evaluation Branch, Special Programs Office  
"Special Projects Management"
- 7 Dec 1961 Dr. Alex Bavelas, Professor of Psychology, Graduate School of Business, Stanford University  
"Organization Theory and Communication"
- 15 Jan 1962 RADM Lot Ensey, USN, Deputy Comptroller, Department of the Navy  
"The Budget Process and Financial Management"
- 26 Jan 1962 Mr. Foster Weldon, Director of Research, Matson Navigation Company  
"Simulation of Fleet Operations"
- 9 Feb 1962 RADM Marshall E. Dornin, USN, Superintendent, U. S. Naval Postgraduate School  
"Legislative Liaison Activities"
- 9 Mar 1962 RADM Frank B. Miller, USN, Commander, Fleet Air, San Diego  
"The Navy Planning System"
- 26 Mar 1962 Dr. John M. Pfiffner, Professor of Public Administration, University of Southern California  
"Organization in the Future and the Changing Theories/ Concepts of Organization"

#### AERONAUTICAL ENGINEERING CURRICULUM

- 18 Oct RADM F. L. Ashworth, USN, Bureau of Naval Weapons  
"Status of New Aircraft" - (Secret)
- 25 Oct Mr. F. G. Morgan, McDonnell Aircraft  
"Project Mercury" - (Confidential)
- 1 Nov Commander G. H. Eamonson, USN, Pacific Missile Range  
"Air to Air Missile Systems" - (Secret)
- 8 Nov Captain R. J. Trauger, USN, Office of Naval Research  
"Current Aeronautical Research Programs"
- 15 Nov Dr. B. Kowalski, North American Aviation, Inc.  
"Future Carrier Aircraft of Interest to the Navy" - (Secret)
- 29 Nov Mr. J. T. Grey, Thiokol Chemical Corporation  
"Advance Solid Rocket Propellants" - (Confidential)
- 6 Dec Commander W. A. Schroeder, Jr., OPTEVFOR  
"Weapons Delivery Systems" - (Secret)



## ORDNANCE ENGINEERING CURRICULA

- 4 Dec 1961 Dr. J. E. Ablard, Program Chief for Chemistry & Explosives, USNOL, White Oak, Silver Spring, Maryland  
"Research Problems in Explosives at White Oak" (Secret)
- 1 Mar 1962 Dr. C. J. Thelen, NOTS, China Lake, California  
"Current Developments in Explosives and Propellants" (Secret)

## SPECIAL

- 15 Dec 1961 Mr. Don Liddell, USNEL, San Diego, California  
"Diagnostic Techniques and Automatic Fault Location in Tactical Data Systems"  
(Confidential)

## NPS CHAPTER OF THE SOCIETY OF SIGMA XI

- 31 Aug Dr. Fred Holzer, Plowshare Division, Lawrence Radiation Laboratory  
"Project Gnome: The First Plowshare Nuclear Experiment"
- 11 Oct Dr. L. F. Bates, Professor of Physics, Nottingham University, England  
"Visualization of Magnetic Processes"
- 8 Nov Dr. Gordon B. Oakeshott, Deputy Chief, California Division of Mines  
"Faults and Earthquakes in California"
- 6 Dec Dr. Wheller J. North, Research Biologist, Scripps Institution of Oceanography, La Jolla, California  
"The General Biology of Kelp Beds"
- 14 Feb Dr. Stanley L. Miller, University of California, San Diego  
"The Origin of Life"
- 21 Mar Dr. W. F. Libby, Nobel Prize Winner in Chemistry, 1960  
"Radiocarbon Dating"
- 18 Apr Dr. Rafael Dominguez, Pathological Research Department  
St. Luke's Hospital, Cleveland  
"Applications of New Scientific Techniques to Studies of the Body Functions"

## NPS CHAPTER OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

- 14 Sep 1961 Professor E. K. Gatcombe, Department of Mechanical Engineering  
"European Developments in Bearings, Gears, and Lubricants"
- 15 Nov 1961 Professor P. F. Pucci, Department of Mechanical Engineering  
"Some Aspects of Re-entry Heat Transfer Research"
- 9 Mar 1962 Professor G. Cantin, Department of Mechanical Engineering  
"Impressions of East Africa"

15 May 1962 Professor C. A. Hering, Department of Chemistry  
"Rocket Propellants"

NPS STUDENT BRANCH OF THE AMERICAN ROCKET SOCIETY

13 Sep 1961 Professor J. E. Sinclair, Department of Chemistry  
"Explosive Devices for Missiles and Rockets"

13 Feb 1962 LCDR H. E. Davies, USN  
"Missiles and Pocketry of the Operational Fleet"

6 Apr 1962 Joint meeting with AIEE, IRE (see AIEE notes below)

12 Apr 1962 Joint meeting with IAS  
Dr. W. S. McEwen, Head Chemistry Div., NOTS, China Lake, Calif.  
Explanation of Research Dept. at NOTS and showing of film  
"Soft Landing Vehicle for Lunar Exploration"

15 May 1962 Dr. C. Hering, Department of Chemistry  
"Rocket Propellants and Propulsion Systems"

17 May 1962 Joint meeting with IAS  
Dr. H. Neiderman, Atlantic Research Corporation  
"A Review of Developments in Propellants and Rockets"

NPS STUDENT BRANCH OF THE INSTITUTE OF AERONAUTICAL SCIENCES

5 Apr 1962 Mr. W. E. Mallett, Engineering Dept., Aeronautics and Missiles Division,  
Chance Vought Corporation, Dallas, Texas  
"Recent Power Plant Development"

