Brown's Seaplane Base

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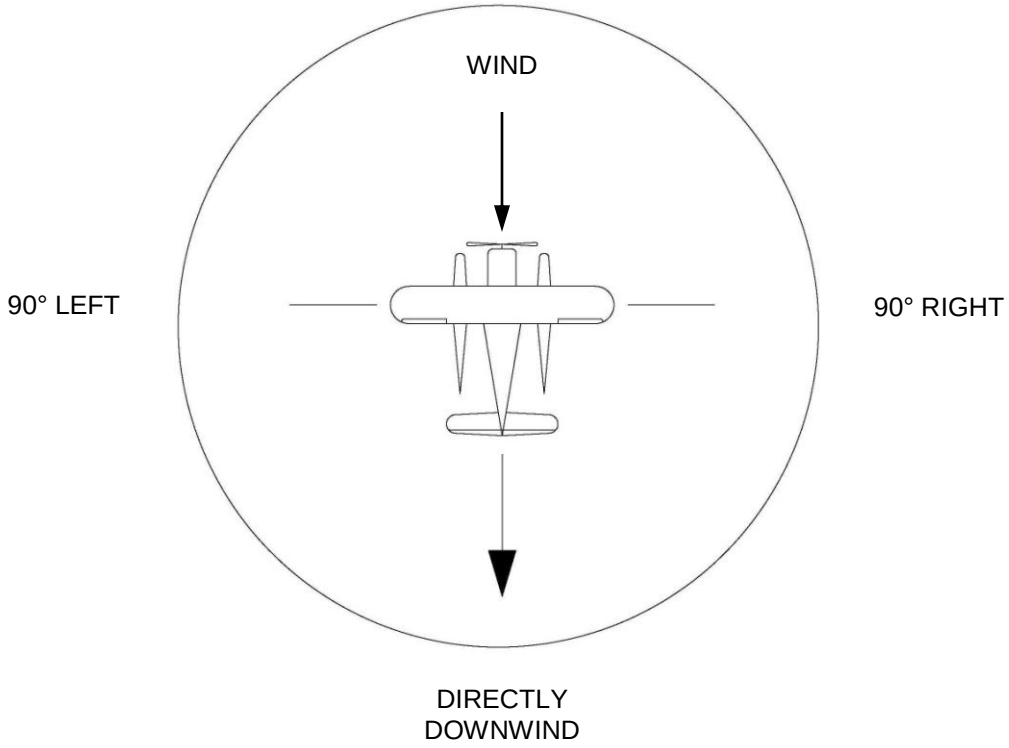
Single Engine Sea Course Guide

Sections

Note: The information provided in this course guide is consistent with the Piper J-3 seaplane. When operating other types of seaplanes, different procedures and power settings will most certainly need to be considered.

I. Taxiing, Turning and Weathervaning on Water
Weathervaning or Wind Turn

The natural tendency of a seaplane is to point directly into the wind. This is called weathervaning. Weathervaning into the wind is accomplished with power either on or off, water rudders up or down. The wind speed will determine how fast the seaplane will weathervane. If the wind speed exceeds the engine thrust, the seaplane will drift backwards downwind.



Note: Weathervaning force is zero when pointing into the wind and increases to maximum at the 90° position and decreases back to zero when directly downwind.

There are 3 types of water taxi/turns that are used with a seaplane.

1. Idle Taxi.
2. Plow Turn.
3. Step Taxi.

The characteristics of the three water taxi/turn types are summarized in the table below:

Type of Taxi/Turn	Carburetor Heat	Area	Water Rudders	Elevator	Power	Ailerons
Idle Taxi	Off	Clear 360°	Down	Stick Full Aft	Recommended 1000 maximum RPM	Headwind - Stick into Wind Tailwind - Stick away from Wind
Plow Turn	Off	Clear 360°	Down	Stick Full Aft	Full Power Then 2300 RPM	Headwind - Into Wind Tailwind - Away from Wind
Step Taxi	Off	Clear 360°	Up	Stick Full Aft Then As required to maintain correct step attitude	Full Power Then Upwind 2000 RPM Downwind 2100 RPM Turns 2100 RPM	As required to maintain wings level

Idle Taxi

Idle taxi is generally considered to be the best form of taxiing because there is:

1. Good visibility.
2. Good cooling.
3. No prop spray problem.

Use idle taxi whenever possible. Idle taxi will give the smallest radius of turn. Water rudders are down for this maneuver as airflow over the air rudder may not be sufficient to maintain control of the seaplane. Use a max of 1000 rpm to minimize prop spray, however if necessary use power as required.

Plow Turn

Plow turn is generally considered to be the least desirable form of turning because there is:

1. Poor visibility.
2. Poor cooling.
3. Potential prop spray problem.

To turn from upwind to downwind when the wind is too strong for an idle turn, use a plow turn. The plow turn is accomplished by configuring the seaplane to weathervane in the reverse sense.

In the plow attitude the center of buoyancy shifts aft, allowing the seaplane to reverse weathervane. Airflow over the rudder is not sufficient enough to turn downwind, therefore the water rudders are down for the plow turn.

