Seaplane Rating Add-On

N3909Q Training Syllabus

ADVENTURE SEAPLANES

TRAINING, RENTALS, SALES & TOURS

AIRCRAFT SPECIFICATIONS

Airspeeds

Vs0	40
Vs1	45
Vx	65
Vy	85
Vfe	90
Va	96
Vno	127
Vne	140
Best Glide	80

*All speeds in MPH

Engine Specs

Lycoming O-320 (4 cylinder)
160 HP at 2700 RPM
Max RPM 2700 RPM
Oil Type: Aeroshell W 100 (cold WX use Aeroshell 15 w 50)
Max oil Capacity: 8 U.S. Quarts
Normal Operations: 6 U.S. Quarts
Add 1 quart when at 5 1/2 quarts

Propeller Specs

Manufacturer: McCauley
Prop Type: Fixed Pitch
Number Blades: 2
Prop Diameter: 80 Inches
Prop Pitch: 42

Note: Floatplane props are longer and have a flatter pitch than a land plane of similar type

Fuel

Capacity:	52 U.S. gallons
Usable:	48 U.S. gallons (24 per side)
Fuel Burn:	8 Gallons per Hour (average)
Fuel Type:	100LL (Blue) AVGAS

Floats

Manufacturer:	Baumann Floats
Model:	BF2550
100% Buoyancy per Float:	2550 lbs.
Weight:	275#
Storage Lockers (2)	50 # max per side
Minimum Draft	12”

WEIGHT AND BALANCE

Gross Weight: 2350 lbs.
Empty Weight: 1634.79 lbs.
Useful Load: 715.21 lbs.

Float Storage Lockers: 50 lbs. max each side

Fill in Weight and Balance for your Check ride

	Weight	Arm	Moment
Empty Floatplane	1632.79		62219.53
Front Seats		37.5	
Rear Seats		73.5	
Baggage Area 1		100	
Float Compartments		20.0	
Fuel		48.8	
Totals			

