DECEMBER, 1997

<u>BEFORE YOU FLY</u>: The big day is here. You worked hard. You earned the praise. Enjoy it. This is the last and probably the most important part of the manual.

**Let's take an important moment!** We all have limitations. Some have better flying skills than others. You are about to fly a new aircraft that may have characteristics you never experienced before.

We recommend that you hire an experienced test pilot and have him perform the first few hours of testing. If you must make that first flight, then have a test pilot fly with you. OUR INDEPENDENT TEST PILOT IS AVAILABLE TO TEST FLY YOUR SEAWIND. WE STRONGLY RECOMMEND YOU USE HIM.

<u>INSURANCE</u>: Insurance is expensive. Buy the expensive flight coverage for at least the first quarter of the year or for the first year. Then decide how much insurance you want to have, after you have spent some time flying. One mishap can cost much more than the premium for hull coverage.

**Universal Insurance Services** (800-510-1799) will insure you from the first flight if you use an approved test pilot. We strongly recommend you do.

**AVEMCO** (800-638-8440) & **Hayes Utley and Assoc., Inc.** (502-459-1988), will insure you after 10 hours of flight; **Aviation Underwriting Specialist** (800-325-8075), will insure you for the first flight.

<u>FLIGHT TESTING</u>: **MANDATORY READING!**

The Experimental Aircraft Association (EAA) and the FAA got together and prepared an excellent pamphlet on flight testing. It tells you what to do better than we can. **Order it!**

**Advisory Circular: AC-90-89 - "Amateur-Built Aircraft Flight Testing Handbook, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.**

For now, that is all we will say about testing. We will rely on **AC-90-89** for the basic flight testing instruction.

Another excellent book is **"Flight Testing Homebuilt Aircraft"**, by Vaughan Askue, Iowa State University Press.

**GOOD LUCK AND HAPPY FLYING. SEE YOU AT THE SPLASH-INS.**

DECEMBER, 1997

## MARKINGS, PLACARDS AND SAFETY MARKINGS

The following markings are mandatory for all homebuilt or kit built "Experimental Registered" aircraft in the United States or Canada, and are an integral part of every Seawind sales and ownership agreement.

1. The word "EXPERIMENTAL" in 2" high letters must appear in a conspicuous location for all passengers getting into the aircraft.

   Suggested location: On the top horizontal face of the longeron.

2. Warning must be posted so that it is clearly visible from every seat, stating: **"PASSENGER WARNING - THIS AIRCRAFT IS AMATEUR BUILT AND DOES NOT COMPLY WITH FEDERAL SAFETY REGULATIONS FOR STANDARD AIRCRAFT."**

The following markings and placards are mandatory on all aircraft registered in the United States or Canada and must appear in your Seawind.

**23.1545 Airspeed Limitation**: The airspeed indicator must be marked as follows:

a) Never exceed speed ($V_{NE}$) temporarily set at 160 knots (174 MPH) indicated, permanent 230 MPH.
   Marking: Radial Red Line.

b) Maximum structural cruise speed (VNO) temporarily set at 160 knots (174 MPH) indicated, permanent 180 MPH.
   Marking: Yellow Arc.

c) Operating maneuvering speed 80 to 160 MPH.
   Marking: Green Arc. Green arc should start at $V_{SI}$ or 72 MPH with flaps set at "0" degrees.

d) Flap extended speed 120 MPH to 59 MPH.
   Marking: White Arc.

e) Stall Speed: $V_{SO}$ 59 to 61 MPH ($30^o$ Flap), 57 to 59 MPH $40^o$ Flap.
   Marking: Red Line.
   Depends on gross weight: i.e., 59 MPH at 3,200 lb. or 61 MPH at 3,400 lb.

NOVEMBER, 1994

**23.1547 Magnetic Direction Indicator (Compass):** A calibration placard showing the calibration in level flight with engine and radios operating.

~ The headings in not more than 30$^{o}$ increments.
~ The maximum deviation 10$^{o}$.

**23.1549 Tachometer:** A red radial line or red line at 2,700 RPM.

If there are any RPM operation restrictions because of your engine or propeller vibration characteristics, they must be marked with red radial lines or a red arc.

**23.1553 Fuel Indicator:** Each indicator from the point of 5% capacity to zero must be marked with a red arc.

**23.1555 Control Markings:** Except for the primary flight controls, all other controls must be plainly marked.

1) Fuel selector.
2) Fuel indicators and capacity.
3) Fuel transfer pumps.
4) Fuel booster pumps.
5) Retractable landing gear position switch must have round wheel shape and lock in the "Up" (retracted) or "Down" (extended) position.
6) Flap position switch must have airfoil shape. It may lock in the "Up" position, but must be momentary contact in the "Down" position.
7) All switches, circuit breakers and fuses must be marked as to their use. All switches should be mounted in the "Up" position for "On" - "Down" position for "Off".

**EACH EMERGENCY CONTROL MUST BE RED.**

**23.1557 Miscellaneous Markings and Placards:**

1) Rear Baggage Cargo: You must calculate your safe weight capacity for your aircraft weight and balance. The maximum allowed is 125 lbs. with passengers, **AS LONG AS YOU REMAIN WITHIN THE SAFE C.G.**

   **MARK FOR OPERATING RANGE AS FOLLOWS:**
   **"MAXIMUM AFT LUGGAGE WITH PASSENGERS *** LBS. AT STA. 170.**

   *** You calculate and fill in the weight.

NOVEMBER, 1994

2) **Fuel Fill Openings:** Marking - "AVGAS - 100 L.L. - 37 Gal. (Main) or 18 Gal. (for Auxiliary Tank).

3) **Fuel Drain:** Label "Fuel Drain" at each sump drain.

4) **Emergency Exit:** Each exit device must indicate the method and direction of operation, both inside and outside.

**23.1559** There must be a placard in clear view of the pilot stating:

a) "The markings and placards installed in this airplane contain operating limitations which must be complied with when operating this airplane in the NORMAL category. A temporary restriction shall apply to the maximum indicated airspeed of 160 MPH."

b) This aircraft may not be operated under (*,*) and icing conditions.

* Insert IFR if not so equipped.
* Insert NIGHT if not so equipped.

**23.1561 Safety Equipment:**

a) Safety equipment must be plainly marked.

b) Stowage provisions for required safety equipment must be marked for benefit of occupants.

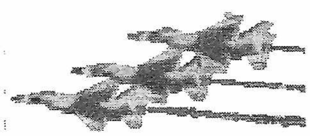
**<u>Examples</u>**:

"Life jacket in seat back pocket".
"Type IV - Throw device".
"Anchor and flares in nose compartment".

**23.1567 Flight Maneuver Placard:** All Seawinds must be marked:
**"NO ACROBATIC MANEUVERS INCLUDING SPINS ALLOWED."**

For your safety and that of your passengers, you are required by the FAA, Canada DOT, and the purchase and operating provisions of the contract to comply with all the safety provisions of the Government, including but not limited to all those above.









# GENERAL AVIATION RULES OF THUMB

## Standard Pressure, Temperature, and Lapse Rate

Sea level standard pressure = 29.92" hg
Standard lapse rate = -1" hg. for each 1000' increase in altitude
Sea level standard temperature = 15°C / 59°F
Standard Lapse Rate = -2°C / -3.5°F for each 1000' increase in altitude

## Take Off

T/O distance increases 15% for each 1000' DA above sea level
A 10% change in A/C weight will result in a 20% change in T/O distance
Available engine HP decreases 3% for each 1000' of altitude above sea level
Fixed pitch, non-turbo A/C climb performance decreases 8% for each 1000' DA above sea level
Variable pitch, non-turbo A/C climb performance decreases 7% for each 1000' DA above sea level
During each 1000' of climb, expect to see a loss of approximately 1" of manifold pressure
During each 1000' of climb, expect TAS to increase 2%
If you don't have 70% of your take off speed by runway midpoint, abort the take off
Level Off – Lead your level off by 10% of airplane's rate of climb. e.g. – 500'/minute rate of climb; lead level off by 50'
Pressure Altitude – Set A/C altimeter to 29.92 and read PA from the altimeter
DA increases or decreases 120' for each 10°C the temperature varies from standard temperature
Standard temperature (ISA) decreases 2°C Per 1000' increase in altitude
TAS increases 2% over IAS for each 1000' above sea level

## MANEUVERING

Maneuvering speed Va = ~1.7 x Vs1
Va decreases 1% for each 2% reduction in gross weight
Vy decreases ~1/2 to 1 knot for each 1000' DA
Vy, Vx and Vg (best glide) decreases ~1/2 Knot for Each 100 pounds Under MGW
Vr = ~1.15 x Vs

