SEABEE FAMILIARIZATION AND WALKAROUND
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Here's this ungainly looking aluminum cliff dwelling that we 'Bee-keepers' call "SEABEE". But, unlike the swan, when she's in the water she's even more beautiful. No other single-engine, 4-place factory amphib has her water capabilities and attributes. What characterizes the lure of becoming a seaplane pilot? Mainly, to be able to fly your boat to your favorite body of water, perhaps accompanied by your favorite body of companionship with whom to share the pleasure. It is human nature to be lured away from our ground-bound milieu back to our natural element, of which our bodies are mostly composed. Water. The Seabee is a boat that flies, as opposed to the others that are just planes that can land on the water.

Republic Aviation RC-3 "SEABEE" was produced from early 1946 to October '47, in which time 1,060 were built. They were all powered by the Franklin Air-cooled Motors "500", model 6A8-215-B8F and -B9F engines of 215 hp, with reversible Hartzell props. The 'Bees empty weight is 2100 lbs., with gross at 3150. Her 75 gallons of fuel will take you 580 miles on 13.5 gph, at the normal cruise of 103 mph. Stall speed, with the normal 30 degrees of full down flaps, is 58. Draft at gross is 18 inches. Wingspan is 38 feet and length is 28. Her sturdy stance is seven and a half feet between the main gear wheels.

Enough background. Let's do the preflight walkaround. You climb up into the left seat and I'll take the right. Just put your right foot on the tire, then left foot on the spray rail, and swing your right foot up onto the floor as you hoist yourself up into the seat. I wasn't exaggerating when I said "climb". Flight controls are standard and simple, with the exception of trim control. This is a trim tab ship. Here's the trim control crank right above my head. Turn it with your right hand. To trim for nose up, turn it clockwise. Takeoff position is here with the indicator positioned opposite the "N" in NOSE, for land takeoff. For water, trim up about one more full turn of the crank. Do not attempt to fly her without the use of trim.

The right hand control wheel is removable for easy access to the bow door. Just pull out this knob in the center of the control yoke, and pull the wheel and arm out. Stow the wheel into this bracket under the right seat, then replace the knob into the yoke. But before takeoff it's a good idea to have that control wheel installed back in place so the person in the right seat can manipulate it if necessary. Also make sure that the bow door is latched closed (but not locked) before takeoff, especially from water.

The landing gear and flaps are both hydraulically actuated from the same reservoir and pump, which is manually operated with this long central handle protruding from the floor between us. The landing gear selector is the short round-knobbed lever just to the right of the pump handle. It moves fore and aft in that slot. The round knob has a spring- loaded locking detent in both the UP and DOWN (forward) position to prevent inadvertent movement from the desired position. Landing gear selector DOWN for ground landings, UP for water. There's very significant difference, obviously. All gear actuation includes the tailwheel.

In normal operation, before taxiing, move the gear selector knob forward, making sure that is in the locked position, then pump the handle until you feel resistance. This ensures that the tailwheel will not roll out from under you as you taxi. There should be a green down light on the panel. Quite often these 39 (53)-year old water-borne wind-wagons have malfunctions of one kind or another, in one of two categories: minor and major. A minor infraction includes the gear light wiring system. That's when the purpose of the small mirrors mounted on the floats become apparent. Pumping the gear down and hearing the "clunk" of the over-center locking arrangement, then checking the mirrors to make sure that the tailwheel and mains are down (or up, as the case may be) is standard practice. Any questions about the gear? Yes, the main wheels are connected to each other by the one-piece shaft to which both gear legs are attached.

Gear up, such as after takeoff from ground, is the same technique. After airborne, and past the point where you could use the runway in case of power interruption, reach down to feel the round ("Wheels are round") knob, lift the knob up out of the locking detent and move the gear selector aft so it will lock into the gear UP detent. Pump the handle until the wheels are tucked up just behind the wing lift struts, at which time you'll hear a metallic "clunk" and the red gear up light comes on. Check the mirrors to make sure the tailwheel is also up. Yes, it's possible to get the red gear up light, but still have the tailwheel down. (Wiring and microswitch design)

Actually it doesn't matter much aerodynamically whether the gear is up or down in flight, being equally exposed. But, if you have a power interruption (THAT comes under the heading of major malfunction!), and you have to land in rough off-airport terrain, doing so with the gear up is far safer than with the gear down. One reason this tough old girl is slow is because of her strength and stoutness of hull. It'll protect you. So much for the gear operation at this point.

