Republic Seabee
Initial Checkout Guide

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INTRODUCTION

The purpose of this training guide is to provide the trainee with guidance through the checkout or flight review 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 Seabee pilot. Offense will not be taken if you modify, change or add any information you deem necessary to safely operate your Republic Seabee.

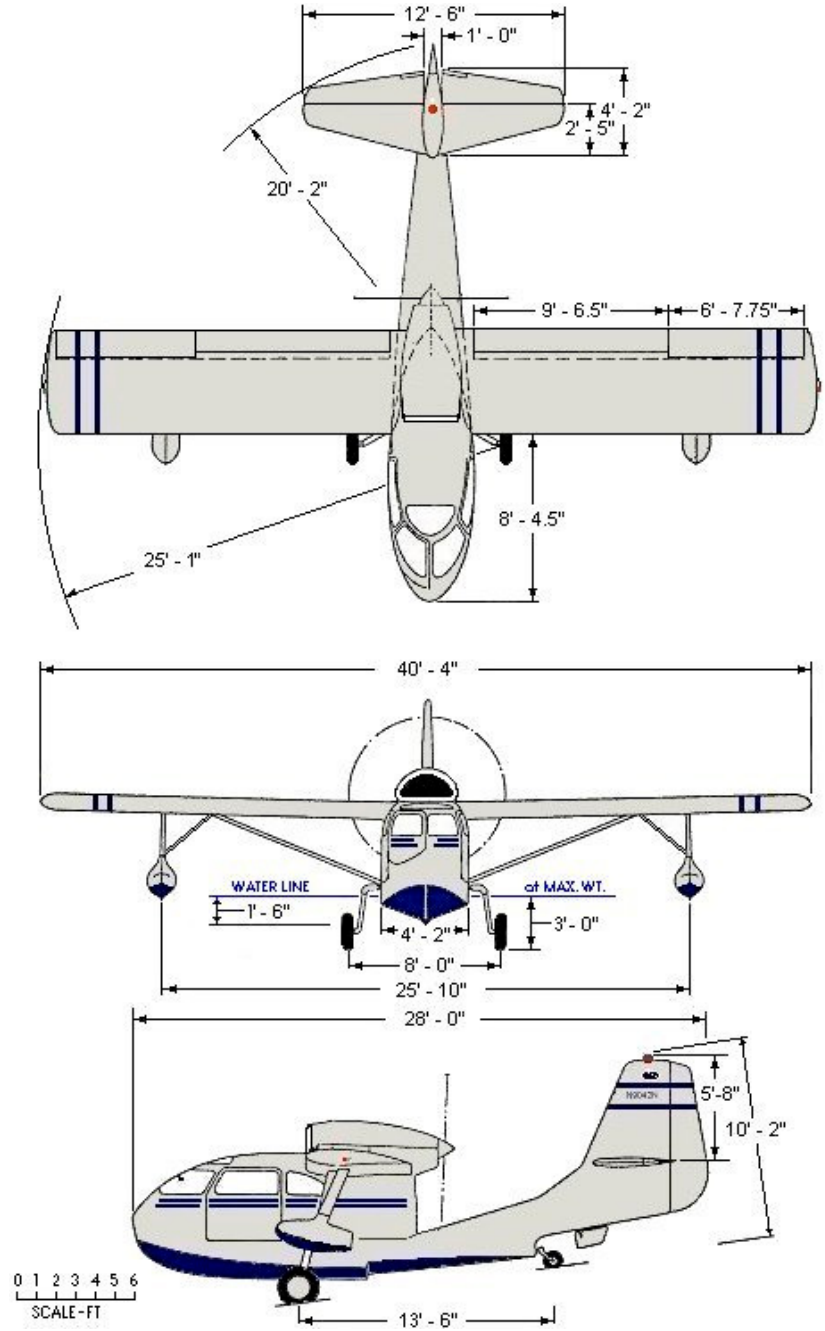
This guide is not intended to have the answer to every possible question given during a Flight Review. Instead it is designed to get you thinking and coax you into answering your own questions by reviewing the Airman's Information Manual (AIM), FAR's, Seabee Flight Manual and other pertinent references. If your are prepared (or forewarned!) for your flight review or flight training, it makes for less stress and a more productive day of flying.

Specific notes are added when there is no danger of ambiguity. Diagrams are given when necessary and some tips and tricks are added where appropriate.

I hope this will help you and please fly safely!

Index

Checkout Syllabus



Seabee Three View Drawing

Seaplane Rules-General

When the Seabee is on the water, it is subject to all the rules governing boats in that area. You should make absolutely sure that Seaplanes are permitted on the body of water you are attempting to invade. The Seaplane Pilot's Association has a Website (www.seaplanes.org) that is free to SPA members and has much information on approved landing areas for every state. They also offer the Water Landing Directory that includes rules for most states and other good information. A local boating shop or library may have publications on boating rules and local regulations. You can even call the local Sheriff's department to get clarification on seaplane operations.

Seaplane pilots, as a group, are particularly vulnerable to the local laws and scrutiny of the public at any given time. We must maintain our good reputation as friendly, safe and quiet neighbors if we are to continue to enjoy the lifestyle that brings us to these lakes and rivers. A little research and a healthy dose of common sense will go along way in preserving our ability to use our waterways. Keep it quiet and safe.

A note about the Airplane Flight Manual:

As you probably know, there is only one FAA approved airplane flight manual for your airplane. This is the document with all the FAA stamps, approvals and perhaps some STC's stuck in for good measure. It may have corrections to the weight and balance information that is mandatory when new equipment is added or removed. The approved manual should be the main reference for answering questions about your Seabee. The information given below is a generic version of what you might see in your approved manual. Please use YOUR manual and not the information in this guide to resolve questions you may have.

A college professor once told me, ***"Airplane Owners Manuals are purposely vague and sparse in their content so as not to scare potential customers away from the purchase."*** One must dig to find treasure. I believe this to be true.

Operating the Seabee

Performance and Specifications

The tables below should be referred to when determining takeoff and landing performance. These are copied directly from the FAA (CAA) Approved Republic Seabee Flight Manual (not the Owner's Manual). These numbers are based on the Franklin Engine version of the Seabee. Later Lycoming, Continental or GM modified Seabee's will meet or exceed these specifications.

Takeoff Distance

DISTANCE REQUIRED TO TAKEOFF AND CLEAR 50' OBSTACLE ON PAVED SURFACE RUNWAY (*LAND TAKE-OFF*)

FLAPS UP **WEIGHT – 3150 LBS**
GEAR DOWN **NORMAL CATEGORY**

FULL THROTTLE - PROPELLER IN TAKEOFF POSITION
TAKEOFF AND CLIMB SPEED 79 MPH TIAS - ZERO WIND.

TEMP°F / P. ALT	-40	-20	0	20	40	60	80	100
0	NA	1600	1710	1835	1985	2150	2315	2510
2000		1950	2125	2315	2525	2740	2985	3270
4000	2120	2505	2815	3090	3435	3755	4170	4610
6000	3075	3470	3640	4320	5050	5670	6480	7320
8000	4400	5100	6055	6910	8130	9790	11670	NA

DISTANCE REQUIRED TO TAKEOFF AND CLEAR 50' OBSTACLE (*WATER TAKEOFF*)

FLAPS DOWN **WEIGHT – 3150 LBS**
GEAR UP **NORMAL CATEGORY**

FULL THROTTLE - PROPELLER IN TAKEOFF POSITION
TAKEOFF AND CLIMB SPEED 75 MPH TIAS - ZERO WIND.

TEMP °F / P. ALT	0	20	40	60	80	100
0	1980	2160	2375	2665	2940	3315
2000	2605	2935	3355	3830	4405	5220
4000	NA		5480	6855	8940	12600
6000			13690	NA		

Landing Distance

Water

TOTAL LANDING DISTANCES (in feet) OVER 50' OBSTACLE

WATER LANDINGS — NORMAL CATEGORY
FLAPS DOWN — WEIGHT 3150 LBS
GEAR UP — ZERO WIND
THROTTLE CLOSED-PROPELLER IN TAKEOFF POSITION
APPROACH SPEED 75 MPH TIAS.

TEMP °F / P. ALT	0	10	20	30	40	50	60	70	80	90	100
0	1200	1212	1226	1239	1252	1266	1279	1295	1309	1326	1340
2000	1245	1259	1275	1291	1307	1322	1338	1353	1370	1384	1401
4000	1300	1316	1334	1351	1368	1385	1404	1421	1440	1454	1470
6000	1360	1382	1398	1418	1438	1456	1473	1492	1509	1525	NA
8000	1430	1450	1471	1490	1507	1524	1540	NA			

Land

TOTAL LANDING DISTANCES (in feet) OVER 50' OBSTACLE

LAND LANDINGS — NORMAL CATEGORY
FLAPS DOWN — WEIGHT 3150 LBS
GEAR DOWN — ZERO WIND
THROTTLE CLOSED-PROPELLER IN TAKEOFF POSITION
APPROACH SPEED 75 MPH TIAS.

TEMP °F / P. ALT	-40	-30	-20	-10	0	10	20	30	40	50	60
0	946	956	966	975	986	996	1007	1017	1028	1038	1048
2000	978	988	1000	1010	1022	1032	1044	1056	1066	1076	1087
4000	1013	1025	1037	1050	1062	1073	1084	1096	1108	1119	1132
6000	1053	1066	1078	1091	1103	1117	1128	1142	1156	1169	1181
8000	1094	1108	1123	1137	1150	1165	1180	1194	1209	1224	1239

Total Landing Distance = Distance from Clearance of 50' Obstacle to End of Roll

Stall speed chart

(Flaps Up)

According to the approved FAA Flight manual, Utility category is restricted to a weight of 2810 pounds. Normal category is 3150 pounds. There are other limits that are categorized by Utility vs. Normal, for example:

Flight Load Factor: Utility-4.4g, Normal-3.8g

Stall Speeds (TIAS)		
Bank Angle	**Normal**	**Utility**
0º	61	53
10º	62	54
20º	63	55
30º	65	57
40º	70	60
50º	76	65
60º	86	74

Weight and Balance

FAR's require that the pilot in command is responsible for the correct loading and proper location of the center of gravity (CG). The charts below simplify the 'number crunching' process. On some Seabees ballast is required under some circumstances. *Refer to your particular FAA Approved Flight Manual or actual Weight and Balance and use those weights in place of the numbers listed below!*

Ballast Requirements

Pilot	Passengers		Max Fuel (U.S. Gallons)	Max Baggage (Pounds)	Required Ballast
	Front Seat	Rear Seat			
1	1	2	31.0	0	0
1	1	1	59.0	0	0
1	1	0	75.0	77	0
1	0	2	55.0	0	20*
1	0	1	75.0	27	50*
1	0	0	75.0	165	82*

*If ballast is required, it must be at station **4.5**

Weight and Balance Work Sheet

	Weight	x	Arm	=	Moment
EMPTY WEIGHT	2361.9		126.35"		298,421.79
FRONT SEAT			62.0"		
REAR SEAT			96.0"		
OIL (7.5 lbs / Gal)	22.5		149.0"		3,352.5
FUEL (6.0 lbs / Gal)			116.0"		
BAGGAGE (200 lbs. MAX)			116.0"		
BALLAST			4.5"		
TOTAL WEIGHT			Divide into →		
	Max 3150		to get CG → (111.5 to 118.3)		

(Chart above is for reference only. DO NOT USE THESE NUMBERS!)

