

APPROVED FOR RELEASE DATE:
27-Oct-2011

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SR/DOB/59/1751

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8 October 1959

MEMORANDUM FOR: TSS/SR

ATTENTION :

SUBJECT : TSS developed semisubmersible Skiff.

1. Per your request for information concerning the subject skiff, the following information and recommendations are submitted:

a. For specific and/or technical information, recommend you contact TSS/WAD, on extension 3840.

b. Check for desired specific information in the "SKIFF - OPERATING AND INSTRUCTION MANUAL" which may be obtained from TSS/WAD. SR/DOB has a copy of this Manual which you may borrow if you wish.

c. Based on certain personal information gained through training and operational use, the undersigned would prefer the Skiff as an operational vehicle in many maritime operations over other means of transportation. Obviously, consideration must be given each specific operation and its peculiar needs; however, generally speaking, it is felt the Skiff has many points to its credit.

d. In comparing the Skiff with Rubber boats and silenced outboard motors (in general), the following points are submitted:

Skiff advantages

- (1) Extremely quiet
- (2) Low silhouette
- (3) Minimum radar pickup
- (4) Ballast easily flooded to present absolute minimum silhouette or radar pickup.
- (5) Ballast easily pumped to obtain more speed in less critical areas.
- (6) Quickly cached, eliminating necessity for agents remaining in critical landing areas
- (7) Personnel and equipment arrive dry
- (8) Long range possible due to adequate "built-in" fuel capacity.
- (9) Warm for personnel
- (10) Weight limits rapid deviation in compass courses due to surface conditions.

DOCUMENT NO. 2
 NO CHANGE IN CLASS.
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- 2 -

Disadvantages

- (1) Relatively slow speed
- (2) Limited visibility
- (3) Bulk and weight presents problem of getting Skiff to launch point
- (4) Requires relatively calm seas to operate and navigate (under 6')
- (5) Definite personnel, cargo and weight limitations.

2. In summary and from a layman viewpoint, the undersigned feels that the Skiff definitely has many operational possibilities.

[Redacted Signature]

SR/DCB/COP

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6 October 1959

MEMORANDUM FOR: Chief, TSS/WAD

SUBJECT: Semi-submersible Skiff

REFERENCE: Your memo, same subject, to Chairman, In-Exfiltration Panel, TRB dated 18 August 1959

1. The In-Exfiltration Panel, TRB discussed the reference memo at its 30 September meeting and agrees that the skiff in its present form is inferior to other vehicles for the purpose. There is no objection on the part of the Panel to the disposal of the remaining craft.

2. SR representative on the Panel is of the opinion that the concept of such a craft is still valid although the item produced in response is not satisfactory. His ideas regarding future development effort along these lines will be the subject of a separate memorandum after review by the Panel.

X-1

Chairman, In-Exfiltration Panel
Technical Requirements Board

DOCUMENT NO. 3
NO CHANGE IN CLASS.
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DATE: 2011
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DATE: June 8 REVIEWER:

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18 August 1959

MEMORANDUM FOR: Chairman, Technical Requirements Board
In/Exfiltration Panel

ATTENTION:

SUBJECT: Semi-submersible Skiff

1. TSS/WAD previously developed and completed two (2) in/exfiltration craft, called the Semi-submersible Skiff. This craft is listed in WAD Class A Project Booklet, Water Project W-9.

2. One of these boats was shipped to FZ for operational use. It is understood that it was never used operationally, and has since been scrapped in the field. The other boat has been stored and maintained by WAD and recommissioned on two occasions for actual operations. The boat was shipped to the field, but on both occasions, the operation was cancelled.

3. TSS/WAD recently has reviewed the characteristics of the semi-submersible Skiff relative to those of the RB-12 powered by an 18 HP Special Outboard engine. The following is a brief summary of comparative characteristics of these two in/exfiltration craft:

<u>Characteristics</u>	<u>Skiff</u>	<u>RB-12</u>
Pay - load	Maximum: operator & 2 passengers, plus 120 lbs. of equipment.	Maximum: Four men with equipment up to 1100 lbs, total
Speed	2 to 5 kts depending on load, submersion, and state of sea.	5 to 12 kts depending on load and state of sea.
Range	Approx. 110 miles in calm seas. (Full load)	Approx. 12 miles per can of gasoline in calm seas. (Full load)

DOCUMENT NO. 4
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Characteristics

Skiff

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RB-12

Seaworthiness

Acceptable sea keeping qualities.

Good sea keeping qualities, but wet in rough seas.

