



SCRAMBLING FOR NEW 'CROWS' are L. E. Loneragan, AK3; G. G. Miller, AMH3; C. D. Rau, AMH1; D. E. Marcus, ATR3; R. D. Burkart, ADJ3; C. C. Johnson, BM3, and E. R.

Lundy, AO3, as their advancements in rate are announced by Cdr. H. N. O'Connor, Air Development Squadron 5 commanding officer, in recent ceremonies.

Civil Air Patrol Marks 22 Years of AF Support

Members of the China Lake Civil Air Patrol Composite Squadron 84 joined 2,000 communities across the nation last Sunday in observance of the 22nd anniversary of the Civil Air Patrol.

The CAP was founded six days before the attack on Pearl Harbor.

Its strength has grown from a few members, who performed stalwart service during World War II in their small aircraft on coastal submarine patrols, to over 74,000 members today.

Approximately 8,000 of these are licensed pilots. Three thousand of whom own their own planes. The CAP can call on 900 additional aircraft which are corporation owned.

Local Squadron

The local squadron was founded at Burroughs High School in November 1956 with 15 members. Today, it numbers 42 senior members and 22 cadets.

Twelve of its members are licensed pilots, nine of whom own their own planes which are used in search and rescue work.

Lt. Robert B. Thomas is commanding officer of the Squadron. He succeeded Lt. Col. Frederick L. Richards as head of the unit in September of this year when Col. Richards was assigned to the Staff, California Wing Headquarters, Lockheed Air Terminal, Burbank.

Search and Rescue

The local squadron has participated in six search and rescue operations this past year.



LT. ROBERT B. THOMAS

Nationally the CAP logs more time in search and rescue missions than the combined military services and civilian agencies.

The CAP's emphasis on American youth has mushroomed into a cadet program which offers its 39,000 cadets hundreds of special scholarships and an International Air Cadet Exchange program.

The China Lake squadron has the distinction of having had two of its members, Capt. Tyrone St. Louis and 2nd Lt. Gordon Brahm, selected as exchange cadets.

Dow To Retire On December 27

PASADENA — After 20 years and one month at Morris Dam, Wallace H. Dow is leaving. His retirement will be effective on December 27.

A photographer, Wally first went to Morris Dam in November, 1943. It was CalTech in those days and he worked with Dr. Ira Bower, now head of Palomar Observatory, and Harry Christy, now deceased.

Morris Dam Pioneer

He transferred to Civil Service in 1946. With the exception of a few months of broken service in 1946, he has been continuously on duty at Morris Dam these many years.

He is a member of the Ballistics Section, Range Branch of UOD's Systems Operations Division.

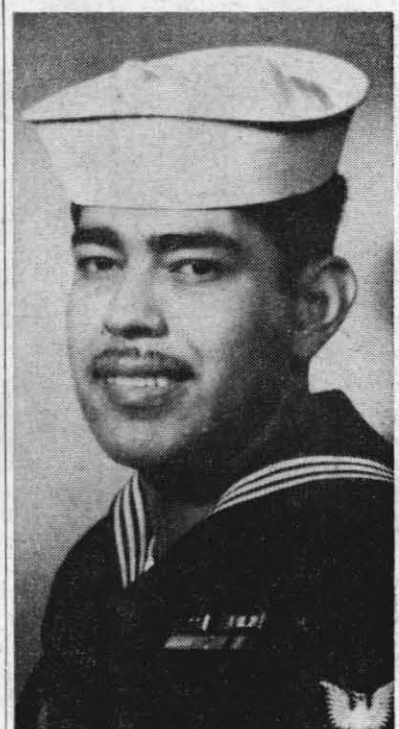
What does he plan for the future? Well, Wally says first on the list is a month's trip to Mexico, to a favorite spot since their first trip in 1958 — Puerto Vallarta. Then freelance photography.

He hopes to get into "surgical" photography, a field he was in before going into the Army in 1942.

He and his wife, Helene, are avid golf enthusiasts also, and are looking forward to having time to devote to the game.

Residents of Azusa for the past 17 years, they plan to continue to make their home there.

San Clemente Sailor Reenlists for Six



SHOWBOAT

FRIDAY DEC. 6

"WIVES AND LOVERS" (103 Min.)
Van Johnson, Janet Leigh, Shelley Winters
7 p.m.

(Comedy) Success goes to the head of a struggling author when he writes a hit play. Domestic troubles move in but all ends well despite a cynic-divorce neighbor and a fiasco party. It's mad! (Adult)

SHORT: "Canine Patrol" (7 Min.)

SAT. — MATINEE — DEC. 7

"TORPEDO RUN" (98 Min.)

Glenn Ford

1 p.m.

SHORT: "Bad Luck Blackies" (7 Min.)

"African Jungle No. 9" (16 Min.)

— EVENING —

"LEHI" (76 Min.)

Oceanographic Expedition to Hawaii

— Capt. DeVere Baker

7 p.m.

(True Adventure in Color) Only this dedicated former businessman could overcome reverses, ridicule and perilous dangers to prove a theory—as he drifted for 69 days on an 18x24 foot raft across the Pacific. See towering seas, survival techniques, deep sea denizens and Tangaroa, his little dog that was adopted by the Navy. (Family)

SHORT: "Coy Decoy" (7 Min.)

"Jungle Terror" (18 Min.)

SUN.-MON. DEC. 8-9

CROSSWORD PUZZLE

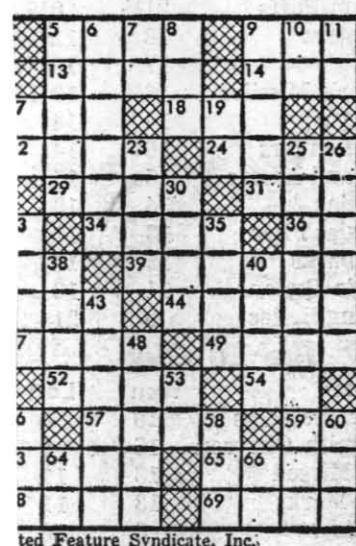
ACROSS
1-Algerian seaport
6-Square
8-In what manner?
12-Man's nickname
13-Rockfish
14-Exist
15-Cooled lava
16-Stumble
18-Sailor (colloq.)
20-Conjunction
22-Later
24-Possessive

4-Openwork fabric
5-Threefold
6-Rumor
7-Indefinite article
9-Stroke
10-Rabbits
10-Conjunction
11-Pronoun
17-Sun god
19-Exclamation
21-Bag-shaped
23-Metal fastener
25-List of plays
26-Look, fixedly

Answer to Previous Puzzle

THEME STEEP
PRIMAL CELLAR
LE STEERED TIL
ENS SCRAM NIT
ACER TAW BONE
SHREWS BLAMAS
TIVA ANI
AVANT PRANCE
DARE OBT LEAD
ERS TWINE END
LI TREESTLE AA
BERTER OILERS
DINES SALAD

48-Unbound
49-Took one's part
61-Symbol for tantalum
63-Greek letter
66-Number
68-Afternoon party
60-Aged
61-River in Italy
62-Paid notice
64-Compass point
66-Symbol for silver



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PLACE
STAMP
HERE

TELL NOTS' ROLE IN SUBROC DEVELOPMENT



Vol. XVIII, No. 48 Naval Ordnance Test Station, China Lake, California Fri., Dec. 6, 1963

Full-Scale Firings Held at SCI, SNORT Tests Here

The full story of SUBROC and NOTS' part in development and testing of the rocket-boosted submarine-launched nuclear-armed depth bomb, was revealed to the nation and the world this week.

The Navy's most advanced anti-submarine weapon, capable of killing enemy subs at long range, SUBROC is an underwater-to-air-to-underwater missile.

While the story was being released at a national press conference in New York City, details of SUBROC's testing at the U.S. Naval Ordnance Test Station, China Lake, and at the Pasadena Laboratory's San Clemente Island Sea Range, were told by Capt. Charles Blenman jr., ComNOTS, and Capt. G. H. Lowe, Officer in Charge, NOTS Pasadena.

SNORT and SCI's Part

China Lake's part included land based flights and runs on the Supersonic Naval Ordnance Research Track (SNORT). They provided data on launch characteristics, control system performance, guidance, and flight conditions.

