

# Sea Hunt

*at the*

**NEW YORK WORLD'S FAIR  
1964-1965**

**OFFICIAL  
SOUVENIR  
PROGRAM**

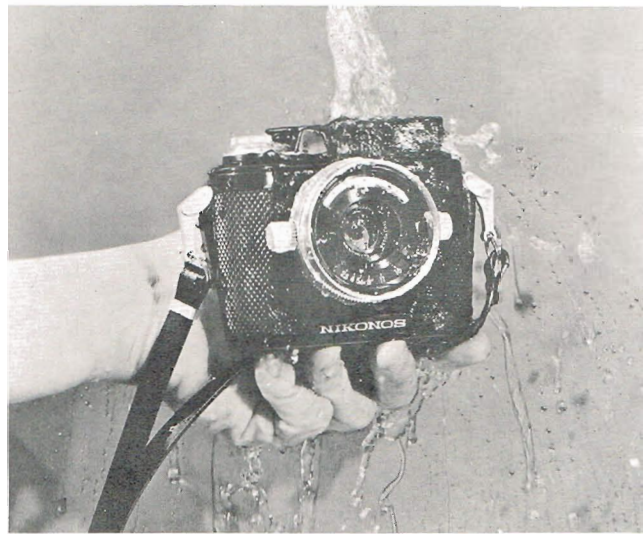
WITH NARRATION BY

**LLOYD BRIDGES**

in the Transportation and Travel Pavilion

**Nikonos is the underwater '35' that really can take it.**

**Rain,  
snow,  
sleet,  
ice,  
hail,  
salt,  
sand,  
silt,  
slush,  
dampness,  
mud,  
mildew,  
heat,  
pressure,  
anything...  
without a  
housing.**



## **It all comes out in the wash.**

The new, amphibious all-weather '35' by Nikon weathers the worst the elements can offer. It can withstand water pressures to 160 feet without a housing—even exposure to radioactive dust without ill effects.

You can use a Nikonos where you'd never risk another. And when you're done, you simply rinse it under the faucet. It's a great fair-weather camera, too—trim, compact—fast and easy to handle. Uses standard color and black & white 35mm film; accepts flash; and is equipped with a fabulous Nikkor f2.5 lens—removable and interchangeable. Price is only \$169.50. For complete details, write Dept. SHP. **Nikon Incorporated**, 111 Fifth Avenue, New York 3, N.Y. Subsidiary of Ehrenreich Photo-Optical Industries, Inc. In Canada: Anglophoto Ltd., Montreal 9, P.Q.



about . . .



## LLOYD BRIDGES

Now busy before the cameras in his fourth successful year as the star of TV's SEA HUNT, LLOYD BRIDGES is firmly established as "America's most famous skindiver" and one of our most eminent TV stars. As an athlete who specialized in dry-land sports like football and basketball, that brand of fame borders on the amazing. But for a versatile and energetic actor whose stage, film and TV credits cover a broad range of activities and locales, his skindiving stardom in SEA HUNT marks a superbly-done job that warrants its unprecedented success.

Before Bridges became Mike Nelson, he had gained an enviable reputation as one of Hollywood's

top young actors. And because of his skillful and flexible acting abilities, he fit into an unlimited variety of roles. Result, Bridges really got around!

He appeared with Gary Cooper and Grace Kelly in the frontier classic "High Noon." A featured role in the mountain-climbing film, "The White Tower," brought him to the dizzy heights of the French Maritime Alps. Co-starring opposite Dana Andrews in "A Walk In The Sun" found Bridges under the scorching Mediterranean sun at the Anzio beachhead, while he probed Outer Space in the daringly-conceived "Rocketship XM" and strolled through a beautiful film star's gilded surroundings, in "The

Goddess," Columbia Picture's recent success that won an Academy Award nomination.

So, the beauty and menace of the ocean depths meant for Bridges just another in a long line of challenging, off-beat locales. Little did Bridges realize that stardom in SEA HUNT would prove the high point of his career! Now, over 80 Mike Nelson stories later, Bridges is still travelling to exciting places to appear in ever-fresh and ever-varied undersea adventures—California's famed "Marineland of The Pacific" and the coves of Catalina Island, the rugged coast of South America, Jamaica and the surrounding Caribbean, bustling New

*Continued next page*



York harbor, the Gulf of Mexico.

A native Californian, Bridges played basketball at UCLA, while studying law. Only when he became president of the University Dramatic Society did he realize that he might have a future as an actor. He went East and joined hundreds of young hopefuls pounding the pavements of Broadway. For several years, he "did the rounds" of agents' and producers' offices . . . looking for the big break. During that time, he did bit parts with an off-Broadway group called "The Playroom Club," taught dramatics at an exclusive private school in Darien, Conn., "Cherry Lawn" and—in between theatrical seasons—starred at the Weston, Tarrytown and Green Mansions Summer Theatres.

Work at the Green Mansions brought the long-awaited break. A vacationing Hollywood producer, Sydney Buchman, dropped in to see the show, "discovered" young Bridges and ordered a screen test. And a successful one it proved!

With a coveted screen contract in his pocket, Bridges went home to California, where he now lives with his wife Dorothy, sons Beau and Jeff and daughter Lucinda.

Just as his prowess on the stage led to his chance in motion pictures, Bridges' success in a score of top Hollywood films resulted in choice dramatic parts in top-rate TV drama series. In 1956 and 1957, Bridges starred in practically every top dramatic program including "The Lloyd Bridges Show," an artistic triumph, Playhouse 90, U.S. Steel Hour and Studio One. For his spectacular performance in The Alcoa Hour's presentation of "Tragedy in a Temporary Town," Bridges won an Emmy nomination for the Best Single Performance of the Year.

The success of SEA HUNT as the nation's top syndicated TV show has made Bridges a full-fledged celebrity. He's managed to squeeze an impressive array of TV guest appearances in between his fast-paced shooting schedule. He has appeared with Tennessee Ernie Ford and Steve Allen, was guest panelist on "To Tell The Truth" and "Who Pays?". During the summer of '59, he starred in the road company of "Guys and Dolls."



*Lloyd Bridges and wife, Dorothy, head for one of the exciting locations used while filming the Sea Hunt television series.*



*Acting talent has been well distributed in the Bridges family. Daughter Cindy (left) and young Jeff (center) have appeared with their Dad on Sea Hunt and The Lloyd Bridges Show. Beau Bridges (right) has become a familiar face to millions of TV fans as a result of his appearances on such shows as Mr. Novak, Dr. Kildare, Combat, Eleventh Hour, Ben Casey and The Lloyd Bridges Show.*

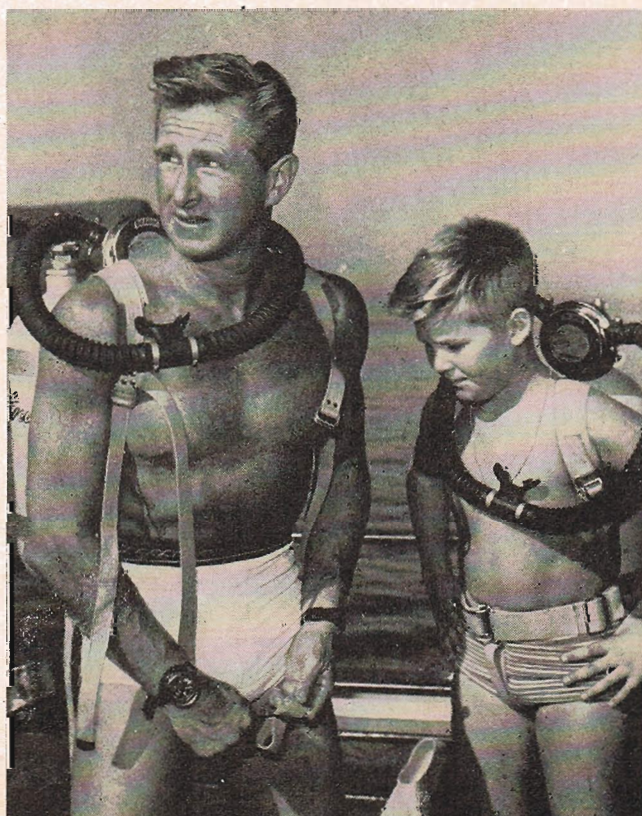


*The tremendous popularity of Lloyd Bridges and the Sea Hunt Show, brings out crowds of enthusiastic fans all over the country.*



