Second week

1. A The high pressure pumps is a Kinney type gear pumps and is non-reversible, only discharging to sea through a high pressure pumps sea and stops discharge to sea on the starboard side in motor room. This pumps can pumps from the main drain or the trim line to sea. Its capacity is 200 gallons per minute at a 300 feet head and it runs by its own independent motor controlled in the motor room.

B. The low pressure pumps is a centrifugal water pumps, pumping 1500 gallons per minute at a 20 feet head. Used generally to quickly pumps the main ballast tanks through the main drain to sea, or the surface only. This pumps also have suction from the trim line or motor room manifold. Through this pumps from sea is the means of flooding the main drain by opening sea and stops discharge to sea for pumps, opening suction from main drain, and opening main drain vent which is located near pumps.

c. The trim pump is a Viking type rotary gear pump, and pumps 20 gals. per minute at a 30 ft. head. The controller for running the pump may be rotated either "clockwise" or counter clockwise. To start pump, hold up on contact making lever, and turn controller wheel slowly clockwise or counter clockwise as desired. To stop pump, turn controller wheel to "off" position. When rotated "clockwise", the pump takes a suction from the forward side of the manifold and discharges to the after side. When rotated "counter clockwise" the pump takes a suction from the after side of the manifold and discharges to the forward side.

2A The trim line for 0-Boat runs along the starboard side of the boat from frame 5 to 106.

B. This line is made of copper except the flanges where put together, which are made of brass and brazed on to the copper.

C. Bolted together, this line is tested to 88.8 lbs. per sq. in. hydrostatically, except the sea connections which are tested to 150 lbs

D. This is a 3" line, known as the secondary drainage system for the purpose of transferring water from tank to tank or from tank to sea.

3. A. To start trim pumps, hold up on contact maker lever, and turn controller wheel slowly clock wise or counter clock wise as desired. To stop pumps, turn controller wheel to "off" position.

B. The three main things to remember when using the trim pumps and manifold are

1. make sure all valves are open
2. make sure your vents are open
3. Make sure you are pumping the right way

4. To pump 500# of water from regulator tank to auxiliary tank. First open valve #7 on the manifold water comes up through from regulator tank, by pass #8, close C.T.S. valve open T.P.S. & D. #1 close M.D.S. and open T.P.S. & D. #1 counter clock it then can go around through trim pump rotate and back into manifold have #2 open and down to auxiliary tank.

Have the quick opening vent open and watch regulator tank gauge as soon as 60# has left immediately close down trim pump

5. In pumping 60# from forward trim tank to after trim tank, open Fwd. trim tank flood suction valve, open T.L.S. and close cross connection open #1 valve on C.R. manifold and T.P.S.&D. valve goes through trim pump, open T.P.S.&D. close C.T.S. and open #7 valve on C.R. manifold through two way cock which is turned vertical open trim line fwd and trim line aft on motor room manifold from there into after trim tank as completing the operation.

6. In pumping 60# from auxiliary tank to forward trim tank open #2 valve on Control room manifold & #1 open T.P.S.&D. goes through trim pump it rotates "clockwise" open T.P.S.&D and close C.T.S. and open #8 valve on Control Room manifold open cross connection and T.L.S. open Fwd trim tank flood suction valve on torpedo room manifold and into the forward trim tank

7. In pumping 200 lbs from regulator tank to sea open #7 valve on C.R manifold & #8, close C.T.S. and T.P.S.+D. through trim pump rotating counter clockwise, open T.P.S.+D. and #103 valves on C.R. manifold, open sea & stop valve letting it out to sea.

8. In pumping torpedo tubes to sea with high pressure pump open all four tube drains, T.L. and cross connection goes through two way cock, open #103 valves on motor room manifold open H.P.P. suction valve goes through pump thru open sea & stop, and out to sea

For the bilges open T.R. bilge valve and cross connection, goes through two way cock, open #1 and 2 valves on manifold goes through the strainer, open H.P.P. suction valve thru sea and stop, and out to sea

9. In pumping auxiliary tank dry using high pressure pumps open #2 and 1 valve on control room manifold keep T.P.S.+D valve closed. Open cross connection, goes through two way cock, open #7 and 3 valves on motor room manifold open the H.P.P. valve and the sea and stop valve, and out to sea.