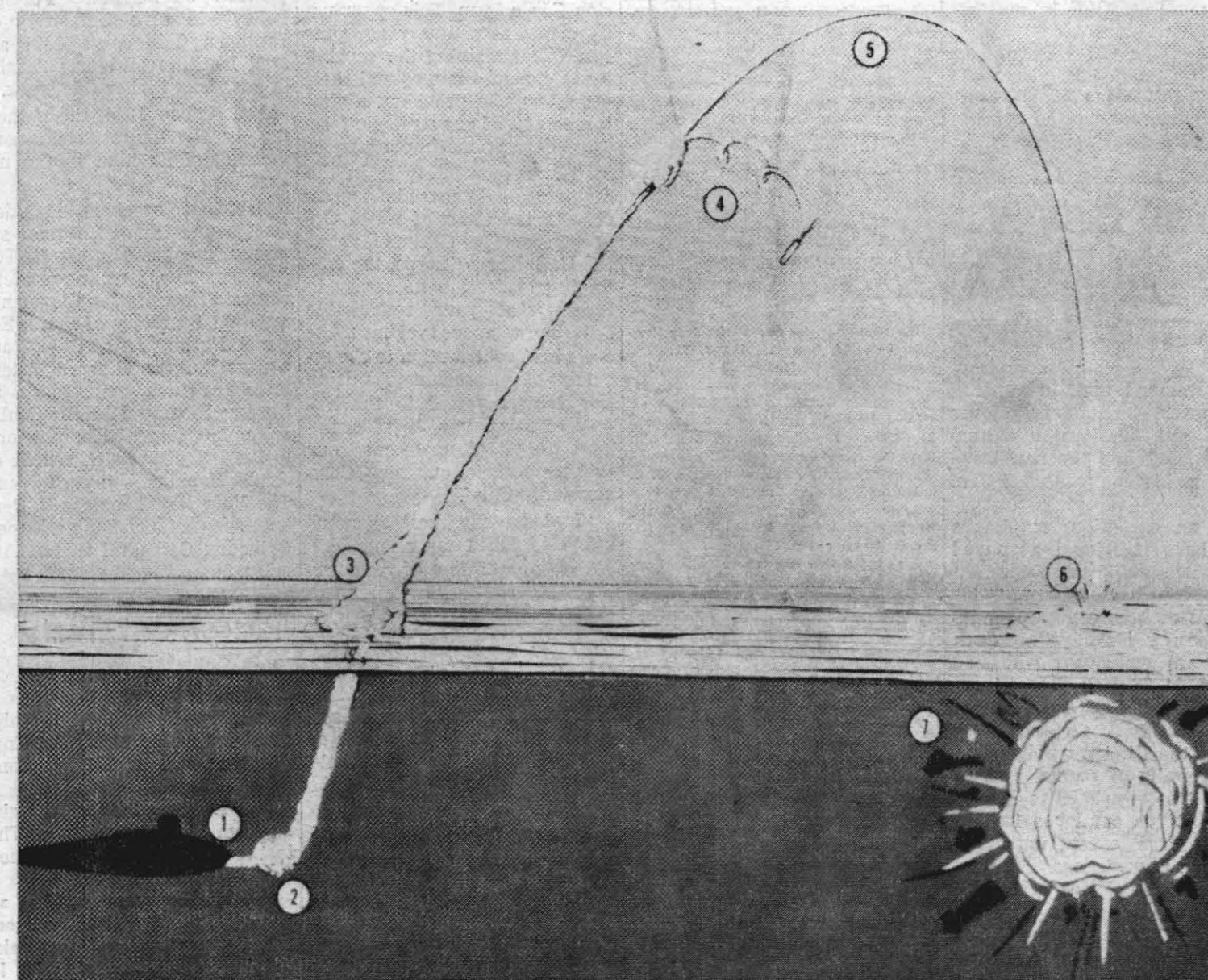
NOTS Pasadena's SCI range was the site of air drops, static and live firings, and many full-scale firings from a specially designed and built underwater launch pad.

Utilized in the tests were an LCU vessel with an instrumented launcher system which can be lowered to various ocean depths, a thrust stand for firing static firings, and operational equipment for firings from submarines.

More recent tests at the island facility have included firings from the submarine USS PERMIT.

The U. S. Naval Ordnance Laboratory, White Oak, Maryland was assigned the over-all technical program responsibility and management for the development.

(Continued on Page 4)



ARTIST'S CONCEPTION depicts submarine-to-target path of Navy's SUBROC missile. Underwater-to-air-to-underwater weapon is launched horizontally (1) from conventional torpedo tube of attack submarine, then rocket motor ignites (2) at safe distance from ship and thrusts missile upward and

out of water (3). Rocket motor separates (4) from the nuclear depth bomb. Guidance system and automatic controls regulate the missile's flight (5). It re-enters the water (6) at supersonic speed and the nuclear warhead explodes (7), destroying enemy sub. (Other pictures on Pages 4, 5 and 6.)

90-Min. Program To Tell Of Weather Modification

A 90-minute technical presentation of NOTS efforts in Weather Modification has been scheduled at the Station Theatre on Wednesday, Dec. 18.

Joel Trimble of the Instrument Development Division of the Test Dept., is program coordinator.

Included in the program, starting at 3 p.m., will be a screening of the Cyclops I film and slide projections.

Speakers explaining the Weather Modification Program will be Capt. Charles Blenman jr., ComNOTS; Dr. Pierre St. Amand and John A. Donnan of the Earth and Planetary Sciences Division of the Research Dept.; Dr. William C. Finnigan and Dr. Lohr A. Burkardt, also of the Research Dept.; Ronald F. Vetter of the Propulsion Dept.; John B. Burmeister, Engineering Dept.; and Joe Trimble, Test Dept.

As a technical presentation,

the program will be open to all Station employees, Station residents, and the general public.

Arrangements for off-Station personnel are being coordinated by William Hampton's office, Code 002.

Santa to Visit Here

Bob Belisle announces that the Youth Employment Service is arranging for Santa Claus to visit NOTS this year. He will appear Saturday, Dec. 21, throughout the China Lake and Ridgecrest community, riding on a fire truck with a group of helpers to distribute candy to youngsters. The goodies were purchased from proceeds of the YES dance.



BRIGHAM YOUNG University students and faculty hear L. G. Garman (right), Head of NOTS Supersonic Track Division, explain project prior to witnessing a SNORT test run during tour of the Station Wednesday. They

also visited various departments in Michelson Laboratory, test ranges, and took part in question and answer period conducted by Dr. Wm. B. McLean, NOTS Technical Director, following luncheon at the COM.



WALLY DOW cuts cake at honor. With him is his wife, Helene.

CHAPLAIN'S MESSAGE

A Watermark Of Character

By CHAPLAIN MARK E. FITE



Cicero once noted, "A thankful heart is not only the greatest virtue, but the parent of all virtues."

If we read the biographies of the truly great people of the ages, who have left a worthy heritage, we are struck with the regularity with which they bear a testimony of gratitude.

There were ten men who had been quarantined by their community as menaces to public health. Upon hearing of an outstanding physician in another city, they went to him for help. Following his instructions they were cured of their disease.

Next they went to the civil authorities to get a clean certificate of health. Having received it, all went on their own way just as if nothing had happened, except one.

He returned to express thanks and then continued to show gratitude through his praise to God. (Luke 17:12-19).

Thus, only one man was really made WHOLE in soul as well as body, for eternity as well as time.

Thanksgiving day of 1963 is past. Our Chief Executive, the President, encouraged us to go to our public places of worship and many did so. But true gratitude is a quality that extends throughout life in consistent Thanksgiving and Praise.

A thankful heart is to personal life what sterling is to silver — a watermark of character.

PROMOTIONAL OPPORTUNITIES

Present Station employees are encouraged to apply for the positions listed below: Applications should be accompanied by an up-to-date Form 58. The fact that positions are advertised here does not preclude the use of other means to fill these vacancies.

Staff Nurse, GS-5, Code 88 — General and specialized nursing care in Station Hospital and outpatient department. Intermittent positions.

File application for above with Judy Newman, Bldg. 34, Room 26, Phone 72723.

Supervisory General Engineer, GS-13, PD 25504Am1, Code 552 — This position is that of Associate Head, Electro-mechanical Engineering Division, Engineering Department.

The incumbent of this position has the responsibility for assisting the Division Head in the formulation and executive implementation of policies and procedures to provide the necessary guidelines to the Branches.

Clerk (Steno), GS-4, PD 055003, Code 5516 — This position is that of Secretary to the Engineering Evaluation Branch, Engineering Department.

The incumbent is responsible for the secretarial and clerical duties of the entire branch. Prepares all correspondence, receiving visitors and telephone calls, prepares work requests and stub requisitions from rough drafts or verbal instructions, etc.

Architect (Design), GS-11, PD 170078, Code 7037 — This position is located in the Arch Structural Branch, Public Works Department.

The incumbent is assigned work covering alterations and improvements, construction, replacement, maintenance and repair of roads, runways, drainage facilities, structures, water and sewage systems, and pipelines.

File applications for above with: Dora Childers, Bldg. 34, Room 32, Phone 7193 or 72032.

Administrative Officer, GS-11, Code 457 — Performs administrative work for two divisions in a combination of technical administrative management fields such as personnel, management analysis, budget, and workload planning and reporting.

File application for above with Judy Newman, Bldg. 34, Room 26, Ext. 72723.

Health Physicist, GS-13, Hawaii; Foreman Mechanic (Power Plant), Philippines.

Head Electrician (Telephone), Guantanamo Bay, Cuba — File application for above with Navy Overseas Employment Office (Atlantic), Headquarters, PRNC, Washington, D. C. 20390, no later than Dec. 20.

Accounting Officer, GS-510-12, Guam; Health Physicist, GS-13, Hawaii; Foreman Mechanic (Power Plant), Philippines.

File application for above with Navy Overseas Employment Office (Pacific), Federal Office Building, San Francisco 2, Calif., no later than Jan. 4.

PASADENA To apply for positions, contact Nancy Reardon, Pasadena Personnel Division, Extension 492. A current SF-58 must be submitted when applying.

Photo-Optical Equipment Technician, GS-9, PD 24563, Code P8084, Duty Station: Morris Dam. Responsible for the acquisition of all photo-optical test data at Morris Dam including planning, development, and operation of photo-optical documentation.

Electronic Engineer (Instrumentation), GS-11, PD 1P55005, Code P5511 — Responsible for designing electronic components and systems, preparing specification for the design and fabrication of electronic components, and preparing and conducting test programs for the evaluation of electronic components and systems.

Decorate COM Christmas Tree Tomorrow Night

The Commissioned Officers Mess (Open) will hold its annual Christmas tree "Decorating Night" tomorrow during a special Happy Hour from 8 to 10 p.m. WACOM announces.

All decorations for the tree that will greet patrons through the holiday period ahead, will be provided by the Club.

