Sonex Aircraft, LLC

N604X

Pilot's Operating Handbook

Revision 8
Updated 08/19/2008

Pilot's Operating Handbook

Make:	Shultz
Model:	Sonex
Serial Number:	604
Registration Number:	N604X
Date of Certification:	Sep 27, 2006
First Flight:	Oct 7, 2006

Owner Information

Name:	Jeffrey D. Shultz
Address:	xxxxx xxxxx
Telephone:	xxxxx
Email Address:	xxxxx

Kit Manufacturer:	Sonex Aircraft LLC
Address:	P.O. Box 2521 Oshkosh, WI 54903-2521
Telephone:	920-231-8297

INDEX

Section		PAGE
I	Introduction and Description	3
II	Aircraft Specifications	6
III	Performance	12
IV	Engine Operation	19
V	Weight and Balance	22
VI	Systems	28
VII	Preflight Inspection Checklist	34
VIII	Normal Procedures	37
IX	Emergency Procedures	41
X	Servicing Requirements	43
XI	Equipment List	46
XII	Passenger Disclaimer Form	48
XIII	Revisions List	49

I. Introduction and Description

The Sonex is a high-performance, homebuilt aircraft. Its compact external size and extremely efficient design results in superb performance and unequaled fuel economy using a relatively low horsepower engine. Even though the Sonex has relatively low horsepower, it can outperform many general aviation aircraft while retaining unequaled fuel economy. Typical cruise speed is 130 mph, burning under 4 gallons per hour, yielding fuel economy in excess of 30 miles per gallon.

The structure of the Sonex is almost entirely 6061T6 aluminum, yielding a design that is easy to construct, conventional to maintain, and resistant the effects of weather and corrosion.

The engine that powers the Sonex is an AeroVee 2180 aircraft engine, produced by AeroConversions, Inc. This engine features a forged steel crankshaft, dual spark plugs per cylinder, 4 independent ignition modules, adjustable mixture control, alternator, and electric starter. It is a lightweight, modern, reliable aircraft engine that is user-assembled and easily maintained. The AeroVee is fitted with an AeroCarb, offering superior operation, power, and efficiency in all modes of operation.

Flight Controls

Pitch and roll capability is accomplished by conventional dual control sticks located at each seat. Pitch control is provided by elevators mounted on the horizontal stabilizer. Roll control is accomplished by ailerons on the outboard portion of the main wing. Yaw control is provided by a rudder mounted on the vertical stabilizer, and is actuated by conventional rudder pedals. All flight controls including the flaps are pushrod actuated.

An in-flight cockpit adjustable pitch trim system is provided. A lever mounted on the left cockpit sidewall adjusts a movable control tab mounted on the left elevator half. The trim system is completely independent of the normal pitch control system, thus providing back-up pitch control system in the event of a primary control problem.

The primary pitch control system (i.e. the stick) can override any position of the trim system.

Engine Controls

The throttle, identified with a black handle, is located in the left of the instrument panel. It is a vernier style cable, which can be adjusted quickly by depressing the center button or set very precisely by rotating the handle. A vernier mixture control is located to the right of the throttle, and is identified by a red handle.

Landing Gear

The main landing gear legs are 1 1/8" titanium rod, mounted directly into the engine mount. Due to the mechanical properties of titanium, the Sonex gear is extremely robust, yet forgiving. The titanium gear legs will bend gently under landing loads, then rebound slowly without springing the aircraft back into the air. The tail wheel is mounted to a 5/8" titanium rod. Steering is accomplished through a direct linkage to the rudder, resulting in very accurate and positive directional control while taxiing, and during takeoff and landing.

Brakes

The braking system consists of mechanical drum brakes on each main tire, cable actuated by an aluminum lever in along the left hand cockpit sidewall. A catch bracket serves as a parking brake.

Fuel System

The 17 gallon main fuel tank is located just aft of the firewall above the occupant's legs. Unusable fuel quantity is less than ½ gallon. Fuel is delivered by gravity feed. A fuel shutoff valve is located inside the cockpit at the tank outlet, consisting of a ¼ turn ball valve. The fuel valve is closed by rotating the handle rearward so that it is perpendicular to the valve body. A capacitance fuel probe is

installed to measure fuel quantity. Slight variations in fuel level readings are typical when comparing equal quantities of 100LL and auto fuel. However, the addition of alcohol and/or TCP fuel additive will introduce significant error into the fuel level displayed by the EIS until that fuel has been consumed. Fuel level should be checked while in level, balanced flight to avoid inaccurate fuel quantity measurements. The fuel filler cap is located on the upper forward fuselage, accessible from the outside of the aircraft through the fuel filler door in the cowling. Approved fuels include 92 octane automotive fuel and 100LL aviation fuel.

Engine Cowling

The cowling is split into right and left sections. To remove the cowling, loosen the ¼ turn SouthCo fasteners along the upper firewall. Next, remove the upper and lower piano hinge pins, thereby separating the right and left cowling sections. Lastly, the hinge pins connecting the cowl section to the fuselage may be removed, and the cowling detached from the fuselage.

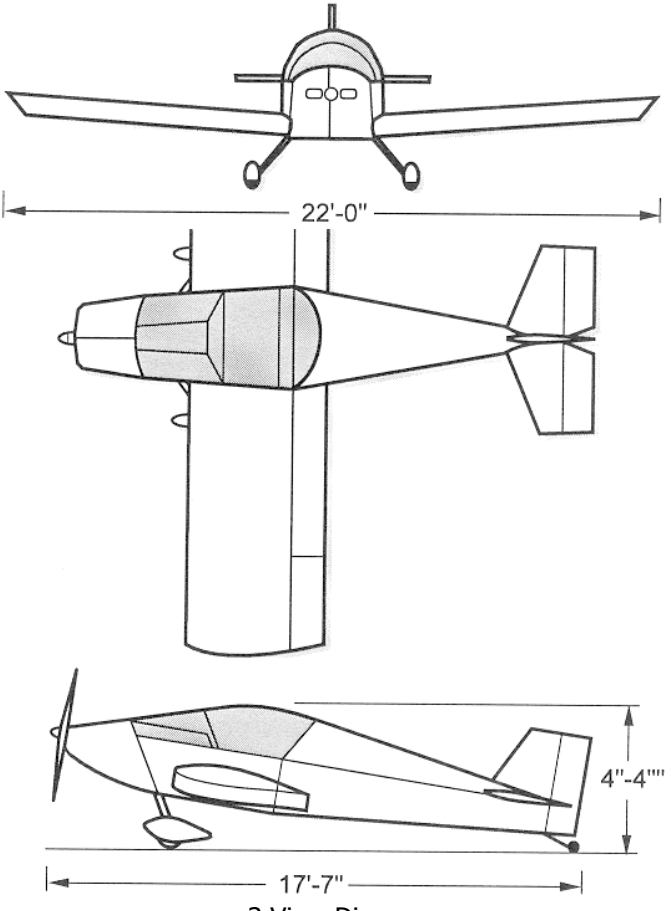
Baggage Compartment

A baggage compartment is provided aft of the occupants' seats. The baggage limit is 40 pounds. Depending on the pilot, passenger, and fuel loads to be carried, baggage may have to be limited to remain within gross weight and/or center-of-gravity (CG) limits.

Ventilation and Heating

NACA scoops on the forward fuselage sides provide fresh air ventilation. These scoops feed into rotating eyeball vents mounted in the corners of the instrument panel. The flow of air can be directed and controlled by adjusting the vent opening. No cabin heat is installed.

II. Aircraft Specifications



3 View Diagram

Exterior Dimensions

Span:	22 ft
Length:	17 ft, 7 in
Height:	4 ft, 4 in
Wing Area:	98 sq ft

Weights

Empty Weight:	648 lbs
Gross Weight:	1200 lbs
Aerobatic Gross Weight:	950 lbs
Useful Load:	552 lbs
Fuel (17 gal):	102 lbs
Full Fuel Payload:	450 lbs
Max Baggage:	40 lbs

CG Limitations

Datum	53" Forward of Wing Leading Edge
Mean Aerodynamic Cord:	54"
Forward CG Limit:	63.8" (20% MAC)
Aft CG Limit:	70.3 " (32% MAC)
Acro CG Limits:	65.4" – 68.7" (23-29% MAC)

Loadings

Wing Loading:	12.2 lb/sq ft
Power Loading:	15 lb/hp
Load Factor Limit	
- 950 lbs	+6.0, -3.0
- 1200 lbs	+4.0, -2.0

Powerplant

Engine:	AeroVee 2180cc, 80 HP
Prop:	Sensenich 55x44 (W54LVG-44G)

Control Surface Deflections

Ailerons	20° up, 12° down
Flaps	0°, 10°, 30°
Rudder	25° right and left
Elevator	25° up, 20° down
Elevator Trim Tab	30° up, 30° down

Engine Information

Specifications

Model:	AeroVee 2180cc VW Conversion
Serial #:	258
Carburetor:	AeroCarb ACV-C03-32mm
Serial #:	5541P
Type:	4 cylinder, 4 stroke, horizontally opposed, normally aspirated
Cooling:	Air-cooled, with external oil cooler
Drive:	Direct drive
Weight (complete, less oil)	168 lbs
Rated HP:	80
Rated RPM:	3400
Maximum RPM:	4000
Cruise RPM:	3000 +/- 200
Idle RPM:	1000-1200
Bore:	92mm
Stroke:	82mm
Compression Ratio:	7.5:1
Firing Order:	1-4-3-2
Valve Gap Adjustment:	.006-.008"
Alternator:	10 amp

Ignition

Timing:	Fixed @ 28° BTDC	
Ignition Module Gap:	.010 - .014"	
Spark Plugs:	Autolite MP4163	
Plug Gap:	Top: .018"	Bottom: .032"
Ignition System: "Right" Setting		
- Upper Magnetron	Top Front Plugs	
- Lower Magnetron	Top Rear Plugs	
Ignition System: "Left" Setting		
- Right Ignition Coil	Bottom Front Plugs	

- Left Ignition Coil	Bottom Rear Plugs

Fuel

Approved Fuel Grades:	92 octane Auto fuel 100LL Avgas
Total Fuel Capacity:	17 Gallons
Usable Fuel:	Approximately 16.8 Gallons

Lubricant

CAUTION
Do not use Aviation Lubricant!

