



Sun Ship Historical Society's

Fact Sheet For:

Subj: Sun Ship's Submersible "GUPPY"
Date: 1968-1971
Rev: 03/08/2018

The GUPPY was designed and built by Sun Ship's Aero/Hydro Space Division and was designed to be a practical, economical submersible for all-around ocean engineering including; inspection of oil rigs and drilling equipment and ocean floor-continental shelf geological surveys.



Here, shown as a model, is the 5,000-lb Guppy.

Photo Courtesy of: G. Howarth 59D
 SSHS: 460.03.005

The GUPPY, a two-man submersible, was Sun Ship's functional, economic approach for all-around undersea engineering and surveys. By 'tethering' the Guppy to a surface-support vessel by an electric cable saves significant weight of the submersible by removing the crafts batteries. For at 5,000 pounds the GUPPY is lighter than some submersibles batteries alone.

Specifications:

- Operating Depth:1, 000 Ft.
- Collapse Depth:2, 000 Ft.
- Safety Factor:2
- Length:11'-0"
- Beam:8'-0"
- Pressure Hull Inside Diameter:66"
- Height:7'-6"
- Draft:5'-6"
- Weight in Air:5, 000 Lbs.
- Submerged Displacement:6,100 Lbs.
- Max. Emergency Buoyancy:700 Lbs.
- Crew/Passengers:2
- Submerged Speed Max:3 Knots
- Submerged Range:12 Miles
- Thrusters-10-hp, rotatable:2
- Total Payload:850 Lbs.
- Tethered Electrical Power at.....440 Volts

Options

By offering unique 'customization' of options, the GUPPY can be acquired for between \$95,000 to \$150,000 or lease for \$1,200/day.

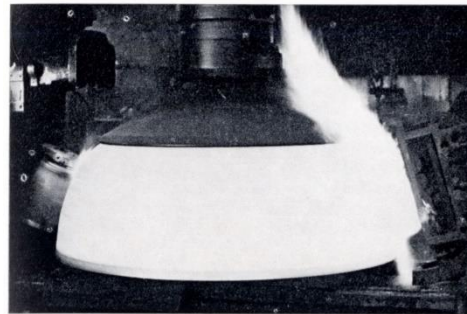
Various options may be included by the customer in adapting the GUPPY to specific needs. For example, the GUPPY has been designed with ample space to allow for:

- TV Cameras and Video
- Tape Recorders
- TV Monitors
- Still Cameras
- Motion Picture Equipment
- 1 or 2 Manipulators
- Salvage Operations Systems
- Sampling Baskets
- Forward-Looking Sonar
- Heating/Air Conditioning Sys.
- Torpedo Recovery Sys.

Structure:

- 66 inch I.D. with 1/2" HY-100 Steel
- Two 8-inch Plexiglass Hemispherical Viewports
- One 16-inch Plexiglass Hemispherical Top Window
- Upper hatch with 20" opening

Fabrication of Pressure Hull



Under intense heat and pressure, the head of the sphere is spun into shape at Lukens Steel

Photo courtesy of Sun Ship and ABS Surveyor (Aug, 1969)
 SSHS: 020.34.6908.29

Pressure Hull:

Fabricated from HY-100 HSLA (High Strength Low Alloy) steel with a yield strength of 100,000 psi. Sun Ship designed the GUPPY with the highest rating as per the 'ABS' Guide for Classification of manned Submersibles 1968', a pioneering document and the first guide on manned submersibles to be offered by any classification society.

In addition, the ABS required that submersibles have a depth safety factor of 1.5 to 2.0 of its maximum operating depth. Sun Ship's GUPPY was designed at the maximum operating depth range of 1,000 feet with a safety factor of 2.0, so that the GUPPY could withstand pressures at 2,000 feet.

After the 'spinning' of the sphere, then machine tools cut and trim the head to precise tolerances and then the two halves will be welded together.