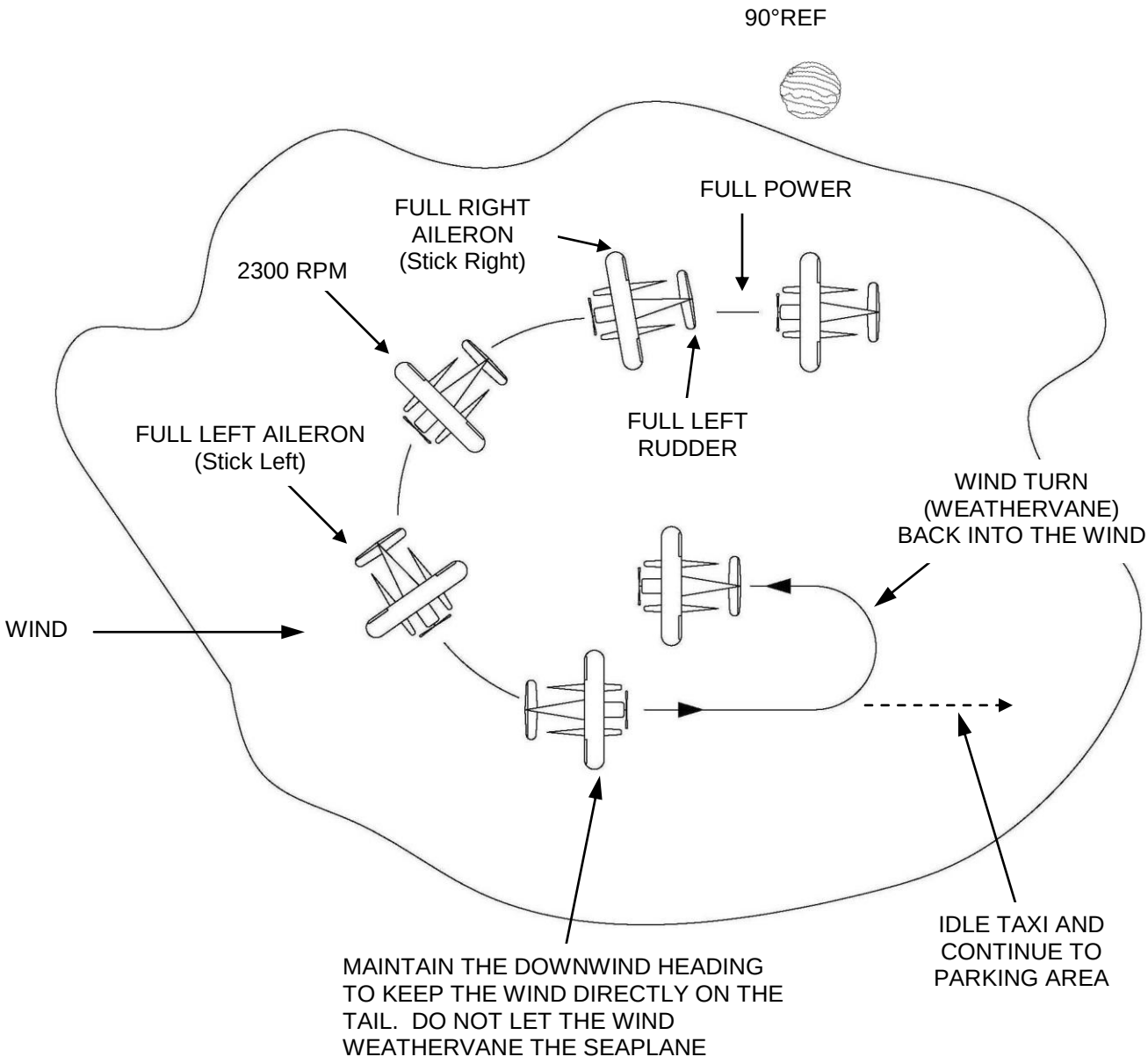
Plow turning is accomplished as follows:

1. Let the seaplane weathervane directly into the wind.
2. Pick a 90° reference point off one of the wingtips to help determine when the seaplane has turned 180°.
3. Apply full power. After the initial nose up pitch, use rudder in the direction of the turn and opposite aileron (stick into the wind). Reduce power to approximately 2300 rpm. As the seaplane turns downwind, position the stick away from the wind.
4. When established downwind, neutralize the rudder and ailerons.
5. Reduce power as required for downwind taxi to parking area or close throttle to turn back into the wind (wind turn).

In exceptionally strong winds, it may not be necessary to use full power (i.e., one could go directly to 2300 rpm or as required to start the maneuver). After the turn, the stick (elevator control) may have to be held forward to help keep the tail down.

Note: When the wind velocity has increased to the point that a plow turn is no longer safe, sailing the seaplane to the downwind side of the lake may be a desirable alternative. In some cases the seaplane should be taxied to the upwind side of the lake, and secured while waiting for the winds to subside.

Plow Turn



Note: Left turns are easier and have a smaller turn radius because of torque and P-factor.

Step Taxi

Step taxi is used to travel long distances in a short period of time when the water is sufficiently calm to do so without putting undo stress on the floats. Step taxi is considered to be a good taxi configuration because there is:

1. Good visibility.
2. Good cooling.
3. No prop spray problem.

During step taxi, the wing surface (lift) supports about 30% of the weight of the seaplane and the floats (hydrodynamic) supports about 70%.

Be “patient” when transitioning from displacement onto the step. Do not release back pressure too quickly. The most common reason for porpoising is because the stick is not in the proper neutral position.
Step taxiing is accomplished as follows:

1. Point the seaplane directly upwind or downwind.
2. Apply full power and maintain lane (runway) heading with rudder. Initially, the nose will pitch up significantly and then a secondary more subtle nose pitch rise will occur. At this time, release the back pressure on the stick and the floats will come out of "displacement" from the water and the seaplane will transition onto the step.
3. Do not push forward on the stick to “force” the seaplane on the step. Once established on the step it may be necessary to maintain a slight amount of back pressure on the stick. This is to prevent the seaplane from getting into a nose low porpoise. On the other hand, if there is too much back pressure, it will cause a nose high porpoise. If the porpoise cannot be stopped by use of stick pressure, close the throttle and slowly bring the stick full aft.
4. When established on the step at the right speed and “attitude”, reduce power to the correct setting as per the table on page 3.

Note: When the seaplane is in the water (displacement), that attitude is very much the same when the seaplane is on the step (out of displacement). It is important to learn the "step" attitude as soon as possible because it will also be used for normal, rough, glassy and confined area takeoffs.

In strong winds, step taxiing from downwind to upwind should be avoided because the wind direction and centrifugal force from the turn work in the same direction and the seaplane becomes unstable, resulting in the possibility of capsizing. Make sure the area is large enough and is clear of obstacles before performing the maneuver.

If a step taxi downwind is required, be prepared to apply power immediately after raising the water rudders, so the seaplane does not weathervane.

II. Normal Takeoff and Landing, Traffic Pattern

Normal Takeoff

Chose the longest lane (runway) on the lake consistent with the wind direction. Apply full power and maintain lane (runway) heading with rudder. Initially, the nose will pitch up significantly and then a secondary more subtle nose pitch rise will occur. At this time, release the back pressure on the stick and the floats will come out of "displacement" from the water and the seaplane will transition onto the step. Once on the step, maintain a slight amount of back pressure on the stick and the seaplane will lift off. Then, climb out at a 60 mph “attitude”.

