Republic Seabee

Initial Checkout Syllabus

By
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Note:
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INTRODUCTION

The purpose of this syllabus is to provide guidance through the checkout process in the Republic Seabee. It should be noted that every Seabee is different. One could not possibly include in this outline every modification that Seabee's have acquired over the years. The approved FAA Flight Manual (AFM) along with any STC's should be referred to if questions arise that are not covered in this document. This document is NOT FAA approved! It is intended only as a guide for the trainee and the flight instructor. Offense will not be taken if you modify, change or add any information you deem necessary to safely operate your Republic Seabee. The trainee/instructor take full responsibility for the safe operation of their Seabee!

Most insurance companies require a certain amount of minimum training before they will cover you and your Seabee. This syllabus is not recognized by any of them but should fulfill most insurance requirements and will make your training a little easier and more fun. If you are prepared (or forewarned!) it makes for less stress and a more productive day of flying. It may even shorten the checkout period.

Each lesson plan contains a Lesson, Objective and Description. Specific notes are added when there is no danger of ambiguity. Diagrams are given when necessary and some lessons contain tips and tricks where appropriate.

Keep in mind that more than one lesson can be accomplished in any given period of time, however some may be recurring and repetitive to insure the lesson has been thoroughly understood. It is assumed that the trainee has basic aeronautical knowledge on subjects such as fuel management, navigation, ATC procedures, Complex/High(er) Performance Airplane systems, etc.

Extra blank pages at the end of this syllabus are provided to add your own lesson plans and checkout notes. I hope this will help you and please, fly safely!

Republic RC-3 Seabee

Instructor and Trainee
Initial Checkout Syllabus

Lesson 1: Student and Instructor familiarization.

Objective: To gain information and establish a rapport with the prospective trainee.

Description: The instructor should check licenses and medical certificates to insure compliance with pertinent FAR's and good operating practices. Ask questions about the trainee's experience level and especially previous Seabee experience. Ask about any medical conditions that you should be aware of. Brief the trainee on this syllabus and training aids that will help during the transition. Reading material (Seabee manuals, AFM, Seaplane books, etc.) should be made available prior to the first flight in order to efficiently use the time made available for training.

Offer the trainee a brief resume of your credentials and interests as flight instructor. Answer any questions the trainee may have. This may be a good time to review the Seabee manual for general procedures and flight characteristics.

Assure the trainee that this will not be a 'check' ride. The purpose of this exercise is to become familiar with the Seabee's character and to promote safe operating techniques. The process should be a relaxed and fun!

Notes:

Lesson 2: Seabee familiarization and checklist use.

Objective: To acquaint the trainee with the Republic Seabee controls and indicators and checklist usage.

Description: An exterior walk-around should be accomplished pointing out the peculiarities and unique features of the Seabee. Special attention should be devoted to safety related items such as floatation devices, signaling device, fire extinguisher, hull plugs, ELT, extra hydraulic fluid (within reach!), etc. It must be pointed out that loose items left in the engine compartment will go through the propeller!

Explain all external parts, vents, fluid capacities and how to verify quantities. Check hydraulic system operation and show the trainee how to pressurize it and that hydraulic quantity must be checked with flaps up and gear down. Be sure to demonstrate checking the fuel quantity manually with the dipstick. Emphasize the importance of never trusting an electronic fuel gauge. Point out the fuel sump(s) and how to check for water or contamination.

Special attention should be given to the landing gear and brake inspection along with explanation of how they operate. Point out the mirrors located on the floats for gear inspection in-flight.

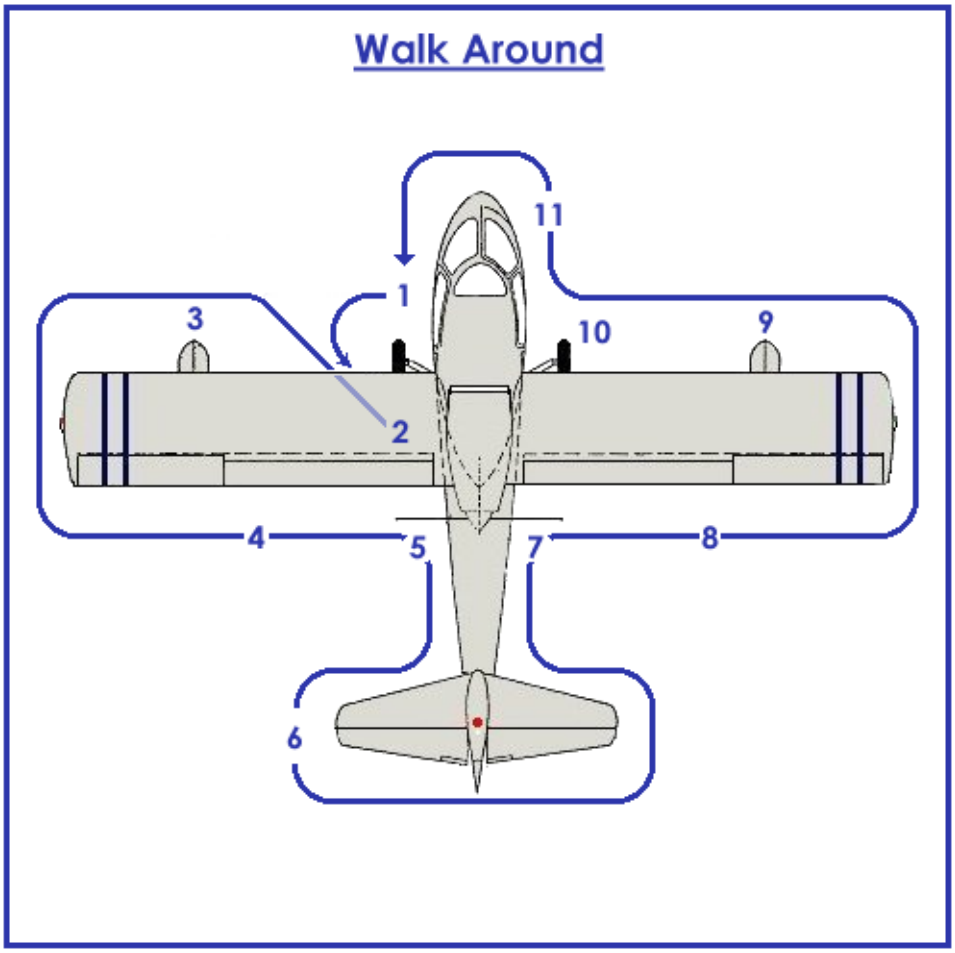
The trim system should be carefully checked prior to flight. Advise the trainee of the compliance with Airworthiness Directive (A.D.) 48-01-03 for excessive elevator trim play. Explain that the Seabee is a “trim” airplane and one should not leave home without it! Just look at how big those trim tabs are. Why do think Republic put two on the Seabee?

