Backcountry Flying Experience
Single Engine Seaplane Syllabus

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Single-engine Seaplane Training

BASIC COURSE

Backcountry Flying Experience offers single engine training in a Piper PA-12 160HP floatplane. The course includes dual flight time, ground instruction, study materials and FAA checkride. This course is designed to train the student to handle a single-engine seaplane confidently, not just to pass a basic requirement. Students are expected to solely and competently fly the aircraft at the end of the course.

4.0 Hours seaplane operations:
Aircraft familiarization/operation; seaplane fundamentals; water takeoff and landings

1.0 Hour Prep Work
Checkride Preparation

1.0Hour Checkride
Private or Commercial FAA Checkride

These are average flight times based on a student who is single engine current, especially with aircraft handling in slow fight, take-off, landings and emergency procedures. These flight times may be adjusted to fit the student's individual needs. If a student is not current they may need additional time, but most students complete the course within the given time.

ASES COURSE PRICE $1500.00

ADVANCED HIGH MOUNTAIN LAKES COURSE

Eight hours of flight instruction including high elevation mountain lakes and additional ground Instruction.

ADVANCED COURSE PRICE $1800.00

Additional dual $225.00 per hour

Suggested Reading Materal: FAA-H-8083-23 Seaplanes, Skiplane Float Operations Handbook Available at www.faa.gov

PA-12 FLOW CHECK

Take off

left to right

fuel left tank

flaps one notch

carb heat off

trim

area clear

water rudders up

After take-off

60 mph flaps up

fuel right tank

Landing

right to left

carb heat on

0ne notch flaps

fuel left tank

carb heat off

water rudders up

AIRCRAFT SPECS:

1949 Piper PA-12 Super Cruiser - LYCOMING 0320 160 HP

VX 65
VY 75
VFE 85
VSO 40
VS 44
VNE 138
VNO 110
Best glide 60-65

TO'S & LND'S

X-W Flaps 1 notch

Rough Water, full flaps

Landing glassy water, full flaps speed 50/45 @ 1800 rpm
Confined Area take-off, 1 notch flaps climb @50
Confined Area landing, full flaps 50/45

Air Craft Systems

Gross Wt. 1838
Empty Wt.1282.8 Arm 11.9 Moment 15,265.32
Useful load 555.2 fuel +23, oil -41, pilot +6, passenger +34, Baggage +56, max 65lb. aft baggage +84, max 20lb.
Float Displacement 2000 lbs. / 9 =2222 lbs. These floats are over floated for this a/c. That's good!
They will support a/c gross wt. of 2222 lbs. They have 6 pump outs per float.
If 2 compartments are full of water they still float.
Fuel 38 gal 8gal per hr. Approx range 330 miles in 4 hrs. 30 min reserve.
8 qts. Oil Aeroshell 100W
Battery 12V located under pilot seat.
55 amp alternator

Backcountry Flying Experience
Piper PA-12 160HP
N49SL
TRAINING PROCEDURES

PRE-FLIGHT

Same as land airplane plus:

1. Pump floats
2. Check water rudders and cables
3. Check fly wires and struts
4. Check propeller for water damage
5. Check inside engine area for bird nests

PREFLIGHT BREIFING

1. Know how to operate the seatbelts and shoulder harness
2. Understand how to exit the aircraft in an emergency
3. Locate the fire extinguisher, paddle

PRE-CAST OFF

1. Water rudders down (tanks mixture mags & switches)
2. tanks- left tank
3. Mixture-full rich
4. Mags- left mag
5. Switches-master
6. Clear area & start

TAXI / RUN-UP

Stick back 1700 check mags carb heat

STEP TAXI

1. No flaps
2. Stick back eases power to full power
3. On step reduce power to stay on step below 30 mph or preferably slower
4. When turning use full aileron in direction of turn
5. In turns add power to stay on step
6. Do not shut down in a turn