Note: The seaplane takeoff is divided into four phases:

1. Displacement
2. Plowing
3. Step
4. Liftoff

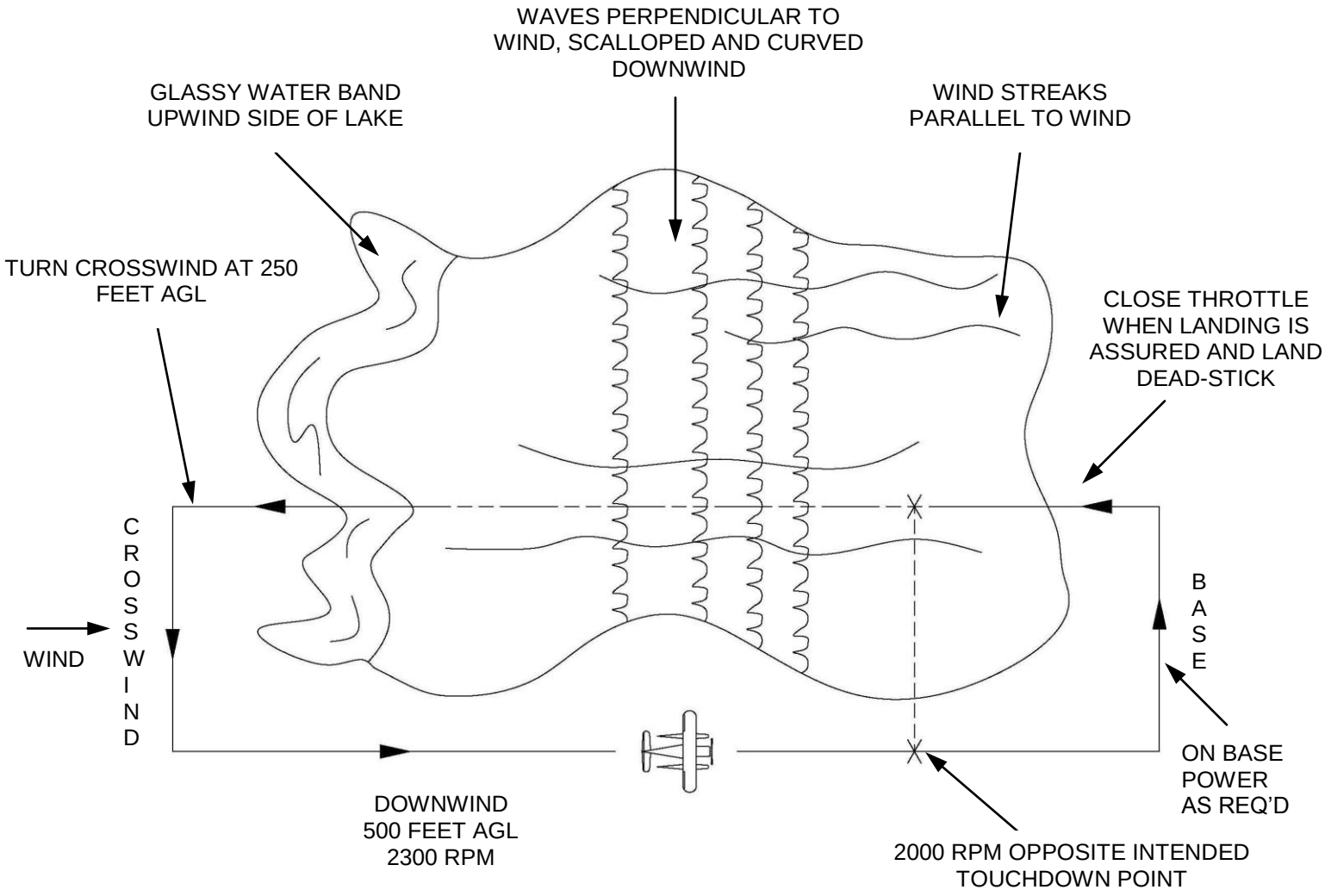
Normal Landing

Choose the landing lake or area (SPA Directory, FAR 91.115). Locate wind direction/speed indicators. Then use the acronym NTOWL when overflying the body of water intended to land on.

N **N**oise abatement
T **T**owers, **T**errain and **T**raffic
O **O**bstructions (both on and under the surface)
W **W**ind, **W**ater conditions
L **L**anding **L**ane

Fly a normal traffic pattern (page 8). On final approach when landing is assured (minimum of 10’ above obstacles), close the throttle and maintain a nose down 60 mph “attitude”. Level off about 10' above the water (approximately step attitude). As the airspeed dissipates, use continuous aft stick pressure to keep the nose up while the seaplane approaches the water. After touchdown when you "feel” the water, slowly continue to apply full aft stick pressure while the floats settle into the water (displacement). Maintain lane (runway) heading with rudder.

Note: Prior to landing in a small body of water, make sure that you will have enough room for takeoff.



Keep in mind that the power settings are rough estimates. Use power as required to fly a safe, consistent pattern. When possible, the pattern should be flown within power off gliding distance of the water.