Chairman of the decorating committee is Theresa Valenteen. She will be assisted by Angie Tambini, Joann Donahue, Ione Thompson, Charlie Cossairt, Alene Morgan, Penny Kistler, Sandy Newhouse and Doris Pierce.

Club members are invited to help them decorate.

Hazard in Airport Lake Area - Duds

A warning that an "extremely hazardous and dangerous condition exists in the Airport Lake area due to numerous unexploded duds" was issued this week by LCdr. R. C. Clasen, Security Officer.

All personnel are warned to keep clear of this area until further notice.

"Pop" Lofinck is on leave. His Desert Philosopher column will resume on his return.

SecNav Paul Nitze Tells Of Privilege and Responsibility

Following is a message from the new Secretary of the Navy Paul H. Nitze:

"I am conscious of both the great privilege I have been given and the serious responsibility I have accepted in taking the oath of office as Secretary of the Navy, today.

"The privilege is in the opportunity to work together with the men and women, military and civilian, active and reserve, who make up our superb Navy-Marine Corps team. This opportunity comes at a time when your role in maintaining the capability to control the seas and their littoral and in providing a vital component of our strategic forces, is of supreme importance.

"The responsibility is in the requirement to provide, together with the Chief of Naval Operations and the Commandant of the U. S. Marine Corps, the continuing leadership necessary to insure that your remarkable skills and weapons systems make their best contribution to the security of our country. During this critical period in the history of our nation, it is incumbent on all of us to give our full support to our new Commander-in-Chief.

"I pledge my most strenuous effort to fulfill my responsibility. My observation of your per-

formance over the years leaves me no doubt that I shall have the benefit of your loyal and competent support in that task."

PAUL H. NITZE.

Higgs On Panel at USC Institute

Louis D. Higgs of NOTS' Behavioral Sciences Group was a panelist on "Making Foreign Policy" in the University of Southern California's 40th annual Institute of World Affairs at Pasadena earlier this week.

Founded in 1924, the gathering is the oldest continuous meeting of its kind in the nation.

Principal speakers included Gen. Lauris Norstad, former supreme commander of NATO; Jose Figueres, former president of Costa Rica; Harlan Cleveland, assistant Secretary of State; Edgar S. Furniss Jr. of Ohio State University; Sir Richard Allen, former British ambassador to Burma; Richard E. Kelfa-Caulker, ambassador of Sierra Leone to the UN; Francis O. Wilcox of Johns Hopkins University, and The Very Rev. Leonidas C. Contos, dean of St. Sophia Greek Orthodox Cathedral in Los Angeles.

Bakersfield College Placement Tests Slated for Tomorrow at Burroughs

Testing for placement of students in the spring semester of Bakersfield College will be held tomorrow on the Burroughs campus of the college.

Dean Omar H. Scheidt has announced that the Desert Division will give four tests beginning at 8 a.m.

The tests, he emphasized, are not for admission but for placement of students. Admission to the college is open to members of the community who are over 18 or have a high school diploma. The tests, he said, determine which classes a student will be assigned to.

The English Classification Test will be given from 8 to 10

a.m. This test, Scheidt said, places students either in English grammar or English composition classes.

The Reading Test will be given from 10:30 to 11:30 a.m. The test is for placement in Psychology 1A or History 17B.

All students working for an Associate in Arts Degree from the Desert Division must take all three tests, Scheidt said. In addition, he said, those wishing to enroll in English, psychology or history courses should also take these tests.

Those taking the tests should bring a ball-point pen and five cents for the English examination blue book.

October Housing Assignments

TYPE	PRIORITY LEVEL REACHED	HIRAL DATE OF EMPLOYEE ASSIGNED
JOQ (2)	CB	3/14/50
Panamint (3)	CB	2/26/50
Juniper (3)	MD	1/1/62
Hill Duplex (3)	CB	6/22/51
Joshua (4)	CC	8/2/50
Yucca (4)	MG	5/16/60
Tamarisk (4)	MG	5/16/61
Old Duplex (3)	SC	9/30/50
Old Duplex (2)	CH	2/16/53
Wherry (4)	MH (CS1)	5/16/58
Wherry (3)	MH (KH2)	1/23/56
Wherry (2)	CI	4/8/63
Old Duplex (2-LBP)	CH	5/9/62
Normac (3)	MI	5/16/60
Normac (2)	MI	11/9/62
Normac (1)	CK	8/23/63
LeTourneau (2)	MI	7/15/63
Hawthorne (3)	CI	9/2/58
Hawthorne (2)	MI	11/9/62
Hawthorne (1)	CK	8/23/63
Motel (0)	OG	8/1/63
Apartment (3)	CI	9/2/58
Apartment (2)	MI	7/15/63
Apartment (0)	OG	6/28/63
Old Duplex (1)	CI	1/14/46

Single employees eligible for apartments are encouraged to make application at the housing office.

RIM SHOTS

By BILL VALENTEEN



Horseback billiards was one of the favorite pastimes of those who passed this way before us during the time of the great western migration of the middle 19th century.

Billiards was played, as the game implies, on horseback and indoors to crowds of standing room only. The sport had its problems, as one can well imagine. Horses had to remain quite steady, and it sometimes took some doing to maneuver the animal into just the right position, before bending down to take a shot.

If those billiard players were like me, they would probably have to maneuver the horse several times before deciding just where is the best spot to sit for the next shot.

THE GAME LASTED FOR DAYS

Huge amounts of gold dust and money were bet on the outcome of these matches, and the game was known to last for days. During the game, of course, tempers flared, and not a few barrooms were totally destroyed as a result of the monotony and the boredom of such an era. And particularly, during a game of horseshoe billiards.

In these wild and wooly days of the gold rush, sports were found in various stages and ways. Pitching horseshoes was the most popular of the day, with participants going to extreme pains to measure "lies," and sometimes to their deaths over the outcome. Life was cheap in those days, because there was not much to living except work, work, work.

Bare-fisted fighting and no-holds-barred wrestling, as well as horse-racing, cock-fighting, and dog-fighting made up the breadth of the sportsman's delight during this time. And, of course, gambling for money and gold dust was the life-blood of the period.

They played faro, blackjack, the Chinese brought mah-jong. Man, they had every possible type of game of chance known to us today, and some we'll never hear about. Anything to lessen the monotony and the loneliness of the gold rush days.

HOWDY STRANGER — YOU'RE 'COVERED'

Craps, of course, was the game that everyone played. A stranger would meet another stranger on the trail. They'd strike up a conversation, break out the jug, and start rolling the dice right then and there. After one of them was broke, or they were tired of playing, they would race each other, double or nothing to the nearest water hole or town.

Sports of all kinds grew out of a desire to use excess time. The game of football, as we know it, grew out of something to do between wars, for the armies of countries who were getting soft from lack of conflict.

Sports are now, however, an integral part of our daily lives. People devote their entire lives to it, and our economy would suffer badly from the lack of it.

Keep smilin', Sport! See you next week.

Bowling Standings China Lake Women's League

Team	Won	Lost
Cream Puffs	21½	8½
Splinters	18	12
Jets	17	13
Miller's Missiles	16½	13½
Gypsy's	16	14
The Loaners	16	14
Hits and Misses	15	15
Bonnies	14	16
Douglas Flies	13	17
Kickbacks	13	17
King's Queens	11	19
Rolling Belles	9	21

The 30 Club

Teams	Won	Lost
Unpredictables	18	6
V. Smith-Chevron	15	9
Just Missed	13	11
Easy Marks	13	11
Quints	8	16
Twisting Poodles	5	9