10. Standard procedure for surfacing.

A. Three blasts close main ballast tank main vents.

B. Diving officer directs man on air manifold to blow specified tanks

C. Planesmen bring boat to surface by means of bow and stern planes

D. Batteries are usually shifted to series combination

E. Quartermaster in conning tower. Diving officer watches depth gauge

F. When boat has positive buoyancy and is on surface the diving officer shall order:

(a) "Secure air on main ballast tanks"

(b) "Close Kingstons on #1 and 2 M.B.T."

(c) "Low pressure pumps on main drain"

(d) "#1 and 2 M.B.T. drain valve open" as soon as suction is reported by man on air manifold he shall order "Her ballast tank hatches open and main drain

(e) Report to Commanding Officer, "Suction on both main ballast tanks."

G. After suction has been obtained the commanding officer may order the flapper opened and main induction cracked

H The diving officer shall observe barometer and when pressure is equalized he shall report same to commanding officer.

I The commanding officer then orders given the hate

J for pumping up all main ballast tanks will be left on main drain until the motor room reports suction has been lost on the low pressure pumps. When granted permission by commanding officer tanks will be vented through the outboard vents until after pump has lost suction on main drai

K When all main ballast tanks are dry, kingsto and vents are secured and the pumps are secured, the diving officer shall report to bridge (O.O.D. & C.O.) "all main ballast tanks dry, kingstons, vents, and low pressur pumps secured"

L The O.O.D. will man the periscope continuously except when secured by commanding officer, from time order is given to surface until control of ship has been shifted to bridge.

M The torpedo tubes will be pumped as ordered by the diving officer.

11 To flood main drain open sea and stop valve open L.P.P. suction valve and M.D. vent.

12 To flood magazine open sea and stop valves in control room and #3 and 1 on manifold, have th. T.P.S.&D. closed open magazine flood valve and int magazine

13 To put high pressure pump on main drain open H.P.P. suction to main drain go up to the strainer then open th. H.P.P. suction valve and the sea & stop valves, and then out the sea.

14 To put low pressure pump on main drain open L.P.P. suction and the sea and stop and open M.D. vent. have H.P.P. suction to main drain closed

15 How to pump engine room bilge to sea open one of the two engine room bilge valves at a time have check valve closed, it goes through the two way cock, open #1 and 2 valves on motor room manifold, it then goe through strainer open H.P.P. suction and sea & stop valves

16 When "rigging in dive" in torpedo room:

A Close and dog access hatch and inspect rubber gasket to see that it is seated properly

B. Inspect loading hatch

C. Close and lock main induction flapper and open drain valve

D. See all tube drain valves closed also forward trim tank flood & drain closed.

E. Flood torpedo tubes (if there are torpedos in tubes do not flood).

F. See that forward trim line and bilge valve closed

G. Open local blow valve, see the vent valve closed for F.T.

H. Close sea valve for fuel compensating system from sea (with the knowledge of engineering officer.

I. See all bilge valves in after manifold are closed also magazine flood valve closed

J See that battery watering drain valves are closed

K See gyro is out.

L Door tender for closing

M See that all gear is secured, men on stations, take reading on forward trim tank, man telephones, report reading to control room and that "torpedo room is rigged for dive".

17 The valves that are opened in torpedo room at order "Trim on trim line" are trim line flood and the trim line stops.

You watch the water gauge

18. The Klaxon signal is used for diving and surfacing. The siren is used for collision only and for anything else it is sent along by word.