*Proud Pop poses with daughter Cindy in scene from their joint appearance in an episode from The Lloyd Bridges Show.*

*Bridges takes time from busy on-camera activities to teach son Jeff the right way to go scuba diving.*





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### "NORDIC" DIVING SUIT

3/8" foam neoprene rubber, skin two sides, in a new form-fitting "contour" design. Zippers on arms, legs and jacket. Includes shirt, pants, hood and boots. All sizes. State height, weight, and chest. **\$29.95**

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3/16" Two-piece "non-terfoam" contoured suit. One brass zipper in jacket only. No talcum needed. Ideal for under ice diving. State weight, height, sleeve, waist. **\$39.95**

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CHRONOSUB 17-jewel automatic. Nylon strap, movable bezel. **\$39.95** plus fed. tax.

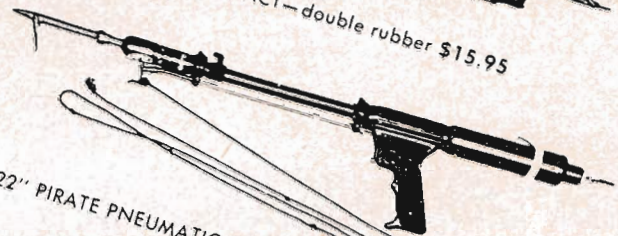
CHRONOSUB CHRONOGRAPH Stop Watch/Timer. **\$49.95** including fed. exc. tax.

For stainless steel expansion band, add **\$10.**

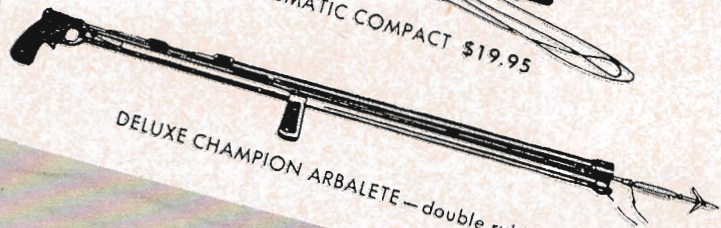
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22" PIRATE PNEUMATIC COMPACT **\$19.95**



DELUXE CHAMPION ARBALETE—double rubber **\$18.95**

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Truly professional package for the experienced diver. Professional diving mask, full-foot diving fin and "j" snorkel. Minimum value \$25. **\$15.**

Above items shipped postpaid upon receipt of check or M.O.

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presents

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with narration by

**LLOYD BRIDGES**

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in the

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---

### CAST

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Susan Tabor  
Elaine Moore  
Lilio Aragonnes  
Jean Perry

Jim McAaron  
Mike Gentry  
Joe Gentry  
Jim Carroll  
Vincent Van Linn  
Jose Perez


### CREDITS

Producer-Director  
Technical Consultant

Stage Managers  
Director of Diving  
Underwater Safety Adviser  
Aquatic Supervisor  
Architect  
Engineering  
Pool by  
Scenic Designer  
Aquarium Lighting  
General Lighting  
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# Scuba Diving Is Family Fun

While scientists are planning greater achievements beyond the atmosphere, man is also just beginning to really enjoy the magnificence of underwater life. The mysteries beneath the surface, often the source of evil legends and darker stories of the unknown, have become the New Frontier for adventurous souls.

With the development of modern skin diving equipment and methods the treasures and excitement under water are now within our reach. Spearfishing, photography, specimen collection and searches for ancient shipwrecks have become a few of the fascinating hobbies open to us through this new sport.

Visits to other parts of our country (as well as to other countries) take on greater interest as we investigate and discover new worlds beneath the waters in each area. To boat owners, the sport adds a new purpose for a cruise and a new project for a vacation.

There are no real limitations to participation in skin diving. It is an activity for the entire family. The requisites are relatively simple: confidence and competence in the water; the ability to swim reasonably well and a desire for adventure. Certain rules must guide the diver and adherence to these regulations will enable him to fully enjoy all the breathtaking wonders of the submarine world.

**One precaution.** Never dive alone. Take along a buddy at all times.

## **Scuba Diving**

First, some basic explanations. Skin diving, in the pure sense, refers to diving without an air supply, such as an air tank. Scuba diving, which is the basis of this report, is an abbreviation of "Self-Contained Underwater Breathing apparatus."

The most important piece of equipment in scuba diving is the source of air, namely, the high-pressure tank strapped to a diver's back. The size and capacities of these cylinder tanks vary. They depend upon the need and size of the wearer. Single, double and triple units are available. The larger the unit, the more available air. Capacity is determined by the amount of compressed cubic feet of air at atmospheric pressure within each cylinder. (The technical specifications can best be explained by an experienced diver or where such equipment is purchased, such as Richards Aqualung Center in Times Square, New York.)

The air from the tank is automatically adjusted to normal breathing pressure by a regulator attached to the cylinder. The regulator is often called the "nerve center" of scuba diving. It is connected by an inhalation hose to a valve atop the cylinder. Obviously, the better the regulator the easier it is to obtain the proper quantity of air when needed. This function is called "suction effort."

The flow of air from the tank is controlled by a valve atop the cylinder. These are two kinds of valves: the "J" valve which has a built-in constant reserve that allows the diver an additional 5-minutes of air when the pressure in the tank falls below minimum level. The "K" valve does not have this



reserve feature. (The difference in cost is considerable.)

These are the three basic pieces of equipment required for scuba diving—tank, regulator and valve. The tank, however, also requires a harness and backpack which hold the cylinder in proper place on the diver's back—and for the quickest removal in an emergency. But, before you purchase any equipment, be sure you are first guided by an experienced scuba diver.

### Accessories

The following are some of the other standard equipment needed: **Face mask:** The humas was designed to focus in air, not in water so that, in a sense, the development of the tight fitting face mask was one of the most important developments in skin diving. Without any artificial air source, a diver can, by holding his breath and wearing a mask, enjoy some of the beauties of underwater life. For extended periods of time he must either use a snorkel or an air tank. **Snorkel:** A "J" shaped breathing tube. Ideal for surface breathing. With a snorkel a diver does not have to wear an air tank or raise his head above the water to breathe. At one end of the snorkel is a rubber mouthpiece which he clenches in his teeth while the other end extends above the surface. (Similar to breathing through a bamboo reed.)

**Flippers:** Giant rubber feet that provide the swimmer with greater mobility and speed through and under the water. Choose your flippers on comfort rather than design.

**Diving Suits:** When water temperature is below 70°, a diver's normal reflexes are slowed; he is chilled, judgement impaired and efficiency reduced. To enable divers to stay in colder waters for a longer time, the exposure suit was developed. With it the diver can even be active in ice water for several hours in comparative comfort.

The wet suit, the most popular, is generally made of foam neoprene. Form fitting and worn close to the skin, the suit allows water to seep under it and to form a thin film between the body and the suit. The water is quickly warmed by body heat, giving the diver a savory sensation of swimming in warm

water.

The quality of a good suit depends upon material and workmanship. It fits like a second skin, fully protecting the diver from the outside colder temperatures. Wet suits can be custom-fitted or purchased in a kit to be tailored to individual measurements. Generally accepted thickness is 3/16".

**Emergency floats:** Safety devices are always necessary implements. The most efficient one is the vest-type, self-inflating float. Inflates quickly by squeezing an attached CO<sub>2</sub> cartridge.