Maneuverability

Fair, due to cramped space, restricted vision of operator, the small rudder, the single screw, and the low power available. Restricted to deeper water since propeller is fixed.

Excellent. Greater speed makes for better maneuvering. Shallow draft permits smaller turning circle. Good vision all around. Can be beached and operated in unknown, shoal waters since engine is hinged & can swing up.

Safety

Operation of gasoline engine in enclosed space is hazardous. A serious explosion is possible if operator does not follow purging procedures.

No hazard as long as normal precautions are observed in handling gasoline in containers in the open.

Caching

Requires caching in calm water of adequate depth to cover Skiff throughout rise and fall of tides. Maximum caching depth of Skiff is 30 ft. which is also depth trained man can dive without aqua-lung. Two anchors are required to hold boat in position on bottom plus a retrieving line to beach which must be hidden. Through personnel or material failure Skiff can be flooded. If flooded, engine would be impossible to start. Caching boat off shore requires operators to have small RB available for transporting themselves & equipment to shore.

Simple to hide or cache on shore. Easy to relocate & reinflate. Ground cache more reliable; boat & engine should be dry, if properly cached in dry ground above water-level.

Radar, Sonar Detectability

Equal

Equal

Engine Noise

Equal

Equal

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Characteristics

Skiff

RB-12

Initial Costs	Large development and construction cost - Approx. \$50,000/unit	Comparatively cheap - Boat - \$1200, Engine - \$1200
Maintenance Costs	High and continuous while boat is in commission in the water.	Nil
Overseas Shipping	Requires huge crate, cranes & large truck to handle, special reservations for ship transportation, subterfuge in labeling, etc.	Small cube permits easy handling & shipping. Boat & engine can be shipped separately. Can be shipped as recreational equipment.
Weight	Boat - 3000 lbs. Boat in crate with accessories - 7800 lbs.	Boat 150 lbs. Engine 125 lbs.
Spares & Accessories	Large spare part & accessory list.	Very few
Launching from Mothercraft	Requires slings & crane as well as skill & good seamanship. Chance of damaging boat always present.	Easily accomplished under most any and all circumstances. Chance of damaging boat small
Technician Requirement	Requires presence of technician in field with Skiff. (TSS/WAD technician accompanied Skiff to area on both overseas operations)	No technician required.
Training	Extensive training is required. Good practical engineering ability needed by the operator. Operator also must be a trained swimmer and capable of diving to 30 ft. and searching for Skiff in pitch dark water. Operation of Skiff blowing & Trimming down system requires training, familiarization and continual association to insure reliable operation.	Only nominal training required to insure reliable inflation, cacking of boat and operation of the engine

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Characteristics

Skiff

RB-12

Potential for
maritime operation

Very limited

Very versatile. Can be
used in many types maritime
operations.

5. It is requested that the TRB Panel review the above and that the requirement for the semi-submersible Skiff be reassessed so that a conclusion may be made regarding the retention or disposal of the remaining developmental Skiff.

[Redacted]

Chief, TSS/WAD

DISTRIBUTION:

Orig & 1 - Addressee

- 1 - TSS/SRB
- 1 - TSS/WAD

[Redacted]

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Skiff

17 July 1956

25

Doc. No. _____
CLASSIFICATION _____
DATE _____
BY _____
9/6/81

MEMORANDUM FOR: Chief, SR/7

SUBJECT: Semi-Submersible "Skiff",
Performance vs. Sea and Wind Conditions

1. In accordance with verbal request from a representative of SR/7 the following information is supplied:

a. Swells are long waves caused by distant wind disturbances. Wind waves are short in length and are caused by local winds.

b. Swells, as distinguished from wind waves, will ordinarily have no measurable effect on the speed of the "Skiff".

c. For flat or nearly flat sea conditions, where wave height does not exceed one foot and wind is under 10 knots, the curves for the buoyant and semi-submerged condition (figure 5, lower chart, "Skiff" Operating and Instruction Manual) are conservative. "Skiff" can be expected to make the speeds shown by the curves, for each rpm selected.

d. For sea conditions where winds are 10 to 15 knots and height of waves are 1 1/2 to 3 feet, the "Skiff" speed may be reduced about 1/4 knot when running with or across the seas, and possibly as much as one knot when running into the seas.

e. For heavier than ordinary sea conditions, where the height of waves is 3 1/2 to 5 feet, represented by winds as high as 18 - 20 knots, the speed may be expected to be reduced by nearly one knot when running with or across the seas, and will be reduced by about 2 knots when running into the seas.

f. When winds are above 20 knots and height of seas over 5 feet, it is recommended that use of the "Skiff" be delayed until conditions moderate.

g. On the assumption that the mother ship will be 80 to 100 feet in length, we do not recommend launching in seas over 3 feet (15 knot wind), in order to be conservative.

h. It is noted that a recent Air Maritime Division study dated 8 June 1956 of the areas under consideration indicates that during the

summer months/

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summer months, winds seldom exceed 8 to 12 statute miles per hour. From this data it appears that moderate winds and seas will prevail, if the launching time is planned over a period of 2 to 3 days.