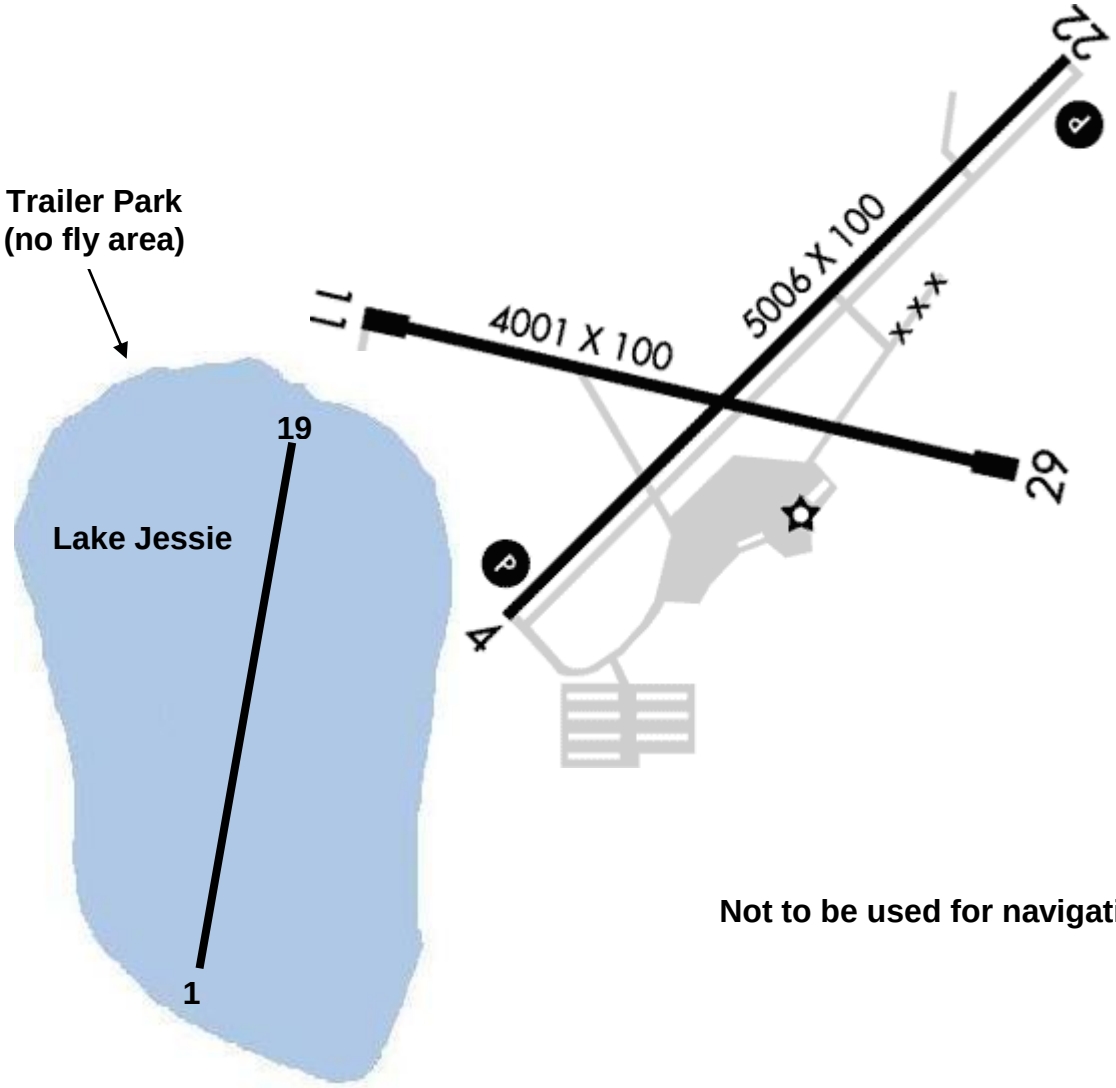
The ability to read the water surface is an integral part of seaplane flying.

Determining wind direction and speed:

1. Glassy band of slick water on the upwind side of the lake.
2. Waves scalloped and curved downwind.
3. Waves perpendicular to the wind.
4. Wind streaks at 6-8 knots.
5. White caps at 10-12 knots.

Note: Dark, separate, shaded areas on the water may indicate “gusts of wind.” Be aware that wind direction and velocity can change over short distances.

Winter Haven's Gilbert (GIF) & Jack Brown's (F57) Airport Diagram



Not to be used for navigation.

KGIF

Communication Frequencies:

Unicom: 123.05
GCO: 121.725
CTAF: 123.05
FSS: SAINT PETERSBURG 123.6
Approach Freqs: Tampa:119.9 ; Tampa:120.65
WX Contact: ASOS 133.675 863-293-1604
FSS: SAINT PETERSBURG 800-992-7433

Field Data:

Elevation: 145 MSL
Charts: JACKSONVILLE
Traffic Pattern: All Aircraft: 1000 MSL
Runways: (11-29) 4001X100; asphalt; road ry 11; trees ry 29 (4-22) 5006X100; asphalt; PCL; trees ea end

F57

Communication Freqs:

CTAF: 123.05
FSS: SAINT PETERSBURG 123.6
FSS: SAINT PETERSBURG 800-992-7433

Field Data:

Elevation: 140 MSL
Charts: JACKSONVILLE
Traffic Pattern: All Aircraft: 500 MSL
Runways: (1-19) 3600X2200; fresh water; trees ea end
Notes: Beacon and Unicom lctd at Winter Haven Municipal airport adj to SPB Intensive Flight Training Noise Abatement: Do not fly over trailer park on N end of Lake Jessie

III. Rough Water Operations

Takeoff

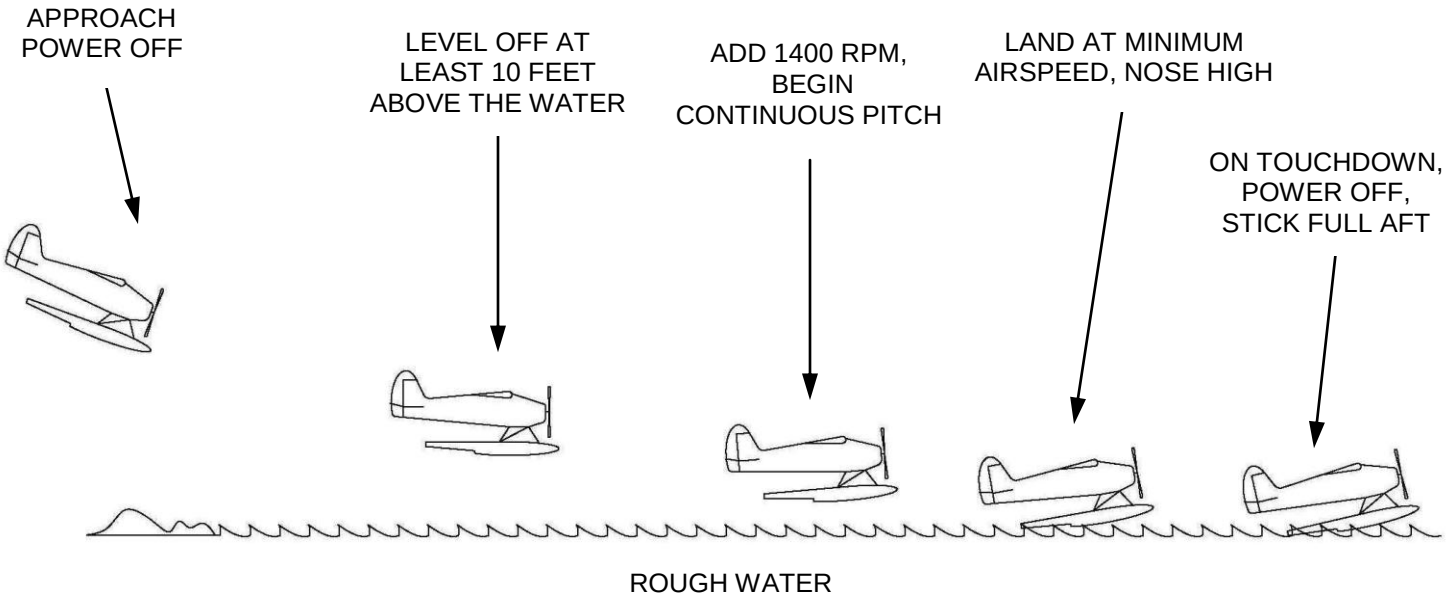
1. Use a higher nose up “attitude” during the takeoff run (about 5° higher).
2. Become airborne at minimum airspeed.
3. Level off 10-15 feet above the water, accelerate and slowly increase pitch to climb out at a 60 mph “attitude”.