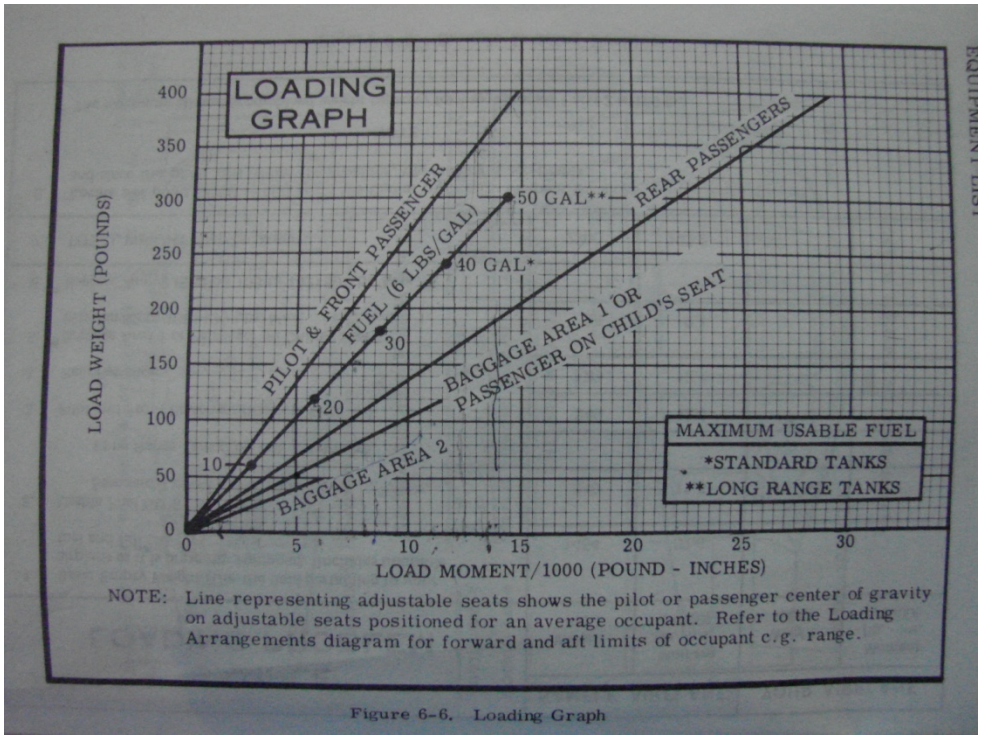


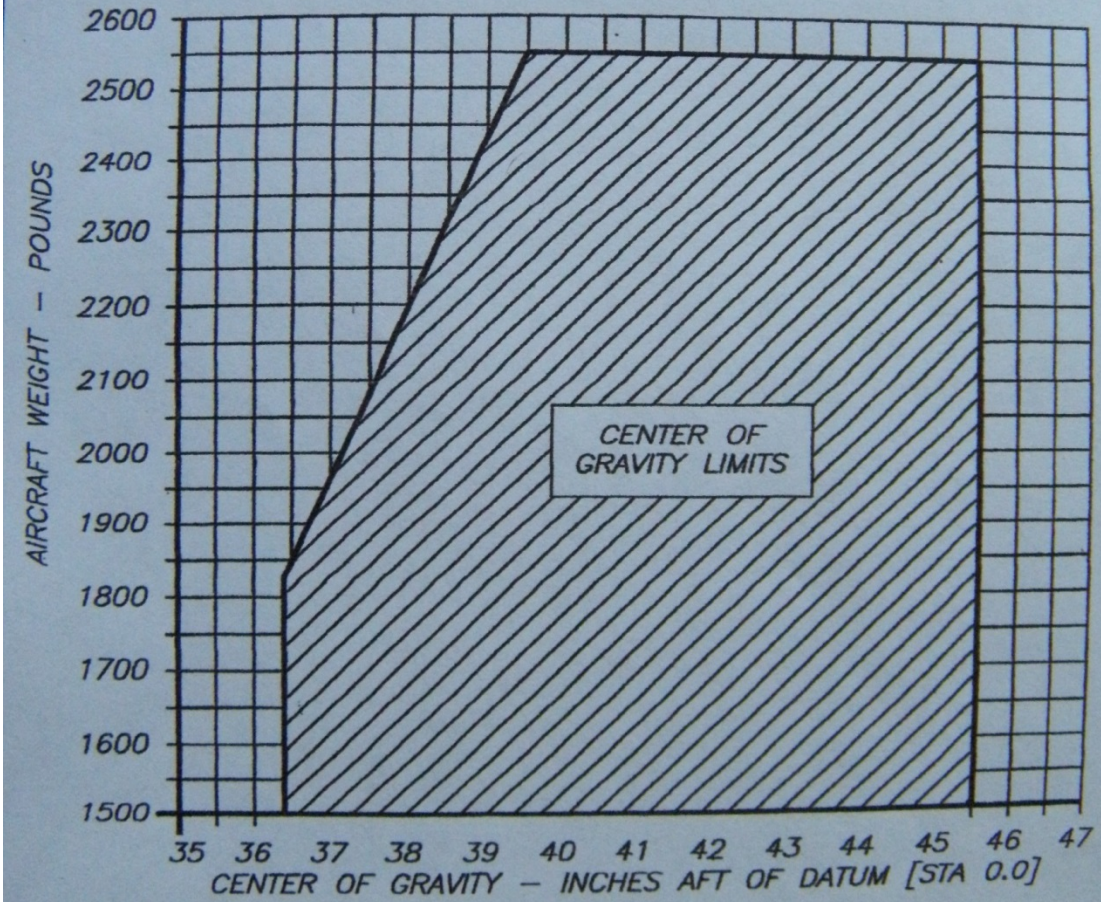
Figure 6-6. Loading Graph

BAUMANN FLOATS
121 AIRPORT ROAD
NEW RICHMOND, WI 54017

POH SUPPLEMENT FOR
CESSNA MODEL 172N

CENTER OF GRAVITY ENVELOPE

CESSNA MODELS 172S WITH McCAULEY 1A200WFA PROPELLER, 172 Q WITH McCAULEY 1A200DFA PROPELLER, 172 M, N, P APPLICABLE WITH ENGINES MODIFIED AS STATED BY STC'S: SA332GL, SA703GL, SA4428SW, SA2196CE, SA420CE, SA647CE, SA807CE, SA00461SE OR SA564NE. CESSNA MODEL R172K AND R172K MODIFIED WITH STC SA1437CE AND SE1436CE EQUIPPED WITH BAUMANN FLOATS MODEL BF2550 FLOATS



FAA APPROVED 26 APR 2005

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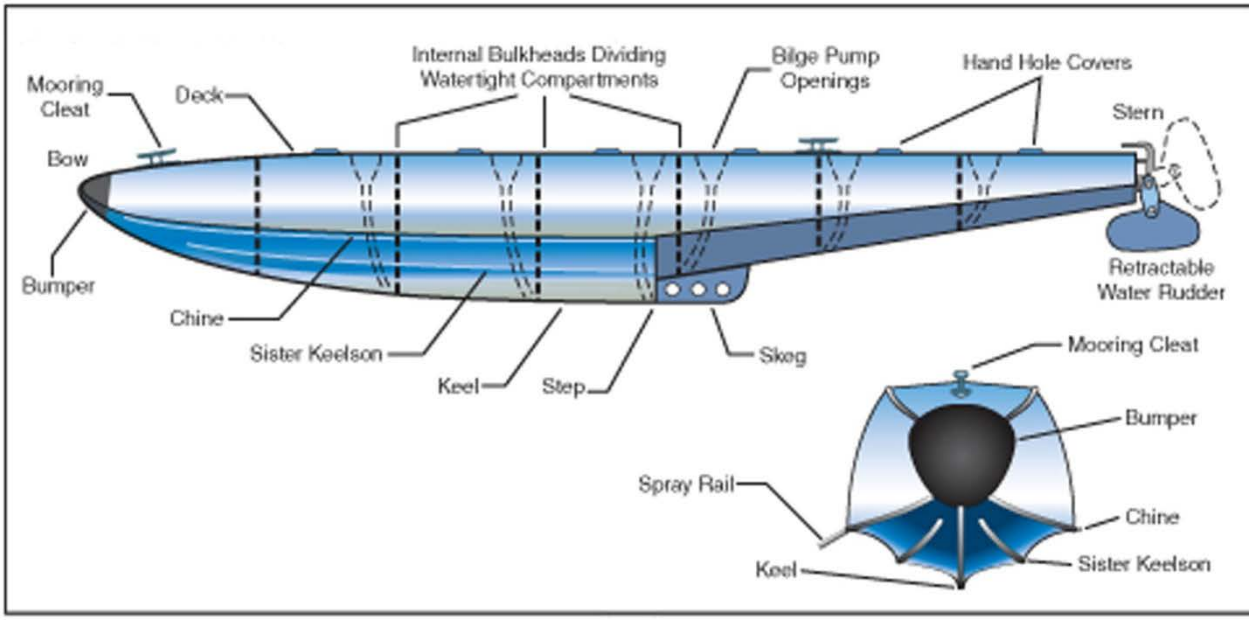
FLOAT DESIGN AND REGULATIONS