AIR WORK

1. Slow flight
2. Stalls flaps on & off power on & off-dutch rolls

NORMAL TAKEOFF

1. Pre take off flow check, area clear
2. Stick back
3. Smoothly apply full power
4. Maintain directional control with rudder
5. Keep stick back until you see the nose rise twice
6. Reduce back pressure and allow aircraft onto the step
7. You will be able to feel the spot where there is the least amount of drag
8. As airspeed increases allow the aircraft to fly off the water about 40 mph accelerate to 60 mph
9. When airspeed and altitude permit, flaps up and climb out at 70 MPH turn xwind @300 ft above water

ONE FLOAT TAKEOFF

1. Perform pre-takeoff flow check
2. Follow procedure for normal, glassy water, or cross wind takeoff.
3. After airplane is on the step and approaching flying speed, apply full aileron to right or left depending on which float is to be raised.
4. After float comes off the water, neutralize ailerons
5. Maintain proper takeoff attitude and direction.
6. Accelerate to lift off speed. Airplane will fly off water at 40 to 45 mph at 1 notch of flaps
7. Increase speed to 60 mph and bring up flaps
8. Climb at 70 mph

CROSS WIND TAKEOFF

1. Perform pre-takeoff flow check.
2. 1 notch flaps in light to moderate wind, 0 degrees flaps in moderate to high wind.
3. Where possible begin takeoff into the wind.
4. stick all the way back.
5. Full power.
6. As necessary turn crosswind and establish direction while applying aileron into the wind.
7. As airplane comes up on the step stop any porpoising continue to hold aileron into the wind.
8. When downwind float lifts off water, neutralize ailerons
9. Maintain proper takeoff attitude and direction.
10. Accelerate to lift off speed.

CROSS WIND LANDING

1. Fly over landing area and observe wind, waves, and check for debris.
2. Line up with point of land in distance to observe drift.
3. Drop wing into direction of wind and slip into wind to stop drift. Avoid tendency to watch the waves and avoid drifting across water at same speed as the waves.
4. Flare – raise nose to landing attitude, increase power as needed to slow descent while Maintaining landing attitude and slipping into wind.

5. After touchdown – maintain directional control with rudders as airplane will want to turn toward upwind float as it will be the first to touch the water.
6. Slowly bring stick to full back position

Continue to hold aileron into the wind. After landing do not turn up wind

NORMAL LANDING

1. Pre landing flow check, Select and inspect landing area check for debris & observe wind & waves
2. Identify wind direction
3. Enter pattern at 500 ft above water
4. Abeam landing point
5. Turn base and set flaps one notch
6. Airspeed 60 MPH
7. Reduce power as necessary to maintain stable descent rate
8. Turn final at a safe altitude and continue normal descent
9. Check landing area
10. Level over water 10 to 15 feet
11. Judge height and begin landing attitude
12. After touchdown, power to idle and stick full back
13. Water rudders down

ROUGH WATER TAKEOFF

1. Full Flaps for rough water
2. Apply takeoff power
3. Allow aircraft on step
4. Fly aircraft off water as soon as possible
5. Stay in ground effect to get to safe airspeed
6. Raise flaps one notch
7. Airspeed to 60 before climbing
8. When airspeed and altitude permit, flaps up, climb at 70 mph

ROUGH WATER LANDING

1. Set up like normal landing
2. Use FULL flaps on final
3. When ready to touchdown, reduce power and set pitch for landing attitude so the aircraft touches down as slowly as possible with the lowest possible rate of decent.
4. At touchdown, immediately reduce power to idle
5. As aircraft begins to settle, smoothly apply a small amount of forward pressure with stick. This will help the front of the floats cut through the waves and not pound over each one. Be cautious with applying forward pressure, wait until the aircraft has settled in from landing and power is at idle.
6. When aircraft is off the step, bring stick full back

CONFINED AREA LANDING

Fly over landing area and observe wind, waves, and check for debris

1. Downwind and opposite point of intended landing – perform pre-landing flow check, flaps 1 notch, power as needed
2. Base leg – speed 55mph, full flaps , power 1500 rpm or as needed
3. Final approach – speed 50 mph, power as needed
4. maintain a steady decent using power to control altitude & attitude to control a/s
5. aim slightly before your touch down point Flare – raise nose to landing attitude (avoid tendency to flare too high) 45 mph or slower, power as needed or off while maintaining landing attitude
6. After touchdown - slowly bring stick to full back position (avoid tendency to release back pressure after landing)