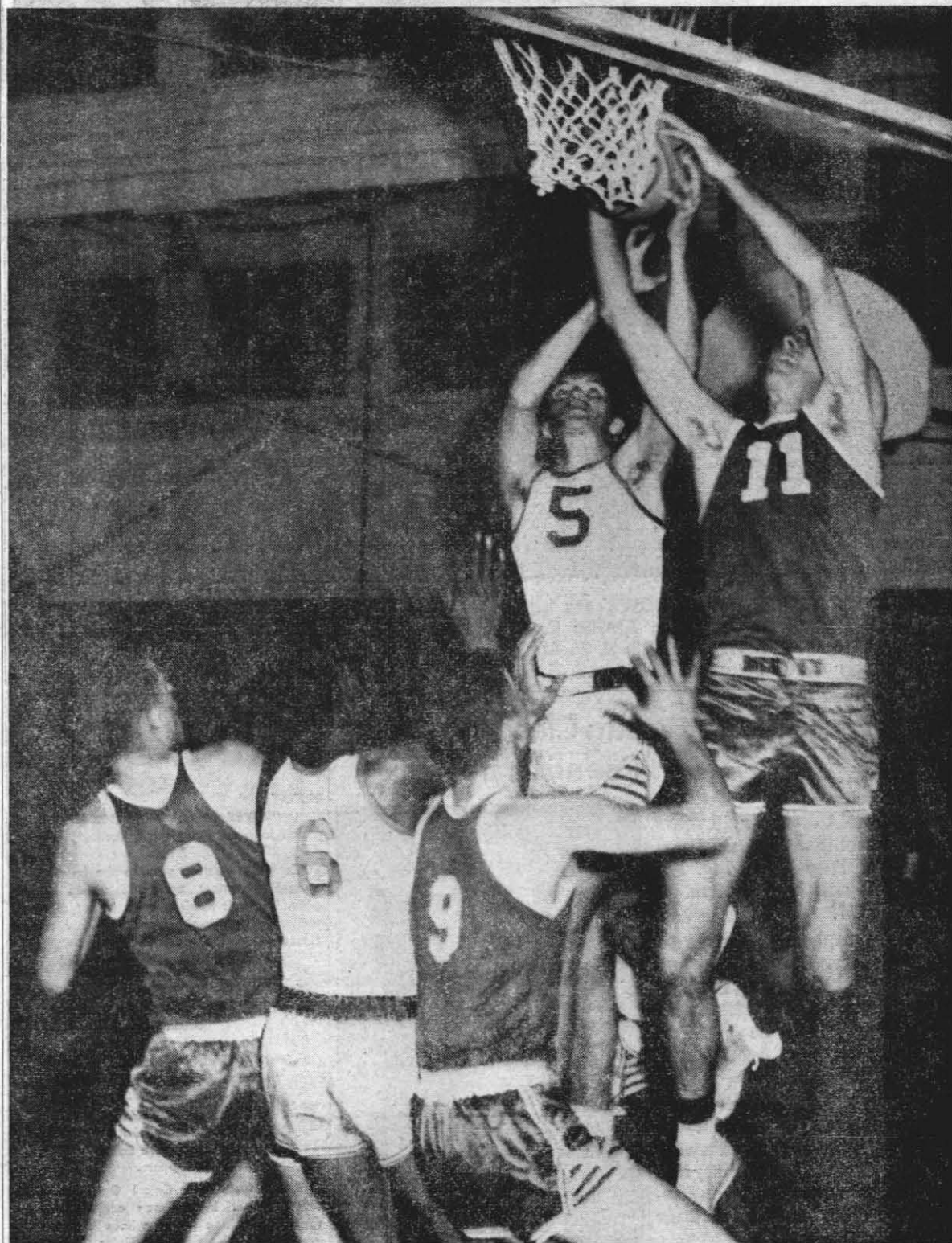
Premier League

Team	Won	Lost
Station Restaurant	19	11
Desert Playhouse	15	15
Apes	15	15
Roadrunners	14	16
CPO Club	13½	16½
Safeco	13½	16½

Highest score by a teen-ager in bowling was made by Don Schmidt of Lansdale, Pa., in the 1959 singles, when he was 18.

Oldest bowling champion was E. D. (Sarge) Easter of Detroit, who at the age of 67, was winner in the 1950 team event.

VX-5 Downs NAF, 90 to 83



OVERTIME CAGE ACTION—VX-5's Charlie Wickner (11) wrests ball from hands of NAF's Johnny Johnson (5) in second overtime period of Tuesday night's play in which VX-5 downed NAF 90 to 83. NAF's Leslie Bailey

(6) is flanked by VX-5's Tom Rose (8) and Jerry Swarting (9). In Tuesday night's twin bill NOTS took their second game of the season by defeating AOD 67 to 44 under the tutorage of their new coach, Lt. (jg) Bill Elrod.

SPORTS QUIZ

1. What is the record number of clay pigeons shot in one hour?
2. Where is the world's largest artificial ice rink?
3. What is the record for the most goals scored by a team in major league professional hockey game?
4. What was the longest hockey game played in the major leagues?
5. Who was the youngest golfer ever to shoot a hole in one?
6. Who and how old was the best golfer to score a hole in one?

(Answers to Quiz)

1. 1,308 shot in England in 1857.
2. In Tokyo, Japan, the ice rink contains 43,000 ft. (or 0.99 res).
3. 14 by Toronto in 1957 when they beat the N. Y. Rangers 14-1.
4. 3 hours, 56 minutes and 30 seconds, sixth overtime period as etroit beat Montreal 1 to 0.
5. The youngest was Joe Dobson (6 years, 3 months, 1 day) in klahoma on a 115 yard hole.
6. The oldest was T. S. Smith (71 years) on a 110 yard hole in ingland.

Greatest Attendance

The world record attendance at a basketball game is 75,000 in the Olympic Stadium, Berlin, Germany, to see the Harlem Globetrotters in 1951.

The Rocketeer

Official Weekly Publication of the U. S. Naval Ordnance Test Station China Lake, California

Captain Charles Blenman, Jr., USN Station Commander

"J. T." Bibby Public Information Officer

Jack G. Broward Editorial Advisor

Richard Gruenberg Editor

Budd Gatt Associate Editor

Frederick L. Richards Special Assignments

DEADLINES News Stories — Tues., 4:30 p.m. Photographs — Tues., 11:30 a.m. The Rocketeer receives Armed Forces Press Service material. All are official U. S. Navy photos unless otherwise identified. Printed weekly with appropriated funds in compliance with NavExos P-35, Revised July 1950. Office — 50 King St., Bldg. 00929. Phones — 71354, 71655, 72082.



Christian Science (Chapel Annex) Morning Service—11 a.m. Sunday School—11 a.m.

Protestants (All Faith Chapel) Morning Worship—8:30 and 11 a.m. Sunday School—9:30 a.m., Graves and Richmond elementary schools.

Roman Catholic (All Faith Chapel) Holy Mass—7, 9:30 a.m., and 12:30, 5:30 p.m. Sunday.

6 a.m. Monday through Friday, 8:30 a.m. Saturday.

Confessions—8 to 8:25 a.m., 6 to 8:30 p.m. Saturday, Thursday before First Friday—4 to 5:30 p.m.

NOTS Hebrew Services (East Wing All Faith Chapel)

Every first and third Friday, 8:15 p.m. Sabbath School every Saturday morning.

Unitarian Fellowship (Parish Hall) Fellowship Meeting — Sundays, 7:30 p.m. Sunday School — 9:30 a.m.

RAdm. Hines Says SUBROC Deters Enemy Sub Menace

Remarks by Rear Admiral W. T. Hines, deputy chief, Bureau of Naval Weapons at the National Press Conference on the Subroc weapon system, New York City, Dec. 4, 1963:

"I am very pleased to be here today and take part in the unveiling of the SUBROC weapon system. This weapon system, even though it is still undergoing tests, will prove to be a decided asset in our antisubmarine warfare arsenal.

"One of the major threats to the security of this country and the free world in the event of hostility is the menace of enemy submarines. It is no secret that the Soviet Union has approximately 500 submarines. You may recall that Hitler began World War II with 57 subs and during the course of the war built 1000 more. He never had more than 325 operational at any one time; but, the submarines sank nearly 3000 Allied merchantmen, many of them off the East coast of this country.

"Enemy submarines are a definite challenge to the free world's use of vital shipping lanes, especially when you consider that the United States imports and exports over 99 per cent of all materials by ship. In addition, with the advent of missile firing submarines, the protection of our coastal cities becomes a problem of the highest priority. The Navy is meeting this threat with its development of weapon systems such as SUBROC which promises to be of the utmost importance in combating the submarine menace.

"Earlier this year, the United States Navy suffered the loss of the nuclear submarine THRESHER. This ship was the first of its class to be equipped with the SUBROC weapon system. Beyond a doubt, she was the most advanced operational attack submarine in the world. The USS Permit, a sister ship, is also equipped with SUBROC and has been responsible for a major portion of the testing up to this date.

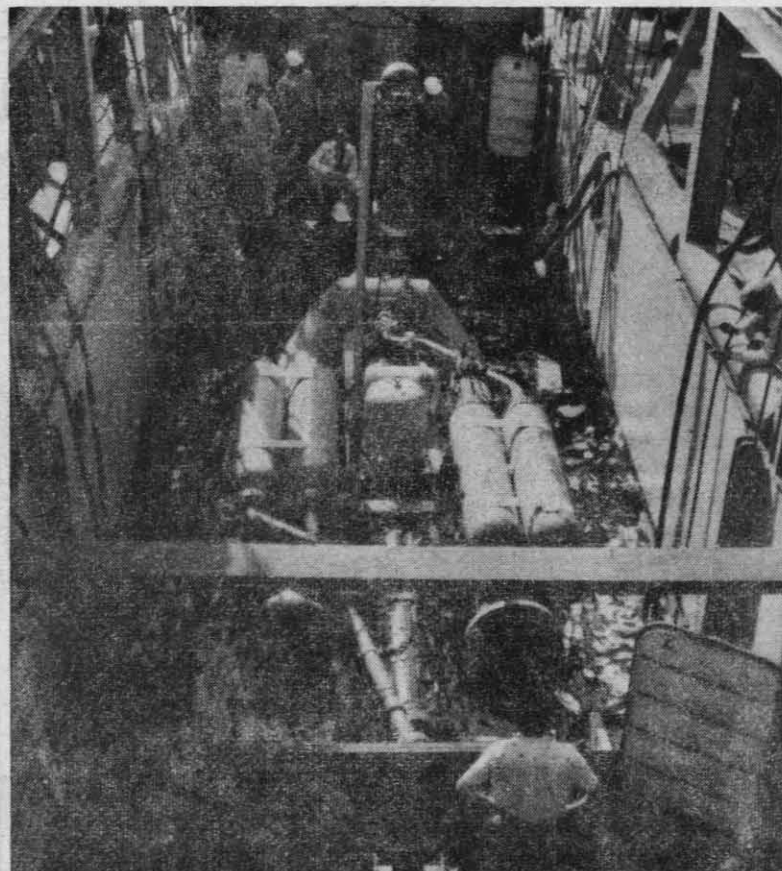
"The United States is building approximately 25 of these fast nuclear attack type submarines capable of seeking out hostile submarines and destroying them with SUBROC missiles. The development of this extremely complicated system is a tribute to the relationship and cooperation which exists between American industry and the military. It also points out the value of such organizations as the Naval Ordnance Laboratory at White Oak Maryland which conceived and established the feasibility of such a system.

"As long as we have this type of cooperation between industry and military, I am sure we will continue to make advances in solving the problems of underwater warfare."

Community Orchestra Presents Free Concert Monday Eve, Dec. 9

"Handel's Water Music" will open the Monday evening concert by the Desert Community Orchestra at the James Monroe School Auditorium in Ridgecrest.