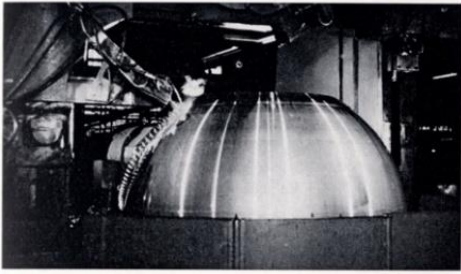
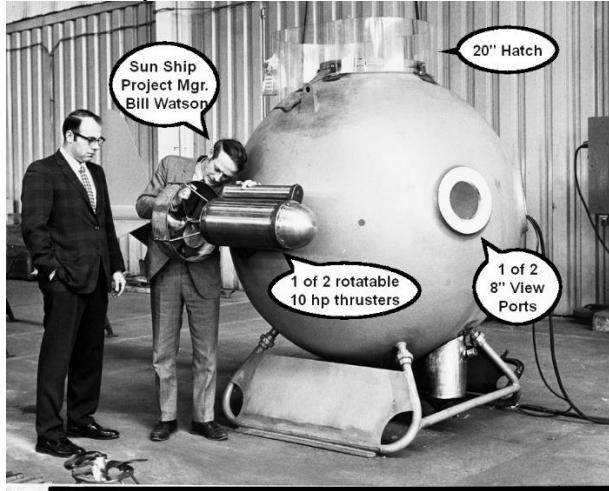


Photo courtesy of Sun Ship and ABS Surveyor (Aug, 1969)
SSHs:
020.34.6908.29

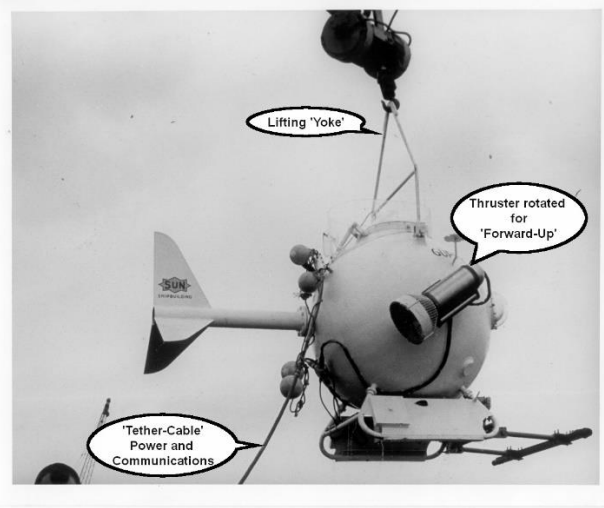
GUPPY-Outfitting in Sun Ship's North Yard-Rocket Shop

Photo Courtesy of: HML-74319.4904



The "GUPPY" ready for its undersea certification tests off the coast of California in May, 1969.

Photo Courtesy of: HML-74319.4909.01



Certification Test

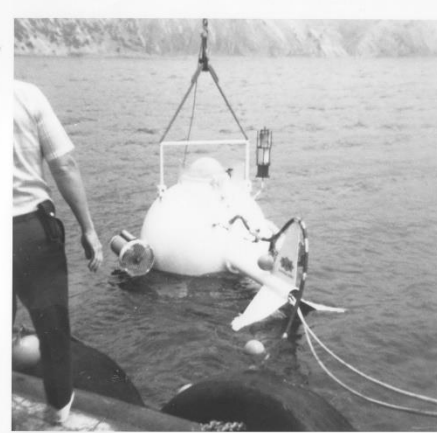
Bill Watson, Sun Ship Project Mgr. and John Reeves, Pilot (and ex-Navy SeaLab aquanaut) on GUPPY while on ABS certification 625-foot test dive off Santa Barbara, CA. These dives also included an unmanned hydrostatic dive to 1,100 feet.



Bill Watson (Sun Ship Proj. Mgr) and John Reeves (Pilot) off California coast-May, 1969

W. Watson (left), John Reeves (right).

Photo Courtesy of SSHS #: 706.7101-05.03

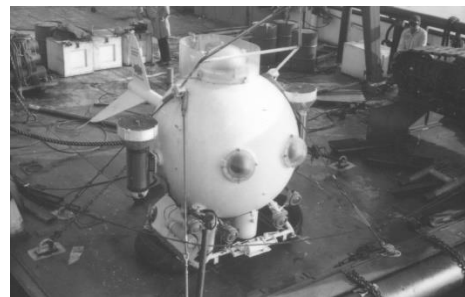


GUPPY at the Gulf of Alaska. Note thruster located in the forward position. Part of the transport vessel crew would be a diver who would be in the water to secure and unsecure the crane hook as required.