## Cruise

The width of one finger = ~5NM on a sectional chart (average person)
Tip of the thumb to the knuckle = ~10NM on a sectional chart (average person)
Cruise fuel consumption of a non-turbocharged A/C engine = ~1/2 the rated HP/10
Cruise climb airspeed should be reduced by 1% for each 1000' of climb

To determine a relatively proficient cruise climb speed, take the difference between Vx and Vy and add that sum to Vy. For example, if Vx = 65 and Vy = 75, the difference is 10KTS. Add 10KTS to Vy (75KTS) and you have a cruise climb of 85KTS
Landing
Final Approach Speed = 1.3 x Vso. Also known as Vref
A tailwind of 10% of your final approach speed increases your landing distance by 20%; A headwind of 10% decreases landing distance by 20%
A 10% change in airspeed will cause a 20% change in stopping distance
A slippery or wet runway may increase your landing distance by 50%
For each knot above Vref over the numbers, the touchdown point will be 100' further down the runway
For each 1000' increase in field elevation, stopping distance increases 4%
A 10 Reduction in Approach Angle Will Increase Landing Distance 13%
10° – 25° of flaps add more lift than drag; 25° – 40° flaps add more drag than lift

## Maximum Glide

Weight has no effect on max. glide range or ratio
Weight does have an effect on max. glide airspeed
Reduce glide speed 5% for each 10% decrease in gross weight
Tailwinds increase glide range; headwinds reduce glide range
With a 10, 20 or 30 KT tailwind, reduce glide speed by 4, 6 or 8 KT, respectively
With a headwind, increase glide speed by 50% of the headwind component
Maximum Glide = Minimum Drag. Low on fuel? Fly an airspeed equal to maximum glide to achieve maximum endurance

## Other

Rollout from a turn – Lead your rollout by an amount equal to _ your bank angle. e.g. – 30° angle of bank; lead rollout by 15° prior to new heading
The radius of a standard rate turn in meters = TAS x 10
Most structural icing occurs between 0°C to –10°C
Deviate 10-20 miles upwind around thunderstorms; Don't fly under anvil
Hail may be found 10 miles or more underneath the anvil
Dew point of 10°C or 53°F = Enough moisture present for severe thunderstorms

*Compiled by Jim Van Namee. Jim is a CFII at Taos Regional Airport. He is a retired Naval Aviator and owner of Silver Eagle Aviation. Jim can be reached at 505-377-6786 or jimvn@aol.com.*

**Editor's note: These "rules of thumb" are meant as general observations. Pilots should consult official materials, such as approved charts and aircraft manufacturers operating handbooks, for information specific to their aircraft or flight.**

**Click here to return to the beginning of this article. ▲**



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# Seawind Flying

From Seawind North America, Corp. (SNA)

Sections:

1. Introduction
2. Flight Characteristics
3. Flying on land
4. Flying on water

## Introduction

The Seawind is a versatile, fast amphibian introducing the thrill of water flying to many, while offering those familiar with water flying an expansion of water flying capability. With the Seawind, it is possible to leave a base and fly 400 NM to a week's fishing in Canada and return to home base without refueling. This can be accomplished while taking off and landing on the water at either or both ends of the trip. This section of the web site will deal with gaining the skill and confidence to perform this kind of flying routinely.

Flight Characteristics: All airplanes have a great deal in common but have native characteristics usually derived from their engineering and geometry which differentiate them. The primary idiosyncrasies of the Seawind which we will deal with here are high thrust line, thick vertical stabilizer and main wheel location.

HIGH THRUST LINE: The high thrust line of the Seawind is its most important characteristic and accounts for most of the difficulty initially experienced in flying the airplane on land or on water. Most of us are familiar with flying airplanes whose thrust line is incident (or close) to the longitudinal line going through the center of lift of the wing. When you add power the nose pitches up. When you reduce power the nose pitches down. The Seawind acts opposite of this and this takes a little getting used to.

In addition, the high thrust line is responsible for adverse yaw, which requires positive use of the rudder in leading coordinated turns.

VERTICAL STABILIZER Probably because of structural requirements to support the 500# Lycoming IO-540 (preferred power plant) and its thrust, the vertical stabilizer is unusually thick, and this has a significant blanking effect on the rudder.

MAIN LANDING GEAR: The main landing gear are close together (narrow track) and a significant distance aft of the center of pressure of the wing.

These characteristics work sometimes alone and sometimes together to make learning to fly the Seawind something of a challenge when compared to the average Cessna or Piper, and even the venerable Lake Amphibian. The purpose of this discussion is to make this learning experience somewhat less exciting (alas!) than it can be but presumably significantly safer. We can then enjoy the tremendously rewarding thrills the Seawind offers on the water.

## FLYING THE SEAWIND ON LAND

### TAKEOFF

The high thrust line and aft location of the main landing gear make land takeoffs different from what we have all been used to. The preferred technique has evolved to the following:

Assuming a center of gravity between 140 and 141, flaps set at 20 degrees, and appropriate elevator trim, the yoke is pulled to the aft stop before application of power. During the takeoff run maintain directional control with a combination of nose wheel steering, brakes and rudder (in that order) and wings level with ailerons. After making sure that the nose wheel is centered, smoothly (2-3 second duration) apply full power. At 50-55 KIAS (I will deal exclusively in knots and nautical miles throughout. If your plane is instrumented for statute miles per hour, please convert these numbers) the nose wheel will lighten and start to skip. Reduce back pressure to the "sweet spot" (learned by practice) and the plane will fly off normally. The previous procedure left the yoke neutral until 60 KIAS, then pulling the yoke to the aft stop to get the nose moving up. Once the main wheels left the runway, the plane was in a seriously over rotated condition and required significant forward pressure to stay out of the stall. This still works but the new procedure is less exciting and just as effective. Thanks to Dean Rickerson for this refinement.

### LANDING

There are a number of different techniques which may be used for landing the Seawind on land, from porpoising on the nose wheel (and usually breaking something) to landing so slow that the tail contacts before the main wheels (another needless repair job). The following technique intends to be compatible with water landings and will prevent either of the two extremes above.

With the gear down and full flaps, maintain 80 KIAS at the 90-degree (base leg) position in your landing pattern. Slow to 75 KIAS on close final and smoothly and slowly reduce the power to idle at about 20 feet of altitude. This **smooth** reduction of power combined with ground effect will reduce your 500 feet per minute descent to 200-300 FPM and cushion your touch down with little to no deliberate flare on the part of the pilot. One small balloon can be dealt with but if you have a large oscillation, or two small ones, **go around**, being sure to anticipate the nose down moment with power application.

## FLYING THE SEAWIND ON THE WATER

Most of the mischief that has been and will be done in the Seawind will be done on the water. I will take a more elementary approach with Seawind water flying, since even among seaplane pilots (especially in amphibian aircraft) little time is actually spent on the water.

The best way to become comfortable with your Seawind on the water should be part of your initial checkout; that is, to ramp it into the water if at all possible. Bring a buddy with you the first time, who can check out the back very thoroughly for water leaks. This done you can check the function of your water rudder. Before entering the water, you should have set your engine idle to 500 RPM, under no circumstances greater than 600 RPM. You also have taken all the slop out of your water rudder and given yourself 50 degrees or more deflection in the starboard direction and 45 degrees or more to port. Confirm that the rudder is all the way down and forward. It has a tendency to kick up 10-15 degrees without us noticing it thereby reducing water rudder effectiveness by about half. If it was turning well and now isn't, check the water rudder completely down.

Slow taxi is called displacement taxi (as opposed to step taxi which will be discussed later). Never exceed 1000 RPM while in displacement taxi. We must remember that when the engine is running on the water, the airplane is moving. The brakes don't work on the water and slow speed control can be very critical. The preferred method of engine shut down is still mixture to cutoff, but both magnetos off works in an emergency. Another trick for slowing down on the water is to turn one mag off.

After entering the water, ensure the plane is floating and the wheels are clear of the bottom and raise the gear. When you are sure that you have four to five feet of depth, lower the water rudder. Immediately check for directional control and be prepared to shut down if necessary. Have your paddle at the ready. The water rudder is fragile and any contact with the bottom is likely to result in a repair job.