Buoyancy

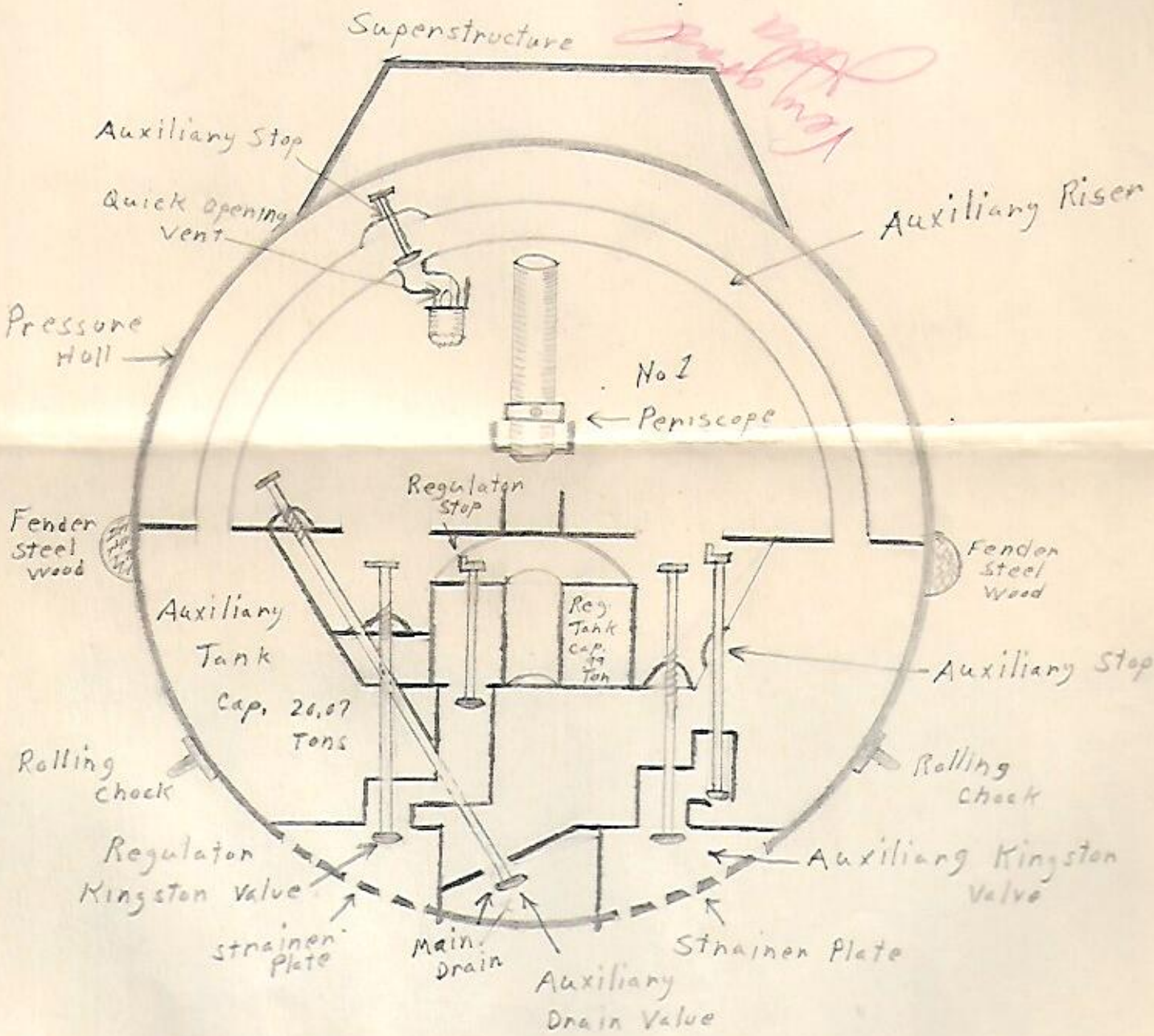
1. Positive buoyancy is the condition of a body immersed in a liquid which is capable of displacing a weight of liquid greater than its own weight.

2. Negative buoyancy is the condition of a body immersed in a liquid in which the body is incapable of displacing a weight of liquid equal to or greater than its own weight. Hence it sinks

3. Neutral buoyancy is the condition of a body immersed in a liquid in which the body displaces a weight of liquid exactly equal to its own weight. Hence the body has no tendency to either sink or come to surface of the liquid.