The oil passages in the AeroVee engine are quite small, and unsuitable for the larger molecular size of aviation oil.

Use only brand name multi-grade oil marked "SL" or "SJ" in accordance with the API system.

Type:	SAE 20W-50 (or 15W-50 Synthetic)
Oil Sump Capacity:	2 ¾ Quarts
Oil Cooler Capacity:	½ Quart
Minimum Safe Quantity:	2 ¼ Quarts

Operating Conditions

Cylinder Head Temp:	330-380° F desired, 450° F max
Exhaust Gas Temp:	1200-1350° F desired, 1400° F max

Oil Temp:	160° F min, 230° F max
Oil Pressure (psi):	20 min, 100 max, 30-40 cruise
Fuel Pressure (psi):	1 psi min, 4 psi max

Airspeed Limitations

	Speed	IAS	Remarks
V_{NE}	Never Exceed Speed	**197 MPH**	Do not exceed this speed in any operations
V_{NO}	Maximum Structural Cruising Speed	**125 MPH**	Exceed this speed only in smooth air
V_A	Maneuvering Speed	**125 MPH**	Do not make full control movements above this speed. Full elevator deflection will result in a 6 G load at this speed
V_{FE}	Maximum Flap Extended Speed	**100 MPH**	Do not exceed this speed with flaps down
V_y	Best Rate of Climb	**70 MPH**	
V_x	Best Angle of Climb	**65 MPH**	
V_S	Stall Speed Clean	**46 MPH**	Significant Instrument Error exists at low speeds
V_{SO}	Stall Speed Landing Configuration	**40 MPH**	Significant Instrument Error exists at low speeds

Airspeed Indicator Markings

Marking	Value / Range	Significance
White Arc	**40–100 MPH**	Full Flap Operating Range. Lower limit is VSO. Upper Limit is maximum speed with flaps extended.

Green Arc	**46–125 MPH**	Normal Operating Range. Lower limit is VS. Upper limit is maximum structural cruising speed.
Yellow Arc	**125–197 MPH**	Operations must be conducted with caution and only in smooth air.
Red Line	**197 MPH**	Maximum speed for all operations.

Maneuvers – Aerobatic Category

When operating in the aerobatic category (950 lbs gross weight), the following maneuvers with recommended entry speeds are approved:

Stalls (except whip stalls)	
Spins	
Chandelles	80 – 110 mph
Lazy Eights	80 – 125 mph
Wing Over	90 – 110 mph
Loops, Horizontal Eights	110 – 125 mph
Aileron Rolls, Barrel Rolls	100 – 125 mph
Hammerhead	80 – 125 mph
Split S	75 – 85 mph

While executing these maneuvers, do not use abrupt control inputs. Aerobatics that may impose high loads must not be attempted. Bear in mind that the airplane is clean in aerodynamic design and will build speed quickly with the nose down. Proper speed control is essential for execution of any maneuver, and care must be exercised to avoid excess speed, which in turn can impose excessive loads.

Inverted Flight

Flight at negative "G" conditions is to be avoided due to lack of inverted fuel and oil systems.

Required Placards

The following placards must be in full view of passengers:

1. WARNING THIS AIRCRAFT IS AMATEUR BUILT AND MAY NOT COMPLY WITH FEDERAL AIRWORTHINESS STANDARDS

2. EXPERIMENTAL

III. Performance

Speed	**950 lbs**	**1200 lbs**
Top Speed:	150 mph	140 mph
Cruise: 75% power @ 8000 ft	140 mph	130 mph
Cruise: 55% power @ 8000 ft	125 mph	120 mph
Stall Speed:	40 mph	42 mph

Ground Performance	**950 lbs**	**1200 lbs**
Takeoff Distance:	550 ft	1000 ft
Landing Distance:	450 ft	850 ft

Climb / Ceiling	**950 lbs**	**1200 lbs**
Rate of Climb:	800 fpm	500 fpm
Ceiling:	12,500 ft	10,500 ft

Endurance	
Fuel Quantity:	16.8 gallons
Fuel Consumption: 100%	5.75 gph
Fuel Consumption: 75%	4.25 gph
Fuel Consumption: 55%	3.1 gph
Range: 75% @ 4000 ft	500 sm
Range: 55% @ 8000 ft	695 sm

Note: Performance values are stated at Sea Level, Standard Temperature and Pressure, unless otherwise noted.

CRUISE PERFORMANCE
(Full Fuel 17 Gal)

Altitude (Feet)	RPM	% BHP	TAS (MPH)	Fuel Flow (GPH)	Endurance (Hours)	Range (Miles)
S.L.	3300	100	130	5.7	2.8	365
	3200	87	125	5.0	3.2	403
	3100	77	120	4.4	3.6	437
	3000	70	115	4.0	4.0	461
	2900	60	110	3.4	4.7	515
	2800	55	105	3.1	5.1	536
4000	3300	87	140	5.0	3.2	452
	3200	76	135	4.3	3.7	501
	3100	67	130	3.8	4.2	545
	3000	61	124	3.5	4.6	572
	2900	52	119	3.0	5.4	640
	2800	48	113	2.7	5.9	663
8000	3300	77	151	4.4	3.6	550
	3200	67	145	3.8	4.2	608
	3100	59	139	3.4	4.7	658
	3000	54	133	3.1	5.2	693
	2900	46	128	2.6	6.1	778

	2800	42	122	2.4	6.6	809

1. Maximum Cruise is normally limited to 75% power.
2. Endurance and Range are for **No-Wind**, **No Reserve** conditions.
3. Figures do not include take off, landing, or reserve.
4. Cruise RPM for AeroVee is 2800-3200 RPM.

TIME, DISTANCE, & FUEL TO CLIMB

Weight (lbs)	DA (Feet)	Climb Speed (MPH)	ROC (FPM)	From Sea Level		
				Time (Min)	Fuel (Gal)	Distance (Miles)
950	S.L.	80	620	0	0	0
	1000	80	585	2	0.2	2
	2000	80	550	3	0.3	5
	3000	80	515	5	0.5	7
	4000	79	480	7	0.7	11
	5000	79	445	9	0.9	14
	6000	78	410	12	1.1	17
	7000	77	375	14	1.3	21
	8000	76	335	17	1.6	26
	9000	75	300	20	1.9	31
	10000	75	265	24	2.2	36
1200	S.L.	80	495	0	0	0
	1000	80	460	2	0.2	3
	2000	80	425	4	0.4	6
	3000	80	390	7	0.6	10
	4000	79	355	10	0.9	14
	5000	79	315	12	1.1	18

	6000	78	285	16	1.4	23
	7000	77	250	20	1.8	29
	8000	76	210	24	2.2	36
	9000	75	175	29	2.7	44
	10000	75	140	35	3.2	54

TAKE OFF DISTANCE

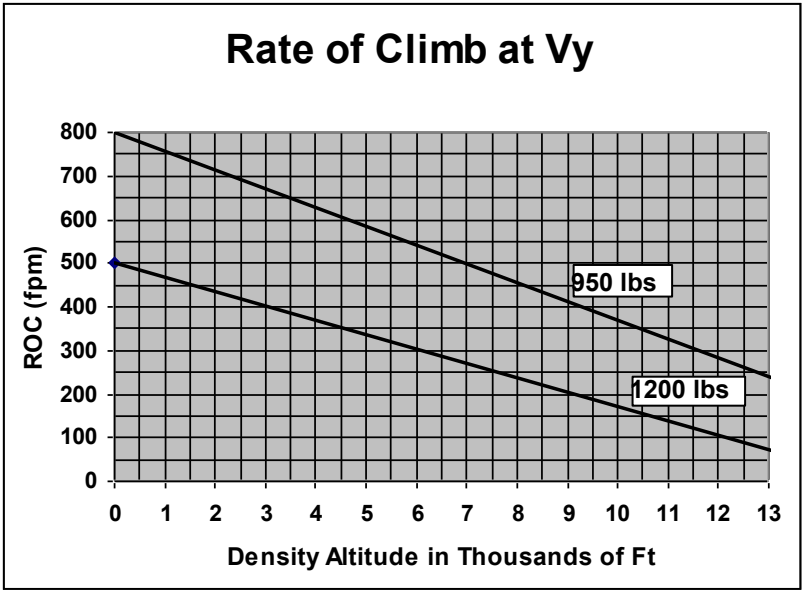
Elevation and Temperature	950 lbs		1200 lbs	
	Ground Run (Feet)	Over 50-ft Obstacle (Feet)	Ground Run (Feet)	Over 50-ft Obstacle (Feet)
Sea Level @ 59° F	550	1020	1000	1715
2500 ft @ 50° F	670	1385	1190	2150
5000 ft @ 41° F	780	1735	1430	2860
8000 ft @ 30° F	950	3815	1650	7380

