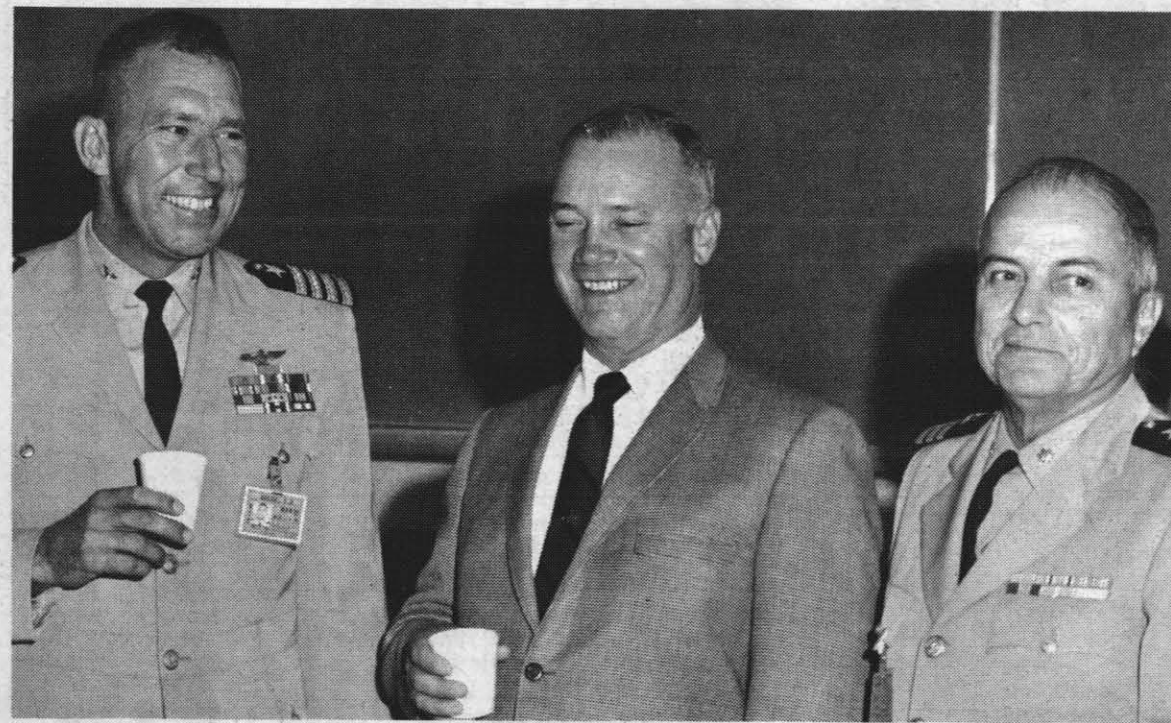


Now Full-Time Scientist



LAUNCHING A NEW CAREER — At a Michelson Lab coffee given for him last week, Dr. Richard Clark talks over new year prospects with Capt. F. R. Walsh, NWC Plans and Operations Officer, and Cdr. M. C. Jack, Military Assistant at Earth and Plane-

tary Sciences Div. of Code 50. Army Liaison Officer here until December 31, 1967, Dr. Clark is now working with Dr. Pierre St. Amand in Code 502. He is studying the possible scientific relationships of the Division to other activities.

Zabel Slated For Guest Appearance At Writers Meet

The Sierra - Panamint Chapter of the Society of Technical Writers and Publishers will hear guest speaker Larry Zabel describe his impressions of Viet Nam at their January 18 meeting. Zabel also will emphasize the value of the Navy Art Program as a permanent historical collection.

Zabel has gathered, by motion picture film, photographic slides and sketches, extensive material for art-rendered impressions of life in Viet Nam. Dinner will follow a social hour at 7:15 p.m. at The Hideaway Restaurant. Dinner reservations should be made through Mrs. Thelma St. George, hospitality chairman of the Sierra - Panamint Chapter.

Rabies Clinic Readied for Dogs At NWC Next Fri.

The Kern County Health Department recently announced that a rabies vaccination clinic for dogs will be held at Naval Weapons Center in Building 00936 from 12 noon to 7 p.m. on Friday, January 19.

All dog owners are urged to obtain 1968 rabies vaccinations and license tags for their pets at this clinic. Owen A. Kearns, M.D., County Health Officer, pointed out that all dogs four months of age and older are required under a county ordinance to be vaccinated every two years with the two year vaccine and licensed at the beginning of each calendar year. Dog owners who obtained two-year vaccines for their pets last year must still get new 1968 license tags, available from these clinics, even though their dogs need not be vaccinated this year.

Pet owners are reminded that rabies is a fatal disease. Kern County has been declared a "Rabies Area" by the State Health Department as the result of the positive diagnosis of rabies in wildlife. The best measure for preventing rabies from spreading to domestic animals and people is adequate vaccination.

SHOWBOAT

FRIDAY JANUARY 12
"THE GIRL & THE GENERAL" (98 Min.)
Virna Lisi, Rod Steiger
7:00 P.M.

(War Drama) An Army private enlists the aid of a gorgeous peasant girl to assist him in taking a captured general to the Italian lines, and offers to split the reward with her. The trio's trek makes exciting and spicy film fare. (Adult.)
Short: "Brothers Carry Mousse Off" (7 Min.)

SATURDAY JANUARY 13

—MATINEE—
"WIZARD OF BAGHDAD" (94 Min.)
Dick Shawn
1:00 P.M.
Shorts: "Golden Eggs" (7 Min.)
"King of Carnival" No. 6 (13 Min.)

—EVENING—
"THE FANTASTIC VOYAGE" (100 Min.)
Stephen Boyd, Paquel Welch
7:00 P.M.

(Science/Fiction) The miniature detergent forces shrink men and equipment to microbe size and enter the bloodstream of an important scientist to repair brain damage. An extraordinary, thrilling adventure plus Raquel Welch (Adult, Youth, Mature Children.)
Short: "Last of the Mohican" (11 Min.)

SUNDAY-MONDAY JANUARY 14-15

"GUNN" (95 Min.)
Craig Stevens, Laura Devon
7:00 P.M.

(Mystery) Peter Gunn steps right out of TV to solve the murder of a gangland czar whose successor first warns Pete to lay off and then wants him to clear him of murder. Pretty gals lots of humor and fast moving action. (Adult.)
Short: "Smoky Mountain Magic" (17 Min.)

TUESDAY-WEDNESDAY JANUARY 16-17

"CAST A GIANT SHADOW" (138 Min.)
Kirk Douglas, Angie Dickinson
7:00 P.M.

(Adventure) An exciting story of Israel, and of an American officer who faced resentment and obstacles in efforts to weld military factions into a fantastic force. It's a "don't miss" film of drama, humor, even romance. (Adult, Youth, Mature Children.)

THURSDAY-FRIDAY JANUARY 18-19

"THE ST. VALENTINE'S MASSACRE" (100 Min.)
Jason Robards, George Segal
7:00 P.M.