NPS STUDENT BRANCH OF THE INSTITUTE OF THE AEROSPACE SCIENCES

18 Oct 1961 CDR Forrest S. Peterson, USN, NASA X-15 Project  
Edwards Air Force Base  
"The Current and Planned X-15 Project" - (Secret)

19 Apr 1962 Mr. Edward Williams, Project Engineer for Supersonic Transports,  
North American Aviation, Inc., Los Angeles, California  
"Mach Three Aircraft" - (Secret)

NPS STUDENT BRANCH OF THE AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

20 Sep 1961 RADM M. E. Dornin, USN, Superintendent, USNPS  
"Benefits of Active Membership in a Professional Society"

18 Oct 1961 Dr. George Thaler, Professor, USNPS  
"Presentation of Student Technical Papers"

12 Jan 1962 Mr. C. R. Day, Chief Engineer, Sacramento Municipal Utility District  
"Proposed Merger of AIEE and IRE"

6 Apr 1962 Mr. Claude Davis, Bell Telephone Laboratories, Murray Hill, N. Y.  
"Communications in Space"

NPS STUDENT BRANCH OF THE INSTITUTE OF RADIO ENGINEERS

23 Aug 1961 LT Jack R. Harris, USN  
"Interesting ASW Detection Concepts" - (Secret)

22 Sep 1961 Mr. John Gabbert, Station KPEN, San Francisco, California  
"FM Multiplex Stereo"

3 Nov 1961 Mr. Peter Sherrill, Hewlett-Packard Corporation  
"Understanding Electronic Equipment Manuals"

1 Dec 1961 Mr. Bill Eitel, President, Eitel-McCullough, Inc.  
"Design & Manufacture of High Voltage Vacuum Tubes"

12 Jan 1962 IRE-AIEE Joint Meeting (see AIEE above)

5 Mar 1962 Prof E. C. Crittenden, USNPS  
"Masers and Lasers"

6 Apr 1962 IRE-AIEE Joint Meeting (see AIEE above)

11 May 1962 Dr. Royal Weller - Joint Meeting with SF Section of IRE and Professional  
Group on Reliability and Quality Control  
"Living with Quality"



### RESEARCH AT THE NAVAL POSTGRADUATE SCHOOL

Experience in recruiting of faculty for the Naval Postgraduate School in the recent past has demonstrated a radical change from the time-honored picture of the cloistered university professor with his single-purposed dedication to teaching. A balanced division of time between teaching and research ran salary considerations a close second in recruiting negotia

Much of this change is a consequence of the increased competition during the past two decades among the industrial, governmental, and academic institutions for the man who is capable of coping with a changing and advancing technology. Today more than ever before, our university professors are spreading their efforts beyond teaching into research and consultation which ultimately contributes to the solutions of some of the world's most difficult problems

While advanced instruction of the naval officer is and will remain the School's major academic effort, opportunities for some faculty members to devote portions of their efforts to research is a definite part of the over-all program planning. This research effort leads to increased individual and institutional professional stature and enables the researcher to develop the foresight to predict and anticipate new knowledge upon which systems can be designed to maintain our national security. Furthermore, this foresight makes possible the preparation and implementation of curricular changes in anticipation of system changes. Providing research opportunity for some faculty members in turn provides a research experience for the officer students which will enable them to distinguish between genuine research and the pretense to research commonly known as "gadgeteering". Such experience prepares them to exploit their own creativity in developing, testing, evaluating, gaming, procuring, and operating systems for national security during future duty assignments.

The accompanying table shows the dollar support of the NPS research effort since FY 1956. These funds have been used to procure research material and equipment, to pay the full-time salaries of research technicians, and to pay the part-time salaries of research professors. The school's Research Council reviews proposals and recommends the sub-allotment of these funds. Proposals are supported to help individuals implement their own research programs. Experience has indicated that genuine support in terms of funds and reduced teaching loads to balance the drudgery and frustration during the implementation period of a new research program is necessary. After implementation, professors will continue their research even though assigned a full-time teaching load when such assignment becomes imperative.

HISTORY OF LEVEL AND SOURCE OF RESEARCH SUPPORT

FY	Research	Funds	Approximate Total Budget	% (Research)
	Amount	Source		
1956	\$ 30,000	ONR	\$ 3,500,000	0.9
1957	30,000	ONR	3,300,000	0.9
1958	25,000	ONR	3,500,000	0.7
1959	57,500	ONR	3,900,000	1.4
1960	55,000	ONR	4,500,000	1.8
	10,000	BuPers		
	10,000	BuOrd		
	10,000	BuShips		
1961	200,000	ONR	4,200,000	4.8
1962	300,000	ONR	4,600,000	6.5
1963	300,000	ONR	4,900,000	8.0
	91,000	SP		

Occasionally, the results of our research programs have been sufficiently pertinent and timely that we have received direct allotments from sources other than ONR to continue or expand the original modest effort. For example, with minimal ONR support during the past few years, our Operations Research Program yielded several Master's Degree theses pertinent to the Polaris System. Accordingly Special Projects will support this research during FY 1963 at the rate of \$91,000 per annum. We are confident that other research projects of equally modest beginnings will yield telling and timely results in oceanography, propulsion, plasmas, optimization of systems, management and operations analysis.

The assignments of professors to ONR supported research billets during the year was equivalent to seven full-time research professors. This by no means represents the total research effort, but that supported by ONR funds. At the beginning of FY 1963 eighteen faculty members were supported by ONR funds. Thirteen of these eighteen are occupying a research billet for the first time. This equivalent effort of seven full-time professors is less than the equivalent of one full-time professor per academic department. We plan to increase our research effort so that we have the equivalent of at least one full-time research professor per department. This, we believe, is the minimum research effort that should be maintained.

