

REPUBLIC AVIATION CORPORATION  
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• • • SERVICE DEPARTMENT • • •

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### AMPHIBIOUS OPERATION

Seaplane operation, whose popularity has increased steadily since the advent of the Seabee, calls for several slight innovations in the art of flying that are not normally necessary when flying land based aircraft. Here at Republic our aim is to see that every Seabee owner enjoys to the utmost all the advantages of his new airplane. With this in mind we are attempting to set down some of the basic rules and principles involved in seaplane operation. Landplane pilots will soon discover that only a few additional fundamentals and precautions are to be observed to insure successful and carefree amphibious operations.

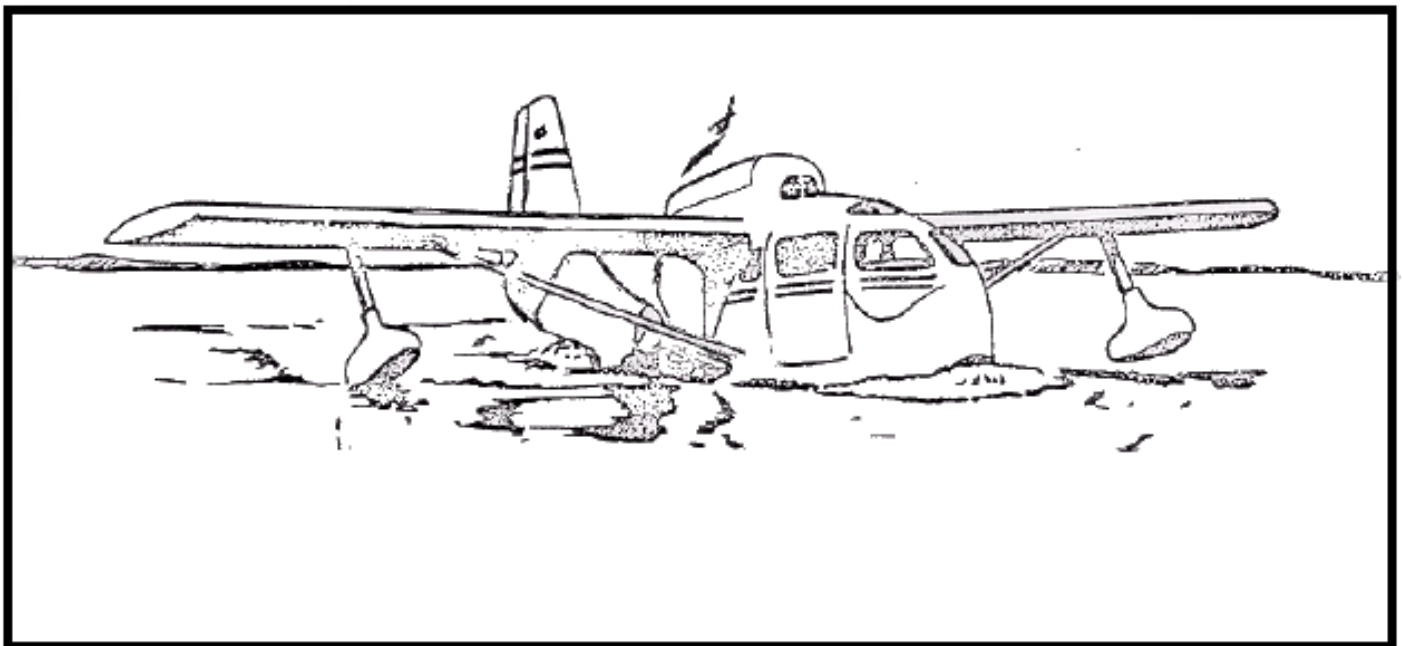
### IDLING AND TAXIING

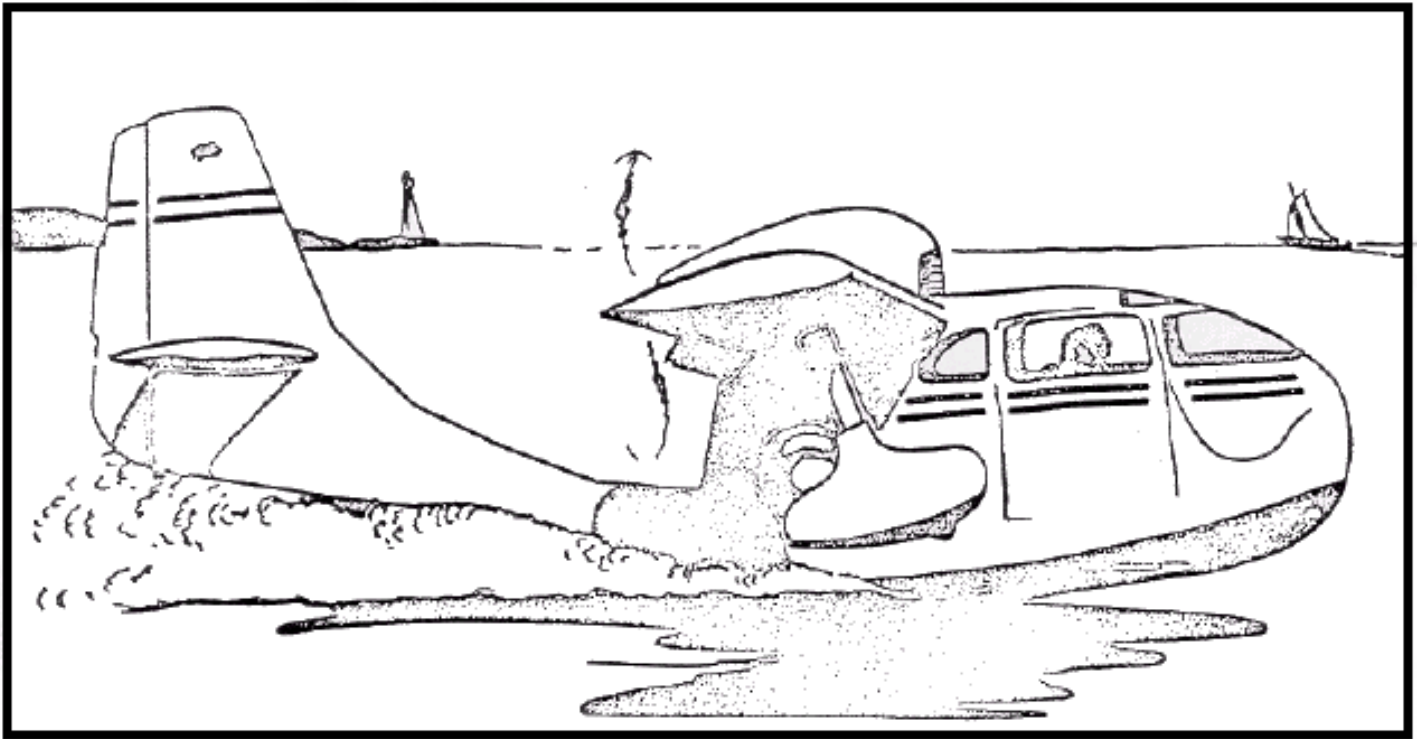
A Seabee on an airport with its engine idling will remain stationary whereas the Seabee afloat under identical conditions will be motivated by the various forces that are prevalent. Any free floating seaplane, whose engine is off or idling, will like a weather vane, tend to head into the wind.

In this position it is likely to be subject to still further movement depending upon water currents, wind velocity, and propeller thrust. Should another than an upwind position be desired it will be discovered that more propeller blast will be required to obtain and maintain this position.

Prior to taking the Seabee out the pilot should study the prevailing conditions so as to determine in advance just what the aircraft is likely to do. Careful consideration must be given in advance to the taxiing problems to be encountered unless of course the wind and water currents are light and the approach and take-off areas are wide open, and free from large waves.

Contrary to standard landplane technique it is extremely important that the control wheel be held all the way back the *entire* time the Seabee is being maneuvered on water. This positioning lifts the nose which reduces the spray and improves maneuverability. The only exceptions are those of actual take-off or when the Seaplane is taxied at speed using considerable power.