STEP TAXI

When you are ready to step taxi, point the nose 5° STARBOARD of the wind, ensure that the gear are up, the flaps are set at 20° and yoke is neutral. Just before power application, RAISE THE WATER RUDDER. Smoothly (3-4 seconds) increase throttle to full power setting. The nose will start rising and when it stops rising the airplane will begin climbing up onto the step. As it climbs onto the step, the bow wave will start a porpoise. Use back pressure to stop the porpoise and ease the nose back down to the "sweet spot". Since we are only practicing step taxi, reduce power to about 18" manifold pressure approaching 40 KIAS and adjust power thereafter to maintain 40 KIAS. 38 KIAS is too slow and 43 is too fast. Practice this in water of no more than 4" of chop until you are very comfortable with what 40 KIAS feels and sounds like. Keeping speed carefully at 40 KIAS, practice step turns as follows:

ALWAYS use rudder for directional control and ailerons for wing position between 10° port wing down and 10° starboard wing down during step maneuvering on the water. If you begin to feel uncomfortable, reduce turn rate with the rudders, while reducing power to idle and holding the nose position. When coming off the step, turn rate should be zero and wings level. Power should be smoothly reduced to idle while pulling yoke back gradually as speed decreases until yoke is against the back stop as the aircraft falls off the step. Put the water rudder down and test steering. This procedure is the same whether terminating step taxi practice or landing. I can't overstress the importance of step taxi practice in chop conditions up to about 6" for the competent Seawind pilot. The cross-controlling involved in step taxi in wind will go a long way towards water mastery of your aircraft.

TAKE-OFF

Now that you have gained some level of comfort in the airplane on the water, it is time for your first take-off. The procedure is the same as for step taxi up to a point. Be mindful that you may have to correct for porpoise as many as three or four times before getting airborne. Here we go:

Nose 5° starboard of the wind, gear up, 20° flaps. IMMEDIATELY before advancing smoothly to full power, water rudder up. Nose will start climbing and when it stops the aircraft will begin climbing onto the step. The bow wave will induce a porpoise, which is stopped by BACK PRESSURE. When porpoise is stopped, relax back pressure, placing nose in the "sweet spot". Repeat as often as necessary. If it becomes exaggerated, hold your nose position while smoothly reducing power to idle and come off the step as illustrated above. Assuming you have the porpoise under control and are accelerating in the "sweet spot", the aircraft will come off the water at 60-65 KIAS. Because of the smooth hull and the resultant surface tension, the aircraft has to be flown off the water. Accelerate to 90 KIAS, raise the flaps and you're on your way.

One note on the water rudder before we start water landings: it is necessary to provide for a positive lock for the up position of the water rudder. If you do not, it will auto lower on a bounce and depart the aircraft on the subsequent bounces.

WATER LANDINGS

Of all the maneuvers you will perform in your Seawind, water landings provide the greatest opportunity for damage to your aircraft and injury to yourself and other occupants. It is a great idea to approach them very cautiously and study up on the techniques as much as possible. A seaplane rating with practice in a Lake Buccaneer or Renegade is also excellent preparation.

The magic number for touching the step (the aft part of the forward hull), is 60 KIAS (or 68 MPH). If you are appreciably faster than this, the nose will have a tendency to dig in. If you're slow (even 58 KIAS) the airplane will bounce nose up with any appreciable chop. Either of these scenarios complicates the landing solution. How do we get to a nearly "0" sink rate touchdown on the step of the airplane at 60 KIAS? As follows:

Make sure the landing gear is up and the flaps are set at 20°, fly 80 KIAS in the pattern to the 90° position (base leg). On final, lower flaps to full down and gradually decelerate to 70 KIAS, trimming for 70 KIAS, keeping a little power on the airplane. The power at the flare transition should be sufficient to maintain 300-400 FPM sink rate at 70 KIAS. At 10-20 feet of altitude, ease about ½ of the remaining power off and smoothly flare to a touch at 60 KIAS. Once the aircraft is on without bouncing, reduce power to idle, come off the step and lower the water rudder. Note of caution: If your flap/aileron mixer is not disabled, be very cautious about using full flaps in any situation.

The following rules are absolutely crucial if you are to avoid burying the nose of the Seawind in the water at high speed:

1. Anytime the step touches the water the direction of the nose travel must be either static or coming up, preferably rotating up.
2. The only time you can ease nose pressure down is when the step is in contact with the water; NEVER when airborne and close to the water.

This dictates the following procedures in the event of a bounce. If it's a small bounce (2-3 feet), establish the 60-knot attitude (the aircraft will be slower), and re-contact at this attitude. Usually three total bounces are required to make the airplane stick on the water. A slight addition of power (2-3 inches manifold pressure), reducing before touchdown, will help. If the bounce is larger than this, climb up to 30 feet, reestablish the profile and try again. If your lake is small, go around and try again.

The key here is that on the water significant nose movements down can be disastrous and back pressure is your friend. It is much better to mush in on the tail from 10 feet in a near stalled condition than to chase the nose up and down and run the risk of burying the nose.