## RESEARCH IN PROGRESS

\* ONR sponsored

# A continuing project reported in 1961

1. A study of satellite orbital transfer in minimum time.  
BLEICK, W.E.
2. Estimation of the component parameters in a mixed distribution.
3. Limit theorems for censored data.
4. Short range prediction of station temperatures.  
BORSTING, J. R.
- \* 5. A study of high energy particle physics using nuclear emulsions.  
BUSKIRK, F.
6. Digital computer solution of generalized beam.  
CANTIN, G.
- \* 7. A study of non-machine communication systems.  
COTTON, M. L.
- \*# 8. Investigation of the mechanism and origin of the moving striations in inert gas glow discharges.  
COOPER, A. W., OLESON, N. L. and KELLY, R. L.
- \*# 9. A study of thin film superconductivity.  
COOPER, J. N.
- \* 10. Application of superconducting magnets.
- \* 11. A study of phonons in solids by microwave and other techniques.  
CRITTENDEN, E. C., Jr.
- \* 12. Interactions of 16.2 Bev/c negative pi mesons with emulsion nuclei.  
DYER, J. N.
- \*# 13. Development of methods to solve various problems in control, particularly optimum control, on the digital computer.  
FAULKNER, F. D.
- \*# 14. Investigation of liquid air as a possible lubricant for gears.  
GATCOMBE, E. K. and PROWELL, R. W.
15. Investigation of the effects of support flexibility and damping, including non-linear effects, on critical speeds and amplitudes of machine rotors.  
GAWAIN, T. H.
16. A study of the role of boundary migration in shearing across interfaces.  
GOLDBERG, A.
17. A study of microwave plasma amplifiers and oscillators.  
GRAY, G. A.

## RESEARCH IN PROGRESS

18. Computation of vertical velocities in the atmosphere.
19. Dynamic stability of zonal wind currents.
20. Energy conversion in the atmosphere.
21. Numerical prediction of the pressure field.  
HALTINER, G. J.
- \*# 22. Determination of numerical parameters associated with the expression for sputtering ratio.  
HARRISON, D. E.
- \*# 23. Diffusional operations in chemical engineering.  
HERING, C. A.
- \*# 24. Study of the basic phenomena occurring in large-hole (very "leaky pipe") slotted multimode waveguide radiators.  
JOHNSON, R. M., Jr.
- \*# 25. Investigation of physical relations between the atmosphere and the oceans including (i) horizontal energy transport; (ii) transport across the air-sea interface; (iii) empirical relations between the atmosphere and the ocean thermal structure.  
JUNG, G. H. and WICKHAM, J. B.
- \* 26. Development of a mosaic infrared detector.
- \*# 27. Optical dispersions of  $H_2O$  in the 1-12 micron region.  
KALMBACH, S. H.
- \*# 28. Tabulation of atomic spectrum lines.  
KELLY, R. L.
- \*# 29. Mechanism of damage by thermal radiation.  
KINNEY, G. F.
- \* 30. Use of reverberation time measurements for underwater acoustic measurements in a small tank.  
KINSLER, L. E.
- # 31. A study of the hardness of iron-nickel alloys.  
MARSHALL, G. D., Jr.
32. Diagnosis of the field of divergence using a Fourier analysis of the height field.
33. Spectral studies applied both to the micro-scale and macro-scale of turbulence.
34. Statistical forecasting techniques applied to weather maps on a hemispheric scale.  
MARTIN, F. L.
35. Studies on the structure of the wind and of eddies in the surface layer.  
MARTIN, F. L. and VAN DER BIJL, W.
- \* 36. Measurement of the number of atoms knocked off the backside of a thin foil bombarded by protons.  
MILNE, E. A.

## RESEARCH IN PROGRESS

- \*# 37. A study of the radiations emitted by nuclear states formed by the reactions of protons and deuterons on certain light nuclei.  
MILNE, E. A. and HANDLER, H. E.
- \* 38. Performance of solid state devices in high frequency circuitry with particular application to transistors and tunnel diodes in a synchronous detection system.  
MURRAY, R. P.
- \*# 39. A study of low temperature electrical and mechanical properties of solids.  
NEIGHBOURS, J. R.
- 40. Dynamic behavior of columns.  
NEWTON, R. E.
- \*# 41. Plasma oscillations in a dc near glow discharge.  
OLESON, N. L.
- \*# 42. Investigation in a rare gas plasma, of the diffusion of charged particles across magnetic fields.  
OLESON, N. L., COOPER, A. W., and KELLY, R. L.
- \*# 43. Current conduction phenomena in insulating oil flowing between electrodes.  
POLK, O. H.
- \*# 44. Matrix diagonalization by interchanges in rows and columns only.  
PULLIAM, F. M.
- \*# 45. A study of the ammine complexes of palladium.  
REINHARDT, R. A.
- 46. Quantitative precipitation forecasting for the Monterey Bay area.
- 47. Specification and analysis of maximum wind level data.  
RENARD, R. J.
- \* 48. Investigation of the half-lives and decay schemes of radio-isotopes with half-lives in the 0.1 to 10 second range.  
RODEBACK, G. W. and HANDLER, H. E.
- \* 49. Study of acoustic shock waves in traveling and standing wave tubes.  
SANDERS, J. V.
- \* 50. Hydrogen bonding in alcohols.
- \*# 51. Infrared spectra of some inorganic compounds.
- \* 52. The infrared spectrum of the  $\text{H}_2^0$  molecule in unusual media.  
SCHULTZ, J. W.
- \*# 53. The decay rate of pressure as a function of the volume area ratio of the pressure vessel.
- \* 54. Investigation on the effect of temperature/time slopes upon the detonation temperature of explosives.  
SINCLAIR, J. E.