The first movement of Cesar Frank's Symphony in D minor, Samuel Barber's "Adagio for Strings," and the "Emperor Waltzes" by Strauss will also be performed by the 52-member orchestra under the direction of Dr. Perry Stone.



UNDERWATER pneumatic launcher is lowered through well of LCU for firing of SUBROC missile during development phase of test program at San Clemente Island.

SUBROC Presented Problems

(Continued from Page 5)

ible form can solve many problems simultaneously, Knowles said.

Once it is on its way, SUBROC's speed places it on target before the enemy can take evasive action. The weapon system has the further advantage of being able to detect targets at great distances and to fire missiles in rapid succession, an important defense against "wolf-pack" tactics.

In addition to the Bureau of Weapons, Naval Ordnance Laboratory, Goodyear Aerospace Corporation, Naval Ordnance Test Station at Pasadena and China Lake, Calif., the following subcontractors were included in the program:

Librascope Division, General Precision, Inc., Glendale, Calif., fire control; Thiokol Chemical Corporation, Elkton Division, Elkton, Md., solid fuel and rocket loading; Garrett Corporation's AiResearch Division, Los Angeles, missile control and auxiliary power unit; and Aerospace Systems Division, General Precision, Inc., Little Falls, N. J., stable platform for the guidance system.

Development of the SUBROC missile posed for scientists and engineers one of the knottiest sets of problems ever encountered in the missile age.

First the size of the missile was limited in length and dia-

meter to the size of a submarine torpedo tube. Second, the powerful rocket motor had to ignite underwater and propel the missile out of the water and into the atmosphere.

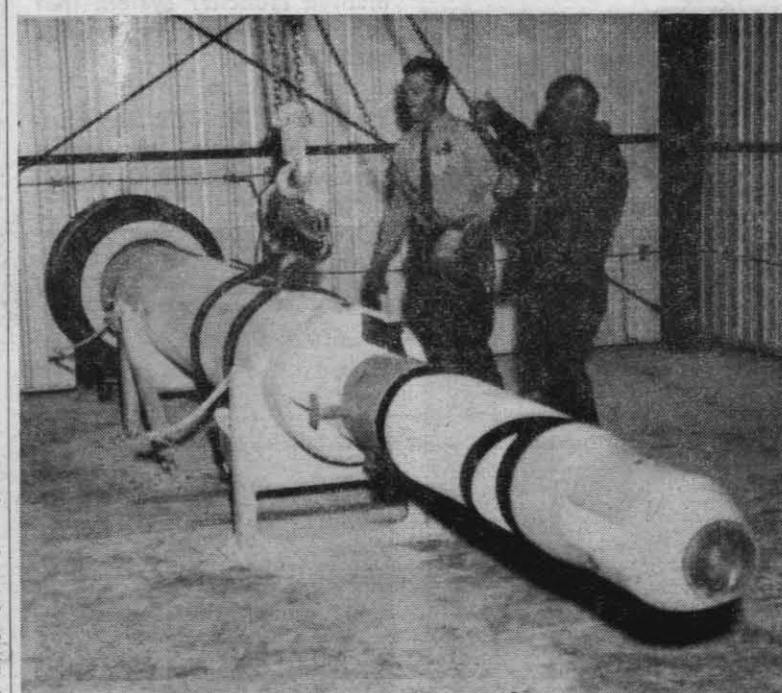
Because of its water-to-air-to-water operational and the aerodynamic characteristics of a missile. They also had to develop a shock-mitigating device that assures operation of the arming device and warhead after the missile has re-entered the water at supersonic speed.

A unique, thrust-vectoring device utilizing four jetavator type nozzles was developed, enabling the missile to change course underwater to guide its angle of emergence from the water and to control stability during the rocket burning sequence.

Separation of the rocket motor from its nuclear depth bomb is accomplished through a combination of thrust reversal system and explosive bolts, which permits the warhead to continue on its trajectory and sends the spent motor tumbling to the sea.

Once separation occurs, fins on the depth bomb control pitch, yaw and roll to steer the missile to the target and control the angle of water re-entry.

Upon water re-entry, a shock-mitigating device cushions the impact and the depth bomb sinks and explodes.



SUBROC is prepared for shipment to San Clemente Island at the Assembly and Checkout building at Seal Beach.

Facts on SUBROC

Name	SUBROC
Mission	Anti-submarine missile, underwater-to-air-to-underwater.
Description	Submarine-launched, rocket-propelled, inertially-guided nuclear depth bomb for destruction of hostile underwater craft.
Range	Greater than any other ASW weapon except aircraft.
Propellant	Solid fuel.
Warhead	Nuclear.
Weight	Approximately 4,000 pounds.
Launch Technique	Launched horizontally from standard submarine torpedo tubes, using conventional launch methods. Submarine can be moving, need not be pointed at target.
Method of Operation	Once clear of submarine, rocket motor ignites under water and propels missile up and out of water. Missile is steered during powered flight by jetavators which deflect the thrust of the burning gases in accordance with signals from the guidance system. At a predetermined velocity, a thrust reversal technique separates the depth bomb from the rocket motor. The depth bomb continues toward its target, guided by aerodynamic fins controlled by the inertial guidance system. Upon re-entry into the water, the bomb sinks and detonates.
Fire Control	Highly accurate, rapid, digitized system. Designed on the building block principle, making possible modifications of varying complexity to suit needs of specific submarines. System can handle other submarine-launched weapons in addition to SUBROC. This is a milestone in missile accomplishments.
Advantages	Can be carried dormant in torpedo tubes for long periods and can be launched with a minimum of make-ready time. High speed places it on target before enemy can take evasive action. Weapon system can detect submarines at great distances and can fire missiles in rapid succession. Can attack in areas inaccessible to surface ships and aircraft. Has maximum safety features, does not require special launching tubes, increases submarine attack capability without sacrificing existing weapons or space on board. Minimum of special handling equipment required.
Management Director	Bureau of Naval Weapons.
System and Technical Direction	U. S. Naval Ordnance Laboratory, White Oaks, Silver Spring, Md.
Prime Contractor	Goodyear Aerospace Corporation, Akron, Ohio.
Test and Evaluation	U. S. Naval Ordnance Laboratory, White Oaks, and U. S. Naval Ordnance Test Station, Pasadena and China Lake, Calif.
Subcontractors	Librascope Division, General Precision, Inc., Glendale, Calif.—responsible for fire control system. Aerospace Systems Division, General Precision, Inc., Little Falls, N. J.—major portion of guidance system. AiResearch Division of the Garrett Corporation, Los Angeles, Calif.—auxiliary power system. Thiokol Chemical Corporation, Elkton, Md.—manufacture and loading of propellant.

WACOM Luncheon Meeting Tuesday

The December meeting of WACOM will be held Tuesday at the Commissioned Officers Mess.

The cocktail hour will commence at 11:30 followed by luncheon at 12:30 and entertainment at 1:30.

Luncheon reservations may be made through Dec. 7 by calling Joann Jensen, FR 8-3761, Naomi Soifer, 723734, or Pat Hodson, 723943.

Following the luncheon members will be entertained by Miss Virginia Scott, talented singer of American Folk Songs, who accompanies herself on the auto-harp.

Preparing table decorations to accent the Holiday Season are hostesses Mary Pennington and her committee of Helen Weals, Dot Shull and Phyllis Wair.

All members are reminded that WACOM will vote on recommended changes in the By-Laws at this meeting.



STORMFURY PHOTOGRAPHER Lee Mascarello, PH2, earned Command's praise this week for his ground and aerial photography of cloud seeding this year in Caribbean areas by NOTS' Earth and Planetary Sciences division and U. S. Weather Bureau.

Rocketeer Photog Commended For 'Stormfury' Films

Ace Navy photographer Lee Mascarello, PH2, already cited once this year for his still camera work by the Navy's Chief of Information, this week won an official Command commendation for his photographic support work during Project Stormfury cloud seeding operations in the Caribbean areas this summer.

Regularly assigned as a Rocketeer staff photographer, Mascarello filmed ground preparation and actual cloud seeding conducted jointly by members of NOTS' Earth and Planetary Sciences division and the U. S. Weather Bureau.

In his letter of commendation, Dr. Pierre St. Amand, head of the local division, said, "Mascarello performed a superb job of documenting various phases of the operations photographically, both from the air and from the ground... contributed more than his share to the NOTS effort put forth at Puerto Rico."

The first endorsement to the commendation came from Captain Charles Blenman, Jr., COMNOTS, who extended his congratulations for the outstanding service contributed.

Mascarello, a Chicago, Ill., native, is a member of the local military division Thirteen. He has worked in both motion picture and still camera sections for the Public Information Office since reporting here for duties two years ago.

Art League Schedules Decoration Workshop

Members of the Desert Art League and AAUW will join together for a workshop on holiday decorations tomorrow at 1:30 p.m. at the Art League studio, 411 McIntire.

Members attending are asked to bring a Christmas decoration, either for indoors or outdoors, that they have made, or that has been hand-made by someone.

Schedule Series Of Youth Concerts At Station Theatre

A series of Youth Concerts sponsored by the Music Parents Club, China Lake Elementary Schools, at the Station Theatre, is scheduled as follows:

Tuesday, Dec. 17 — 3:30 p.m.

Lee Lockhart "Sounds of Music" Mr. Lockhart brings the science of sound on the brass, woodwind and string instruments in a manner enjoyed by all ages.

Tuesday, Feb. 11, 1964 — 3:30 p.m. —

The Van Winkle Marionettes Crawford Eagle and Grace Van Winkle present something new in marionettes. This "Review in Miniature" has special lighting effects.