Answer any questions the trainee may have and clarify any misconceptions. Review limits as they arise during the exterior check.

Let the trainee sit in the pilot’s seat and explain all controls, indicators and switches. Make sure the trainee touches the controls and switches to gain familiarity. Simulate a start, engine warm-up procedures, engine limits, takeoff and landing procedures. Review Seabee limitations and placards as they arise during the conversation. Point out and explain over head controls (propeller reverse, trim and possibly throttle and engine controls). Insure that the trainee has a clear understanding of all controls and review normal checklist use. O.K., take a break!

Notes:

(An excellent reference for this lesson is “Seabee Familiarization and Walkaround” by Capt. Richard W. Sanders. This is available free from the Seabee Website or e-mail: smestler@bellsouth.net and one will be sent to you post haste!)



1-Interior Check
2-Fuel Check, Sumps, Wheels
3-Float, Mirrors
4-Ailerons, Flaps, Wing tips
5-Hull, Fuel Sump
6-Tail wheel, Emmpenage
7-Engine, Propeller
8-Ailerons, Flaps, Wing tips
9-Float, Mirrors
10-Wheels, Brakes
11-Windows, Doors

Lesson 3: Pre-Flight procedures.

Objective: To familiarize the trainee with engine starting, taxiing and pre-flight checks. Checklist use should be emphasized.

Description: Review the start procedure and insure the trainee is aware of checks to be made before and after engine start. For example: Before starting, gear selector in down position, flap selector up and hydraulic system pressurized before start and taxi to assure tailwheel is locked down. After the start, check oil pressure and engine temperatures.

Explain the importance of a thorough engine warm-up before high power settings are to be used. Review pre-taxi procedures such as radio checks and additional cockpit setup.

Practice taxiing and making turns. Demonstrate Seabee geometry on the ground and sight cues to insure proper alignment and obstacle clearances. The wingtips cut the widest arc when turning sharp. The rudder is a close second. Explain braking techniques and parking brake use. Complete the engine run-up and demonstrate use of propeller reverse. Review limits for reverse: 1750 RPM with older propellers and keep the doors closed when using reverse! Yes, all the doors! Complete the before takeoff checklist.

Explain the use of locking/steerable tailwheel as appropriate.

This lesson is ongoing as every flight contains an engine start, run-up, etc. Proficiency should be gained after the first few flights. Answer any questions the trainee may have as you go through each procedure.

Notes:

Lesson 4: Airport (Land) Takeoff Procedures.

Objective: To familiarize the trainee with the different configurations for takeoff. Flaps, no flaps, effect of weight and temperature and especially density altitude.

Description: The trainee should have a clear understanding of the effects of atmospheric conditions on the performance of the Seabee (especially with lower power engines installed). Consult the performance charts (if available) for take-off performance computations. Explain the effect that flaps have on takeoff/climb and how to set flaps if they are to be used. Emphasize that the neutral position of the flap selector will lock the flaps in place until retraction is required. Both partial flap and no-flap takeoffs should be accomplished to see how the Seabee performs in both cases. Consider using an inch or two less manifold pressure on a takeoff to simulate a high-pressure altitude/high temperature day if airport conditions permit. Remind the trainee that the torque and P-factor are reversed because of the pusher configuration of the Seabee. LEFT rudder may be in order on takeoff. Point out that the propeller blast on takeoff is directed straight over the empennage and that little, if any control delay will be noticed.

Just prior to takeoff, review with the trainee the after takeoff procedures:

1-Takeoff power set. Review limit at T.O. power if appropriate (i.e. 5 min. for GO-480)
2-Keep airplane straight (LEFT rudder may be required)
3-Takeoff speed-about 70 MPH
4-Flap and Gear retraction point (>250' AGL and 80 MPH)
5-Propeller RPM/Throttle reduction (climb power)
6-Climb speed (80 or 90 MPH)
7-Confirmation of Landing Gear and Flap position
8-After takeoff checklist: Flaps, Gear, Engine instruments.

Practice takeoffs and landings in the traffic pattern until the trainee feels comfortable and you are assured he/she has the takeoff procedures understood. Crosswind takeoffs should be accomplished if possible, emphasizing correct aircraft control inputs. Remind the trainee of the huge vertical stabilizer on the Seabee and the effect a crosswind has on ground tracking. Braking may be required to keep ground track on course or for turning downwind.