**Weight belts:** Buoyancy caused by air trapped in a wet suit makes it virtually impossible to dive without added weights. These are incorporated in an adjustable weight belt with a quick-release buckle that can be rapidly opened with one hand. (To determine the proper amount of weight needed, many divers test their buoyancy in shallow waters or a pool.) Fresh water requires less weight than salt water.

**Gloves:** Protection against sea organisms, sharp rocks, etc. Should be flexible and should not become stiff when wet. 3-fingered neoprene gloves are recommended for cold water diving.

**Ear plugs:** *Do not* wear plugs when diving.

**Knives:** Not for protection or as a weapon, a knife is necessary for cutting lines, ropes and sea weed; for getting and cleaning fish; for prying loose unusual shell-type animals. Your knife should always be sheathed when not in use.

### Spearfishing

Photography, underwater exploration and spearfishing are some of the most pursued activities in scuba diving. Within this limited space, however, we shall only discuss spearfishing. This is one sport that can be enjoyed in either salt or fresh water, most anywhere in the world.

The sport is hunting fish *only*, so at the very onset we must point out the danger of using or even pointing spearguns and hand spears at other divers or swimmers.

The equipment now used in spearfishing are obviously vast improvements over the native weapons of the Polynesians who have been fishing underwater for cen-

turies.

The most commonly used spear-gun is the rubber-powered Arbelate. Powered by heavy elastics, the gun, which looks like a long barreled pistol, propels a steel harpoon. It is cocked by stretching the rubbers, usually 2 to 4 strands. Power varies according to the number of strands and length of the barrel.

To be sure that shafts are not lost or that a prey does not escape when shot, a cord is attached to the shaft from the gun.

For your protection all guns should be cocked or loaded just prior to use in the diving area. Spear points should always be covered when out of water.

Areas with a sandy bottom indicate home waters for flounders, flukes, rays and skates. Where grounds have rocky bottoms, you will most likely find bass or blackfish. Here you will discover the fish around some wreckage, jutting rock or hidden in a rock cave.

Aim carefully, but quickly, for the fish's head or eye. This means instant death and makes it easy for the diver to handle the catch.

The buddy system comes in particularly handy when spearfishing. While one diver inspects the game area, the other should remain on the surface. *Precaution:* check the laws of each state in which you are diving. Spearfishing laws vary, and it is wisest to know the local regulations before you learn that you are violating them.

### Diving Clubs

Because scuba diving should not be a solo effort, clubs have been organized throughout the country for communal diving and for exchange of information and techniques. The clubs generally have use of a local pool for practice and members are often called upon by local authorities for assistance in an underwater emergency.

Skin diving is an exciting new sport. There are many facets still to be explored as you will soon discover on your first dive. Once you become a devotee of scuba diving you will find that even in your non-diving hours, you will be planning week-end trips and summer vacations more with an eye on the water than with sights on the land.

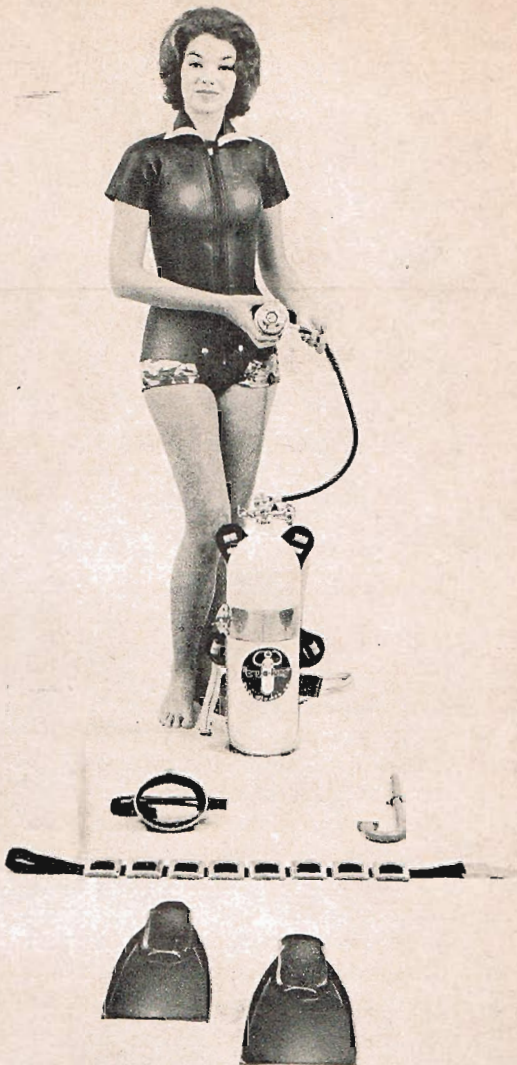


# LET'S GO DIVING

You've seen some of the fun . . . part of the high adventure that awaits you in the wonderful underwater world. Now, you too, can join such fun . . . hunt treasure, spear fish, take beautiful underwater pictures or just explore.

Ever since Captain Jacques-Yves Cousteau and Emile Gagnan invented the "Aqua-Lung," about twenty years ago, more and more people like yourself have heeded the call of "Let's Go Diving." You can choose from a wide variety of skin diving equipment, some of it shown here, bearing the exclusive "Aqua-Lung" trademark of U.S. Divers Co. You'll know you own the finest, safest, most dependable diving equipment to be had anywhere.

While you're here, see some of the diving equipment bearing the world-famous "Aqua-Lung" trademark. It is on display right here at the "Sea Hunt" exhibit. Decide now to join the fun next time you hear the call "Let's Go Diving."

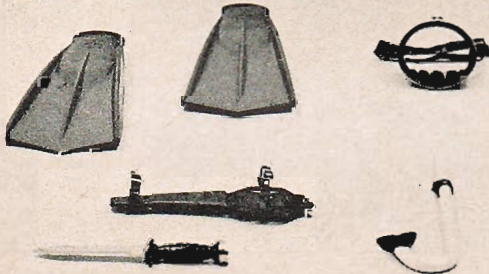


**SUGGESTED BASIC PACKAGE**

<b>Tank and Regulator</b>	
0691	TANK, Yellow, 52.8 cu. ft. with Reserve Valve (J) .....
	\$ 64.95
0817	"AQUA-LUNG" Pac .....
	\$ 17.50
1040	"AQUA-DIV" Deluxe Regulator .....
	\$ 34.95
	<b>Total</b> .....
	<b>\$117.40</b>
<b>Accessories</b>	
5000	"CHAMPION" Deluxe Mask, Blue .....
	\$ 4.95
6077	"OTARIE" Fins, Black, Medium .....
	\$ 10.95
7311	"AQUATIC" Snorkel, Blue .....
	\$ 1.50
3184	"BAHIA" Water Wear Jacket, Med. .....
	\$ 24.95
7125-50	WEIGHT BELT, 8 lb., "SLIP-QUIK" Buckle .....
	\$ 11.95
	<b>Total</b> .....
	<b>\$ 54.30</b>

*world's largest manufacturer of skin*



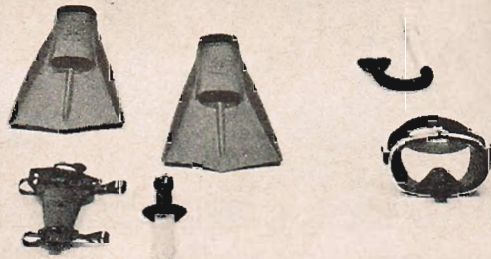


**SUGGESTED DELUXE PACKAGE**

<b>Tank and Regulator</b>	
0682	TANK, Yellow, 71.2 cu. ft. with Reserve Valve (J) ..... \$ 74.95
0818	"KAM E-Z PAK" ..... \$ 17.95
1030	"CALYPSO" Regulator ..... \$ 59.95
	<b>Total \$152.85</b>

**Accessories**

5048	"EQUI-PURGE" Mask, Black ..... \$ 6.95
7310	"AQUA-MASTER" Snorkel, Yellow \$ 1.95
6034	"AQUA-LUNG" Professional Fins (M-L) ..... \$ 13.95
3158-40	"ADRIATIC" 3/16" "NON-TERFOAM" Suit ..... \$ 57.50
7125-30	WEIGHT BELT, 12 lb., Deluxe ..... \$ 18.95
4226	"MASTER" Knife ..... \$ 9.95
	<b>Total \$109.25</b>