This airplane is to be operated in the NORMAL Category.
Fwd and Aft CG limit: 111.5 (22.3% MAC) to
118.3 (33.0% MAC) inches aft of Datum.
Datum is located 97.5 inches forward of the wing leading edge.

Ballast requirements vary from airplane to airplane. Be sure you use the ballast and ballast location (the position at which ballast must be placed) that is required for your airplane.

Tip: make copies of the forms listed below (with the actual numbers for your particular Seabee) and fill them out ahead of time for various passenger/cargo/fuel configurations. You can then keep them in the airplane for quick reference when required. Some even laminate them for water protection.

Ballast Requirements

Pilot	Passengers		Max Fuel (U.S. Gallons)	Max Baggage (Pounds)	Required Ballast
	Front Seat	Rear Seat			
1	1	2			
1	1	1			
1	1	0			
1	0	2			
1	0	1			
1	0	0			

Weight and Balance Work Sheet

	Weight	x	Arm	=	Moment
EMPTY WEIGHT					
FRONT SEAT					
REAR SEAT					
OIL (7.5 lbs / Gal)					
FUEL (6.0 lbs / Gal)					
BAGGAGE (200 lbs. MAX)					
BALLAST					
TOTAL WEIGHT			Divide into to get CG (111.5 to 118.3)		Total Moment

(Chart above can be used with YOUR numbers from the Flight Manual)

This airplane is to be operated in the NORMAL Category.
Fwd and Aft CG limit: 111.5 (22.3% MAC) to
118.3 (33.0% MAC) inches aft of Datum.
Datum is located 97.5 inches forward of the wing leading edge.

Airspeeds

These speeds are from the flight manual and are TRUE INDICATED airspeeds (TIAS). That means that the markings on the airspeed indicator will be pretty close to these speeds but not exactly the same.

(Normal Category-3150 lbs.)

Vs	Stall Speed Clean	61 MPH
Vso	Stall Speed Landing Configuration	58 MPH
Vx	Best Angle of Climb Speed	67 MPH
Vy	Best Rate of Climb Speed	79 MPH
Vfe	Flap Operating Speed	105 MPH
Vlo	Landing Gear Operating Speed	120 MPH
	Normal Cruise Speed (75% power)	103 MPH
Va	Maneuvering Speed	117 MPH
	High Speed Cruise	120 MPH
Vne	Never Exceed Speed	148 MPH

Chances are no one will ever ask you what the distance is from the top of the vertical stabilizer to the ground but just in case they do, here are all the dimensions. You may need to refer to these when parking the Seabee in a confined area.

Dimensions

Wing Span (max)	37’ 8”	(*40’ 4”)
Length (max)	28’ 0”	
Height (max)	10’ 1”	
Wheel span (main gear)	7’ 6”	
Cabin width (interior)	3’ 10”	
Cabin height (interior)	4’ 2”	
Cabin length (interior)	9’ 2”	
Baggage compartment (volume)	20 cu. ft.	
Draft loaded	1’ 6”	
Wing area	196 sq. ft.	(*215)
Ailerons	13.7 sq. ft.	
Flaps	25.3 sq. ft.	(*28.4)
Fin	22.8 sq. ft.	
Rudder	10.5 sq. ft.	

(*) 16” Extended Wing per STC.

For sure you won't be asked these numbers but if you ever need them or you want to check your Seabee here they are:

Surface Movements

Rudder right	30°
Rudder left	30°
Ailerons up	20°
Ailerons down	20°
Elevators up	28°
Elevators down	28°
Water rudder right	30°
Water rudder left	30°
Elevator trim tab up, down	22°

You may be asked these numbers though:

Weights

Max Gross Weight	3150 lbs (*3250)
Empty Weight (approx.)	2350 lbs
Useful Load	900 lbs
Max Baggage (aft compartment)	200 lbs
Fuel Load (full tank-75 gal)	450 lbs

*Lycoming GO-480 conversion Max Takeoff weight

Interior Check

Prior to the exterior check, a brief interior check should be done to insure a safe condition.

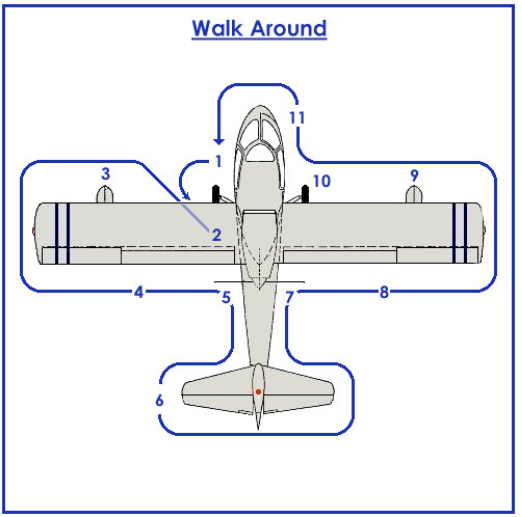
Gear Selector	Down
Flap Selector	Up
Hydraulic Reservoir	Filled
Hydraulic System	Pressurized
Master Switch	On
Green Gear Light	On
Fuel Quantity Gauge	Checked
Master Switch	Off
Elevator Trim	Centered
Emergency Equipment	Installed

Emergency Equipment should include:
Fire extinguisher, ELT, Flashlight, Life vest for each occupant, Throwable boat cushion with line attached, Signaling device, extra Clevis Pin (for landing gear actuator) and any other survival equipment required for the flight.

Exterior Check

A preflight check should be accomplished before each flight. It should be noted that the preflight should be accomplished with no distractions! The Seabee always attracts a crowd, so politely excuse yourself and do the preflight unencumbered by the Seabee fans until it is complete.

Arguably the most important part of the Seabee preflight is to check that the hull plugs are in. Even if there is no intention of landing on water, the plugs should be installed just in case the engine quits over water. Tip: Put all the plugs in first before the rest of the pre-flight so that none will be forgotten.



Start the preflight from the left-hand door. Check the front hull bottom for damage. Check the left gear and brakes for hydraulic leaks and general condition. Especially check under the 'knuckle' (the 90° elbow on the gear) for cracks. These are notorious for cracking under certain adverse conditions. Check main tire for condition and inflation (35 psi).

Check the fuel with the dipstick and when checking, keep the numbers on the dipstick down (toward the outside). *Do not trust the electric fuel gauge to determine fuel quantity!* Secure the fuel cap.

Check the condition of the left wing and wing float. Check exterior lights if required. Check the left mirror for cleanliness. Check the left aileron and flap hinges for clevis pins and cotter pins. Also check for hydraulic fluid leaks around the flap actuator area.

Inspect the bottom of the hull and step area. While you are there, check the fuel sump for water and dirt. Check the security of the round bilge pump access covers especially the ones under the propeller on top of the hull.

The engine compartment should be checked thoroughly. Check for loose items. Keep in mind that anything in the engine compartment that isn't bolted down will go through the propeller! Check the oil, ignition wires, exhaust for cracks and security and propeller condition. A slight twist to each blade will determine if excessive play is evident. On Lycoming powered Seabee's rotate the propeller back and forth and check for excessive play in the gearbox. A noticeable 'clunk' should be evident. About a half-inch at the propeller tip is the limit from 'clunk' to 'clunk'.

The tail wheel should be checked for proper trail angle (0-5° aft of vertical) and tire inflation (50-60 psi). Check steering cables if so equipped. Check the water rudder for security and that it turns with the rudder. Wiggle the air rudder back and forth and see if the water rudder moves in both directions. If it doesn't move in one direction (or both), there is a broken water rudder cable.

Check the elevator and rudder hinges for clevis pins and cotter pins. Be very leery of the elevator trim system. There is an Airworthiness Directive (AD) for inspection every 25 hours until steel bushings are installed in the trim tab control horns. There should be no more than ⅛" total play in the trim tab vs. control rod. If excessive play is allowed to continue, severe vibration could result in flight causing loss of control. Watch the trim play very closely before each flight. Remember, YOU CANNOT OVERRIDE THE FORCE OF THE ELEVATOR TRIM INFLIGHT! Do not fly with a malfunctioning trim system!

Check the right wing, flap, aileron, wing float, mirror, tires and brakes, etc., just as the left side was checked. Check the security of the front door. It should be pointed out that the doors should not be locked in flight.

On Franklin powered Seabee's, the fuel sump should be under the right wing, however, it might be under the left wing on some engine installations. Check it for water, contamination and correct fuel color.

Engine Starting

Before the engine start, pump the hydraulic pump a few times to pressurize the system so the tail wheel won't be tempted to collapse. Fasten your seatbelt.

Consult your Engine Operating Manual for starting procedures. As you become familiar with your engine, you will discover a procedure that works every time (provided your engine is in decent shape!). A few precautions are in order, however. First, don't let the starter grind away for more than a few seconds. If the engine won't start in a few turns of the propeller, something is wrong. The starter should be allowed to cool for one minute for every 30 seconds of starter operation. If not allowed to cool, it will surely fail just when you need it most. Second, if flooded, the engine is a definite fire hazard. If a fire is evident during the start, KEEP CRANKING! The excess fuel will be sucked into the engine and not onto or into your airplane. Lastly, don't allow your engine RPM to go much above an idle during and after the start. Internal parts are not getting much lubrication when started and time is needed to allow the oil pressure to do its job. This will increase your engine life and you know we need all of that we can get.

Warm-Up

Once your engine is started, let it warm up for a few minutes at idle. This will allow the engine to heat up evenly and the internal temperatures to stabilize before higher power settings are used. Think about it; if you started your engine and immediately took off, it would be like putting a hot marble in a glass of ice water…C-R-A-C-K! Look at the engine instruments, particularly the cylinder head and oil temperatures. Let them stabilize completely before you takeoff. It will be well worth the wait.

Tip: As you wait for the temperatures to come up, do other stuff; set your radios, get a head start on your checklists, check your altimeter, get the ATIS, call clearance delivery for your clearance, brief your passengers on use of seat belts and other safety equipment. By the time you finish all that your engine will be plenty warm enough. Engines need to be hot to operate efficiently. Let them.

Taxi

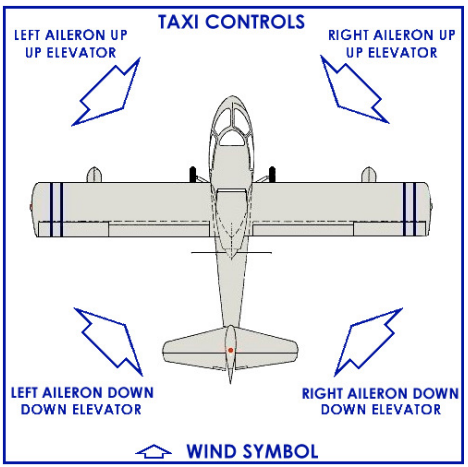
When taxiing on a hard surface keep the wing floats in mind as you move across the taxiway. The float clearance is only a foot or so above the ground and objects sticking up along the taxiway can be hit very easily.

Use the rudder pedals to turn and you can use the brakes for those tight turns. Make sure the airplane is moving before you start using the rudder pedals, as this will take the strain off the steerable tailwheel cables. Once the airplane starts to move it tends to keep moving so no large power requirements are required. Needless to say, keep an eye out for other traffic and obstacles. If a control tower is present make sure you follow the tower instructions. It is very easy to cross an active runway on your way to your runway so follow the tower instructions. If necessary, write down the instructions before you start to taxi.