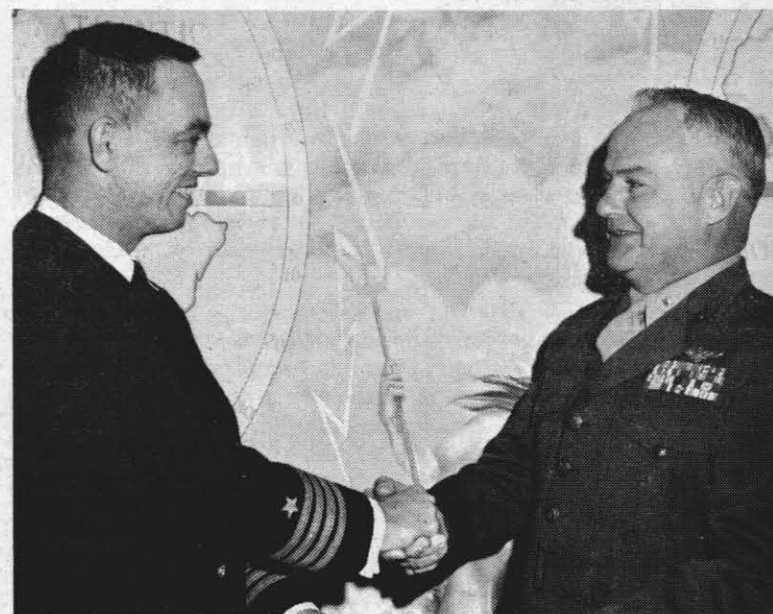
(Crime Drama) The infamous Roaring Twenties when the Capone gang traded shots almost daily with the Moran gang on Chicago streets. An example of unbridled crime and the penalty it offers in blood and violence. Not for timid! (Adult.)
Short: "Way Up and Way Out" (9 Min.)

Instructor First Aid Course Ready Sunday

A review course for Red Cross First Aid instructors will be offered Sunday, January 14 and Sunday, January 21.

Any qualified first aid instructor, whether or not he has taught any classes this past year, should attend the review to update his certificate.

To register or for further information, call Mrs. John Cox at 723374.



220-MISSION MAN — Capt. M. R. Etheridge, NWC Commander, presents Lt. Col. K. P. Rice, USMC Liaison Officer, with a silver star device in lieu of an eleventh Air Medal. Col. Rice flew the 20 missions over Viet Nam, represented by this award, as Squadron Commander of VMA 211 based at Chu Lai. He was there from September, 1966, to October, 1967. Col. Rice took up his duties here November 17, 1967.

Family Service Center Ready For Military Members

Naval Weapons Center Housing Office recently announced the establishment of a Family Service Center for military personnel with Chief R. O. Markoton in charge.

Military members and their dependents may call Ext. 71528 for information. The office is located in the Housing Office, Bldg. 35 on Blandly Ave.

Chief Markoton will be available during regular working hours to assist NWC military residents with questions and problems relative to government quarters and to obtain information on private housing in Ridgecrest.

KNBC TV-4 Will Air River Patrol Tomorrow Night

KNBC TV, Channel 4, Los Angeles, California, will air the west coast television premier of the Navy produced documentary "River Patrol" tomorrow from 5 to 5:30 p.m.

The film is in color and shows Delta Patrols with scenes of actual battle with Viet Cong Forces.

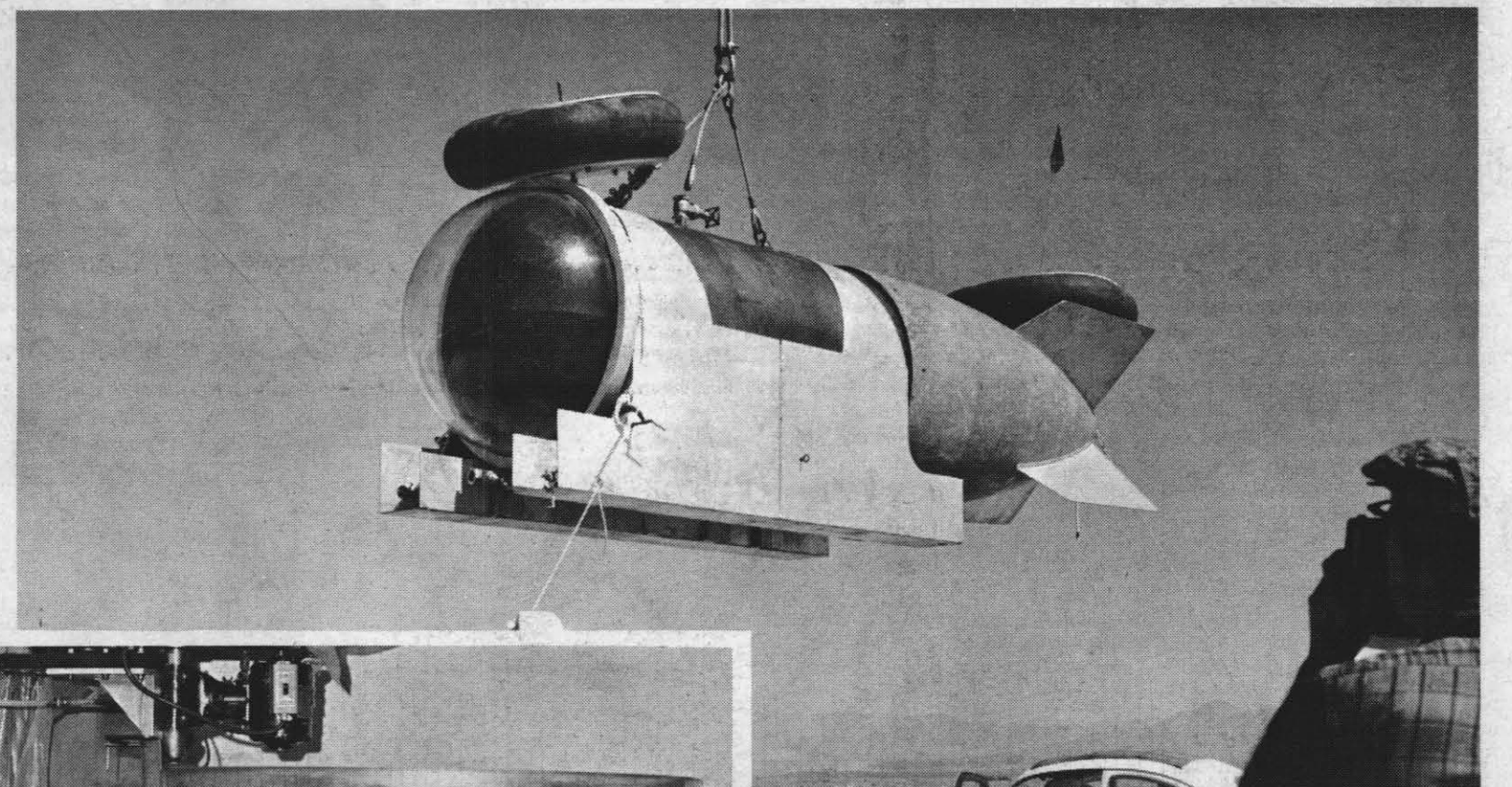


Vol. XXIII, No. 2

Naval Weapons Center, China Lake, California

Fri., Jan. 12, 1968

Deep View Near Seaworthiness As Glass Submersible Pioneer



Project Work Since 1965 Uncovers New Promise in Undersea Operation

BY JOHN R. McCABE

The Navy's effort to probe the depths of the seas further down and for longer periods of time than ever before — with the help of glass or semi-glass submersibles — is moving closer to full-scale sea trials.

Two submersible research vehicles, born at China Lake, are leading the Navy's advance. Hikino, using a complete glass sphere for two operators and another for instrumentation and life-support equipment, is the creation of Dr. William B. McLean, until last summer Technical Director of the old Naval Ordnance Test Station and now in the same post at the Naval Undersea Warfare Center, Pasadena.

Deep View is the second submersible, and uses a steel cylinder capped at the forward end with a glass hemisphere as the single personnel and equipment hull. Heading work on the Deep View project is Willis R. Forman, formally a member of NUWC, but physically located at China Lake and working as a tenant of NWC's Engineering Department.

Craft Nearly Ready

Some two years of developing Deep View's configuration and of testing replica and scale models of the craft, along with 10-inch diameter models of the pressure hull, is beginning to pay off, as Forman announced in an article in the December issue of Under Sea Technology magazine. He co-authored the article with Dr. Robert DeHart of Southwest Research Institute of San Antonio, builders of the first full-scale glass hemi-

sphere, to be tested this summer with a completed boat. Forman then said the steel hull was nearly finished at Hahn and Clay, Inc., of Houston. He will travel there to accept the tested steel portion of the hull at the end of this month.