**SUGGESTED PROFESSIONAL PACKAGE**

<b>Tank and Regulator</b>	
0684	TANK, Yellow, 71.2 cu. ft. with 0523 Audio Reserve Valve ..... \$ 84.95
0818	"KAM E-Z PAK" ..... \$ 17.95
1010	"AQUA-MASTER" Regulator ..... \$ 71.50
	<b>Total \$174.40</b>

**Accessories**

5050	"PACIFICA" Mask ..... \$ 8.95
6040	"AQUA-MASTER" Fins ..... \$ 13.95
7313-10	"AQUA-FLEX" Snorkel ..... \$ 2.95
3174-40	"BAL TIC" 1/4" Deluxe "NON-TERFOAM" Suit ..... \$ 62.95
3516-20	"NON-TERFOAM" 1/4" BOOTS ..... \$ 5.95
7125-10	WEIGHT BELT, 15-lb., Deluxe ..... \$ 21.45
4226	"MASTER" Knife ..... \$ 9.95
	<b>Total \$126.15</b>

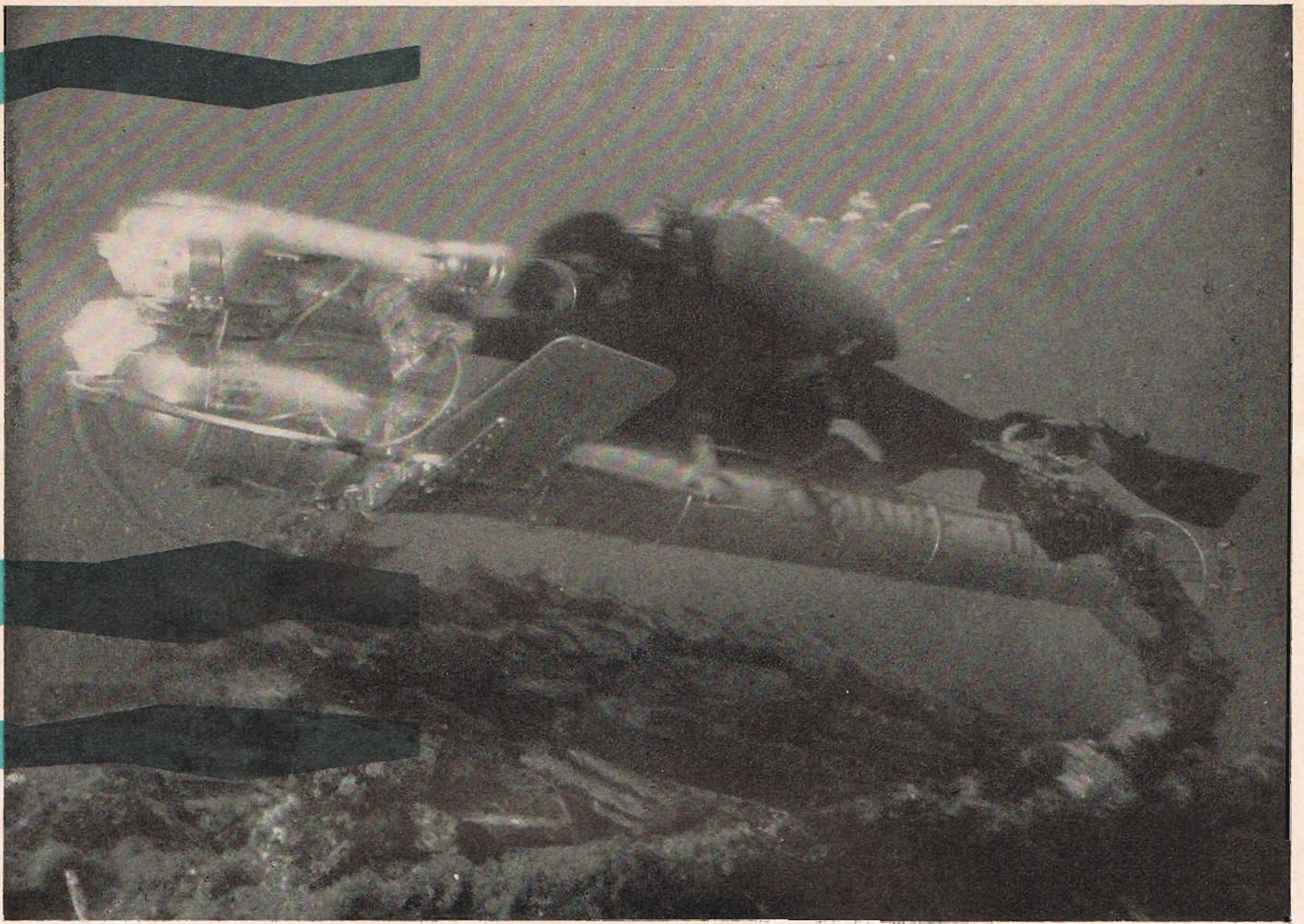
*diving equipment.*

**u.s. divers co.**

3323 w. warner avenue, santa ana, calif.







## Submarine Flight Is About To Open The Undersea World

BY D. REBIKOFF, *Chicago*

We do not always realize the practically infinite immensity of the sea. 75 per cent of the Earth's surface is more than all of planet Mars! Skin diving with Scuba air tank has become popular to about 100 feet of depth. However, the diver is severely limited in horizontal mobility. He can barely swim a few hundred yards before

his air supply is exhausted. He cannot follow the roaming fishes. He usually winds up back to his starting point on the beach or boat after having seen a pitifully small spot of the sea. He is also slowed down by his equipment, cameras, bigger air tanks, cold water suit, etc.

After many frustrations trying to

follow playful fishes and bikini-clad mermaids, I decided 10 years ago to use my powerful floodlights battery system ("Torpedo") to also provide propulsion to supplement my  $\frac{1}{2}$  knot or less swimming speed. Many problems had to be solved before we had a reliable underwater vehicle. The present Rebikoff Pegasus used by the U.S. Navy



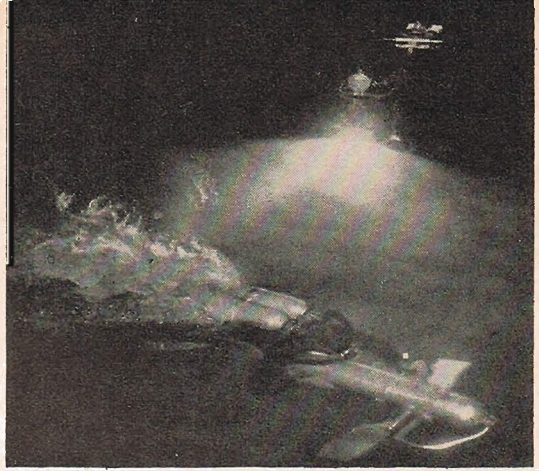
U.D.T. and also by the German, the British Navies and the Japanese Institute of Fisheries has brought horizontal freedom to the underwater explorer. The speed is over 3½ knots (or 4 MPH) for about 5 hours, which means that about 20 miles of ocean are covered with each dive instead of a few hundred yards! It is a revelation repeated every time of the discovery of always something new and unexpected; wrecks ancient and modern, canyons, cliffs and seamounts, teeming marine life. It is also an exhilaration beyond description to be able to follow the surface from below while upside-down, to jump out of the water like a porpoise, to chase and exhaust a big fish of almost any kind, including the airplane-sized manta ray. We are weightless and much freer than any astronaut ever will be.

