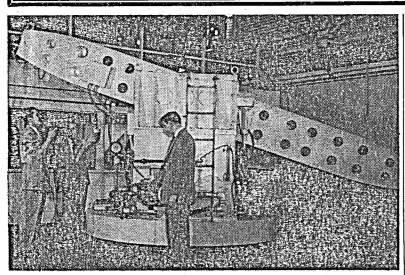
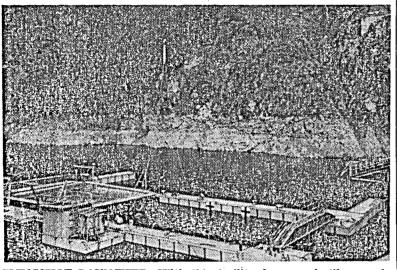
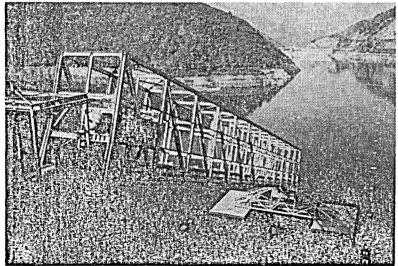
### PASADENA ANNEX



dynamic Simulator is a device designed to duplicate, in a dry run, a torpedo's behavior exactly as it would occur during detection and pursuit is to provide underwater clude the Foothill Plant in Pasadena (shown above), which is the headof a target in the ocean. The Simulator and attached computer provide Weapons systems for the Fleet quarters and chief work area for the Annex; the Morris Dam Test an exact record of each movement of the torpedo in terms of deviation, through a program of re-



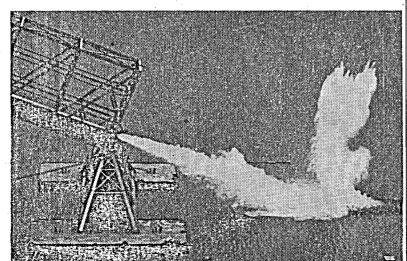
SLINGSHOT LAUNCHER—With this facility, large projectiles can be raised on a cable up to 160 feet and slung into the water below. Photographic coverage of these drops gives weapons designers information of mportance on the water-entry forces.



VARIABLE-ANGLE LAUNCHER—The VAL, called the largest air gun in the world, has two 300-foot launching tubes one 22.5 inches and another 32 inches in diameter are several NOTS facilities known through which torpedoes or other projectiles ported on one end by floating barges that can be Located at the Morris Dam Test moved to change the water-entry angle of the pro- Range, near Azusa, are such facijectile to any vertical angle up to 40 degrees. Thus, lities as the Variable-Angle Launchthis facility makes it possible to simulate the re- er, shops, test pits, and laboratories

velocity and angle of attack. A battery of high-speed motion picture plied research groups. cameras record performance of the projectile as it enters the water. The Here, test stands for model perunderwater trajectory is determined by an array of underwater ears formance studies provide facilities

Following the launchings, Navy divers recover the torpedoes.



Visitors on Armed Forces Day will see hourly firings on the VAL. Station, Long Beach.

## WHAT IS NOTS?

The Naval Ordnance Test Station (NOTS) is the Navy's largest ordnance research center. The work here provides the Navy and other fighting forces of this country with superior weapons.

#### Our Mission

The principal objective of search, development, and test-

NOTS is able to carry ordnance developments through from inception of an idea to the completion of weapons ready for mass production. It has all the specialized facilities and technical personnel for conducting research, production, engineering, and pilot production. Some of the weapons that NOTS deals with are rockets, guided missiles, torpedoes, and aircraft fireontrol systems.

#### Military-Civilian Teamwork

Smooth, coordinated teamwork is naintained between scientist, engineer, and military at NOTS. To develop modern weapons, eamwork must be utilized.

It is the military man's job to advise and coordinate weapon development so as to guarantee that these weapons can be used by the Fleet with the greatest possible ease, efficiency, and effectiveness. It is the engineer's job to develop the weapon and supervise it through production. It is the scientist's job to supply basic data on which to develop the weapons.

When one of the team comes up with a new idea for a weapon, between them they can be sure that the idea is well-grounded scientifically, is developed on sound engineering principles, and will give the Fleet what it needs. Such a three-man team pays off not only in efficiency but in mutual stimulation among all concerned.

#### Locations

The Naval Ordnance Test Station s located in a number of different physical locations. The main facility, covering over 1,000 square miles, s 155 miles northeast of Los Anceles in the northwestern part of

In the vicinity of Pasadena, there collectively as the Pasadena An-

lease of a projectile from an aircraft at controlled for the underwater propulsion ap-

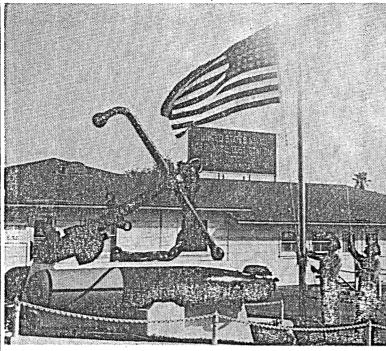
for final engineering and design work on new weapon systems and components.

#### Foothill Headquarters

At 3202 E. Foothill Boulevard in Pasadent are the headquarters of Pasadena Annex. Here also are located the Hydroballistics Laboratory, the Structures Laboratory, the Hydrodynamic Simulator, the Headquarters of the Underwater Ordnance Department, and divisions of the Engineering, Public Works, Supply, and Personnel Departments, as well as the Command Administration Division for Pasadena Annex.