Baumann 2550

FAA Regulations

- Each float must have 4 compartments minimum
- Each float must support 90% of gross weight (both floats support 180%)
- Must be able to support the aircraft with two compartments flooded
- The model number “2550” refers to the buoyancy of each float. Each Float will displace 2550 lbs of fresh water

FLOAT DESIGN AND REGULATIONS

- The preflight inspection of the floatplane itself is accomplished same as the land-plane as described in the pilot's operating handbook for that aircraft (usually involving a walk around inspection checking fuel, oil, lights, control operation, etc.)
    - Carefully inspect the propeller for damage as water picked up under power is very harmful to a floatplane prop (appearance is similar to gravel damage from a soft runway.)

- The floats should also be looked over carefully during a walk around inspection of the aircraft.
    - Visually check the floats for any sign of damage that may have occurred while docking, beaching, ramping, or moving the aircraft in or out of the water using a floatplane dolly.
    - Visually check the aircraft fuselage around float attach points and the firewall for any indication of damage from events such as a hard landing
    - Check water rudder(s) and cables for damage and proper operation. Inspect all float attach points to the main fuselage as well as spreader bars and flying wires.
    - Check each water tight compartment for water using the bilge pump supplied with the aircraft. Be sure to reinstall all pump-out plugs tightly as these can pop out on rough water.

PASSENGER BRIEF

- Additional passenger briefing items may include:
    - Location and use of PFD's. Do not inflate PFD's until clear from the aircraft
    - Brief passengers the strategy to exit a capsized aircraft. The cabin may have to fill with water for pressure to equalize and doors to open. Occupants should locate a known reference point in the aircraft prior to releasing seatbelts.
    - Brief passengers on any assistance required departing the dock. IN NO EVENT SHOULD A PASSENGER OR DOCK HELPER BE ALLOWED IN FRONT OF THE STRUT.

ENGINE STARTING AND TAXI

WATER RUDDERS DOWN – MASTER – MIXTURE – MAGS –START

- For startup, it is important that all seatbelts, shoulder harnesses, headsets, etc. are off and out of the way. These items can prohibit the quick exit from the floatplane if it becomes necessary to save the floatplane from drifting into something. Although this may seem like a violation of a FAR, it's not. FAA regulations allow the pilot and/or required crew members to leave seatbelts off for the purpose of docking and undocking a floatplane.

- When departing from a dock the wind conditions must be carefully taken into consideration. Remember that a floatplane on the water always tends to "weathervane" into the wind. Leave the dock facing into the wind if possible. Water rudders should be lowered prior to startup. Since floatplanes have no brakes, it is important that the pilot complete the preflight and prepare the engine for startup before the floatplane is untied from the dock, not after. Utilize a dock helper if available. If not, usually a gentle shove away from the dock prior to starting the engine is satisfactory. Holding a dock line while starting the engine is generally discouraged by Adventure Seaplanes staff; damage to water rudders, etc. can result if

the line is not thrown clear of the floatplane after startup. Rubbing up against the dock while taxiing away should be avoided as damage to sides of the floats may result.

- When departing from a beach with the heels against the shore, be sure that the floatplane is floating enough to allow the floatplane to power itself off the sand. Do not use high power to free the floatplane from shore. Be considerate of persons and property on shore.

- Use caution when departing the dock to not hit any dock hands or dock posts with the horizontal stabilizer. A gradual turn away from the dock will prevent this AND will prevent the back of the floats from either hitting the dock or going underneath it.

Run-Up

- FLOW or T CHECK
- FUEL on BOTH
- STICK BACK
- MAG CHECK **1300** RPM
- CARB HEAT CHECK
- POWER **800** RPM
- Trim Set
- Flaps 15-20
- Area Clear
- Rudders Up
- Stick Back

Taxiing

There are three ways to taxi a floatplane:

- Idle (displacement) Taxi
- Plow Taxi
- Step Taxi

Water rudders are down for a displacement and plow taxi only.

Idle Taxi

In most cases idle taxi is the preferred taxi method. It generally allows the easiest maneuvering of the floatplane in tight areas, around docks, boats, other floatplanes etc. For idle taxi:

- **F**uel……check
- **T**rim……set
- **F**laps……up
- **C**arb Heat……off
- **A**rea……clear
- **R**udders……down
- **S**tick……full aft
- Throttle……**800** RPM