Entirely new techniques have been developed to make this new undersea freedom safe and useful. A complete airplane-like instrument panel is necessary to find the way. There are not yet any road signs in the open ocean. Powerful floodlights and automatic cameras with water refraction corrected lenses are necessary to record the beauty of the marine world or at least make a strip chart. A set of airplane-like stick and rudder controls provide fighter-like manoeuvrability to avoid obstacles and have fun around canyons and through caves and wrecks. A sonar makes possible operation in murky harbor water, often the richest in wrecks and jobs. A towed radio buoy provides voice communication with the accompanying boat or the "wingman" buddy. It is so similar to professional aviation that the new Pegasus pilots receive their navigation training in the Link Trainer. Like aviation, it is a lifetime challenge to learn and discover more.

The latest Rebikoff Pegasus is available as a low cost kit to be assembled by the diver and to be improved with more advanced equipment every year. It is such a breakthrough the second and third horizontal dimension that the dulllest harbor or lake dive has become today the world's most fascinating

sport. Competitions of speed, distance covered, manoeuvrability, precision of navigation will very soon replace the oldtime swimming pool contests. Discovery of in-

numerable treasure wrecks and little known marine life will also follow, making each submarine flight the most rewarding experience the skindiver can ever have.



**Technical notes:**

- Material: Marine aluminum alloy and plastics.
- Length: 9 feet.
- Diameter: 10 inches.
- Weight: 220 pounds.
- Power: electric motor 1½ HP.
- Speed: 3½ knots or 4 miles.
- Range: 20 statute miles.
- Towing pull: 70 pounds.

The instrument panel includes a gyro-compass, an artificial horizon, a log and a clock, a battery voltmeter, leak warning lights, a battery discharge meter and a forward looking sonar.



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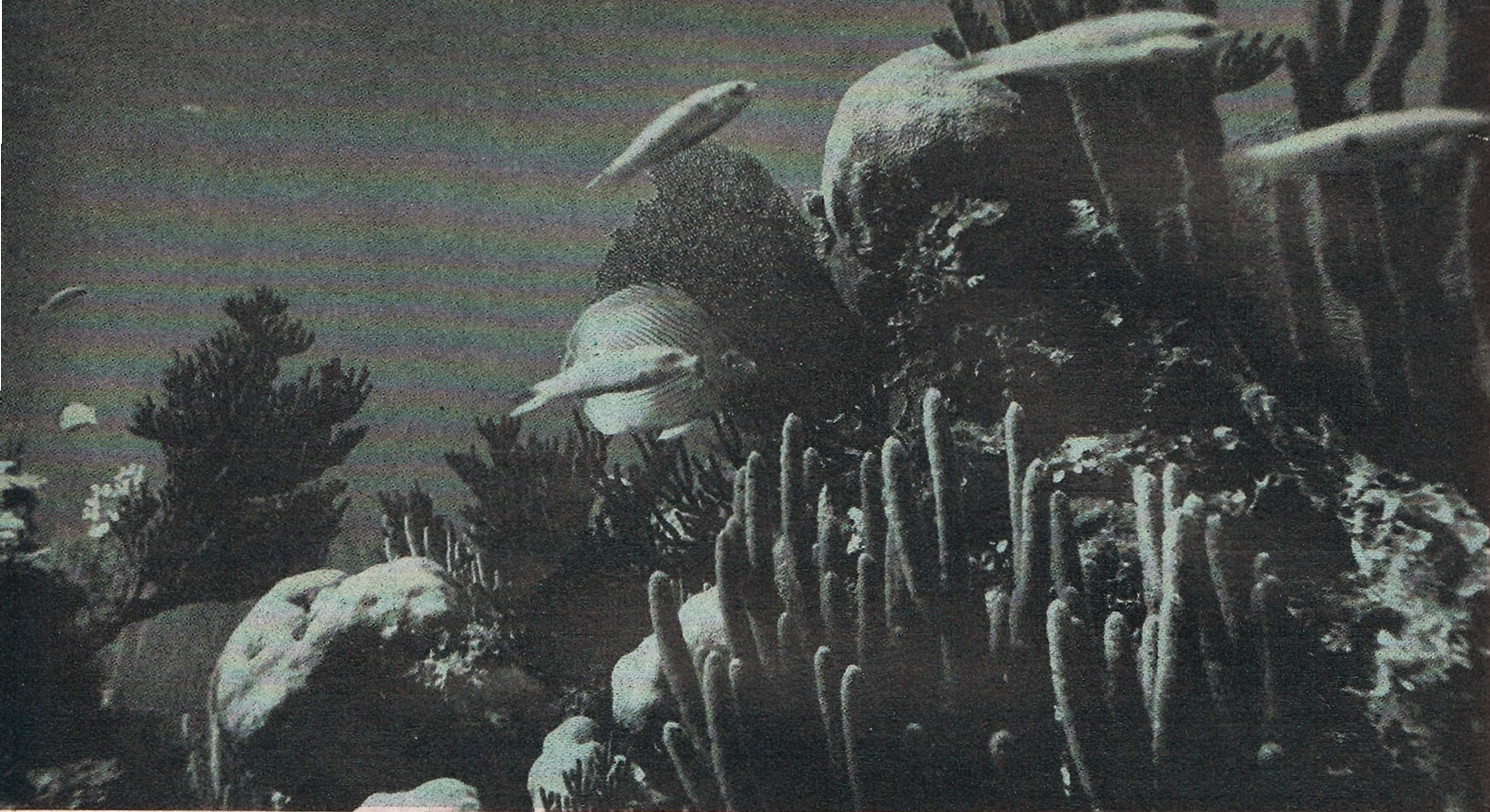
Elsewhere, for information, write:

**DEXTRA SURFBOARDS**

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## PHOTOGRAPHY UNDERWATER

ELGIN CIAMPI

The underwater photographer must shoot under conditions which resemble a fog; and the closer the subject is to the camera, the sharper and more contrasted will be the photographs. An important rule for taking good pictures underwater is that the shorter the visibility, the closer the camera must be to the subject.

Getting the correct exposure underwater is one of the most difficult problems because of changing light conditions. Lighting changes with depth, shooting angle, surface conditions, and type of bottom.

It is important to remember that

the closer the subject is to the meter, the more accurate the exposure will be, because of the "scattering" effect. This also applies to the light available underwater in a known location on a given day, look at the surface. On windy days the water will be choppy and approximately 20 to 30 per cent of the direct sunlight will be lost in the turbulence at the surface. There will be less light underwater on these days, and almost the equivalent light underwater on cloudy days with a flat calm surface. The best days for underwater photography will be when the sun

is bright and the surface calm. Then only 3 per cent of the incident light is reflected back from the surface.

**LIGHT LEVEL DECREASES WITH DEPTH.** With the conditions above and the water constant, the percentage of the surface light remaining at different depths and locales will depend on the depth and the amount of particles suspended in the water. In waters of 5-foot visibility there will be considerably less light at a depth of 50 feet than in waters of 30-foot visibility. To determine the amount of light available and to secure the best results when taking photographs, use a light meter or an electric eye camera.

**WATER FILTERS THE COLORS OF LIGHT.** In addition to the loss in intensity of light with depth, water also selectively filters out the colors of sunlight the deeper it penetrates. The red end of the color spectrum suffers most. At 15 to 20 feet almost no red is visible; yellow is lost at approximately 65 feet; only green and blue are seen below 65 feet, and blue is the

### ABOUT ELGIN CIAMPI

*Elgin Ciampi has been involved in film production for the past ten years. He has worked in all phases of production; producing, directing, editing, film writing, sound recording, photography.*

*This section on underwater photography was condensed from Elgin Ciampi's best selling book on all aspects of skin diving, *The Skin Diver*. Ronald Press \$5.95*





dominant color visible at the greater depths.

Many underwater photographers, including myself, will sit for hours watching under- and overexposed, out of focus, and jerking movies of a diver's recent trip to the warm clear waters. The fascination of this new world is very strong, and the camera tells best the experience and adventures of the aquanaut.

