SEABIRD AVIATION

AUSTRALIA PTY LTD

SEEKER SB7L-360A

(SERIES 2)

For Microsoft Flight Simulator X

This manual is for the Seeker SB7L model by Marty Strong and modified by Darrel Woodhouse 2011 (Original freeware aircraft available at http://aussiex.org/forum/)

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LEGAL

INTRODUCTION

Seabird Aviation Australia Pty Ltd (SEABIRD) has designed, developed and certified the Seeker SB7L-360A2, a multi-role utility aircraft so as to achieve optimum effectiveness, performance and safety in low level observation tasks. A result of thousands of hours of tough military patrol, surveillance and training operations, the Australian designed and manufactured SEEKER is now available for commercial and private use.

For commercial use, with operating costs a third that of the helicopter equivalent, the SEEKER provides an efficient and cost-effective alternative for power and pipeline inspection, coast watch, environmental and stock monitoring, aerial photography and security where VTOL (vertical take-off and landing) is not mission essential. The Seeker's visibility is unrivalled by any other fixed-wing aircraft and is superior to many helicopters.

For the private owner, the SEEKER provides a safe and enlightening flying experience not available in conventional fixed wings.

Once you fly the SEEKER you will immediately realise its unique attractiveness and outstanding effectiveness in providing a safe, cost-efficient alternative to many conventional fixed-wing and rotary wing aircraft.

At the time of writing Seabird Aviation have orders for two upgraded aircraft for use by Ergon Energy, the electricity distributor for all of Queensland outside the Brisbane metropolitan area. These aircraft will be used for powerline inspections and collect data using on-board state of the art spatial data and mapping systems.

The upgraded version will include a Lycoming IO-390-A1B6 engine, glass panel, structural upgrades and lighting and electrical improvements, and will be designated the Seeker SB7L-360A3.

NOTES ON THIS MODIFICATION

This modification consists predominately of an upgraded 2D panel for Marty Strong’s Seeker designed for FSX. The original model and texture files have been retained, along with the virtual cockpit, the original flight dynamics have been slightly altered, mainly in relation to the engine specs and performance.

The 2D panel is built on a photo of the Seeker’s panel and while it does not contain exact replicas of all the gauges and features, most of the gauges are relevant to this type of aircraft. With the exception of three gauges, the multi function ”COM Gold” radio, and the Satellite Assisted Landing System gauge, both by Glen Copeland, and the Microsoft Garmin GPS500, all the gauges have been purpose built, or at least, are significantly modified “default” or freeware units.

Some enhancements and additional gauges and functions have been added to this aircraft to allow for greater involvement from a flight simulator point of view, while hopefully, not detracting too much from the authentic aircraft. Some of these enhancements include full radio capability, (com 1 & 2, NAV 1 & 2, ADF and

transponder), full autopilot capability, as well as the inclusion of items such as SALS and TFR capability.

Most of the new gauges that are on the 2D main panel, and some from the pop-up panels, have been incorporated into the original virtual cockpit. Some of the original virtual gauges, the throttle and mixture levers for example, have been retained in lieu of the 2D units.

The pop-up panels from the 2D panel are also available in the virtual cockpit to allow greater visibility of features such as radio and GPS. Of course, these panels will be fixed on the screen and will not move relative to the actual cockpit when panning around the virtual cockpit.

The sound files are from Turbine Sound Studios Cessna 152/172 freeware sound pack. This set of sound files have been used in preference to the default Cessna set as they offer a closer approximation to the real aircraft.

This aircraft comes with two sets of lighting. A full set of lights using default Microsoft lighting effects, OR, a set of lights using the payware Shockwave lights. See LIGHT section for more details.

Included with this aircraft are 5 freeware texture files all separately available at http://aussiex.org/forum/





"Camo" Reg N72163	"Spirit of Hervey Bay" Reg VH-SEE	Country Energy Reg VH-OPT	Reg VH-SBO	Reg VH-SUA Seabird company demonstrator

Also included is a set of unpainted textures for a "paintkit" version for those with a skill at re-painting who wish to develop further textures. This texture set does not load with the other aircraft, but the files are included in the Seabird Seeker SB7L directory.

FLYING THE SEEKER SB7L-360A

This is not a detailed flight manual but rather a few notes to allow those with limited experience to operate this aircraft with relative ease.

PRE-START CHECKS

Carry out all pre start checks according to appropriate check list

STARTING

Check park brake is applied.
Fuel valve open
Mixture 100% (% of control setting not air/fuel ratio)
Fuel boost pump on
Battery master on
Alternator on
Left and right magneto on
Push start button
Allow warm up for several minutes
Fuel boost pump off
Increase throttle settings to approximately 10%
Check that low fuel and oil pressure warning lights extinguish
Run engine up to approximately 80% and test for satisfactory magneto operation by switching off each magneto in turn. If power drops by about 5% when each magneto is off they are functioning satisfactorily.
Return to idle until take-off is commenced

TAXIING

Set taxispeed control to suitable maximum taxi speed. Because of the high mounted engine, the SB7L has a relatively high centre of gravity, so watch those sharp turns. For taxiing in tight turns speed should not exceed 10kts, straight line taxiing can be performed at speeds up to 25-30kts. As different taxi requirements are reached the speed setting can be easily adjusted on the taxispeed control gauge.

Although the SB7L is fitted with a steerable tailwheel, steering can be difficult at low speeds, so differential braking should be used for steering at taxispeeds, and during the initial take-off run prior to tailwheel lift-off and rudder becoming effective.

TAKE-OFF

The following procedure will allow for take-off performance close to that detailed in the Seeker performance characteristics as detailed in the Seeker Specifications

Set flaps to 10º
Set take-off trim (8º)
Release parking brake
Ensure mixture at 100% and open throttle steadily to 100%
Aircraft will rotate to take-off pitch at approximately 35-40kts
Allow aircraft to lift itself off at approximately 68kts (a small amount of assistance by the use of elevators may be required depending on actual take-off weight)

On reaching climb-out speed (70kts plus) retract flaps
If using manual control, reduce elevator trim as required

CLIMB

Continue climb at appropriate climb rate (500-700fpm)
Reduce mixture setting as required as higher altitude is gained

CRUISE

The Lycoming 0-320-B2C engine in the Seeker has been de-rated to allow continuous power settings. These power settings should produce approximately 168HP (at sea level, or a little higher) and allow for max cruise speeds of 129kts. Economical cruise is achieved with 112kts at approximately 75% power, depending on altitude.