The FAA has a neat Jeppessen-size handout available at most FBO's and GADO offices that have all the new runway and taxiway markings for airports. It's a good idea to have one in the airplane at all times to refer to in case of confusion. These markings conform to ICAO standards and are standardized worldwide. Smaller airports may not conform to such standards however.

Final Check

As you taxi to the runway check the Directional Gyro, Compass and remember to keep the flight controls in the correct position for the wind. Even though the Seabee is a fairly heavy airplane, it's amazing how strong the wind can be sometimes so keep the controls correct for the existing wind.



When in the run-up area, leave the throttle at 1000 RPM and check the reverse lever for proper operation. Make sure the doors are closed and limit the check to the minimum time possible for engine cooling. Lock the reverse lever forward and make sure it's guarded. Do the engine run-up according to the manufacturers recommendations. Do not takeoff with one magneto inoperative! If the RPM drop is out of tolerance, get it checked by a mechanic. Cycle the propeller a few times, especially if it is cold. Check all the engine instruments and make sure they are 'in the green'.

To check the flight instruments, read them like a book; top to bottom and left to right. Be sure everything that can be set for takeoff is! Set all radios to something you might be able to use after takeoff even if you think it doesn't make any sense, you might just have to use it. For example, you may not think the ADF will be necessary after takeoff, but what if the VOR or GPS fails! If the ADF is set before takeoff, you won't have to be fumbling around trying to find frequencies or bearings, etc.

Use the checklist for takeoff making sure the trim is set, the flight controls work correctly, all controls are in their correct position and any other particular items on your checklist. When you are satisfied that all items are correct, call the tower or make a radio call for takeoff.

Land Takeoff

A land takeoff is done normally with the flaps up. Half flaps can be used if the runway is shorter than normal or if a heavier load than normal is anticipated. In a strong crosswind, flaps are not recommended due to the possibility of controllability issues during initial climb. If a short runway is used, full flaps can be used to reduce takeoff distance. Care must be exercised upon flap retraction in ground effect. Bring the flaps up very slowly and after the flaps are up, the Seabee will climb eagerly. Flaps on takeoff also improve tailwheel tire wear. The tail rises just a little bit faster when flaps are used.

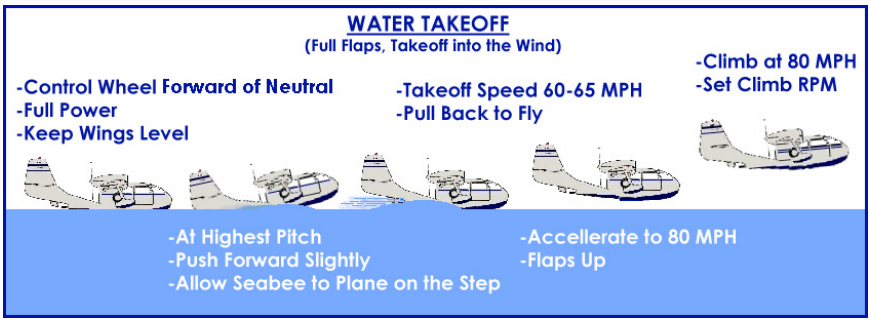
After lining up with the runway, check that the compass is reading correctly (runway heading), and note the current time for flight planning. Push the throttle in slowly and, using the rudder pedals, keep the airplane on the centerline. Remember that the center of gravity is behind the main wheels and if allowed to get too far outside the airplane centerline, a ground loop could be in your future, so keep it going straight! The rudder and elevator are effective almost immediately because of the pusher configuration of the Seabee. Use the flight controls correctly for the existing wind and slowly reduce the inputs so that as the airplane lifts off the controls are neutral.

As the airspeed increases, the tail will come up. Let the airplane accelerate to about 65 MPH and slowly increase the back pressure on the elevator and fly off the runway at about 70 MPH. Let the airplane accelerate to 80 MPH which is a good climb speed. Check the trim and reset if necessary to

hold 80 MPH. If flaps were used for takeoff select them up when clear of obstacles and 80 MPH is attained. The air load on the flaps should bring them up most of the way. Select the wheels up and start pumping the hydraulic pump handle. It should take about 20 pumps to get the wheels up. If you are lucky enough to have an electric hydraulic pump, activate it now. Reduce power to climb if necessary. Call your turns in the traffic pattern if you are at an uncontrolled airport; otherwise follow the tower instructions (clearance). After clear of the traffic pattern, climb at 90 MPH for engine cooling and a better visibility ahead. Besides, you'll get there faster! Do the after takeoff checklist (Gear Up, Flaps Up, Engine Instruments).

Water Takeoff

When taking off on water, use full flaps and be sure the gear is up. All takeoffs should be done directly into the wind. Unless limited by the shape of the body of water, there is really no excuse for making a crosswind takeoff. Before any takeoff is attempted, check the area for floating objects, boats and especially jet skis. Give everyone and everything a wide berth when getting ready. After checking the area and completing the takeoff check list, line up into the wind, keep the control wheel slightly forward of neutral and slowly push the throttle all the way in. As the speed increases, keep the wings level with aileron control and rudder. You will then notice the nose come up to an almost frightful attitude. As it reaches the maximum nose up attitude, relax the backpressure on the control wheel just enough to get the Seabee 'on the step'. You will also notice the speed increase noticeably when this happens. Keep this attitude with elevator control making sure the wings are level. As the speed gets to about 60 MPH, increase the backpressure. This will get the nose into the flying attitude. The Seabee will fly off the water on its own. Once airborne, lower the nose slightly to increase speed to 80 MPH then retract the flaps. Avoid any populate areas after takeoff.



(Remember, noise is our number one enemy over populated waters!)

A few common mistakes on takeoff are listed below:

1-Symtom: Wing float buries itself into the water shortly after applying full throttle.
Cure: Stop the takeoff and reposition the Seabee into the wind. Keep the wings level with aileron AND rudder.

2- Symptom: Slow to get on the step.
Cure: Decrease backpressure on control wheel or stop the takeoff and check that the wheels are up! Make sure the flaps are full down for takeoff. In very rare cases, the hull may be full of water. If necessary, pull onto a ramp and drain the hull. During heavy weight takeoffs, the takeoff run will be longer than normal. See procedure below when this occurs.

3- Symptom: Porpoising. This is a noticeable up and down motion of the nose after the Seabee is on or near the step.
Cure: Increase the backpressure slightly until the cycle stops. It may just be that the Seabee wants to fly and you need more up elevator to get off the water. The Seabee is very stable during takeoff and very little if any porpoising should be noticed. You almost have to induce porpoising yourself!

4- Symptom: Waves over 1 foot.
Cure: Go back to the dock or ramp and have a beer. Try it again tomorrow.

During heavy weight takeoffs, it will take a considerable amount of water to get on the step. A technique widely used is to get on the step in stages. As the nose comes up to the highest point the first time, lower the nose sharply to get partially on the step, then keep repeating this process (two or three times) until you feel the Seabee definitely accelerate as evidenced by the airspeed passing about 40 MPH.

If the water is glassy, you may have to make your own waves on the surface to break the suction for the takeoff. Make circles out in the takeoff area to rough up the water,

then go back to the starting line and make the takeoff run across the waves you just made. If, by chance, you are not airborne by the time you reach the end of the waves, stop. Go back and try again. You will probably make it the second time because there are a lot more waves that you just made.

No takeoff discussion would be complete without a talk about takeoff distance. If the water you are trying to takeoff from is unfamiliar, it is a good idea to check the takeoff distance required before you land. That's right, before you land. The following is paraphrased from Water Flying Concepts, by Dale De Remer, Ph.D. (1990).

As a good Seabee pilot you have timed your takeoff runs with different weights, density altitudes and water conditions. Let's say for example, that it takes 30 seconds to takeoff and reach an altitude of 100'. When you reach the unfamiliar landing spot, slow the Seabee down in the landing configuration at landing speed (about 75 MPH) and fly over the landing area in the direction you will be landing starting the stop watch just as you pass the shoreline. Time for 30 seconds (or whatever time is appropriate) and if you don't run out of water when the time is up, you're okay. Go ahead and land. If, however, the clock is still running when you are over the trees at the far end, look for another lake!

This timing works because the original time required to takeoff (30 seconds) is done at speeds less than approach speed so the distance measured during the timing process for landing is longer than that for takeoff. Don't cheat on this! It is entirely possible to get into a lake that will require disassembly of the Seabee to get it out! Be careful.

While we are talking about adverse conditions, a crosswind takeoff is rarely required when lakes are used, but can be done on narrow bodies of water (rivers) if a few basics are understood. You must understand the effect that the wind has on your airplane and the ways to counteract them. First, you know that the wind will always point the Seabee into it. When in doubt, let go of the rudder pedals and let the Seabee weather-vane. Your direction of takeoff will be most evident. If a crosswind takeoff is attempted without using the

methods described below, you will surely drag a wing float or worse.

A crosswind takeoff should be started into the wind or as close to the wind as you can get. Normal takeoff techniques are used except that we will use centrifugal force to counteract the effect of the crosswind during the takeoff run. As the takeoff progresses and on the step, start a slow turn crosswind and toward the long part of the river or narrow lake using centrifugal force to neutralize the cross wind. You will feel this. Use all available controls to keep the wings level and the wing floats out of the water. Slight cross controlling (i.e., left aileron and right rudder) is to be expected. Continue the arc out of the wind until flying speed is attained. After you are airborne, turn back into the wind to climb out away from populated areas or obstructions.

If you find that the takeoff is not progressing the way you had planned, simply reduce the power and point the airplane into the wind. Try it again if you dare.

I highly recommend reading Water Flying Concepts, by Dale De Remer, Ph.D. He explains things better than I can and has quite a few neat tricks that could come in handy if you find yourself in an unusual situation.

Climbing

After the takeoff has been completed, hopefully to a successful conclusion, turn to your course heading and set up a climb at 80-90 MPH. The higher speeds are good for engine cooling and forward visibility. The most important thing to do during the climb is to check for traffic and the engine instruments every once in a while.

If it is a hot day the oil and cylinder head temperatures may be higher than you are used to seeing so simply increase your airspeed and check it again in a few minutes. Also check the mixture control is on the rich side to keep the cylinder heads happy.

When you are satisfied with the engine performance, start navigating. (I won't go into navigation because if you own or fly a Seabee, you most likely know how to get from here to there.)

Cruise

When cruising altitude is reached, lower the nose, trim for cruise airspeed (about 110 MPH) and reduce to cruise power; about 75% in any book is normal. You can use less power if you need to save Avgas or you are not in a hurry.

Cruise Power Settings

Due to the wide variety of powerplants offered on the Seabee, no power settings are offered here. Please refer to the cruise power charts for the engine mounted on your airplane. These are usually found in the engine operating manual or Airplane Flight Manual. For Franklin Engines, Republic Seabee Service News No. 23A (available on the Seabee Club website) has the power charts in it.