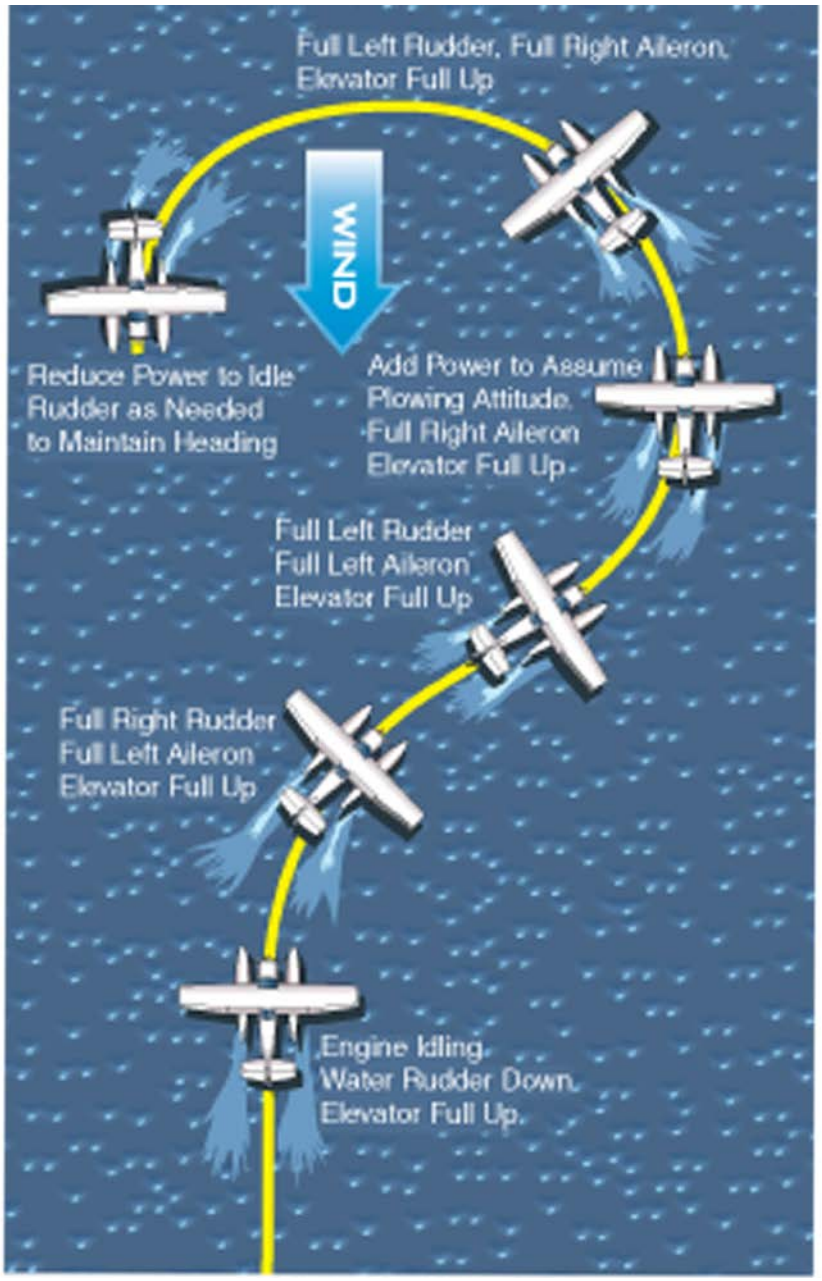
Plow Taxi

Plow taxi is considered to be the least desirable taxi method and is rarely used. Plow taxi is only used to conduct a "plowing turn" to turn the floatplane downwind in high wind conditions when it becomes difficult to overcome the weathervane tendency of the floatplane. Plow taxi creates spray which could quickly cause damage to the prop. Plow taxi also provides insufficient engine cooling and poor visibility due to the nose up attitude during plow taxi. Always consider power-off sailing as a better alternative to plowing turns.

If it becomes necessary to perform a plowing turn:

- **F**uel……check
- **T**rim……set
- **F**laps……up
- **C**arb Heat……off
- **A**rea……clear
- **R**udders……down
- **S**tick……full aft
- Throttle……Full Power
- Rudder……full left
- Aileron…… Yoke opposite of turn
- Throttle…… 2200 RPM to complete turn
- Throttle……**800** RPM when downwind

*Note: Always perform plowing turns to the left due to torque and p-factor.



Example of a plowing turn initiated by a slight turn off the wind in the opposite direction.

Step Taxi

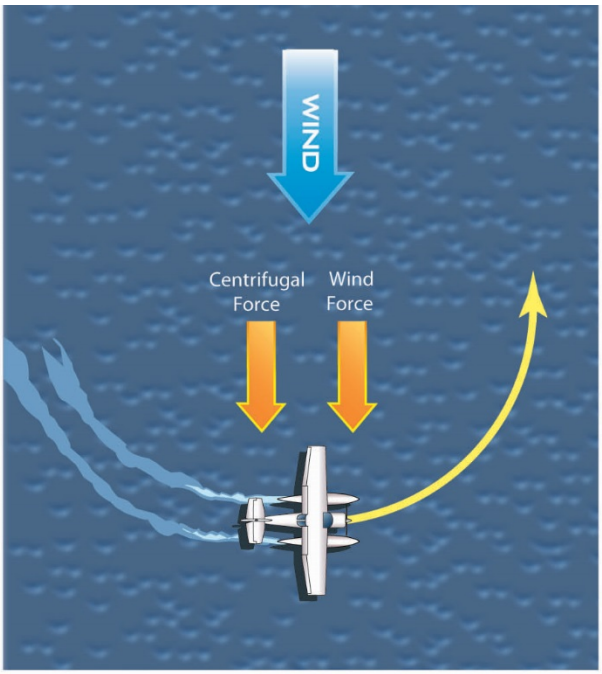
Step taxi is used under ideal wind and water conditions to cover long distances across the water. There is little or no spray problem when the floats are on plane or "on the step," and the attitude of the floatplane provides adequate engine cooling and good visibility. Speed – 35-40 mph