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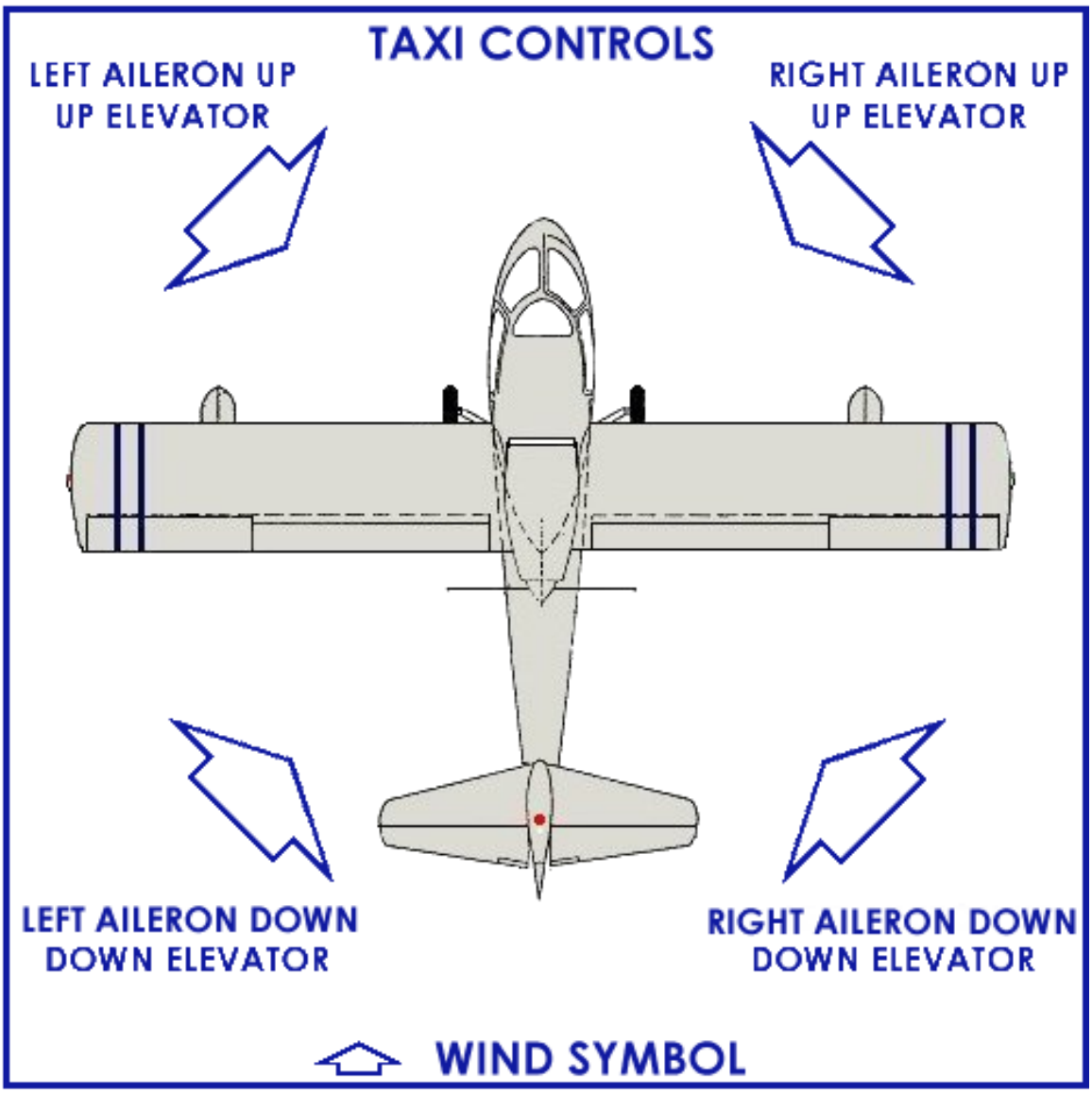

TAXI CONTROLS
LEFT AILERON UP
UP ELEVATOR
RIGHT AILERON UP
UP ELEVATOR
LEFT AILERON DOWN
DOWN ELEVATOR
RIGHT AILERON DOWN
DOWN ELEVATOR
WIND SYMBOL

Lesson 5: Level off, cruise and airwork.

Objective: Familiarize the trainee with trim use and power settings for cruise. Flight characteristics should be demonstrated at various power settings and flight regimes.

Description: The trainee should be exposed to the various trim requirements for the Seabee. Demonstrate that the Seabee is a 'trim' airplane and one should not fly without it. Level off procedures and cruise power settings should be discussed and demonstrated. The power increase/decrease sequence should be explained.

> To increase power: Mixture rich, Propeller forward, then increase throttle to climb setting.
>
> To decrease power (for cruise): Reduce throttle, reduce propeller RPM, then lean mixture (if required).

Climbs and descents should be accomplished leveling off for a period of time so that experience with the trim may be gained. Try flying the airplane during climbs and descents with trim only! Do this at various speeds. It's a good exercise in airplane/power control. Explain that the trim system is independent of the elevator system and can be used for pitch control if the elevator system becomes inoperative.