Most Seabees have a constant speed propeller and a big engine. To reduce power to the cruise setting, bring the throttle back first to a setting an inch or so below what you want for a final cruise setting; then slowly decrease the propeller to the cruise RPM. For example, let's say that we would like to cruise at 2400 rpm and 23 inches of Manifold

Pressure. You would reduce the throttle to about 22 inches of Manifold Pressure and then reduce the RPM to 2400. The Manifold Pressure will increase slightly as the propeller RPM is reduced. Never just pull the propeller control back in flight as propeller surging may occur. This is not good for the propeller or the engine. It is too hard to smoothly change the RPM by pulling the control so please, unscrew the propeller slowly to the RPM you want. Your propeller and engine will thank you.

Stalling

Most Seabees do not have stall warning devices. You must rely on seat-of-the-pants to determine if a stall is imminent. As the stall is approached, a definite buffet is evident. It is a gentle maneuver with no bad tendencies if everything is rigged right. Power on or power off stalls react the same way. The only difference is the pitch attitude on a power on stall is quite high and the recovery is a little more dynamic than that of the power off stall. You will find that simply lowering the nose and leveling the wings will get you out of the stall situation. If you simply let go of everything the Seabee will recover quite nicely; a good thing to know if you are disoriented or in the clouds without an instrument rating (shame on you).

If you practice stalls, give yourself plenty of room. Climb to at least 3000 feet and away from other traffic and populated areas. Over a lake is a good place.

Diving

Planning a descent is actually very simple. You don't want to start down too early or you'll end up cruising along in the bumps for a while and burn more gas than you would if you had planned the descent later on. You don't want to start down too late because you'll be circling the field for a turn or two and you will again burn more gas. So if a descent is not planned out just right, you will burn more gas. We don't want that (unless you own Aeroshell stock).

A good descent is planned with a known ground speed. That's right, groundspeed. You are planning to be over a certain point over the ground at a certain altitude so it's all about ground speed.

Let's take two extreme cases: You are at 5500 feet MSL and you want to be at traffic pattern altitude say, 1000 feet, about a mile from the airport. One example at 60 MPH ground speed and one at 120 MPH ground speed.

At 60 MPH:
Your traveling a mile every minute. You need to lose 4500 feet. At a 500 feet per minute descent rate it will take you 9 minutes to be at traffic pattern altitude. So 9 minutes equals 9 miles because we are doing one mile per minute. If you start your descent 10 miles out, I would say you'd be right on the money. Okay now…

At 120 MPH:
You are now zipping along at two miles a minute and you still need to lose 4500 feet to be at traffic pattern altitude. At 500 a foot per minute descent it will still take you 9 minutes to get down but in 9 minutes you will have traveled 18 miles! Adding a mile or two for maneuvering at traffic pattern altitude, you need to start down about 20 miles out! Twice what it took at 60 MPH. Make sense?

Keep in mind that if you need to maneuver to get in position around the airport subtract those miles from your total miles and start down at that point from the airport to be in the right position in the traffic pattern.

For example, if you know it will take 9 minutes or 18 miles to descend to traffic pattern altitude but the pattern is on the far side of the airport, you will need to fly an additional two or three miles beyond the airport to get in position to enter the pattern. 18 - 3 = 15. Start down 15 miles from the airport and you will be in the ballpark.

Anyway, no big deal here except you also want to keep the engine in mind as you go down. First don't just simply pull the throttle all the way back at once as this will surely reduce the life expectancy of your engine.

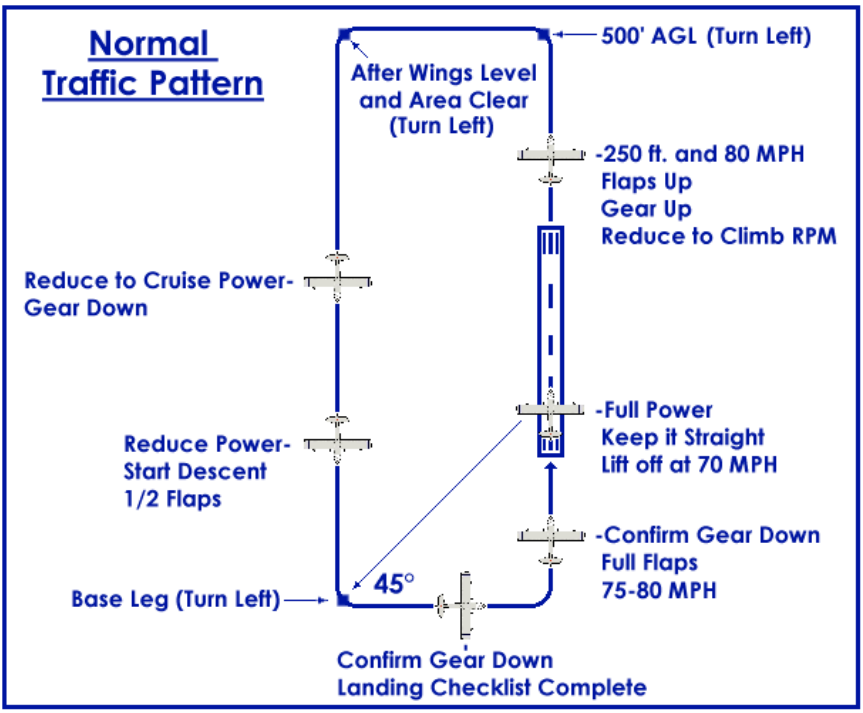
Always keep an eye on the manifold pressure. Remember climbing out how the manifold pressure decreased one inch for every thousand feet you climbed? Well it's going to do the same thing only backwards going down. It will increase one inch for every thousand feet we descend. So as you descend, pull the throttle back an inch or so every thousand feet to keep the power under control. This is especially critical on supercharged engines where an over-boost situation could present itself. Over boosting can wreak havoc in an engine if allowed to continue for more than a few seconds. Watch your engine instruments in a descent.

When it's time to start down, simply re-trim to a nice 500 foot per minute rate and reduce the throttle a couple of inches to maintain your speed. (A descent rate of 500 feet per minute is used to prevent ear discomfort). It's as simple as that. Remember the airplane is trimmed to a specific airspeed. As long as you maintain that speed, the airplane will remain in trim. A slight adjustment in trim may be necessary if the speed is allowed to wander too much from the original setting.

As you get closer to the airport (or lake) start reducing the power (slowly) to a setting that will give you about 80 MPH in level flight. You have determined the 80 MPH, level flight power setting haven't you? It's entirely possible to still be in a normal descent with this power setting it's just that you want to minimize the power adjustments made during any given descent/landing event. Again, think of the engine. With this power setting and as you reach traffic pattern altitude, simply re-trim to level flight and 80 MPH will appear magically without ever having to touch the power.

Approach

With the descent far behind us, we can begin the approach. An approach should be planned just as we planned the descent and at about the same time! Review the airport diagram or lake if necessary. Find out in which direction you will land or the runway in use at the airport of choice. Listen to the weather broadcast on ATIS, AWOS,



Flight Service Station or tower. Plan a turn-off point from the runway. Find out which side of the airport the traffic pattern is on. Listen to the advisory frequency or tower well before your initial radio call. This will give you a very good idea of what is going on down there and you can plan accordingly. Make the appropriate radio calls as they become necessary. If the airport is uncontrolled, don't forget to make the required advisory calls in the pattern. If you have any questions about radio calls, check with the latest AIM (Airman's Information Manual) for the most current

procedures. This document has everything you need to know.

With the appropriate clearance or when in the pattern begin setting up for the landing. On downwind be at 80 MPH with the flaps up and extend the gear early if landing on an airport. (If landing on water make sure the gear is up!) If you have trouble extending the gear you don't want to be fumbling with it on final! Abeam the end of the runway or waterway extend the flaps about ¼ of the way down. Fly 80 MPH all the way around the pattern except on final approach. Turning base check the landing gear down (or up for water) and verbally state, out loud, the position of the wheels. Check them visually. Pump the flaps down about half way now.

Turning final, check the wheels again. Pump the flaps down all the way and stay on the extended runway centerline. Reduce to the appropriate approach speed. Use 80 for normal runway landings, 75 for water landings and 65 for glassy water landings (which will be discussed in the next section). Remember the level flight 80 MPH power setting? It should not have changed a bit. You can fly the whole approach and landing at that power setting! The flaps and gear slow you down and the resultant descent should allow you to maintain the 80 MPH power setting right to touchdown. If your planning was correct, you haven't touched the power for quite a few minutes and then only a little at a time all the way down to the ground. The up-side to this is simple; less fidgeting with engine and airplane controls making for a more comfortable descent, stable engine temperatures, more time to plan for the landing.

One point to remember with Seabee's and their airspeed indications when landing either on water or land; they all read a little differently due to the placement of the pitot tube, static system and whether the vent windows are open or not! Republic published Service News No. 41 on this very subject. (available at www.republicseabee.com)

Runway Landings

We will assume, for the moment, that it is a perfect day. Light winds right down the runway. As you turn final and are sure that the runway can be made, you lower the flaps all the way, check the gear down again and check the speed at 80 MPH. Keep the centerline of the runway under your right leg. Monitor the approach angle (glide path) and adjust as necessary with power. Remember that the airplane should be trimmed and will fly the same airspeed regardless of the power used. So if you are high, reduce the power and allow the nose fall slightly until you are back on the glide path. If you are low, add power and allow the nose to rise until you again establish the correct descent angle. In both cases, very little if any elevator input is required because the airplane is in trim, right?

Anyway, as you approach the runway, remember you are in a tail wheel airplane. The rudder will be your best friend after touchdown. Start a flare about a foot or so above the runway to a tail low attitude not allowing the tail to hit first, of course. Maintain the runway track and land on the main wheels first, then let the tail go down by itself. Stay on those rudder pedals to keep the track on centerline.

If you bounce, don't panic just add a little power and hold the attitude you have or go around (see Go Around below) and try it again if the runway is getting too short. Do not pull back if you bounce! This will only exacerbate the situation. If you do, you may stall at a very unfortunate altitude and the landing that follows will surely raise the eyebrows of anyone within earshot. A go around is, sometimes, the best course of action and should NOT be interpreted as poor

performance. On the contrary, it shows good judgment! The FAA will never question a go around. Unless the go around itself is done poorly.

As the airplane slows down on the taxiway after that beautiful landing, keep flying the Seabee until you are parked. That is, use the controls correctly just as you did during the taxi out as a hedge against the wind effects. Do not touch any control, except flight controls, until you are clear of the active runway. The FAA takes a dim view on the 'Speedy Gonzales' that wants to raise the flaps, turn the transponder off, re-trim, push the propeller control forward or anything else, all BEFORE taxi speed is attained! Don't do it. More than one airplane has collapsed onto its belly, much to the dismay of the pilot, all because the pilot was in a hurry and retracted the wheels right out from under the airplane. For a Seabee pilot it is fortunately more of an embarrassment than damaging, but with any other type airplane (propeller in the front) it could be a very expensive lesson. Keep the good habits. Wait until you are clear of the runway and at normal taxi speed before 'cleaning' up the cockpit.

Okay, lets talk about all the variables that come into play if that perfect day has come and gone. If a crosswind is encountered upon landing, there are two (maybe three) different philosophies regarding airplane control during the final stages. One is while on final approach maintain the wings level with a drift angle to maintain the runway centerline then, at the moment of flare, drop the upwind wing and apply enough 'top' rudder to keep the airplane going straight down the runway making contact on the upwind wheel and allowing the downwind wheel to fall gently to the runway. All the while keeping the ailerons turned into the wind and keeping the Seabee going straight with the rudder. This is a good technique.