We still have the wing flap operation. There are only two practical positions of the flaps: up and down. Down is the aforementioned thirty degrees. Flaps are actuated by the square knobbed shaft just to the left of the long hydraulic pump handle. There are three positions of the flap selector. Flaps up position is fully aft. Forward is for flaps down. There is a neutral position which hydraulically locks the flaps in whatever position they are when you move the lever to neutral, but in normal operation is not used. Pumping the hydraulic handle moves the flaps to the selected position, the same as gear selection does. Both flap and gear selectors are beside the pump handle, so it is easy to get the wrong selector by just feeling for it. The republic engineers realized that and made the flap actuator knob square, as in rectangular flaps, and the landing gear actuator knob is round, as are wheels. When you feel for a knob, say to yourself, “Wheels are round”. Could prevent severe embarrassment.

Practical flap operation is as follows: full flaps down for water takeoff, and for landing on water or ground. What about takeoff from ground? Flaps are not recommended. Obstacle clearance is better, because of climb gradient, without flaps. For water takeoff, flaps are down, then, after takeoff, retracted above 300 feet and accelerating through 80 mph. Climb at ninety. Flap retraction is simple. Reach down for the flap selector knob (Square), and move it aft to the up position. Air pressure will move the flaps up for you. No pumping is needed. And your attention is not diverted from the most important aspect of any takeoff, water or ground, which is looking outside the plane for other traffic, and for better control.

Landing flaps, for water or ground, are actuated at or below 90 mph. White arc is actually higher than 90, but why not save that much wear and tear on the flap system. We know that the ‘Bee is not going to “float” without the flaps. One thing’s for sure about the SeaBeast: without a bunch of power she’s going to be heading down. Admittedly, she’s the proverbial “brick”. Flaps or no. Of all her maligning rumors, that one is true. Use the flaps when you’re on final and have the runway, or water, made. Questions? Differential flaps on landing? Doesn’t make any difference. If one flap has leaked the pressure and is up, but the other flap is even fully down, just add about 3 mph to your normal target speed. So much for the hydraulic system. The reservoir is just aft of the handle. This finger tight, threaded cover gives access for adding or checking the fluid.

Continuing with the instrument panel, this is the prop pitch control knob in the upper right corner. Full forward for 2500 rpm. Below it is the throttle, and below that are carb heat, mixture, master and ignition/mag switch. Along the bottom edge of the panel is the usual assortment of switches, which by now probably bears little resemblance to the original panel configuration as designed by Republic. The same goes for the instruments. One interesting switch, on the far left, beside the parking brake knob, is marked “ANCHOR”. As a bona fide water vessel, the ‘Bee is required to show a white light from the tallest structure while anchored at night. The light is atop the vertical stabilizer. That small light is wired directly to the battery, rather than through the master switch, for minimum battery drain. There's a unique feature of the interior that might impel one to anchor at night. The front seat backs can be folded down to abut the rear seats and form a two-place bed.

Somehow we got diverted from the instrument panel. Most Seabees still have their original engine instrument cluster, consisting of RPM, fuel pressures from both engine driven pumps, oil temp and pressure, fuel quantity and amperage. On the ceiling, above you, is the guarded prop reverse control knob. Reversing capability is another outstanding feature of this seagoing creature. If you've (on purpose) taxied up to the FBO's crowded fuel pump, and just nosed up into the only space left for you, onlookers will wonder, "How's he going to taxi out of there?". All fueled and finished, you climb up into the 'Bee, start 'er up and back out. However, while showing off thusly, if any of your three doors is unlatched, the moment you've produced enough reverse thrust, any and all unlatched doors will be opened forcefully by that thrust, bending or breaking something you hadn't intended to.