HIGH ALTITUDE CRUISE

Ceiling for the Seeker is claimed to be 15,000ft, and while it is possible for this model to reach that altitude, it is difficult. 10,000ft is quite easily reached but strict attention must be paid to mixture control and vertical speed. As the aircraft approaches 7-8,000ft vertical speed must be reduced to 200 or even 100fpm and the mixture reduced considerably. Watch airspeed and as it approaches 70kts or so reduce vertical speed. For best mixture setting, reduce (or increase) mixture levels to achieve the highest horsepower figure by watching the power setting on the main panel. A good idea is to use the mouse wheel to adjust mixture setting to allow precise movement of the control knob.

DESCEND

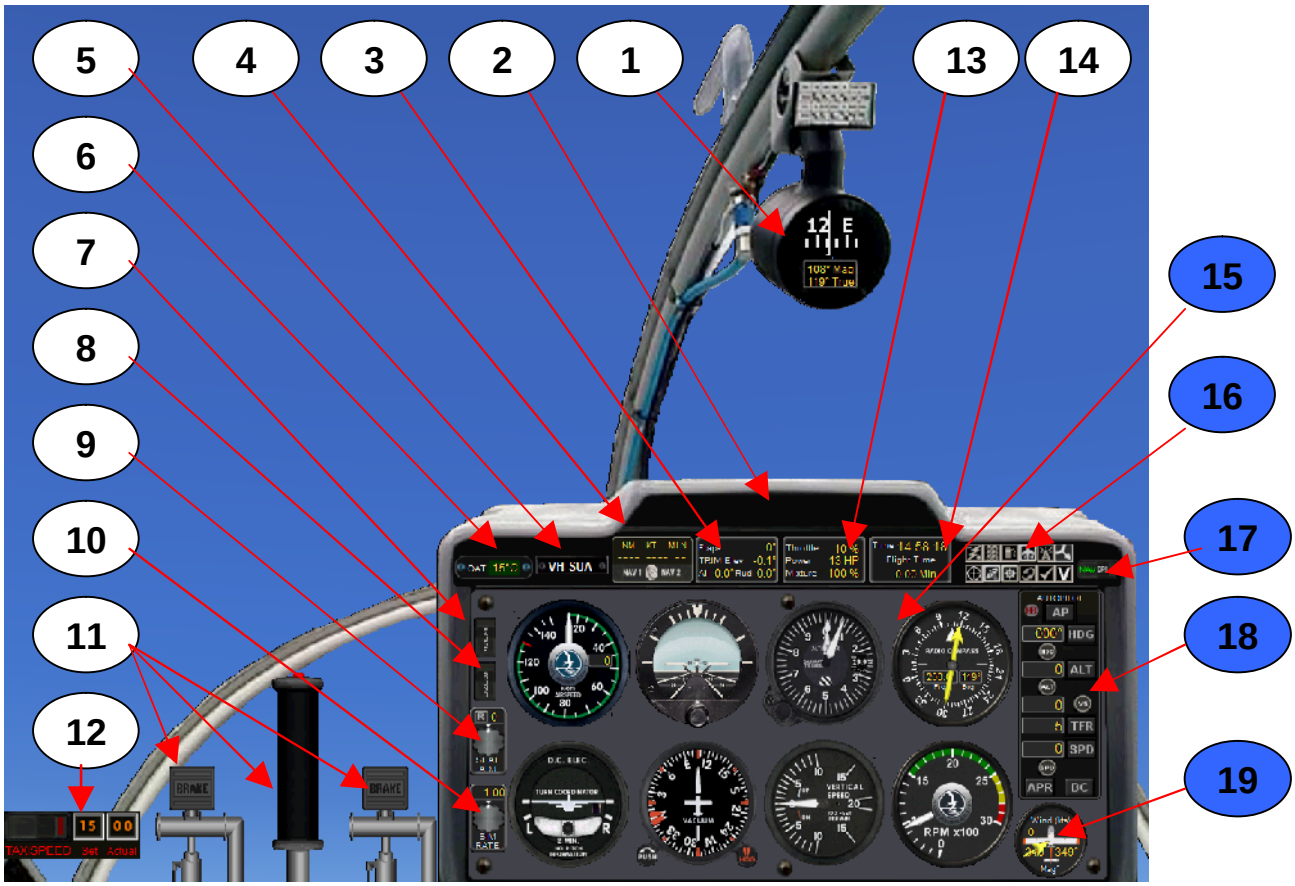
Reduce power setting as required to prevent overspeed (Vne never exceed speed is 129kts)
Increase mixture setting as lower altitudes are reached.

LAND

Approach at 70kts
Final approach at 60kts with full flaps
Hold pitch at about 6º-7º until main wheels touch down
Retract flaps fully
Allow tailwheel to touch before applying brakes.
Taxi to an appropriate position and apply parking brakes
Begin shutdown procedures.

2D PANELS

MAIN PANEL



Fullscreen view of main panel

1 **Compass**

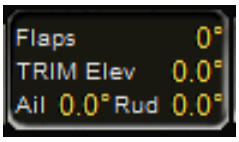
Standard “Whiskey” compass with additional digital display of magnetic and true heading

2 **Warning Annunciators**

Brakes -- Indicates parking brake is applied
Exits – Indicates Cabin doors are open
Glide Scope – Glidescope warning light
GPWS – (Ground Proximity Warning System) Indicates aircraft has descended below 200 ft (AGL)
Oil Temp – Indicates when oil temperature has exceeded 100ºC
Oil Pressure – Indicates when oil pressure falls below 50PSI or above 100PSI
Low Fuel-L (&R) – Indicates that fuel in respective tank has fallen below 10% of maximum capacity
Fuel Pressure – Indicates that fuel supply pressure is below 8PSI

Annunciator lights will carry out a self test when the battery switch is turned on and will extinguish when the engine is started.

3 **Control Surfaces Display**



Visual display only, for flaps position and elevator, aileron and rudder trim.

4 **DME (Distance Measuring Equipment)**

Displays distance (nautical miles), current groundspeed, and time at current groundspeed, to selected VOR/DME station. Use mouse click on rotating knob to select VOR/DME 1 or VOR/DME 2.

5 **Aircraft Registration Plate**

6 **Outside Air Temperature**

7 **Pause Switch**

8 **Sound Switch**

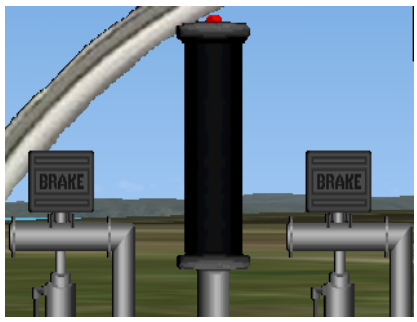
9 **Seat Adjust Switch**

Raises or lowers the seat position (eyepoint). Click on right side of knob to raise, left to lower and on the “R” button to reset to default.