The next type is an exercise in precise aircraft control that should be attempted with a few Seabee hours under your belt. Start by using the same procedure as the previous maneuver but as you approach the runway (this is where it gets tricky), push the downwind rudder pedal to straighten

the airplane out just as it touches the runway. The ailerons should be used into the wind to counteract the tendency for the upwind wing to rise and again keep it going straight with the rudder pedals. I guess you could say that both of these are really identical procedures but the latter is done all at once.

The third technique is to keep the airplane longitudinal axis right in line with the runway centerline using the rudder and opposite aileron, essentially 'slipping' down final to a landing. The advantage to this is that you can establish the correct aileron and rudder inputs early in the program. The disadvantages are that it could be very uncomfortable for your passengers, as it tends to cause the body to lean toward the low wing all the way down final approach.

Gusty winds pose a different challenge by taxing your ability to control the Seabee at any given time. You might consider using partial or no flaps. Consider this; with the wind blowing from who knows where at who knows how fast, full flaps may be more of a hindrance than a help. If a gust just happens to quit with full flaps the Seabee may, at the most inopportune time, decide to stop flying momentarily until the next gust comes along. With the flaps up or partially up, the stall protection is increased due to the lack of drag by the full flap position. Keep in mind that the drag on the airplane from the flaps is greatest when they are more than half way down. The flap drag is very little with half flaps and nonexistent at flaps up. Use this basic law of aerodynamics to your advantage. You might consider, very seriously, adding 5 MPH to your approach speed in gusty conditions. You won't use up that much more runway and it gives you much more controllability when it is needed most. Make a wheel landing. That is, land on the main wheels and stay there for a while before allowing the tail wheel to contact the runway. This type landing is done at a higher than normal approach speed (+5 MPH or more) and permits better

control after you land. Again, these should be practiced when you are comfortable flying the Seabee (at least 10 to 20 hours). Practice these techniques with a safety pilot and in good weather before you attempt the real thing.

Water Landings

The most important thing to remember when landing on the water is LEAVE THE WHEELS UP! If the wheels are down the Seabee will flip over on its back…period! I understand that no one has ever died in a Seabee that has landed gear down on the water but no one wants to be first either. Check the gear two or three times before landing on the water. Say the Seabee mantra out loud a few times before landing; "The wheels are up for a water landing". Check the gear visually.

The next most important thing is to make absolutely sure the area you plan to land on in the water is clear of all obstacles (deadheads) and is adequate for you to land *and* takeoff again. Circle the area before landing a couple of times to get a good idea of what the area looks like. If it looks like there are any obstructions, go to another part of the lake or an airport.

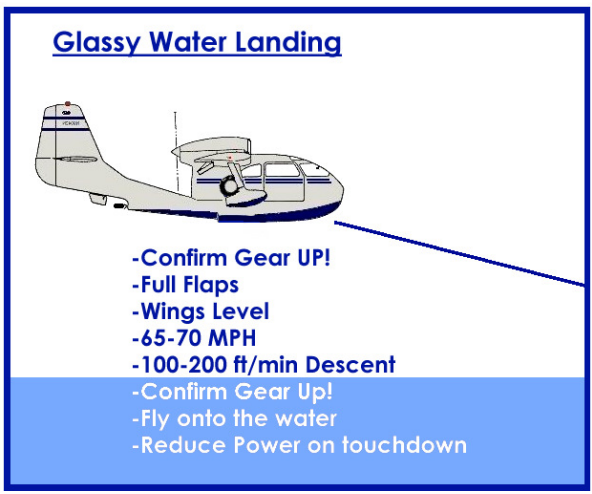
When you are satisfied that it is safe, begin a normal traffic pattern. Treat a lake exactly as you would an airport; downwind, base, final, the whole shootin' match. This will keep your good habits intact. If you do the same thing every time, you won't be rushed or confused about what to do.

On downwind, slow to 80 MPH if you are not there already. Abeam the 'numbers', reduce the power to begin a slow (500 FPM) decent. Flaps can be gradually lowered at this point but not all the way. Quarter flaps are plenty at this point. Turn base leg just as you would at an airport and check your wheels UP! Visually check the main wheels and the tailwheel in the mirror on your wing float. Add half flaps now. Turning final, adjust your airspeed for the appropriate conditions. For a normal surface, less than 6" swells, 75 MPH is a good all around number. For glassy water, 65 MPH is better. (Glassy water landings will be discussed in a minute). When on final confirm again that your wheels are UP. Say the 'Mantra' out loud. If you get funny looks from your passengers, so what.

Fly your approach speed and about a 500 FPM descent rate down to a normal flair position; about 2 feet off the water. Slowly reduce the power as you increase the pitch attitude and land the Seabee at the slowest possible speed! In ground effect (or water effect), this speed will be close to 55 MPH. Keep the wings level. Do not let the wing floats touch the water at this point for it could be catastrophic. After you touchdown simply bring the power and the elevator back slightly. You will feel yourself settle into the water achieving what they call 'displacement'. It is now just a matter of using your rudder pedals to taxi to the dock or beach or to get ready for another takeoff.

It should be noted that any time you are on the water at taxi speeds, keep the control wheel back slightly. This prevents the nose from digging into the water too much and prevents the elevator from banging against the mechanical stops.

Okay, glassy water landings: Glassy water is probably the most dangerous thing a seaplane pilot has to face. The water is mirror smooth and your depth perception is all but nonexistent. You may or may not know what the elevation is of the lake making it almost impossible to judge your altitude above it. Take these landings very seriously and practice them many, many times before your first real one! I sure hope your first landing alone is not on glassy water. If you find it hard to determine where the surface is, divert and land somewhere else.



The power setting and Seabee configuration should be determined before the first glassy water landing. Configure the Seabee for landing at a safe altitude and slow to “Glassy Water” approach speed (65 MPH IAS). Keep a power setting that wil maintain level flight then adjust the power to give a 100-150 FPM descent rate. REMEMBER THIS POWER SETTING! My Seabee power setting happens to be 16” MP at 2625 RPM. The power setting will vary slightly with load of course. Now practice “Glassy Water” procedures under normal (slight wave action) conditions.

As before, make a few circles around the lake and check it out. One technique to prevent the lack of depth perception is to drop newspapers, a map or something that floats out the window so you can see where the surface of the water is and then land by this marker. (Be sure to pick them up before you leave)

As you fly the traffic pattern, everything is normal until turning final. When on final approach and after the wheels are confirmed up, descend to within about 200 feet of the water. At this point increase the power to maintain a 100-150 foot per minute descent rate using the pitch and power determined above. Keep the wings level and the airspeed at 65 MPH. If you think about it, this is really an instrument approach as the only thing you have to look at that makes any sense are the airspeed and vertical speed indicator. Any outside references might just confuse you! Stay on the gauges and fly the Seabee right onto the water. The attitude will be a little higher than a normal water landing. Landing on glassy water might be so smooth it will be hard to tell if you are on the water so when the airspeed gets to about 40 MPH you can be pretty sure you are there. Reduce the power and keep the control wheel back slightly and taxi to your shoreline destination.

Keep in mind as you are landing on glassy water. It is very ‘sticky’. It wants to suck you right into it. You may notice the bow will want to pitch down sharply as you touchdown so keep a steady hand on the control wheel; pulling back slightly as you touch down.

Go-Around

If you find yourself high, fast or things just don't look right on an approach to a landing, a go-around may be the best option. There is no stigma attached to a go-around! In fact, it shows very good judgment on your part. If you have been flying a while, you will agree that more than just a few airplanes should have gone around when they didn't. You've seen it at your local airport; an airplane flies the pattern and you can tell from the ground that he (or she) is too high or too fast or both and lands more than half way down the runway at warp eight! Thank God for brakes. Maybe a go-around might have been more prudent than landing long and jamming on the brakes and squealing the tires. In a water landing situation you can see that this decision is even more critical when landing on a short lake (no brakes!). Remember, you do have reverse thrust but think about it; all things being equal, if you have to use reverse to land in a lake, you probably shouldn't be landing there in the first place.

Always keep a go-around in your back pocket just in case. It's never too late to go-around unless you have trees or something looking down at you!

To go-around, do this:

-Push the propeller control full forward slowly (if it isn't there already)
-Slowly add full power
-Rotate the pitch to a normal climb attitude and speed
-After clear of obstructions, retract the flaps and wheels
-Reduce to climb power (if required)
-Climb out and fly the traffic pattern
-Try the landing again
(If this procedure appears suspiciously like a normal takeoff, well, it is, only your airborne!)

Unless the circumstances require something very drastic, there is absolutely no reason to hurry through this procedure. Slow and deliberate manipulation of the

appropriate controls are all that is required. We don't want to damage the engine or propeller so easy does it.

Docking, Beaching and Ramping

Practice docking starts out in the open water. It's a good idea to throw a soft floating object into the water and practice docking to it a few times. See if you can pick it up from your side of the Seabee. Be sure to keep your seatbelt on and don't forget to pick the object up on your way out!

You should approach a dock (or the soft floating object) from upwind if possible (nose into the wind). This keeps your 'ground speed' as slow as possible. As you approach, keep directional control with the rudder. The water rudder is most effective at slow speeds so keep it as slow as you can. Practice using reverse as the dock (soft floating object) comes within a few feet. To use reverse, set the throttle at 1000 RPM and use the reverse control just as you would the throttle from this point on. You can do any maneuvering in this configuration. If you need more than 1000 RPM to get to where you need to go, the wind is probably blowing much too hard and you probably shouldn't be there in the first place.

When you're ready, approach a real dock in the same way. The only difference is that you should drop a boat cushion over the nose cleat as a bumper against the dock to prevent damage to the Seabee. Other than that, all procedures are the same.

As contact is made with the dock leave the engine in forward thrust to keep it against the dock. You can then use the rudder pedals to keep the Seabee heading in the direction required while loading or unloading. Obviously an experienced helping hand from the dock would be a big advantage.

If you plan to tie up to the dock and don't have anyone onboard that can help you, sit in the right seat, stow the right hand control wheel and open the front door and secure it. Put the boat cushion over the nose cleat. Tie a line around one of the right hand rudder pedals and have it ready to heave at your helper on the dock or get ready to step onto

the dock yourself. Approach the dock in the manner discussed above and as you make contact at the slowest possible speed, throw the line to your mate on the dock or stop the engine and quickly step onto the dock with the line in your hand. (Be sure to have the reverse lever full forward and locked before shutting down the engine.) Tie the Seabee to the dock using cushions and lines as necessary to prevent any banging and clanging of the Seabee parts against the dock. Remember to park downwind from the dock if at all possible.

If you have access to a ramp, you will be spoiled beyond belief. It is really the way to go if at all possible and it's easy! Be absolutely sure the ramp allows access to an area where the Seabee can be turned around without hitting anything. The wheelbase of the Seabee is about eight feet, consequently you will need an area of firm support that is at least sixteen feet wide for the wheels. The wingspan is about forty feet so make sure there is adequate clearance for the wing tips as you make your turn around.

When you are well away from the ramp, put the wheels down early and make sure they are locked. If the wheels are in transit as you contact the ramp (or anything else for that matter) you run the risk of shearing the clevis fork that attaches to the top of the landing gear hydraulic actuator. If this happens, there is no way to determine if the wheels are locked or not so you must fix the problem before you attempt to ramp the Seabee again. Some keep a spare clevis fork in the airplane at all times just for this occasion.