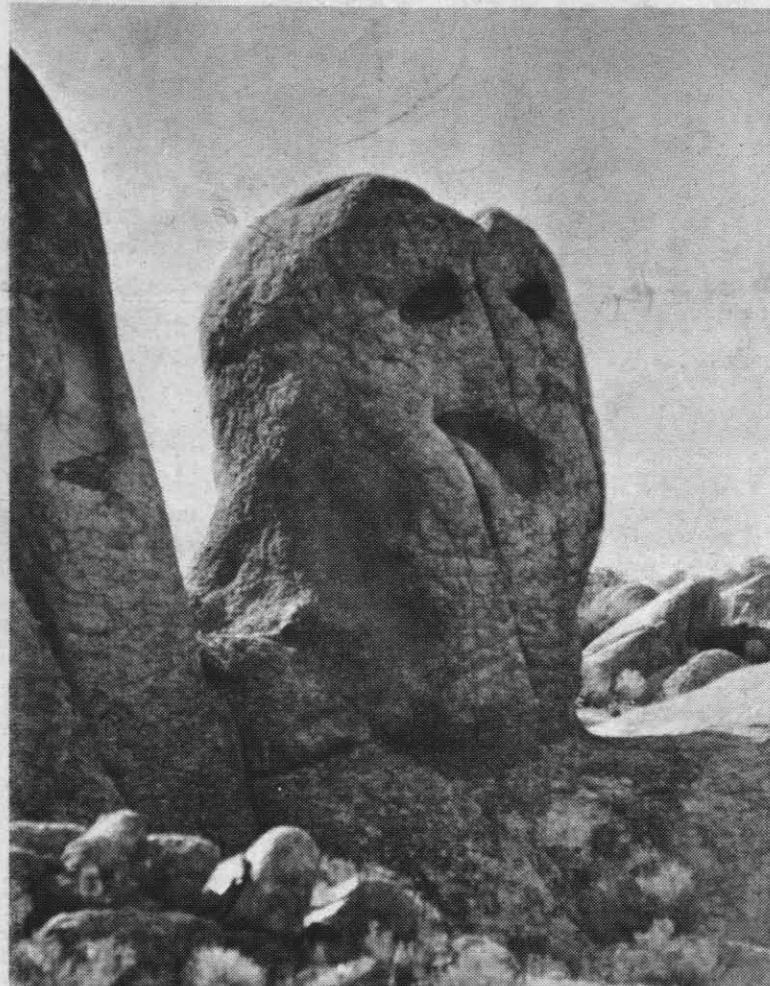
"This will be the world's first submersible to use glass as part of its pressure hull," says Forman. "It's maybe not yet ready to be set up as an all Navy-operated boat, but we hope to certify it as a one-of-a-kind research and development craft."

He adds that, when the Deep View is at last ready for use, it will demonstrate the capability of glass as a transparent structural material for submersibles. In the magazine article, Forman pointed out that he searches for the sunken atomic-powered submarine Thresher and for the lost H-bomb off the Spanish coast "have firmly established the general need for more visibility and maneuverability in deep water." The use of glass in pressure hulls, he explains, provides not only wide and unobstructed visibility, but also greatly improves the craft's strength to weight ratio.

As Will Forman proceeded with development work on the Deep View project, a major problem presented itself in the form of cracks appearing in the middle of the glass thickness around the edge of the hemisphere, where it sealed against the metal cylinder of pressure test models.

(Continued on Page 6)

Nature's Masterpiece of Stone Art



LONE SENTINEL — Don Mooney, NWC Range Officer and Robert Barling (Code 7035) were on a mining survey trip during November when they happened upon this lone sentinel. As far as Mooney knows, there is no known name for this masterpiece of nature's fine art work. Barling put his camera to use and came up with this unusual picture of the 40-foot rock resembling a "Halloween Spook." Wind and rain carved this facial expression out of solid granite. Mooney said the rock is located approximately 4600 feet on the east side of the Argus Range in Crow Canyon. Entry is obtained with a four-wheel drive vehicle or on foot. Permission to enter the area may be obtained from NWC Security Office who will issue the required recreation pass.

Physical Fitness Ready for Ladies Monday Evening

The Ladies physical fitness program will get under way once again next Monday evening, according to Athletic Director Ray Gier. The program, which is designed to provide fitness and trimming exercises to all participants is scheduled to begin at 7 p.m. Monday.

Also included in the program will be an organized volleyball and badminton session which will be held immediately following the exercise portion of the program. All ladies interested in participating in the program are requested to contact Gier at Ext. 71334.

Roaring Twenties Night Featured Tomorrow at Club

Featured entertainment tonight at Club Chaparral is dancing to Cy Young and his Golden Tunes. Tomorrow night, the dance band will highlight "Roaring Twenties Night." Club members and their guests are invited to wear their pin stripe suits and bring along their violin cases to the affair.

The club is presently forming a Women's Auxiliary with the first meeting scheduled for 2 p.m. Sunday. The auxiliary is open to military and civilian women, married or single.

Club Chaparral manager has announced that the dining room will remain closed on Sunday and Monday evenings until further notice.

China Lake Ski Club

The China Lake Ski Club will have its traditional January Party at 8 p.m., Tuesday, January 16 at the home of Captain R. Williamson II, located at 2 Enterprise on the Center. Ski Club members are invited to bring their mugs.

From _____

TO _____

STAMP

CHAPLAIN'S MESSAGE

Inescapable Christ

CHAPLAIN JUDE R. SENIEUR



Many great men have been born into the world whose influence has changed the course of history.

While they lived, these great men brought peace or war; they controlled for awhile the strings of fortune or failure; but their power and their influence were inevitably swallowed up in the unceasing march of time.

Great names that once graced the thrones of mighty nations or struck a note of fear among enslaved millions are now buried in the pages of history, of interest only to the scholar or momentarily burdening the memory of school children.

Only one person was an exception to this rule. Only one person has ever so influenced the world and changed the course of history so radically, that the world is compelled to renew its recognition and refreshen its memory with every new generation.

Strangely enough, the Man whose influence has outlasted nations and whose influence gives every promise of continuing to the end of time, never occupied a national throne and never wielded a weapon of war.

No man was ever his subject or his slave. He had only friends and enemies. No one was ever forced to follow him or compelled to be his friend.



VISITING DIGNITARY — Captain John K. Beling (left), Head, Air, Surface and Electronic Warfare Division, OP-72 is greeted upon his arrival at the Naval Air Facility recently by Captain R. F. Schall (center), NAF Commanding Officer and Captain R. Williamson II, NWC Executive Officer.

The Rocketeer

Official Weekly Publication U.S. Naval Weapons Center China Lake, California. Capt. M. R. Etheridge, USN NWC Commander.

DIVINE SERVICES

Protestant—(All Faith Chapel)—Morning Worship—8:15 and 11 a.m. Sunday School—9:30 a.m., Chapel Annexes 1, 2, 3, 4 (Dorms 5, 6, 7, 8) located opposite Center Restaurant.

PROMOTIONAL OPPORTUNITIES

Present Center employees are encouraged to apply for the positions listed below. Applications should be accompanied by an up-to-date Form 58.

Branch Head (Code 4565), GS-13, Physics, Mathematics, or Engineering — Planning and directing analytical support for various warhead programs and systems engineering and exploratory development programs.

File applications for above with Jan Bixler, Bldg. 34, Rm. 26, Phone 72218. Electronics Engineer, GS-855-9, 11 or 12 (One vacancy), Code 3573 — This position is located in the Systems Development Branch, Development Division VII, Aviation Ordnance Department.