10 **Simulator Rate Adjust Switch**

Increases or decreases the simulation rate. Click on the right side of knob to increase, left to decrease.

11 Moveable Yoke, Rudder Pedals, Brakes & Differential (Toe) Brakes



Yoke and pedals move in response to manual operation of yoke and rudder. There is no provision to remove them from the display.

LEFT click on the upper half of the left or right toe brake pedal to activate the respective differential brake. A single click will turn the aircraft about 1º, additional clicks will increase the turn by about 1º each click. This feature is useful for ground steering when used in conjunction with the taxispeed control.

RIGHT click on the lower half of either toe brake pedal to activate both the left and right brakes simultaneously. This feature simulates pushing both pedals together, unfortunately we only have one mouse, so can only operate one pedal at a time. While this feature will operate with the taxispeed control active, the speed will return to the pre-set figure when the brakes are released, so it's probably best to de-activate the taxispeed.

The virtual cockpit does NOT use the 2D yoke and rudder pedals (including toe brakes).

12 Taxispeed Control

When active, this gauge controls the groundspeed of your aircraft while taxiing. The auto-throttle will control the speed as long as the taxispeed control gauge is active. There is no need to manually operate the throttle.

- The target taxispeed can be adjusted from 3 - 40 knots.
- The actual taxispeed is kept constant within 1-2 knots of the set target speed.
- Auto-deactivates when the Parking Brakes are set or the throttles are manually set to 70% or higher.
- The control is temporarily deactivated when the Brakes are applied
- When the actual groundspeed - targetspeed is more than 4 knots, the brakes are applied with 50% pressure.

The gauge will only be visible when the aircraft is on the ground and INDICATED AIRSPEED is less than 40 knots.

The gauge can only be activated if all the following conditions are met:
- the parking brakes are released
- the aircraft is on the ground
- the engines are running.

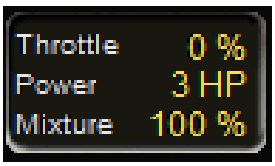
Red light indicates that one or all of the above conditions are not met.

To activate, click on switch, green light will illuminate.

To adjust desired taxispeed, click on left or right sides of left numerical display "Set".
To de-activate, click on switch, green light will extinguish.

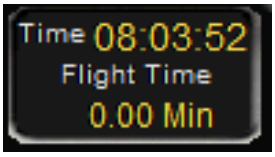
Note that the taxispeed gauge is also included in the VC but the toe brakes are not.

13 **Engine Information Display**



Visual display only, of throttle setting, engine power and mixture setting.

14 **Clock and Flight Timer**



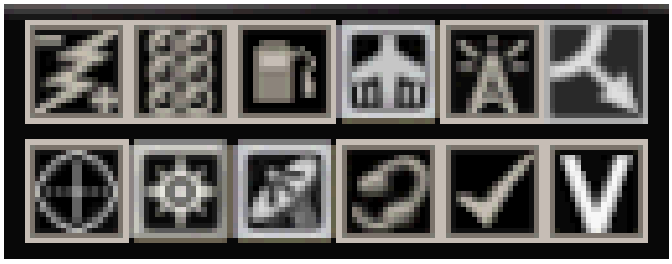
Top line displays local time, bottom line displays flight time in minutes and decimal minutes. Flight time begins when aircraft exceeds 35kts IAS and ceases when aircraft slows to 35kts IAS. This eliminates taxiing being included in flight time, and to avoid wind speeds affecting the elapsed time while the aircraft is on the ground.

15 **Basic Flight Instruments**

Top row from left:	Airspeed Indicator (incl digital display which changes color to red above Vne 129kts) Attitude Indicator Altimeter (incl barometric calibration knob) Radio Magnetic Indicator (RMI) (incl digital display of active ADF frequency and bearing to station)
Bottom row from left:	Turn Co-ordinator Heading Indicator Vertical Speed Indicator (VSI) Tachometer

16 Panel Icons

Note that except for SALS, VOR1, map & kneeboard, all icons are duplicated on the respective pop-up panel to close that panel.



1	Electrical and starter panel	7	VOR1 pop-up display
2	Engine instruments panel	8	Standard map display
3	Fuel panel	9	Garmin GPS500 panel
4	Engine and flight controls (incl Parkbrake and exit)	10	Air Traffic Control (ATC) panel
5	Radio panel	11	Standard kneeboard display
6	Satellite Assisted Landing System (SALS) pop-up display	12	Switch to virtual cockpit (the virtual cockpit has an equiv-alent icon to return to 2D)

17 Nav/GPS Switch

18 Autopilot

Push buttons for power on, heading hold, altitude hold, terrain following radar hold (see later), airspeed hold, approach hold and backcourse.

Rotating knobs for heading, altitude, vertical speed and airspeed hold selection. Click on right side of knob to increase, and left side of knob to decrease selection. Default vertical speed is set at 500 fpm.

Terrain following radar mode is something definitely not on the actual aircraft but is a useful feature on an aircraft such as this. To activate push the TFR button at any altitude above 100 feet and de-activate the ALT hold, and the system will hold the radar altitude at the time of activation.

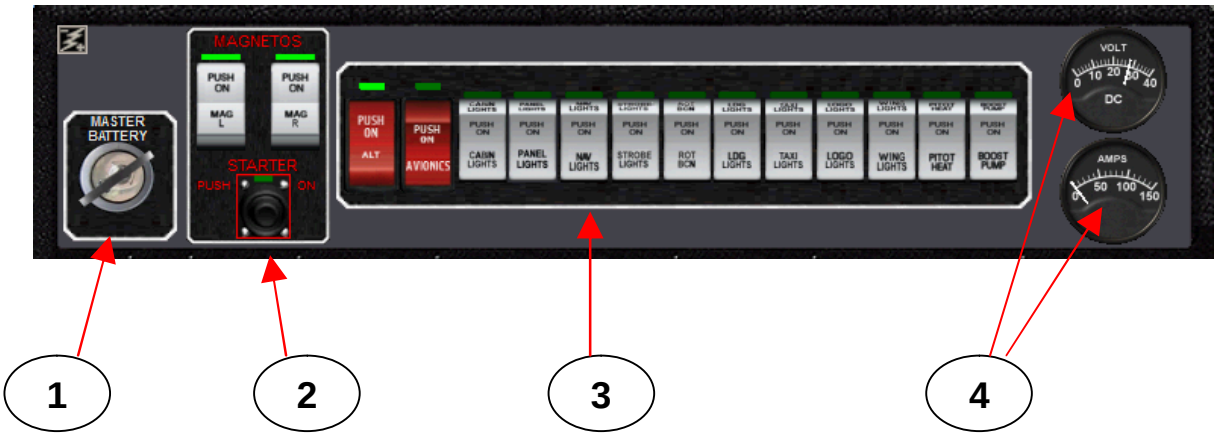
Be warned, however, that constant attention must be given to engine power settings as the system will constantly be changing the vertical speed to follow the terrain. Steep changes to the terrain below will correspond to steep changes to the rates of climb or descent, and will place significant power demands on the engine that should be performed manually. The autospeed function is effective during manoeuvres requiring “reasonable” power demands, but care should be taken during its use in conjunction with

the TFR. The display for the TFR will always display the radar height (AGL) even when TFR is not activated.