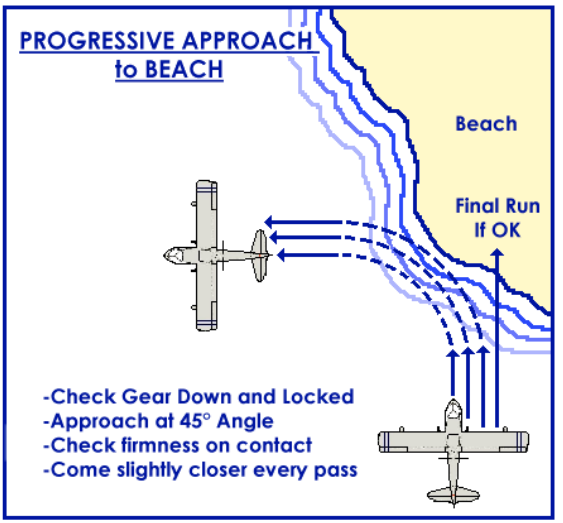
Note: If you have too much speed through the water, the gear may not extend all the way using the electric hydraulic pump. Water resistance will turn the pump off before the gear is locked down. Slow down and extend the gear again.

When the wheels are down and locked, it is safe to approach the ramp. You will notice the Seabee isn't quite as responsive in the water with the wheels down. This is because the water going over the water rudder is now being partially blocked by the tail wheel and is less effective. It is adequate but sluggish so be careful and anticipate required

turns. Line up to the ramp early and keep the Seabee tracking on the ramp centerline. You may have a slight drift angle due to the wind and/or current but unless the crosswind is really strong (over 10 knots) this posses no problem for the Seabee. With a strong crosswind, more power will be required to keep the track straight. Contact with the ramp can be with one wheel first. This is okay and the other wheel will make contact shortly thereafter. Keep the power up and depending on the ramp angle, use power accordingly to climb the ramp at a slow, steady speed.

It is recommended that you make your turn toward the water on dry land to ease the re-entry maneuver. After the Seabee is headed toward the water again, shut the engine down, set the brake, chock the wheels and enjoy the atmosphere as the crowd appears.

To enter the water upon departure, simply start the engine and coast down into the water. Retract your wheels and complete the appropriate checklist before takeoff. It's that easy. If, however, the ramp is more than 15° it is recommended by Seabee pilot's with more experience than I that you don't turn around on the ramp. Park in a position where you can back up into the water. This prevents damage to the water rudder. When backing up remember that depending on your tail wheel configuration, it may be necessary to pull forward a few times before you get to the water as your tail wheel may unlock prior to the point of entry. Use the rudder pedals judiciously and light braking for steering backward. Plan ahead and turn away from any obstructions using the water rudder



and reverse thrust. When clear, put the propeller control into forward thrust and lock it. Continue with a normal water taxi and takeoff clear of the populated area.

Beaching is a unique maneuver unto itself. Advanced planning is required to successfully pull onto a beach. You will get wet unless the beach is unusually hard surfaced. If there is any way to get advanced information, preferably from an amphibian pilot that knows about the beach you intend to use, get it. It is well worth the time and trouble to get the inside scoop on the area. If it is a beach that is unfamiliar to you, use extreme caution as you may get stuck if you are not very careful.

Circle the area from the water a couple of times to get an idea how the beach would handle a Seabee. Make multiple passes at a 45° angle to the beach and get progressively closer to determine if the beach is solid. If it is found to be satisfactory, pull onto the beach and swing the tail away from the water. KEEP THE POWER UP! You will find that a lot of power is necessary to keep the Seabee moving. Don't let it stop or you may get stuck.

The Seabee is then headed toward the water again just as you did on the ramping exercise. This makes egress immensely easier. If you are in an area of tidal change, keep this in mind as you tie down the Seabee or you could be swimming after it later in the day or waiting for high tide a few hours later than you had planned. An excellent article on this very subject is written by Don Kyte, "Seabee Beaching and Ramping" and is available on the Seabee Club website (www.republicseabee.com). It is mandatory reading for every Seabee pilot prior to beaching for the first time. Good luck.

Emergencies

Before we get into specific emergencies, some discussion is in order about the situations that compel us to take drastic measures in dealing with emergencies. The very first thing to do in any emergency is FLY THE AIRPLANE! More than one accident has occurred simply because the pilot didn't keep enough flying speed or lost situational awareness (knowing where you and your airplane are at all times) and allowed a perfectly good airplane to fly right into the ground. If you simply fly the airplane your chances of survival are a lot better than if you stop flying at any altitude.

The second thing to do is identify the problem. This sounds really easy, but put yourself in an airplane that is shaking or on fire and then let's see how easy it is to identify a specific problem. It can be quite confusing in the heat of the moment. For example, it would be a terrible waste of time to fight an electrical fire when a cabin fire is really the culprit.

The next thing to do, if you have time, is call someone and tell them you're in trouble. Many pilots keep a radio on 121.5 for just such an occasion. If you can't get a hold of ATC, make a call in the blind on 121.5 MHz. More airplanes are listening than you think. The call should be short and sweet identifying yourself, your position/altitude (if known) and your intentions. The message will eventually fall into the right hands. For example, "Mayday, Mayday, Mayday, Seabee N123 is 25 miles west of Anytown VOR has lost engine power at 3500 feet and am making an emergency landing". Everything that anybody needs to know about your situation is in that sentence.

Lastly, don't panic. Okay, it's a stressful moment but panicking will not help at all and will, in fact, cause more problems for you. When stress (panic) sets in, a human is prone to 'tunnel vision', narrowing the already dwindling set of choices we have to make. Keep your head.

There are very few real emergency situations in a Seabee. The one that comes to mind that is quite serious is a fire of any sort.

An engine fire can be taken care of simply by pulling the fuel shut off handle under the pilot's seat. This will turn off the fuel at the fuel tank and starve the engine and the fire of fuel. The engine should quit almost immediately, hopefully putting out the fire. You should also pull the mixture control out and while there is still oil pressure, pull the propeller control out all the way. This will put the propeller into high pitch (low RPM) decreasing the drag and increasing your gliding distance. Now all that is required is to maintain best glide speed and find a suitable landing area.

If you don't know by now, the Seabee doesn't glide worth a darn! Surely you've heard this one:

Seabee Instructor: *"Why did Republic put that window in the ceiling of the Seabee?"*

Seabee Student: *"Gee, I don't know."*

Seabee Instructor: *"Because if your engine quits, that's the window you'll be looking through to find a place to land!"*

An engine or engine compartment fire is one thing, a fire in the cabin is quite another. If you have a fire in the cabin, get your fire extinguisher out and discharge it at the base of the fire (if you can find the base of the fire) until the fire extinguisher is empty! LAND AS SOON AS POSSIBLE! This means just what it says, pull the power all the way back and establish glide speed and land at the nearest suitable piece of real estate. An empty field, a long stretch of concrete (highway) or if you're really lucky an airport. Unlike a minor emergency like the wheels won't go down where you have time to think and make decisions, a cabin fire requires that you land immediately! If you have time and/or the fire goes out, increase your speed to the redline and land at the nearest suitable airport which, by the way, may be behind you if you are headed into the wind! Think and think hard.

Any other situation you can think of are a whole lot less serious than fires. Oh, you could have an electrical fire, but that is easily taken care of by turning off the master switch or alternator switch and opening the vents for fresh air. Electrical fires are unique because of their smell. Burning plastic, electrical sparks, an acrid chemical smell are all electrical fire symptoms.

Other 'emergencies' are really not. Think of one situation, other than a fire, that would require that you land ASAP. I can't. The gear won't go down? Big deal. Land on the keel. The flaps won't go down or up? Big deal, land with a little more speed if the flaps are up and land normally if the flaps are down.

Republic, evidently, did some flap studies with one flap up and one down. The book says that there is plenty of aileron control at most speeds to overcome the rolling tendency caused by such a problem. You could add a few knots to your approach speed just in case. I would probably pick a longer runway than normal at an airport with fire trucks…just in case. We pay for the fire trucks; why not use them?

In any of the above cases, be sure to 'declare' an emergency with ATC! Even if the situation only remotely resembles an emergency. You will still have to fill out paper work, but by declaring an emergency with ATC, you have just received a license to steal and covers up a whole gamut of 'gotchas' from the FAA. The first thing the FAA will ask after you make that emergency landing on I-95 is, "Did you declare an emergency?" If you answer yes, they will move on to something else. If you answer, "Why, no, I didn't." They will have a bunch of other questions for you. You didn't have anything to do for the next three days anyway did you?

Instrument failure? Practice partial panel flying with a flying buddy. If you find yourself in the clouds when you shouldn't be, make a standard rate 180° turn and get out of the weather and land at that cute little airport you saw a while back.

Runaway propeller (Propeller overspeed)? Pull the throttle back to keep the RPM within limits and land.

Okay, engine failure is an emergency that requires you to land right now, but in that instance we have no choice. We have to land and we are not on fire! Again, fly the airplane, identify the problem and tell someone.

I don't mean to trivialize these abnormal situations, but if you think ahead and have a plan, you will survive.

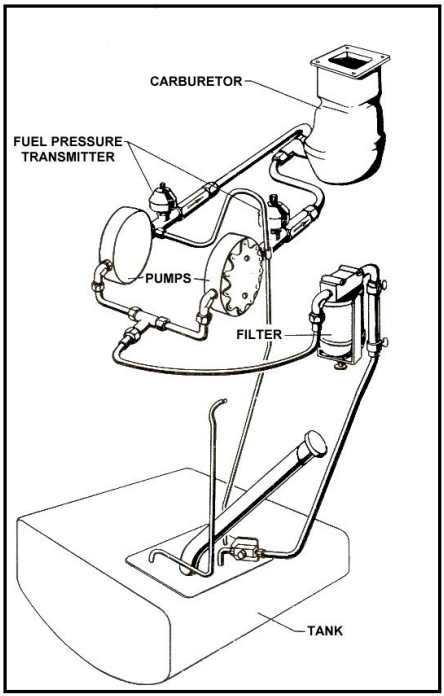
One resource that quite a few people have recommended is the AOPA legal service plan. It is reasonably priced and seems like very cheap insurance. If you find yourself in an accident or incident, they can lead you through the process as painlessly as possible. AOPA has full time professionals that do nothing but FAA type legal stuff. Hopefully, we will never have to deal with that kind of situation but it's nice to know there is someone on our side if we need it.

Systems

Engine and Propeller

Due to the wide variety of powerplants and propellers in the Republic Seabee, please refer to your Franklin, Lycoming, Continental or General Motors operating manual for specific instructions on how to run your engine to the best of its ability. Read the manual carefully. It contains all the information you need to keep you engine running when you need it most. Many people have worked very hard to establish operating standards for your engine and their procedures are tried and true. Follow them.