Landing

1. Add approximately 1400 rpm after level off.
2. Land at minimum airspeed, nose high.
3. Power off and stick full aft upon touchdown.

Note: Do not “chase” the RPM setting. Primary concentration must be focused by looking outside.

In extreme winds, consider landing closer to the upwind side of the lake to avoid the large waves. A rough water takeoff and landing is similar to a soft field takeoff and landing in a landplane.



IV. Glassy Water Operations

Takeoff

1. Plan for an increased takeoff distance of approximately 30% more.
2. After adequate speed has been obtained on the step, use a slight amount of left aileron.
3. Use necessary opposite rudder to hold lane (runway heading).
4. As soon as the seaplane “rolls left”, position the stick (aileron) back to neutral to raise the left float.
5. To avoid flying back into the glassy water conditions, establish a positive rate of climb and then a normal rate of climb thereafter.

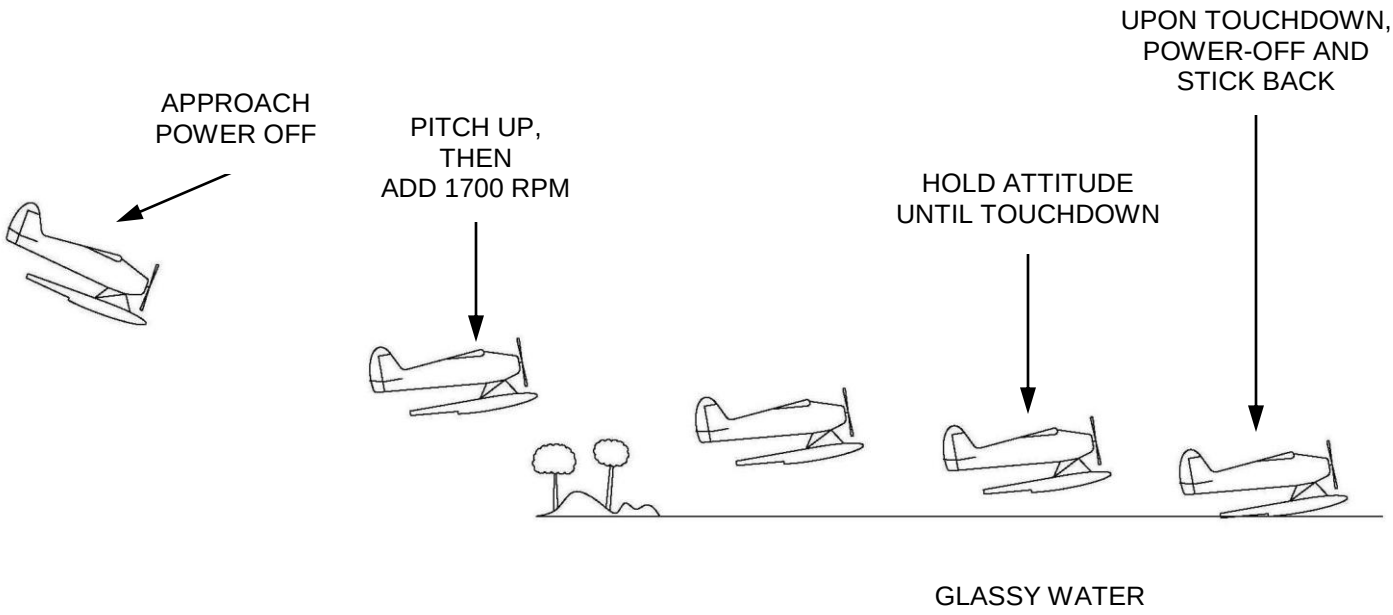
Note: Lifting the right float is easier because of torque and P-factor.

Consider taking off parallel to the shoreline for visual cue reference in case of engine failure during climb out.

Landing

1. Choose a Last Visual Reference (LVR) on downwind.
2. Reduce power on downwind opposite the LVR.
3. Approach the LVR power-off at the lowest safe altitude (not less than 10 feet).
4. **Prior** to the LVR (**not after**) establish the correct glassy water pitch landing attitude.
5. Add appropriate power setting (minimum 1700 rpm) **prior** to the LVR.
6. Do not continue **nose low** past the LVR (if not setup, go around!)
7. Hold the attitude established until touchdown. Nail it!
8. Do not attempt to flare visually.
9. Due to the higher touchdown speed on the glassy water condition, expect greater drag and forward stick “pressure”.
10. When you “feel” the water, power off and stick back slowly until float displacement.

Glassy water landings can be dangerous because of the absence of depth perception and visual cues. The maximum rate of descent for a glassy water landing is 150 fpm. When picking an LVR, use the lowest possible one (i.e. lily pads, swamp grass, bushes, small trees).