File applications with Mary Morrison, Bldg. 34, Rm. 32, Phone 72032. Supply Clerk (Typing), GS-2040-3 or 4, (Two vacancies), Code 2575 — Insures the timely processing and completion of documents for the acquisition and reservation of special material categories, high priority, and surplus material to meet planned requirements.

File applications for the above with Vicki Mead, Bldg. 34, Rm. 28, Phone 72218. Supply Clerk, GS-3 or 4, (One vacancy), Code 255 — Controls levels and movement of stock through analysis of IBM listings.

File application for the above with Vicki Mead, Bldg. 34, Rm. 28, Phone 72218. Station Theater Manager, \$500 per month — Non-appropriated fund position. Three years' responsible experience as manager of theater required.

File application for the above with Sue Prasolowicz, Bldg. 34, Rm. 26, Phone 71577. Clerk (Typing), GS-4, Code 5554 — This position is located in the Documentation Distribution Branch, Technical Data Division of the Engineering Department.

File application for the above with Loretta Estep, Bldg. 34, Rm. 34, Phone 71514. Administrative Officer, GS-9 or 11, Code 4033—This vacancy is located in the New Conventional Weapons Branch.

File applications for above with June Chip, Bldg. 34, Rm. 26, Phone 72676. Photographer (Scientific and Technical), GS-10607 or 9, Code 3032 — Photographer by means of still or motion picture cameras in either color or black and white test and experiments for the purpose of recording, reporting, and documenting them for later use by scientists and engineers to analyze or measure test results.

File applications for above with Fawn Haycock, Bldg. 34, Rm. 34, Phone 71514. Registered Nurse, Code 88 — Position located in the Nursing Services Branch of the U.S. Naval Hospital, China Lake.

File applications for above with Vicki Mead, Bldg. 34, Rm. 28, Phone 72218. COMPETITIVE PROMOTIONAL EXAMS — Competitive promotional examinations are announced for: Planner and Estimator

Corona People Highlight The News



SCIENTISTS ASSIGNED TO CORONA — Gordon R. Selby (left) and David P. Noon were recently welcomed aboard Naval Weapons Center Corona Laboratories.



WELCOME ABOARD — Lt. Col. Richard K. Markel (left) recently assigned to NWC Corona Laboratories and Air Force representative on the Standard ARM Program with John A. Hart, Associate Head of the Missile Systems Department at Naval Weapons Center Corona Laboratories and is responsible for the Standard ARM Program.



AWARD WINNER — Harold G. Watson demonstrates the accuracy of his winning beneficial suggestion on a light table. A master grid of solid, distinct black lines on a transparent mylar film allows positioning of printed circuit drawings to within 0.005-inch tolerances.

encies, and duplicate color negatives, paying particular attention to color balance and the artistic use of color. File application for above with Fawn Haycock, Bldg. 34, Rm. 34, Phone 71514. Registered Nurse, Code 88 — Position located in the Nursing Services Branch of the U.S. Naval Hospital, China Lake.

THE LOCKER ROOM

The World Champion

By ED RANCK



Human nature being what it is, most people have a tendency to arrive at some preconceived conclusions concerning the appearance of other people prior to their first meeting.

WELL-KNOWN FACT

It is a well-known fact that those who string words together for newspapers are superior to the rest of the human herd in this respect.

A few days ago we had the opportunity to meet a world champion. He isn't quite as famous as Mickey Mantle or Johnny Unitas, but he is a champion and this, no matter what the endeavor may be, is quite an accomplishment.

Everyone knows of course, that all handball players are bald and have gray complexions, caused by having had at least one cardiac within the past six months.

STUFFIE SINGER

When we finally met Stuffie Singer, talked to him and saw him in action, two things became obvious. First, he is a guy whose heart will probably be in good running condition for a long time.

Singer is 26 years old and looks a lot younger. Despite his youthful appearance, he is an athlete with plenty of experience.

He has been a champion table tennis player and has played professional baseball and college football.

Handball is basically a simple game, the rules and shape of the playing area being roughly the same as those of squash, paddle ball or jai alai.

A PHYSICAL GAME

According to Singer, and he should know, handball is now the game with largest active participation of all sports carried at the intramural level in colleges throughout the country.

It is a physical game, a means by which a man can get into good physical condition and still have a lot of fun in the process.

Despite the fact that the game is basically a simple one, there are certain things that separate men like Singer and other nationally ranked players from the casual handball player.

WHAT MAKES A CHAMPION

What makes a champion? Speed, strength and intelligence are the primary requirements just as in any sport.

Junior Archers Annual Tourney Starts Jan. 20-21

The China Lake Junior Archers will hold their 16th annual tournament on January 20-21 at their range located at 57-B Rowe St.

Seventh Straight Victory Grabbed By Loewen's Falcons Tuesday Nite

The Loewen's Falcons rolled to their seventh straight victory Tuesday evening, defeating the VX-5 Vampires, 60-30 at the base gym.

second half as Genge outscored the Tigers 30-19. Blue was high scorer for the night with 19 points while Berry had 18.

Basketball Scoreboard STANDINGS

Table with columns for team names, wins, losses, and scores. Includes teams like Loewen's, NAF, Genge Industries, VX-5 Rebels, NWC, VX-5 Vampires, and Special Services.

Next Week's Schedule Jan. 16—Special Services vs. VX-5 Rebels; Genge vs. NAF; Jan. 17—NWC vs. VX-5 Vampires; VX-5 Rebels vs. Loewen's; Jan. 18—NWC vs. NAF; Special Services vs. Genge.



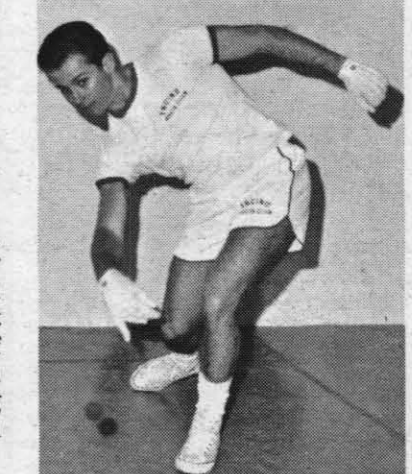
— During last December's flurry of snow and cold, China Laker Carl Hamel takes advantage of the temporarily iced-up Mirror Dry Lake to cut some fancy turns on his figure skates.



FALCONS TANGLE WITH VAMPIRES—Aggressive competition was the word for action taking place on the hardwood floors at the Center Gym Tuesday evening when the Falcons and Vampires fought for a team victory.

Register Now For Volleyball Teams

The 1968 intramural volleyball season will get under way at the Center Gym starting the second week of February.



WORLD CHAMP — Singles Handball Champion, Stuffie Singer, demonstrates his rapid right-handed form on the handball courts at Naval Weapons Center gym.

Cutsinger, Maxwell Roll Top Series To Lead Bowlers in Mixed Foursome

Chuck Cutsinger rolled 255 and Floyd Maxwell had a 622 series to lead all bowlers in the Mixed Foursome last week.

Craig Rae had high single game in the Desert Handicap League with 232 and Dan Branson was the only bowler to break the 600 mark.

In the Premier League, Foremost moved back into second place and edged a bit closer to the league leading Woodard Cosmetics team.

Foremost 23 1/2, Starlite 23, Tom's Place 23, Boyd's Auto Parts 22, Mercury Movers 21 1/2.

Peck and Tom Short 209; Al Hebert 206; Ray Freascher 204; Elmer Davis 203; Ben Whiteside 201 and Craig Rae 200.

Sandy Smith led the Women's Monday Night Scratch League with 550 and Royce Dowd was second with 544.

Mark Barkemeyer rolled 182-180-210 for a 572 series to pace the Junior Mixed League.

