1. BASIC SPECIFICATION LIST

IMPORTANT: Much of the information in this section needs to be filled in upon completion of your aircraft's flight test period. Always refer to the Operational Data Charts in section 6 for flight planning.

Engine	_____
Propeller	_____
Length	17 Feet, 7 Inches
Height	see diagram, next pages
Wing Span	22 Feet
Wing Area	98.0 Square Feet
Wing Loading	_____
Seats	2
Empty Weight	_____
Useful Load (Utility category)	_____
Maximum Useful Load	_____
Payload w/full Fuel & Oil	_____
Max. Gross Weight (Utility Category)	1100 lbs with 80 HP engine 1220 lbs with ≥100 HP engine
Max. Gross Weight (Aerobatic Cat.)	950 lbs
Fuel Capacity (16 Gallons nominal)	_____

Performance

Minimum Runway Required (T.O. Distance @ Gross Weight @ SL)	_____
Rate of Climb @ Gross	_____ fpm @ _____ mph
Maximum Speed	197 mph (CAS)
Cruise @ 75%	_____
Range @ 75% (45 minute reserve)	_____
Duration @ Max. Cruise (No Reserve)	_____
Stall Speed @ Gross (w/Full Flaps)	40 mph (CAS)
Maneuvering Speed (V_A)	125 mph (CAS)
Stress Factors	Utility Category: +4.4 / -2.2 Gs Aerobatic Category: +6 /-3 Gs

4. WEIGHT and BALANCE

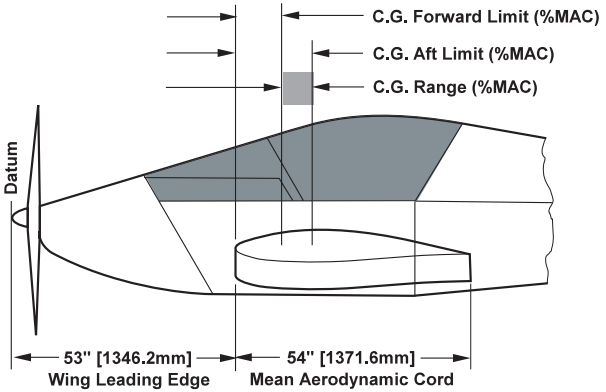
The information on pages 20-25 will help you determine your aircraft's empty weight and center of gravity. The information provided on pages 24-29 will help you determine your aircraft's loaded center of gravity. Sample weight and balance calculations are provided on pages 25.

IMPORTANT: Operating your aircraft at weights or C.G.s outside the designed envelope is dangerous and is not permitted. Operating your Sonex near the edges of its designed envelope (near the fore or aft C.G. limits or near maximum gross weight) must be done with caution.

Allowable Weight and Balance Range

The center of gravity is defined as a percent of the Mean Aerodynamic Cord (MAC). Your Sonex must be operated within the designed center of gravity range of 20% to 32% of the MAC *at all times*. If the center of gravity is outside this range, the aircraft will be dangerous.

ALLOWABLE CENTER OF GRAVITY RANGE



	Utility Category	Aerobatic Category
Maximum Forward C.G.	20% MAC	23% MAC
Maximum Aft C.G.	32% MAC	29% MAC

ALLOWABLE MAXIMUM GROSS WEIGHT

Your Sonex must be operated at or below the following gross weights:

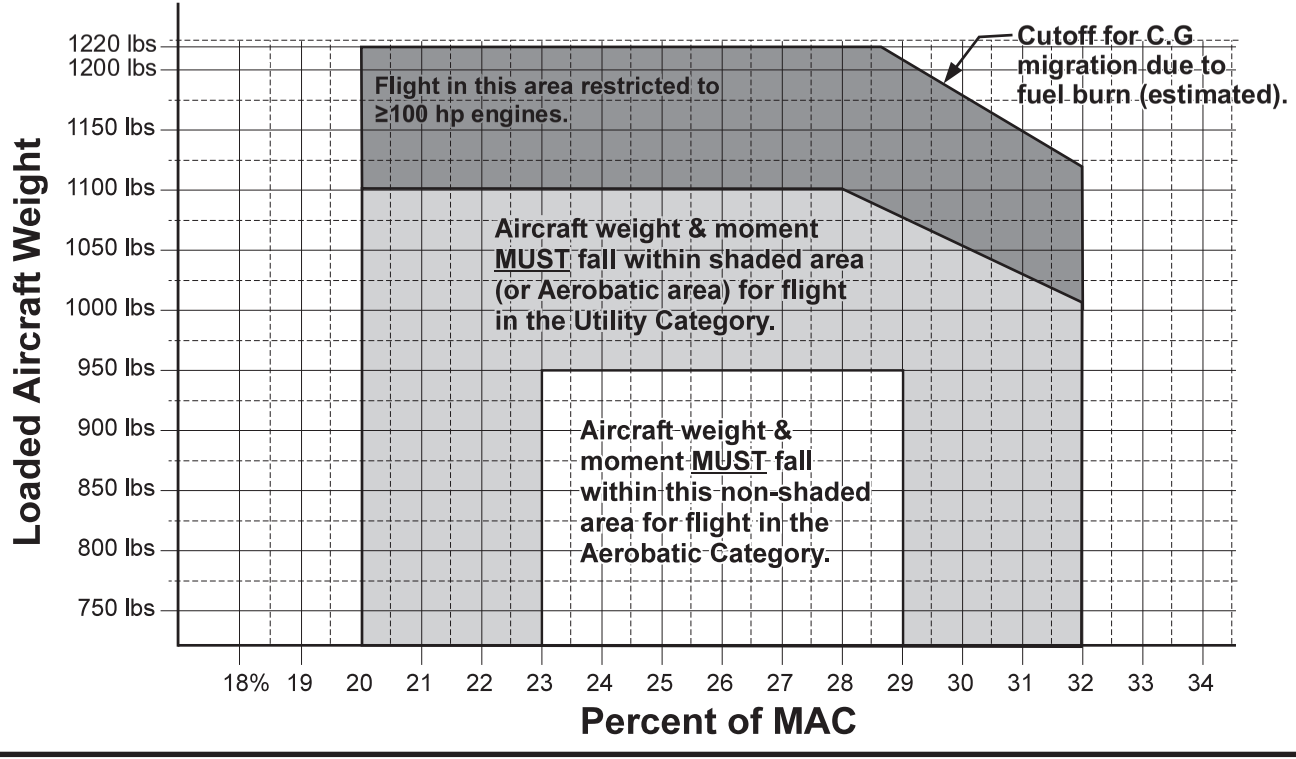
	Utility Category	Aerobatic Category
Max. Gross Weight - 80 hp	1100 lbs	950 lbs
Max. Gross Weight - ≥100 hp	1220 lbs	950 lbs

Calculating Weight and Balance of the Loaded Aircraft

The following steps can be used to determine your aircraft's weight and center of gravity for any loading situation. Sample loading tables are provided on the facing page as well as a blank loading table for you to use in determining your aircraft's weight and balance for any loading situation.

1. Enter your aircraft's empty weight and moment, as calculated and recorded on page 21 or 23, in the loading table on the following page.
2. Calculate the combined weight of the pilot (and parachute, if one is worn) and passenger. Use this weight to determine the pilot and passenger moment from the chart on page 28. Record the total weight and moment in the loading table on the following page.
3. Calculate the fuel weight in the aircraft (full fuel is 96 lbs). Use this weight to determine the fuel moment from the chart on page 26. Record both the fuel weight and moment in the loading table on the following page.
4. Calculate the baggage weight in the aircraft (the maximum baggage allowed is 40 lbs in the utility category 10 lbs in the aerobatic category). Use this weight to determine the baggage moment from the chart on page 27. Record both the baggage weight and moment in the loading table on the following page.
5. Add the empty aircraft, pilot and passenger, fuel, and baggage weights together and record the total in the loading table on the following page. *The total weight must not exceed 1100 lbs. for flight in the Utility Category (1220 lbs with a ≥100hp engine), or 950 lbs for flight in the Aerobatic Category.*
6. Add the empty aircraft, pilot and passenger, fuel, and baggage moments together and record the total in the loading table on the following page.
7. Using the calculated total weight and total moment for the loaded aircraft, verify that the loaded aircraft is within the allowable C.G. envelope by finding the appropriate in-lbs curve (or interpolating between curves) on the chart on page 29 and following that curve until it intersects with the loaded aircraft's weight. The lines must intersect within the intended category for the flight. **Flight outside the intended category is prohibited.**

ALLOWABLE WEIGHT & BALANCE



5. OPERATING LIMITATIONS

Your Sonex or Waiex exceeds the requirements of airworthiness set forth by Sonex, Ltd. as submitted to the FAA.