For normal movement in reverse, first check that nothing has blocked you since you last looked. Remember that people do not expect an airplane to back up with power. Ensure that flaps are up. They're not designed for airloads from the rear. Also, you can't see behind you with them down. If you want the tail to steer left you touch a small bit of left rudder. The tailwheel is steerable, but beyond 15 degrees of travel either side of center, taxiing forward or backward, the tailwheel becomes free swiveling and will have a merry time steering itself into a quick 270 degree turn, normally into the wind. Stomping on the brakes does little good because they are not that effective. If the brakes will hold your position for the 1700 rpm runup, we consider that "good brakes". The best taxiing technique is to use very small rudder pedal movements, in order to prevent the steering cam from reverting to full swiveling.

Back to the prop reversing aspect. The most efficient use of power, and finesse of accurate positioning, ground or water, is to set the throttle at 1200 rpm and leave it at that setting. Don't touch the throttle again. Think of the engine now as being a turboprop, where the reverse knob now becomes the thrust lever. Alpha and Bata. Forward and reverse, and "neutral" (Ground Fine). Push on each of the three doors to make sure they are secured. Unlatch the guard over the reverse knob and move the knob slowly aft. The rpm will rise as the pitch changes, but, depending upon the dash number hub, the rpm is allowed to go to 2500, with the larger hub. Don't touch the throttle. When you get the knob near or at the center (by the restraining screw) of the track, the prop will be in flat pitch. Further movement aft of that position increases the amount of reverse pitch and resultant thrust. Keep enough brake pressure to hold your position until your ready to move. On the ground, that is. The brakes are really not too effective in the water. Despite knowing better, you'll find yourself putting on the brakes upon occasion while maneuvering on the water.

You'll never need very much reverse thrust for maneuvering. A dab'll do you. The primary use for this feature is for docking or picking up a buoy, etc. Ideally, you should approach your target heading directly into the wind, ease into reverse thrust and slowly continue, with minor adjustments to the thrust, forward or reverse, until you can touch the nose of the 'Bee to the dock, etc. Gauge your relative movement by watching the left float's progress through the water.

Continuing with our cabin familiarization, this front seat frame is adjustable, fore and aft, by means of this lever between the seats. It does not go very far aft, like a Cessna seat does, but check that it is locked in place anyway. Being thrown forward by a sudden stoppage can also be hazardous to your health. This red knob on the floor under your right leg is the fuel shutoff. In case of engine fire pull this red knob forward. It will extend almost three inches and will cut off fuel flow immediately. The hand-held fire extinguisher is stowed in a bracket under the front edge of your seat. Forward of your rudder pedals are the hydraulic brake cylinders that exert pressure to the expander tube brakes in the wheels (or the brake pistons on 'real' brakes).

Under my feet, in front of the RH seat, is a hatch built into the floor. Twist this bail, pull it up and back, removing the hatch. Voila! Le anchor! That's the 5 pound Danforth with 100 feet of line attached. Continuing forward, the right hand rudder pedals have no brakes. That step in front of them covers the battery and jumper cable, for THOSE times. I've had to get a jump start in the water, if you can imagine that. The aluminum tube along the aft edge of the bow door is for holding the bow door open. The bow door not only provides passageway, but cooling air while taxiing. In addition, the open bow door, securely held by the arm, acts as a sail for more control in taxiing crosswind, ground or water. That covers all that we can reach from the front seat. Baggage? We can carry up to 200 pounds in this compartment behind the rear seat backs. Beneath the cargo floor is the rubberized fuel cell. Now, let's debark and do the walkaround.

As you're standing here by the port wheel, you can see how the main gear would "retract" straight back behind the wing strut. The tire likes 30 psi. The strut extension should be at least 5 1/2 inches. When you and your Seabee are just lazing on the water is an appropriate time to check the wheel bearings. Reach out and rotate each one to see how freely it moves. The spray rail at the chine extends forward from the hull step, helping to minimize prop leading edge damage from water takeoffs, etc. Just above the strut fitting is the fuel cap. If it comes off in flight it hits the prop. Badly. Anything loose in the engine compartment, like tools, nuts and washers have to go right into the prop too. Mechanics take note.