[Redacted]

Chief, TSS/WAD

[Redacted]

Distribution:

- Orig & 1 - Addressee
- 1 - TSS/SRB
- 2 - TSS/WAD

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18 June 1956

MEMORANDUM FOR FILE

SUBJECT: a. Re-ballasting of "Skiff" No. I
b. Installation of Heavy-duty Pullies and Belts on "Skiff" No. I

1. Between 12/14 June 1956 the permanent ballast arrangement on "Skiff" No I was changed, as follows:

- a. 27 lbs. was removed from after part of middle ballast tank, port side, 25" aft of gas tank bulkhead.
- b. $5\frac{1}{2}$ lbs. was removed from after part of middle ballast tank, port side, 25" aft of gas tank bulkhead.
- c. $28\frac{1}{2}$ lbs. was removed from after part of middle ballast tank, port side, 12" aft of after bulkhead of gas tank.
- d. 25 lbs. was removed from after part of middle ballast tank, starboard side, 13" aft of gas tank bulkhead.
- e. 28 lbs. was removed from after part of middle ballast tank, starboard side, $28\frac{1}{2}$ " aft of gas tank bulkhead.
- f. 6 lbs. was removed from after part of middle ballast tank, starboard side, 12" aft of after bulkhead of gas tank.

2. The two supposedly 100 lbs. lead pigs in the forward part of middle ballast were removed and $43\frac{1}{2}$ lbs. of lead was cut from each. The remaining, 55 lbs. ($98\frac{1}{2}$ lbs. actual initial weight), was re-installed with the starboard 55 lbs. using the original forward securing hole and the port 55 lbs. using the aft original securing hole. This avoided changes in the ~~main~~ longitudinal position of the two weights.

3.- One additional small piece was removed from the forward middle ballast tank by

a. The above arrangement was to provide for removing 200 lbs. of soak up of the wood in the "Skiff" during the past $1\frac{1}{2}$ and 2 years and for 2-man, 687 lbs of equipment, including 5 gals. of additional gas in the _____ compartment, 5 gals. in deck over the engine compartment, and certain additional weights such as extended gas filling line.

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DOCUMENT NO. 28

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IS RECLASSIFIED

CLASS. AUTHORITY IS 204

DATE 5/6/81

BY

DATE 5/6/81

BY

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b. On 15 June 1956 heavy-duty pulleys and new heavy-duty belts were installed on the water pump of "Skiff" No. I. The new pulleys were standard steel types, the one on the propeller shaft having 20 teeth, bored for 1" shaft, with the keyway cut to 1/4" width and 1/8" depth. The pulley on the pump had 28 teeth bored to 3/4" diameter with the keyway being cut to 3/16" depth. Bored pulleys were cadmium plated in Baltimore, prior to installation. The belt is a Gilmer timing belt, made by New York Belting and Packing Company, Passic, N.J., but with the Timing Belt Division at Tacony, Philadelphia 35, Pa. The belt is known as No. 420-H -100 "Timing" Belt. The pitch of the teeth is 1/2" instead of 3/8" pitch. We have been using this pitch on the light-duty drive. In installing the new pulley and belt along with two spares along the propeller shaft, it was not necessary to make a new bracket for the water pump. The distance between the propeller and pump shafts remained almost exactly the same as before.