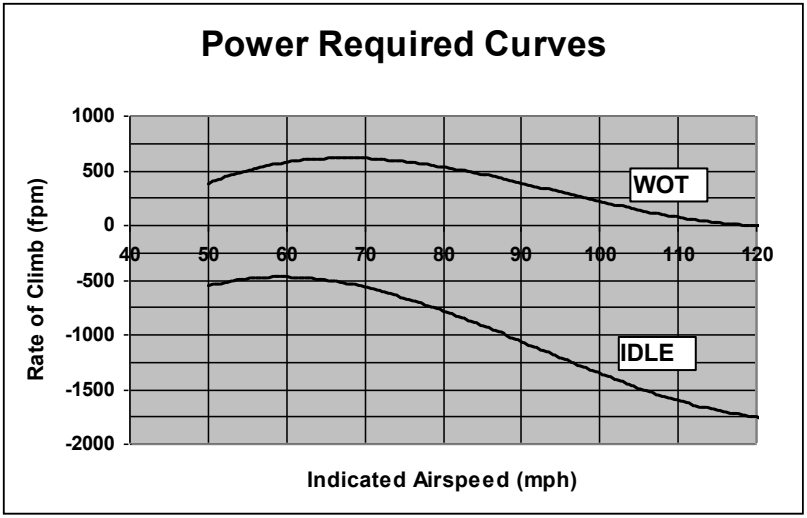
1. Figures for clean, level, hard surface runway.
2. Increase distance 10% for each 35° F increase in temperature above standard day temperature.
3. Increase distance by 10% for dry grass runway, 25% for wet grass.

LANDING DISTANCE

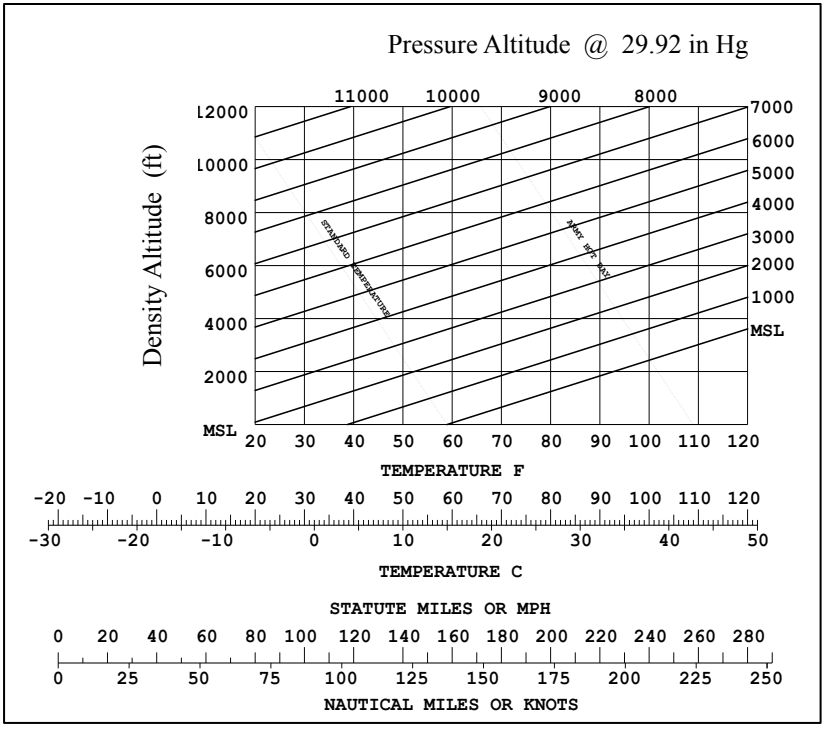
Elevation and Temperature	950 lbs		1200 lbs	
	Ground Run (Feet)	Over 50-ft Obstacle (Feet)	Ground Run (Feet)	Over 50-ft Obstacle (Feet)
Sea Level @ 59° F	450	1045	650	1245
2500 ft @ 50° F	500	1095	705	1300
5000 ft @ 41° F	550	1145	765	1360
8000 ft @ 30° F	600	1195	830	1425

1. Figures for full flap, no wind conditions, on clean, level, hard surface runway.
2. Decrease distance by 30% for each 10 mph of head wind.
3. Increase distance by 50% for each 10 mph of tail wind.
4. Increase distance 10% for each 35° F increase in temperature above standard day temperature.
5. Increase distance by 10% for dry grass runway.

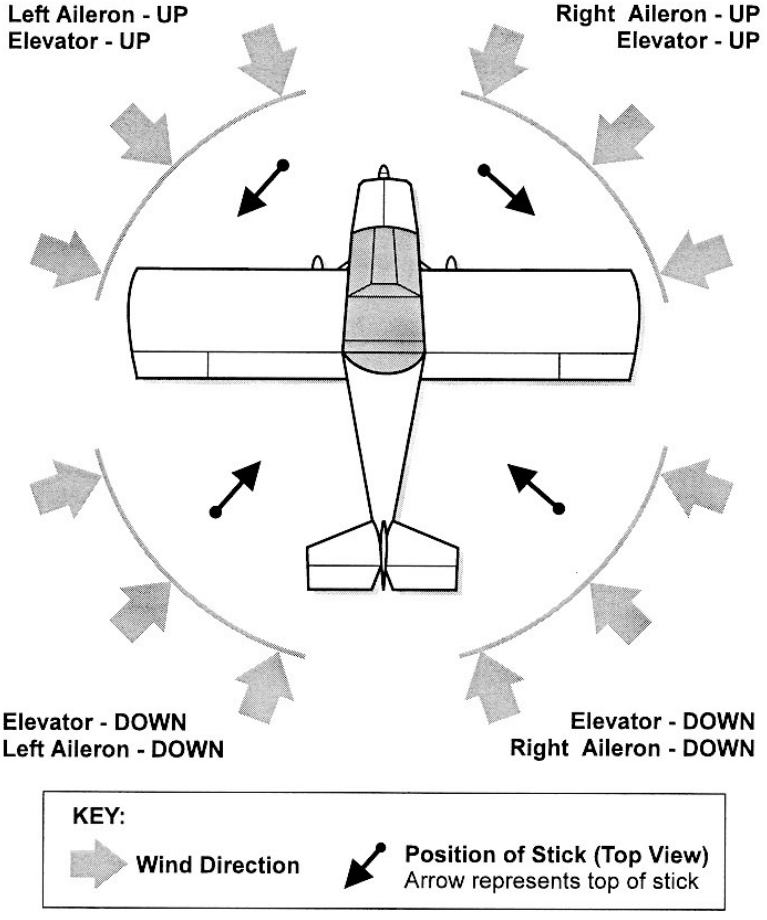

Rate of Climb at Vy
ROC (fpm)
800
700
600
500
400
300
200
100
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13
Density Altitude in Thousands of Ft
950 lbs
1200 lbs


Power Required Curves
1000
500
0
-500
-1000
-1500
-2000
Rate of Climb (fpm)
40
50
60
70
80
90
100
110
120
Indicated Airspeed (mph)
WOT
IDLE

Estimating Density Altitude



CONTROL POSITIONS while TAXIING



IV. Engine Operation

The AeroVee engine is equipped with an AeroCarb float-less carburetor. The AeroCarb is not altitude compensating, but is designed with an in-flight mixture adjustment control. The ability to lean the engine in flight allows the pilot to configure the engine for peak performance. Generally, Exhaust Gas Temperature (EGT) is used as an indication of mixture setting. All references to engine EGT are typically to the hottest cylinder(s). Due to the design of the induction system, the rear cylinders typically run 100º-150º hotter (thus leaner) than the front cylinders.

Taxi

The design of the AeroCarb inherently results in a relatively rich mixture setting at low rpm. It is recommended to "aggressively lean" at low rpm to reduce spark plug fouling and carbon buildup inside the engine. Aggressively leaning is defined as leaning to the point where any additional leaning or increased throttle movement will cause the engine to sputter from lack of fuel. Aggressive leaning created a fail-safe situation where it is impossible to attempt a takeoff with a partially leaned mixture. Should a takeoff be attempted while aggressively leaned, the engine will sputter and instantly remind the pilot of the leaned mixture.

Take Off and Climb

Takeoffs should generally be conducted at full throttle, using the full rich setting. This allows the full required fuel flow to reach the engine, and is important to achieving full power as well as proper cooling. When the AeroCarb is properly adjusted, takeoff EGTs should be approximately 1250-1350º Fahrenheit. Under certain conditions, including high Density Altitude or very hot outside air conditions, it may be desirable or necessary to lean for takeoff. The recommended procedure is to lean the engine while on the ground so that full throttle EGTs are between 1250º -1350º, or until the

engine runs smoothly. Temperatures should be monitored throughout the takeoff roll and initial climb out, and the mixture adjusted as needed to remain within limits.