#### Sea Ranges

Underwater and air-to-air-rockets are tested in extensive deep-water facilities at San Clemente Island sixty miles off the California coast. and on a sea range operated from a base located at the U.S. Naval



the Pasadena Annex of the PASADENA ANNEX-There are several NOTS facilities known collec-Naval Ordnance Test Station tively as the Pasadena Annex. Major parts of the Pasadena Annex in-Range, which is used for torpedo water-entry and underwater-trajectory studies; and specialized facilities at Long Beach and San Clemente Island for sea-range tests.

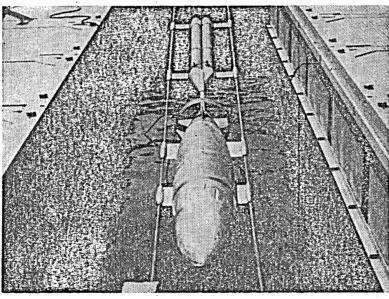
## WELCOME ABOARD

We of the Naval Ordnance Test Station welcome each of you to the Morris Dam Test Range. You are seeing part of the Navy team dedicated to research and development of inexpensive but hard-hitting weapons for your Fleet. Through the continuous efforts of Navy personnel and civilian scientists here and at a handful of similar stations, your Navy

cloak. However, you can see many of the research tools used and meet some of the men who use them. We hope you enjoy your visit.

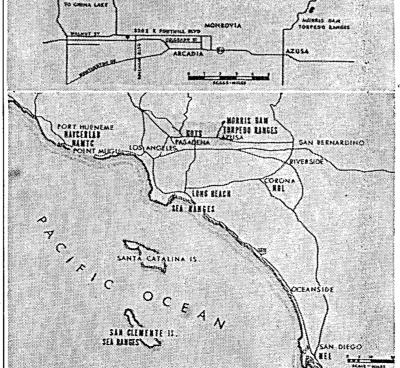
J. J. O'BRIEN Commander, USN Officer in Charge Pasadena Annex

Head, Underwater Ordnance Department.



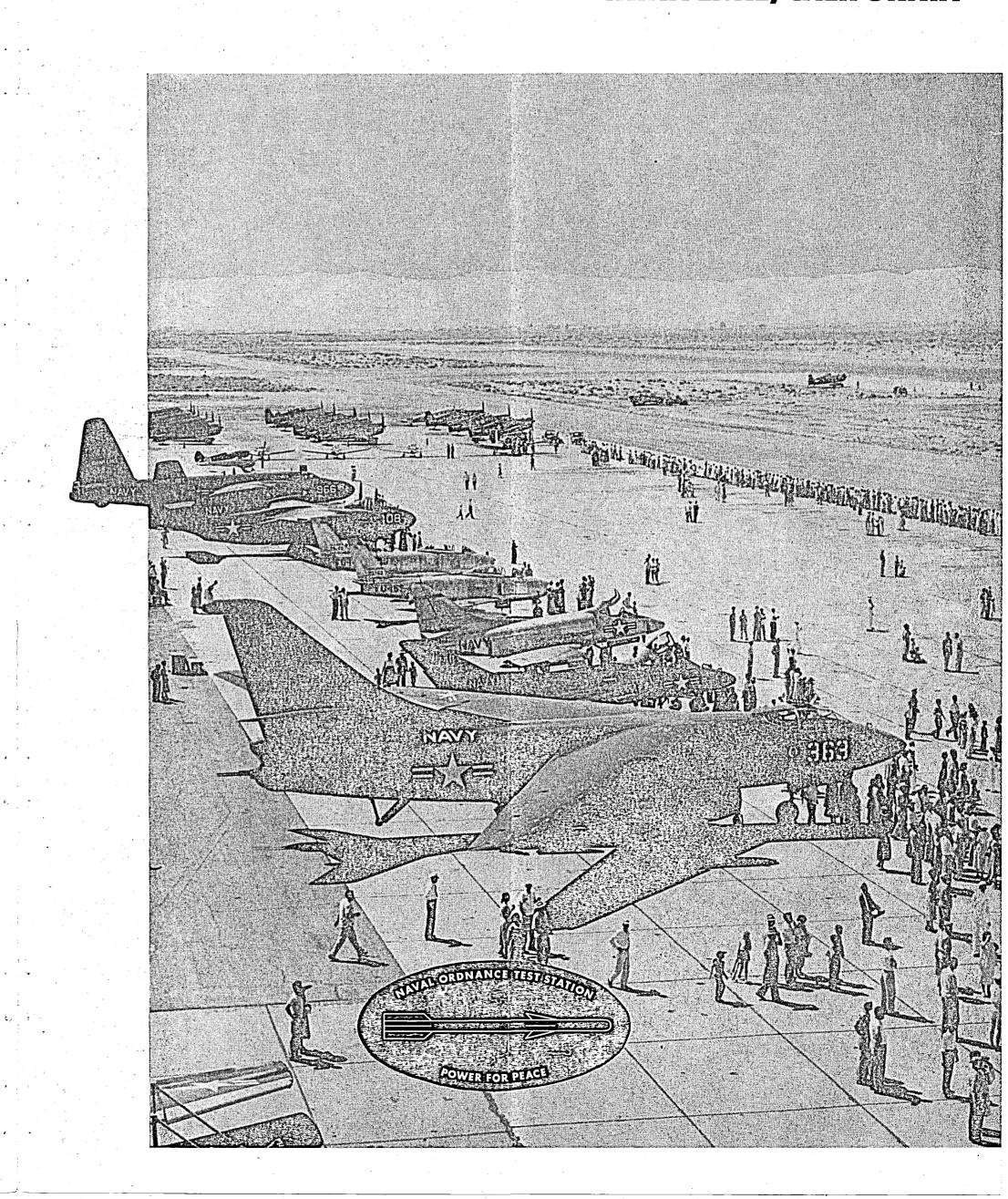
nex. The Pasadena Annex is the UNDERWATER CABLEWAY-This is a device used for underwater can be blown into the water by compressed air. operational center for NOTS in unand it operates at a depth of about 60 feet