Fuel System



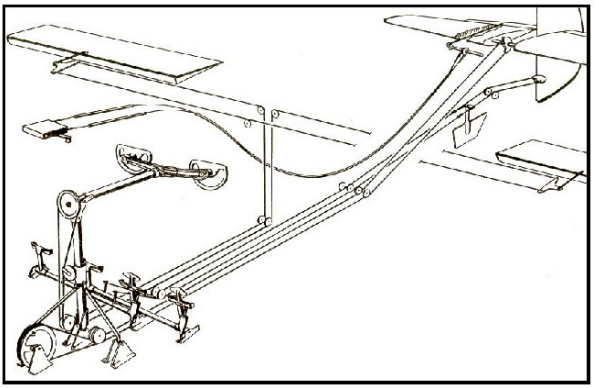
The fuel system is as simple as it gets. Fuel for the Seabee is contained in one bladder type cell of 75 U.S. gallons capacity located in the hull under the aft baggage compartment. The fuel is piped to the carburetor through a strainer and pumped by two AC diaphragm type engine driven pumps. Either pump can supply sufficient fuel to the engine. Some of the later model Seabees have an electric pump, in addition to an engine driven pump, located close to the fuel tank to provide fuel under pressure to the carburetor.

The fuel quantity gage is electrically operated from a float in the fuel tank. A fuel pressure gage indicates pressure for either the left or right fuel pump (or the electric or engine driven pump) as selected by a fuel pump switch on the instrument panel.

Normally the fuel is shut off by pulling the mixture control to the idle cut-off position; in emergencies fuel may be stopped by pulling on the fuel-flow shut-off control located under the pilot's seat.

Before the fuel gets to the pumps, it is filtered. This filter should be checked on each pre-flight check and is normally located under the right wing root but some have been located on the other side. Boost pumps and fuel system components may vary from Seabee to Seabee. Check your FAA Approved Flight Manual and STC's for your specific components.

Flight Controls



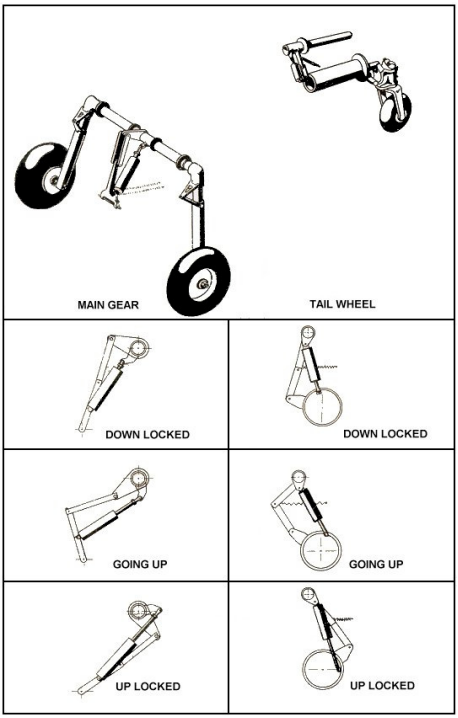
The control surfaces of the Seabee are actuated by the rudder pedals and the control wheel through a series of flexible cables housed under the cabin floor and lead through a series of pulleys to the control surfaces. The dual rudder pedals are synchronized with the pilot's pedals by mating gears on the connecting torque tubes between the two sets of pedals and the dual control wheel is synchronized with the pilot's wheel by engaging a split sprocket in the dual control column to a mating sprocket in the pilot's control wheel column. The dual column is removable and may be stowed under the front seat in the bracket provided.

The water rudder cables are coupled to the air rudder cables so that operation of both surfaces is synchronized and made by the same pedals.

Some models of Seabee have steerable tail wheels that are also part of the rudder cable assembly. The rudder pedals also control the tail wheel steering system.

The elevator trim tabs are controlled through sprockets and chains at the control handle and the trim surfaces. The control is a crank located on the ceiling overhead the pilot. Fixed tabs are provided on the aileron and rudder. An FAA Airworthiness Directive has been issued for the elevator trim system. Each pre-flight should include a thorough check of the trim tabs on the elevators. No more than 1/8" inch play should be evident. If it is more than that, get a mechanic to check it. Steel bushings will negate the AD but it should still be checked prior to flight.

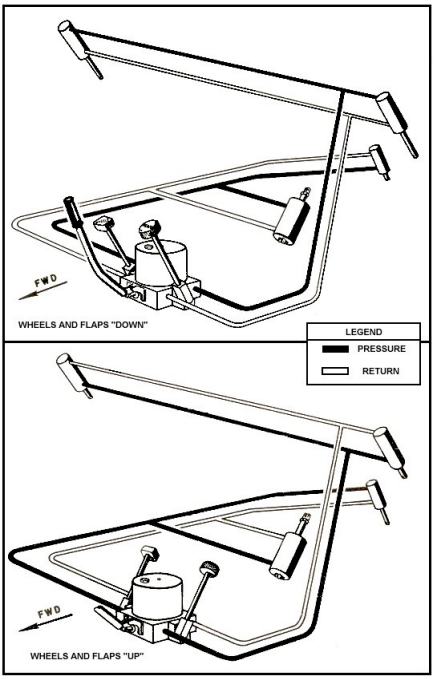
Landing Gear



The reliable, hydraulically controlled, landing gear is maintained in the up or down position by the geometry of the linkage. As noted on the landing gear diagram, the linkage is designed so as to "break" during the transition phase of the gear operation and to "remake" at the up or down position, so that the center pivots of the linkage are past dead center travel. In this manner, positive lock is maintained until hydraulic pressure is applied to the cylinder permitting a "break" in the linkage.

Note that the tail wheel is rotated (to starboard) to the up and down position and that the main gear is retracted and extended. The landing gear position lights (Red and Green) are wired so that when all three wheels are down and locked the green light is illuminated. However, when the Red light (Up) is illuminated it does not necessarily mean the tail wheel is locked up. It may be down or any position including up and locked. Use the wing float mirrors to confirm the tailwheel position.

Hydraulic System



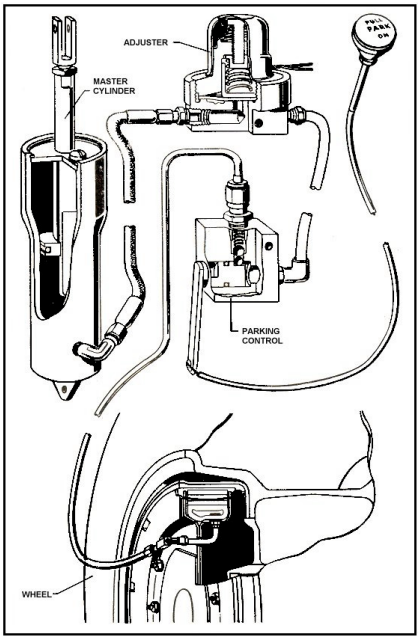
The flaps, main landing gear and the tail wheel are extended and retracted hydraulically. A single, manually-operated hydraulic pressure system activates both the landing gear and the flaps.

A large lever, extending upward from beneath the floor between the two front seats activates the pump with which hydraulic pressure is built up. Two other arms extending from this unit control the action of the fluid. The right lever directs the section of the landing gear while the one located on the left side determines the position of the flaps. The hydraulic power pack incorporates a series of check valves which prevent the temporary dropping off of pressure when transferring the hydraulic action from wheels to flaps or reverse. Some Seabees have an additional electric hydraulic pump operated by a switch on the forward instrument panel or control wheel button. Momentarily activating the switch or button turns on the pump and pressurizes the system and operates the selected flap or landing gear system until it reaches the up or down position and turns off automatically when the pressure in the system reaches a predetermined value (≈800 psi).

The system has a three and one-half pint capacity and uses a petroleum oil base hydraulic fluid, Specification 3580D or equivalent (Mil-5606).

Brakes and Wheels

The main wheels of the Seabee 7.00 x 8 and the tail wheel is a 10” smooth contour type.



Each main wheel on original Seabees is equipped with bladder-type brakes which is fed from its own master brake cylinder at each of the rudder pedals. A brake adjuster and a parking valve are installed in each of the lines between the master brake cylinder and the wheel. The positions of these parking valves are controlled at the instrument panel by a single parking control lever. Pushing the brake pedals down firmly and pulling the parking brake knob out sets the parking brakes. To release, just push in on the parking brake knob.

A control is provided in the cockpit, on early model Seabee’s, to engage or disengage a tail wheel lock thus permitting the tail wheel to be locked in the centered position (takeoff and landing) or to be unlocked in order to swivel (taxi and ground operations).

A steerable tail wheel assembly is available on some Seabees. These models use cables attached to the rudder cables that steer the tail wheel up to a certain limit. If forced beyond this limit, the tail wheel unlocks and is free to swivel until forward, straight movement locks it in the steerable position again.

Later modifications that allow for an improved model disc brake system. These are typical disc brakes that are identical to the above system with the exception of the bladder and drum that are replaced by the caliper and disc. There is no adjuster in the system for they are self-adjusting.

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Republic RC-3 Seabee

Instructor and Trainee
Initial Checkout Syllabus

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 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, 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!

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.

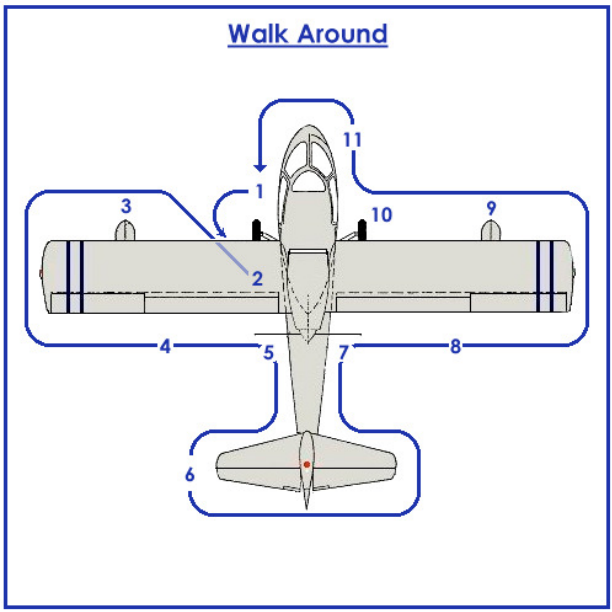
The trim system should be carefully checked prior to flight. Advise the trainee of the compliance with Airworthiness Directive AD48-01-03 for excessive elevator trim play. Explain that the Seabee is a “trim” airplane and one should not leave home without it! Just look at how big those trim tabs are. 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@pbtcomm.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, Empenage
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.

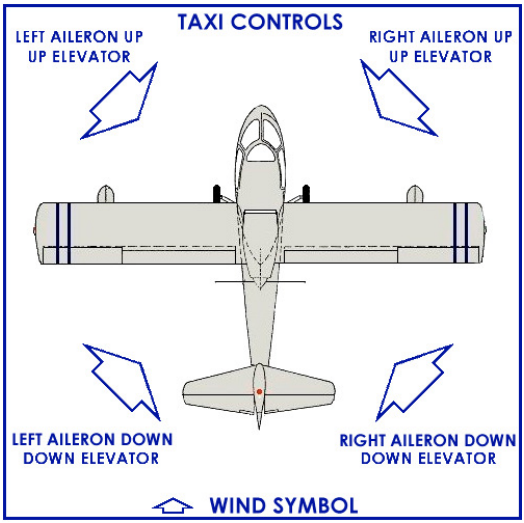
Objective: To familiarize the trainee with the different configurations for takeoff. Flaps, no flaps, effect of weight and temperature and especially density altitude.

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/runway 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 (i.e. 5 min.)
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 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.



Notes:

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.