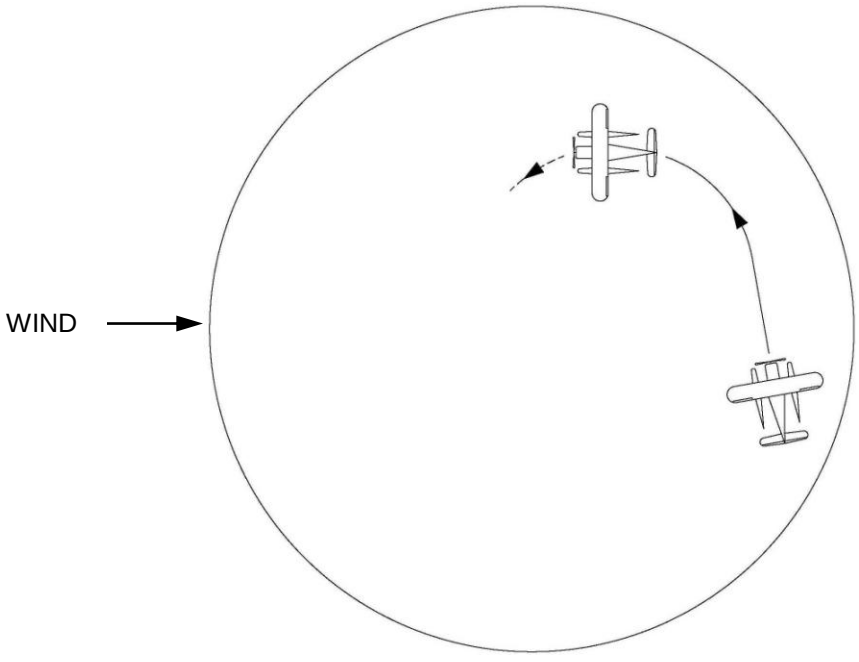

APPROACH
POWER OFF
PITCH UP,
THEN
ADD 1700 RPM
HOLD ATTITUDE
UNTIL TOUCHDOWN
UPON TOUCHDOWN,
POWER-OFF AND
STICK BACK
GLASSY WATER

V. Confined Area Takeoff

Confined area takeoffs are necessary when the takeoff lane is not long enough or obstacle clearance is a problem. The general idea is to takeoff and climb in a circular pattern over the lake until obstacles are cleared. To perform a confined area takeoff do the following:

1. Position the seaplane approximately crosswind with the stick to the left (left aileron).
2. Apply takeoff power and accelerate straight ahead until the floats are up on the step.
3. Once on the step, turn the seaplane left in a circular pattern (turning towards the wind).
4. As soon as the seaplane "rolls left", position the stick (aileron) back to neutral to raise the left float.
5. After the seaplane leaves the water, maintain a left "shallow bank" turn.
6. Continue the left turn in a circular pattern until enough altitude is reached to clear obstacles.

In a strong wind it is helpful to leave the water rudders down just prior to applying full power for takeoff to ensure enough rudder authority. In the J-3 seaplane, one can easily raise the water rudders and move one's hand directly to the throttle to smoothly increase power.



Note: The stronger the wind, the initial lane (runway) heading can be more into the wind.

VI. Power Failure

Steps to follow when power failure occurs (500 feet AGL):

1. Pitch nose down to a 60 mph “attitude”.
2. Pick acceptable lake.
3. Fly to the nearest point of water, then turn to base if required.
4. If necessary, accept a crosswind component.
5. Consider the touchdown like a normal landing.

Note: If landing on glassy water, land parallel to the shore line for visual cues.

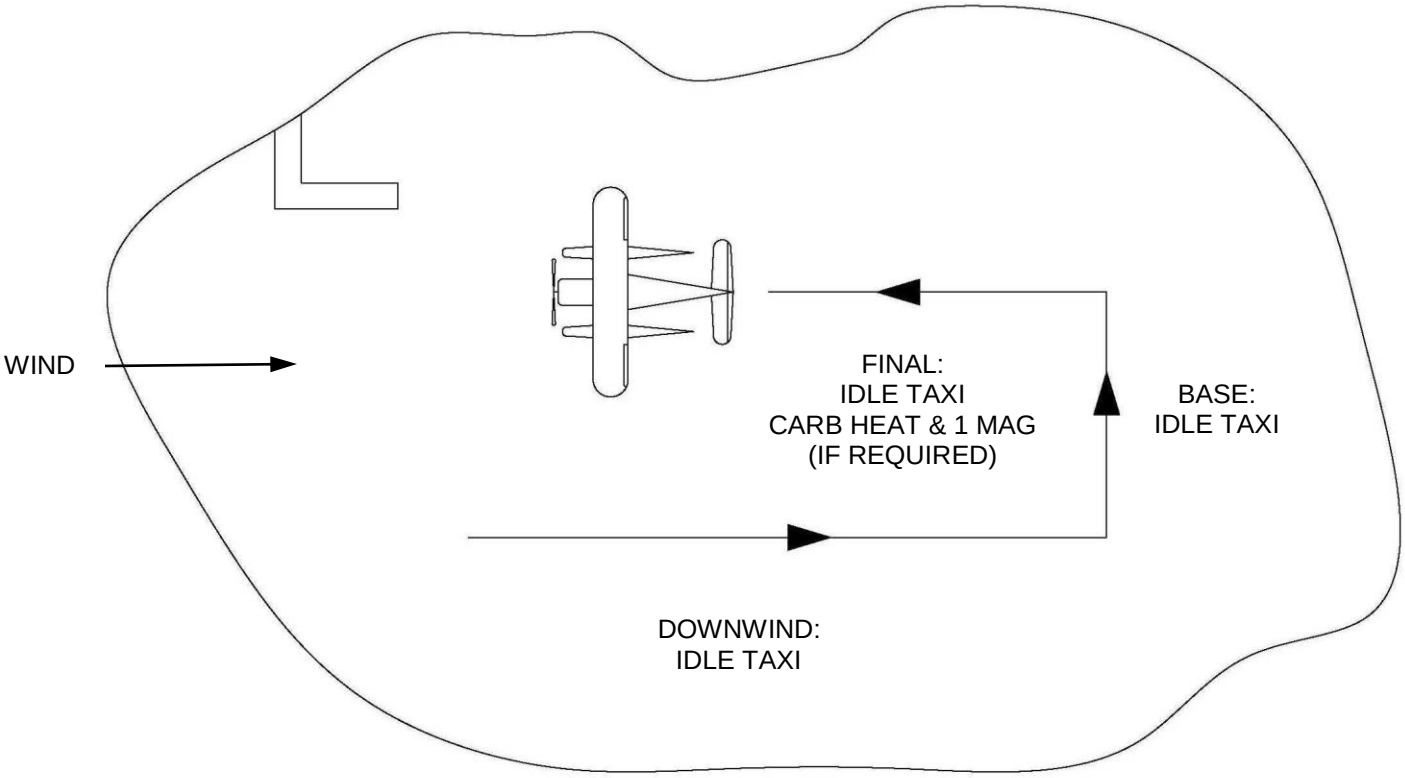
If necessary seaplanes can be safely landed on a hard surface or grass.