#### Pasadena Annex and other Naval Activities

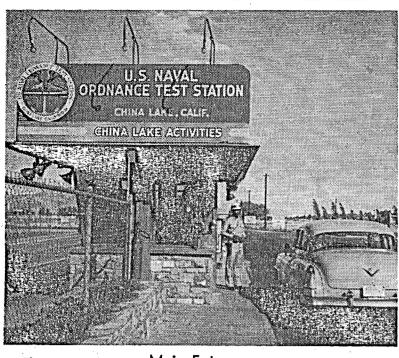


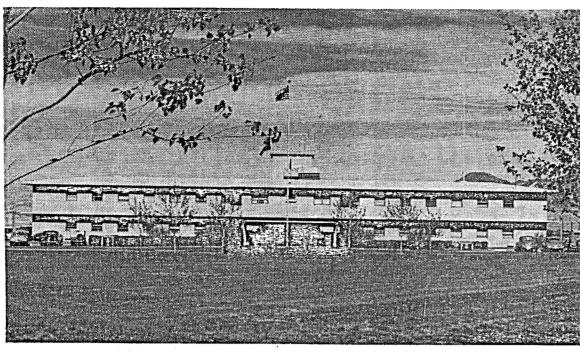
# SOUVENIR EDITION

MAY 18, 1957 CHINA LAKE, CALIFORNIA



## CHINA LAKE WELCOME





Main Entrance

Administration Building



Capt. F. L. Ashworth, USN Commander, NOTS

Your Naval Ordnance Test Station welcomes you and your family on Armed Forces Day.

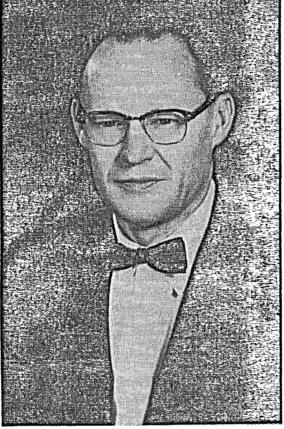
We who are working here at the Naval Ordnance Test Station are proud of the progress we are making for you in building the defenses of our nation.

This Station is engaged in research and development work. Progress at this type of military installation must be continuous in many areas, often secret. Periodically, developments become a reality in the Fleet and can then be demonstrated.

Accomplished developments of this type which have been disclosed here since last Armed Forces Day are momentous. The NOTS-developed SIDEWINDÉR missile has entered the Fleet and is revolutionary for simplicity, effectiveness and economy. The Marine Corps has proved here at NOTS that the TERRIER missile, already in use by the Fleet, is effective in Marine Corps tactics. Navy Air Development Squadron Five has been able to unveil the advanced bombing technique which they developed here.

Pridefully, we exhibited these developments in actual demonstrations on March 1 of this year for the press so that they could be reported to you in the manner to which you are accustomed

Today, on the Eighth Armed Forces Day at NOTS, we are privileged to demonstrate these developments for you first hand. We hope you will find these and other demonstrations and exhibits interesting and informative.



Wm. B. McLean Technical Director

## Home of the U.S Naval Ordnance Test Station

Navy's largest ordnance research and development center, It is a place where ideas count, and ideas are generated best provides the Navy and other fighting forces of this country by individuals who are encouraged to use their initiative OFFICIAL WEEKLY PUBLICATION with superior weapons. This permanent field station of the and are given opportunities to develop themselves along the Bureau of Ordnance is manned by a civilian-military team lines of their individual specialties. of some 6300 individuals concerned not only with immediate requirements but also with weapon systems required five and 10 years from now.

weapons and carry these ideas through the development in the midst of the desert vastness. cycle to the completion of weapons ready for mass production. Military personnel provide operational know-how and bring to the attention of the Station the ordnance needs of the Fleet.

ber of different physical locations. The main facility is 155 commissary store, Navy Exchange, theater, library, telemiles northeast of Los Angeles and covers an area of 1,000 graph office, bank, post office, barber shop, laundry, dry square miles, a mere drop in the bucket for the Mojave des- cleaners, telephone exchange, eating establishments, and ert—but the Station itself is larger than the entire state of other facilities. Rhode Island. It is in this vast "proving ground" of sand that top civilian scientists and engineers join hands with the military to analyze new ideas in ordnance, and support all phases of research, development, experimental production through high school, is among the best in California. and testing of rockets and guided missiles.

In spite of this imposing list of physical facilities, the most important asset of China Lake is its people. Men and women—on the weapon-development team represent many different professions and trades, particularly in the scientific and engineering fields. They are specialists working together as a team that can focus its effort on difficult weapon development problems and can come up with answers needed by the military forces.

A factor of particular significance in the China Lake ed with the lusty sagas of the West.

The Naval Ordnance Test Station (NOTS), the philosophy of operation is the importance of the individual.

China Lake itself is a modern, trim and prosperous community of more than 10,000 people. Trees and lawns W. E. Jackman have appeared like magic within the few years since its Phillys Wair ..... Civilian scientists and engineers originate ideas on new establishment in 1942, spreading an emerald carpet of green ROCKETEER PHOTO STAFF

In other respects, China Lake is similar to other communities of its size. Its physical appearance is much the same; its residents join clubs, participate in civic enterprises, Shav Monsen, A. E. Block, and amuse themselves as people do anywhere. There is a The Naval Ordnance Test Station is located in a num- complete shopping center, including a super-market-type

> A community chapel is used by different religious denominations for church, Sunday School, and other religious \* services. The public-school system, covering kindergarten

Evening classes for adults are particularly popular and provide educational opportunities in a wide variety of fields at both high-school and college levels. A graduate program in engineering and science subjects is offered by the University of California at Los Angeles.