Cruise

Cruise flight is typically conducted at 3000-3200 rpm, however, this may vary with DA and temperature. Significant reductions in fuel flow can be achieved by properly leaning the engine during cruise flight. Additionally, proper leaning in cruise helps reduce carbon buildup inside the engine and prolong engine life.

Prior to leaning for cruise, the engine should be allowed to stabilize in rpm and temperature for a few minutes. Once stabilized, the engine should be leaned according to the following procedures, with minor modifications as needed to keep the engine running smoothly and within temperature limits. The engine may be operated in the following 3 modes: Rich of Peak, whereby more fuel is consumed for the sake of cooler temperatures, near peak, producing maximum power, but at greater heat and strain on the engine, or Lean of Peak, resulting in the lowest fuel flow. Peak EGT is approximately 1425º - 1480º Fahrenheit. When operating Lean of Peak, EGTs will peak, then fall somewhat. The engine will not be damaged as long as CHTs are stable and within limits (380º Fahrenheit or less).

Rich of Peak (ROP): 1275º -1325º EGT

When leaning to ROP, the recommended procedure is to gradually move the mixture lever while watching EGT readings, stopping at the desired setting.

Peak Power: 1350º -1375º

Gradually reduce the mixture setting until EGTs on the hottest cylinders reach 1350º -1375º. Continue to monitor CHTs to

ensure they remain within limits. This setting will generally produce the best power.

Lean of Peak (LOP): 1375º -1420º EGT

For LOP operation, it is preferable to lean quickly and drastically to reduce the time spent at peak EGT settings. This can be described as "the big mixture pull", whereby the mixture knob is pulled out 1"-1.5" over the course of 5-10 seconds, while observing EGTs. Due to imbalances in the induction system, it may not always be possible to lean all 4 cylinders to LOP operation without causing engine roughness and/or vibration. If roughness occurs, richen the mixture slightly until the engine runs smooth again. Continue to monitor CHT to ensure they remain within limits. In some cases, the front cylinders may be running near peak EGT while the rear are LOP. This poses no problem as long as the CHTs are stable and within limits. If a suitable setting cannot be found, it may be necessary to richen the mixture enough to return to ROP operation on all cylinders to control CHTs.

Maximum Engine Stress: 1380º -1480º EGT

The engine is under maximum stress when EGTs are approximately 50º -100º rich of peak. This generally corresponds to EGTs of approximately 1380º -1480º. High power settings should be avoided in this mixture range.

Descent

Descent may be initiated by simply reducing the throttle to the desired rpm, while leaving the mixture setting leaned as in cruise. This will help prevent cooling the engine excessively during the descent and low power operation. Prior to resuming application of cruise power setting, as in entering the traffic pattern, the mixture

should be adjusted or richened accordingly. In the event of a touch-and-go landing, or go-around, the mixture should be returned to the takeoff setting (full rich, or leaned as appropriate) before advancing the throttle to full.

V. Weight and Balance

Weight and Balance Report

Jeffrey Shultz
14405 Howard Lane
Dixon, MO 65459

Make: Shultz **Model: Sonex** **Serial #: 604** **Registration #: N604X**

Datum: Front Tip of Spinner
Aircraft Leveled by placing bubble level on top fuselage longitudinal at cabin

Maximum Gross Weight: 1200 lbs
Maximum Acro Weight: 950 lbs

Forward CG Limit **63.8"** (20% MAC)
Aft CG Limit: **70.3"** (32% MAC)
Acro CG Limits: **65.4"-68.7"** (23-29% MAC)

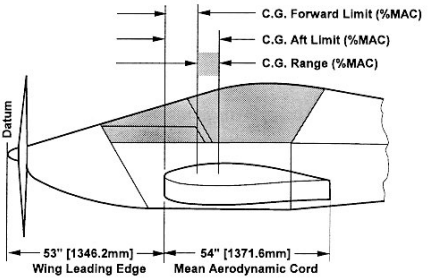
EMPTY WEIGHT			**Wt. X Arm**
Weighing Point	**Weight (lbs)**	**Arm (in)**	**Moment**
Right Main	313	55.7	17434.1
Left Main	292	55.7	16264.4
Tail Wheel	43	216.3	9300.9
Equipment added or removed after weighing aircraft:			
			0.0
			0.0
			0.0
TOTAL	648		42999.4
MOMENT / WEIGHT = EMPTY WEIGHT CG (in)			**66.4**

Installed Equipment
Comm Radio
ELT
EIS 4000

	MOST ADVERSE FORWARD CG		
Item	**Weight (lbs)**	**Arm (in)**	**Moment**
Aircraft Empty	648	66.4	42999.4
Pilot	170	76.9	13073.0
Passenger	0	76.9	0.0
Fuel	96	45.8	4392.0
Baggage (max 40 lbs)	0	102.0	0.0
TOTAL	914		60464.4
MOMENT/WEIGHT		Most Foreword CG	**66.2**
		% MAC:	24.4
		Limit:	63.8

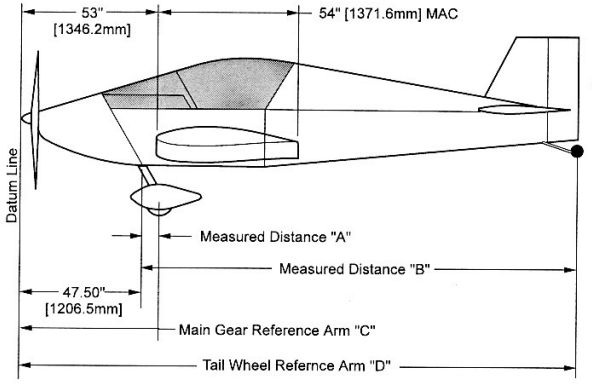
MOST ADVERSE AFT CG		
Weight (lbs)	**Arm (in)**	**Moment**
648	66.4	42999.4
170	76.9	13073.0
215	76.9	16533.5
0	45.8	0.0
0	102.0	0.0
1033		72605.9
	Most Aft CG	**70.3**
	% MAC:	32.0
	Limit:	70.3

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

ARM DIAGRAM - CONVENTIONAL GEAR



Datum = Tip of Spinner

Measured Distance "A" = 8.0”

Measured Distance "B" = 167.5”

Main Gear Reference Arm "C" = 47.50" [1206.5mm] + "A" = 55.5”

Tail Wheel Reference Arm "D" = 47.50" [1206.5mm] + "B" = 215.0”

Right Hand Main Gear Weight = 313 lbs

Left Hand Main Gear Weight = 292 lbs

Tail Wheel Weight = 43 lbs

Blank Weight and Balance Worksheet

The following table can be used to determine the aircraft's weight and center of gravity for any loading situation. Complete the weight column in the table below using the fuel, baggage, and pilot/ passenger weights for the situation being considered. Next, using the moment charts on the following pages, record the appropriate moments into the table. Use the Total Weight and Total Moment from the table to find the aircraft's loaded center of gravity using the Allowable Weight and Balance chart.

Weight x Arm = Moment

Item	**Weight** (lbs)	**Arm** (inch)	**Moment** (in-lbs)
Aircraft, Empty	648	66.4	43,000
Fuel		45.8	
Pilot & Passenger		76.9	
Baggage		102.0	
Total		---	

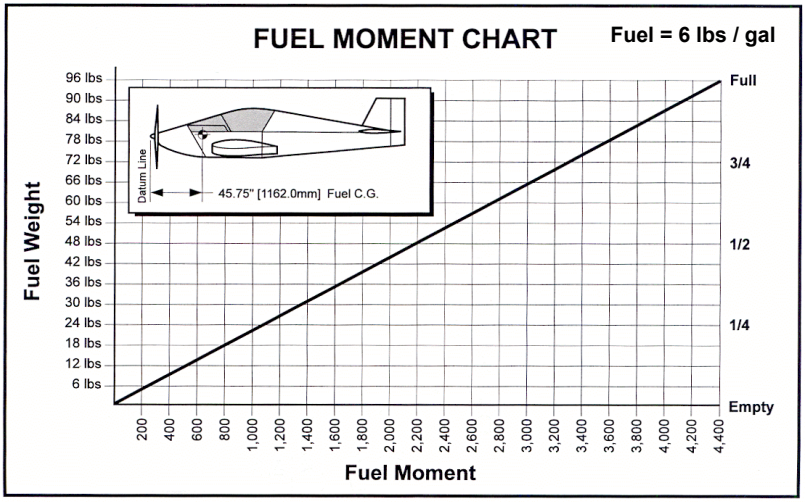
$$\text{CG (inch)} = \frac{\text{Total Moment}}{\text{Total Weight}} = \frac{\quad}{\quad}$$