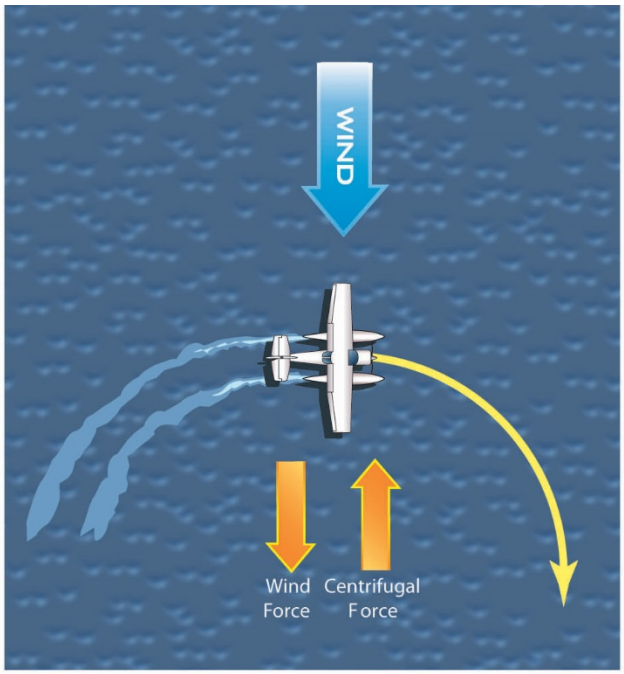
When the floatplane is on the step the elevator control is used to find the "sweet spot" which is the optimum planning angle [5 degrees nose up] at which the water drag on the floats is at a minimum. An experienced floatplane pilot can easily locate this position by feel, but beginning floatplane pilots may find it easier to note the position of the top of the engine cowling in relation to the horizon when demonstrated to them.

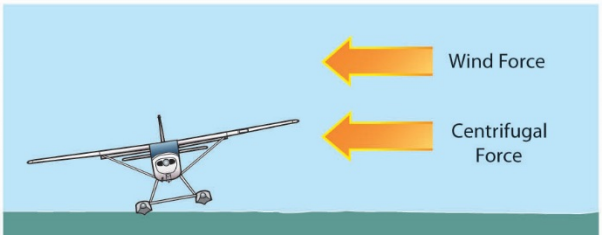
The floatplane should always be facing into the wind before beginning step taxi. Also, step taxiing should not be used on rough water or in high wind situations, boat wake must be avoided during step taxi.

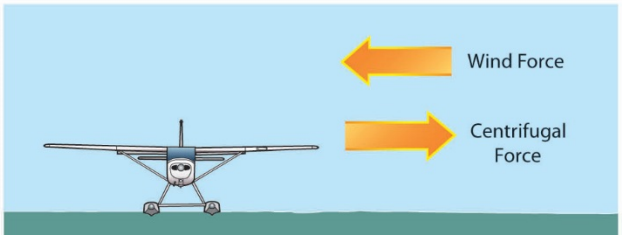
- **F**uel……check
- **T**rim……set
- **F**laps……up
- **C**arb Heat……off
- **A**rea……clear
- **R**udders……up
- **S**tick……full aft
- Throttle……full then **2000- 2200** RPM when on step
- Stick……adjust for "sweet spot"

Step taxi turns require a much larger turning radius then idle taxi turns and should be done with caution. Avoid making step taxi turns from downwind to upwind. The reason for this is the centrifugal force of the turn and the wind are both acting in the same direction making the floatplane very unstable and more likely to capsize. Turning from upwind to downwind these forces act in opposing directions and tend to cancel each other out, making the floatplane more stable. Utilize the ailerons to maintain the cowl level to the horizon during the turn, i.e. yoke left for left turn and right for a right turn. This helps keep the floatplane level and reduces the risk of capsizing. It will require more power [2200 rpm] when entering from crosswind to downwind turns to maintain the ideal 35-40 mph speed and 5 degrees nose up attitude.









Sailing

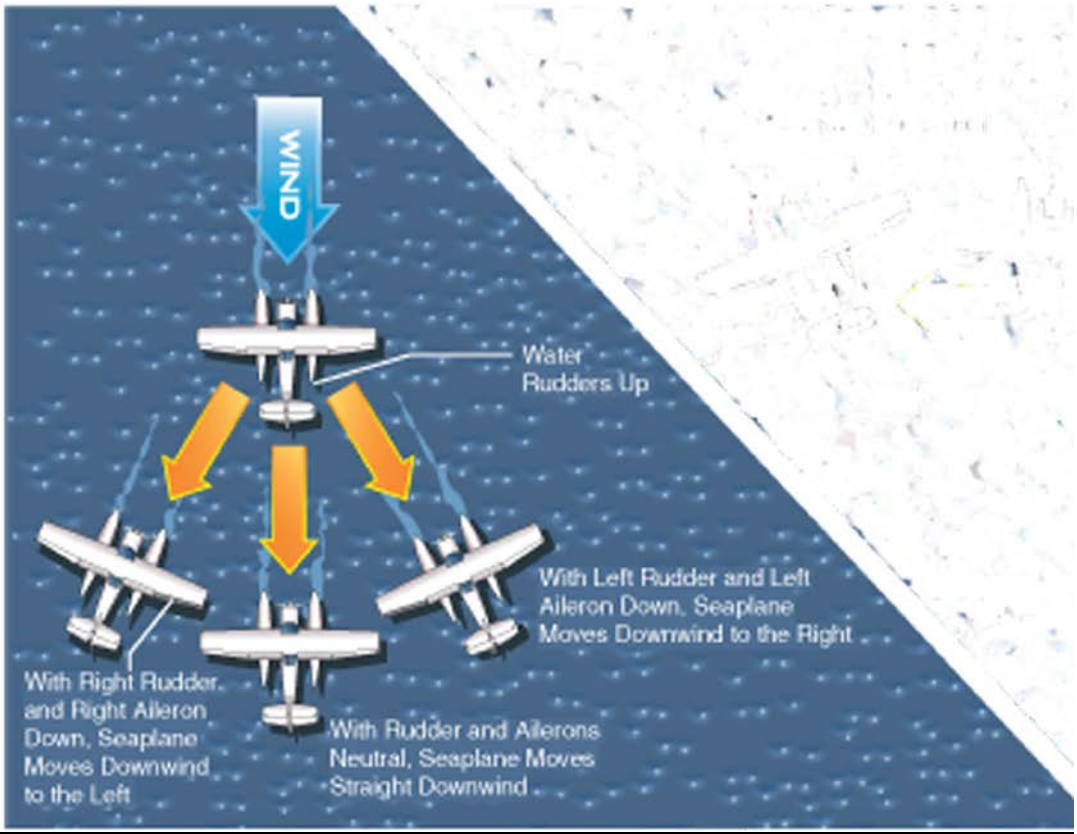
Power-off sailing is a technique that should be used when high wind conditions prevent maneuvering the floatplane in idle taxi. In most cases, this is much more favorable than performing a plowing turn which can result in costly damage to the floatplane. Flaps can be put down to get a faster wind drift backwards.