Revised 6/19/2008

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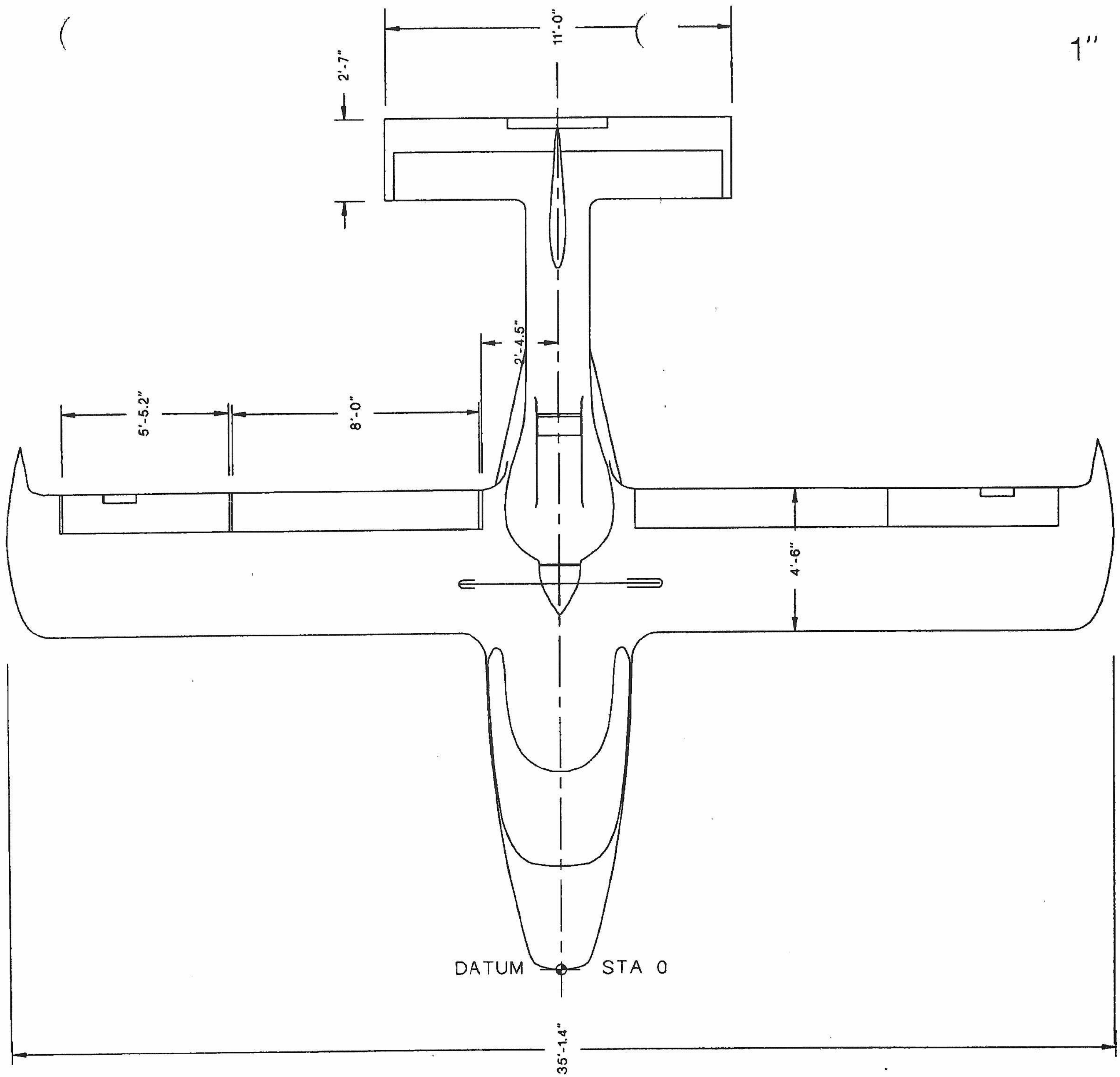
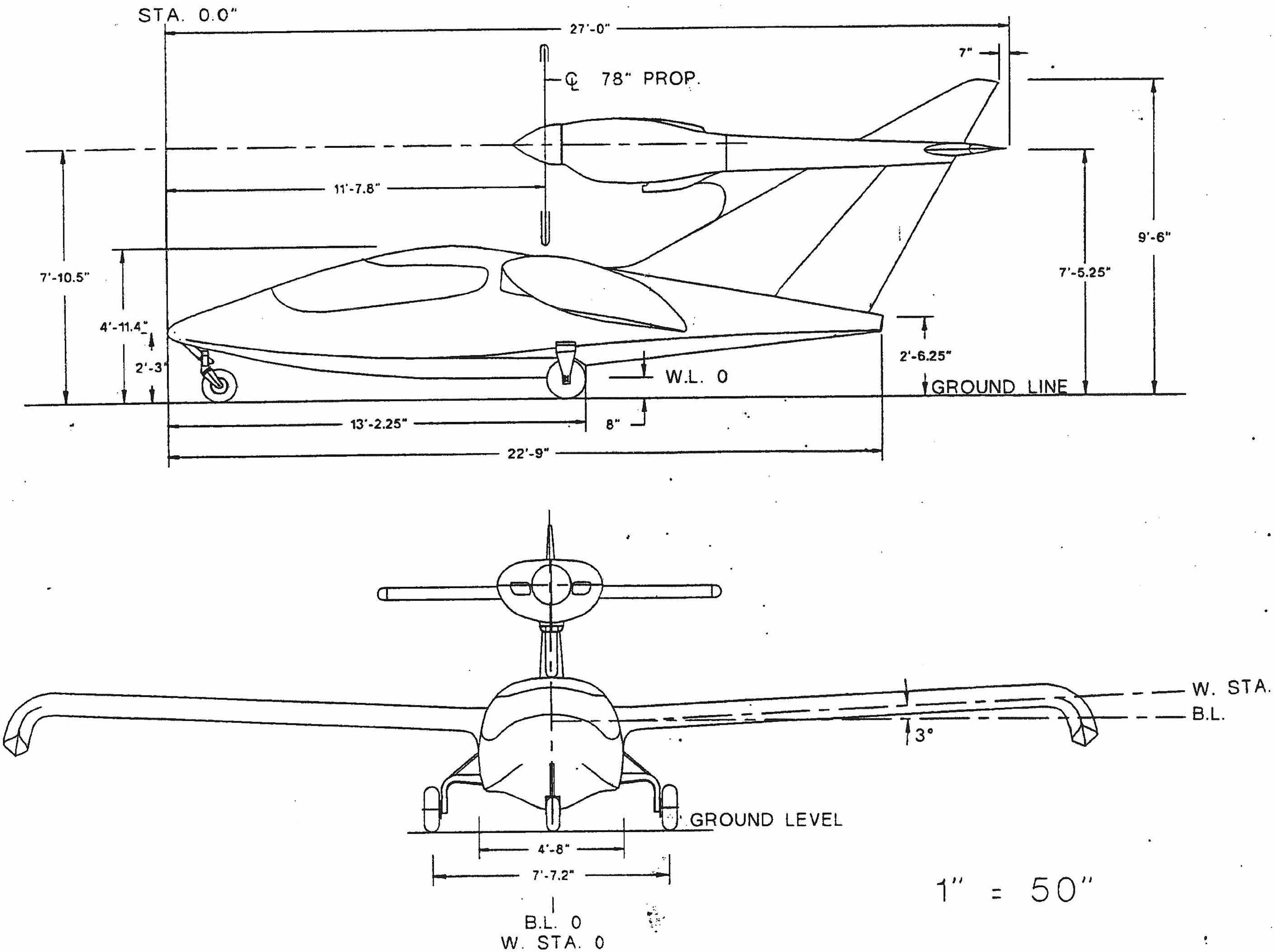
Revised 6/19/2008

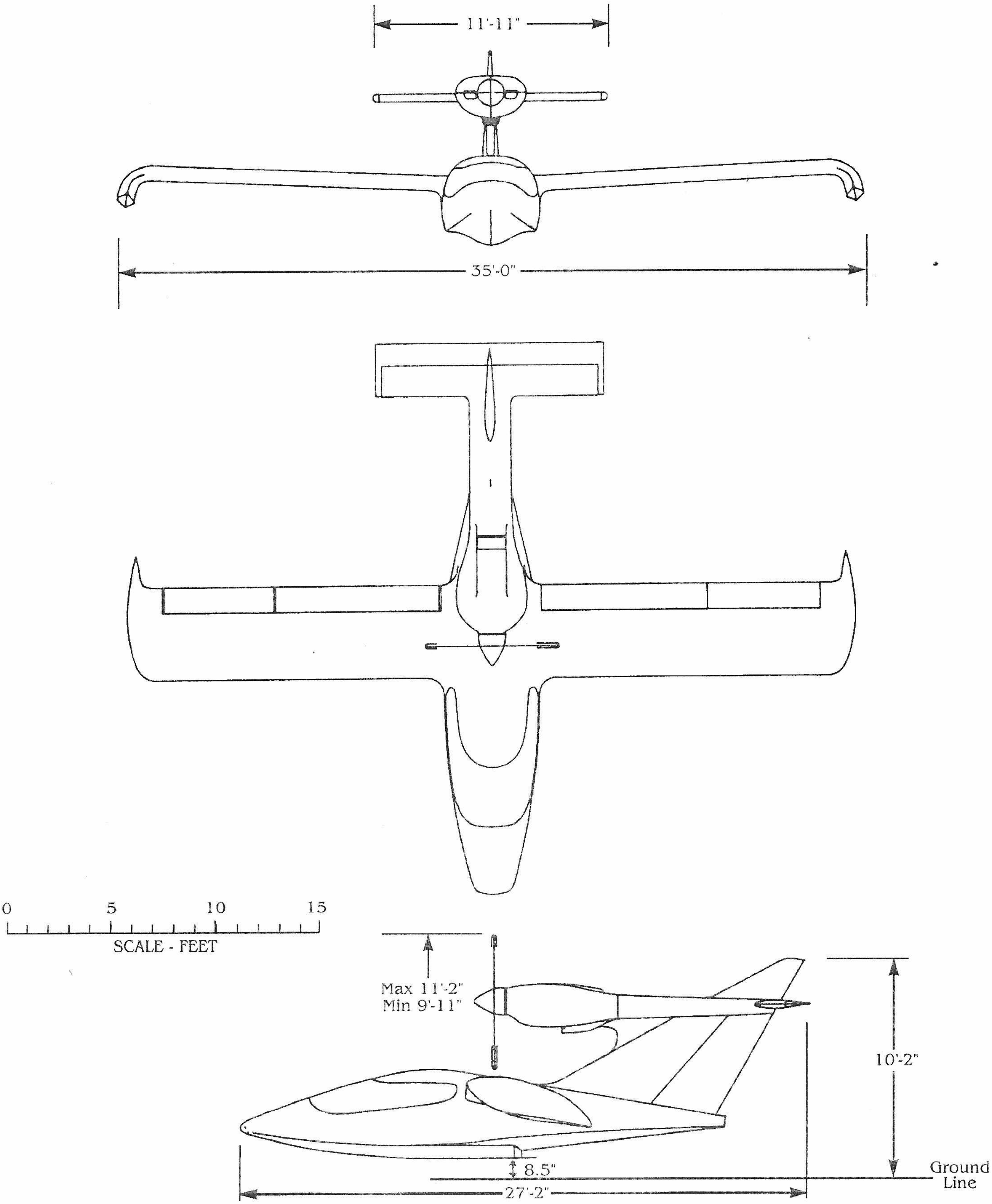
1" = 50'




STA. 0.0"
27'-0"
7"
℄ 78" PROP.
11'-7.8"
7'-10.5"
4'-11.4"
2'-3"
9'-6"
7'-5.25"
2'-6.25"
W.L. 0
GROUND LINE
13'-2.25"
8"
22'-9"
W. STA.
B.L.
3°
GROUND LEVEL
4'-8"
7'-7.2"
B.L. 0
W. STA. 0

1" = 50"

# SEAWIND 3-VIEW



## FLIGHT CHARACTERISTICS

**LAND TAKEOFF**: The Seawind accelerates quickly down the runway. At 70 MPH, a one hand rotation is applied and the craft lifts off between 70 and 80 MPH.