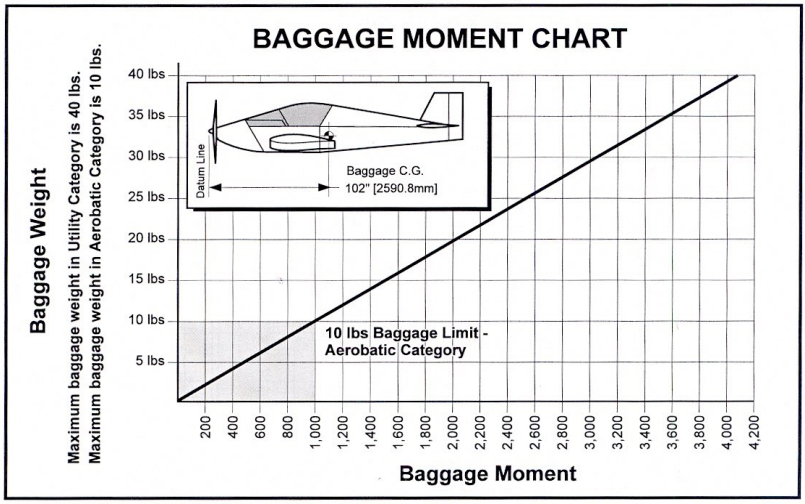
CG (inch) = _____

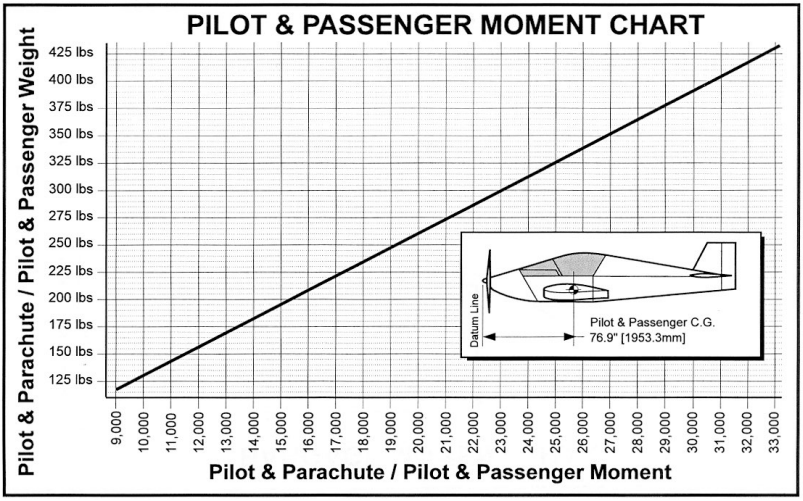
Safe to Fly? YES ☐ / NO ☐

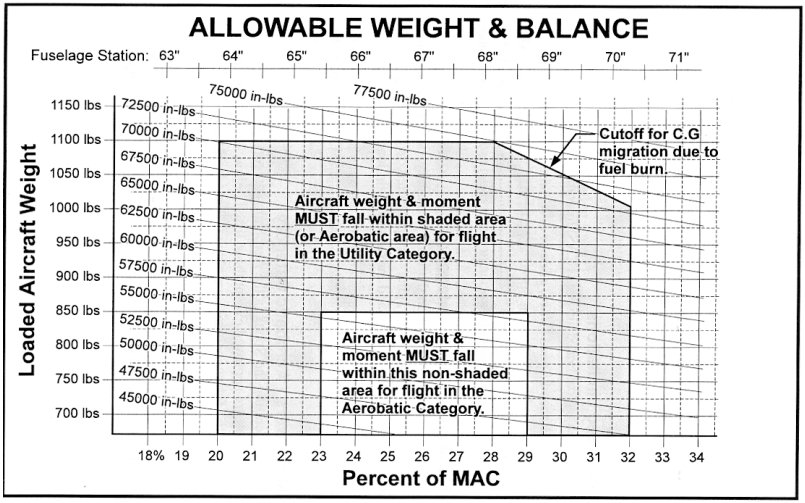
Note: Pitch stability is significantly reduced at C.G. conditions aft of 69.9". Exercise caution when operating from 70.0" – 70.3".

Moments


FUEL MOMENT CHART
Fuel = 6 lbs / gal
Fuel Weight
96 lbs
90 lbs
84 lbs
78 lbs
72 lbs
66 lbs
60 lbs
54 lbs
48 lbs
42 lbs
36 lbs
30 lbs
24 lbs
18 lbs
12 lbs
6 lbs
Datum Line
45.75" [1162.0mm] Fuel C.G.
Full
3/4
1/2
1/4
Empty
200
400
600
800
1,000
1,200
1,400
1,600
1,800
2,000
2,200
2,400
2,600
2,800
3,000
3,200
3,400
3,600
3,800
4,000
4,200
4,400
Fuel Moment

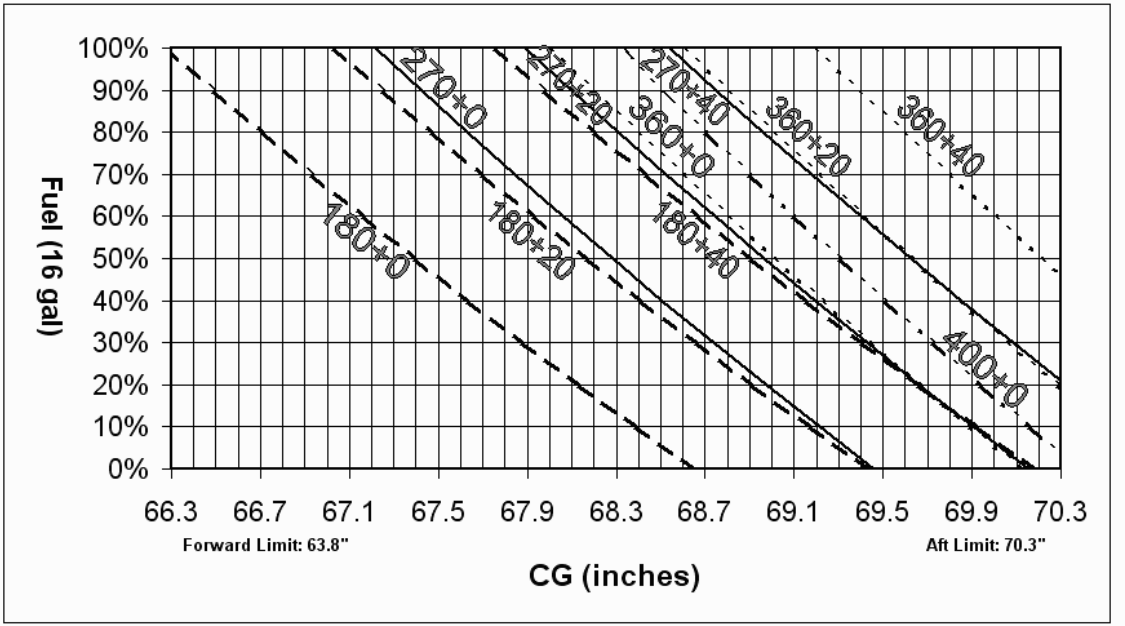

BAGGAGE MOMENT CHART
Baggage Weight
Maximum baggage weight in Utility Category is 40 lbs.
Maximum baggage weight in Aerobatic Category is 10 lbs.
40 lbs
35 lbs
30 lbs
25 lbs
20 lbs
15 lbs
10 lbs
5 lbs
Datum Line
Baggage C.G.
102" [2590.8mm]
10 lbs Baggage Limit -
Aerobatic Category
200
400
600
800
1,000
1,200
1,400
1,600
1,800
2,000
2,200
2,400
2,600
2,800
3,000
3,200
3,400
3,600
3,800
4,000
4,200
Baggage Moment


PILOT & PASSENGER MOMENT CHART
Pilot & Parachute / Pilot & Passenger Weight
425 lbs
400 lbs
375 lbs
350 lbs
325 lbs
300 lbs
275 lbs
250 lbs
225 lbs
200 lbs
175 lbs
150 lbs
125 lbs
9,000
10,000
11,000
12,000
13,000
14,000
15,000
16,000
17,000
18,000
19,000
20,000
21,000
22,000
23,000
24,000
25,000
26,000
27,000
28,000
29,000
30,000
31,000
32,000
33,000
Pilot & Parachute / Pilot & Passenger Moment
Datum Line
Pilot & Passenger C.G.
76.9" [1953.3mm]


ALLOWABLE WEIGHT & BALANCE
Fuselage Station: 63" 64" 65" 66" 67" 68" 69" 70" 71"
Loaded Aircraft Weight
1150 lbs
1100 lbs
1050 lbs
1000 lbs
950 lbs
900 lbs
850 lbs
800 lbs
750 lbs
700 lbs
72500 in-lbs
70000 in-lbs
67500 in-lbs
65000 in-lbs
62500 in-lbs
60000 in-lbs
57500 in-lbs
55000 in-lbs
52500 in-lbs
50000 in-lbs
47500 in-lbs
45000 in-lbs
75000 in-lbs
77500 in-lbs
Cutoff for C.G migration due to fuel burn.
Aircraft weight & moment MUST fall within shaded area (or Aerobatic area) for flight in the Utility Category.
Aircraft weight & moment MUST fall within this non-shaded area for flight in the Aerobatic Category.
18% 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34
Percent of MAC

Fuel Burn Diagram

Note: Under certain loading conditions (i.e. Occupant Weight of 360+ lbs), ballast (unusable) fuel must be carried in the fuel tank to keep the center of gravity from exceeding the aft limit before the end of the flight.


100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Fuel (16 gal)
270+0
270+20
270+40
360+0
360+20
360+40
180+0
180+20
180+40
400+0
66.3
66.7
67.1
67.5
67.9
68.3
68.7
69.1
69.5
69.9
70.3
Forward Limit: 63.8"
Aft Limit: 70.3"
CG (inches)
Occupants (lbs) + Baggage (lbs)

VI. Systems

Engine Information System (EIS)

The EIS integrates all engine and flight data into a single instrument. Information is displayed in a series of "Pages", each providing the pilot specific information. Two user configurable pages allow for custom displays. Unused display pages can be disabled for convenience. All monitored parameters have limits established by the user. When a parameter exceeds the set limit, the EIS warning light illuminates and the display flashes the out-of-limit parameter.