- SIMPLE RULE FOR SAILING

TO SAIL LEFT – CONTROL YOKE LEFT & APPLY RIGHT RUDDER (Hint: "Left, Left, Right")

TO SAIL RIGHT – CONTROL YOKE RIGHT & APPLY LEFT RUDDER (Hint: "Right, Right, Left)

WATER RUDDERS ALWAYS UP FOR SAILING TO PREVENT DAMAGE



TAKEOFFS

3H's "HEADSETS, HARNESSES, HATCHES"

A final pre-takeoff check should be completed immediately prior to any takeoff

- **T**rim Set
- Flaps
- Carb Heat Off
- **A**rea Clear
- **R**udders Up
- **S**tick Back

Normal Takeoff and Climb

- **F**uel…….selector on BOTH
- **T**rim…….set
- **F**laps…….**20** degrees
- **C**arb Heat…….off
- **A**rea…….clear
- **R**udders…….up
- **S**tick…….full aft
- Throttle…….full open
- Stick…….adjust for sweet spot after nose "peaks"
- Airspeed……..Lower nose - accelerate to **70 MPH** after airborne
- Flaps…… retract slowly
- Airspeed……. **80** MPH

Rough Water Takeoff and Climb

Rough water operations are conducted similar to soft field techniques used in land-planes. The objective of a rough water takeoff is to get the floatplane off the water at a lower airspeed, then remain in ground effect while accelerating to Vx.

- **F**uel……check quantity and selector
- **T**rim……set
- **F**laps……**20** degrees
- **C**arb Heat……off
- **A**rea……clear
- **R**udders……up
- **S**tick……full aft
- Throttle……full open
- Stick……sweet spot or slightly nose high
- Airspeed……accelerate to **60** after airborne
- Flaps……retract to 10 degrees
- Airspeed……**70 MPH**
- Flaps……up slowly
- Airspeed……85 MPH

Glassy Water Takeoff and Climb

Glassy water makes it more difficult to unstick the floatplane from the water due to maximum surface friction between the floats and the water. Using aileron rolling the aircraft up onto one float can be an effective technique for getting airborne in this situation. Once you are on step and have found your sweet spot on the floats turn your yoke to the left at about a 60 degree angle, once you feel the right float starting to rise increase back pressure on the yoke and use right rudder to keep the nose of the aircraft going straight ahead, it will want to go into a left turn. Once you lift off the water you will need to level the wings and lower your nose to maintain a 5 degree nose up attitude for climb out making sure you do not contact the water again. In true glassy water it is like looking in a mirror and you cannot tell where the water surface is.

- **F**uel……selector on BOTH
- **T**rim……set
- **F**laps……**20** degrees
- **C**arb Heat……off
- **A**rea……clear
- **R**udders……up
- **S**tick……full aft
- Throttle……full open
- Stick……sweet spot
- Aileron……raise one float
- Airspeed……accelerate to **65 MPH** after airborne
- **Flaps……retract slowly**
- **Airspeed……70 MPH**

Confined Area Takeoff and Climb

Confined area takeoffs can be performed in one of two ways. If significant wind is present, the best technique is to taxi the floatplane to the end of the longest suitable portion of the lake that favors the wind. Takeoff using the maximum recommended flap setting for takeoff (20 degrees for our floatplane) and establish maximum rate climb after liftoff to clear any obstacles.

The other technique for getting the floatplane out of a confined area is to place the aircraft on the step with full power traveling crosswind with aileron into the wind, then entering a step turn into the wind as your airspeed increases and flying off one float, followed by leveling your wings and lowering your nose high attitude. This should only be attempted in light wind conditions.

Cross wind Takeoff and Climb

Narrow lakes and rivers may necessitate the use of a cross wind take off. Use aileron into the wind to counter the effects of wind lifting the upwind wing and creating drag on the downwind float. It may be necessary to establish a "lead angle" to account for drift that will occur before the flight controls become effective. To limit drift and premature turning during the initial acceleration water rudders may be left down briefly until air rudder authority is achieved by adding power to 1800 RPM, then you can lift your water rudders and apply enough rudder pressure to keep your nose straight. Pick an object on the far shoreline as a reference point, this will help you with directional control. As you accelerate you can decrease your aileron and rudder input and allows a few mph of airspeed before becoming airborne. The aircraft will also fly better with some extra airspeed as you are climbing out.