Whether or not you get good pictures underwater or not will depend mostly on your ability as a photographer. Above water almost anyone can take pictures on a clear sunny day, but underwater you are taking photographs under conditions which are similar to the worst of those found on the surface. It is as if you took pictures only on cloudy, foggy, and rainy days of subjects in motion while you yourself are walking. You must understand the fine points of photography to overcome these conditions and get good pictures. You are dealing with limited visibility, flat lighting, and close-up action photography.

Almost all cameras can take pictures underwater, but the camera that best meets the requirements is the 35 mm. Besides the important advantages of its compactness, interchangeable lenses, extreme depth of field, and faster lenses, its larger film load — or 36 exposures — enables the diver to take more shots on one dive without returning to the surface for the troublesome job of removing the diving equipment, opening the camera housing, and reloading the camera.

Outstanding among the 35 mm. cameras are a few that use spring or electric motors, such as the Nikon and Robot, to automatically transport the film and cock the shutter.

The automatic exposure movie cameras have proved to be ideal for underwater use. They adjust the exposure automatically. Thus a diver can follow a fish from the bright light of the surface to the dim light of deeper water and have every single foot of film correctly exposed. Clouds moving overhead or changing brightness of the bottom or subjects are all compensated for by the automatic aperture control. This is certainly the camera for underwater photographers.

An excellent camera especially designed for underwater use is the

NIKONOS (it can also be used on land). Its compact, rugged and simple design makes it my first choice among cameras available. Photographers on LIFE, Saturday Evening Post, Sports Illustrated use it for underwater assignments. The design is unique because no underwater housing is required. Its small size allows one to carry two of them hanging around the neck, one loaded with color and the other with black and white film. This camera's compactness frees one's hands for other underwater activities and allows one to swim freely without the drag characteristic of the bulky separate camera housings. This camera's advanced design has changed the whole concept of underwater cameras. The NIKONOS has a flash attachment as well as special interchangeable NIKKOR lens. It's waterproofed to a depth of 150 feet.

The owner of a new and expensive camera is probably concerned about taking his camera underwater and having it ruined by the water. He need have no fear, as a great deal has been learned about waterproofing at great pressures. Cameras are ruined mainly because of carelessness, such as leaving a bolt loose or sloppy construction of home-made cases. "O" ring seals are used on almost all housings, and they can withstand pressures greater than those the diver can. Many photographers as an extra precaution pressurize the underwater "housing" by installing an air valve and pumping air into it. If a leak should develop, escaping air bubbles will warn the diver and allow him time to get to the surface to save the camera.

**BUILDING HOUSING.** Many photographers build their own housing, not only because of the high costs of readymade housings, but out of necessity, since many cameras do not have underwater housings designed specifically for them. The approximate cost of building a housing is \$10 to \$20. It will, if properly built, be safe down to at least 100 feet.

Surface conditions determine the amount of sunlight that will pass the surface. To get an estimate of automatic electric-eye still and movie cameras. These cameras are ideal for underwater photography. They not only reduce the amount

of external camera housing controls and eliminate light meters, but also eliminate the constant underwater problem of changing light conditions. A photographer using a light meter cannot match the exposures of an automatic exposure camera underwater.

The best meters are the direct reading type, which need no manipulations. The Weston DR is an excellent example.

A light meter can be installed in a pickle jar, using a rubber washer in the cap as a seal. A better arrangement is to put a light meter into your camera case with the light-receiving end facing in the same direction as the lens. It will give constant readings while shooting. This is especially effective when using a movie camera.

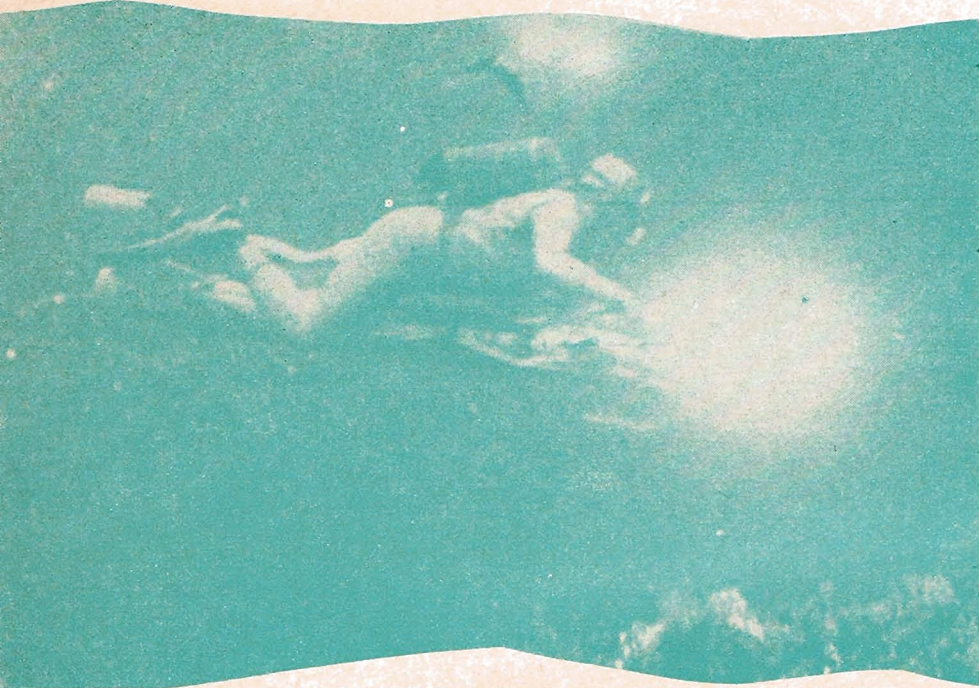
The camera angle is very important in underwater photography. Never shoot down on a subject, since pictures taken at this angle always look flat and lack depth. Always try to shoot on the same level as your subject for the most natural shots of marine life. Use rocks, plant life, and reefs in the foreground to help create the impression of depth in your pictures. Notice the position of the sun; the best time of day to shoot is not during the midday when the sun is directly overhead and there are no shadows—pictures turn out flat. But when the sun is at an angle of about 45 degrees, at two or three o'clock in the afternoon, the light under water is directional, giving light and dark shadows to subjects. Take advantage of this lighting to get good contrast in your pictures by shooting with the light hitting the subject from the side.

Photographing marine life can be an extremely fascinating aspect of underwater photography. If you are interested in marine life, learn all you can about its behavior. The more you know, the better will be the content of your pictures. Interesting movie or still pictures can be taken of mating behavior, food-getting methods, territoriality (competing for food and living space), protective coloration and devices. Almost all of the material about most fish has never been photographed, and many fish have never been photographed under natural conditions.



## OUR FUTURE IN THE SEA

BY ARTHUR C. CLARKE



Our age has seen the opening-up of the two greatest frontiers in all history—Space and the Sea. It may be a century before we can colonise the Moon and planets, but already we are living in the sea and tapping its almost endless resources. Yet what we have so far achieved is just a feeble beginning; we must do much more if this New Frontier—which Captain Cousteau has christened “Inner Space” — is to

Arthur C Clarke, the British science writer, has published almost forty books on Space and the Sea, such as *The Exploration of Space*, *Indian Ocean Adventure*, and *The Challenge of the Sea*. He now lives in Ceylon, where his partner the underwater photographer Mike Wilson recently discovered the 260-year-old wreck of a 22-gun ship carrying a ton of silver. (See *The Treasure of the Great Reef* and *Indian Ocean Treasure*.) A past Chairman of the British Interplanetary Society, in 1963 Mr. Clarke was awarded a gold medal of the Franklin Institute for having originated communications satellites.

be of real use to Mankind. For example:—

The Sea produces many times as much food as the land, yet because of our primitive methods of fishing we use only a tiny fraction of it. Can we do better? Yes: remember that before Columbus, this country could support only one or two million buffalo-hunting Indians. Today, modern agriculture can feed a hundred times as many people from the same land.

The lesson is clear. We must learn to farm the Sea as we have farmed the prairies. We must grow, harvest and process the crops of floating plankton upon which all marine life depends. Perhaps we may drive and corral the whales—the mighty cattle of the oceans—abandoning our present cruel and inefficient methods of whaling for more scientific techniques.