**CLIMB**: With the landing gear retracted and the flaps set to zero, the Seawind will climb dramatically to altitude.

**CRUISE**: The cruise configuration is with flaps reflexed to -10°. Once trimmed straight and level, the Seawind is a true hands off machine.

**LAND LANDINGS**: Landings on land are normal with a gear down speed of 140 MPH maximum, and a flap down speed of 120 MPH. The pattern speed is 90 to 100 MPH as you apply a little up trim to what feels naturally comfortable. Full flaps are applied and propeller set to high RPM on the final leg, with the speed at 90 MPH. After crossing the threshold at 80 MPH, flare to a touchdown speed of between 65 to 70 MPH.

**WATER LANDINGS**: Landings on water are virtually the same as land landings except, of course, the landing gear is up. Final approach is at 90 MPH with full flaps, at high RPM. A few feet above the water, the Seawind is leveled and slowed to 80 MPH and the nose is raised to about four degrees. The Seawind lands on the step and the throttle is eased back once the touchdown occurs.

**STEP TAXIING**: Step taxiing can be performed with full flaps or reflexed flaps. The time onto the step is a couple of seconds quicker with zero flaps. The wings are held level and steering is performed with the air rudder.

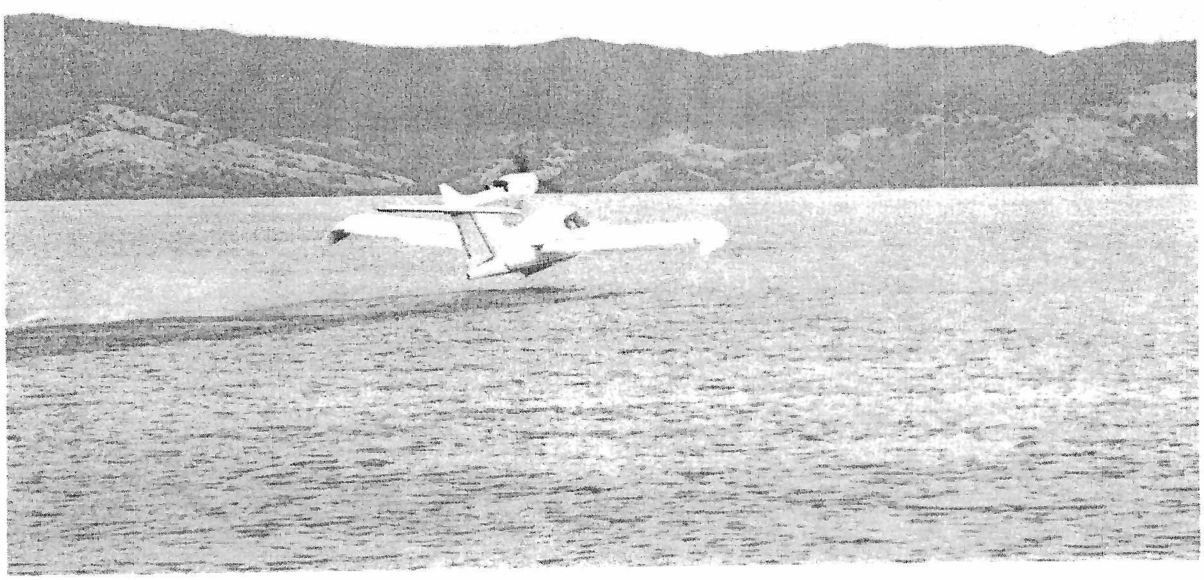
**WATER TAKEOFF**: Water takeoffs are comfortable. The Seawind rises onto the step virtually by itself. A bit of up elevator is applied as the bow wave moves by. Then, the controls are relaxed and with full flaps at 62 MPH, the Seawind flies itself off the water.

**TURNS**: Like any amphibian or high thrust line aircraft, turns should be coordinated with rudder and ailerons.

**PITCH CONTROL**: The Seawind has superb pitch control. A full power go around just above the water is easily executed with one arm pull back. The nose will not drop.

**CROSS WIND LANDINGS**: Carry a little power in a cross wind landing to make the air rudder more effective. Idling the power tends to block the flow over the air rudder. So, apply just a little power.

**STALLS**: Stalls are gentle and straight ahead, with a warning buffet.



## SPECIFICATIONS FOR SEAWIND AMPHIBIAN

**TYPE**

4-place amphibian - single engine tractor type - retractable gear.

**CONSTRUCTION**

All fiberglass, vinylester resin & PVC closed cell foam composite.

**DIMENSIONS**

| | Width | Height |
|---|---|---|
| Cabin Length | | 105" |
| Cabin Front | 52" | 43" |
| Cabin Rear | 54" | 39" |
| Baggage Opening | | 18" x 40" |
| Baggage Length | | 74" |
| Baggage Volume | | 20 cu. ft. |

| | |
|---|---|
| Wing Span | 35 ft. |
| Height | 10 ft. 2 in. |
| Overall Length | 27 ft. 2 in. |
| Ground Clearance | 8.5 in. |
| Water Draft | 18 in. |
| Water Freeboard | 13 in. |

### ESTIMATED

**POWER** ... 260/250 HP

| | | |
|---|---|---|
| Engine | | Lycoming IO-540 |
| Propeller | | Hartzell 3 blade 76" Constant Speed |
| Wing Area | | 160 sq. ft. |
| Wing Loading | | 21.25 lbs./sq. ft. |
| Power Loading | | 13.6 lbs./hp |
| Weight-Max. Takeoff | | Land 3400, Water 3300 lbs. |
| Empty | | 2230 lbs. |
| Useful | | 1170 lbs./1070 lbs. |
| Fuel Capacity - Mains | | 74 US gals. (444 lbs.) |
| Optional - Aux. | | 36 US gals. (216 lbs.) |

**PERFORMANCE**

| | | |
|---|---|---|
| Sea Level Speed 100% Power | | 187 mph |
| Cruise 75% Power | (8000 ft.) | 178 mph |
| Cruise 65% Power | (8000 ft.) | 167 mph |
| Economy Cruise 55% Power | (8000 ft.) | 157 mph |
| Fuel Burn at 55% Power | | 10.8 gph |
| Maximum Range (no reserve) | | 1075 miles |
| With Optional Fuel | | 1600 miles |
| Rate of Climb | | 850 fpm |
| Best Rate of Climb Speed 0° Flap | | 95 mph |
| Best Angle of Climb 20° Flap | | 77 mph |
| Stall Speed | | |
| Clean | | 72 mph |
| Flaps & Wheels | | 59 mph |
| Takeoff Distance | | <u>50 ft. obst.</u> |
| Land | 1010 ft. | 1550 ft. |
| Water | 1600 ft. | 1980 ft. |
| Landing Distance | | |
| Land | 770 ft. | 1300 ft. |
| Water | 620 ft. | 1150 ft. |
| Service Ceiling | | 14,800 ft. |
| Glide Ratio | | 10.9:1 |

### ACTUAL

**POWER** ... 300 HP

| | | |
|---|---|---|
| Engine | | Lycoming IO-540 |
| Propeller | | Hartzell 3 blade 76" Constant Speed |
| Wing Area | | 160 sq. ft. |
| Wing Loading | | 21.25 lbs./sq. ft. |
| Power Loading | | 11.33 lbs./hp |
| Weight-Max. Takeoff | | Land 3400, Water 3400 lbs. |
| Empty | | 2300 lbs. |
| Useful | | 1100 lbs. |
| Fuel Capacity - Mains | | 74 US gals. (444 lbs.) |
| Optional - Aux. | | 36 US gals. (216 lbs.) |

**PERFORMANCE**

| | | |
|---|---|---|
| Sea Level Speed 100% Power | | 200 mph |
| Cruise 75% Power | (8000 ft.) | 191 mph |
| Cruise 65% Power | (8000 ft.) | 180 mph |
| Economy Cruise 55% Power | (8000 ft.) | 169 mph |
| Fuel Burn at 55% Power | | 12.8 gph |
| Maximum Range (no reserve) | | 980 miles |
| With optional fuel | | 1460 miles |
| Rate of Climb | | 1250 fpm |
| Best Rate of Climb Speed 0° Flap | | 99 mph |
| Best Angle of Climb 20° Flap | | 74 mph |
| Stall Speed | | |
| Clean | | 72 mph |
| Flaps & Wheels | | 59 mph |
| Takeoff Distance | | <u>50 ft. obst.</u> |
| Land | 870 ft. | 1175 ft. |
| Water | 1100 ft. | 1450 ft. |
| Landing Distance | | |
| Land | 770 ft. | 1300 ft. |
| Water | 620 ft. | 1150 ft. |
| Service Ceiling | | 20,700 ft. |
| Glide Ratio | | 10.9:1 |

Performance figures for the 300 HP engine are the result of actual test data. The performance figures for the 250 HP engine are projected from test data of the 300 HP aircraft. All performance figures are for a sea level standard day and maximum takeoff gross weight of 3200 lbs., unless otherwise stated. Specifications are subject to change without notice.