LANDINGS

Landing attitude will be the same attitude that is seen when on the "sweet spot" during the step taxi.

DO NOT relax back pressure on the stick during touchdown. This is a common habit of pilots who learned in tricycle gear land-planes. This action causes the bows of the floats to submerge and can even flip the floatplane onto its back if done aggressively.

Normal Approach and Landing

A good landing checklist to use in a floatplane is **GUMPS**:

- **G**as……selector on both
- **U**ndercarriage (water rudders)……check up
- **M**ixture……full rich
- **P**rimer……Locked
- **S**eatbelts……check passengers

Downwind

- Throttle……**2300** RPM –90 MPH
- **GUMPS** Check
- Carb Heat……check then off
- Trim ……..as required

Abeam intended Touchdown Point

- Throttle……**2000** RPM
- Flaps……..10 degrees
- Airspeed……85 MPH
- Trim……as required

Base Leg

- Throttle……**1700** RPM
- Flaps……**20** degrees
- Airspeed……**80** MPH
- Trim……as required

Final

- Throttle……**1200 - 1400** RPM
- Airspeed……..**70** MPH
- Trim……..as required

- Nose **UP 5** degrees to landing attitude 10 feet above water and add power to **1400** RPM, carry power until touchdown.

After Touchdown

- Throttle…….close
- Stick…….slowly aft as floatplane falls off step

Note: DO NOT relax back pressure on the stick during touchdown. This is a common habit of pilots who learned in tricycle gear land-planes. This action causes the bows of the floats to submerge and can even flip the floatplane onto its back if done aggressively enough.

Rough Water Approach and Landing

The objective of the rough water landing is to minimize the stress on the aircraft by touching down smoothly and avoid being bounced back into the air.

Downwind

- **2300** RPM – **90** MPH
- **GUMPS** check
- Carb Heat……check then off
- Trim……as required

Abeam intended Touchdown Point

- Throttle……**2000** RPM
- Flaps……**10** degrees
- Airspeed……**85** MPH
- Trim……as required

Base Leg

- Throttle……**1700** RPM
- Flaps……**20** degrees
- Airspeed……**80** MPH
- Trim……as required

Final

- Throttle……**1200 - 1400** RPM
- Flaps……**30** degrees
- Airspeed……**65** MPH
- Trim……as required
- Nose UP 5 degrees to landing attitude 10 feet above water and add power to 1600 RPM, carry power until touchdown.

After Touchdown

- Throttle…….close immediately
- Stick…….aft

Glassy Water Approach and Landing

Glassy water can be one of the most dangerous situations for a floatplane pilot. Even though it may look quite inviting, depth perception fails over the mirror-like surface of glassy water and has resulted in many accidents. Because of this problem, we have a special technique for landing on glassy water.

When glassy water conditions exist, it is safe to assume that there is little or no wind to affect the landing. The pilot should therefore select a long shoreline and land parallel to it using it as a height reference for the landing. As this floatplane reaches the shoreline or object that the pilot has selected as a last visual reference, the floatplane is pitched up to **60** MPH and power set to **1800** RPM. This airspeed and power setting will place the floatplane in slightly nose-up attitude in which it will settle onto the water on its own at a rate of approximately **100-150** feet per minute. The trick is to not change the pitch attitude after the floatplane is set up at the appropriate airspeed and power setting. Using both the horizon and the angle of the wing in relation to the shore (while looking out the side) this proper pitch attitude can be maintained. This is not an instrument landing. Do not become fixated on the airspeed indicator or VSI. Also it is important not to change the power setting once set up on a glassy water approach.

Downwind

- **GUMPS** check
- Carb Heat……check then off
- Trim…….as required

Abeam intended Touchdown Point

- Throttle……**2000** RPM
- Flaps……..**10** degrees
- Airspeed…… **85** MPH
- Trim……as required

Base Leg

- Throttle……**1700** RPM
- Flaps……..**20** degrees
- Airspeed……..**80** MPH
- Trim……as required

Final

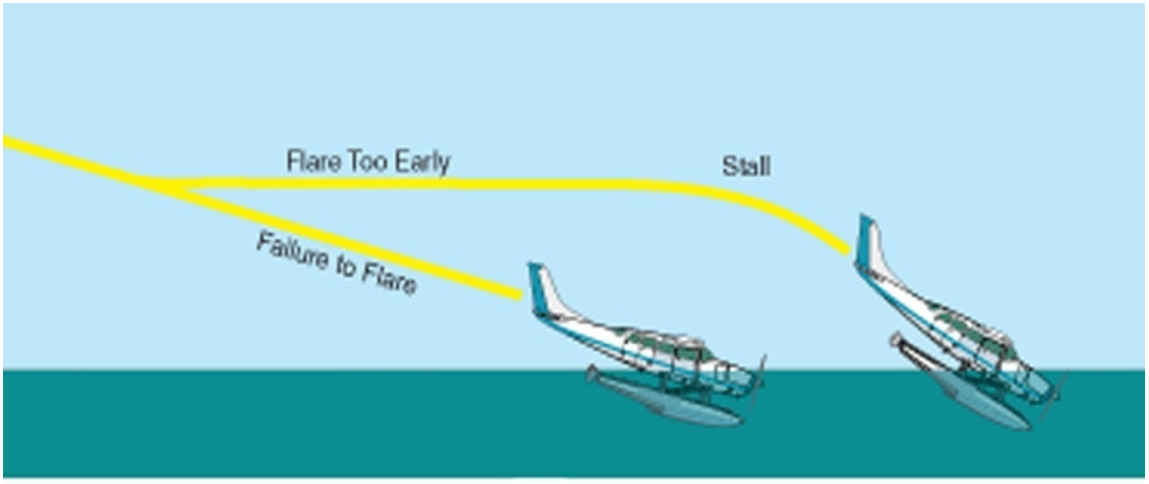
- Throttle……as necessary to allow low approach over LVR – Last Visual Reference
- Airspeed……**65** MPH
- Trim……as required