CONFINED AREA TAKEOFF (OBSTACLE CLEARANCE)

1. Perform pre-takeoff flow check
2. 1 notch flaps
3. stick all the way back
4. Full power
5. After second rise of nose release back pressure
6. As airplane comes up on the step stop any proposing
7. Find the slippery spot by making small changes in attitude forward and backward
8. Rotate airplane at 40 mph
9. Increase speed to 50mph and climb
10. After clearing obstacles,
11. Increase speed to 60 mph
12. Climb at 70 mph

POWER OFF LANDING

1. Power off
2. Speed 70 mph, 0 degrees flaps, When water landing is assured add 1 notch flaps
3. Maintain 65 mph approach speed into flare
4. Flare – SLOWLY raise nose to landing attitude (avoid tendency to flare too high), slowly
5. bleed off airspeed and altitude while maintaining landing attitude
6. After touchdown – slowly bring stick to full back position (avoid tendency to release backpressure after landing).

GLASSY WATER TAKEOFF

1. Apply takeoff power
2. Allow aircraft onto the step
3. You may feel the floats want to stick on the water. Find the spot where there is the least amount of drag
4. If necessary, smoothly apply full aileron to lift one float. Maintain directional control with rudders.
5. Let aircraft fly itself off the water.
6. Establish positive rate of climb
7. Climb to 300 ft before making turns
8. When airspeed and altitude permit, flaps up, and climb out at 70 MPH

GLASSY WATER LANDING

1. Extra long approach pattern
2. Choose a reference point
3. Enter downwind, when 45 º past reference point reduce power to 1700 RPM
4. White arc, set flap 2nd notch
5. Setup pattern so you will be on final at least 200 feet above the water
6. Extra long final 65 MPH and no more than 500FPM decent
7. Fly over reference point
8. When you are over the reference point, set pitch for 50 MPH (slight nose up attitude from normal landing attitude)
9. Set power to maintain 150 FPM descent, 1800 RPM should give you that
10. Pitch for 40-43 MPH, power for descent
11. Once established in proper configuration, wait for aircraft to touchdown
12. Do not flare!!!
13. Upon touchdown power to idle and stick all the way back

If you are fast and or flat, the aircraft will want to nose over due to the extra drag induced by the smooth glassy surface.

EMERGENCY LANDING (LOSS OF POWER) AT ALTITUDE

1. Turn immediately toward the water
2. Speed 60 to 65, 0 degrees flaps
3. Perform pre-landing checklist
4. When water landing is assured increase speed to 75 mph, add flaps as needed
5. Maintain 75 mph approach speed into flare
6. Flare – SLOWLY raise nose to landing attitude (avoid tendency to flare too high), slowly
7. bleed off airspeed while maintaining landing attitude
8. After touchdown – slowly bring sick to full back position (avoid tendency to release backpressure after landing

SAILING

1. Engine off
2. Water rudders up
3. Turn stick in direction you want the tail of the aircraft to go
4. Step on opposite rudder
5. You can also use flaps and doors to help sail but only straight back.

DOCKING

1. When approaching the dock be sure your seatbelt and headset are off
2. Open door
3. Approach the dock from the downwind side and into the wind
4. Approach as slowly as possible with idle power left mag and carb heat on
5. Hand on mixture- not throttle- shut down so aircraft floats to dock at slowest speed.
6. Account for momentum
7. Mixture out mags off
8. Master off
9. Exit aircraft and secure to dock

BEACHING

1. Fly over and check for any obstructions
2. Land and idle taxi past beach for closer look
3. If possible pick a beach that faces into the wind
4. Approach the beach as slowly as possible
5. Pull mixture early to ensure that aircraft glides slowly onto the beach
6. It is better to shut down early and use your paddle if you are not 100% sure beach is
7. free from obstructions under the surface or on the shore.
8. Contact beach, raise water rudders
9. Exit aircraft and turn plane around
10. Lift empennage and pull onto the beach
11. Secure back of floats on beach

MOORING

Fabricate rope so it can be tied to two front cleats of the floats with the middle tied to the buoy. Alternatively, fabricate halter for propeller to tie to buoy. Approach buoy into the wind.