Photo Courtesy of: HML-74319.4913

Gulf of Alaska-First Job

GUPPY undertaking an ocean floor geological survey of the Alaskan continental shelf for a consortium of six domestic oil companies which would take place from 8 to 60 miles off the southern coast of Alaska in waters up to 600 feet



GUPPY and crane on stern of transport vessel ready to head-out into the Gulf of Alaska

Photo Courtesy of: HML-74319.4926

Post Dive Check List

Post dive check list from the Independence Seaport Museum, Sun Ship Archives
 Courtesy of ISM. #SSA-0902

GUPPY POST DIVE CHECK LIST		Page 1 of 1
		Date
		Dive No.
		Tech.
RETURNING TO DECK	Initial Remarks	
Verify deck crew ready for recovery		
Check that umbilical and safety line clear		
Advise pilot when hook up is made		
ON DECK		
Chain down boat		
Advise pilot to break seal		
At pilot request turn power "off"		
Turn off umbilical and recovery winch breakers		
Turn auto-manual switch to manual		
Lower control knob down (volt meter reads 0 V.)		
Stop generator - RECORD TIME		
Verify Guppy secure on deck		
Verify bouys and umbilical secure		
Advise Captain that Guppy system is secured		
Check with pilot for deficiency list		

Dated: 6/9/1970

Transport vessel with the GUPPY on the stern in Alaska

On this dive, GUPPY was marked with 37 completed dives in the Gulf of Alaska
 Photo Courtesy of: HML-74319.4931



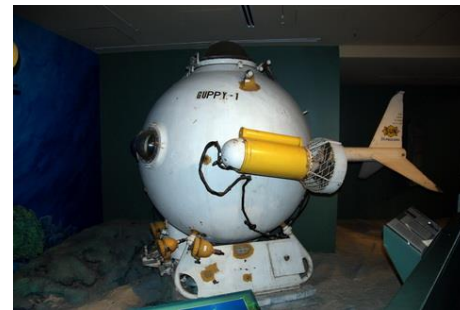
GUPPY & crane on stern of transport vessel

GUPPY on-display at Independence Seaport Museum

Series of photographs of the GUPPY on-display at ISM taken by Dave Boone (SSHS) 9/13/2013



Gift: Courtesy of Sun Ship to ISM, accessioned in 1987.
 No: ISM 87.55



Courtesy of SSHS #460.03.1670



Locations where the GUPPY saw service



Courtesy of SSHS #460.03.1667

L/R: John Costello (SSHS) and Dave Kavanagh (SSHS)

Courtesy of SSHS #460.03.1669

GUPPY-Dive Check:

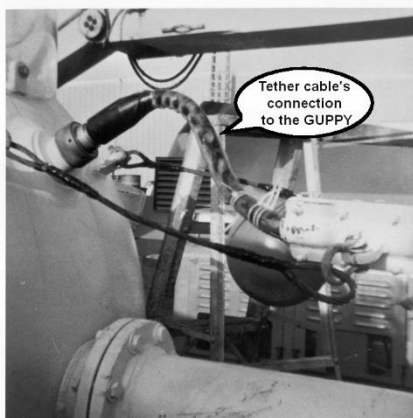
Surface crew, Rich Griffith (Sun Ship) and Norm Hibbard (Sun Ship), performing maintenance tasks on the GUPPY
 Courtesy of: HML-74319.4931



Tether-Cable:

The GUPPY was 'tethered' to the transport vessel via the

communications and power cable. While the vessel had in excess of 1,000 feet of cable, the vessel had to follow the GUPPY while the submersible's crew would relay the heading and depth to the transport vessel so it could follow.



Tether cable's connection to the GUPPY

Photo courtesy of: HML-74319.4916

GUPPY Leaving ISM- and On 'Her' way to the
National Iron and Steel Heritage Museum
50 S 1st Ave, Coatesville, PA 19320
Date: 2/23/2018

The National Iron and Steel Museum is located on the old site of the Lukens Steel Plant. Many of the hemispheres for Sun Ship's submersibles including; the 'GUPPY', the 'DEEP QUEST'² (Bi-Sphere) and the 'DSRV' (Navy's Tri-Sphere-Deep Submergence Rescue Vehicle) were manufactured at the Lukens's Steel Plant in Coatesville, PA.

Photo courtesy of ISM: 20180223_080035



Note 1: ABS (American Bureau of Shipping)

Note 2: Sun Ship only built the pressure vessels for both the 'Deep Quest' and the 'DSRV'. The 'Exostructure' that provides the hydrodynamic shape for these submersibles was provided by others.