Display Pages

Page 0	Disabled	Fuel Flow
Page 1	Disabled	User Defined 1
Page 2		User Defined 2
Page 3	Disabled	EGT / CHT Bar Graph
Page 4	Disabled	EGT Cruise Bar Graph
Page 5		Exhaust Gas Temperature
Page 6		Digital Leaning
Page 7		Cruise Monitor
Page 8		Cylinder Head Temperature
Page 9		Altimeter, Vertical Speed Indicator, Airspeed
Page 10		Flight Timer, Engine Hours
Page 11	Disabled	Tachometer, Oil Temperature, Oil Pressure
Page 12	Disabled	Auxiliary Inputs 1-3
Page 13	Disabled	Auxiliary Inputs 3-6
Page 14		Outside Air Temperature, Voltmeter
Page 15	Disabled	CHT Rate-of-Cooling, EGT Span, Carb Temp

EIS Buttons

The user navigates through the pages and configuration menus by pressing buttons or combinations of buttons.

Button Label	Button #	Effect
Next/Ack	1	Go to Next Page
Next/Ack	1	Acknowledge Alarm
Display (Hold)	3	Temporarily Replaces Numeric Data with Labels for easy ID
Display (Twice)	3	Return to Home Page
Set Limits	1 &2	Set Configuration & Limits
Save Lean Point	2 + 3	Store Current EGT for Leaning Reference
Page Configuration	2 + 3 (Hold)	Modify Display of Pages

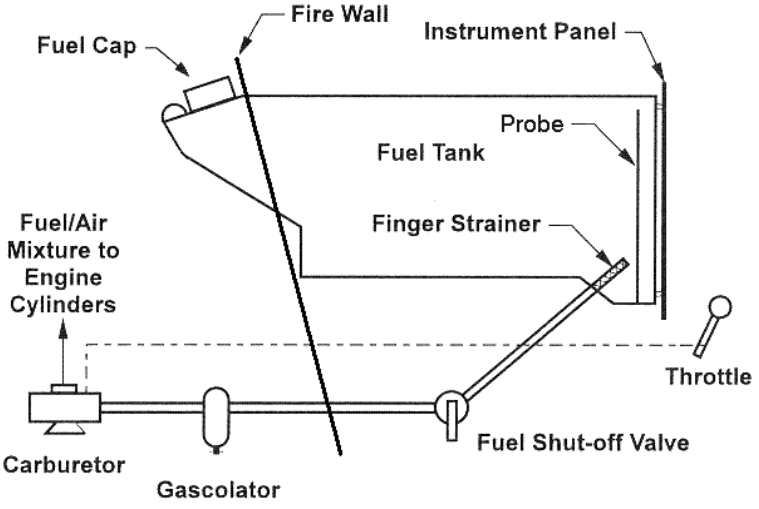
Leaning

The EIS is capable of accurately and precisely tracking EGT readings. This feature is very helpful in leaning the engine during cruise flight. The following leaning procedure takes full advantage of the built-in digital leaning function.

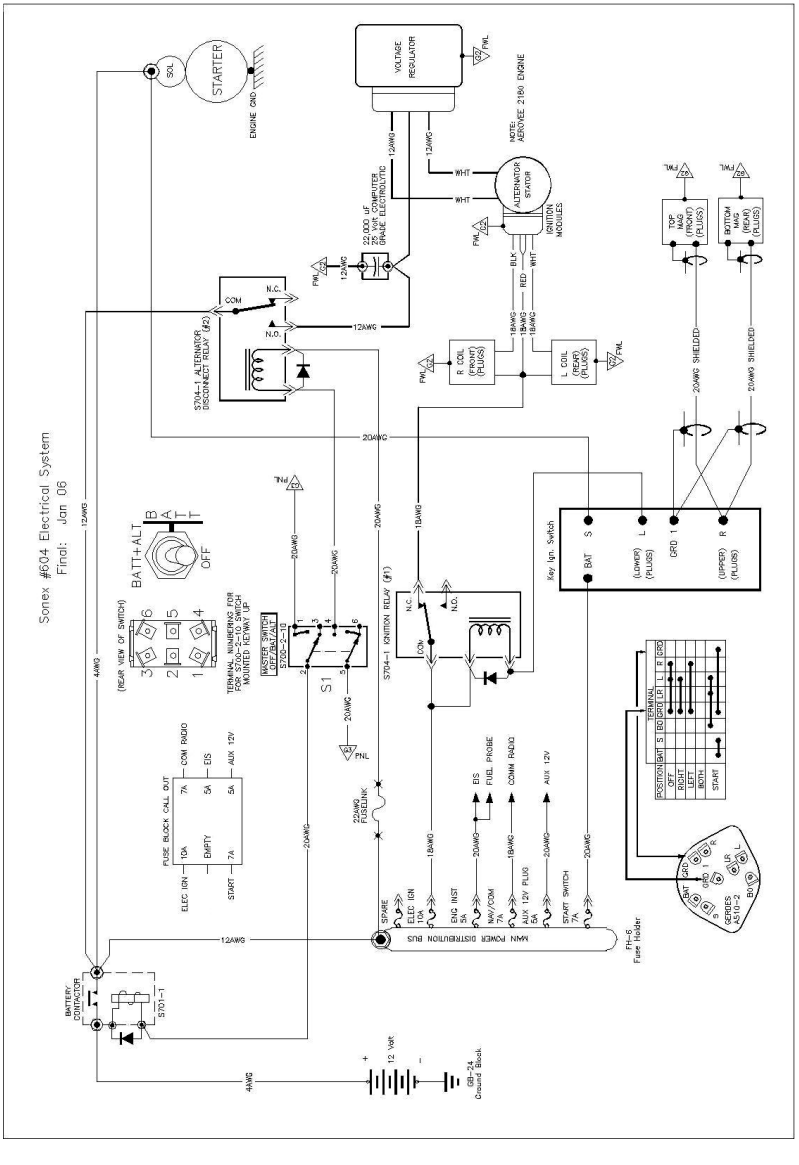
Leaning Procedure

1. Establish Cruise Configuration
2. Select the Digital Leaning Page ("L" in lower right corner)
3. Press "SAVE LEAN POINT" (Buttons 2 & 3)
4. Select "RESET"
5. Slowly Lean Engine
6. After First-to-Peak, enrich to 50 degrees rich of peak (negative 50 displayed)
7. Press "SAVE LEAN POINT" (Buttons 2 & 3)
8. Select "YES"
9. EGT are now referenced from saved Lean Point temps on the Cruise Monitor (CZ) Page

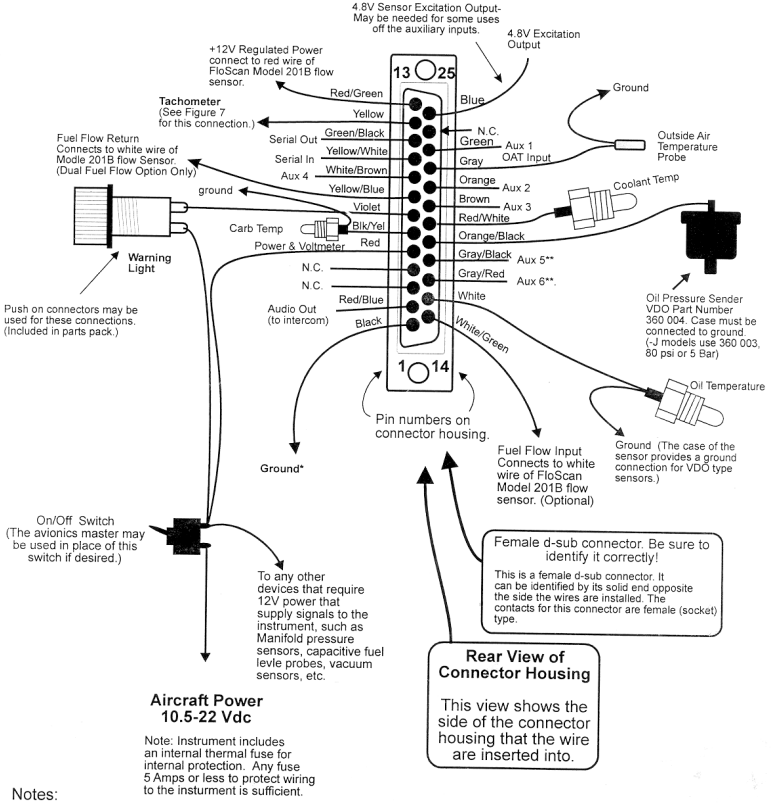
Fuel System Diagram



Electrical System Diagram


Sonex #604 Electrical System
Final: Jan 06
STARTER
VOLTAGE REGULATOR
ENGINE GND
NOTE: AEROMEE 2180 ENGINE
ALTERNATOR STATOR
IGNITION MODULES
22 OHM, 1/2 WATT, 255 VOLT BRAKE ELECTROLYTIC
S704-1 ALTERNATOR DISCONNECT RELAY (#2)
BATT+ALT
OFF
(REAR VIEW OF SWITCH)
TERMINAL NUMBERING FOR PROCESS CUT SWITCH MOUNTED KEYWAY UP
MASTER SWITCH OFF/BAT/ALT S700-2-10
S1
S704-1 IGNITION RELAY (#1)
Key Ign. Switch
R COIL (FRONT) (PLUGS)
L COIL (REAR) (PLUGS)
TOP MAG (FRONT) (PLUGS)
BOTTOM MAG (REAR) (PLUGS)
20AWG SHIELDED
FUSE BLOCK CALL OUT
ELEC IGN
EMPTY
START
COMM RADIO
EIS
AUX 12V
20AWG FUSELINK
SPARE
ELEC IGN
ENG INST
MAG/COM
AUX 12V PLUG
START SWITCH
KAWN POWER DISTRIBUTION BUS
FH-6 Fuse Holder
TERMINAL BLOCK
POSITION
OFF
RIGHT
LEFT
BOTH
START
SERIES AS10-2
BATTERY CONTACTOR
S701-1
12 Volt
GB-24 Dreamt Block

EIS 4000: Connector A Wiring



Notes:

* See the "Installation" section, "Wiring" sub-section of the manual for notes regarding proper grounding.