Situated in a year-round vacationland of stark contrasts-ranging from historic Death Valley to the awe-inspiring mountain retreats in the High Sierras-China Lake is a sun-worshipper's paradise in a region romantically link-

### THE ROCKETEER

of the U.S. NAVAL ORDNANCE

TEST STATION Captain F. L. Ashworth, USN Station Commander

Tom Long, PH2. ... Photographer Art Illustration by Technical Informa-

PASADENA ANNEX

Jeanne Smith ...... Photographers Printed weekly by Hubbard Printing, Ridgecrest, Calif., with appropriated funds in compliance with NAVEXOS P-35, Rev. Nov. 1945.

The Rocketeer receives Armed Forces Press Service material which may not be reprinted without AFPS permission. All photographs are official U.S. Navy



## **Armed Forces Day Open House Bus Schedule**

Saturday, May 18,1957

<b>Originating Point</b>	Time	Destination	
Main Gate	7:30 to 9:30 a.m. (Buses will shuttle back and forth between points)	Bennington Plaza (Station Theatre)	
Bennington Plaza (Station Theatre)	8:30 to 10 a.m. (Buses will shuttle back and forth between points)	Naval Air Facility	
Naval Air Facility	At conclusion of Air Show (Buses will shuttle back and forth between points)	Bennington Plaza (Station Theatre)	
Bennington Plaza	Starting at noon as	SNORT Track	

(Buses will shuttle

back and forth

back and forth

between points)

SNORT Track

At conclusion of firing Bennington Plaza SNORT Track (Buses will shuttle

(Station Theatre)

between points) Starting at noon Bennington Plaza (Buses will shuttle back and forth

At conclusion of firing (Buses will shuttle (Station Theatre) **SNORT Track** back and forth

## **Local Stations** Will Broadcast Today's Events

Today's activities promise to be the most extraordinary Armed Forces Day Open House program ever presented at the Naval Ordnance Test Station

The famous Navy Missiles MIGH-TY MOUSE, ZUNI and SIDE-WINDER, all developed here, will be demonstrated in actual firings at the Naval Air Facility, starting

In addition to the demonstrations planned, the morning program will broadcast in its entirety over stations KRKS (1240) and KRCK (1360) in a joint three hour broadcast starting at 9 a.m.

The broadcasts will provide an on-the-spot report, interviews, and descriptions of the flight demonstrations. The broadcasts are planned to keep those informed, who may be late in arriving, or parked beyond the coverage of the public address system, or persons who for personal reasons prefer to enjoy the program in the comfort of their

Visitors are advised to bring their lunch, although hot dogs and soft drinks will be sold. Sun glasses and wide-brimmed hats are ad-

## **Armed Forces Day Open House** Saturday, May 18,1957

7:30 a.m. GATES OPEN TO PUBLIC

9:00 a.m. STATIC DISPLAYS at NAF including A3D Skywarrior, A4D Skyhawk, F4D Skyray, F3D Skyknight, WV2 Super Constellation, FJ4 Fury, F9F Cougar and F2H Banshee.

Propellant demonstration — 1st TERRIER firing — F4D takeoff and flyby — 2nd TER-10:00 a.m. RIER firing — Red Bird demonstration — ZUNI and 2."75 rocket firings — High altitude

AIR SHOW AT NAF-Drone launches-

bombing — Toss and loft bombing — Helicop-12:00 noon ter rescue — CAP flyby — SIDEWINDER firing - Marine Corps mock attack on ground positions — Land aircraft — Firefighting demonstration.

#### PICNIC AREA

2:00 noon KELLY FIELD - Hot dogs, popcorn, ice to 2 p.m. cream and soft drinks for sale.

1:00 p.m. CONTINUOUS MOVIES - Station Theatre (Film on NOTS and U.S. Navy) Michelson Laboratory (open all afternoon), Aeroballistics Laboratory (open all afternoon).

1:30 p.m. SNORT FIRING. 3:30 p.m. SNORT FIRING.

NOTS ARMED FORCES DAY AREA MAP - MAY 18, 1957 MICHELSON LABORATORY BENNINGTON PLAZA BLANDY ENTER HALSEY HALSEY TO HIGHWAYS 6 AND 395 CIRCLE KELLY GATE **FIELD** PARKING AREA

STATION RESIDENTS are urged to use the free bus service which will be shuttling back and forth from Bennington Plaza to the Naval Air Facility air show and the SNORT track firings because parking space for private vehicles will be extremely limited during the demonstrations. Buses will be available for every event taking place today, both at NAF and SNORT.

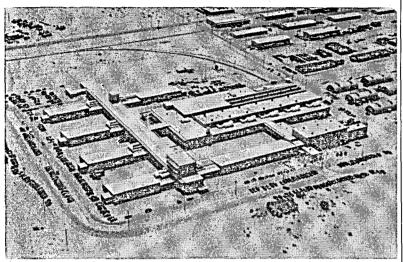
## NOTS Has \$200 Million Facilities for Ordnance Work

The completeness of its physical facilities is the major of photographic and electronic instruments for obtaining reason NOTS is able to develop weapons systems of major the data required to analyze the performance of rockets School Trustee Election significance to the nation's security. There are complete and missiles under development. facilities for basic research in chemistry, physics, ballistics, aerodynamics, propulsion, explosives, and other fields.

There are facilities for complete testing during all stages of the development of a weapon, and there are facilities to ets and guided missiles to simulate aircraft or shipboard Multi-use room. produce pilot-production quantities of new weapons. Al- launchings, and for conducting terminal ballistics studies. together, buildings and equipment at NOTS are valued at One of the three tracks, the 4.1-mile Supersonic Naval Ordnearly \$200,000,000.