RAMPING

Approach ramp with wheel and yoke all the way back. About 10 feet from ramp, apply power sufficient to slide airplane up ramp. The a/c will ride up the ramp on the bow wave.

Boats and Floats

Written by: Dave Wiley/ Dave Wiley Seaplanes

1. Do not fly over boats or people if you are below tree top level. Go around them just as you would if you were on the surface
2. Do not land behind a sail boat on a tack. He does not see you and will come about in front of you. Guaranteed!
3. Do not land in front of a ski boat that is dead in the water. He is watching the skier and could make a fast start at any moment.
4. Do not land alongside a boat that is pulling a skier. If the skier falls down the boat will turn in front of you.
5. Stay in the channel when on the surface or anywhere near it, but do not force another vessel to yield the channel when you could more easily do so.
6. When on a collision course with another vessel, be the first to turn. This tells him that you see him and what you expect him to do.
7. Landing in the smooth water behind a boat is preferred to landing in the bow wake, but if it is a large boat you will find yourself landing in hard to see swells. You may also find a fallen skier from a small boat.
8. Rules of the road for both water and air are generally based on the more maneuverable craft yielding to the less maneuverable one. When we are taxiing at high speed or flying low we are the most maneuverable, having the option of going up, and must yield to everyone.
9. When we are in displacement mode with the wind blowing, we are the least maneuverable, but other don't know it so don't expect them to help you with your problem.
10. The only thing predictable about a personal water craft (Jet Skis) is that they will not go straight and the driver will not look before he turns. Stay away!

PA-12 Wt. & Bal.

EMTY WT.	ARM	MOMENT
1282.8	11.9	15265.32
fuel	23	
oil	-41	
bag	56	
pilot	6	
pass	34	
aft bag	84	

total wt.	arm	total moment

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total wt.	arm	total moment

EXAMINER'S PRACTICAL TEST CHECKLIST

Airplane Single-Engine Land
And
Airplane Single-Engine Sea

APPLICANT'S NAME_____

LOCATION_____

DATE/TIME_____

I. PREFLIGHT PREPARATION

F. Performance and Limitations (ASEL and ASES)
G. Operation of Systems (ASEL and ASES)
H. Water and Seaplane Characteristics (ASES)
I. Seaplane Bases, Maritime Rules, and Aids to Marine Navigation (ASES)

II. PREFLIGHT PROCEDURES

E. Taxiing and Sailing (ASES)

III. AIRPORT AND SEAPLANE BASE OPERATIONS

C. Airport/Seaplane Base, Runway, and Taxiway Signs, Markings, and Lighting (ASEL and ASES) *FAA-S-8081-12B* 1-xii

IV. TAKEOFFS, LANDINGS, AND GO-AROUNDS

A. Normal and Crosswind Takeoff and Climb (ASEL and ASES)
B. Normal and Crosswind Approach and Landing (ASEL and ASES)
E. Short-Field (Confined Area—ASES) Takeoff and Maximum Performance Climb (ASEL and ASES)
F. Short-Field Approach (Confined Area—ASES) and Landing (ASEL and ASES)
G. Glassy Water Takeoff and Climb (ASES)
H. Glassy Water Approach and Landing (ASES)
I. Rough Water Takeoff and Climb (ASES)
J. Rough Water Approach and Landing (ASES)

IX. EMERGENCY OPERATIONS

A. Emergency Approach and Landing (Simulated) (ASEL and ASES)
B. Systems and Equipment Malfunctions (ASEL and ASES)

XI. POSTFLIGHT PROCEDURE

C. Docking and Mooring (ASES)

ASES PRACTICAL TEST

Oral:

- Seaplane characteristics
- Seaplane bases, rules and aids to marine navigation Performance and limitations
- Seaplane systems
- Pre-fight visual inspection
- Taxiing
- Sailing
- Seaplane base landing area/runway markings and lighting
- Normal, rough-water, glassy water, confined area, crosswind takeoff and landings Emergency approach and landing
- System and equipment malfunction Docking, beaching, ramping, mooring and anchoring

Flight:

- Confined area takeoff from pond
- Fly to lake and determine wind direction and type of landing Normal takeoff and landing
- Confined area landing
- Rough water t/o and landing
- Glassy water t/o and Landing
- Emergency procedures
- Step taxi and sailing
- Docking
- Beaching
- After landing securing

<u>Performance and Limitations</u>

I. Compute a weight and balance for this flight
II. What is the max gross weight for this aircraft?
III. Explain how you would take-off at a high elevation lake? Performance limitations you would expect?
IV. Where in the POH can you find floatplane performance data?