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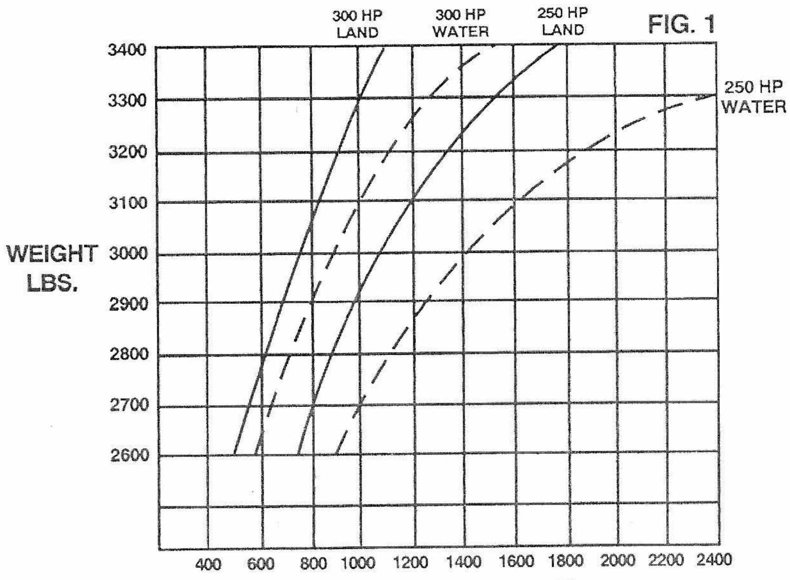
610 384 7000

Figures 1 and 2 below show the takeoff and climb performance comparisons for the recommended 300 & 250 HP engines. All the data is for a standard day.

The 300 HP performance data was plotted from actual test data. Tests were performed at 3200 lbs. and 3400 lbs. gross.

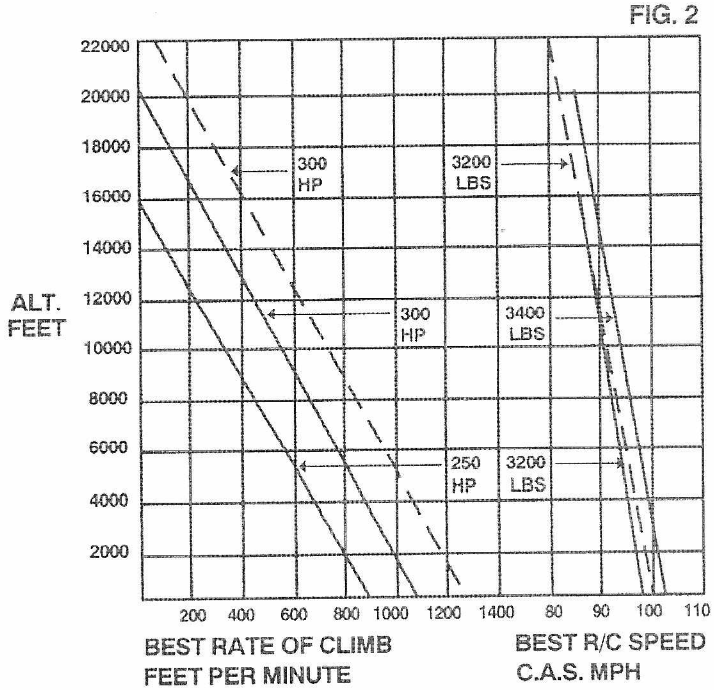
The 250 HP performance data is estimated and projected from data recorded from the 300 HP aircraft flight testing.

FIG. 1




Standard day sea level flaps - 20° land, 30° water
300 HP actual 250 HP estimated

FIG. 2




Climb performance 0 degree flap
Standard day Service ceiling projected

We are continuing to investigate the suitability of other engines for the Seawind. Of particular interest are the two stroke supercharged diesel engines being developed for general aviation. Some of our earlier builders will be installing other than the Lycoming powerplants. We will be supporting and evaluating the results.

The unique tail-mounted engine location greatly reduces cabin noise and positions the propeller well away from careless people. The exhaust discharges well behind the propeller, making the Seawind one of the quietest general aviation aircraft available. Most amphibians are pusher types and the exhaust discharges through the propeller which chops and makes the exhaust noisier.

An optional semi-tuned exhaust system will give up to a 10% boost in power.

The tail and engine mount structure has undergone finite-element analysis and testing of both the tail and mount. In the areas of the tail, we actually used a standard twice the FAR requirements to ensure there would be absolutely no doubt of its integrity. It was designed to a loading of 15 g's vertical, which is five times the requirement for normal category aircraft. The tail is designed for 20 g's forward instead of the 9 g's recommended by the FAA.

# N-71RJ

**The markings and placards installed on this aircraft contain operating limitation which must be complied with when operating this aircraft in the NORMAL category.**

**NO ACROBATICS OR SPINS ALLOWED**

**Not certified for operations in known icing conditions**

| Lb Weight limits | Departure | Landing. |
|---|---|---|
| Hard surface | 4000 | 3950 |
| Water | 3500 | 3400 |

**Fuel heater on at flights below 5 degrees C**

**Check oil level within 5 minutes of shutdown**

**VNE: Never Exceed 173 KIAS**

V-SPEEDS FOR FLAPS, GEAR, DEPARTING, LANDING, ECT. AT 3200 LBS GW
SEE POH FOR OTHER GROSS WEIGHT PERFORMANCE ENVELOPES

| ARCS IN KIAS: | GREEN | YELLOW | RED |
|---|---|---|---|
| FLAPS 0 | 66-148 | 149-172 | 173 |
| FLAPS 20: | 55-105 | | |
| FLAPS 40 WHITE | 41-105 | | |
| VLE | 122 | | |
| VA | 87-113 | | |
| VX/VY | 64/86 | | |
| VGL (BEST GLIDE) | 87 | | |
| CROSSWIND | 17 | | |
| ROUGH AIR | 113 | | |

USABLE FUEL SYSTEM: JET A ONLY.
TWO TIP TANKS 17 GAL EACH
TWO MAIN TANKS 37 GAL EACH
ONE REMOVABLE CENTER TANK 34 GAL

SAFETY & WATER OPERATIONS: EQUIPMENT IN COLOR CODED BAGS.
ORANGE: EMERGENCY ONLY.
BLUE: WATER RELATED EQUIPMENT
ANCHOR, INFLATABLE BOAT, PADDLE, SIGNAL DEVICES AND TIE DOWN EQUIPMENT MARKED AND FOUND IN CARGO COMPARTMENT AFT OF REAR SEAT

FIRE EXTINGUISHER LOCATED IN PASSENGER AREA ON FLOOR JUST AFT OF FUEL SELECTOR VALVE

TURN ON ENGINE FIRE SUPPRESSION BEFORE ENGINE START

TO START ENGINE WITH AUXILLARY POWER SEE POH

# N71RJ Profile

- Crew: 1-2 pilots
- Capacity: 4 adult passengers or 2 adult passenger and 3 children
- Length: 27 ft 2 in (8.28 m)
- Wingspan: 35 ft 0 in (10.67 m)
- Height: 10 ft 2 in (3.10 m)
- Wing area: 163 $ft^2$ (15.14 $m^2$)
- Airfoil: NLF(1)-0215(F)
- Empty weight: 2,769 lb (1,256 kg)
- Useful load: 1,181 lb (536 kg)
- Max. takeoff weight: 3,950 lb (1,792 kg)
- Powerplant: 1 × Pratt & Whitney PT6A-20 engine, 550 hp (411 kW)
- Propellers: 1, MT 5-blade Constant Speed propeller
- Propeller diameter: 74 in (1.88 m)