#### Michelson Laboratory

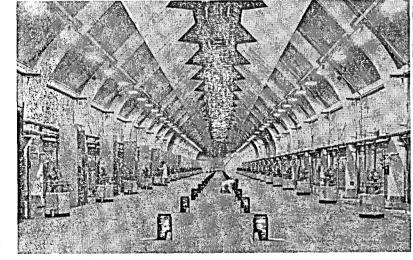
Its 10.3 acres of floor area are used for offices and laboratories for weapon development personnel; laboratories for development and testing of ordnance items. research in chemistry and physics; a technical library; large machine shop; foundry; heat-treating shop; electroplating shop; and environmental test chamber where conditions of



climate and altitude may be simulated by varying temperature, humidity, and capable of detecting flaws in 5-inch steel, and computing equipment, including an IBM 704 digital computer. The building has 8 wings and a main corridor 762 feet long, and it is named in honor of Albert Michelson, America's first winner of the Nobel Prize for physics.

### **Thompson Aeroballistics Laboratory**

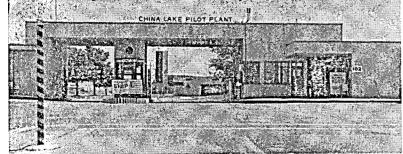
This well-instrumented indoor range is 480 feet long and allows the observation in free-flight of full-scale rounds or models from 70 millimeters to 5 inches in diameter. Test vehicles passing through the range may be photographed



as many as 220 times to produce very accurate data about trol Section, Track Operation dustrial Division. The incumbent FRIDAY the performance of a test vehicle at transonic and super- Branch, SNORT. The incumbent is will be responsible for performing

#### **Pilot Plants**

Together, the China Lake and Salt Wells Pilot Plants have 220 buildings that are used for research, development pects of the testing program. Inter- of other Defense activities. Freand pilot production in the fields of propellants and ex- ested personnel contact Fawn Hay- quent nationwide travel is required.



plosives. At these pilot plants not only are new propellants and explosives developed, but also processing and handling the evaluation of the new guidance equipment is developed for use in mass-producing the new systems or components. For furthpropellants and explosives.

#### **Ground Ranges**

There are five major ground ranges at NOTS. These tion is located in the Drone Elec- will speak on the sale of season ranges, considered as a group, represent the nation's most tronic Instrumentation and Evaluation Branch of Naval Air Facility.

flight of short-distance rockets and guided missiles and for flight of short-distance rockets and guided missiles, and for Joan Klaus, Ext. 71471. obtaining data on the events occurring at launching and during the first part of the trajectory of long-distance rock- See Armed Forces Day Program, transportation may call Ext. 725124 ets and guided missiles. These ranges have a wide variety Bus Schedule, and Map on Page 7. or Ridgecrest 8-3922.

NOTS has three well-instrumented test tracks used for Housing electors will vote on the captive testing of ordnance items, for pre-accelerating rock- stage of the Burroughs School nance Research Track (SNORT), is designed to make possible sustained runs with heavy carriage weights at velocities The earthquake-resistant Michelson Lab is one of the up to 3,500 feet per second. Extensive electronic and pho-District world's most complete research and development centers. tographic instrument systems in connection with these tracks make possible the collection of data required for the

#### Aircraft Ranges

Considered as a group, the four aircraft ranges at NOTS represent some of the country's most complete facilities for developmental testing of aircraft ordnance and asso- the Propellants and Explosives Deciated equipment such as armament-control systems. Also, the use of these well-instrumented ranges is valuable for American Institute of Chemical developing tactics for using completed weapon systems. Engineers next Monday, May 20. Many of the special cameras and electronic instruments on the aircraft ranges and on other NOTS ranges, have been developed at the Station to meet the unusual requirements developmental testing

#### Air Facility

The Naval Air Facility at NOTS provides support for home of Sylvia Murray, 700-B Esmany of the Station's research, development, test, and eval- sex Circle next Monday, May 20, at uation projects in connection with guided missiles, aircraft 1:30 p.m.

Reviews will be given by memrockets, rocket launchers, underwater ordnance, and arma- bers of the Sophomore English class ment-control systems. It has three runways, one of which of Burroughs Honor Program. is 10,000-feet long, extensive aircraft maintenance facilities, Dianne Renne will review "Madame Bovary" by Flaubert. "Deand the only land-based aircraft catapult and arresting gear siree" by Annemarie Selinko, will installation on the Pacific Coast. Over 5,000 flights were be reviewed by Carolyn Barker, and made from NAF during 1956 in support of NOTS pro- "Tale of Two Cities" will be reviewed by Alan Robertson.

#### Randsbura Wash Test Activities

The four permanent ranges of the Randsburg Wash gram) of Burroughs' Junior High Test Activities at NOTS have the most complete facilities the Middle East next Wednesday. in the United States for accurate fuze testing in an environ- May 22, at 8 p.m. at 501 Essex Cirment similar to tactical conditions. It is the only place in cle the United States where full-sized airplanes as large as B-29 tor of the first panel group on the bombers may be suspended as high as 250 feet above the historical background of the Midground for use as targets in fuze tests. These test ranges are rie Furman, Sandra Massaro, and located in an isolated 15-mile-long valley, 23 miles from Colin Jensen participating. Michelson Lab and the Station's administration building. The second panel group will dis-

## Job Opportunities

tion, Track Project Branch, launchers, and will make engineer-SNORT. The incumbent of this ing evaluations of items to detersted personnel contact Fawn Hay- activities, and will be required to

in charge of all field operations in standardization work for a major cock, Ext. 71577 or 71514.