VII. Docking

Dock into the wind after making a traffic pattern on the water. Use carburetor heat “on” and 1 magneto on final, if necessary, to slow the seaplane down.

The steps for docking are as follows:

1. Check for poles, pilings or other obstructions.
2. Come in as slowly as possible.
3. Make a traffic pattern on water.
4. Come in on the side where the door is located (right side of J-3 seaplane).
5. Make a long final approach into the wind for positive control and slower speed.
6. Use carburetor heat and magnetos as required.



Note: When docking, consider and ensure that the wing, wing strut and tail will clear all portions of the dock. If necessary, the passenger can stand on the right float just behind the wing strut to assist in securing the seaplane when arriving at the dock.

VIII. Ramping and Beaching

When ramping or beaching do the following:

1. Check for rocks, stumps and sandbars (beaching).
2. Approach at slowest possible speed.
3. Idle power.
4. Shut down.
5. Raise water rudders after ramping or beaching.

Note: When beaching in an unfamiliar area, consider walking or paddling the seaplane to shore. When ramping with a strong crosswind, leave the power at idle until the float “bow waves” subside.

IX. Sailing

When the seaplane is moving backwards, it is considered sailing (power on/off). There is limited directional control with aileron and rudder. The down aileron provides the sail. Position the stick in the direction you want to go and use opposite rudder. Use the sailing technique to get the seaplane from upwind to downwind in strong wind conditions. It would be the safest method to use to get the seaplane downwind with some semblance of control.

Use sailing when:

1. Pushing off from a parking area.
2. Approaching a parking area in high winds.
3. If there is no other way to maneuver the seaplane.

Note: If the seaplane is stationary or moving toward the wind it is considered to be water taxiing, not sailing.

X. General Knowledge

1. The certificates and documents that must be on board the seaplane are: airworthiness certificate, registration, weight and balance and appropriate placards.

2. A pilot's license, plus medical and photo I.D. must be in your procession before acting as pilot in command.

3. Center of buoyancy is the average point of buoyancy in floating objects. Weight added above this point will cause the floating object to sit deeper in the water in a level attitude.

4. The displacement position is the attitude of the seaplane when its entire weight is supported by the buoyancy of the floats, as it is when at rest or during a slow taxi. This is also called the idling position.

5. When on the surface of the water, the best way to determine wind direction is to let the seaplane weathervane.

6. When flying a seaplane the best indication of wind direction is the glassy band of slick water on the upwind side of the lake. Wind streaks cannot stand alone as a wind direction indicator.

7. FAR 91.115 states, in part, that the seaplane on the water shall, in so far as possible, keep clear of all vessels and avoid impeding their navigation and shall give way to any vessel or other seaplane that is given the right-of-way by any rule of this section.

8. Boats have the right-of-way over seaplanes because FAR 91.115 mandates it.

9. A seaplane departing requires the right of way over a seaplane landing due to less maneuverability and the fact that the pilot has less visibility. The seaplane on the water also has to contend with other traffic (boats, waverunnners, other seaplanes, etc.)

10. The color of a rotating beacon at a seaplane base is an alternating white and yellow flashing light. An anchor symbol identifies a seaplane base on a sectional chart. If there are 4 squares around the symbol, that seaplane base offers services.

11. If severe porpoising occurs, close the throttle and stick back. The 3 main causes of porpoising are:
    a. Improper pitch (nose too high or nose too low).
    b. Center of gravity out of limits (improper loading, flooded forward or aft float compartment, etc.).
    c. Waves (seaplane, boat, large rogue waves).

12. The characteristics of the J-3 seaplane approaching a stall are the following:
    a. Slight wing buffeting.
    b. Mushy controls.
    c. Door comes up.

13. To make sure that a waterway is available for a seaplane, the SPA Water Landing Directory is the number one source; others may include the Department of Natural Resources, city or local authorities, the controlling agency of that area, etc.

XI. Tips to Flying a J-3 Seaplane

1. The checklist to use prior to idle/step taxiing, plow turning, takeoff, ramping, docking, beaching and sailing is the acronym **C. A. R. S.**