## RESEARCH IN PROGRESS

- 55. Dynamics of sand beaches.
- 56. Structure and sediments of continental shelves.  
THOMPSON, W. C.
  
- 57. Formulation of the philosophy of operations research and its application to human conduct.  
TORRANCE, C. C.
  
- 58. Development of a method for predicting behavior of a subsonic turbine.
- \* 59. Investigation of the influence of bearing flexibility and dampening on critical speed.
- 60. Investigation of the radial turbine.
- 61. Theoretical investigation of propulsion units for supersonic aircraft.  
VAVRA, M. H.
  
- 62. Analysis of stationary time series -- digital computer calculation of power spectra.
- 63. Curve fitting by digital computer -- representation of naturally decaying phenomena by sums of exponential functions.
- 64. Non-linear programming.  
WILLIAMS, D. G.
  
- \* 65. Studies on hypersonic waves.
- \*# 66. A study of the propagation of elastic waves in crystal benzene.  
WILSON, O. B.

## BOOKS PUBLISHED

Volume Two - Anthology of Modern Icelandic Literature in English Translation, 1800-1950 -  
Two Volumes - University Extension, University of California, 1961  
BJARNASON, L. L.

Thermodynamics, 4th Edition - MacmillanCo. - May 1962  
FAIRES, V. M.

Eigenschaften und Anwendung von Kunststoffen (German translation of monograph in English  
on "Plastics") - Berliner Union Stuttgart - February 1961  
KINNEY, G. F.

Chapter on "Theory of Shock Isolation" - Shock and Vibration Handbook - McGraw-Hill Book Co.  
1961  
NEWTON, R. E.

Analysis and Design of Nonlinear Feedback Control Systems - McGraw-Hill Book Co.  
March 1962 (Thaler and Pastel)  
THALER, G. J.

## PAPERS PUBLISHED

(Where one individual is responsible for more than one publication his name appears after the last one)

Book Review - Vid Ljodalindir, by Richard Beck, *Scandinavian Studies*, Vol. 33, August 1961.

Book Review - Homerspydingar Sveinbjarnar Egilssonar, by Finnbogi Gudmundsson, *Scandinavian Studies*, Vol. 34, May 1962.

Book Review - Atlantic Crossings Before Columbus, by Frederick J. Pohl, *Swedish Pioneer Historical Quarterly*.

BJARNASON, L. L.

Critical Currents for Moving Striations in the Inert Gases - Proceedings of International Conference on Ionization Phenomena in Gases, Munich, Germany, Vol. 1, pp. 566-572, 1961.

COOPER, A. W. and OLESON, N. L.

Decay Measurements in Emulsion on Particles of Negative Strangeness - *Physics Review*, Vol. 124, No. 4, p. 1209 (Barkas, Dyer, Mason, Nickols and Smith)

DYER, J. N.

U. S. Naval Postgraduate School Research Paper No. 29 as a late paper at ARS meeting on Guidance and Control - Stanford University - July 1961.

FAULKNER, F. D.

Pneumatic Shock Absorbers for Missile Transportation - *Space and Aeronautics* - January 1961 (Gawain and Jarman)

GAWAIN, T. H.

Algunas Consideraciones en el Uso y Desarrollo de Aleaciones Para Altas Temperatures - *Minas, Peru*, No. 15, p. 33 - 1961.

Comments on Lozinsky and Simeonova's paper on Superhigh Plasticity of Commercial Iron under Cyclic Fluctuations of Temperature - *Acta Met.*, Vol 9, p. 510 1961 (Goldberg and Sherby)

The Effect of Concurrent Straining on the Annealing Behavior of a Cold-Rolled Vacuum-Melted Electrolytic Iron - *Transaction ASM*, Vol. 54, p. 331 - 1961 (Goldberg and Gurney). Research Paper 28 - 1 March 1961.

Some Observations on the Annealing Behavior of a Cold-Rolled Low Carbon Steel - *Anales de la VII Convención de Ingenieros de Minas del Peru, Sección Hierro*, p. 53 - 1961.

GOLDBERG, A.

Continuous Wave Redemption - *IRE National Convention Record* - 1962 (Hahn and Lanza)

HAHN, G. M.

Higher Order Geostrophic Wind Approximations - *Monthly Weather Review*, Vol. 90, No. 5 - May 1962 (Haltiner, Arnason, and Frawley)

Minimal-Time Ship Routing - Journal of Applied Meteorology, Vol. 1 - March 1962  
(Haltiner, Hamilton and Arnason)

A Note on the Diurnal Wind Variation - Tellus, Vol. 13 - 1961  
HALTINER, G. J.

Energy Anomalies Observed in Ion Beams Produced by rf Sources - The Review of Scientific Instruments, Vol. 33, No. 6, pp. 649-652, June 1962 (Heinz, Book, Lorents, and Peterson)  
HEINZ, O.

A 'Layered' Exponential Model of Radar Refractivity - Journal of Geophysical Research - December 1961 (Martin and Waldron)  
MARTIN, F. L.

Book Review - American Political Science Review - July 1962  
NAGLE, T. W.

Easily Demountable Pressure Bomb for Use at Low Temperatures - Review of Scientific Instruments, Vol. 132 - December 1961 (Neighbours and Filson)  
NEIGHBOURS, J. R.