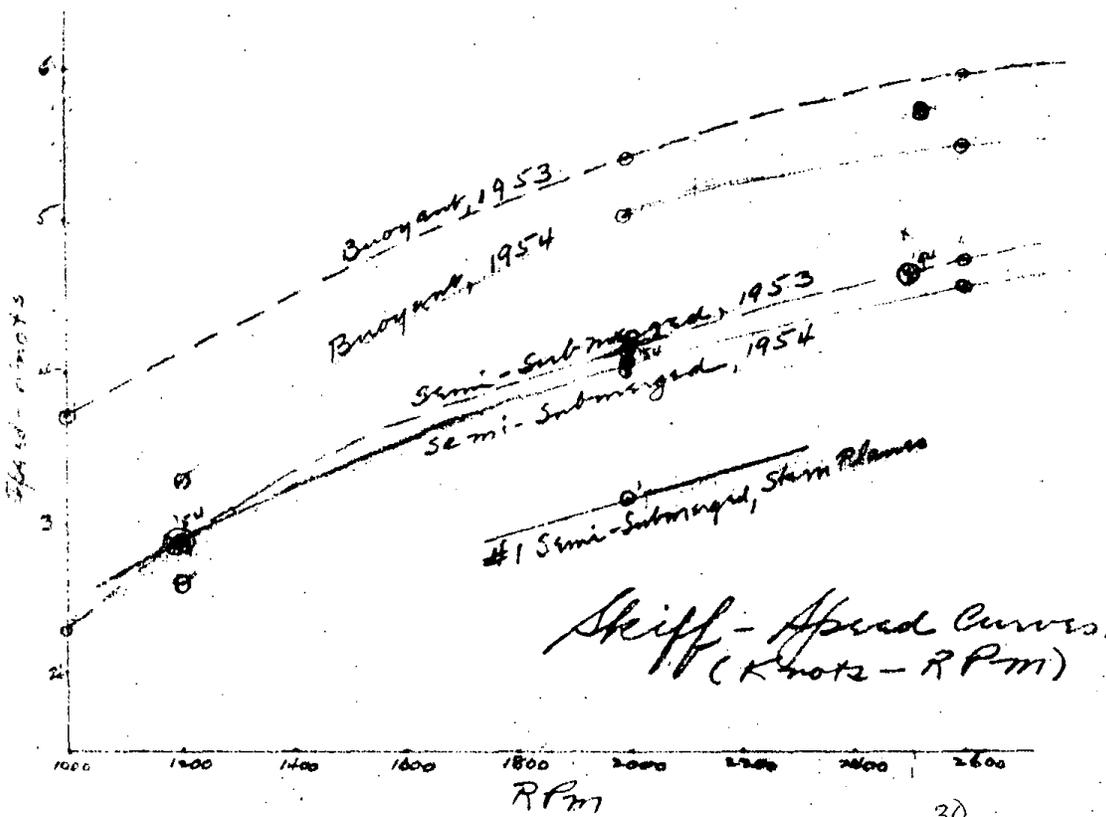
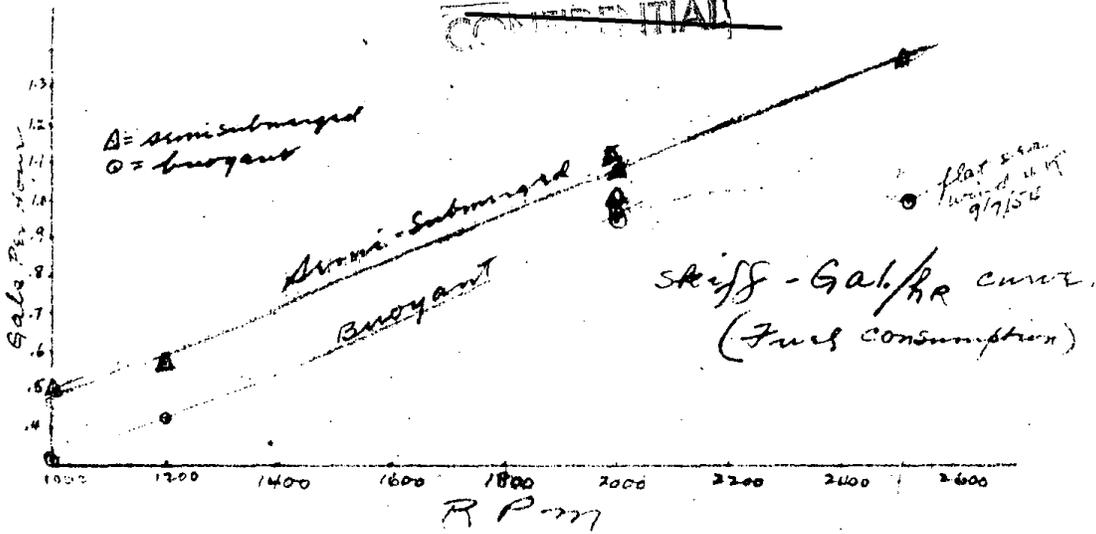


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Skiff Curves (Gal/mi curves not plotted)

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DOCUMENT NO. 30
 NO. OF PAGES 204
 DATE 5/6/81

Fuel run Skiff #2

DATE - 7/23/59

WIND - 20 TO 25 MPH FROM THE NORTH

CONDITION OF WATER - CHOPPY - 1/2'

" " SKIFF - BOUYANT

SPEED - 2000 RPM

RUN STARTED - 1335

RUN ENDED - 1535

GASOLINE USED - 7.5 QUARTS = .94 gal/hour #
= .107 gal/mile #

SPEED RUNS SKIFF #2

DISTANCE - 1520 FT.