19 **Wind Indicator**

Indicates direction of prevailing wind (relative to the aircraft), by the yellow arrow and the digital readouts below the wings. The strength of the wind in knots is shown above the wings. Both digital readouts are duplicated to ensure that at least one of each is always visible under the yellow arrow.

ELECTRICAL PANEL



1 **Master Battery Switch**

Click on switch to insert key and activate switch.

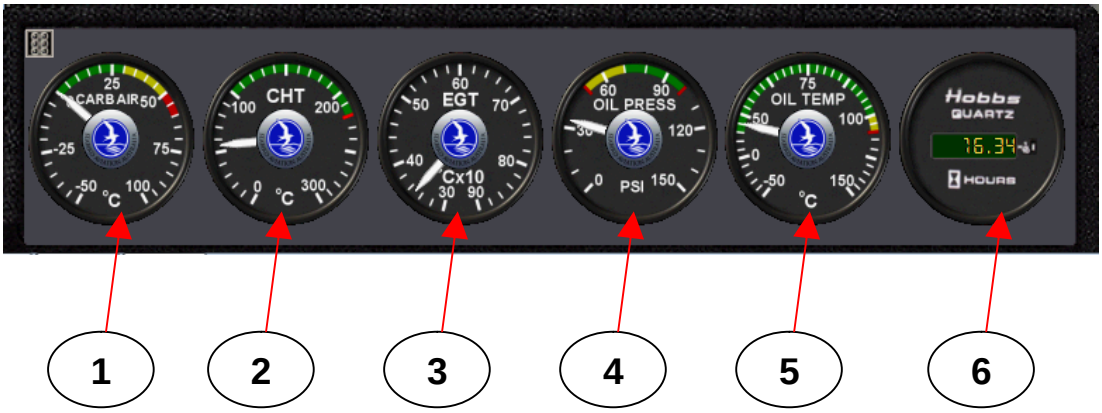
2 **Magneto Switches and Starter Button**

3 **Switch Bank**

Switches for alternator, avionics, lighting, pitot heater and fuel boost pump.
NOTE: When in virtual cockpit mode, “cabin lights” must be on to illuminate instrument panel.

4 **Voltmeter and Ammeter**

ENGINE GAUGES PANEL



1 **Carburettor Air Temperature**

2 **Cylinder Head Temperature**

3 **Exhaust Gas Temperature**

4 **Engine Oil Pressure**

5 **Engine Oil Temperature**

6 **Engine Hour Meter**

NOTE: To reset engine hours, reset the **STATE.CFG** file to **accumulated_time=0.00000** (or whatever you like)

For the Seeker, this file can be found in **C:\Users\.....\Seabird Seaker SB7L** directory (or something like……. *c:\Users\Home\AppData\Roaming\Microsoft\FSX\SimObjects\Seabird Seeker SB7L*). The "Home" sub-directory may be different, but the remainder should be the same.

FUEL PANEL

1 Left and Right Fuel Gauges

On the virtual cockpit these gauges are contained in the overhead panel above the compass

2 Fuel Tank Selector

Click on “LEFT”, “BOTH” or “RIGHT” to select tank. Note that left or right should be used for level flight only.

3 Fuel Shut-Off Lever

Click on red knob to open or close fuel valve.

4 Fuel Pressure Gauge

5 Fuel Status Gauge

This gauge shows:

Current fuel flow in gallons per hour
Total remaining fuel in gallons
Total fuel used in gallons
Time to empty at current fuel flow, in hours and minutes
Range at current groundspeed and fuel flow, in nautical miles

6 Fuel Control Gauge

Use this gauge to dump or replace fuel. The “Fill” button will add fuel to both tanks simultaneously at a rate of 25% capacity per mouse click. Note that the aircraft MUST be on the ground with engine stopped and park brake applied for this feature to be activated.

The “Dump” button will dump fuel continuously from both tanks. Fuel is dumped from the left tank first then the right. To fully empty both tanks takes about I minute. Clicking the switch a second time will stop the dumping process. Fuel can be dumped at any time.

The current capacity of each tank is displayed in gallons. The text will change to red when the quantity of fuel in the respective tank is below 10% of capacity.

ENGINE CONTROLS AND FLIGHT SURFACES PANEL

1 Flaps Control

Set flaps position (0º, 10º, 20º, 40º) by clicking on lower half of rotating knob to extend and upper half to retract. NOTE that the actual aircraft does not have the 10º flaps position.

2 **Stall Speeds Label**

Label showing actual stall speeds for the aircraft and maximum flap extension speed (Vfe). The current indicated air speed is also shown.

3 **Exits**

Pulling the knob will open both cabin doors.

4 **Carburettor Heater**

Pulling the knob will switch on the carburettor heater.

5 **Trim Controls**

Manual controls for elevator, aileron and rudder trim.

6 **Pitch Indicator**

Displays the current pitch of the aircraft in both graphical and digital form.

7 **Auto Trim Control**

Automatically sets elevator trim to a position that provides appropriate trim for a realistic take-off. Trim is set to 8º eliminating the need to operate the manual trim adjusting wheel. The auto trim setting is overridden by manual adjustment or by the autopilot, when engaged.

8 **Air to Fuel Ratio**

Displays the current ratio of air to fuel as set by the mixture control.

A little about air/fuel ratio

The air/fuel ratio is the ratio by weight of the air and fuel in the mixture. Stoichiometric air-fuel ratio is the ratio at which the exact amounts of air and fuel are present to give complete combustion of the fuel with no residual of either. For most gasoline fuels this ratio is 14.7:1. This ratio does not take into account engine or fuel system design. Generally speaking, a number below 14.7 is a rich mixture and a number above 14.7 is a lean mixture.

Most engines are designed to run somewhat on the rich side to prevent damage and to ensure maximum power is always available. In an aircraft not equipped with turbochargers (or superchargers) (such as this aircraft), the reduced density of the air at higher altitudes will result in an increasing proportion of fuel entering the engine. Therefore the

fuel mixture will need to be constantly leaned to maintain the appropriate air/fuel ratio.