Desert Community Orchestra The Desert Community Orchestra will have a special concert for students probably in March 1964.

Tickets for series of concerts, Students and Pre-schoolers, \$1; Adults \$1.50.

Single tickets at the Box Office, Students and Pre-schoolers, 35¢; Adults 50¢.

Avionics Officer



Roy B. Penwell Named 'Bluejacket of Month'



"BLUEJACKET OF THE MONTH" Roy B. Penwell, MT2, goes to Bakersfield today to start "guest" weekend in that city. Penwell, attached to Guided Missile division, is Command's final selection of outstanding enlisted men for 1963.

Christmas came early for bluejacket Roy B. Penwell, a guided missile technician attached to NOTS China Lake's Guided Missile division.

The 21-year-old Navyman was named this week to represent the Naval Ordnance Test Station as "Bluejacket of the Month" at Bakersfield this weekend.

Potato Bowl Game Guests Accompanied by his wife, Jane, and their 21-month-old daughter, Rochelle, Penwell will be feted as a "guest of honor" at the annual Potato Bowl football game Saturday.

Hosted by the Bakersfield Chamber of Commerce, Penwell is the final selection from China Lake for 1963.

Auto dealer Ed Fant will provide Penwell and his family with the use of a new car during their visit which starts this afternoon and ends Sunday afternoon.

Free lodging and meals at that city's plush Bakersfield Inn, recognition gifts from numerous Bakersfield merchants are included in the "red carpet" treatment in store for Penwell.

A native of Akron, Ohio, Penwell lettered in football and track before entering the Navy in 1960.

Here Since April, 1962 A graduate of the Navy's class "A" and "C" guided missile technician schools, he reported here in April, 1962.

"I hit it lucky!" claimed the slender Navy man this week, stating that his tour of duty here gave him the opportunity "to apply my Navy education at the same time new programs are being developed."

"In my estimation, it's the best duty I could've gotten," he adds. This attitude, according to Penwell's division officer, Lieutenant (jg) W. F. Elrod, is the bluejacket's distinguishing characteristic.

"It is a pleasure to have Penwell in our division. This is a feeling that all of his shipmates have toward him," states Elrod. This week's selection of China Lake's Navy man as "Bluejacket of the Month" ends the 1963 series. The program will be resumed in January, 1964.

Pasadena Cancels Christmas Party

Pasadena's Employee Service Organization-sponsored Christmas party which was scheduled for Friday evening, December 20, has been cancelled, announces ESO President Jack Sayre.

The cancellation was made to concur with the 30-day period of mourning for the late President John F. Kennedy.



BAKERSFIELD EXPLORER GROUP TOUR—Members of the Bakersfield Museum Explorer Group are briefed by Ken Robinson (extreme right), president of the Maturango Museum Board of Trustees, prior to a tour

of the Little Petroglyph Canyon. Maturango Museum officials and the Station co-hosted the Bakersfield group. The event took place last Sunday, Dec. 1, on the first anniversary of the dedication of the local museum.

NOTS' LAND, AIR, SEA TESTS PROVE SUBROC VERSATILE

Underwater Launch Pad Built at SCI

(Continued from Page 1)
ment of SUBROC by the Bureau of Naval Weapons.

Goodyear Aerospace Corporation, under the technical direction of NOL, was prime contractor.

Newsman Briefed

At the press conference in New York, newsmen were given their first glimpse of the weapon and received a thorough briefing of its future application and place in the Navy arsenal.

Board Chairman E. J. Thomas of Goodyear told the newsmen that SUBROC has undergone a highly successful test program, during which time the missile was fired from varying depths and programmed for selected distances up to its classified maximum range.

Rear Adm. W. T. Hines, deputy chief of the Bureau of Naval Weapons, said that in the event of hostilities "enemy submarines would be a definite challenge to the Free World's use of vital shipping lanes. In addition, with the advent of missile-firing submarines, the protection of our coastal cities becomes a problem of the highest priority."

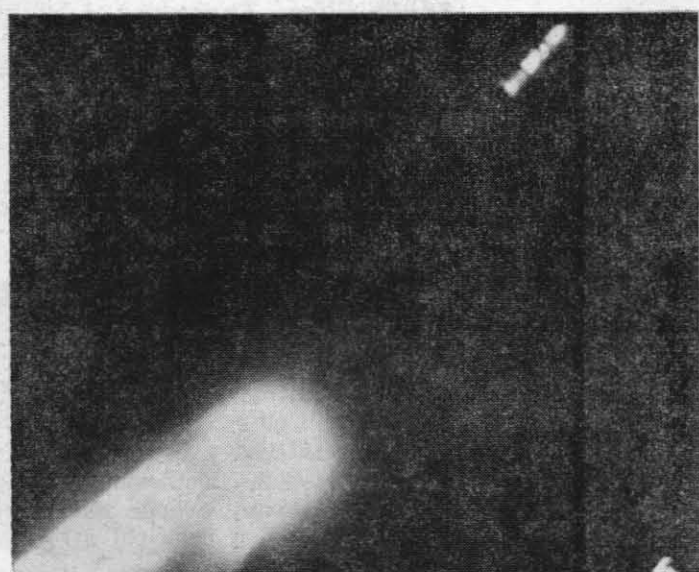
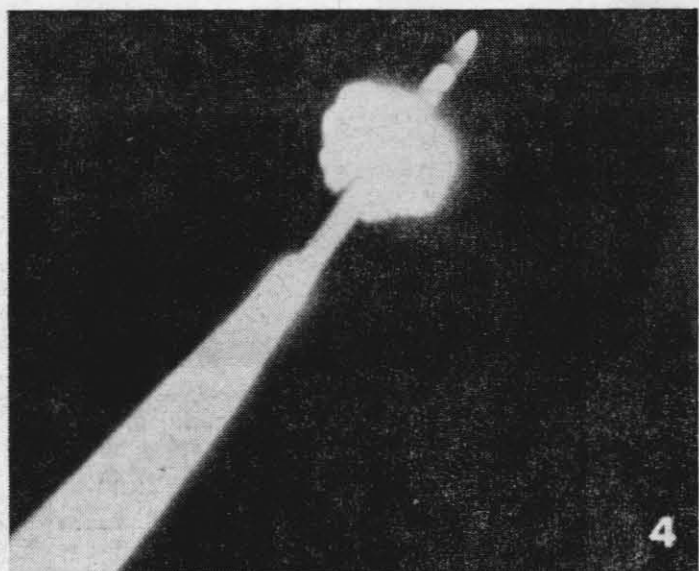
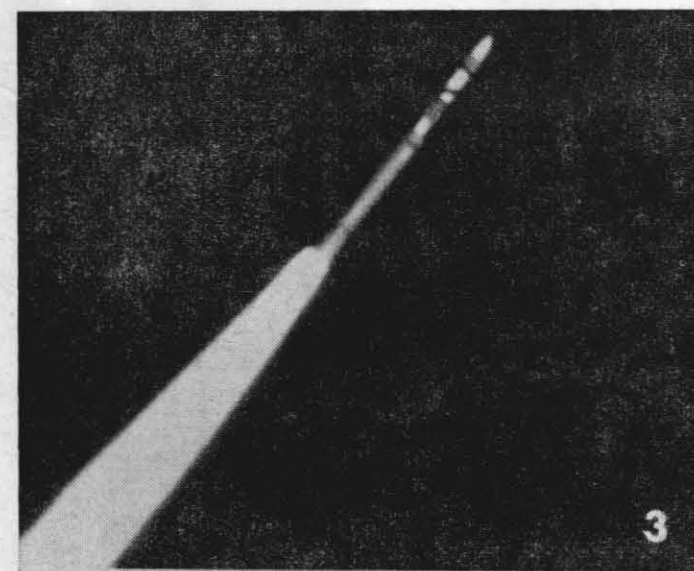
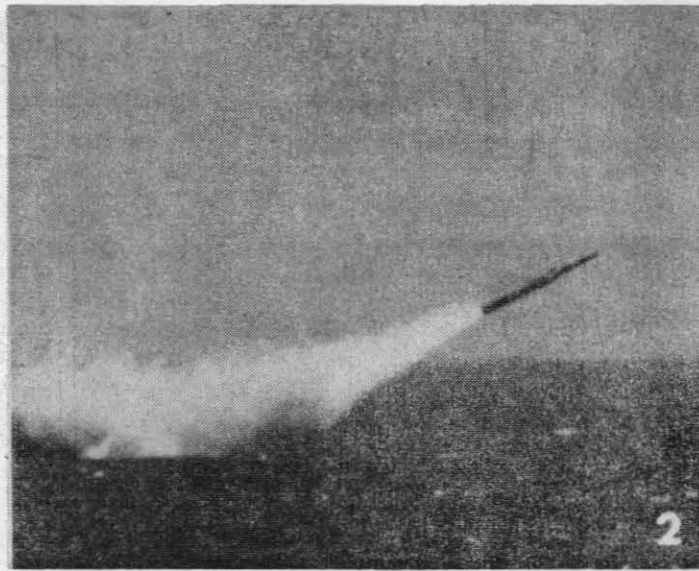
"The Navy is meeting this threat with development of weapons systems such as SUBROC, which promises to be of utmost importance in combating the submarine menace."

Adm. Hines said the United States is building approximately 25 fast, nuclear-attack-type submarines "capable of seeking out hostile submarines and destroying them with SUBROC missiles."