Premier League Standings Woodard Cosmetics 31 17, Foremost 23 1/2, Starlite 23, Tom's Place 23, Boyd's Auto Parts 22, Mercury Movers 21 1/2.

Corona Laboratories Develop Navy-Wide Test Telemetry

SOLID STATE DEVICES OPEN NEW VISTAS IN COMPACT DESIGN



FIRST SERVICE TEST MODEL — T. B. Jackson (left), Head, E. D. Herberling, Associate Head, Instrumentation Division, and R. D. Sweet, Electronics Technician, shown with the first service-test model of the PAM telemetry decommutation system. The units are being transferred to Naval Weapons Center China Lake to establish initial capability for processing the PAM/FM data. The PAM telemetry decommutation was designed and built at NWC Corona Labs.



COMPACT BUNDLE — The compact size and weight of the new PAM/FM airborne transmitting components developed by Naval Weapons Center Corona Laboratories are shown by T. B. Jackson (left), Head, Instrumentation Division and J. L. Weblemoie, Head, Development Branch. Telemetry is used in the test of missile flights.

New UHF (ultra high frequency) telemetry transmitting and receiving systems developed by Naval Weapons Center Corona Laboratories will double — and in some cases triple — the transmission efficiencies of data systems now used in Navy missiles, according to Dr. F. S. Atchison, Technical Director of the Corona Laboratories.

The discovery and development of solid state devices has made it possible to build equipment to operate at UHF in the severely restricted space and weight limitations of missiles; and an order by the Department of Defense will make it mandatory to use UHF after January 1, 1970. Current telemetry systems use VHF (very high frequencies) and have considerably less information capacity. (Telemetry is communication between a remote vehicle and a base receiver where operational data is recorded and analyzed.)

Instead of the VHF band which covers the frequency range from 225 to 260 Megacycles now in use, all telemetry will shift to the new UHF bands which are 1435 to 1540 and 2200 to 2300 Megacycles.

Corona a Leader
The Naval Weapons Center Corona Laboratories has for several years functioned as the Navy's lead laboratory for the development of new standardized telemetry hardware for use in the new frequencies. This assignment includes design, development, and evaluation of both transmitters and receivers — airborne and ground units respectively.

The UHF telemetry system developed at Corona by T. B. Jackson and the staff of his Instrumentation Division uses pulse amplitude modulation of a frequency modulated carrier wave. It is designated PAM/FM as opposed to the old FM/FM, which means frequency modulation of a frequency modulated carrier.

With its greatly increased data capacity, the PAM/FM can send all the quantities to be measured in a flight test with one transmitter instead of the two or three presently required in a typical missile flight.

At about \$3500 each, multiplied by the number of missiles flown each year, there will be a considerable total saving of money with the new system.

In addition to the compact size and dollar-savings, the work will also result in telemetry units which will be standard off-the-shelf items throughout the Navy, and will be applicable to many of the Department of Defense requirements also.

Telemetry is used in the test and evaluation of missile flights during developmental phase as well as during training exercises and sometimes in tactical operations. The quantities transmitted include such continuous information as temperature, altitude, speed, and the many voltages and currents that indicate the performance of motors, controls, guidance systems, radars, etc.

Flight Test Coming
The Engineering Group (Code 3060) of the Instrument Operations Division at the Naval Weapons Center, China Lake, in conjunction with the Instrumentation Division, Code 73, of the Corona Laboratories, has recently completed a series of captive-flight tests with the PAM/FM system installed in a Bullpup UHF Propagation Test Pod. Results have been excellent.

Code 3060 China Lake, has now arranged for the first live-flight test of this system in an upcoming Shrike test flight. The telemetry PAM commutator and a model of a new standardized UHF transmitter will be supplied by the Corona Laboratories for the test. The Corona Instrumentation Division will furnish China Lake with the first service-test model of the PAM decommutation system also designed and built at the Corona Laboratories.

A commutator is a device for changing measurement information from several different sources into a group of pulses to modulate a transmitter. At the receiving end, a decommutator re-converts the pulses into voltages representing the original measurements.

Service test models of the decommutator system are also being built by Corona for the Pacific Missile Range and the Naval Missile Center at Point Mugu, as well as for other Navy facilities that will process telemetry data. These service-test models will establish the initial capability for the Navy test ranges to receive and process telemetered data in the new PAM/FM formats.

Deep View Work Probes Frontier

(Continued from Page 1)

"They occurred singly or in multiples," he reported in Under Sea Technology. "Usually they appeared as semicircles extending up the wall of the glass about the height of its radius."

He was then using a seal of flat edge to flat edge with gasket material between. It was found, as he suspected, that lines of tension had developed at the seal surface of the glass. Glass, although of great strength in compression, is brittle and weak in tension.

Forman then had tests made with various shapes on the seal edges of small hemispheres — flat, wedge-shaped, wide radius and radius equal to half the glass thickness. The latter shape proved to be the best, with only compression lines of stress developing.

Probing the Frontier
So far, glass hemisphere models have been tested to five times the pressure of 20,000 psi (pounds per square inch) found at Deep View's designed operating depth of 5,000 feet. The hull has been tested to 30,000 psi.

"This will give us plenty of safety margin," Forman points out. "Actually, we are just beginning to discover the capabilities of glass under the sea. Its potentials have hardly been touched whereas the potentials of steel have been very well developed. There is a great deal of work to be done with glass to advance the Navy's important goals of search and salvage, for example."

The bulge in the deep submersible frontier, represented by Deep View, testifies to much advanced work accomplished in the Michelson Laboratories and in the Engineering Department.

"Deep View is an example of the capabilities of the Engineering Department," testifies Forman. "For example, the machinist who ground the round edge on our glass hemispheres, Jack Herbstreit, had to develop his own tools for the job. He got his own grinder motor and wheels, developed his own grinding wheel and work fixture revolving speeds and feed, and then did a beautiful job."

Society Announces Location, Schedule

Church and Sunday School services of Christian Science Society, China Lake are now being held each Sunday at 10 a.m. in the house at the White Star Mine, South Randsburg Rd. Ridgecrest Heights. Wednesday evening Testimony meetings are held at 8 p.m. each week. The Reading Room, also located at the residence of the White Star Mine, is open after each Sunday and Wednesday service; on Tuesdays from 1-3 p.m. and on Saturdays from 3-5 p.m. The public is cordially invited to attend services and enjoy the privileges of the Reading Room.



Course Introduces 32 To Value Engineering

At the request of the Naval Air Systems Command and the Office of Civilian Management, the NWC hosted a two-week course November 28 to December 8 in the Principles and Applications of Value Engineering.

Instructors for the course were R. Barbrey, Naval Ordnance Systems Command (Headquarters), J. Duggan, Naval Air Rework Facility, Alameda and H. Moore, Naval Air Plant Representative, Lockheed Plant, Burbank. The course was monitored by C. Traimou, Office of Civilian Manpower Management. Guest speakers were S. Schwartz, Naval Air Systems Command and M. Wasserman, ARINC.