Appropriate ratios (at least for flight simulator purposes), are about 11:1 for full power at take-off and initial climb, to about 14:1 for economical cruise and descent. Unlike flying a real aircraft, flight simulators do not give a real sound effect for rich or lean engines, so the engine sound cannot be used to judge the correct mixture. This gauge, in conjunction with the output horsepower display, should allow a close approximation of the correct mixture setting.

There is much information about this subject available, and for a thorough understanding it is suggested that an effort be made to study as much as possible.

9 **Parking Brake**

Pulling the knob will engage the parking brake.

10 **Mixture Control**

Pull knob out to reduce fuel mixture ratio, push in to increase. (Use mouse wheel for greater control)

11 **Throttle Control**

Push in to increase throttle, pull out to decrease.

RADIO PANEL

COM Gold multi function radio courtesy of Glenn Copeland

NOTE: Radios active in this aircraft, Com1, Com 2, Nav 1, Nav 2, ADF, Transponder

Features ----------

> Numeric pad for easy entry of radio frequencies and transponder squawk codes.
> Input active frequencies directly into Com1, Com2, Nav1, Nav2, and the ADF1.
> Input standby frequencies directly into Com1, Com2, Nav1, Nav2, and the ADF1.
> Active and standby frequencies can be switched back and forth as needed.
>Diode indicators show when COM radios are in Transmit and Receive modes.
> When Transponder is in AUTO mode, codes can only be entered into transponder by ATC.
> When Transponder is in MAN mode, codes can only be entered into transponder manually by pilot.
> Data that is outside limits for radio frequencies will display a red ERROR message on screen.
> Data that is outside requirements for transponder codes will display a red ERROR message on screen. This includes illegal numbers 8 and 9.
> Clear button will erase digits or ERROR from small input screen.
>Frequency identification is available for all active navigational radios. When out of range, dotted line is displayed.
> Realistic and accurate signal strength bar animations based on results of attenuation test.
> Gauge is sized and shaped so that it can be installed in panel of Lear45 replacing the default radio. For other aircraft, the gauge can be installed into separate window.

Manual and Automatic Operation of Radio frequencies/transponder code

To manually set frequencies and transponder code, follow this procedure:

a) When ATC transmits a request for a frequency change, punch in the frequency using ComGold's keypad while it is still fresh in your memory. Leave the value in the small input screen.
b) Acknowledge the request to ATC.
c) Transfer the frequency from the small input screen into the active memory of the active radio.
d) The ATC menu will then automatically change to reflect new choices based on the frequency change.
e) Choose from the ATC menu the item number that will establish contact on the new frequency.

f) For manual transponder operation, set gauge to MAN mode.
g) When ATC transmits a request for a squawk code, punch in the code using the keypad while it is still fresh in your memory.
h) Acknowledge the request to ATC.
i) Transfer the transponder code from the small input screen into the XPNDR. This will then allow ATC to "see" the aircraft on radar.

To automatically set frequencies and transponder code, follow this procedure:

a) When ATC transmits a request for a frequency change, acknowledge the request.

b) On the ATC menu, choose the item number that will establish contact on the new frequency. The frequency will be changed in ComGold automatically for you.

c) For transponder, set it to AUTO mode.
d) When ATC transmits a request for a squawk code, acknowledge the request.
e) The transponder code will be changed in Com Gold automatically for you.

General Operation----------

1. Master Battery Power and Avionics must be ON before gauge will operate and illuminate screen displays.

2. A red ERROR message will display on input screen if values outside of design limits are entered into radios or transponder. These limits are:
a)Comm 1 and 2 (active and stby): 118.0 - 136.975
b)Nav 1 and 2 (active and stby): 108.0 - 117.975
c)ADF(active and stby): 100.0 - 1799.9
d)Transponder codes: digits 0 - 7. Maximum code is 7777.

3. When ERROR message displays, clear (C) button also illuminates red to make clearing data more efficient.

4. To clear a displayed value or ERROR from the small input screen, press the C button.

4. Illuminated red diodes in the COM1 and COM2 display areas indicate an active "Transmit" capability. Illuminated green diodes indicate a passive "Receive" capability. For example, if COM1 is the active radio, a red and green diode will be lit. This indicates the COM1 radio will transmit and receive. If the "BTH" audio button is pressed, the green diode in COM2 will light up indicating the COM2 radio is also in receive mode.

3. Radio frequencies can be entered to two decimal places. If 3-decimal places are requested by ATC such as 125.925, enter only the first two decimals, i.e., 125.92. The radio will then tune to the proper frequency.

5. Pressing the Radio heading bracket on the display screen (COM 1, COM 2, NAV 1, NAV 2, ADF 1) will switch the active and standby frequencies for that radio. This can be repeated as needed.

6. Signal strength (NAV1, NAV2, ADF1) is determined by various factors including straight-line distance from station to aircraft and obstructions that may attenuate the signal.
a) If the navigation signal is so weak that identification cannot be made, no bars will show in signal strength window.
b) When a radio signal is strong enough so that station identification can be made, at least one bar will appear in small signal strength window. These increase up to a max. of five bars as signal strength increases.
c) For VOR/DME heading and distance data, minimum signal strength is two-three bars.

6. When Transponder is in AUTO mode, codes cannot be entered manually into gauge. Codes will be set automatically by ATC when you acknowledge their request to set a new transponder code.

7. When Transponder is in MAN mode, the 4-digit squawk code requested by ATC must be entered manually. If digits 8 or 9 are accidentally input into transponder, ERROR message will result.

8. If ATC requests a code starting with zeros such as 0004, press the zero key on the input pad three times, then the 4 key. Even though the small input screen will only show a "4", it still records the three zeros. When this value is transferred to the XPONDR, it will read 0004.

SATELLITE ASSISTED LANDING SYSTEM (SALS)

SALS gauge courtesy of Glenn Copeland

Note that this gauge overlays the attitude indicator. This position was chosen as suitable on the basis that by the time this gauge is opened, the aircraft should be approaching the target, and any turns and changes of altitude can be more easily monitored by switching between the attitude indicator and SALS while focussing on the same spot on the panel.
When the SALS is opened/closed it will always return in the same operational condition. In other words, if it was switched on and set to an airport when closed, clicking the SALS icon will return it in the same condition.

NOTE: SALS is a precision approach and landing guidance system. It will furnish both lateral and vertical guidance to the landing zone of any airport or seaplane base inside MS Flight Simulator. And like ILS, SALS does require a certain amount of piloting technique that can be easily acquired and honed by practice. That gives one a feel for the gauge and how to instinctively respond to its guidance display.