Cold Plasma Trapping in Neutral Injection Experiments - Bulletin of the American Physical Society, Series II, Vol. 7, No. 2, p. 143 - 1962  
(Damm, Steinhaus and Oleson)

Experimental Evidence for Beam-Plasma Interaction in a Low Pressure Argon Discharge - Physics Review Letters, Vol. 7, No. 3, pp. 77-79 - 1961 (Putnam, Collins and Oleson)  
OLESON, N. L.

Survey of Graduate Students in Physics - Physics Today, Vol. 15, No. 6, pp. 42-56, June 1962 (Olsen, Barton and Lindsay)

Francis Weston Sears: Oersted Medalist for 1961 - American Journal of Physics, Vol. 30, No. 6, pp. 399-403, June 1962  
OLSEN, L. O.

A Study of Friction Loss for Spur Gear Teeth - American Society of Mechanical Engineering - December 1961  
PROWELL, R. W.

Backlash in Second Order Feedback Control Systems - Technical Report No. 19 - U. S. Naval Postgraduate School, Monterey, California - September 1961  
(Anderson, Jr., Andrews, Kelley, Luckett and Thaler)

Self-Adaptive Control Systems Part II - Block Diagram Models for the Airframe, and Some Approaches to Active Compensation - Technical Report No. 20 - U. S. Naval Postgraduate School, Monterey, California - October 1961 (Borthwick, McCamey and Thaler)

Feedback Compensation: A Design Technique - Applications and Industry - American Institute of Electrical Engineers - November 1961 (Bronzino, Kirk and Thaler)

Phase-Space Analysis and Design of Linear Discontinuously Damped Feedback Control Systems - Application and Industry - American Institute of Electrical Engineers - September 1961 ( Han ((USNPGS student)) and Thaler)

S-Plane Design of Compensators for Feedback Systems - IRE Transactions on Automatic Control, Vol. AC-6, No. 3 - September 1961 (Pollak and Thaler)  
THALER, G. J.

Marine Sciences in Portugal and Spain - ONRL-72-61 - August 1961

Oceanography in NATO - ONRL-49-61 - June 1961

Physical Marine Sciences in Kiel and Hamburg - ONRL-78-61 - August 1961

Oceanography in Poland - ONRL-28-62 - April 1962

Oceanography at the IUGG Meetings (Helsinki, Finland) - ONRL-C-24-60 - October 1960 (addenda to 1961 report)

Seventh Assembly of the International Commission for Scientific Exploration of the Mediterranean Sea (Monaco) - ONRL-C-3-61 - April 1961 (addenda to 1961 report)

Seventh Coastal Engineering Conference (Scheveningen, The Netherlands) - ONRL-C-27-60 November 1960 (addenda to 1961 report)  
THOMPSON, W. C.

The Logic of Minefield Training - Proceedings of the Fifth Annual Conference - 29 January 1962 on the Naval Minefield (NOL)  
TORRANCE, C. C.

The Mohole - Sky and Atmosphere, Vol. 59, pp. 149-152 - June 1961  
VAN DER BIJL, W.

#### PAPERS PRESENTED

Problem Areas in Management - Western Association of College and University Business Officers Annual Conference - Monterey, California - 2 May 1962  
CHURCH, W. H.

Current-Induced Switching of Superconducting Thin Films - Symposium on Superconductive Techniques for Computer Systems - Washington, D. C. - 17-19 May 1960 (Schmidlin, Learn, Crittenden, Jr., and Cooper)

The Properties of Solids and Liquids at Low Temperatures - Lecture No. 2 of a series of lectures sponsored by the University of California, Extension Dept., San Diego, Fullerton, Los Angeles and Palo Alto - 19-22 February 1962

Superconducting Films - Meeting of New South Wales Academy of Science - Sydney, Australia - 21 March 1961  
CRITTENDEN, E. C., Jr.

A Simple Interpretation of a Degenerate Euler Equation Arising in the Ship-routing Problem - Northern California Section of the American Mathematical Association - Davis, California - 13 January 1962

FAULKNER, F. D.

The Effect of Concurrent Straining on the Annealing Behavior of a Cold-Rolled Vacuum-Melted Electrolytic Iron - Metals Congress - Detroit, Michigan - October 1961

Some Observations on the Annealing Behavior of a Cold-Rolled Low Carbon Steel - National Peruvian Mining Convention - Lima, Peru - August 1961

GOLDBERG, A.

Higher Order Geostrophic Wind Approximations - 4th Numerical Prediction Conference - UCLA - 1 February 1962 (Haltiner, Arnason and Frawley)

HALTINER, G. J.

Energy Chain Effects in Cathode Sputterings - CNRS Colloquium - Bellevue, Seine, and Oise, France - December

A Theoretical Model of the Sputtering Process - Gaseous Electronics Conference - Schenectady, New York - October 1961

HARRISON, D. E.

Elastic Constants of Tantalum - American Physical Society - Baltimore, Maryland - 29 March 1962 (Featherston and Neighbours)

NEIGHBOURS, J. R.

Cold Plasma Trapping in Neutral Injection Experiments - Colorado Springs meeting of the Division of Plasma Physics - Colorado Springs, Colo. - December 1961 (Damn, Steinhaus and Oleson)

OLESON, N. L.

Presentation of the Oersted Medallist, 1961 Francis W. Sears - New York Joint Meeting American Physical Society and American Association of Physics Teachers - 24-27 January 1962

OLSEN, L. O.

Experimental Investigation of Whirl in Self-Acting Gas Lubricated Journal Bearings - American Society of Lubrication Engineers - St. Louis, Missouri - 8-12 May 1962 (Reynolds, D. B., LT, USN and Gross, W. A.)