Supervisory General Engineer, GS-11. Incumbent will be Head of the Design and Evaluation Sections Drone Electronic Instrumentation and Evaluation Branch, Target Air craft Maintenance Division of Nav- nounced recently by Les Fairall. l Air Facility. For further infor-

Electronic Technician, GS-9. This osition is located in Naval Air Facility. The duties include the design and development of drone and target aircraft instrumentation and er information, contact Joan Klaus

Electronic Mechanic. This posi-

## Annex Vacancies

This position is located in the Engineering Department, Industrial by Linda Miller, Christene Walden, Division. Incumbent will be respon- Janice Oldfield, Joe Alpert, John General Ordnance Design Engin- sible for developing a standardiza- Hill and Pat Norris. Lorrie Furman eer, GS-12. This is the position of tion program of rockets and asso- will render a piano solo. Head, Ballistic Missile Test Sec- ciated parts, ammunition, and position is in charge of the plan- mine the desirability of consolidatning, conduction and evaluation of ing, redesigning, or eliminating extests on systems associated with sting items. He will maintain conong range ballistic missiles. Inter- tinuing liaison with other Defense travel on a nationwide basis.

Production Specialist (General), Ordnance Engineer, GS-12. This is GS-11. This position is also located the position of Head, Range Con-in the Engineering Department, Inprogress on the three high speed group of items in the program dethe overall supervision in the field will be required to make decisions of all operational engineering as- in consultation with representatives

### Babe Ruth League Needs One Manager

One more manager is needed in the Babe Ruth League, it was an-

Due to the fact that so many boys nation, contact Joan Klaus, Ext. in the 13-15 age bracket made application to play, four more teams had to be organized and one more manager is still needed. Anyone interested should contact Fairall at

### Navy Wives Club

The Navy Wives Club will mee next Monday, May 20, at 7:30 p.m. at the Anchorage. Guest speakers will be Captain C. K. Phillips who concert tickets, and Mrs. Sylvia Besser who will discuss the function of the Desert Family Service. A nomination committee will be appointed for the next election of

club officers. Anyone needing

Friday, May 17, 1957

Polls open from 7:00 a.m. t 7:00 p.m.

Candidates are as follows: China Lake School District Catherine Joy Anderson. Kern County Union High School

Albert S. Gould D. E. Ruggenberg Member, County Board of Educa-

Curtis H. Graves.

## AICE Dinner Meeting

#### **AAUW Groups Meet** Book Review Group

The Book Review group of the China Lake Branch of the American Association of University Women will hold its May meeting at the

Dianne Renne will review "Ma-

The 8-1 group (Gifted Child Pro-

LeRoy Jackson will be modera-

cuss current events of the Middle East with Keith Emerson as moderator, Mary Davidson, Judy Green, Phil Kelley and Judy Warr will Ordnance Design Engineer, GS-12. participate in this discussion.

An original skit will be presented



"I'LL CRY TOMORROW" (117 Min.) tracks and has responsibility for scribed in the above position. He Her trials and tribulations and her fight back to accepted society. An excellent movie.

> "ANNIE GET YOUR GUN" (107 Min.) Betty Hutton, Howard Keel Filled with song, Annie joins the Buffalo till wild west show. She is a dead shot with rifle, but slow to hook her man. Lots of sic and laughs for all.

MATINEE "THE PATHFINDER" (78 Min.) George Montgomery SHORTS: "Hotsy Footsy" (7 Min.) Hop Harrigan' No. 4 (19 Min.)

"GUNFIGHT AT OK CORRAL" (122 Min.) Burt Lancaster, Kirk Douglas, Rhonda Fleming Trigger-taut drama of the strangest alliance etween the West's most famous lawman and deadliest gambling killer.

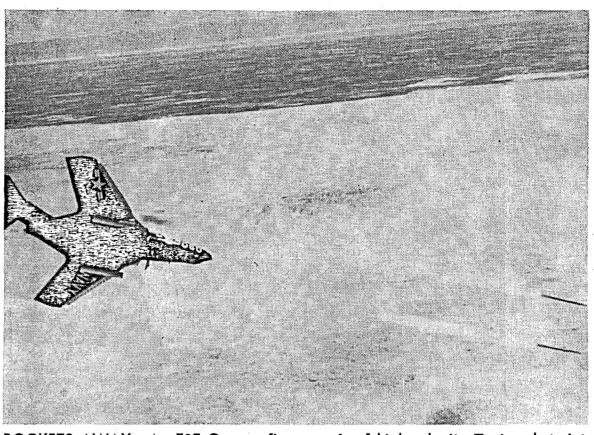
"THE VINTAGE" (93 Min.) Pier Angeli, Mel Ferrer A drama with a romantic tale of l ople during French vineyard season SHORTS: "Donald's Gold Mine" (7 Min.) "Winged Fury" (9 Min.)

"WEST POINT STORY" (107 Min.) James Cagney, Virginia Mayo Broken-down producer is conned into pro ducing show at the Point to woo a talented lad from the Army. Plenty of fun and songs

SHORT: "Matador Magoo" (7 Min.

# NOTS Unveils Powerful ZUNI Rocket

THE ROCKETEER



ROCKETS AWAY—An F9F Cougar fires a pair of high-velocity Zuni rockets into a ground target at NOTS. The high speed of the powerful rockets produces a sonic aircraft can carry four times the paper cones are destroyed; the sonic "boom" on the way to the target. The Zuni can also be used air-to-air. as many of the new ZUNI's as the launchers are then jettisoned to

procuring the off-Station materials

required as well as parts manufac-

Civilian-Military Effort

military coordination at NOTS was

conducting the important air-firing

tests. Lt. H. F. Tipton, who recently

Mission Accomplished

Late in 1956, the task was accom-

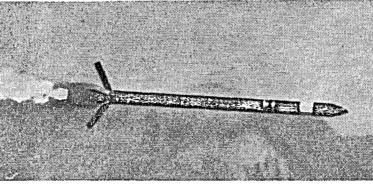
MOSES. Where only one of the old

launcher, four ZUNI's could be ac-

again demonstrated their ability to

tured on Station.

ing the past year.



5-inch Zuni rocket in flight.