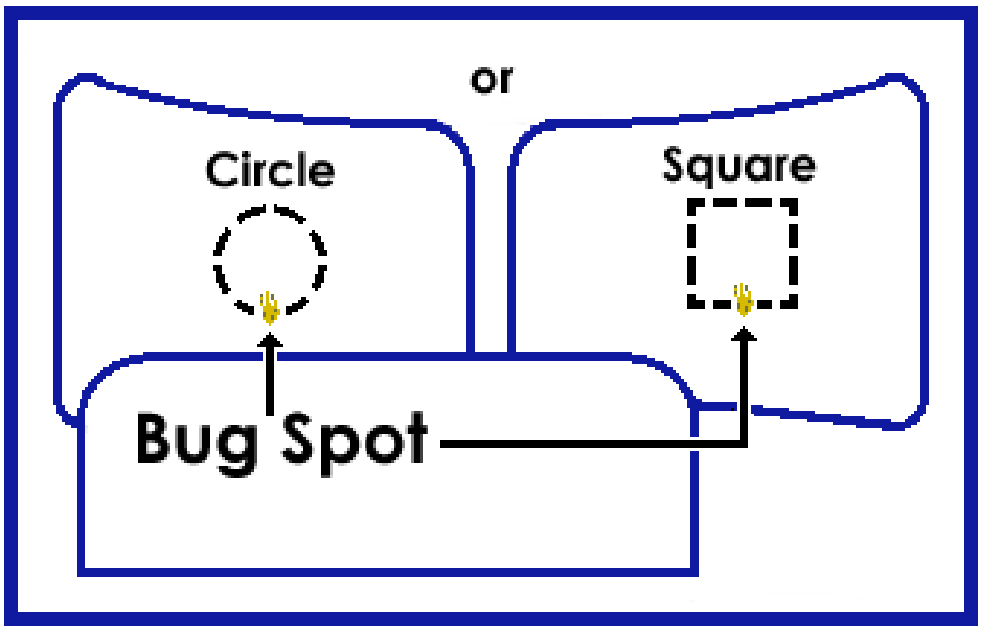
Power setting charts should be consulted if available and special emphasis on smooth engine/propeller control movements should be reinforced. Review engine/gearbox limitations.

Perform clearing turns prior to any maneuver!

Turns of 360° should be performed at differing bank angles to familiarize the trainee with the flight characteristics of the Seabee. Talk through the slow-flight procedure and note the power settings for various speeds. Some of these settings will be used in the traffic pattern.

Demonstrate power-on/off stalls with flaps up and down taking notice of the indications the Seabee gives when approaching a stall (buffet only, no aural warning). Remember to keep the power up slightly even during power off stalls due to the engine gearbox limitation (don't let the propeller drive the engine!)

Try a few rudder coordination exercises so the trainee can gain confidence and experience in how the Seabee controls feel in flight. An exercise could be to pick a point on the windshield (a smashed bug) and with rudder and all other flight controls, attempt to make squares or circles with that point keeping the wings level (see diagram below). Try both directions and different size circles and squares. It will quickly be apparent to all involved if control coordination needs improvement. These exercises require cross controlling to keep the wings level. OK, take another break or stop for gas.



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Lesson 6: Landing (Land) procedures

Objective: To insure the trainee can accomplish safe and well-planned landings at an airport.

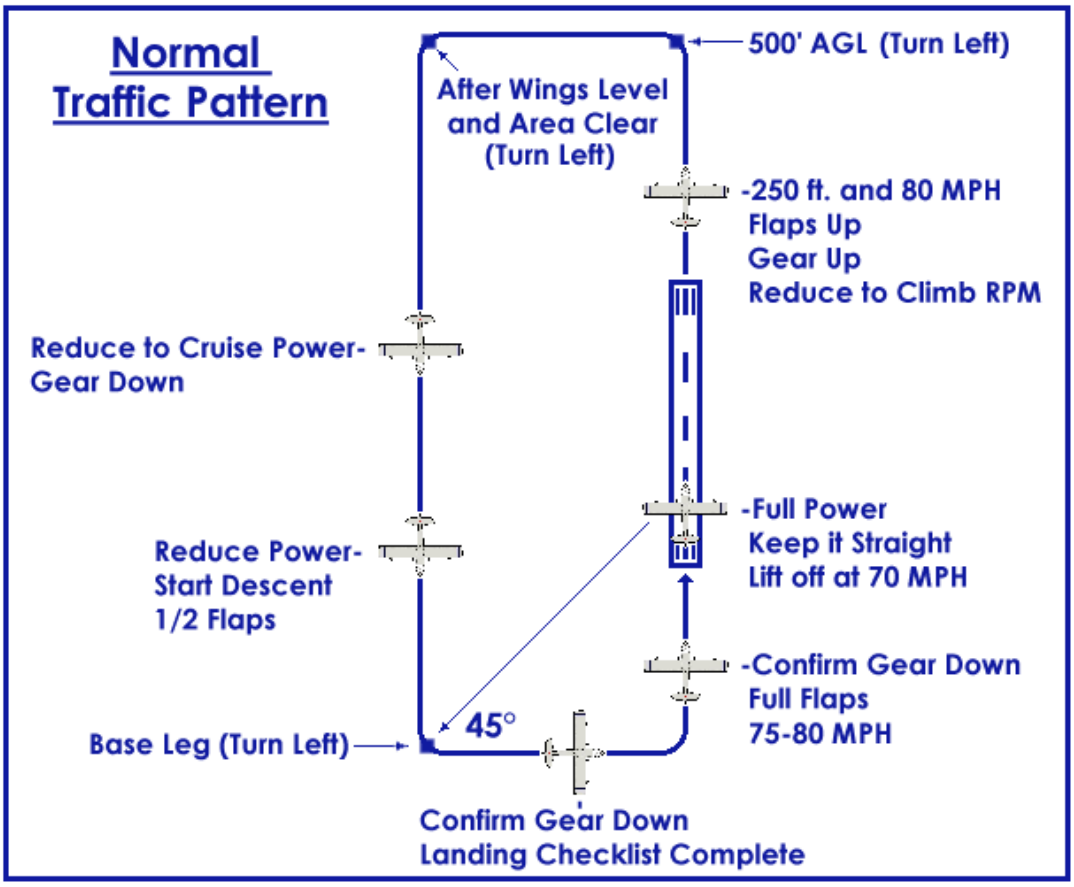
Description: Due to the assumed experience level of the trainee, traffic patterns and entry procedures should not have to be briefed, however if any questions exist, clear them up before the traffic pattern is entered. Discuss planning for the touchdown and aircraft control during the landing with emphasis on crosswind techniques if required.