REYNOLDS, D.B., LT, USN, a student in the Naval Engineering curricula

Cross Disciplinary Education in Control Engineering - Summer General Meeting of the American Society for Engineering Education at the Air Force Academy - Colorado Springs, Colo. - 19 June 1962

Design of Some Active Compensators of Feedback Controls - Joint Automatic Control Conference - New York University - June 1962 (McCamey and Thaler)

Multi-Parameter Self Adaptation Using Auxiliary Models - AIEE Winter General Meeting - New York - January 28-February 2, 1962 (Han and Thaler)

HALER, G. J.

Some Recent Innovations in Mathematical Education in British Universities Due to the Impact of Digital Computers - Mathematical Association of America - University of California, Davis - January 1962

WILLIAMS, D. G.

### LECTURES

Superconducting Films - Dept. of Physics Seminar - University of Nottingham, England - 1 November 1960

Generation of Infrared Phonons by Maser Techniques - Physics Seminar USNPGS - 22 September 1961

Research in Masers - Zenith Radio Corporation Research Laboratory - Chicago - 15 January 1962

CRITTENDEN, E. C., JR.

Radioactivity and Shielding from Radioactivity - Pacific Grove Business Women's Club, Marina Kiwanas Club, Monterey Lions Club, S. Carmel Hills Home Owners Association

HANDLER, H. E.

Foreign Policy: USSR - Monterey Peninsula College series "The Challenge to the West" - 7 May 1962

Chinese Communist Foreign Policy in the Far East - MPC series "The Challenge to the West" - 28 May 1962

HUFF, B. F.

American Political Parties since 1918 - MPC lecture series - 12 March 1962

NAGLE, T. W., LT, USN

Spectral Concept of Ocean Waves (in Spanish) - Spanish Institute of Oceanography - Madrid - February 1961

General Circulation of the Atmosphere and Oceans - Office of Naval Research - London - March 1961

A Classification of Continental Shelves - Hydrographic Department of the British Admiralty - Cricklewood, England - May 1961

Trends in Oceanography in America and Western Europe - Marine Station of the Polish Academy of Sciences - Sopot, Poland - September 1961

A Scientist's Impressions of Poland - Polish Dept. of the Army Language School - Monterey, California - January 1962

Organization and Functions of ONR London - Naval Reserve Research Unit - Monterey, California - April 1962

Science in Poland - Sigma Xi Banquet - USNPGS - May 1962  
THOMPSON, W. C.

Comparative Economic Systems: U. S. - MPC series "The Challenge to the West" -  
26 March 1962

Comparative Economic Systems: U.S.S.R. - MPC series - 2 April 1962  
TJERSLAND, T.

STUDENT THESES GENERATED (students are USN unless otherwise noted)  
(Where one individual was responsible for more than one thesis the name appears after the  
last one)

Mixtures of Distributions - LT Elias A. Parent  
BORSTING, J. R.

Superconducting Properties of Electroplated Thin Cylindrical Tin Films - LT Edward F.  
Jardine, Jr., and CAPT Charles S. McCloskey, Jr., USAF  
COOPER, J. N.

Resonant Radiation Effects on Moving Striations in Argon - LT Gayland J. Mischke and  
LT Don D. Schmidt

Spectroscopic Observations in an Argon Discharge - LT F. Kinley and LT R. O'Malia

Striation Phenomena in Argon Glow Discharges at Low Currents -  
LCDR Eugene A. Pelton and LT Henry C. North, Jr.  
COOPER, A. W., OLESON, N. L. and KELLY, R. L.

An Integrated Display and Control System for Man-Machine Communication -  
CAPT C. G. Lawson, USMC

Design of an Automatic Multi-Processing System - LT R. P. Warrick  
COTTON, M. L.

A Preliminary Analysis of  $16.2 \text{ Bev}/c$  Interactions in Emulsion - CAPT Manuel Sanchez, USA  
and LT Thomas Tyler, USCG  
DYER, J. N.

A Radiological Fallout Prediction System for the Navy - LCDR K. F. Cook  
FAULKNER, F. D. and CUNNINGHAM, W. P.

Critical Speeds of a Rotating System with Flexible, Damped Supports - LT R. F. Crater  
GAWAIN, T. H.

Solution of the W-Equation Including Terrain and Frictional Effects -  
CDR L. G. Clarke and LT G. E. Lawniczak, Jr.

Pressure-Height Predictions for the Upper Troposphere with a Modified Barotropic Model -  
LT W. B. Oakes

An Analysis of a Divergent Model for Numerical Forecasting - LT H. Nicholson

Hemispheric Analysis of Vertical Velocity and Associated Meteorological Parameters by  
Louver Methods - LT F. R. Williams

Stability Characteristics of Barotropic Currents - LTJG R. T. Song, ROK  
HALTNER, G. J.

A Microwave Bridge for the Accurate Measurement of Scattering Matrices Generated by  
Obstacles in Multimode Waveguides - CAPT R. L. Lary, USMC

The Design and Measurement of a Microwave Mode Transducer - LT R. N. Hart  
JOHNSON, R. M.

Effect of a Convection on Mixed Layer Depth at Station PAPA - LCDR A. G. Luskin

Investigation of Convective Circulation and its Influence on the Mixed Layer Depth at Ocean  
Station PAPA - LT D. H. Edgren  
JUNG, G. H. and WICKHAM, J. B.

Pneumatic Infrared Mosaic Detector - LCDR John Dobson and LT Ernest Bischof  
KALMBACH, S. H.