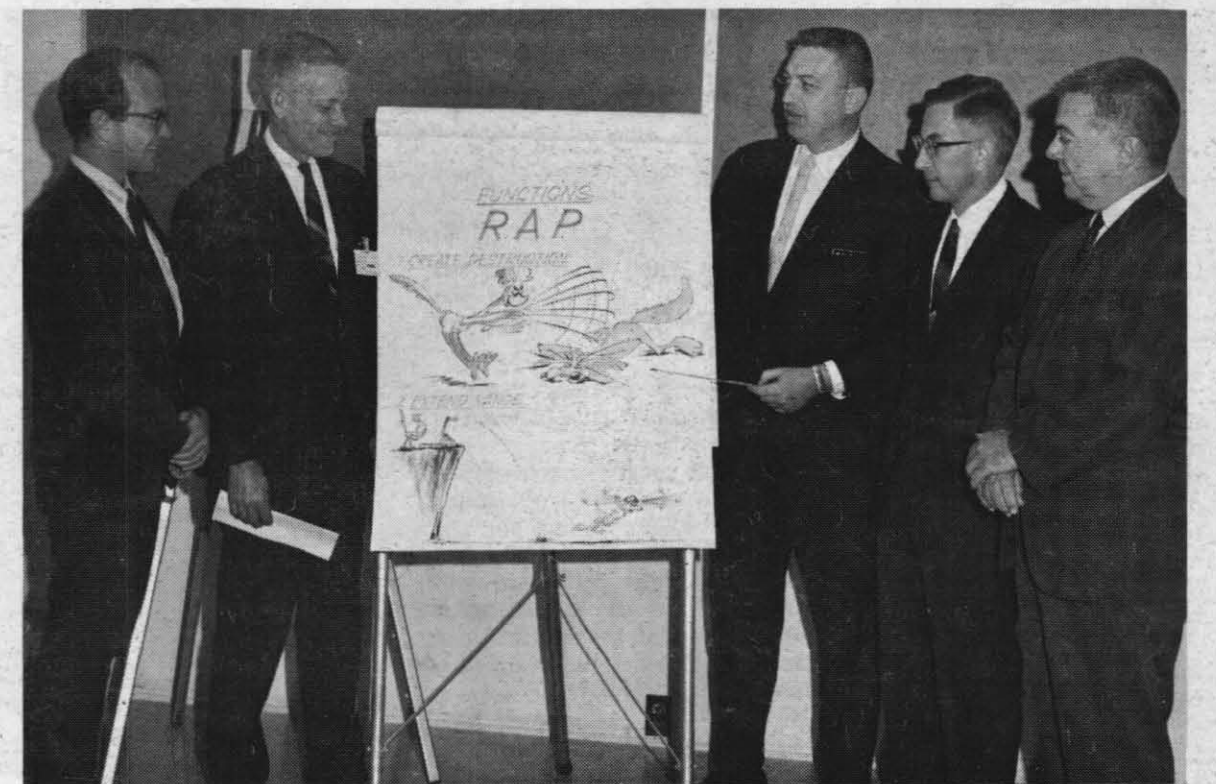
The Training Coordinator for the course was Mrs. Martha Adler, Code 654, and the Value Engineering Coordinator, Wayne Zellmer, Code 55033.

The course covered the definitions and techniques of Value Engineering. Included were:

the evaluation of functions, their cost, value and worth; applications of VE techniques to daily work; problem solving and creativity; Contracts and ASPR requirements; configuration control, and VE change procedures. Approximately 35 hours were spent by the students, working in teams of 4 or 5, applying the knowledge gained, to live projects.

The 32 students who completed the course were from 18 Air Force and Navy activities. Some traveled from as far as Pearl Harbor to the West and Forest Park, Illinois, to the East.

Additional Government-sponsored Value Engineering courses will be taught at various locations throughout the U.S. during the second half of FY 68. Information concerning the locations and contents of these courses may be obtained by contacting Wayne Zellmer, ext. 71720 or 72802.



TALKING VALUE ENGINEERING — Reviewing part of the presentation given by a RAP (Rocket Assisted Projectile) team at the value engineering seminar are (l-r) instructors J. Duggan, H. Moore and R. Barbrey, seminar coordinator W. Zellmer and F. A. Chenuit, head of Engineering Dept. PAVE course teaches cost effectiveness planning.

seminal coordinator W. Zellmer and F. A. Chenuit, head of Engineering Dept. PAVE course teaches cost effectiveness planning.

NWC Credit Union Plans Door Prizes For Annual Meet

A portable television set, a three-day holiday trip to Las Vegas, and \$25 in shares are the door prizes members may win by attending the annual meeting of the Naval Weapons Center Federal Credit Union at 8 p.m., Tuesday, January 16, at the Community Center.

Only members attending the meeting will be eligible to participate in the drawing. The winner of the Las Vegas trip will also receive \$50 spending money. The trip includes hotel expenses, two candlelight dinners and other entertainment.

Members are urged to help make this meeting a success by attending and voting for officials of their choice.



VALUE ENGINEERING GRADS — Completing successfully the recent two-week course here in Principles and Applications of Value Engineering were 32 Air Force and Navy employees from Hawaii to Illinois. Heading the instruction were (front, l-r) R. Barbrey, instructor; M. Adler, registrar; H. Moore, instructor; J. Duggan, instructor; M. Beall, coordinator, and W. Zellmer, coordinator. Students were (1st row, l-r) P. Camberg, T. Akmine, K. Catcott, R. Miura, R. Belchem,

B. Bergstein, C. Roquemore, R. Conover, E. Woods, R. Guard, E. Gutzman. Second row (l-r) J. Hykes, T. Allen, J. Coronado, J. Simmons, M. Kylu, J. Marley, D. Prater, G. Shumway, R. Palmer, R. Simon. Back row (l-r) O. Sahoff, F. Albers, F. Lint, M. Redding, M. Coombs, R. Lyon, R. Altman, V. Davis, M. O'Connor, R. Briggs. Student J. Petty was not present for the photo, but completed the course.

—Photo by PH1 Gary D. Bird

Programmed Instruction and Home Study Courses

PROGRAMMED INSTRUCTION

The Autotutor Mark II teaching device is designed to make the fullest use of the Intrinsic Programming Method. This method uses student feedback to control the rate of teaching and the order in which new supplemental or review material is presented to the student. Intrinsically programmed material makes it possible to combine the patience and efficiency of a machine with the individual attention of a personal tutor.

ENROLLMENT PROCEDURE: Submit a completed Course Enrollment Form 11ND/NOTS 12410/28 to Code 654. The Autotutors are located in the Training Center. Employees are scheduled on an individual basis for two hour sessions. Phone 72648 or 72686 if you have any questions on these programs.

1. Introduction to Fort (4 hours)
2. Basic Statistics (16-24 hours)
3. Career Arithmetic
 - Fractions (8-15 hours)
 - Decimals (6-15 hours)
 - Percentage (7-15 hours)
 - Ratio and Proportion (3-8 hours)
4. Slide Rule Fundamentals and Mathematical Introduction
 - Slide Rule Fundamentals (Part 1 & 2) (2-10 hours)
 - A Mathematical Introduction to Slide Rule Fundamentals (2-10 hours)
5. Introduction to Algebra (4-8 hours)
6. Trigonometry (3 volumes) (8-12 hours)
7. Introduction to Computer Mathematics (8-20 hours)
8. Computer Programming (4 Volumes) (8-12 hours per volume)
 - Part I. Introduction to Programming—Computer Math
 - Part II. Programming Techniques
 - Part III. Advanced Techniques
 - Part IV. Business and Science Applications—FORTRAN LANGUAGE

9. Elementary Electronics (16-20 hours)
10. Electronics (6 parts-10 reels) (12-15 hours each reel)
11. Management Series
 - Effective Planning (3-5 hours)
 - Effective Delegation Practices (5 hours)
 - Effective Organization Practices (3-5 hours)
 - Effective Decision Making (6 hours)
 - Effective Use of Executive Time (6 hours)
 - Effective Managerial Control (4-6 hours)
12. Career English Series (6 volumes)
 - Sentences, Nouns and Pronouns (6-8 hours)
 - Verb Usage (10-12 hours)
 - Modifiers (8-10 hours)
 - Connectives (8-10 hours)
 - Sentence Completers (8-10 hours)
 - Sentence Types (6-8 hours)
13. Improve Your Punctuation (6-12 hours)
14. Improve Your Writing (6-12 hours)
15. Reading Comprehension (4 reels—3-6 hours each)
16. Basic Map Reading (2 reels—20 hours)
17. Blueprint Reading & Shop Mathematics (7 reels-50-70 hours)
18. Scientific Notation (2-4 hours)
19. Physics: 1st Semester; 2nd Semester.