The Sea is also an inexhaustible storehouse of mineral wealth. Al-

ready there are oil-wells and coal-mines under the ocean floor, and vast areas of the sea-bed are covered with valuable ores which could be scooped up and brought back to the surface. What is more, every cubic mile of sea-water contains millions of tons of dissolved metals and chemicals. Some of these we have already learned to extract; one day, many of the raw materials of civilization—including the most important of all, pure water for drinking and irrigation—may be obtained from giant processing-plants at the edge of the sea.

And the Sea is a great museum; it contains our past as well as our future. Whole volumes of lost history lie hidden in a thousand wrecks, buried beneath silt or encased in coral. The sunken treasure of romantic fiction, though it exists, is far less important than the greater treasures of art and archaeology waiting for us beneath the waves.

There are also unlimited scientific treasures to be won from the sea. We would like to know, for example, how whales and dolphins ‘talk’ to each other, as they undoubtedly do. We would like to know why some regions of the sea appear so healthy that the fish there are virtually free from disease. We wonder how the great ocean currents, like the Gulf Stream, affect the weather. The answers to questions such as these may be of enormous benefit to mankind.

To explore and exploit the Sea, we have to develop new kinds of machines—and train new kinds of men. The future will need armies of underwater experts; there will be divers, of course, but there will also be construction, propulsion, mining, communication and chemical engineers—not to mention biologists, geologists, physicists and mathematicians.

However, our future in the sea is not all concerned with the serious business of science and survival. The shallow waters of the world form a marvellous playground—an arena for sport, adventure and plain sightseeing, which can provide endless pleasure for millions.

But not, I hope, *too* many millions. The Sea is Earth’s last wilderness; let us guard it well.

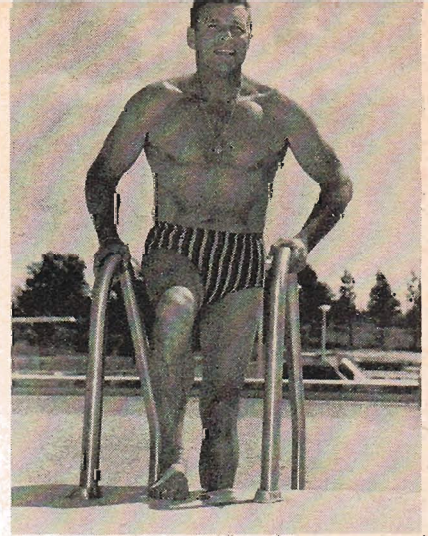


When John McKnight conceived the idea for a live presentation of TV's SEA HUNT, he consulted an old friend about the feasibility of building a tank which would stand entirely above ground and still be strong enough to support enormous water pressure. The "old friend" he consulted was one of America's all time swimming greats, who is even more familiar to television and motion picture audiences as one of their favorite action stars . . . Buster Crabbe. As Captain Gallant of the Foreign Legion (in Television), he has thrilled millions of children and adults. As Flash Gordon and Billy the Kid in motion pictures, Buster has contributed a large measure of excitement and entertainment to the screen.

However, there is another side to the Buster Crabbe story. . . . As Executive Director of the Cascade-Fountain Pool Corp., (Cascade Pool subsidiary) Buster brings to bear his limitless knowledge of water sports by advising on the production of the swimming pool which bears his name. Also, he

finds time in his busy schedule to travel around the country to advise upon the installation of the larger commercial steel tank swimming pool manufactured by his company. It was in this capacity that he told John McKnight that such a pool, required for SEA HUNT at Paradise Island could be built. Proof that it was, stands in the SEA HUNT Theatre today.

Among other advisory activities, Buster currently directs the water sports program at the fabulous Concord Hotel, Kiamesha Lake, N. Y. The one project closest to his heart however, is his CAMP MEE-NAHGA for boys at Onchiota, New York, where Buster devotes a major portion of his summer to directing the curriculum which has received national acclaim for excellence. The pool in which SEA HUNT at Paradise Island is presented, is also winning plaudits for the Cascade-Fountain Pool, Corporation. (Edison, New Jersey). The Pool is built entirely of steel, reinforced many times, in order to contain the 450,000 pounds of water weight. Triangular in shape, it



Buster Crabbe

presents a 35 foot glass front to the audience. Specially cast for SEA HUNT by the Pittsburgh Plate Glass Company, each pane of glass although only 5 by 8 feet in size, weighs over half a ton, and has a thickness of almost two inches. Truthfully, there is no other pool like it in all the world—therefore, it deserves its place of honor in the New York World's Fair.



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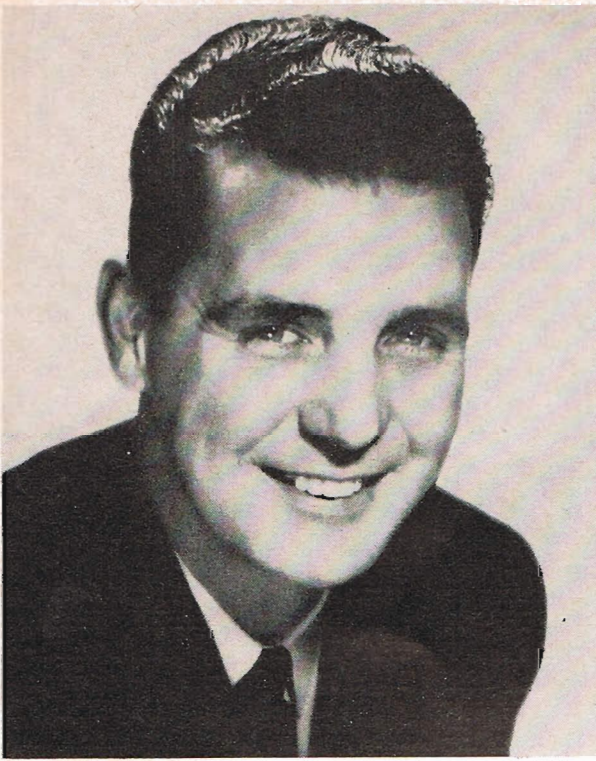
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***Producer-Director  
John McKnight  
and the story of a new type  
of water entertainment***

Sea Hunt at the New York World's Fair is the culmination of an idea which occurred to John McKnight several years ago. After producing and directing the water shows in the World's Fair Amphitheatre where "Wonderworld" is now playing, Mr. McKnight felt the need for a new concept in water show presentation . . . something that had never been done before. While looking in on TV's Sea Hunt, the possibility of a live underwater dramatic show crossed his mind. However, it took two years of effort and negotiations to bring together the various elements necessary to make Sea Hunt at the New York World's Fair a reality. When contacted at his

home in Beverly Hills, Calif., Lloyd Bridges was enthusiastic about its possibilities. United Artists Television which distributes the television version was happy to cooperate. Buster Crabbe, famed not only for his TV and motion picture accomplishments, but also as one of America's all time swimming greats, guaranteed that the Aquarium Pool could be constructed and so directed all the energies of the Cascade Fountain Pool Corp. of which he is President. The Pittsburgh Plate Glass Company agreed to create the special glass panelling (nearly 2 inches thick) required to contain the tremendous weight of the water. Albert Ostrander, who has an

illustrious career as a top scenic designer on Broadway and in motion pictures, started sketches which produced the world's most beautiful underwater seascape. (The aquarium scene is patterned after a reef area off the coast of Huntington Hartford's Paradise Island in the Bahamas. The fact that Sea Hunt at the New York World's Fair is a new concept in show business posed some mammoth problems in construction, but Mr. R. C. Thatcher, as President of the Transportation and Travel Pavilion, is also head of one of the largest construction companies in the world. Consequently, he was able to solve each problem as it arose, by bringing to bear the imagination and creativity of famed architect Clive Entwistle. Where vital engineering knowledge was needed, he called upon the highly respected engineering firm of Rongved and Strobl of New York.