Investigation and Application of Reverberation Measurements in Water - LT Richard W. Case  
and LT Eugene W. Vahlkamp  
KINSLER, L. E. and STENTZ, D. A.

Statistical Prediction of Movement and Intensification of Surface Highs - LT F. S. Steckbeck  
and CAPT A. H. Manhard, USMC

A Relationship between the Deacon Profile Parameter and the Richardson Number -  
CAPT M. Goenadi, Indonesian Navy

Radar Ray Paths in an Atmosphere having a Horizontal Gradient of Refractivity -  
LT F. E. Wright

Space-time Spectral Analysis of the High Latitude Height Tendency Field in the Winter 1958-59-  
CAPT J. T. Smith, USMC

A Comparison of the Geostrophic Vorticity Field Determined from Spherical Harmonic Analysis  
with that Obtained from Fleet Numerical Weather Facility Analyses - LCDR C. E. Cantrell  
and LCDR Chi-chen Chen, Chinese Navy  
MARTIN, F. L.

Transmission Sputtering in Silver Crystals by High Energy Protons - LCDR Victor G. Warriner  
and LT Benjamin E. Tabler  
MILNE, E. A.



Gamma-gamma Angular Correlation in Ni-60 - CAPT Bruce Kennedy, USA  
MILNE, E. A. and HANDLER, H. E.

Acceleration of an Unbalanced Rotor through its Critical Speeds - LT M. R. Gluse

Elastic Columns under Half-Sine Pulse Loading - LT L. H. Taylor, Jr.  
NEWTON, R. E.

Plasma Oscillations in a Low Pressure Neon Discharge - LT D. M. Alderson, Jr. and  
LT J. D. Leonard, Jr.  
OLESON, N. L.

Design and Construction of a Steady State Plasma Study Facility - LT John B. Streit and  
LT Walter E. Olsen  
OLESON, N. L., COOPER, A. W. and KELLY, R. L.

The Interaction of Hydrogen Ion with Tetrammine Palladium (II) Ion in the Presence of Nitrate  
and Chloride Ions - LT James R. Funck  
REINHARDT, R. A.

Measurement of Neutron-Activated Short-Lived Nuclides Using a Pneumatic Transfer System -  
CAPT A. O. Paas, USA and CAPT R. D. Sullivan, USA  
RODEBACK, G. W. and HANDLER, H. E.

Attenuation of Acoustic Shock Waves in Tubes - Major T. C. Bielicki, USA and CAPT L.  
Russell, USA

A Preliminary Investigation into Threshold Behavior of Periodic Shock Waves in Resonating Gas  
Columns - LCDR F. E. Reichwein  
SANDERS, J. V.

The OH Stretching Bands of Alcohols in Non-polar Solvents - LCDR John H. Bres

Infrared Spectra of Bismuth Trifluoride and Chlorodiborane. Attempted preparation of Bismuth  
Hydride for Infrared Study - LT Ralph A. Turner, Jr.

The Infrared Spectrum of  $H_2^0$  in Non-polar Solvents - LT John E. Reisinger  
SCHULTZ, J. W.

Pressure Dependence of the Solid State Reaction between Magnesium and Teflon - Major  
Eugene O. Speckart, USMC  
SINCLAIR, J. E.

Formulation and Solution of Matrix Games without Utility Functions - LT John Hall

Criteria for Nuclear Weapon Protection (A First Approximation) - LT Fred Peterson

Cost-Effectiveness Considerations in the Selection of Patrol Aircraft (U) - LCDR G. W.  
Dittmann  
TORRANCE, C. C.

Critical Speeds of a Rotating System with Damped, Flexible Supports - LT R. F. Crater

An Analytical Investigation of the Performance of Thrust Augmented Turbo-Fan Engines in High Speed Flight - LT J. F. Bell

Prediction of the Performance of an Axial Flow Turbine Using Performance Maps Developed by Digital Computer - LCDR Chris W. Lamb  
VAVRA, M. H.

Determination of the Elastic Constants in Crystal Benzene - LCDR J. C. W. Heseltine, RCN and LT D. W. Elliot  
WILSON, O. B.

### MISCELLANEOUS

Vice-President of the Society for the Advancement of Scandinavian Studies - a national scholarly group. Attended the annual meeting May 4-5, 1962 in Seattle, Washington.  
Sustaining member of The American-Scandinavian Foundation.  
Member of Þjóðraeknisfélag Islendinga í Westurheimi.  
BJARNASON, L. L.

Member, Organizing Committee for the "Ninth International Conference on Low Temperature Physics", to be held in Los Angeles (UCLA), August 1964.  
Member, Planning Committee, University of California, Statewide Lecture Series on "Cryogenic Technology", lectures held February - June 1962.  
CRITTENDEN, E. C., JR.

Consultant, Cryogenic Program, Space Technology Laboratories, Inc.  
COOPER, J. N.

Worked on revision of PROBLEMS ON THERMODYNAMICS, and DESIGN OF MACHINE ELEMENTS.  
FAIRES, V. M.

Writing text on MACHINE DESIGN.  
GATCOMBE, E. K.

Worked on "Theoretical Investigation of Maximum Pressure Rise Attainable Through a Row of Compressor Blades Without Separation."  
GAWAIN, T. H.

Fulbright Visiting Professor, Lima, Peru - April-December 1961.  
Visiting Professor at Instituto de Fisica, Argentina - January-August 1962.  
Wrote a booklet in Spanish on "Imperfections and Mechanical Properties in Metals" - published by Univ. of San Marcos, Lima, in limited quantity pending further review and modifications.  
GOLDBERG, A.