Prior to the traffic pattern, discuss power settings to be used, flap/gear extension and touchdown point. Reemphasize gearbox limitations if appropriate. Make the traffic pattern slow and deliberate to give the trainee time to adjust to the Seabee's configuration changes. Perhaps a wider than normal pattern would assist in time/configuration management for the first few landings.

Brief and practice a go-around: Smoothly push propeller control forward; smoothly push throttle forward and adjust pitch to maintain a normal climb attitude. Climb at normal climb speed and accomplish the normal after takeoff procedures. Above 250' and 80 knots; flaps up, gear up reduce RPM as appropriate. Aircraft control is most important! Fly the airplane first! Then do everything else.

Try no flap landings and crosswind landings, conditions permitting. Consider using less than full flaps if the crosswind is strong. This increases controllability.

This is another ongoing lesson because every takeoff needs a landing. Take the rest of the day off!



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Lesson 7: Water Landing

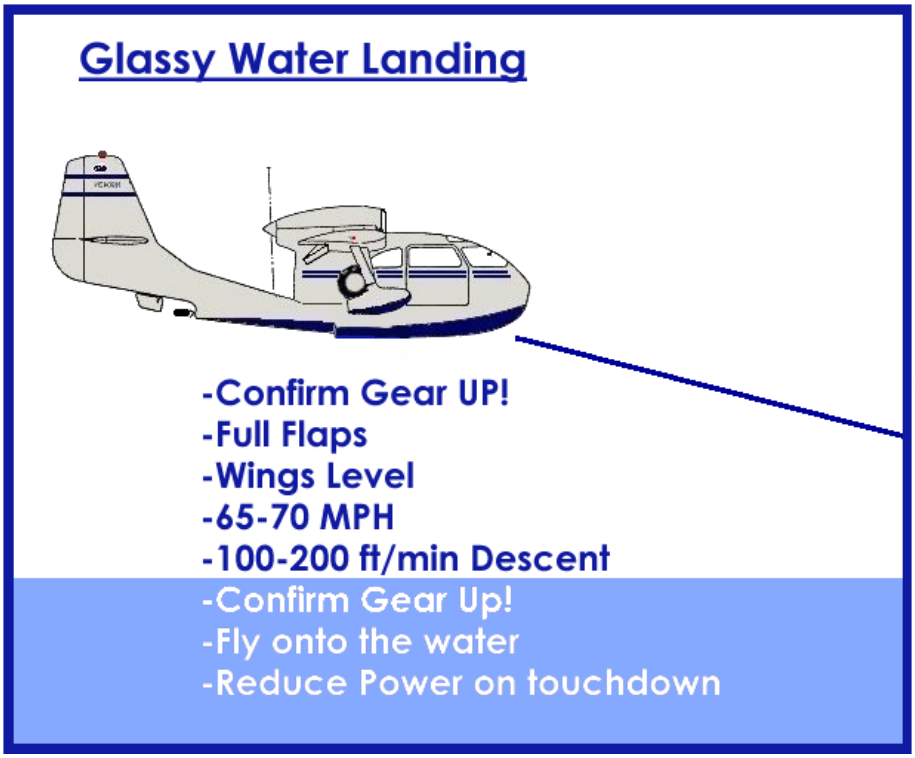
Objective: To gain proficiency in landing on water and taking the necessary precautions prior to entering the water of choice.

Description: Impress upon the trainee the importance of circling the planned landing area a couple of times to be certain the area is clear. Stress the importance of planning a landing as if it was at an airport; fly the pattern! These Seabee's are noisy, consequently the planning should include avoiding populated areas and changing landing spots frequently if numerous landings are to be made.

Stress, with conviction, the importance of confirming the landing gear position (up) prior to landing on the water. This is probably the most important lesson that can be learned about any amphibian. (It is the main reason insurance premiums are so high.) Check the gear two or three times prior to landing. Teach and insist on the trainee verbalizing the Seabee mantra, "The gear is up for a water landing". Say it and mean it many, many times. Insist on using more than one way to confirm gear position (red light on panel, mirrors on wing floats, and most importantly a direct visual check).

Explain that landings on water should be done directly into the wind whenever possible. Fly proper airspeed (as slow as humanly possible) and keeping the wings level on touchdown to protect the wing floats!

Practice glassy water landings right from the start. Emphasize the dangers of glassy water and the techniques involved in a successful completion. Due to the lack of depth perception, instill in the trainee reliance on the flight instruments (primarily the VSI) for the final 200' or so. Reinforce the use of power settings learned earlier to maintain the desired vertical speed (100'-200'/min) on final. Proper planning will insure a safe glassy water touchdown. Be not afraid of a go around!



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Lesson 8: Maneuvering on the water

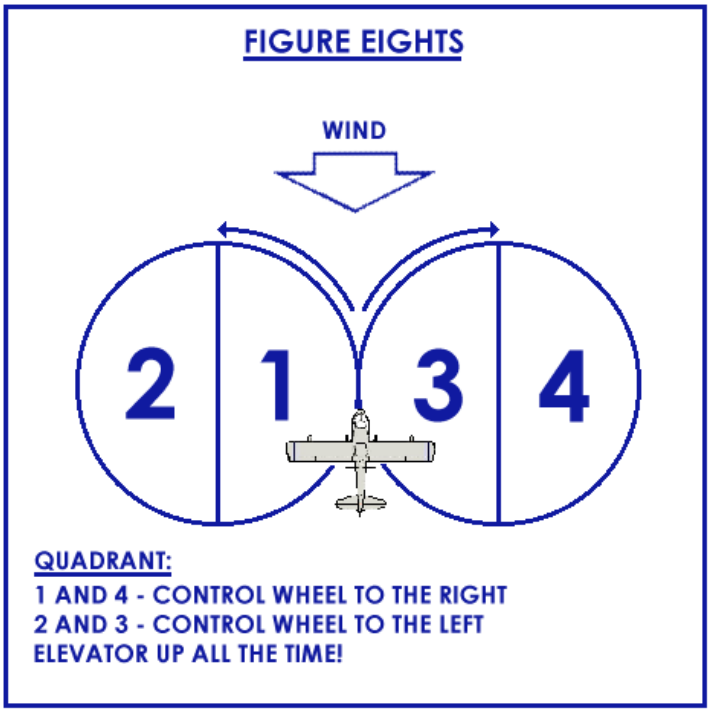
Objective: To expose the trainee to various water maneuvers and insure that he/she has a clear understanding of how much the Seabee loves the water!