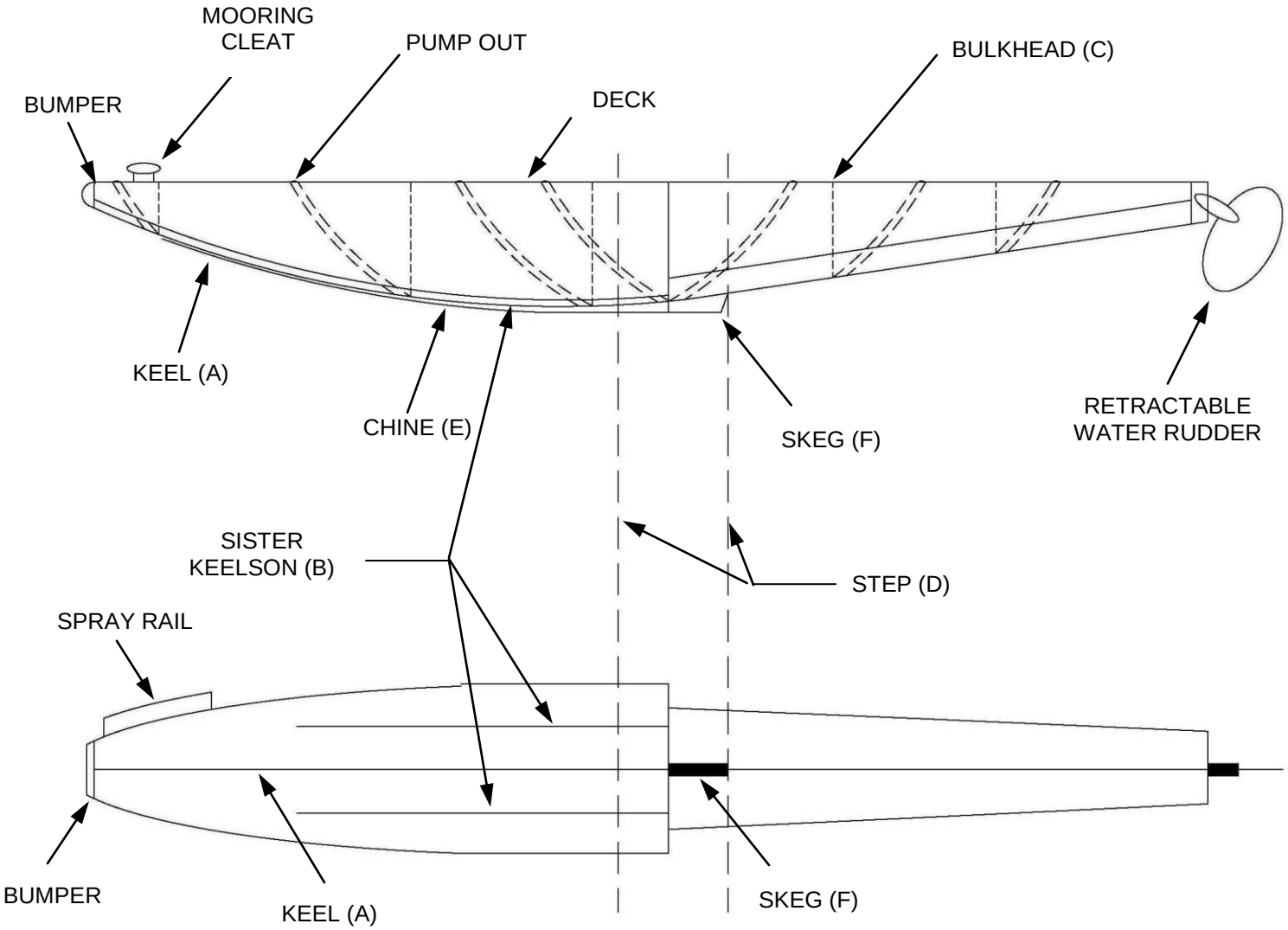
   C **C**arburetor Heat (on/off)
   A **A**rea Clear
   R Water **R**udders (up/down)
   S **S**tick Back

2. Flying the seaplane is all visual and feel.
3. Apply control “pressures” versus movement.
4. “Pressure” the throttle for minor power changes.
5. Although this course guide lists recommended power settings, use “power as required” for proper “air rudder” control.
6. Wings level no later than 100 feet for all approaches.
7. Don’t get “lazy” on maintaining lane (runway) heading for takeoffs and landings.
8. When flying over power lines, fly over the "poles" to make sure that the wires are cleared.
9. In a strong crosswind, there is nothing wrong with leaving the water rudders down until after takeoff power is established.
10. Landing downwind will increase groundspeed and if hull speed is exceeded, the seaplane will nose over.
11. Prior to ramping, beaching and docking the following checklist should be used:

    Triple H Checklist

    H **H**atch (open)
    H **H**arness (unbuckle)
    H **H**eadset (remove)

XII. Aqua 1500 Floats



Descriptions of the float components:

A. Keel: Reinforcement strip on the bottom of the floats. It guides the floats in a straight line through the water and resists sideways motion.
B. Sister Keelson: The two longitudinal members add strength to the floats and function as additional keels. They help provide directional control of the floats.
C. Bulkhead: A structural partition that divides a float into separate compartments. It provides additional strength and prevents sloshing.
D. Step: Least drag, best acceleration point (sweet spot). Allows the floats to operate in two modes: displacement (boat), planing (ski).
E. Chine: Reinforcement strip that connects the side and bottom of the floats. They guide water away from the float, reduce spray and contribute to hydrodynamic lift.
F. Skeg: A short, strong extension of the keel directly behind the step. Smoothes out water flow, reduces drag and helps provide directional control stability on the step. On a level, hard surface, the skeg is a balancing point for the seaplane. Do not stand on the deck aft of the skeg because the seaplane will tip backwards on the aft section of the floats.

Aqua 1500 Floats Characteristics

1. The model number “1500” on the floats represents that each float displaces 1500 lbs. of fresh water.
2. 7 separate, water tight compartments.
3. It takes a minimum of 2 feet of water for float (seaplane) operations.
4. The maximum float speed is 60 mph. Speed in excess of this could cause the seaplane to flip. This is also known as the “hull speed”.
5. The floats are rigidly mounted and therefore there is no flexible or shock absorbing suspension.
6. The floats and rigging weigh 250 lbs. (each float weighs 100 lbs. and the rigging weighs 50 lbs.). The rigging includes spreader bars, forward, diagonal and aft struts and bracing wires.
7. The maximum height of the waves for these floats is 18 inches.

The drawbacks of oversizing the floats are increased weight, increased drag and decreased performance. The reason the floats are oversized is to provide added buoyancy giving an extra margin of safety. If damage is incurred there is greater potential to reach the shore.

If a float plug is missing the seaplane can continue to be operated. Use a plug from the front to replace the missing plug. The front plug is not as necessary, as water will not come over the front of the float in normal operations.

If one of the compartments is dry when pumping out the floats, suspect that the bilge hose has come loose.

A flooded forward or aft compartment is critical due to center of gravity.

FAA Regulations require the following:

1. Each float must support 90% of the gross weight of the seaplane. Both floats together must support 180% of the gross weight of the seaplane.
2. Floats must have at least 4 compartments.
3. Seaplane must float with 2 compartments flooded.

XIII. Piper J-3 Information

Length: 22 ft., 5 in.

Wingspan: 35 ft., 3 in.

Height: 6 ft., 8 in.

Wing area: 178.5 $ft.^2$

Gross Weight: 1300 lbs.

Empty Weight: 850 lbs.

Useful Load: 450 lbs.

Fuel Capacity: 12 gal.

Endurance: approximately 2.5 hours at 5 g.p.h.

Powerplant: Continental C-85 w/ O-200 cylinder heads and crankshaft, air-cooled, opposed, 4 cylinder, 100 horsepower (in the case of the J-3's at Brown's).