## TAKE-OFF

Before take-off it is considered desirable to warm up the engine while the airplane is still located at its ramp or float. If this is not possible the same results may be obtained by taxiing about in an open area.

When the beginning of the take-off area is reached the flaps should be fully extended. Immediately open the throttle wide and pull the control wheel back thus lifting the bow out of the water. As the forward speed increases the bow will continue to raise until a certain height is reached at which point the Seabee will tend to flatten out. When this point is reached the control wheel should be allowed to ride forward close to the neutral position. At this juncture the Seabee will immediately begin to plane and travel on a more nearly level position on the step. After the Seabee is on the step a slight back pressure on the wheel will hold it in position until take-off speed is reached, at which time slight additional back pressure on the wheel will lift the aircraft clear of the water to prevent the possibility of letting the nose drop and of flying back into the water. When safely airborne the flaps should be retracted at a slow steady rate.

Planing the aircraft at an angle flatter than described tends to wet more of the forward section of the hull, thereby increasing resistance and reducing the forward speed. This effect can generally be felt by the increased drag and a slight nosing tendency. Conversely, operation too far back on the hull-step drags the aft section of the hull in the water and will produce appreciable increase in resistance. This latter fault is quite common with pilots just starting water operations as they will often experience an almost irresistible tendency to haul back too far on the control wheel in a vain effort to get into the air. If this occurs let the nose drop back to the proper angle and keep it there until flying speed has been attained.

A technique recommended to the pilot making his first few familiarization flights is to trim the aircraft for a very steep climb and release the controls as the Seabee starts to go on the step. It is quite likely to hit the perfect angle all by itself and actually get into the air sooner than if handled by other than a most experienced and expert pilot.

Sometimes when taking-off from glassy water, a slight but quick jerk on the controls will assist in lifting the hull out of the water once "getaway" speed has been reached. Where the water is unusually rough the nose should be held higher than is considered correct under normal conditions in order to reduce any tendency to bury. This cause the aircraft to bounce and stall before it fully attains flying speed in which case it is necessary to hold the nose up and settle back for a further run.

## LANDING PROCEDURE

Water landings can be made identical to wheel landing except for the broader safe range of attitudes from tail high to tail low, and the fact that the wheels remain up. The Seabee hydroplanes on its vee bottom and directional and lateral control is maintained as long as there is forward speed. The water rudder operates in conjunction with the air rudder.

It is extremely important that the correct type of landing for the prevailing conditions be selected. On reasonably calm water and normal wind conditions a semi-stall landing is recommended. In this case the aft and step sections of hull touch the water simultaneously resulting in a slightly faster landing than the standard three-point on wheels. If the water is smooth, still faster landings can safely be made by bringing the ship in with flying speed and letting it touch the step in full planing position. It must be remembered that any type of fast landing requires considerable skill to accomplish correctly as nosing over tendencies are likely to develop.

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When landing at night or on extremely smooth glassy water it is practically impossible to achieve depth perception with any degree of accuracy. The best method for landing under these conditions is the power stall. The technique is to glide down to a safe altitude in a normal way. A "safe" altitude would probably be about 50 ft. so that the airplane is well cleared of the water. At this point the throttle is opened somewhat and the nose pulled up so that the ship is slowly losing altitude while maintaining a IAS of about 68 MPH. If the settling feels too fast, a little more power is applied. This procedure is followed until the ship touches water.

If the exact opposite condition prevails, that is very rough water particularly with no wind the same approach and landing technique should be observed. Here especially the descent should be as slow as possible in order to eliminate all possibilities of clipping a wave with the nose of the ship.

Regardless of the conditions involved it is considered advisable and desirable always to land with flaps fully extended.

### **PORPOISING**

Extensive testing has proven that it is not customary for the Seabee to porpoise. However as it might be possible for this condition to present itself depending on a combination of aircraft speeds and water conditions it should be given consideration. Porpoising with the power on such as immediately after landing or during fast taxiing can normally be checked by the controls but any exaggerated movement of the controls should be back rather than forward. If the bow raises, push forward very slightly and as it falls, pull back rather hard. Porpoising with power off such as during a landing can best be checked by holding back hard on the controls and any violent porpoising with power-on should always be treated by cutting the throttle and following this procedure.