Description: Explain that the elevator should be up on the water at all times! Have the trainee practice making turns in both directions and complete 360° turns utilizing the flight controls to assist. At idle power into the wind, show the effect of just the flight controls to turn the Seabee. Show the effect of rudder and aileron separately on turn rate and that the "down" aileron creates more drag than the "up" aileron and can be used when maneuvering on the water. Then use controls together to increase turn rate. Use controls when turning even in the slightest wind (there's that big vertical stabilizer again!). The doors may even be used to turn or slow down. Demonstrate the use of the front hatch to assist in turning 180° in strong winds (plow turn with front hatch open).

Practice making figure 8's, utilizing all flight controls at all times, to increase the trainee's confidence in how maneuverable the Seabee is.

Have the trainee demonstrate the use of reverse propeller control. This should be done at idle or a very low power setting (less than 1200 RPM). Show the effect of rudder control when backing up and the maneuverability when going into forward thrust. Insure the trainee knows the locked position of the reverse lever and to check it prior to the next takeoff. Review reverse limits if applicable (1750 RPM and keep the doors closed).

Exercise: If buoys or floating docks are available, practice approaching these at a very slow speed and well clear of populated areas (people, jet skis, moored boats, etc.). Instill the importance of approaching an object from the downwind position (wind on the nose). This allows for slower approach speeds and more controllability. Approaching a floating piece of wood or debris is good if nothing else is available. An extra throw-able cushion could be thrown overboard and used as a buoy. Make sure it is picked up before the next takeoff to prevent hitting it or losing it!



Notes:

Lesson 9: Docking and beaching

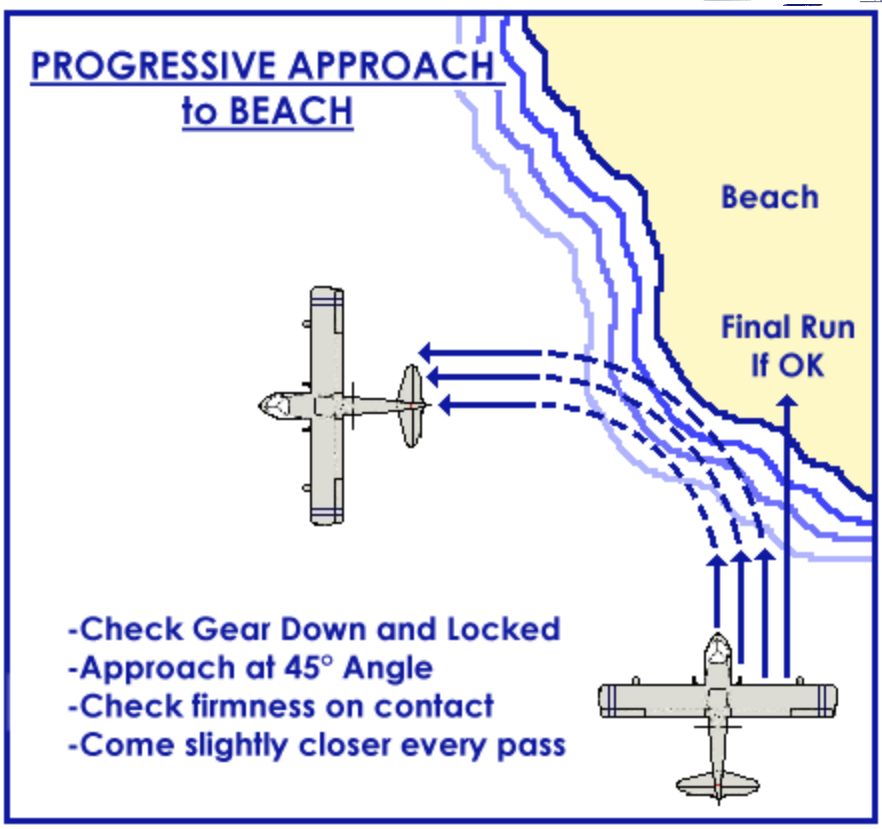
Objective: To assess conditions for docking and beaching and gain experience in approaching a dock, beach or ramp. Good seamanship should be emphasized to safely moor or dock the Seabee.

Description: Always have an escape plan when maneuvering close to a dock or the shoreline! Approaching the dock, beach or ramp should be done at the slowest possible speed to prevent damage to the Seabee and to allow time for changes in planning. When docking, insist on the assistance of another passenger if at all possible. If the trainee is alone, use the old 'Rope-around-the-rudder-pedal' trick:

> *Sitting in the right seat, approach the dock upwind and stow the right hand control wheel and attach a line around one of the right hand rudder pedals. Open and make fast the forward hatch. Using the left hand for reverse or throttle control and the feet for rudder steerage, maneuver toward the dock at idle power using only reverse for speed control. Kill the engine with the mixture control just as the dock is contacted at the slowest possible speed. Jump out through the forward hatch and moor the line to the dock. Fasten additional lines and bumpers to prevent wind and tidal effects.*

Obviously a ramp with adequate clearance would be the ideal landing spot. Check the gear down and locked early and prior to making contact with the ramp to prevent gear mechanism damage. Keep the effects of wind in mind as the Seabee approaches the ramp. A 'drift' angle may be used to achieve the correct water track. Contacting the ramp with one wheel is acceptable as long as it is done at a relatively slow speed. Increase power to climb the ramp and, if possible, turn the Seabee around prior to stopping the engine. Republic recommends exiting a ramp backwards if the ramp angle is greater than 15° to prevent damage to the water rudder (This may stir the feathers of some Seabee pilots-I just tell you want I have read).