<u>Operation of Systems</u>

1. What engine is on this aircraft?
2. How much oil does it hold?
3. How much usable fuel does the PA-12 hold?
4. How are the water rudders connected to the air rudder?
5. When do you use water rudders?
6. How many volts is the electrical system? battery located on this aircraft?
7. What size floats are on this aircraft?
8. What does the # 2000 mean?
9. How can you determine what size floats are required for the aircraft?
10. What are the different parts of the floats

Water and Seaplane Characteristics

1. What methods can be used to determine wind direction from the air?
2. What methods can be used to determine wind direction on the water?
3. At approximately what wind speed do white caps form?
4. When flying to a new lake or new landing area why is it important to fly over the landing area?
5. What are you looking for when picking a landing area?
6. Why is NOISE ABATEMENT so important for floatplanes?
7. When flying around boats what distance should you keep?
8. Why do we avoid landing behind a ski boat or Jet Ski?
9. How much wind is too much wind?
10. When are we most likely to find debris on the lakes?
11. What is proposing and skipping and how do we correct for each?

Seaplane Bases, Maritime Rules and Aids to marine Navigation

1. How do you identify a seaplane base on a chart?
2. How do you know what lakes you can land at?
3. What are the right-of-way rules for water operation?
4. Where can you find this information?
5. If a lake is not listed in the water landing directory ... what should you do?

Taxiing: and Sailing

1. What are three forms of taxiing a seaplane? Explain each
2. What is the maximum speed for idle taxi? Why?
3. How do you want to cross a boat wake at idle taxi?
4. What are some methods for turning out of the wind?
5. Why do we avoid plow turns?
6. When step taxiing, what is the most dangerous turn?
7. When do you want to step taxi?
8. What are the control inputs for sailing?
9. When sailing, where do you want the water rudders?
10. When would you use sailing?

Seaplane bases, Runway, and Taxiway Signs Markings, and Lighting

1. What publications are available for the seaplane pilot to obtain information on seaplane bases and services?
2. What color is a seaplane base beacon

Takeoff and Landings

1. Explain the dangers of a glassy water takeoff and landing.
2. If you have an engine failure over glassy water where is the best place to land?
3. Explain how you would set up for a glassy water landing.
4. Why is it important to have a good reference for a glassy water set-up?
5. After takeoff on glassy water, why do we wait till 300ft AGL before turning?
6. Explain a rough water takeoff and landing
7. Explain a confined area takeoff and landing
8. Why do we avoid rough water?
9. Explain a crosswind takeoff and landing

Emergency Operations

1. What is best glide?
2. Why do you need extra airspeed on final?
3. Why is it important to get on final high in a power off landing?
4. What could be the cause of a loss of RPM while taxiing on the water?
5. What type of taxiing can cause the aircraft to overheat?
6. Describe the procedure for an engine failure after takeoff?
7. When going to the mountain lakes what extra equipment do you need to take?

After Landing Parking and Securing

1. When going alongside a dock or onto a beach, what is the shutdown procedure?
2. Why is important to get the mags off before getting out of the aircraft?
3. After landing when do you remove seatbelts and headset? Why?
4. What are you looking for when approaching a new dock?

Docking and Mooring

1. What is the best way to approach a dock?
2. When approaching a new dock what are you looking for?
3. How can you slow the aircraft down without shutting down the engine?

Ramping Beaching

1. Explain what you are looking for when beaching.
2. Do you want to beach into the wind or downwind?
3. Explain the beaching process.
4. How do you secure the aircraft?
5. Explain ramping?