FEATURES
> Lateral guidance accuracy to within 10 feet of runway center.
> Provides updated list on all airports and seaplane bases within gauge limit of 30 nautical miles.

> Allows one airport to be selected from list as the destination airport.
> Allows one runway to be selected at the destination airport.
> Provides glidepath/glideslope guidance to a calculated landing zone at either end of selected runway.
> Has 1 glideslope needle that operates similar to an ILS glideslope.
> Has 3 glidepath needles; fine, medium, and course. The sensitivities of these needles vary, thus providing enhanced feedback on the rate of glidepath interception or correction.
> Illuminated directional arrows that show the tendency of the glidepath needles to move left/right. When no arrows are illuminated, the aircraft is centered over the glidepath.
> GO VISUAL message will alert pilot when 1 NM from landing zone.
> Screen provides climb out azimuth information in case of missed approaches.
> Backcourse indicator (BC) alerts pilot when glidepath needles are providing reversed information.
> Panel or separate window installation. Includes icon gauge.

ACCURACY NOTE:
A) As the aircraft passes over the landing zone during a missed approach, glide needles may temporarily fluctuate in much the same way as a VOR needle when passing over the VOR station. Accuracy will be regained when the GO VISUAL message disappears as the aircraft gets further from the landing zone.
B) The glideslope angle used by SALS is a 3-degree incline to the landing zone. This zone is located 5-percent of runway length from the nearest end of the runway. Unlike certified ILS approaches, this calculated slope does not take into account any terrain or obstructions around the airport. Therefore, a happy descent should be confirmed visually.

SCREEN MESSAGES:
1) AIRPORT STANDBY (orange)- No airports within 30 NM.
2) GO VISUAL (red)- Within 1 NM of landing zone. Take over visually.
3) BC (yellow)- Selected runway is 90-degrees or more behind aircraft. The glidepath needle is in reverse mode when flying backcourse legs.
4) RANGE LIMIT (orange)- Aircraft is getting further from the selected runway and is nearing the 30 NM range limit. If course is continued, gauge will automatically switch into Approach Mode (see Operation below).

GLIDEPATH NEEDLE TRIO
*Fine needle (top): Half scale deflection = 250' or more from center of glidepath.
*Medium needle (center): Half scale deflection = 1250' or more from center of glidepath.
*Course needle (bottom): Half scale deflection = 3125' or more from center of glidepath.
(Fine is 5 times as sensitive as Medium. Medium is 2 1/2 times as sensitive as Course.
The aircraft is within 10 ft. of glidepath center when all three needles are aligned at mid-scale.)

Operation----------
1. Master Battery Power must be ON before gauge will operate.
2. Button (A) has a dual function. The first function is to control electrical power to the gauge. Pressing this button will turn the gauge ON/OFF.

3. The second function of the A-button is to place gauge in Approach mode when gauge power is first applied.
4. When in Approach mode, the gauge will identify airports within an approach range of 30 nautical miles from the aircraft. A maximum of seven ICAOs can be listed on the screen. They are shown in the order of their proximity to the aircraft with the closest at the number 1 spot on the list. These will constantly be updated as the aircraft changes location. If there are no airports within the 30 NM range, the AIRPORT STANDBY message will be displayed.
5. It is possible in regions with a heavy concentration of airports to not see the destination ICAO on the list of seven even when it is relatively close. That will change as the destination ICAO gets nearer and as other listed airports disappear from the screen.
6. Pressing the DOWN ARROW button on the gauge will allow the listed ICAOs to be scrolled. As each airport is selected, the ICAO will turn from orange to green.
7. When the desired airport has been selected, press the ENT button. That will enter the airport into SALS and inform the gauge at what airport you intend to land.
8. After pressing the ENT button, the gauge will display every runway designation associated with the entered airport.
9. Using the arrow button, scroll through the runway list to select the desired runway designation for landing, then press ENT.
10. The gauge will then enter the glidepath/glideslope mode. The following data is associated with this screen:

a) Title box confirming the ICAO of the destination airport.
b) The two magnetic headings of the selected runway.
c) The length (ft.) of the runway.
d) The elevation (ft.) of the runway.
e) The distance (NM) to the landing zone.
f) The glidepath/glideslope screen containing guidance needles.
g) Glidepath arrows that show tendency for glidepath needle movement.

11. SALS will automatically determine which runway heading to use for its computations when you turn onto the final leg. The runway heading that is within 25-degrees of the aircraft heading will be used for this purpose.
12. Keep the three glidepath needles centered left/right to remain astride the centerline of runway. Turn aircraft TOWARD the needles for heading corrections.
13. a) To intercept the glidepath, fly toward the needles. Having three glidepath needles, SALS provides more advanced notice that the glidepath is nearing interception. This means the initial angle of interception can be a fairly sharp angle (40-60 degrees). This is much sharper than a typical ILS localizer interception. The angle of interception flown will depend upon flight characteristics (speed, turn radius, etc.) of the aircraft. The Course needle will be the first to become centered. As it nears the center of the screen, adjust the angle of glidepath interception to a shallower angle.
b) The Medium needle will be the second needle to become centered. As it approaches center scale, adjust aircraft heading by making the angle of glidepath interception increasingly shallower.
c) The Fine needle will be the last to become . The aircraft should be very close to the runway heading as the Fine needle is approaching center because it moves rather quickly in 10 ft. steps.
d) The illuminated left/right arrows indicate in what direction the glidepath needles have a tendency to move. The arrows are even more sensitive than the Fine needle and indicate the direction of potential needle movement.

If neither arrow is illuminated, all needles are at rest with no tendency for movement. This means the aircraft is directly over the glidepath.
14. Tendency arrows are not active on backcourse legs.
15. Keep glideslope needle centered up/down to remain in center of glide descent to landing zone. Move the aircraft TOWARD the needle for glideslope (altitude) corrections.

16. When the GO VISUAL message appears on screen, you are 1 NM from landing zone and should verify by sight the relationship of aircraft to runway and make adjustments accordingly.
17. When the GO VISUAL message is displayed on screen, the glideslope needle and two glidepath needles (Fine/Medium) remain visible and useable. They retain accuracy until distance to landing zone nears zero miles.
18. At touchdown, the GO VISUAL message will disappear from screen and all needles will center.
19. C-button will clear screen display and return gauge to Approach mode showing the list of nearby airports.

NOTE: For this gauge, BACKCOURSE is defined as any course being flown that places the selected runway 90-degrees or more behind the aircraft and within 30 nautical miles.