It must be noted that observation is a necessity when approaching any 'landing' spot. Circle the area a couple of times to insure there are no obstructions and the area is suitable for the Seabee. Use the 45° angle, progressive approach when beaching on strange territory; make progressively closer and closer approaches to the beach with the gear down and locked and upon beach (bottom) contact, determine if it is suitable for entry. Sometimes it's easier to simply backup to the beach (See Seabee Beaching and Ramping Techniques by Don Kyte on the Seabee Website). Emphasize caution and patience.


PROGRESSIVE APPROACH
to BEACH
Beach
Final Run
If OK
-Check Gear Down and Locked
-Approach at 45° Angle
-Check firmness on contact
-Come slightly closer every pass

Notes:

Lesson 10: Water Takeoff

Objective: To acquire the necessary skills to takeoff from water in a variety of water conditions and airplane performance limitations.

Description: The trainee should be briefed on the takeoff procedures well before the first takeoff attempt. Talk through a complete takeoff sequence stressing important points such as always using full flaps for takeoff, lining up directly into the wind, keeping the wings level and relaxing back pressure (slightly) on the control column at the correct speed to get on the step. Warn against prolonged control inputs that would cause water spray to damage the propeller.

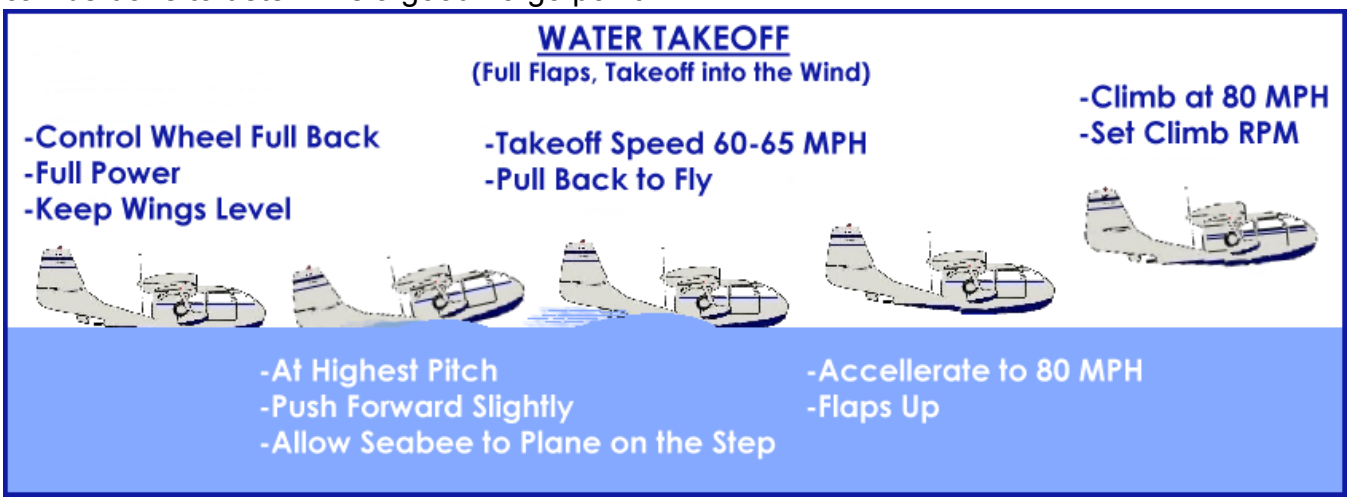
Demonstrate at least the first water takeoff, talking through the procedures as it is accomplished. If time and conditions permit, takeoffs on glassy water should be practiced. Discuss techniques for getting off of glassy water (making circles to stir up the water then making the takeoff run across the disturbed area) and the Seabee characteristics when running on glassy water. Emphasize the need to recognize the 'sweet spot' or 'step' on the takeoff run.

To reinforce the trainee's knowledge of Seabee performance, attempt a takeoff at a reduced power setting to simulate a heavy takeoff or takeoff at a high temperature/high pressure altitude situation.

It may be advisable to demonstrate the step taxi at this time. Attempt a takeoff and, when on the step, reduce power to maintain step taxi at approximately 50-60 MPH. Allow the trainee to turn left and right keeping the wings level and preventing any porpoising. Correct mistakes as they occur paying particular attention to correct planing attitude and keeping the wings level in the turns!

Inducing porpoising is not advisable nor is it easy to get the Seabee to even do it, however, if it should occur remind the trainee all that is required to stop the oscillations is a slight back pressure. If extended step taxi is anticipated, re-trim to prevent the porpoise oscillations.

Glassy water takeoffs should be demonstrated if possible. Explain the 'suction' effect of water and remedies for conquering such a beast. Circles can be made in the water to stir it up and the takeoff run made across the resulting waves. Emphasize the need to have a 'No-Go' point established before the takeoff (Some lakes are very limited in there space available). A trial run can be done to determine a good no-go point.



Notes:

Lesson 11: Emergencies

Objective: To expose the trainee to emergency procedures peculiar to the Republic Seabee.

Description: The key to dealing with emergencies is keeping a clear head and Fly the airplane first! Do not let panic set in and deal with the situation calmly and deliberately.