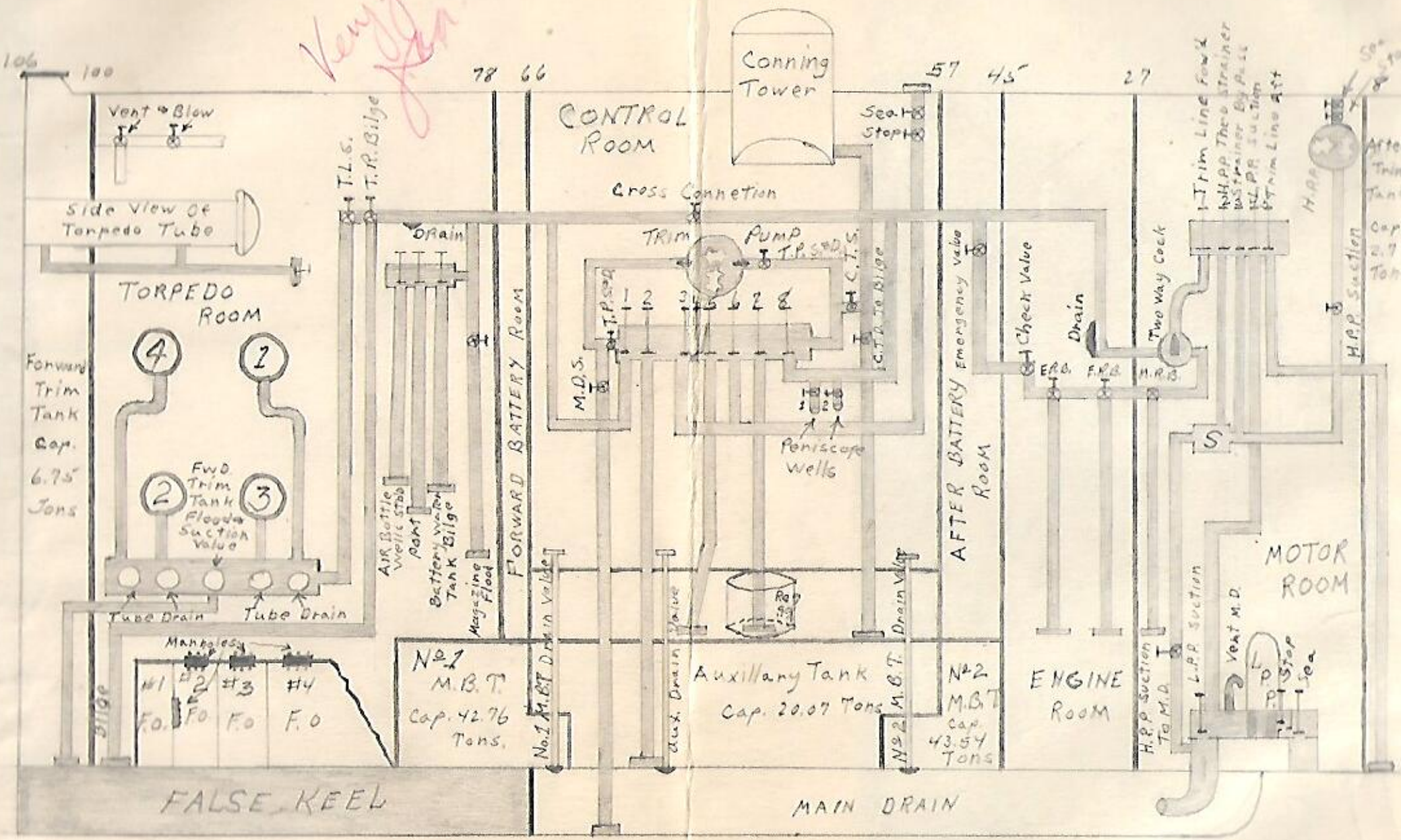
4. Reserve buoyancy this is the submerged displacement and the difference between surface displacement,

#1


Superstructure
Auxiliary Stop
Quick Opening Vent
Auxiliary Riser
Pressure Hull
No 1
Periscope
Regulator Stop
Fender Steel Wood
Fender Steel Wood
Auxiliary Tank
Cap. 20.07 Tons
Reg. Tank Cap. 19 Ton
Auxiliary Stop
Rolling Chock
Rolling Chock
Regulator Kingston Valve
Auxiliary Kingston Valve
Strainer Plate
Main Drain
Auxiliary Drain Valve
Strainer Plate

#2

2nd WEEK



1. FORWARD TRIM LINE
2. AUXILIARY TANK
3. Sea Valve
4. [illegible]
5. Control Room Bilges
6. Sea Valve
7. Regulator Tank
8. After Trim Line

"NOTE"
All Bilge Valves
Are Check Type