# Performance

- Maximum speed: 174 knots (200 mph, 322 km/h) at sea level
- Cruise speed: 147 knots (169 mph, 272 km/h) at 55% power at 8,000 ft (2438 m)
- Stall speed: 63 knots (72 mph, 116 km/h) in clean configuration
- Range: 1,029 nm (1,184 mi, 1,906 km) with main, AUX, and center tanks
- Service ceiling: 24,000 ft (7,315 m)
- Rate of climb: 2,500 ft/min (762 m/minute)
- Wing loading: 20.8 lb/$ft^2$ (102 kg/$m^2$)
- Power/mass: .091 hp/lb (150 W/kg)

# OPERATING LIMITATIONS SEAWIND N71RJ

NUMBER OF SEATS: 4
ENGINE PT6A-20 550 HP De-rated
PROPELLER MTV Constant Speed 5 Blade E-610
AVIONICS G900 FULL SUITE with MFD AND PFD
GRAND RAPIDS MFD, PFD, WX Full NAV AP redundancy for G900 including all engine monitoring on a third screen (Grand Rapids EFIS)

**TIRES:** **Main Landing Gear – 15/600-6 6.**
**Max load** **1950lbs, Unloaded Inflation 52 psi**

Hi altitude capability and one Oxygen tank Portable 2-place headsets and masks
Height 10′ 2″
Length 27′ 2″
Wing span 35 feet
Cabin length 105 inches
Width, front 52 inches
Width, rear 54 "
Baggage area 10 cubic feet
Propeller speed MT Composite 5 blade 74′ constant
Max Gross Wt 4000 take off
Empty Wt ~~2,769~~ LBS 2640
Fuel Total: Jet A, 145 gallons (968 Lbs).
Normal: Two 37 gallon Main wing tanks and two 18 gallon Aux tanks = 110. Also a 35 gallon removable center tank for long range excursions

**Sea-level endurance:** With center tank; 6 hours at 140 knots IAS cruise with IFR reserve estimated at 840 NM. (Actual range varies with altitude/TAS).

Service Ceiling FL 240
Rate of climb (SL STD) 2,500 FPM, 3600 Lbs gross weight
Rate of climb FL200 1,505 FPM
Time to climb " " 20,000 in ten minutes with constant 300 shaft horsepower.

TAS with IAS of 140
FL 200 STD 189 Knots 300 HP
TAS at 8,000 159 Knots 300 HP
Theoretical Max Speed 261 Knots 270 HP 30,000' (calculated) standard atmosphere and 1,000 FPM normal climb rate, 3200 Lbs Gross Wt

| | | |
|---|---|---|
| | Vapr | Approach With Flaps Only |
| | Vmc | Minimum Controllable |
| 64 | Vxse | Best Angle |
| 86 | Vyse | Best Rate. All in knots IAS |

**Tested knots V Description**

66 Vsi Stall Clean
55 Vso Stall Dirty 20*
41 Vso Stall Dirty 40*
64 Vx Best Angle Climb, 20° Flaps
86 Vy Best Rate Climb 1050 FPM 20° Flaps
87-113 Va Maneuvering
140 Vno Normal Operating
173 Vne Never Exceed
122 Vle Landing gear
105 Vfe Flap Extended
87 Vgl Best Glide, ~~91 Knots~~**. 10/1Glide Ratio Clean**
17 Crosswind Component
113 Rough Air

| **Take Off Distance** | **Land** | **Water** |
|---|---|---|
| 3,200 Lbs | 870 Ft. | 1,100 Ft. |
| 3,400 Lbs | 1,175 Ft. | 1,400 Ft. |
| Over 50' Obstacle | 1,400 Ft.* | 1,600 Ft.* |

Maximum Gross Weights

| | Hard Surface | Water |
|---|---|---|
| Take off | 3950 | 3600 |
| Landing | 3800 | 3600 |

1

* Estimated

# V-speeds

**A series of designators used by the FAA and listed in 14 CFR 1 to describe certain flight conditions.**

$V_A$ Design maneuvering speed

$V_B$ Design speed for maximum gust intensity

$V_C$ Design cruising speed

$V_D$ Design diving speed

$V_{DF/MDF}$ Demonstrated flight diving speed

$V_F$ Design flap speed

$V_{FC/MFC}$ Maximum speed for stability characteristics

$V_{FE}$ Maximum flaps extended speed

$V_H$ Maximum speed in level flight with maximum continuous power

$V_{LE}$ Maximum landing gear extended speed

$V_{LO}$ Maximum landing gear operating speed

$V_{LOF}$ Lift-off speed

$V_{MC}$ Minimum control speed with the critical engine inoperative

$V_{MO/MMO}$ Maximum operating limit speed

$V_{MU}$ Minimum unstick speed

$V_{NE}$ Never-exceed speed

$V_{NO}$ Maximum structural cruising speed

$V_R$ Rotation speed

$V_S$ Stalling speed or minimum steady flight speed at which the aircraft is controllable

$V_{SO}$ Stalling speed or minimum steady flight speed in the landing configuration

$V_{S1}$ Stalling speed or minimum steady flight speed obtained in a specific configuration

$V_{TOSS}$ Take-off safety speed for Category A rotorcraft

$V_X$ Speed for best angle of climb

$V_Y$ Speed for best rate of climb

$V_1$ Take-off decision speed (formerly denoted as critical engine failure speed)

$V_2$ Take-off safety speed

$V_{2min}$ Minimum take-off safety speed

# 3. OPERATING PROCEDURES

## PT6-20 NORMAL PROCEDURES

### Description

The PT6A-20 turboprop has a three stage axial, single stage centrifugal compressor, driven by a single stage turbine. Another single stage turbine, counter rotates to the first. It drives the output shaft. Fuel is sprayed in the annular combustion chamber by 14 individually removable fuel nozzles mounted around the gas generator case. An ignition unit and 2 coil igniter plugs are used to start combustion. A hydropneumatic fuel control unit schedules fuel to maintain the power set by the gas generator power lever. Propeller speed remains constant at any selected Prop. Control lever position through the action of a propeller governor, except in the Beta range, where the maximum propeller speed is controlled by the Fuel Topping Governor.

Immediately following touchdown, partial or full reverse thrust may be obtained by lifting and retarding the thrust lever aft of the detent. Varying amounts of reverse thrust are available, depending upon how much the thrust lever is retarded.

**Engine Ratings**
are as follows:

- Take-Off –This rating is the maximum power permissible and corr. To 450 SHP ( =1080 ft x lbs) up to 21 ° C. S.A.T. This maximum allowed torque must not be exceeded.

- Max. Continuous – This rating corresponds to 450SHP up to 21°Cel. SAT it is intended for emergency use only. by abrupt decrease

- Max. Climb- 350 SHP at ISA( International Standard Atmosphere)

- Max. Cruise- This is the max. approved setting for cruising
- 450SHP (ISA)
- Reverse – Either full or partial reverse is obtained by lifting the lock of the thrust lever and moving it to any pos. aft of Idle. The max in full reverse is 450 SHP. Reverse is prohibited during flight, and unwanted reverse would happen, directly apply forward power.

should be feathered. Reducing airspeed and/or shutting down the gas generator, will facilitate feathering.

Engine Controls and Instrumentation

- Thrust Lever (gas genarator) -This Lever serves to modulate engine power from Full Reverse to Take-Off thrust. A lift detent lever is provided which, limits the most rearward position of the lever for flight conditions.

-Propeller Control - This is a Blue push pull lever. It adjusts the prop.constant speed unit to maintain propeller.speed at a selected value and in the max decrease RPM pos., Feathers the propeller

**Caution:** When propeller governing speed below 1650 RPM is selected, Feathering may result, evidenced by abrupt decrease in RPM and increase in Torque. In such instances, selection of a higher RPM quickly restores prop.governing. The gas generator continues to operate even if feathering has occured.

**Caution:** Don't deliberately feather at high power(.>15 psi torque) because transient overtorquing of the engine may occur.

-Engine Cut-off Control: (Starter Lever) It has 3 Pos. CUT- START(Low Idle) Open (Hi-Idle) The Lever is spring locked in each position.

-Engine Starter Key. - Gives Ground to both starter Relays, one for APU start, and one for internal Battery start. Actuates the Starter Generator which powers rotation of the gas generator of the turbine compressor.

-Interstage Turbine Temp.: (ITT) 8 probes wired in parallel indicate the temp. between the compressor and the power turbines.

-**N1 Tachometer**. (gas generator RPM) The tachometer registers the RPM of the gas generator with 100% representing 37,500 RPM.