In-flight cabin fire is the most dangerous situation; land as soon as possible. Use the fire extinguisher. Explain that if electrical in nature, smoke or fires are dealt with simply by turning off the master switch. Obviously, the switch should not be turned back on unless the source of the fire or smoke is positively identified.

Engine fires should be dealt with by pulling the fuel shut-off valve under the pilot's seat. Establish best glide speed and look for a suitable place to land. Republic recommends if time permits, retract or at least unlock the gear prior to making an off-airport landing. This will prevent the Seabee from going over on its back on touchdown and prevent gear damage.

Engine failures are rare but should be discussed. Due to the real danger in practicing engine failures, they should not be demonstrated. Discuss glide speed and attempting a restart. If it is deemed necessary, a slight reduction in power can be introduced to reinforce glide and restart procedures. Discuss pulling the propeller control all the way aft in an actual engine failure to decrease drag and allow for a longer glide distance. Any engine trouble-shooting in flight should be kept to a minimum. Land the airplane as soon as possible and assess the situation when safely on the ground.

Flap emergencies are really not. Republic put asymmetric flap problems in the emergency section of their book, but there is really no problem. Simply adding 5 MPH or so to the approach speed will more than overcome the uncontrollability created by one flap staying up. Consider bringing the good flap up and landing with the flaps retracted. Again, +5 MPH to the approach speed ought to make this a non-event.

Landing Gear problems are really not either! If the gear fails to retract, simply land. If it fails in the up or in-transit position, landing on a lake or paved surface are equally acceptable. Republic says that very minimal damage will occur when the Seabee is landed on the keel even on a hard runway surface. A slight amount of keel removal is the only repercussion. (I read somewhere that Republic and the FAA will allow five (5) landings of this type before a major inspection is required. Don't quote me!)

Propeller Overspeed can be handled by reducing the throttle to keep the RPM under the redline. Check oil pressure and reduce propeller RPM if possible. If overspeed can not be controlled, a landing may have to be made prior to destination.

Remember…In any Emergency…

FLY THE AIRPLANE FIRST!

Notes:

Lesson 12: Cross-Country Check

Objective: This will serve as a final 'check' of the trainees' abilities and Seabee knowledge. Plus it's just plain fun!

Description: A short cross-country should be planned and flown to a lake or perhaps an airport. At least two water landings should be accomplished with a docking or beach maneuver included. The instructor can act as a mere passenger or take on the ominous character of an official nature. Use your best judgment to insure the trainee is safe and competent in the Seabee. It has been known to solo prospective trainees at this point in their training. This is probably a good idea. What better way to say to your student, "Congratulations, you are now a certified Seabee pilot!"

Notes:

Lesson 13:

Objective:

Description:

Notes:

Lesson 14:

Objective:

Description:

Notes:

Lesson 15:

Objective:

Description:

Notes:

Lesson 16:

Objective:

Description:

Notes:

Lesson 17:

Objective:

Description:

Notes:

Instructor Checklist

Ground Instruction:

Personal Information ☐
Licenses and Medical ☐
Seabee Overview ☐
Walk around ☐
Cockpit Familiarization ☐
Checklist use ☐

Flight Training:

Preflight:
Engine start and checks ☐
Taxiing ☐
Use of controls-Taxi ☐
Seabee geometry ☐
Engine run-up ☐

Takeoffs:
Normal takeoff ☐
Crosswind takeoff ☐
Reduced power T.O. ☐
No flap takeoff ☐
Aborted takeoff ☐

Airwork:
Climb procedures ☐
Climbs and descents ☐
Level off and trim use ☐
Cruise power settings ☐
Slow flight ☐
Stalls ☐
Turns ☐
Steep turns ☐
Trim demonstration ☐
Coordination exercises ☐
(Circle and Squares)

Landings:
Normal landing ☐
Crosswind landing ☐
Go around ☐
No flap landing ☐
Water landing ☐
Glassy water landing ☐

Water work:
Turns ☐
Use of reverse ☐
Figure 8's ☐
Step taxi with turns ☐
Docking ☐
Beaching ☐
Ramping ☐
Sailing ☐
Approach to buoy ☐

Emergencies: (simulated)
Engine failure ☐
Engine fire ☐
Flap asymmetry ☐
Gear not down ☐
Electrical fire ☐
Propeller over-speed ☐
Cabin fire ☐
Hydraulic failure ☐
_____ ☐
_____ ☐
_____ ☐
_____ ☐

Cross country check ☐
Solo flight ☐

Appendix

Recommended reading:

How to Fly Floats by Jay J. Frey, EDO Float Corp. (1995)

Flying Boats for Recreation by Gladen Robert Hamilton (1997)

"Seabee Seamanship" by Anonymous (Seabee Club, Intl.)
(Available on the Seabee Website: www.republicseabee.com)

Seabee Owner's Manual by Republic Aviation

Lycoming Operating Manual by Lycoming, inc.

Franklin Aircraft Engines Overhaul Manual by Aircooled Engines Inc.

Airplane Flying Handbook (formerly Flight Training Handbook) by DOT (FAA-H-8083-3)
Chapter 16-Transtion to Seaplanes

Republic Seabee Service News by Republic Aviation
(Available on the Seabee Website: www.republicseabee.com)

Seabee Service Bulletins by Republic Aviation
(Available on the Seabee Website: www.republicseabee.com)

Water Flying Concepts by Dale DeRemer, Ph.D. (1990)

Seabee Familiarization and Walkaround by Capt. Richard W. Sanders (1986)
(Available on the Seabee Website: www.republicseabee.com)

Seabee CD by Steve Mestler (e-mail:smestler@bellsouth.net)
Includes all Seabee Service News, Service Bulletins and Republic Flight Manual as well as other information on CD-ROM. $25. Send an e-mail with your name and address and the CD will be sent to you.