Different From Polaris

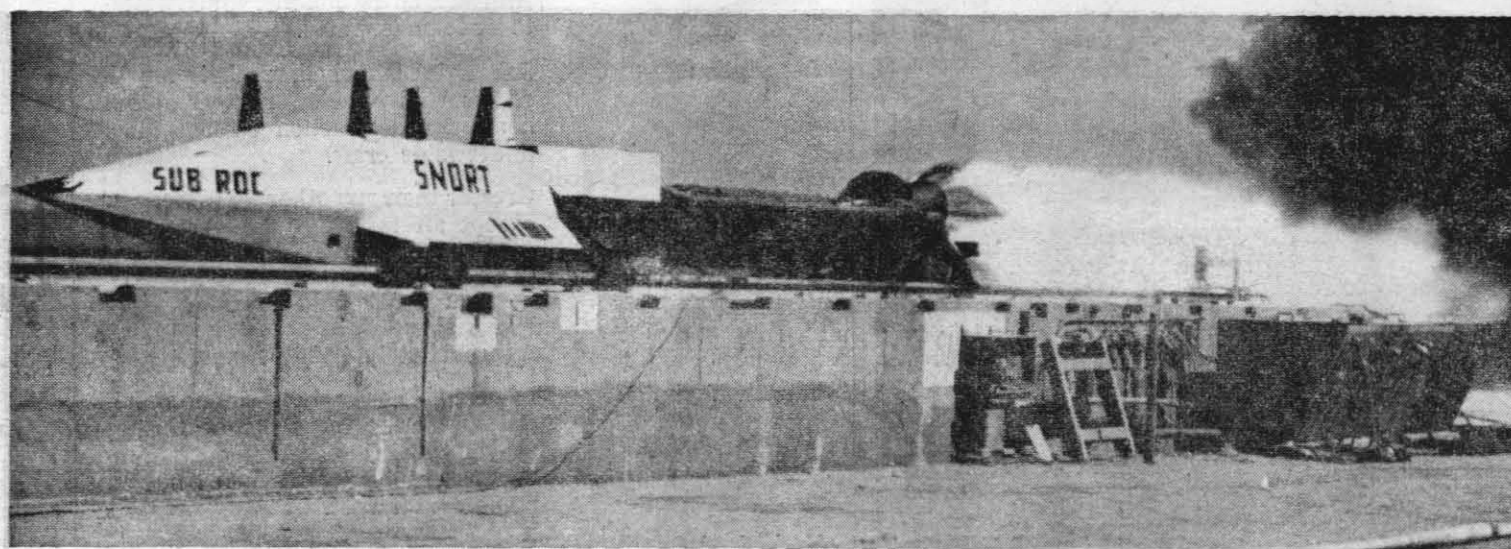
SUBROC, unlike Polaris, is designed to be launched horizontally from standard submarine torpedo tubes, using conventional ejection methods, Goodyear Aerospace President T. A. Knowles explained. Once SUBROC is a safe distance from the moving submarine, a solid fuel rocket motor ignites underwater and propels the missile upward

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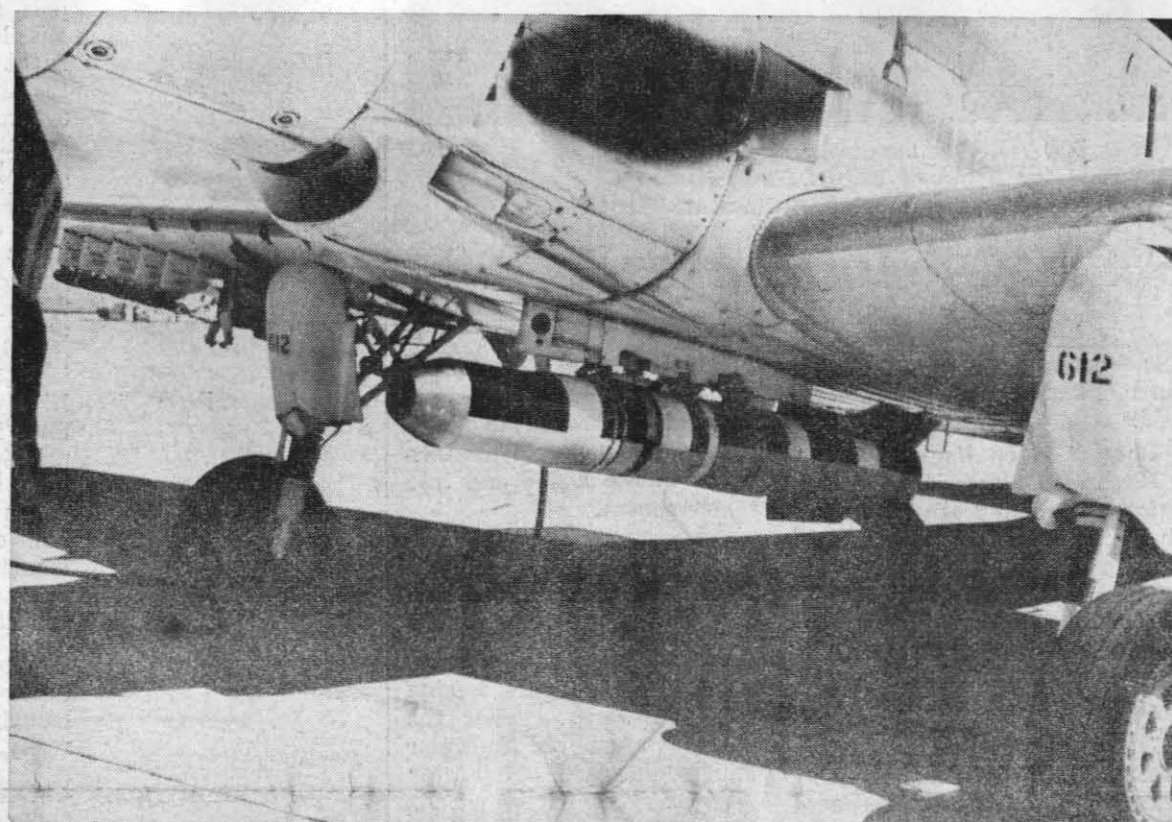
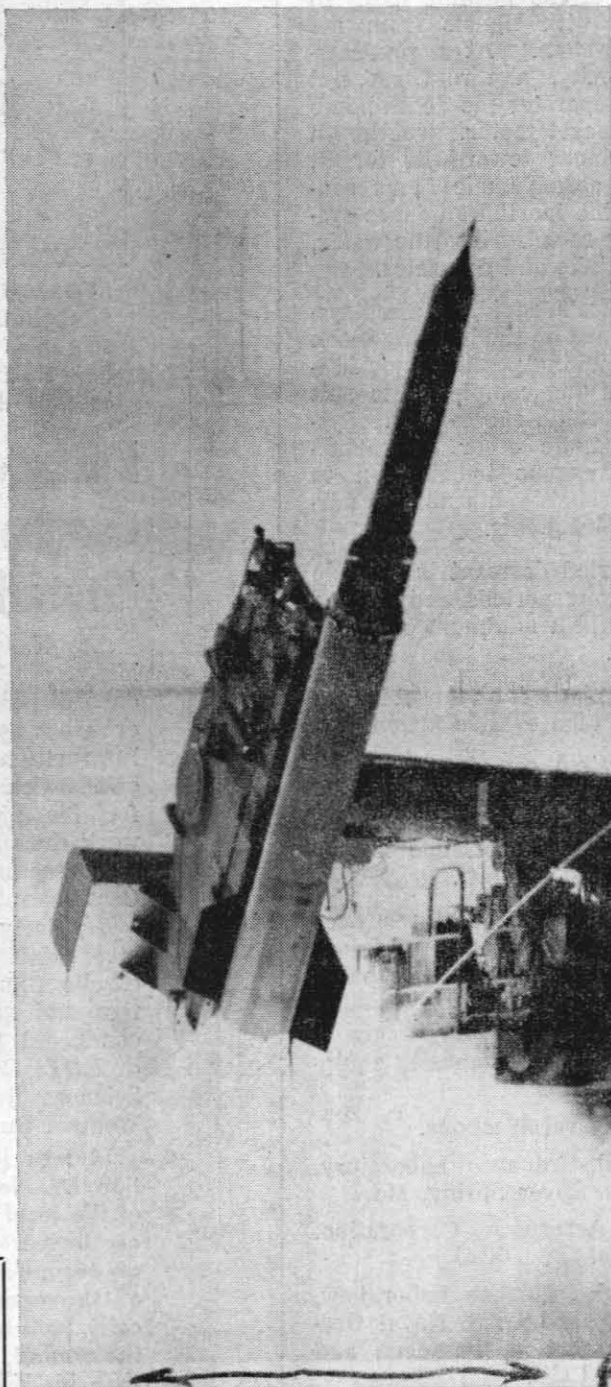


ACTUAL FIRING of a SUBROC is graphically illustrated in this series. Launched horizontally from a submarine's conventional torpedo tube (1), the missile travels a safe distance from the ship before the rocket motor ignites and thrusts the SUBROC out of