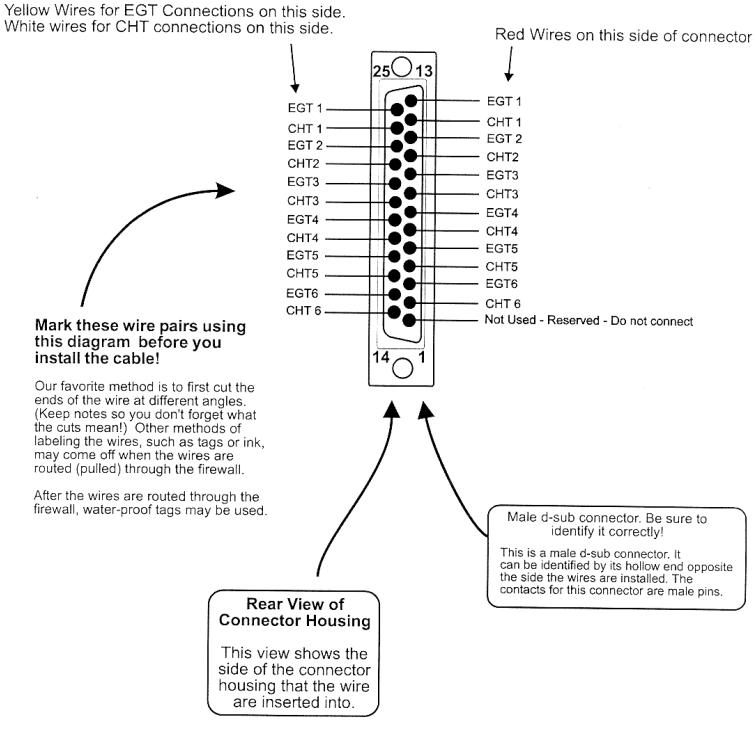
The Serial input, and Audio Output are reserved for future growth. Leave these unconnected at this time.

The Serial Output should be left unconnected. Do not wire to these inputs. They are reserved for future growth.

**Aux5 and Aux6 apply only to instruments with software versions xxx46, or instrument labeled as 6 Aux Inputs. For all others, these inputs should be unconnected.

N/C indicates no connection: Left unconnected or not used.

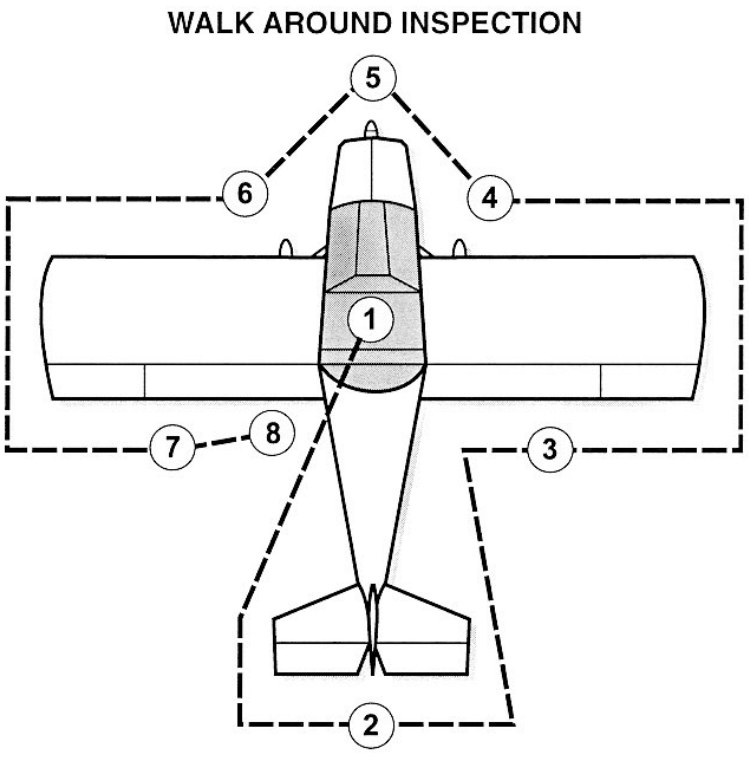
EIS 4000: Connector B Wiring



Notes:

Type K thermocouple extension wire must be used for EGT connections, and type J thermocouple wire must be used for CHT connections when the External Cold-Junction input is not used.
For Model 4000 versions, EGT5, EGT6, CHT5 & CHT6 are not used.

VII. Pre-Flight Inspection / Checklist



1. CABIN

- AROW
- Aeronautical Charts – **CURRENT & APPROPRIATE**
- Seat Belt Securing Control Stick - **RELEASE**
- Ignition Switch – **OFF**
- Battery – Alternator Switch – **"BAT"**
- Fuel Gauge (EIS) – **CHECK** quantity
- Flight Instruments – **SET** – Analog + EIS Altimeter
- Flaps – **DOWN**
- Battery – Alternator Switch – **"OFF"**

- ➢ Fuel Handle – **ON** (forward/parallel) for fuel sump

2. EMPENNAGE

- ➢ Control Surfaces – **CHECK** for movement & security
- ➢ Empennage Fairing – **CHECK** for security
- ➢ Elevator Trim – **CHECK** for movement & security
- ➢ Rudder Cables – **CHECK** for security
- ➢ Tail Tie-Down – **REMOVE**
- ➢ Tail Wheel – **CHECK** for condition
- ➢ Tail Wheel Pushrod – **CHECK** for security

3. RIGHT WING

- ➢ Aileron – **CHECK** for movement & security
- ➢ Flap – **CHECK** for security

4. RIGHT FRONT

- ➢ Wing Tie-Down – **REMOVE**
- ➢ Wheel Chock – **REMOVE**
- ➢ Main Wheel Tire – **CHECK** for proper inflation
- ➢ Gear Leg Fairing – **CHECK** for security

5. NOSE

- ➢ Engine Oil Level – **CHECK** – 2 quarts minimum
- ➢ Propeller & Spinner – **CHECK** for nicks & security
- ➢ Cowl Fasteners & Hinge Pins – **CHECK** for security
- ➢ Cooling Inlets – **CHECK** for obstructions
- ➢ Fuel Tank – **CHECK** visually for quantity
- ➢ Fuel Tank Cap – **CHECK** for security
- ➢ Fuel Tank Vent – **CHECK** for obstruction
- ➢ Gascolator Sump – **DRAIN** sump 4 seconds
- ➢ Exhaust – **CHECK** for security

6. LEFT FRONT

- ➢ Wing Tie-Down – **REMOVE**
- ➢ Wheel Chock – **REMOVE**
- ➢ Pitot/Static Tube – **REMOVE** cover – **CHECK** for obstruction
- ➢ Main Wheel Tire – **CHECK** for proper inflation
- ➢ Gear Leg Fairing – **CHECK** for security

7. LEFT WING

- ➢ Aileron – **CHECK** for movement & security
- ➢ Flap – **CHECK** for security

8. COCKPIT

- ➢ Canopy – **CHECK** for condition
- ➢ Canopy Latch – **CHECK** for operation and security
- ➢ Fuel Handle – **CHECK** off (back/perpendicular) for starting

VIII. Normal Procedures

BEFORE STARTING ENGINE

- Preflight Inspection – **COMPLETE**
- Passenger Briefing – **COMPLETE**
- Seat Belts & Shoulder Harnesses – **ADJUST & LOCK**

STARTING ENGINE

- Fuel Shutoff Valve – **ON**
- Battery – Alternator Switch – **"BAT"**
- Throttle – **"CRACKED" OPEN** approx. ¼"
- Flaps – **UP**
- Mixture – Push **RICH;** Wait 2-3 seconds to prime
- Brakes – **ENGAGED** to "park"
- Propeller Area – **CLEAR**
- Ignition Switch – **"START"**
- EIS – **CHECK** for alerts
- Oil Pressure – **CHECK**
- Battery – Alternator Switch – **"ALT"**
- Throttle – **1600 RPM** for engine warm up