### **MANEUVERING**

The Seabee especially when equipped with the Hartzell reversible prop is capable of pursuing any desired surface course. However, a combination of winds and tides may present itself making it necessary to revert to standard marine methods to make the desired headway.

Probably the most important basic principle involved in the water handling of seaplanes is their weathercock action. It is related to and responsible for another rule calculated to avoid difficulty under windy conditions, namely, never use power when turning into the wind. Conversely, the rule demands applying power in turning out of the wind or maintaining anything but an approximately upwind course.

Unless it is absolutely necessary, never approach a runway or narrow beach while the seaplane is being turned not out into the clear, make the turn, then come in on a straight course. This will allow you time to feel out the plane on the course you intended to follow. It also permits your obtaining the slowest and therefore the safest speed which will give positive control. It is also well to remember to do any necessary maneuvers downwind from an objective providing

conditions make this possible. When coming up to a buoy or boat where there is plenty of room to leeward never attempt to steer straight for it unless the course already happens to be upwind. Instead head the Seabee to leeward and let it weathercock around so you can then idle along until contact is made on an upwind course.

Occasionally the condition arises wherein it is desired to taxi to an object some distance away and more or less directly cross-wind from the starting point. Normally this is no problem, but if strong winds and tides are present it might prove a little difficult. To overcome the capsizing tendency that would develop should a steady cross-wind course be attempted, the sailing technique of tracking should be used.

### **FOUL WEATHER PRECAUTIONS**

In the event of fouling weather it is always considered advisable to land-base your Seabee. However, should land facilities not be available, have no fears, your Seabee afloat can ride out the blow. If at all possible a location that is protected from wave action should be selected. A cove or the lee side of a point or breakwater is desirable. Head the airplane into the wind and secure it in that position with the aid of a buoy or anchor. A heavy weight makes an adequate anchor providing the bottom is rough rock, sand, or mud; but if the bottom is smooth and hard, a fluted anchor should be used. The attaching line should be secured to the bow cleat provided for that purpose. To prevent the possibility of the aircraft rolling while moored in a heavy sea, a form of sea anchor should be secured to the tie down fittings located in the wings. These are 10 to 12 quart canvas pails and are suspended so that they hang just below the water line. When the ship rolls the bucket attached to the high wing will lift out of the water and the weight of the water on the pail will exert a considerable righting force.

All control surfaces must be locked in their neutral position. This is best done in the cabin as the danger of attempting to (?) with external control locks in place is eliminated. The rudder is locked by attaching the rudder locking clamp (see Seabee News No. 4) to the brake pedals and lashing the attaching strap in the control wheel. If possible it is also desirable to attach spoiler boards to the wings.

Whenever the possibility of sand, hail, or snow storms are present extra protective measures should be taken. Covering should be provided for the Plexiglass windshield and windows, the propeller, the engine airscoop and vents and the pitot tube. They prevent weather wear and tear and guard against structural damage in high winds.

In all cases ample warning notices should be prominently displayed in the cabin. These notices should remind the pilot of all coverings, control locks, extra ballast, anchors, and any other tethering device used, as any of them neglected could cause a serious accident if flight were attempted.

### **RANDOM NOTES**

Your Seabee should be equipped with an anchor, rope, fire extinguisher, and emergency personnel floatation gear. The removable air cushions with which your Seabee is equipped

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are capable of supporting an adult in water for an indefinite period of time. It is our hope that these cushions will never have to be used except for their primary purpose, that of increasing your enjoyment of the Seabee through the increased comfort they provide.

Existing civil air regulations state that if a seaplane is to be flown for hire over water, especially beyond gliding distance to shore, approved floatation gear of the "Mae West" type

must be readily available for each occupant. Also a Very pistol or equivalent must be convenient to the pilot.

In the interest of good seamanship it is suggested that serious thought be given to the addition of a light weight oar and boat hook to your Seabee's equipment. In this vein the Coast Guard also suggests the addition of a police whistle, as a whistle of this type is the standard signaling device on inland waters.