In other words, the relatively simple idea for Sea Hunt at the New York World's Fair required the knowledge, imagination and skills of hundreds of craftsmen in order to bring it to fruition in the Underwater Theatre as it is presented each day.

Some members of the audience may recall that the producer of this show, was for many years a well-listened to disk jockey and news commentator on many of the New York radio and television stations. Visitors from other sections of the country would probably remember his voice as the salesman behind their most familiar commercial announcements exhorting them to purchase many of America's top brand names. In producing Sea Hunt at the New York World's Fair, John McKnight feels that he has created a new medium of entertainment which will find other outlets after the conclusion of the Fair and that in time, this form of water show will be offered in many different parts of the world.



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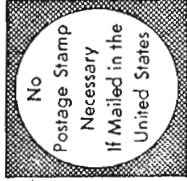
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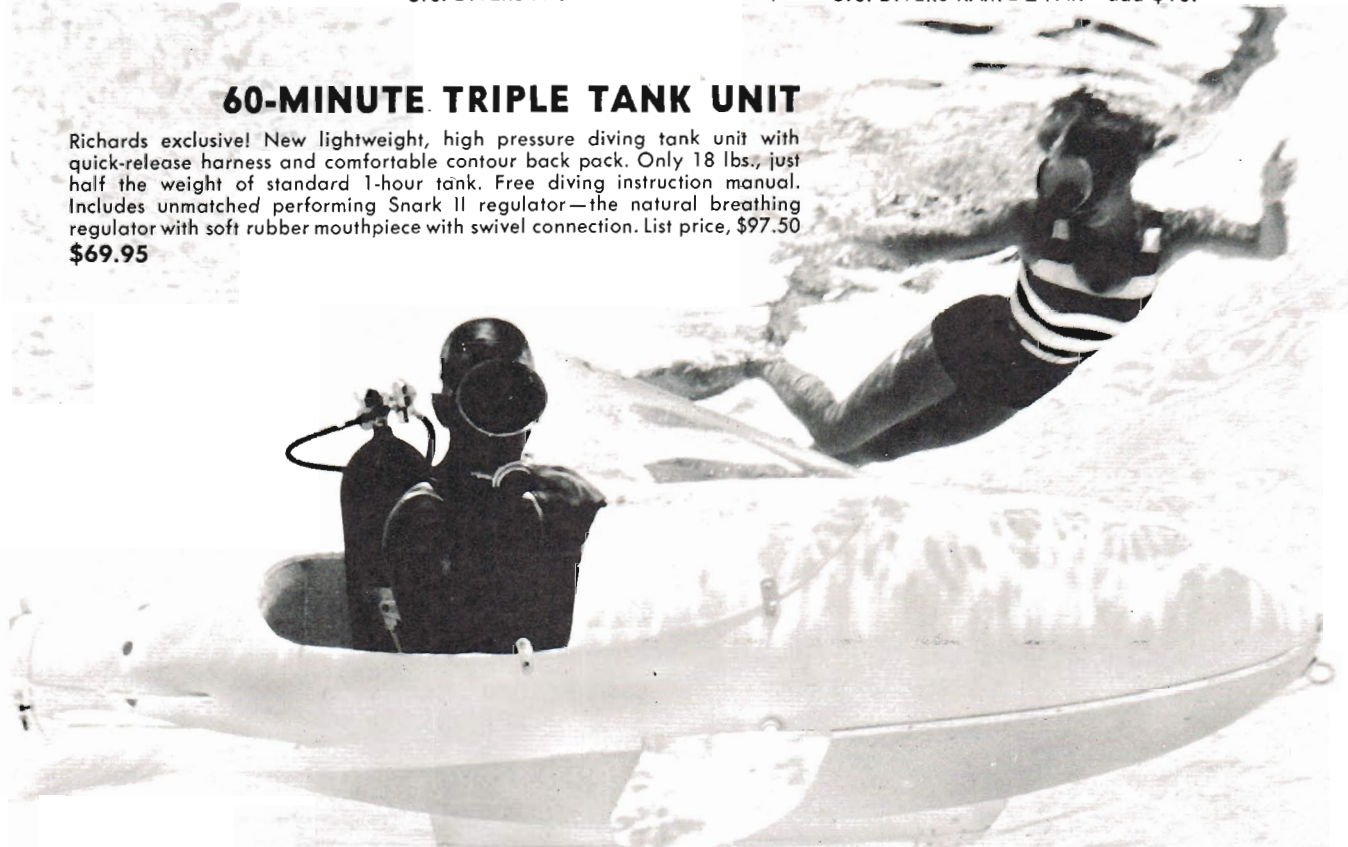
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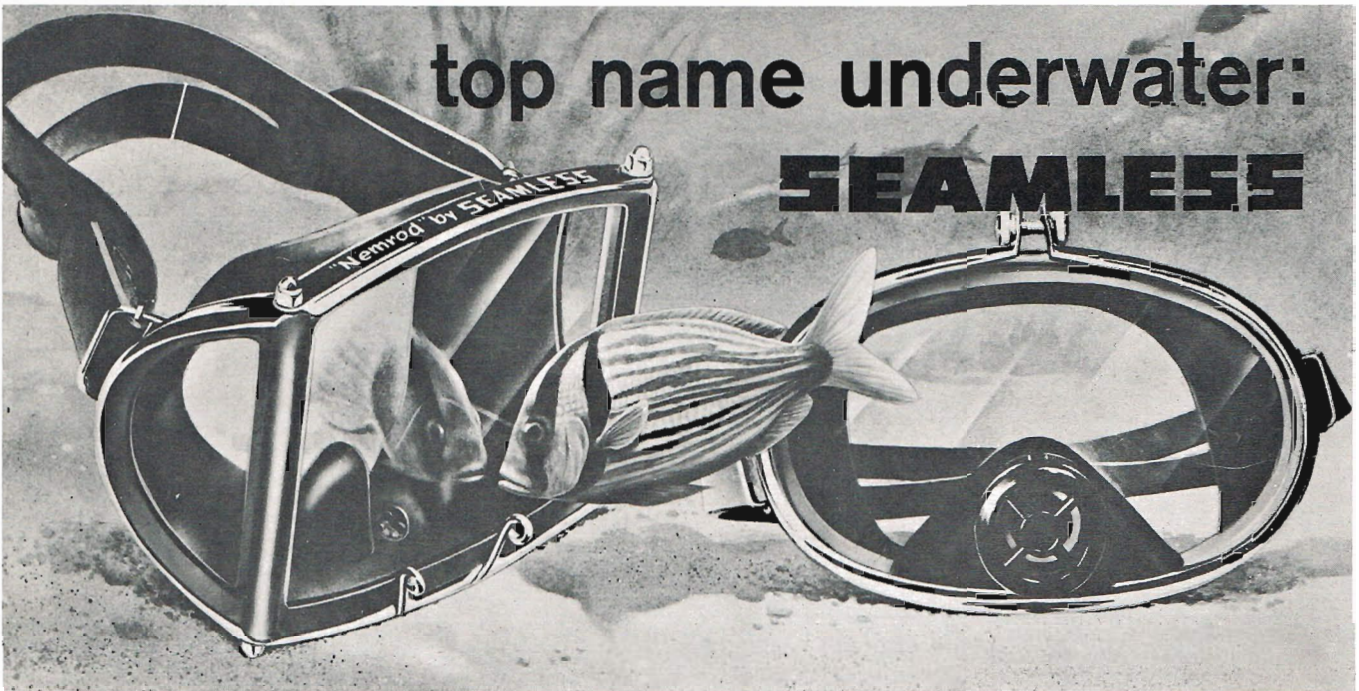
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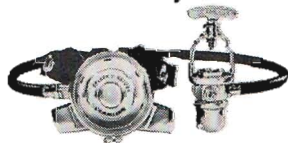
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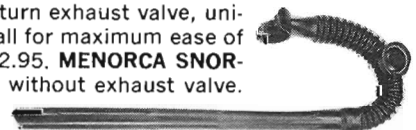


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