20. On backcourse legs, a "BC" message will be displayed at the right side of the ICAO title box. This message means the glidepath needle is to be used in reverse. Turn the aircraft AWAY FROM the needle for backcourse heading corrections.
21. On missed approaches, continue flying at runway heading. When the GO VISUAL message disappears (when bearing to airport lies behind the aircraft and is outside mileage limits), the glidepath needles go into BC mode (reversed) and can be used to guide aircraft away from airport. Keeping needles centered will align the runway directly behind the aircraft. More on this in the TIPS below.
22. After you get within 30 NM of the destination airport and after entering into SALS the runway designation, the aircraft may traverse various legs of the landing pattern. As it does, the BC message may light up as the aircraft passes through areas that meet the backcourse definition. This is normal and only means the gauge does not yet know which end of the selected runway you intend to land on. The "BC" message will turn off once the aircraft has turned onto the final leg of the runway. At that point SALS knows your landing intentions and will begin calculating all glide information accordingly.

TIPS
a) The proper use of the tendency arrows will greatly aid in intercepting and following glidepaths. Once established on the path, the arrows will then allow the pilot to anticipate heading changes before the needles actually indicates a correction is needed.
b) When an arrow is lit, it shows in what direction the Fine needle will travel once it begins to move. If the Fine needle is at its limit, then the arrows show what direction the Medium needle will move. If the Medium needle is at its limit, the arrow shows what direction the Course needle will move. If all needles are at their limit, the arrow indicates that the aircraft is continuing to get further from the center of the glidepath and in what direction.
c) When no arrows are lit, the aircraft is following the center of the glidepath. Should an arrow light up when in this situation, it is a signal that the aircraft should be turned

slightly in the direction of the lit arrow. This will cancel out any needle movement before it actually occurs.

Note: See included SALS Design Parameters.doc for illustrated glidepath/glideslope information.

VOR1

Standard configuration VOR gauge that overlays the turn co-ordinator gauge on the main panel.

GARMIN GPS500

Refer to the operating instructions within Microsoft Flight Simulator for information on this instrument.

AIR TRAFFIC CONTROL PANEL

This panel is activated by the ATC Icon on the main panel and is primarily a means of input to the ATC controller. The standard ATC window is opened, or closed, by clicking on the 

button.

Clicking on the number buttons (1-0) will carry out the appropriate action or initiate the equivalent response to the ATC controller.

The  button will close this panel (but not the standard ATC window), which can only be closed (or opened) by the 

button.

KNOWN PROBLEMS

1 Occasionally the fuel tank selector lever will not appear. It seems to be when an aircraft is loaded that does not have a selector then the aircraft is switched to the Seeker. No explanation why this occurs but it is easily overcome by clicking on the “BOTH” position on the gauge and the lever suddenly appears.

2 Sometimes when using the autopilot with ALT hold activated, the ailerons will not operate manually. The solution is to momentarily activate then de-activate the HDG hold button. Even doing this before the engine is started will remove the problem. (Part of pre start check).

VIRTUAL COCKPIT

The virtual cockpit is based on the original model but with most of the gauges converted to match the 2D panel.

Some exceptions to this are the throttle and mixture levers, the trim wheel, parking brake and rudder trim. The joystick and rudder pedals, of course, are also the original units. Some of these gauges are in fact duplicated by having the 2D versions incorporated into the virtual cockpit, albeit in a different location.

Some of the gauges are located in a different position to the layout for the 2D panel due to the limitation of available positions, particularly the gauges from the fuel and engine and flight surfaces panels.

LIGHTS

In “as installed” condition, this aircraft is fitted with standard Microsoft lighting. This lighting could only be considered ”marginal” at best. If you are fortunate enough to have the payware Shockwave 3D Redux lighting, there is a separate configuration file to allow you to use them.

In the **Seabird Seeker SB7L** directory there are two aircraft configuration files:-

AIRCRAFT.CFG is the standard file using original Microsoft lighting effects. This is the file that is currently active

AIRCRAFT.CFGSHOCKWAVE is the configuration file using “Shockwave” lighting effects. This file is currently in-active. Flight Simulator uses the aircraft.cfg file to obtain configuration information for the aircraft, so the Shockwave file must be renamed **AIRCRAFT.CFG** to allow it to become active. The original aircraft.cfg file should be renamed (BEFORE YOU DO ANYTHING), to something like AIRCRAFT.CFGORIGINAL (or some other name), in case you want to use it again.

Standard lighting

Shockwave lighting

A2A Shockwave 3D Redux lights are available for purchase at:
http://www.shockwaveproductions.com/store/shockwavelights/