After Shoreline or LVR - Last Visual Reference

- Nose up **5** degrees to landing attitude
- Throttle……**1800** RPM (Blue Line on tach)
- This will give you a **100-150** feet per minute descent to the water

After Touchdown

- Throttle……close slowly when settled on water
- Stick……slowly aft as floatplane falls off step



The glassy water landing attitude is the same as your step taxi and normal landing attitude, which is approximately 5 degrees nose up.

Three simple steps for a good glassy water landing are:

PITCH –Up 5°

POWER – 1800 RPM (Blue Line on tach)

PATIENCE – Wait till touchdown and hold some back pressure on yoke

Confined Area Approach and Landing

Downwind

- GUMPS check
- Carb Heat……check then off
- Trim……as required

Abeam intended Touchdown Point

- Throttle……**2000** RPM
- Flaps……..**10** degrees
- Airspeed……..**85** MPH
- Trim……as required

Base Leg

- Throttle……**1700** RPM or as necessary
- Flaps……**20** degrees
- Airspeed……**80** MPH
- Trim……as required

Final

- Throttle…….as necessary to approach low over obstacle
- Flaps……**30** degrees
- Airspeed……**65** MPH (maintain the same descent angle as other landings)
- Trim…….as required
- Nose UP **5** degrees to landing attitude 10 feet above water and add power to **1300** RPM, carry power until touchdown

Forced Landing

At first sign of an engine failure attempt to troubleshoot the problem using the memory items from the emergency checklist (carb heat, fuel quantity, fuel selector, mixture, primer handle, mags, etc.) If a restart is unsuccessful, an emergency landing site must be selected. Remember: Floatplanes have more drag than most land planes; therefore they do not glide as far.

Water Landing

- Best Glide…… **80** MPH
- Flaps……**UP** until you have made it to the water, then 10-20°
- Trim……as required
- Be careful not to flare too high!!! - 10 Feet!

Turf Landing

- Best Glide……..**80** MPH
- Flaps……**20** degrees when landing is assured
- Trim……as required
- Stick……full aft on touchdown

Emergency Descent

In the event an emergency descent is required a standard emergency descent is suggested.

Emergency Descent

- Airspeed…… **80** MPH (Top of the white arc in an actual emergency)
- Flaps…… **30** degrees
- Bank……**45** degrees
- Trim……as required

FLOATPLANE PARKING

There are several ways we can secure the floatplane on the water:

- Docking
- Beaching
- Mooring/Anchoring
- Ramping

Remember to remove seatbelts, headsets, and unlatch cabin doors before docking/beaching. It is up to you to catch the floatplane!

Parking Checklist:

- 3H's "Headsets, Harnesses, Hatches"
- Radios off
- Master Switch off
- Passenger brief

Note: It takes about 5 seconds for the engine to shut down after the mixture is pulled. As long as the prop is turning, it is providing thrust. Plan accordingly.

Based on wind conditions sailing can be used to approach a dock or a beach. When approaching the dock, be extremely careful the back of the floats (and rudders) do NOT hit the dock.

Docking

When possible, the floatplane should always be docked into the wind. Docking with a crosswind must be done with extreme caution. The worst scenario is crosswind docking with the wind coming from the dock side because the floatplane tends to turn (weathervane) into the dock rather than blow away from it.

Think of docking like flying a traffic pattern (downwind, base, final). This allows you to get the floatplane lined up with the dock long before you get to it. A floatplane is not a boat. It is far less maneuverable than most boats and approaching the dock at too much of an angle can cause damage to the bow of the float if you ram the dock nose first. Approach parallel to the dock approximately 6-10" away. Take your time and use plenty of room.

Beaching

Before attempting to beach the aircraft, be sure of the shoreline. Rocks can cause serious damage to the floats. Approach the beach straight on as slowly as possible. Cut the mixture before reaching shore depending upon wind conditions. Don't forget to turn the master switch and mags off before stepping out. Turn the aircraft tail-in towards shore and secure with ropes to at least two points.

Mooring/Anchoring

In some cases where floatplane docks are not available and the shoreline is not suitable for beaching. It may be necessary to moor the floatplane offshore. The line from the mooring buoy should be attached to the front cleats of both floats or to the hub of the prop. Ensure that there is plenty of room for the plane to swing freely 360 degrees and won't hit anything in case the wind shifts.

RAMPING

Idle taxi the aircraft to the wooden ramp at 800 RPM until it comes to a stop, then mixture, mags, master off and water rudders up. Most floatplane ramps will be at 5-10 degree incline on the shoreline and offers good protection for the floats with a rocky or unfavorable bottom.

*** AFTER ENGINE SHUT DOWN ***

MASTER – MIXTURE – MAGS – RUDDERS UP