NAVFAC TECHNICAL HOME STUDY COURSES AND CAREER PROGRAMS

Enrollment in the following courses starts immediately. Submit a NOTS enrollment 12410/28 to Code 654. For further information call extension 72648/72686.

- No. 100—Basic Arithmetic—54 Hours
- No. 102—Basic Drafting—54 Hours
- No. 105—Basic Craft Tools—40 Hours
- No. 111—Basic Principles of Electricity—25 Hours
- No. 112—Basic Control Theory & Control Circuits—40 Hours

- No. 115—Basic Water & Sewage—36 Hours
- No. 116—Basic Boiler Feedwater Manual
- No. 130—Basic Heating and Maintenance
- No. 185—Supervision & Management for Navy Civilian Personnel
- No. 211—Intermediate Electricity (Alternating Current)
- No. 212—Intermediate Electricity (Direct Current)
- No. 215—Intermediate Course Sewage—40 Hours
- No. 216—Intermediate Course Sewage—40 Hours
- No. 230—Intermediate Heating & Maintenance
- No. 315—Advanced Course Water—72 Hours
- No. 316—Advanced Course Sewage—72 Hours
- No. 402—Training and Career Development Program Guide for Utilities Operating, Maintenance and Supervisory Management Personnel
- No. 403—Training and Development Program for Maintenance Control Personnel, Planners and Estimators, and Maintenance Inspectors

Five new courses comprising a total of nine volumes have been added to the Home/Self Study Course offerings of the NAVFAC Technical Training Center. The courses, with accompanying examination procedures are identified as follows:

- NTTC COURSE 117 — Basic Automotive Maintenance and Repair — Volume A — Shop tools and equipment — Volume B — Automotive Principles. Prerequisite — Arithmetic
- NTTC COURSE 217 — Intermediate Automotive Maintenance and Repair — Volume A — Engine systems and Electrical Accessories — Volume B — Power Trains and Chassis Units. Prerequisite—NTTC Course 117 Volume A and B
- NTTC COURSE 317 — Advanced Automotive Maintenance and Repair — Volume A — Vehicle Engine and Engine Systems Maintenance — Volume B — Power Trains and Auxiliary Systems Maintenance. Prerequisite—NTTC Course 217 Volume A and B
- NTTC COURSE 140 Volumes A and B — Plumbing.
- NTTC COURSE 110—Fundamentals of Machinery Prerequisite—Elementary Algebra

Soaring China Lakers Build Modern Aircraft with Eye on Competition

(Continued from Page 5)
been active as an official at most of the recent contests and has been Official Scorer for five of them. The entire McEwan family participated in the National Contest at Reno.

China Lake has been designated as one of the few labs in the United States approved for the calibration of instrumentation carried as proof of the performance on board sailplanes making soaring record attempts. The approval of these record attempts is directed by the Soaring Society of America Record Homologation Committee (Bertha Ryan, Chair-

man). Instrumentation calibration is conducted by Charlie Drew.

Thus far in 1967, nine record claims have been made and eight of them have been partially or completely processed at China Lake before being forwarded to the Federation Aeronautique Internationale in Paris, the organization that supervises sporting aviation records.

Building For Future
At the present time the China Lake Soaring Club is mostly a building club. They occasionally make training expeditions to Inyokern Airport (airplane tow) or, Cuddeback, Dry Lake (auto tow). In the past

they have had many successful soaring and social expeditions to Cuddeback Lake as well as North and South Panamint Lakes.

A group of club members calling themselves the Yellow Bird Section have purchased a PT-23 tow plane which will make the launching of sailplanes much easier than the tedious auto tow method which is primarily used by the club on its dry lake expeditions. The individual pilots, both in and out of the club, also fly at other nearby desert and mountain soaring sites such as El Mirage, Tehachapi, Crystalair and

Bishop. The club is planning an active flying future — in student training, competition and record attempts. Possibly during the summer of 1968 they will sponsor a record camp at Inyokern Airport. The following summer they hope to bid for and sponsor the National Soaring Contest at Inyokern.

From now on when you see someone at China Lake with his eye on the clouds you may recognize him as a soaring pilot. Even when he is on the ground his mind is in the sky where he feels the unseen power of the unmatched desert soaring.

China Lake Soaring Enthusiasts Master Art of Silent Flight

BY BERTHA RYAN
and JOHN McCABE

What do those beautiful clouds in the sky around China Lake mean to you? Do they merely add to the beauty of our desert or are they more than that?

There are about 30 people at China Lake to whom the clouds mean very much more. To these people the clouds are indicators of soaring possibilities in one of the best known soaring areas of the world — the Mojave Desert and Owens Valley.

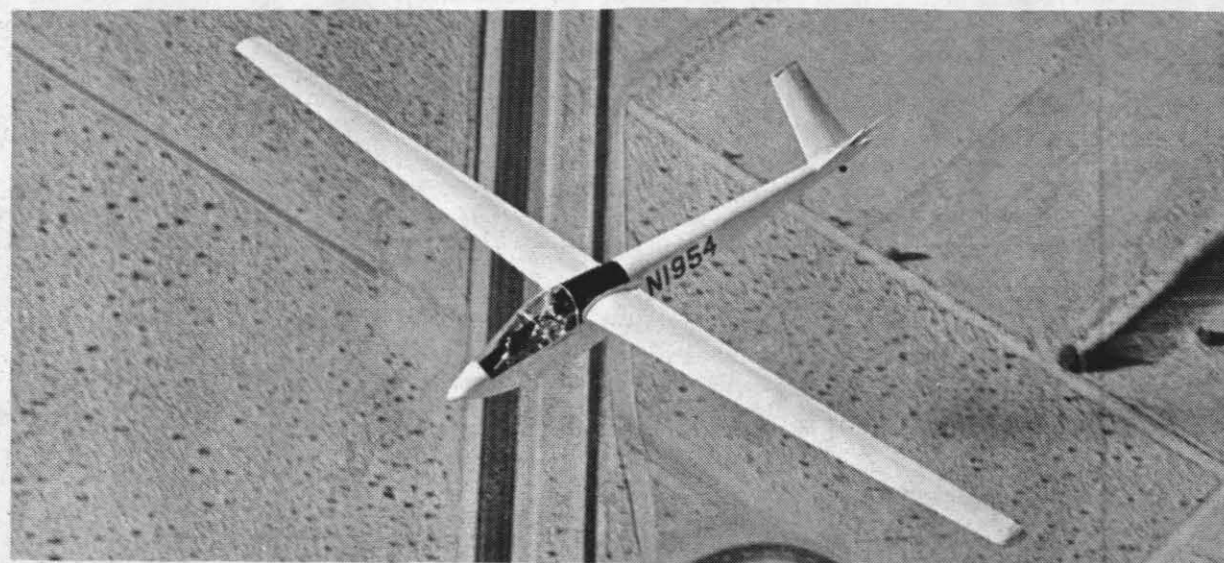
The lens shaped clouds you see in the winter and spring are clues to wave activity. These clouds, called lenticular, are formed as the wind flows over a mountain range. They mark a powerful form of lift which can carry a sailplane and pilot to tremendous heights.

A few years ago a soaring pilot reached 46,267 feet over Jawbone Canyon just southwest of China Lake to establish the current world altitude record

for sailplanes. He was still climbing when he left the lift area as he was reaching the limit of safe flight without pressurization.