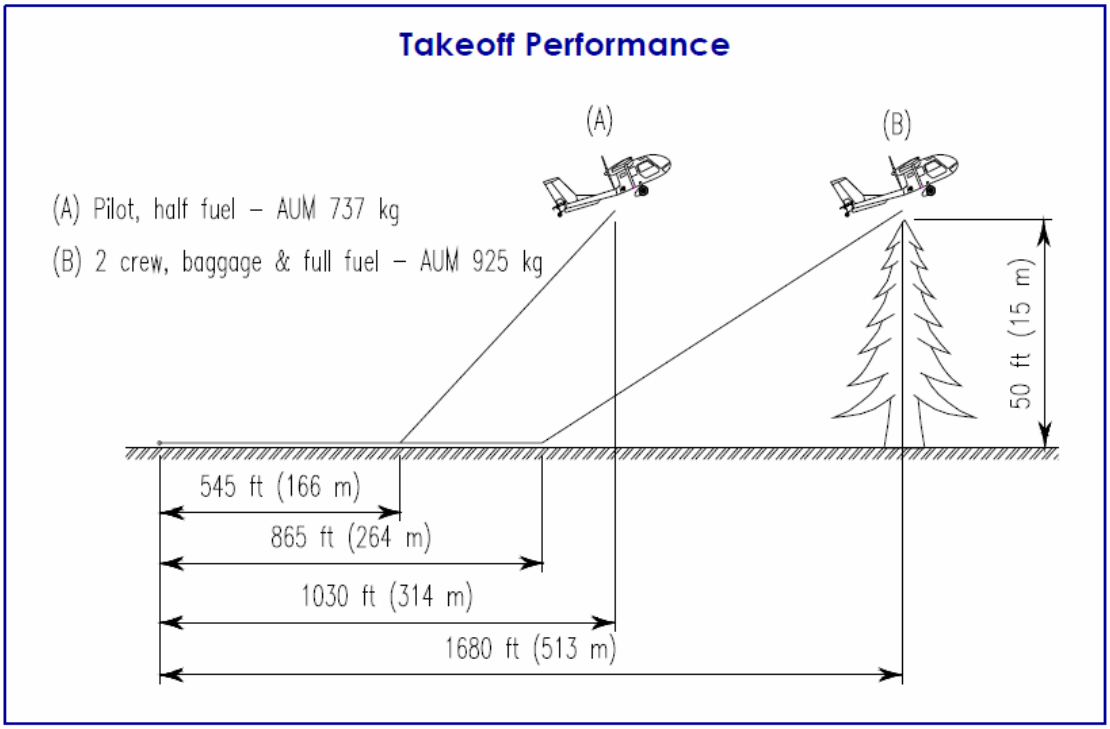
SEABIRD SEEKER SB7L 360A SPECIFICATIONS

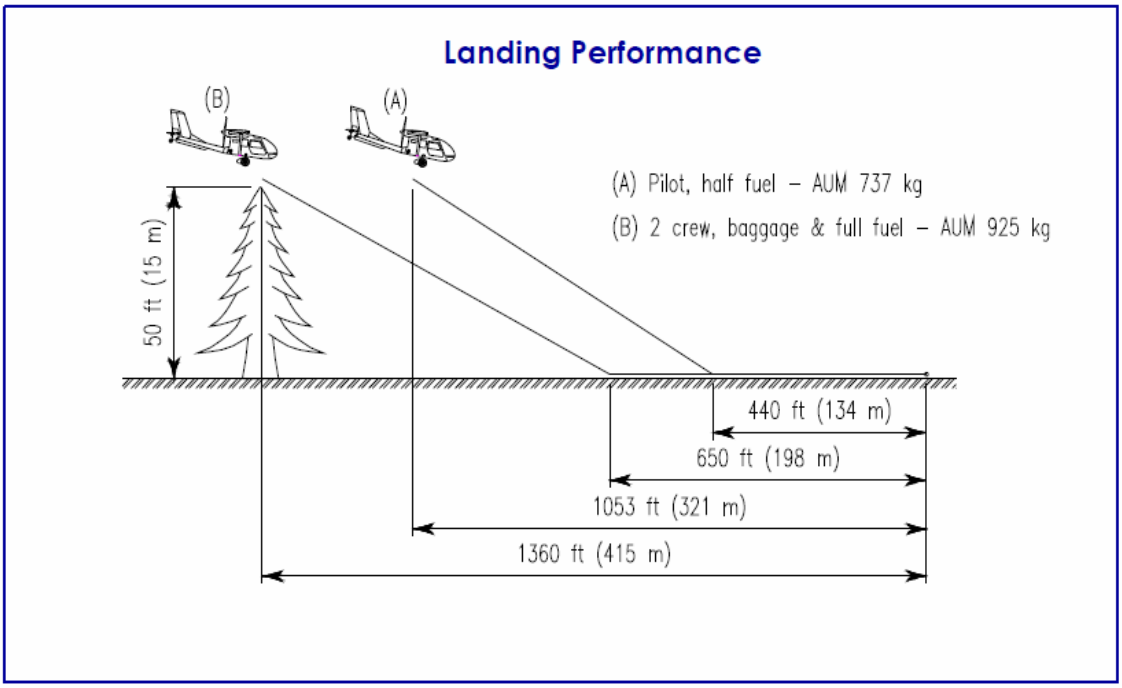
Seeker equipment includes:

* Lycoming 0-360-B2C Engine
* 2- Blade timber-composite propeller
* Sigma-Tek instruments
* Garmin Avionics
* 28V Electrical system, 70A alternator
* Cantilever spring steel main landing gear
* Cleveland wheels and brakes
* Oleo strut tail landing gear
* Scott 8”Steerable tail wheel
* 8.00 x 6.00 low pressure tyres
* Dual primary flight controls
* Dual differential toe-brakes
* Double longitudinally hinged windows and doors
* Baggage/cargo area with tie down points
* 4-point inertia-reel seatbelts
* Wing tip Nav/Strobe lights
* Ground power receptacle
* Floor aperture provision
* Windscreen demister
* Vacuum system (optional)
* Heated pitot tube (optional)

External Dimensions		
Wing Span	11.07 m	36 ft 4 in
Overall Length	7.00 m	23 ft 0 in
Height of Vertical Stabiliser	2.03 m	6 ft 7 in
Wheelbase	2.04 m	6 ft 8 in
Internal Dimensions		
Cabin Width	1.12 m	3 ft 8 in
Doors - Long Axis	1.07 m	3 ft 6 in
Weights		
Empty weight	610kg	1342 lb
Maximum T/O Mass	925 kg	2040 lb
Speeds		
Min Patrol Speed (CAS)	121 km/h	65 kts
Cruise 75% Power (CAS)	208 km/h	112 kts
Never Exceed (CAS)	239 km/h	129 kts
Stall (40° Flap)(IAS)	89 km/h	48 kts
Fuel Capacity		
Usable	180 litres	47.5 US gal
Endurance (inc. reserve)		
Min. Patrol Speed	65 kts	7 h 15 min
Cruise (65% Power)		4 h 30 min

Range		
Patrol Speed (65 kts)	880 km	476 nm
Cruise (65% Power)	869 km	470 nm
Fuel Flow		
Patrol Speed (65 kts)	22 l/h	5.80 US gal/h
Cruise (65% Power)	34 l/h	9.00 US gal/h
Take-off/Landing run at AUW		
T-O run	264 m	870 ft
Landing run	198 m	654 ft
Stressing Limit Load Factor		+3.8 -1.52
Certification		
Certification Basis	FAR 23 up to and including Amdt 34	
Noise Certification	ICAO Annex 16, Volume 1, Chapter 10 FAR Part 36 Appendix G	
Fatigue Analysis	FAR 23 Amendment 38	





Courtesy Seabird Aviation web site: http://www.seabirdaviation.com.au/

ADDITIONAL INCLUSIONS

Included within the Documentation directory are the following files:

Seabird Aviation Seeker SB7L Information Pack (.PDF format)
CASA (Civil Aviation Safety Authority) Type Certificate for the Seabird Seeker SB7L-360 (.PDF format)

CREDITS

The following people and organisations are recognised for their contribution:-

Marty Strong for the original model
Ryan Mason for the Camo paint scheme
Thierry Lustremant for the VH-OPT and VH-SBO paint schemes
“Goober” (name unknown) for the VH-SUA and VH-SEE paint schemes. The VH-SEE was reworked to change the registration from the original JY-SEE.
(Original freeware aircraft available at http://aussiex.org/forum/)

Glen Copeland for the “COM Gold” multi function radio and the Satellite Assisted Landing System (SALS) gauge.

Rob Barendregt for permission to use his taxispeed gauge as a basis for the equivalent gauge used here.

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LEGAL

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