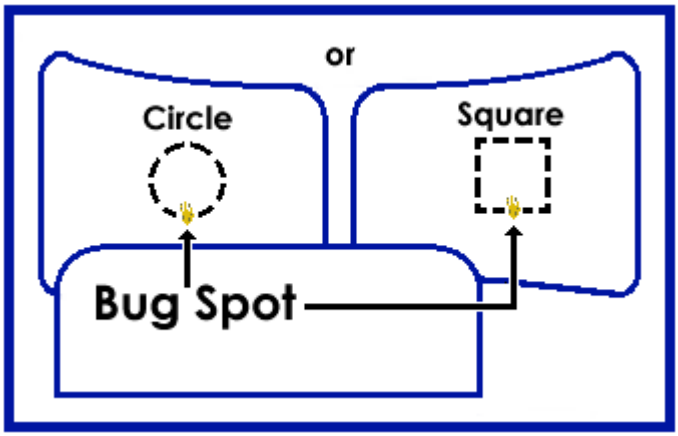
Power setting charts should be consulted if available and special emphasis on smooth engine/propeller control movements should be reinforced. Review engine/gearbox limitations.

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.



Notes:

Lesson 6: Landing (Land) procedures

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

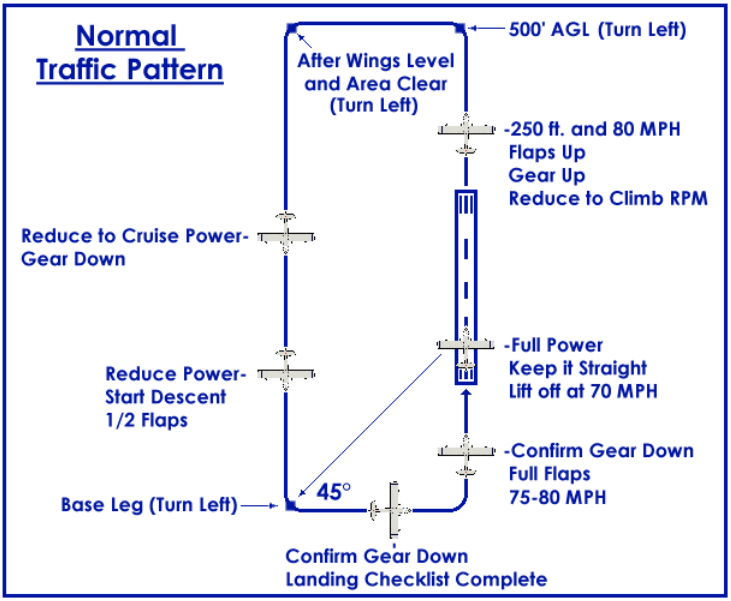
Description: Due to the assumed experience level of the trainee, traffic patterns and entry procedures should not have to be briefed, however if any questions exist, clear them up before the traffic pattern is entered. Discuss planning for the touchdown and aircraft control during the landing with emphasis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


Normal
Traffic Pattern
After Wings Level
and Area Clear
(Turn Left)
500' AGL (Turn Left)
-250 ft. and 80 MPH
Flaps Up
Gear Up
Reduce to Climb RPM
Reduce to Cruise Power-
Gear Down
-Full Power
Keep it Straight
Lift off at 70 MPH
Reduce Power-
Start Descent
1/2 Flaps
-Confirm Gear Down
Full Flaps
75-80 MPH
45°
Base Leg (Turn Left)
Confirm Gear Down
Landing Checklist Complete

Notes:

Lesson 7: Water Landing

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

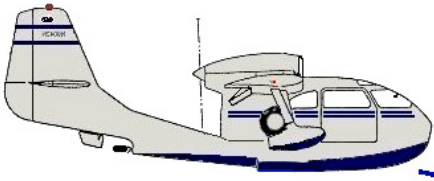
Description: Impress upon the trainee the importance of circling the planned landing area a couple of times to be certain the area is clear. Stress the importance of planning a landing as if it was at an airport; fly the pattern! These Seabee's are noisy, consequently the planning should include avoiding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

Glassy Water Landing



-Confirm Gear UP!
-Full Flaps
-Wings Level
-65-70 MPH
-100-200 ft/min Descent
-Confirm Gear Up!
-Fly onto the water
-Reduce Power on touchdown

Notes:

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 a slight back pressure on the elevator control should be used on the water. Unlike its float plane brother, the Seabee does not require the elevator to be up at all times as this will only put the propeller closer to the water.

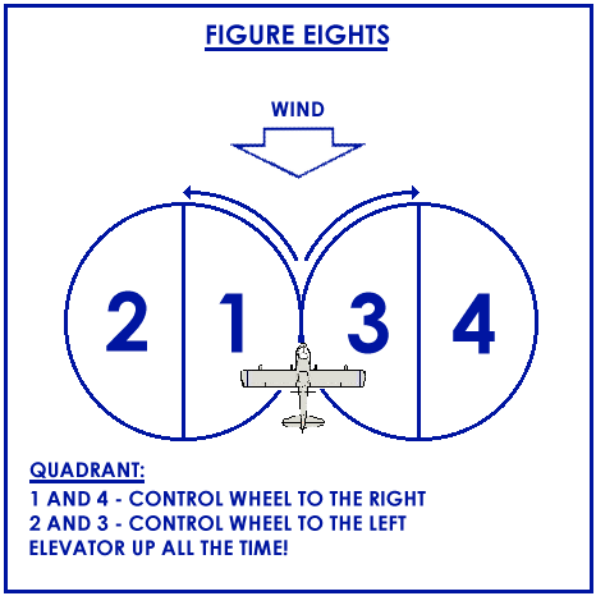
Have the trainee practice making turns in both directions and complete 360◦ turns utilizing the flight controls to assist. At idle power into the wind, show the effect of just the flight controls to turn the Seabee. Show the effect of rudder and aileron separately on turn rate and that the “down” aileron 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!



Notes:

Lesson 9: Docking and beaching

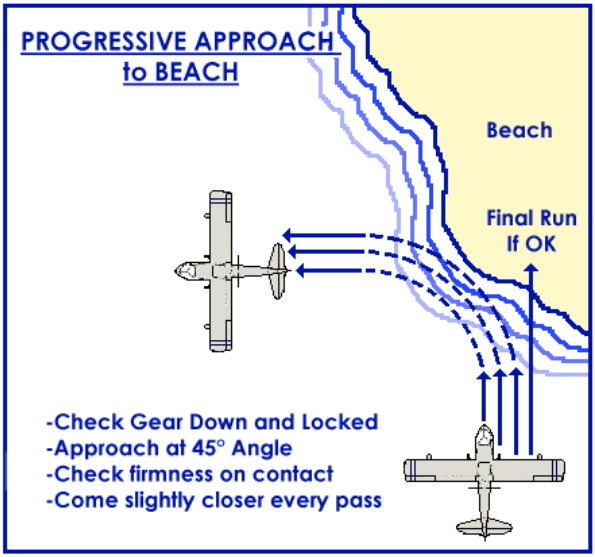
Objective: To assess conditions for docking and beaching and gain experience in approaching a dock, beach or ramp. Good seamanship should be emphasized to safely moor or dock the Seabee.

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 into the wind 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 on the reverse lever, adjust the speed with just reverse control and the feet for rudder steerage. Maneuver toward the dock at idle power using only reverse for speed control. Kill the engine after reverse is stowed 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 damage.*

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.

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. Emphasize caution and patience.



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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.

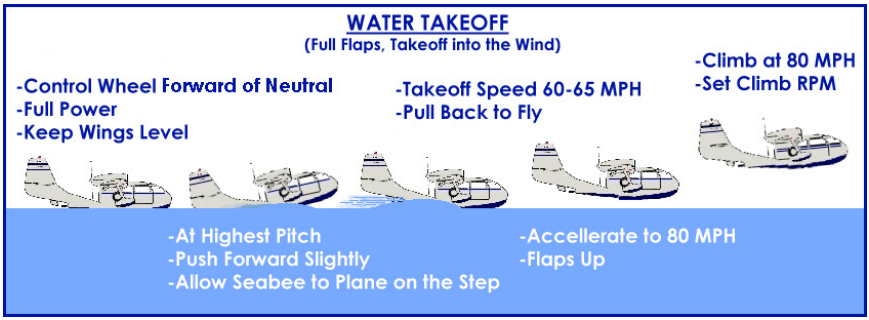
To reinforce the trainee's knowledge of Seabee performance, attempt a takeoff at a reduced power setting to simulate a heavy takeoff or takeoff at a high temperature/high pressure altitude situation.

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.



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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, retracting or at least unlocking the gear prior to making an off-airport landing. This will prevent the Seabee from going over on its back if landing on a soft or rough surface.

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 inflight, other than checking fuel on, magnetos and carburetor heat (if installed), should be kept to a minimum. 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, adding 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.

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.

Open Front Door (Bow Door) must have happened because you failed to check the doors closed before takeoff. Add this item to your checklist just before you takeoff. Republic says there is no difference in aircraft handling for landing but some buffeting may be noticed. Do not try to close the door in flight! Land normally.

Operation with one wing float could happen if a landing is made with one wing low upon contact with the water. If this should happen, keep the wing without the float out of the water. If the non-float wing is allowed to submerge, the airplane could roll over and sink. Do everything you can to keep the good wing on the water including:

- Using centrifugal force, make circles around the wing without the float. Use ailerons as necessary.
- Have someone lean out onto the wing strut with the good float and taxi to shore. Be sure they have a life vest on!
- If you can accelerate to 40 MPH, Republic says this is plenty of speed to use ailerons to keep the good wing float in the water.
- Keep the wing with the missing float headed into the wind.
- If the wing with the missing float submerges, put all available weight on the other side. The water will drain out in a matter of minutes. Continue to shore using the above techniques.

Above all, remember…

FLY THE AIRPLANE FIRST!

Notes:

Lesson 12: Cross-Country Check

Objective: This will serve as a final 'check' of the trainee's 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

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Cross country check
Solo flight

Notes:

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.)

Seabee Owner's Manual by Republic Aviation

Lycoming Operating Manual by Texron-Lycoming, inc.

Franklin Aircraft Engines Overhaul Manual by Aircooled Engines Inc., Syracuse, NY.

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

Seabee Service Bulletins by Republic Aviation

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

Seabee Familiarization and Walkaround by Capt. Richard W. Sanders (1986)

Seabee DVD by Steve Mestler
(e-mail: smestler@pbtcomm.net)
Includes all Seabee Service News, Service Bulletins and Republic Flight Manual as well as other information on a DVD - $50. Send an e-mail with your name and address and the DVD will be sent to you ASAP.

Seabee Newsletters by George Mojonnier and Richard Sanders. Seabee Newsletters of the past with a wealth of information. Send your name and address to e-mail smestler@pbtcomm.net and the CD, $25, will be sent to you.

Note: Most of the above articles are available free of charge on the International Republic Seabee Owners Club website.

www.republicseabee.com

This completes the Seabee Training Guide. If you have any questions don't hesitate to ask someone. I have found, in my brief association with the Seabee community, that Seabee pilots are more than willing to help out a fellow Seabee-ite. After all there are less than 300 Seabees left! We have to stick together or things will surely be hard on every Seabee owner. I encourage you to ask questions and if you can, offer advice and help when needed. It will keep us flying for many more years.

If I can help you I will, although my experience is not as extensive as some Seabee owners. I can surely give you the name of someone who can help you. My e-mail address is smestler@pbtcomm.net. Drop me a line if you have anything Seabee related to pass along, I will be sure to post it on the Seabee website or in this document. Thank you and please fly safely.

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