## ZUNI Development Another Example of Teamwork Here

The development of the ZUNI rocket is another instance of teamwork at NOTS; a Station that has contributed a number of ordnance items to the defense of the nation, several of which have come at very strategic mo-

During World War II and the Propellant grain expert on the Korean War, the NOTS-developed project was G. S. Morefield, now at HOLY MOSES rocket was in op- Salt Wells, and James Metcalf haneration. A five-inch, high-velocity dled the propellant manufacture for aircraft rocket, the HOLY MOSES ZUNI operations at the Pilot Plant. broke the enemy's back in the Bat- Leonard LaRosa, Jr., conducted tle of the Bulge and was used with most of the tests during the early devastating effectiveness against stages of development, and designed Japanese pillboxes and factories.

More Speed Needed However, though the rocket was the project moving right along by plete with disposable pod. effective it did have its weak points. taking requests for hardware and In the first place, it did not have quite the velocity desired of an airto-ground rocket. When the attacking aircraft dove and fired the HOLY MOSES the pilot very rarely saw the results of his labor. He was forced to pull out of his dive as the rocket's time to target was too

wasn't altogether effective in cold left the Station, was project officer In addition, the HOLY MOSES weather as the Korean conflict brought out, and only one rocket could be carried in each launcher.

Thus, BuOrd and NOTS engineers recognized the need for an even plished and production was begun higher velocity rocket whose time on the ZUNI. The NOTS team had to target would be so short that the come up with a rocket that travpilot could see its destruction elled faster than sound, enabling the against the target before pulling pilot to see its effect on the target out of his dive; a rocket that would after firing and before pulling out function well in any kind of weath- of his dive; a rocket that was efer; and one that was compact fective in any kind of weather; and enough to enable the aircraft to one that was compact enough to carry more than one in each of its quadruple the payload of the HOLY

Station Takes Over The ZUNI program began at NOTS in 1953, with the project be- commodated, and up to 48 on one ing undertaken essentially by four aircraft. men. Early developments in the ul- Thus another valuable addition tra-high velocity rocket were con- was made to this nation's stockpile ceived by J. C. McDonald, who is no of effective weapon systems, and

Shefler Heads Project Project Engineer in the ZUNI come up with the right weapon at program almost since its inception the right time. has been Sydney Shefler of the Engineering Department. Mr. Shefler is responsible for the design of the



Shop planner Ken Catcott kept Four to a package, com-

## New Air-to-Ground Rocket Boasts Ultra-High Velocity

ZUNI, a powerful new Navy shaped-charge fragmentation, and Chief of the Navy's Bureau of Or- tanks, and gun emplacements.

Development of the ZUNI was tacking aircraft. accomplished here at the Naval Ordnance Test Station. NOTS enin a series of folding-fin aircraft rockets that can be used together in a unified system with the MK-16 head fragments. fire-control unit, another NOTS development which tells the pilot tems of the Navy and Air Force.

tribe of the southwest United flight home

ZUNI's warheads—armor-piercing. er NOTS development.

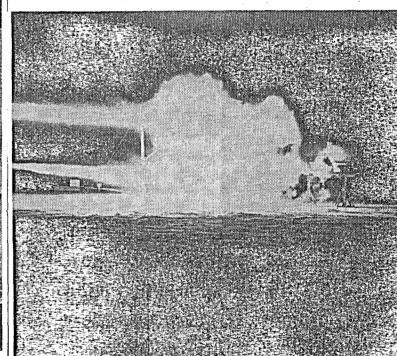
cocket, has shed its secrecy wraps. general purpose—are especially ef-Rear Admiral F. S. Withington, fective against motor convoys,

dnance, recently explained that the In night attack, one ZUNI can il-ZUNI replaces HOLY MOSES, the luminate two square miles of sur-Navy-developed 5-inch rocket used face area with its flare head, while by all the services for air-to-ground a second burst can deliver highbombardment in World War II and explosive warheads to destroy the target in the same pass by the at-

Although not designed chiefly as an air-to-air weapon, ZUNI's high gineers designed the weapon as one velocity and short time to target are effective in bringing down heavy bombers in a cloud of war-

Like its pint-sized older brother, when to fire his rockets in order to the 2."75-inch diameter MIGHTY hit the enemy. The ZUNI can also MOUSE, also developed at NOTS. be used with other fire-control sys- the 5-inch ZUNI is part of a weapons system that includes a fire-Nine feet long and five inches in control unit and package launchers diameter, ZUNI packs enough wal- to carry the rockets on the aircraft. lop with its 15 pounds of high ex- These low cost launchers also serve plosives to knock out tanks, pill- as shipping, storage, and handling boxes, gun emplacements, and even containers. The launcher's nose and trains and small ships. Its folding tail fairings are paper cones that fins make it possible to stow the streamline them for supersonic weapon so compactly that super- flight. When the rockets are fired give the attacking plane an extra Named after a famous Indian margin of speed and safety in its

States, ZUNI is another example of Today, you'll see eight of these a versatile yet simple weapon pro- rockets fired in pairs at one-secduced by the Naval Ordnance Test ond intervals to straddle the ground target. You'll get a first hand idea The ZUNI is effective for both of the terrific speed and explosive air-to-ground and air-to-air attacks. power of the ZUNI rocket: anoth



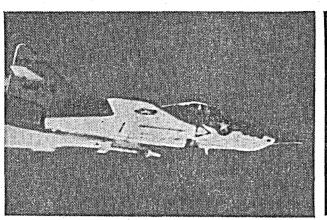
Two Zuni's hit a night-time target.