-**Torquemeter**.- The torquemeter system the shaft output torque. Torque values are obtained by tapping into the 2 outlets on the reduction gear case and recording the differential pressure from the outlets. The relationship btw. torquemeter pressure and prop. shaft power is shown in LIMITATIONS, Section 2. Instrument readout is in foot-pounds(Ft x Lbs)

-**Ignition System**:- The ignition consists of 2 glow-plugs, controlled by :1 an off/on switch. 2. the Ignition Switch is used to ignite the fuel spray in the combustion (hot) section at starting, as well as in precipitation, to avoid a flame out. To check if both are properly functioning, check the amperage load. (Both 20A, one 10A).

-**Engine Idle Control**- The Starter Lever (Condition Lever) is used for controlling min. Idle RPM: Low Idle min 51%; and Hi Idle ~70% N1

**Caution : Operate the engine in "HI IDLE" when a need for rapid engine acceleration is anticipated. Ex.: REV. after LDG**

-**Engine Overspeed Governor protection**. The test switch is guarded on the top left of the panel with a red guard cover. At 95% N1 sel. Push the spring armed switch FWD and check if the RPM drops to ~ 90%. Check before first day flight.

**Before Starting Engine**

Check airplane and engine as per PREFLIGHT CHECKLIST.
The following items should also be checked:

1. OAT – NOTE
2. Controls – UNLOCKED, free and full travel
3. Brakes – SET
4. Baggage secured and Weight & Balance - in – LIMITs
5. LDGG Handel - DOWN
6. PWR Lever – IDLE
7. Propeller Control – FULL FWD

8. Condition Lever – CUT OFF
9. Battery Master Switch – ON
10. Circuit Breakers - CHECK
11. All 3 Fuel Emergency Valves- OPEN and LOCKED
12. Fuel Quantity – CHECK
13. Fuel Booster and AUX transfer Pumps- ON, listen for operation then – OFF

**CAUTION**

a) If total battery voltage less than 24 Volts, use an APU of 28 Volts
b) Check the Polarity with Voltmeter before connecting the plug.

The battery power switch must be OFF when starting engine with an APU and the generator must be switched OFF until the APU is disconnected and the NOSE LID is closed and secured.

## ENGINE START UP

1. Check eng. --CLEAR
2. One Booster Pump – ON (Min. 2 psi. best Main Pump on ~25psi)
3. Ignition Switch – ON 20 AMPS check
4. Starter Key – START ( Check Igniter 30-20 Amp)
5. Condition Lever – START (LOW IDLE) N1@ min 12% RPM, stabilized for 5 sec.
6. ITT and $N_1$ monitor (max 1090°C 2 sec.)
7. Eng. Start and Ign. – OFF at ≥50% $N_1$ ( Check red Starter Relay light - OFF)
8. After APU disconnected, GEN. switch to --ON, and check Voltage 28V
9. Check GEN. charging on all 3 Amp meters.( may go up to 15 Minutes) after an internal Battery Start.
10. OIL and Fuel Pressure CHECK

**NOTE**

Propeller unfeathered indicates OIL PRESSURE 68-80 PSI

## Engine Blow-Out

The following procedure should be used following a hot start or any time it's deemed necessary to remove trapped fuel or vapors from the burner can of the engine.

1. Engine Starter lever CUT-OFF
2. IGNITION – OFF
3. Battery Master switch – ON
4. Fuel System Valve –OPEN
5. Fuel Booster Pumps – one ON

6. Engine Starter Key – ON ONLY for 40"
   Caution: Observe the 40 seconds ON, 60"-OFF, 40"-ON then 30MIN-OFF
7. Engine Starter – OFF,

Booster Pump – OFF

## AFTER STARTING AND TAXI

1. Avionics and RADIO Master – ON
2. Fuel Control Heat – CHECK and set as required
3. Fire Extinguisher System Light- CHECK (Press to Test)
4. Taxi Light – ON
5. Position Lights – AS REQUIRED
6. Flight Instruments – CHECKED
7. Parking Brake – OFF
8. Nosewheel Steering – PULL, ON and check operating normal
9. Brakes - CHECKED

**CAUTION**

If the chip detector light illuminates during runup, do not T/O
Shut down the engine, investigate the cause and initiate nessecary
Repairs.

## NOTE

For Taxi Speed Control, reversing propeller may be used in the BETA RANGE. Beta range is defined as the control range between the idle stop and the point at which $N_1$ RPM begins to increase for REV. POWER. In this range, only blade angle is changed.

**BEFORE TAKE OFF**

1. Fuel Booster Pumps – all 2 on (~30psi)
2. Check Fuel Sel. Lever – BOTH
3. Loadmeter and Generator – CHECK
4. Ail and EL. Trim set to –ZERO
5. Rudder Trim slightly - RIGHT( 3 °<)
6. T/O Flaps – SET and CHECKED
7. Autopilot, if installed – CHECK, then OFF
8. Overspeed governor – TEST
    a) Propeller Control – FULL INCREASE RPM
    b) Thrust Lever – BELOW 1900 RPM
    c) Overspeed Governor Test Switch – ON (Hold)
    d) Thrust Lever – INCREASE (CHECK GOVERNING 1900- 2100 RPM)
    e) Overspeed Governor Test Switch – RELEASE (RPM should increase

## NOTE

Observe maximum ITT and Torque Limits

9. Propeller Feather(manual) – CHECKED( LOW IDLE)
10. Propeller Control – FULL FORWARD
11. Engine Instruments – CHECKED (at 60-70% $N_1$)
12. Flight Instruments – CHECK
13. Flight Controls – FULL FREE
14. Transponder – ON

**WARNING**

Main Booster Pump must be operative for T/O
All 2 should be on for T/O and for flight, minimum one always on.

## TAKE-OFF

- Monitor ITT and Engine Torque
- Increasing airspeed will cause Torque and ITT to increase
- Accelerate to a **Vr** of **80 MPH** and **90 MPH climb speed**
- Retract the Landing Gear before **130 MPH**

**WARNING**

If the chip detector light illuminates during T/O, return to the field for investigation and initiate corrective action.

## CLIMB

1. Gear – UP
2. Flaps – UP
3. Climb Power – SET (Observe max: ITT; Torque; $N_1$;and RPM limits
4. Propeller RPM – 2000
5. Engine Instruments – MONITOR
6. Landing light – OFF ; Taxi Light – ON (up to 10 000 FT)
7. Fuel Caps - CHECKED

## CRUISE

## WARNING

## Do not lift Reverser Lever in Flight!!!

1. Cruise Power – SET (1900 RPM)
2. Engine Instruments – CHECK
3. Fuel System – CHECK

**WARNING**

**Any flicker or illumination of the Chip Detector Light – requires an ASAP landing at the first Airfield**

**If feasible with reduced Power Settings!**

# OPERATING LIMITS

## PT6A-20/20A/20B

| CONDITION | OPERATING LIMITS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | TORQUE | | ITT° C (F) | Ng | | Np | OIL | |
| POWER SETTING | SHP | LB.FT | PSIG | MAXIMUM OBSERVED | RPM | % | RPM | PRESSURE PSIG | TEMP. °C |
| Takeoff and Maximum / Enroute Continued Emergency | 550<br>21° C<br>(70° F) | 1315 | 42.5 | 750° C<br>(1380° F) | 38,100 | 101.5 | 2200<br>(100%) | 65 - 85 | 10 to 99<br>(50° to 210°F) |
| Maximum Climb | 538<br>15° C<br>(59° F) | 1315 | 42.5 | 725° C<br>(1337° F) | | | 2200<br>(100%) | 65 - 85 | 0 to 99<br>(32° to 210° F) |
| Maximum Cruise | 495<br>15° C<br>(59° F) | 1315 | 42.5 | 705° C<br>(1300° F) | | | 2200<br>(100%) | 65 - 85 | 0 to 99<br>(32° to 210° F) |
| Idle | | | | 685° C<br>(1265° F) | 19, 000 | 51 | | 40 (Min.) | -40 to 99<br>(-40° to 210° F) |
| Starting | | | | 1090° C<br>(1994° F) | | | | | -40 (Min.) |
| Acceleration | | 1500 | 48.5 | 850° C<br>(1562° F) | 38, 500 | 102.6 | 2410<br>(110%) | | 0 to 99<br>(32° to 210° F) |
| Maximum Reverse | 500<br>21° C<br>(70° F) | 1315 | 42.5 | 750° C<br>(1380° F) | 38, 100 | 101.5 | 2090<br>(95%)<br>1960<br>(89%) | 65 - 85 | 0 to 99<br>(32° to 210° F) |

**Note:** Refer to Table 2-6-1 Engine Operating Limits (PT6A-20, 20A and 20B) in the Maintenance Manual for additional information.