The fuel quantity is checked with a calibrated dipstick, which is stowed in the aft transverse frame of the front seat. The dipstick is gently inserted all the way down until it touches bottom. Remember that it's a rubber fuel cell, so, easy does it. Remove the dipstick and read the quantity. That's the only accurate reading you can get. Compare it with what the fuel gauge reads and use what ever differential is showing as a guide in flight. The gauge is usually inaccurate. To check the fuel sump drain, reach down to the bottom of the step, at the keel, for the draincock. There is the pitot tube on top of the cabin, and the venturi.

The fuselage/hull has six compartments. The forward five are watertight, with a drain plug in the keel at the aft of each compartment. The tail compartment has two self-bailing drain holes, which are just above the tailwheel. They should be kept free of debris so that water cannot collect, which would add additional, critical, weight to the tail. Each wing float also has a drain plug. That's a total of seven drain plugs to be aware of. Are they all in?

Let's talk about this strange wing. Why these ungainly looking ridges on the wing and tail surfaces? Republic's engineers made a radical departure in designing the wings and tail. Their method was acclaimed as the decade's best technological advancement in aircraft design. Simplified, was the key word. There are only three spars in the wing, and only three ribs. The wing skins were formed on camel-back draw dies, which explains the purpose of the small holes in the leading edge: for positioning the sheet metal in the dies. Here is a comparison between the conventional and the simplified wing construction: Parts, 114 vs 30; Man-hours, 280 vs 10; Weight, 150 vs 110. Quod erat demonstrandum.

The float struts have a built-in weak point, so as to minimize wing structural damage from a waterloop, for instance. There is a tie down ring at the juncture of strut and wing. However, there should also be a tie down ring on each side of the strut, to accommodate the typical built-in ramp tiedowns. You'll see various wingtip configurations, ranging from the factory standard rounded one, through "splates" (wingtip spill plates), to mildly drooped and severely drooped tips. Nothing noteworthy about flaps and aileron, as we continue the tour around. Cowling access is by the three latches on either side. How do you reach them? The best way is to have a step ladder on each side. Other than that, one ladder to move to each side. A long armed person, or an agile monkey, can stand on the tail boom, hang onto the prop hub, and swing around far enough to be able to undo the front latch. That's the latch that is probably stuck and you have to climb down to get the pliers to unstick it. Anyway, when you do get it open, there's the oil dipstick on the starboard side. Full is 11 quarts. Add oil, a continuous process, into this threaded cap on the prop shaft extension. Ahead of the engine is the impeller, or engine cooling fan, which is connected to the crankshaft. It keeps the engine sufficiently cool at slow idle, or taxiing idly on the water, which is another great feature of this water bird.

The tailwheel. Forty five psi. Like the mains, it doesn't really retract, just swivels up to a horizontal position on the right side. But unlike the mains, the tailwheel can be down on a water landing with no deleterious effect. If one lands in the water with the main gear down, they act as a huge water brake, and that rounded nose just digs a hole in the water all the way to the bottom. More amphibs have been lost that way than from any other cause. Back to the tailwheel. The air rudder cables, from the rudder pedals, control the steerable tailwheel. The water rudder is controlled by the same cables, and is very effective in steering in the water, both forward and reversing.

The tail feathers are conventional in operation, except for these huge elevator trim tabs. Each tab is a yard long. As we mentioned in the cockpit, this is a trim tab ship. Before aviating in any ‘Bee, check the play in each trim tab travel. There shouldn’t be more than 1/8 inch play, measured at the trailing edge of the tabs. Unfortunately, the norm seems to be closer to a quarter inch, which could presage dire consequences. While we’re in this vicinity, here is the tail tie down ring, on the bottom aft edge of the tail boom; by the bottom of the rudder. Trim for the rudder is a ground adjustable tab. Under that is the standard tail light. You can see the anchor light atop the fin.

Continuing the tour around alongside to starboard, we see the carb fuel drain under the wing fairing beside the engine. Sometimes there’s also an oil quick drain. The ground adjustable trim tab for the ailerons is on this side. Nothing else is different here, which leaves only the nose cleat on the bow. It is primarily for securing to a dock or mooring line, and for the anchor line. It is tempting to use it for being towed also, but the book says to use a bridle attached to both landing gear, at the through-hull shaft. Any questions?

The only thing remaining then is for us to slip the surly bonds. Maybe next time.

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