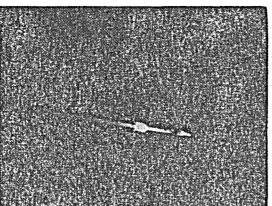


ZUNI TEAM—Some of the men responsible for the successful development of the Zuni weapon system (l. to r.) are: Ken Catcott, shop planner; G. S. Morefield, See Armed Forces Day Program, propellant grain expert; Sid Shefler, project engineer; Jim Metcalf, grain manurocket and much of its hardware. Bus Schedule, and Map on Page 7. facturer; and Lt. H. F. Tipton, project pilot. Leonard LaRosa was not present.

# Navy's Air Power for Peace...

Missile Away



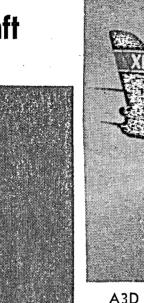


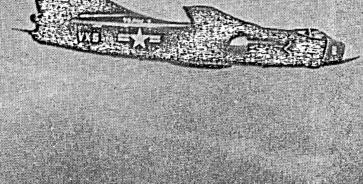


ANOTHER HIT—The deadly Sidewinder air-to-air guided missile streaks away from the wing of an F9F-8 "Cougar" jet fighter, follows its prey, and explodes on the wing of an F6F "Drone" target plane.

**VX-5** 

**Aircraft** 



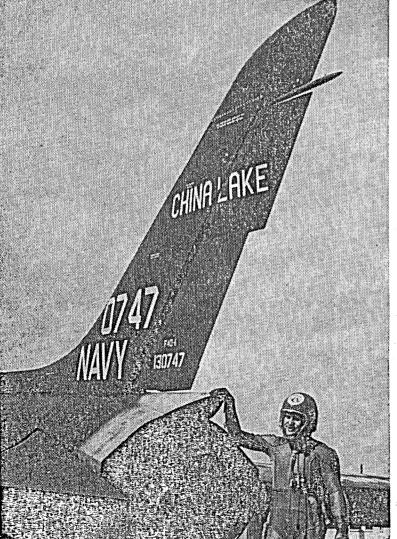


A3D Skywarrior, Navy's carrier-based bomber.

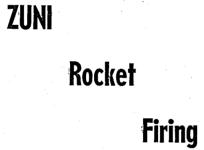
F9F Cougar on a loft bombing mission.

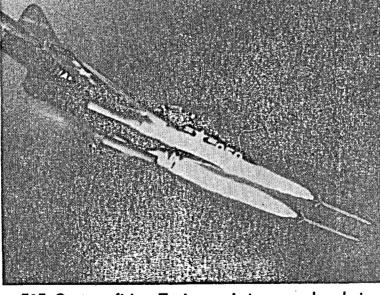
Loft **Bombing** At NOTS

A4D Skyhawk



ray" jet fighter plane.

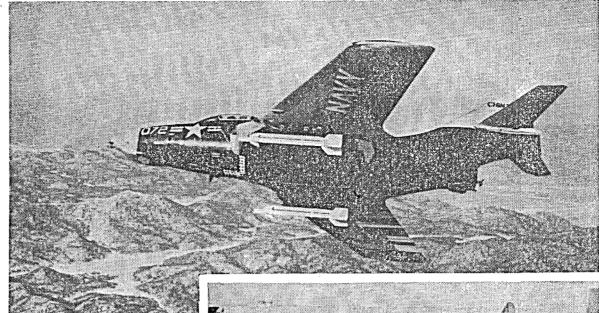






SPACE MAN—Lt. Cdr. G. A. Tierney in a high altitude NATO VISITORS — Recent visitors to China Lake were the senior military of-space suit shown near the afterburner of an F4D "Sky-ficers of the 14 member-nations of NATO. Shown here are the Portuguese representatives with Major B. A. Rushlow of the Guided Missile Test Unit.

# NOTS Shows Work Done for Defense

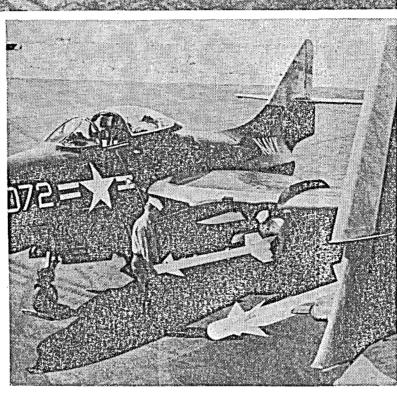


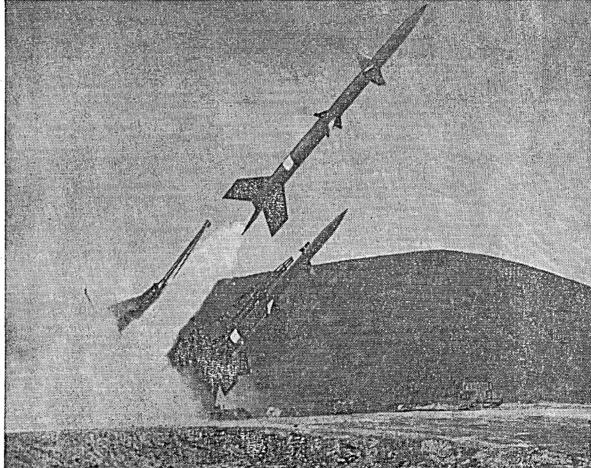
NOTS

May 18, 1957

Sidewinder

Developed





TERRIER missile tested here at NOTS by Guided Missile Unit No. 25 and the Marine Corps Guided Missile Test Unit.

SNORT-The Station's supersonic naval ordnance research track is shown testing a seat ejection system with the world's biggest track sled a 16,000-pound B58 bomber replica.



COMMANDER of the Naval Ordnance Test Station, Capt. F. L. Ashworth, is shown with the Station's famed development, the Sidewinder air-to-air guided missile which is now operational in the Fleet.



WHIRLY-BIRD RESCUE demonstration will be featured today in the Armed Forces Day Air Show at the Naval