The airplane is approved for day VFR operation only.

Your aircraft must be operated in accordance with all FAA-approved markings, placards and check lists in the airplane. If there is any contradiction to FAA approved markings, placards, etc., in this section, it is to be disregarded.

Airspeed Limitations

The following calibrated airspeed (CAS) limitations must be observed:

Never Exceed Speed (Vne), smooth air, dive or glide	197 MPH
Maximum Flap Extension Speed	100 MPH
Maximum Structural Cruise (Vc)	136 MPH
Placard Maneuvering Speed (Va)	125 MPH

Maneuvers - Utility Category

When operating in the Utility category, no aerobatic maneuvers - including intentional spins - are permitted. In the Utility category the following gross weight and maximum flight load factors apply:

Gross Weight, 80 hp:	1100 lbs.
Gross Weight, ≥100 hp:	1220 lbs.
Flight Load Factors:	4.4 Gs positive (Max.)
	2.2 Gs negative (Max.)

Maneuvers - Aerobatic Category

When operating the Sonex in the Aerobatic category, no aerobatic maneuvers are approved except those listed below. In the Aerobatic category the following gross weight and flight load factors apply:

Gross Weight:	950 lbs.
Flight Load Factors:	6.0 Gs positive (Max.)
	3.0 Gs negative (Max.)

While executing these maneuvers, do not use abrupt control inputs:

Chandelles	Lazy Eights
Steep Turns	Spins
Loops	Aileron Rolls
Barrel Rolls	Stalls (except whip stalls)

Aerobatics that may impose high loads must not be attempted. Bear in

RATE of CLIMB at GROSS WEIGHT

Elevation and Temperature	Best Rate (Vy)		Best Angle (Vx)	
	IAS MPH	Rate of Climb Ft./Min.	IAS MPH	Rate of Climb Ft./Min.
Sea Level @ 59° F				
2500 Ft. @ 50° F				
5000 Ft. @ 41° F				

1. Gross Weight: 1100 lbs. w/80 hp; 1220 lbs. w/≥100 hp
2. Full Throttle
3. For hot weather, decrease rate of climb 15ft./min. for each 10° F above standard day temperature for the particular altitude.

TAKE-OFF DISTANCE from HARD SURFACE at GROSS WEIGHT

Elevation and Temperature	Head Wind Knots	IAS MPH	Ground Run (Feet)	To Clear 50 Ft. Obs. (Feet)
Sea Level @ 59° F				
2500 Ft. @ 50° F				
5000 Ft. @ 41° F				

1. Gross Weight: 1100 lbs. w/80 hp; 1220 lbs. w/≥100 hp
2. Full Throttle
3. Increase the distance 10% for each 35° F increase in temperature above standard day temperature for the particular altitude.
4. For operation on dry grass runway, increase distances (both ground run and "To Clear 50 Ft. Obs") by 7% of the "To Clear 50 Ft. Obs" figure.
5. Figures for clean, level, hard surface runway.

LANDING DISTANCE - POWER OFF, NO WIND, FULL FLAPS, HARD SURFACE at GROSS

Elevation and Temperature	Approach Speed IAS - MPH	Ground Roll (Feet)	Total to Clear 50 Ft. Obs. (Feet)
Sea Level @ 59° F			
2500 Ft. @ 50° F			
5000 Ft. @ 41° F			

1. Gross Weight: 1100 lbs. w/80 hp; 1220 lbs. w/≥100 hp
2. Decrease the distances shown by 10% for each 4 knots of head wind.
3. Increase the distances shown by 10% for each 60° F increase in temperature above standard day temperature for the particular altitude.
4. For operation on a dry, grass runway, increase distances (both ground run and "To Clear 50 Ft. Obs") by 7% of the "To Clear 50 Ft. Obs" figure.
5. Figures for clean, level, hard surface runway.

MAXIMUM GLIDE at _____ MPH IAS, PROPELLER WINDMILLING, ZERO WIND