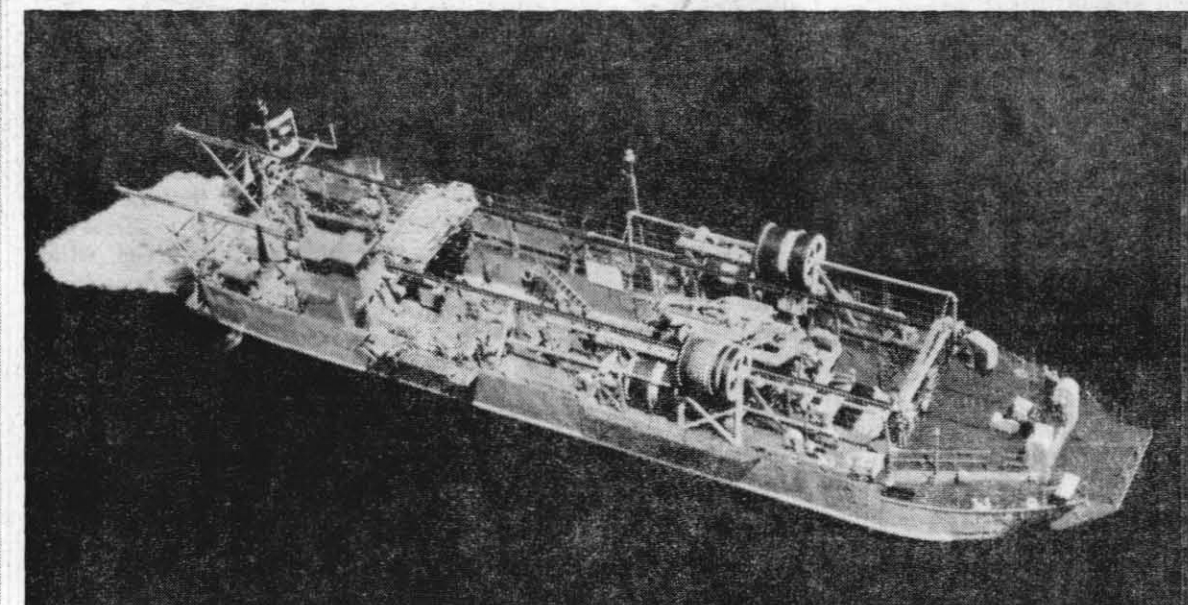
the water (2). The nuclear weapon builds up supersonic speed (3). Rocket motor separates from the nuclear depth bomb in a blaze of burning gases (4 and 5), as the guidance system takes over (6) to direct the missile to its target.



VALUABLE DATA was gathered in tests on SNORT sled and in static firing tests (below) at China Lake.



SUBROC test vehicle is loaded aboard aircraft for air drop test at NOTS.

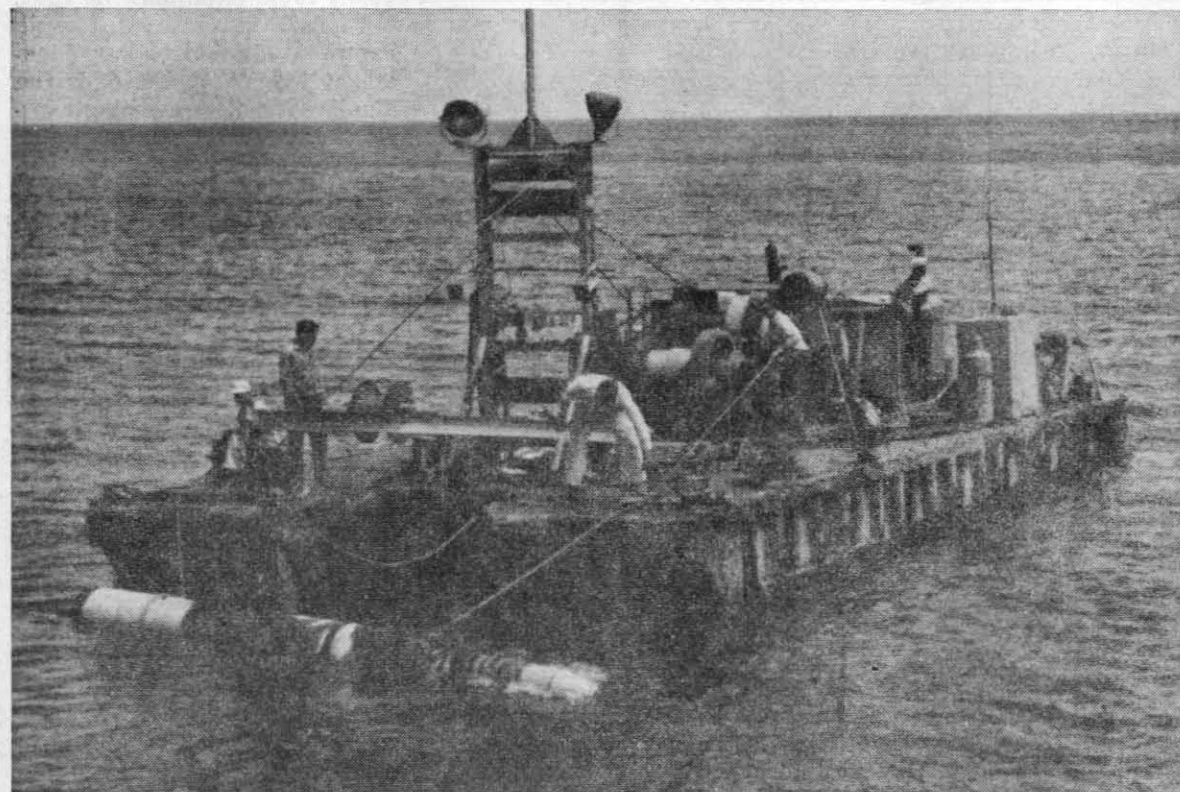


MODIFIED LCU houses instrumented launcher system that can be lowered to various ocean depths.

RANGE ENGINEER Ray Musgrave conducts pre-launch checkout of SUBROC at SCI range.



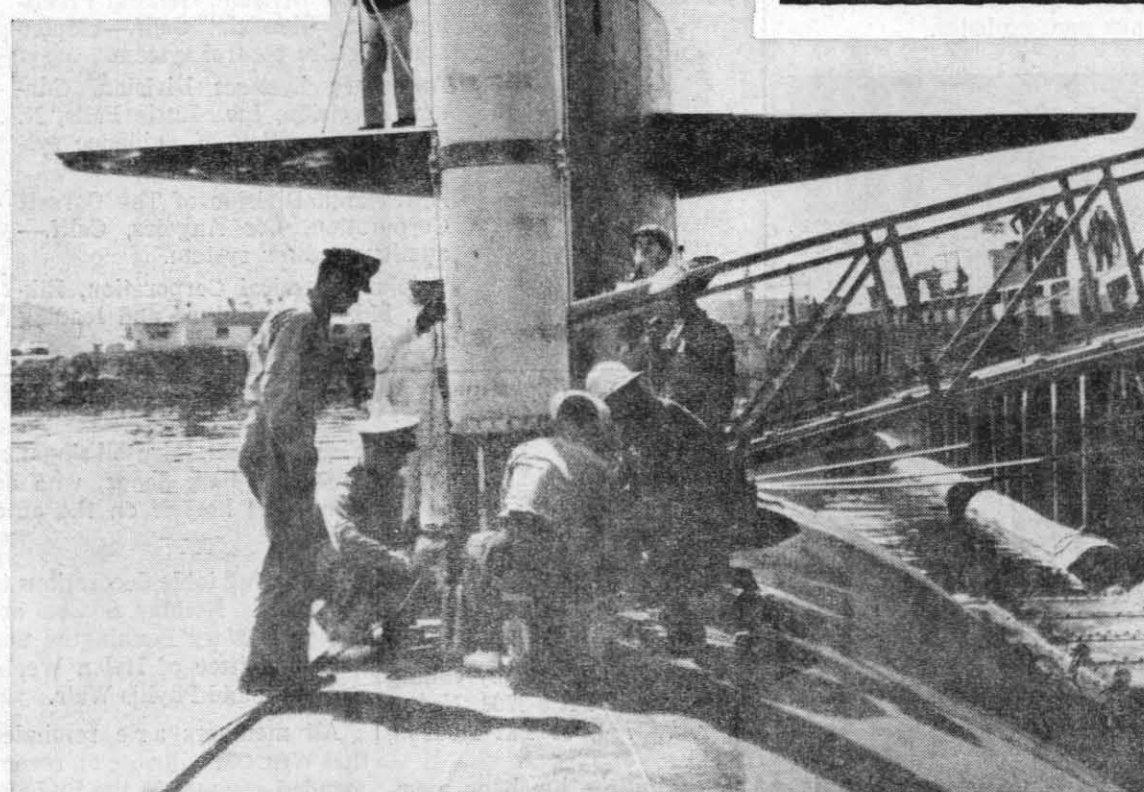
Dummy Missiles Retrieved Off SCI



DUMMY SUBROC is secured at stern of barge during recovery operation off SCI.



NOTS PROJECT manager Howard R. Talkington points to model of SUBROC and photo of the test range at San Clemente Island. With him is Project engineer Frank N. Brady.



LOADED aboard submarine USS PERMIT at Long Beach for full-scale test.

SNORT Runs Gave Control, Guidance Data

(Continued from Page 4)
and out of the water.

A lightweight inertial guidance system directs the missile toward the target area by means of a thrust vectoring system. At a pre-determined range, separation of rocket motor and depth bomb warhead is accomplished by a thrust-reversal and mechanical disconnect system.

After separation the slender depth bomb continues on its trajectory under control of its guidance system, which steers the projectile by means of aerodynamic fins. This determines the position and angle of the missile as it re-enters the water.

Upon supersonic re-entry into the water, a mitigating device cushions the shock. The depth bomb then sinks and its nuclear warhead explodes, destroying an enemy submarine.

Unique in Speed, Action

SUBROC is unique in many respects. It must operate in two environments — water and air. Too, it is the first underwater-launched weapon capable of exceeding the speed of sound, and the first missile to use a rocket engine underwater.

SUBROC employs new, highly developed techniques in guidance and motor design.

The fire control system designed for SUBROC utilizes a digital computer for target motion analysis. This system in its flex-

(Continued on Page 6)