Attended Meeting of International Studies Association and Western Political Science Association, 22-24 March 1962, as representatives of USNPGS.

GRIGSBY, H. C., LCDR, USN, and MONTAG, R. V., LCDR, USN

Preparation of notes for classroom use where textbooks are obsolescent.

HALTNER, G. J.

Paper entitled "Measurement of Multiplication Constant for Slightly-Enriched Homogeneous UO<sub>2</sub> Water Mixtures and Minimum Enrichment for Criticality" AEC Research and Development Report HW-70310 - Hanford Atomic Products Operation - 21 August 1961 (Neeley and Handler).

Prepared an interview on Fallout for publication in the local newspaper.

Appeared before the Monterey County Board of Supervisors during a hearing on the County Fallout Shelter Ordinance.

HANDLER, H. E.

Worked on the development of a complete set of duplicated notes for the two-term senior-level nuclear physics sequence.

HANDLER, H. E. and MILNE, E. A.

Book in preparation "Readings on the Diplomacy of the National Interest." Expected completion July 1963.

Article in preparation for U. S. Naval Institute Proceedings on the Laos crisis.

HUFF, B. F.

Attended the meeting of the American Academy of Political and Social Science, Philadelphia, Penna., 13-14 April 1962, as official delegates of the USNPGS.

HUFF, B. F. and O'NEIL, E. F., CDR, USN

During the year consultation services were provided to the IBM Corporation, Advanced Development Laboratory, San Jose, California in conjunction with the over-the-horizon San Jose-Monterey data communications system.

A contract was signed and work begun on a textbook entitled, "The Impulse Function."

JOHNSON, R. M.

Attended three scientific meetings which dealt with topics closely associated with the research interests described elsewhere: (1) East Pacific Oceanic Conference, Lake Arrowhead, California, 27-29 September 1961; (2) First National Coastal and Shallow Water Research Conference, Los Angeles, Calif., 27-28 October 1961; (3) Western Regional Meeting of the Institute of Navigation, Scripps Institute of Oceanography, La Jolla, Calif., 26 January 1962. Spent 25 January 1962 in conference with Dr. E. R. Anderson, NEL, San Diego discussing the ocean thermal structure.

JUNG, G. H.

Engaged in a one-day discussion, on 7 May 1962 at USNPGS, with Dr. J. P. Tully, Oceanographer in Charge of Canada's Pacific Oceanographic Group, on the subject of thermal structure forecasting for the Northeastern Pacific Ocean area.

JUNG, G. H. and WICKHAM, J. B.

Attended Conference on College Composition and Communications in Chicago, Illinois, April 1962.

LASS, R. N., LCDR, USN

Continued work on Political Socialization and Voter Preferences (previously under a two-year research grant from Michigan State University).

Worked on paper on Recent Soviet-German Relations, to be presented at the 5th Annual Far Western Slavic Meeting to be held at Stanford University in April 1963.

Served as Chairman of Panel on Soviet Politics at the Slavic Meeting for Far Western Schools, Seattle, Washington, April 1962.

NAGLE, Thomas W., LT, USN

Attended American Physical Society meetings; UCLA, December 1961; New York, January 1962. Reviewer for "Physical Review."

NEIGHBOURS, J. R.

U. S. Delegate to the International Conference on Plasma Physics, Salzburg, Austria, September 1961.

OLESON, N. L.

Member Executive Committee, American Association of Physics Teachers.

Chairman, Committee on Sustaining Members, American Association of Physics Teachers.

Member Board of Governors, American Institute of Physics.

Chairman Advisory Committee on Regional Counselors, AIP.

Visiting Scientist, AIP and AAPT.

President Sigma Xi, U. S. Naval Postgraduate School Chapter.

OLSEN, L. O.

Editor of Russian translation: Vector Algebra, by Minorski and Ulanovski State Publishing House of Technical-Theoretical Literature, Moscow 1951 Leningrad. (This is the book our students from USNPGS translated - in the rough - at the Army Language School in the summer of 1961.)

PULLIAM, F. M.

Until February 1962, continued as NATIONAL SCIENCE FOUNDATION Science Faculty Fellow in the Dept. of Meteorology, Florida State University, Tallahassee, Fla., engaged in predoctoral study and research.

RENARD, R. J.

Gave several talks to members of the Northern California Fire Chiefs Association in Monterey and Salinas on the subject of "Plastics as a Fire Hazard."

SINCLAIR, J. E.

On leave to ONR London as Liaison Scientist in Oceanography, June 1960-September 1961; visited 70 oceanographic groups and organizations in 15 European countries.

Scientific meetings attended: International Association for Quaternary Research (6th Congress), Warsaw, Poland, August-September 1961; Shallow-Water Research Conference (ONR and NFS sponsored), Los Angeles, October 1961; American Geophysical Union (Pacific Coast Meeting), Los Angeles, December 1961.

Appointed to the newly formed Panel on Oceanographic Facilities of the National Science Foundation, Washington, D. C., May 1962.

Addition to FY 1961 report:

Honorary election to membership in the Challenger Society (British oceanographic society), November 1960.

Participated in oceanographic cruise aboard the R/V/ ATLANTIS in the Western Mediterranean, February 1961.

Scientific meetings attended: International Association of Physical Oceanography, Helsinki, Finland, July-August 1960; Seventh Coastal Engineering Conference, Scheveningen, The Netherlands, August 1960; International Commission for the Scientific Exploration of the Mediterranean Sea (XVIIth Assembly), Monaco, December 1960; NATO Subcommittee on Oceanography, Paris, France, December 1960.

THOMPSON, W. C.