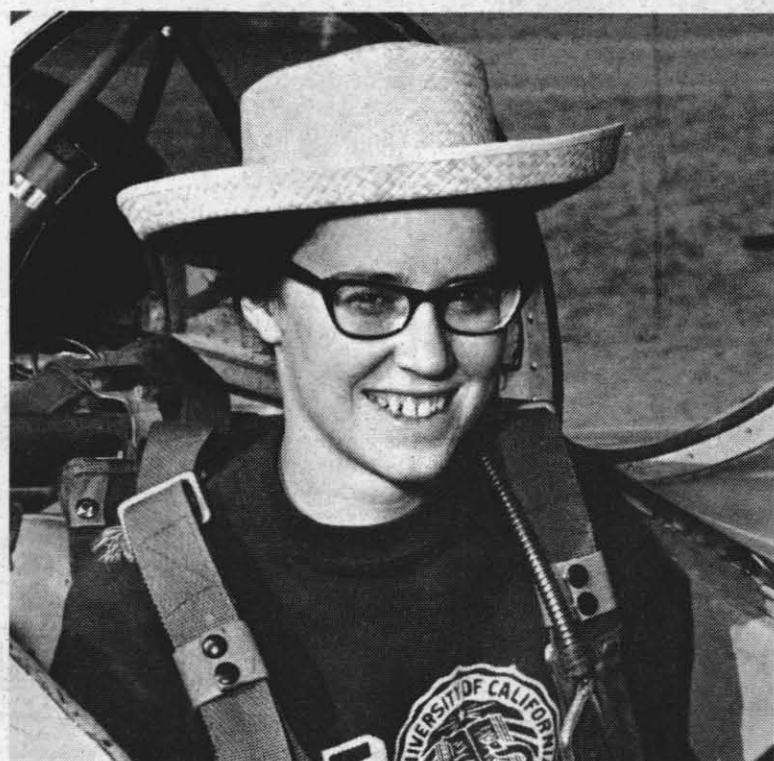
The puffy cumulus clouds of summer (called cu's by soaring pilots) mark the type of lift used for most long distance sailplane flights. The clouds are formed by rising hot air, sometimes in bubbles but probably more often in columns. In the dry desert areas this region of lift is often not marked by clouds but the strength of the lift does raise swirling dust called dust devils. The soaring pilot gains altitude by circling in one of these areas of lift and then gliding (while losing altitude) to the next lift.

In this manner many soaring pilots have made flights of well over 300 miles. The world record, made in Texas, is 647 miles.



POWERED BY NATURE — Charles Drew of the China Lake Soaring Club finds a thermal, or column of rising warmer air, over the new section of Hwy. 395 near Inyokern. Soaring craft are "powered" by such natural air movements over desert floor.

PHOTOGRAPHY BY
PHI JERRY WILLIAMS
and
GEORGE UVEGES



DEDICATED HIGH-FLYER — Shelley McEwan, daughter of club member Dr. William McEwan of NWC Chemistry Div., is the only woman glider pilot here to have trained all the way through the local club to her private pilot's license.



PREPARING FOR FLIGHT — With family 18, operates pull release inside cockpit, while son Lynn, 15, waits aft to join in critical pre-flight operations.



READY TO SOAR — Charles Drew prepares to board his Schroeder HP 11-A craft at Inyokern Airport, "one of the best," according to Drew. Small box atop instrument panel is audio variometer, whose chirping noise varies with altitude.



AUTHOR TAKES TURN — Bertha Ryan prepares to board her Schweizer 1-26 craft for a flight from Inyokern. She is active official at meets, and has scored several



SEARCHING FOR POWER — Charles Drew circles soaring craft over Inyokern in search for thermal of rising warmer air, craft's "power." Finding thermals is an art.



BUILDING FOR LIGHTNESS — Charles Drew installs "cleco fasteners" through skin of fuselage, holding seat in place. Later, rivets will be installed. Helping him is new club member Jim Gladney of Associated Aero Science, learning from ground up.



BUILDING THE WING — As Jim Gladney holds rib steady, Charles Drew installs cleco fastener through "drag strut" along trailing edge of wing. Fasteners projecting upward along ribs in foreground hold thin alignment strips in place.



ATTENTION TO DETAIL — Drew and Gladney check nose piece of soaring craft for perfect alignment as Gladney fastens another rivet in place.

What of soaring at China Lake? It all began many years ago when the nearest population center was Inyokern. Al Sievert of the Engineering Department and a few pioneering companions purchased a war surplus TG-2 training glider and a club began.

In 1953 the club was incorporated as the China Lake Soaring Club. About 1962 the old reliable TG-2 suffered wind damage and, rather than rebuild, the club purchased a newer model — the Schweizer 2-22C two place training glider. For soaring pilots, enthusiasm in soaring naturally leads to interest in building sailplanes, and the China Lake Soaring Club is especially outstanding in this regard.

They managed to find a building and begin construction on several types of gliders, even though no one in the club had any previous building experience. During this period Charlie Drew of the Chemistry Division completed a high performance Briegleb BG-12 and Dr. Bill McEwan, also of the Chemistry Division, constructed a medium performance Schweizer 1-26 from a kit. The members were active in flying projects also. Among the more notable was John Rambo (son of Jack Rambo of the Engineering Department), who soloed on his 14th birthday and received his private pilot's license almost to the hour of his 16th birth anniversary (the legal minimum dates). Shelley McEwan (Doc McEwan's daughter) has been the only woman pilot to train all the way through the club to her private license.

The club suffered a heartbreaking set back a few years ago that would have discouraged men with lesser enthusiasm and determination. The building housing their incomplete sailplane projects burned down destroying years of hard work and a great deal of financial investment. But, undaunted, they determined to start again and after a year of searching, they were able to obtain access to another building (this time of all metal construction). They rebuilt surplus Navy equipment, such as a brake and shear, and solicited donations of expended tools from aircraft contractors who were sympathetic with their plight.

Now China Lake has become famous in soaring circles throughout the world for their production line of HP - type high performance sailplanes. These aircraft are an all metal design capable of very high performance (gliding angle of about 38 to 1). Imaginative local pilots and builders are applying some of their own ideas and designs in the construction.

There have been 11 sailplanes under construction. Last spring the first one was completed, and has been a source of enjoyment all summer to its proud owner and builder, Charlie Drew. Not satisfied with one glider, Charlie is building still another in case he might like its flying characteristics better. "Doc" McEwan is also building two of the HP sailplanes, one for himself and one for his daughter Shelley, who is still active in soaring when she is home from school in the summers. Club pioneers Al Sievert, Larry McKinley and Mike Aley were building two tailless sailplanes, which were destroyed in the fire. However, Sievert began again with a re-designed flying wing incorporating a new airfoil recently developed by NASA. This airfoil has built-in stability requiring no reflex (usually a necessity on flying wing designs). Thus it may be possible to have a stable flying wing aircraft with no drag penalty. If this design is successful, it will be a significant advance in the state of the art. Soaring Fever Spreads There are currently 18 members of the China Lake Soaring Club, but interest in soaring goes beyond this most dedicated group. The Aero-Mechanics Division has a nest of power pilots who have tried soaring and enjoyed it — Ray Van Aken, Lovic Thomas, Al Berryman and Kinge Okauchi. Another member of this division (a relative newcomer to China Lake) Bertha Ryan owns and flies a 1-26 sailplane which she built while living in Santa Monica. Members Compete The interest in soaring at China Lake goes deep and has reached nationally. The National Soaring Contest gives the competition minded soaring pilot the opportunity to match his soaring judgement and skills against those of pilots from all over the United States and a few foreign countries. For the past two years Charlie Drew has competed in these Championships in Reno in 1966 and Marfa, Texas, in 1967. These contests consist of speed and distance tasks. At Reno he flew a total of 1414 miles in 9 days and at Marfa, 1622 miles in 8 days. Bertha Ryan, has (Continued on Page 6)