SPEED - 2000 RPM

SOUTH

NORTH

2' 47"

3' 11"

2' 51"

3' 9"

2' 49"

3' 10"

2' 52"

3' 8"

2' 50"

3' 5"

2 - 49.8

3 - 8.6

3 - 08.6

Average

5 - 58.4

2' - 59.2

= 5.02 knots #

6 May 1954

MEMORANDUM FOR THE RECORD:

SUBJECT: Skiff - Speed Runs at Annapolis, 30 April 1954

Sea conditions - very slight chop, 8 knot wind. Runs conducted off measured quarter mile which will be resurveyed before computing speeds from the times below.

Skiff No. 1: 5M-17S against current
4M-5S with current
5M-31S against current
4M-6S with current

Above times were made at 2000 RPM, semi-submerged heavy conditions, stern planes installed.

Skiff No. 2: (Practically no current)
3M-45S down stream
3M-43S up stream
3M-46S down stream

Above times were made at 2000 RPM, semi-submerged heavy conditions, no stern planes.

3M-17S down stream, practically zero current as above, 2500 RPM, semi-submerged heavy conditions.

3.16 knots #

4.02 K. #
= approx 4 knots

4.57 K #
17 min @ current

CAPTAIN, USN

KGH:maa

Office Memorandum • UNITED STATES GOVERNMENT

TO :

DATE

FROM :

#1 shuff

Trim condition ?

SUBJECT:

SEA...

@ 2000 RPM

DOWNSTAGE

1. 2' 52"

2. 2' 49"

3. 2' 51"

average 2' 48"

1/4 nautical mile course

$$2' \frac{115}{2} = \frac{120}{96} \text{ sec.} = 5.4 \text{ Knts}$$

4 Sept.
1953

1/4 mile Speed test
(1520'). Avanb.

Conditions:

Wind: 16 knots from SSE
Current: negligible
Waves: 1 1/2 feet
Currents: "With" - NNE; "Against" - SSE

At 1000 rpm's -

With: 6' 9" } Aver. 5' 22"
Against: 6' 3 1/2" } " 2.36 K

At 2000 rpm's -

With: 3' 51.5" } Aver. 3' 16"
Against: 3' 11" } " 6.1 K

At 2600 rpm's -

With: 3' 8" } Aver. 3' 16.5"
Against: 3' 5" } " 6.0 K

8 Sept.
1953

Conditions:

Wind: 3 knots E
Current: Negligible
Waves: 10' with 2114
operable swells.

Wind and surge appear to have negligible effect on SHIP in
anch or sea submerged conditions. Hides better flooded or partially
flooded than empty. Except when buoyant, has little roll or pitch.

4 Sept.
1953

1/4 mile speed test
(1520')
Bucyant.

Conditions:

Wind: 16 knots from SSE
Current: Negligible
Waves: 1 foot
Courses: "With" - NNW; "against", SSE.

At 1000 rpm's -

With: 6' 59") Aver. 7' 18"
Agst. 7' 36.5") " 2.05 K.

At 2000 rpm's -

With: 3' 44") Aver. 3' 50"
Agst. 3' 57") " 3.9 K.

At 2600 rpm's -

With: 2' 55") Aver. 3' 4.5"
Agst.: 3' 14") " 4.9 K.

Thurs. 1415
3 Sept. to
1953 1730

1/4 mile speed test
(1520') semi-submerged.

Conditions:
Wind (fitful): 6 knots from SSE
Current: Negligible
Waves: 1 foot
Courses: "With" - NNW; "against" - SSE.

At 1000 rpm's:
With wind and current.)
6 min. 59 sec.) Aver. 7' 18"
Agst.) " 2.05 K
7 min. 36.5 sec.)

At 2000 rpm's:
With)
3 min. 44 sec.) Aver. 3' 48"
Agst.) 3.95 K
3 min. 52 sec.)

At 2600 rpm's:
With)
2 min. 55 sec.) Aver. 3' 4.5"
Agst.) 4.9 K
3 min. 14 sec.)