BEFORE TAKE-OFF

- Fuel Shutoff Valve – **ON**
- Flight Controls – **FREE & CORRECT**
- Elevator Tim – **SET TO MIDDLE**
- Elevator Trim – **NEUTRAL**
- Throttle – 2**000 RPM**
- Engine Run-up – **CHECK MAGS** – 100 RPM drop on each
- Mixture – **FULL RICH** (forward)
- Engine Instruments – **CHECK**
- Throttle – **1000 RPM**
- Flight Instruments – **SET**
- Radio – **SET**
- Seat Belts – **ADJUST & SECURED**

- Canopy – **CLOSED & LATCHED**

NORMAL TAKE-OFF

- Brakes – **HOLD**
- Throttle – **FULL "OPEN"**
- Brakes – **RELEASE**
- Elevator – slightly tail high
- Engine RPM – **3100 RPM** minimum
- Climb Speed – **70-80 MPH**

MAXIMUM PERFORMANCE TAKE-OFF

- Throttle – **FULL "OPEN"**
- Elevator – **LIFT TAIL**
- Airspeed – **ROTATE** at 60 MPH*
  * 65 MPH with 2 people on board
- Engine RPM – **3100 RPM** minimum
- Climb Speed – **70 MPH** (Vx)

CRUISE CLIMB

- Airspeed – **100-110 MPH**
- Throttle – **3300 RMP** or full throttle
- Mixture – **LEAN** for best power
- Engine Instruments – **MONITOR** Temperatures

CRUISE

- Throttle – **3000 RPM**
- Trim – **ADJUST**
- Mixture – **LEAN** to 50° F rich of peak

BEFORE LANDING

- Mixture – **FULL RICH**
- Airspeed – **REDUCE** to 100 MPH or less
- Flaps – **AS DESIRED**
- Airspeed – **70 MPH***
- Throttle – **AS NEEDED** to maintain 70 MPH*

  * 78 MPH with 2 people on board

BALKED LANDING (GO AROUND)

- Throttle – **FULL OPEN**
- Flaps – **RETRACT** slowly
- Climb Speed - **75 MPH**
- Climb out and reenter traffic pattern

NORMAL LANDING (3-POINT LANDING)

- Throttle – **CLOSED**
- Flaps – **AS NEEDED**
- Touchdown – Full stall with stick full back
- Landing Roll – Maintain straight line down runway
- Brakes – Minimum required

WHEEL LANDING

- Throttle – **AS NEEDED** to maintain 60 MPH
- Touchdown – Main wheels first
- Landing Roll – Stick back slowly, lower tail gently
- Brakes – Minimum required

AFTER LANDING

- ➢ Flaps – **UP**
- ➢ Taxi – At slow walking speed, observe other traffic

ENGINE SHUTDOWN

- ➢ Throttle – **1000 RPM** for engine cool down
- ➢ BAT/ALT Switch – **"BAT"**
- ➢ MAGS – **CHECK** for cut-off
- ➢ Mixture – **IDLE CUT-OFF** (pulled full out)

After Engine Stops

- ➢ MAGS – **"OFF"**
- ➢ Fuel Shutoff Valve – **"OFF"**
- ➢ BAT/ALT Switch – **"OFF"**

Note: Failure to close fuel shutoff valve may result in fuel flowing from the AeroCarb after shut-down.

SECURE AIRCRAFT

- ➢ Brakes – **ENGAGED** to "park" as required
- ➢ Master & MAG Switches – **CHECK OFF**
- ➢ Fuel Shutoff Valve – **CHECK "OFF"**
- ➢ Throttle – **FULL CLOSED**
- ➢ Mixture – **IDLE CUT-OFF** (pulled full out)
- ➢ Cockpit – **CLEAN & SECURE**
- ➢ Seat Belt – **SECURED** around control stick
- ➢ Canopy – **LATCHED AND LOCKED**
- ➢ Pitot Tube – **INSTALL COVER** as required

- Wheel Chocks – **INSTALL** as required
- Wing & Tail Tie-Downs – **INSTALL** as required

IX. EMERGENCY PROCEDURES

POWER LOSS ON TAKEOFF

- Stick – **FORWARD**
- Airspeed – **70 MPH**
- Throttle – **CLOSE**
- Mixture – **IDLE CUT-OFF**
- Fuel Valve – **OFF**
- Master & MAG Switches – **OFF**
- Flaps – **AS REQUIRED**
- Land and/or Stop Straight Ahead
- Brakes – **AS REQUIRED**

POWER LOSS IN FLIGHT

- **TRIM FOR BEST GLIDE – 70 MPH**
- Note Wind Direction & Velocity
- PICK A LANDING SPOT
- Mixture – **FULL RICH**
- Fuel Valve – **ON**
- MAGS – **ON**
- Master – **ON**
- Engine – **CHECK EIS**

If Power Not Restored & Time Permits

- Maintain Best Glide – **70 MPH**
- Radio – **121.5** – CALL MAYDAY
- Mixture – **IDLE CUT-OFF**
- Fuel Selector – **OFF**
- Master – **OFF**

- Flaps – **AS NEEDED**
- Canopy – **UNLATCH**
- Seat Belts & Shoulder Harnesses – **PULLED TIGHT**
- Land Tail Low

ROUGH ENGINE

- Mixture – **ADJUST**
- Fuel Selector – **ON**
- MAGS – **CYCLE SWITCHES**
- Run On Best Settings
- Locate Suitable Landing Site & Land ASAP
- Prepare For Off Field Landing If Necessary

OIL PRESSURE LOSS

- Locate Suitable Landing Site & Land ASAP
- Prepare For Off Field Landing If Necessary

HIGH OIL TEMPURATURE

- Reduce Power
- Increase Airspeed
- Observe Trend

If Oil Temperature Cannot Be Stabilized

- Locate Suitable Landing Site & Land ASAP
- Prepare For Off Field Landing If Necessary

ENGINE FIRE DURING START-UP

- Throttle – **FULLY OPEN**
- Starter – **CRANK**
- Mixture – **IDLE CUT-OFF**
- Fuel Selector – **OFF**
- Master and MAG Switches – **OFF**

ENGINE FIRE IN FLIGHT

- Throttle – **CLOSED**
- Mixture – **IDLE CUT-OFF**
- Fuel Selector – **ON**
- Master & MAG Switches – **OFF**

➢ Locate Suitable Landing Site & Land ASAP

X. SERVICING REQUIREMENTS

Exterior Care

N604X is painted with Loehle Aero Coatings urethane paint system. The exterior coat is Loehle urethane clear coat. The paint may be washed with mild soap and waxed with automotive waxes as desired.

Windshield and Canopy Care

The windshield and canopy are standard plexiglas acrylic. Care must be taken to keep the plexiglas clean and unscratched. Flush away grit with water to prevent scratching, then wash with water with mild detergent or commercial plexiglas cleaner, such as Novus or Plexus. Never use benzene, gasoline, alcohol, acetone, carbon tetrachloride, lacquer thinner or glass cleaner to clean plastic. These materials will damage the plastic and may cause severe crazing.

Brakes

N604X uses Azusa mechanical drum brakes, and machined aftermarket drums, purchased through Sonex Aircraft. The brake pads are integral to the unit, and can only be removed through disassembly. Pads should be checked for wear annually. Normal brake pad life is estimated at 500 hours.

Propeller

The Sensenich propeller is a composite coated, laminated wood propeller. It is extremely durable, and resistant to corrosion and damage. Re-torque propeller bolts every 50 flight hours, every 6 months, or with drastic seasonal changes. Proper torque is 145 inch-lbs, +/-15 inch lbs. Place the propeller in a horizontal position when not in use. Routine cleaning can be accomplished with mild detergents.

Tires

Nankang/Shin 11-400x5 6-ply tires and tubes are used. Tires should be replaced when the remaining tread depth reaches 1/16". Inflate tires to a pressure of 50 PSI. Use of higher tire pressures is not recommended due to loss of shock absorption and increased wear of the tires. Clean and repack the main wheel bearings after the first 100 hours, then every 200 hours thereafter.

Battery

The Odyssey PC625 battery is a high performance, sealed lead-acid 12 volt battery. It is rated at 16 amp-hours, and 625 cranking amps for 5 seconds. Under normal conditions, no servicing or maintenance is required. The battery cable terminals, lugs, and wires should be inspected annually for security and corrosion.

Fuel and Oil Requirements

The AeroVee engine is rated for 92 Octane Automotive fuel, including up to 10% ethanol. Aviation grade 100LL fuel may also be used, and may be combined with auto fuel in any proportion. Addition of TCP lead scavenger fuel additive is recommended when using 100LL fuel for extended periods of time, and will help prevent lead buildup inside the engine. Auto fuel, especially fuel containing alcohol, is

susceptible to vapor lock in warm climates. Blending auto fuel with 25%-50% 100LL will greatly reduce the potential for vapor lock and/or detonation from insufficient octant rating, and is a recommended practice for ambient temperatures greater than 90º.

Automotive 20W-50 multi-grade oil (Pennzoil or Castrol GTX) is used year round, although fully synthetic (Mobile 1 15W-50) or synthetic blends may be substituted for added protection. Lighter weight oils may be used in colder climates if hard starting occurs. In very cold temperatures (<20 F), 10W-30 multi-grade oil may be substituted. Engine pre-heat is recommended when temperature is below 40º Fahrenheit to save unnecessary wear and tear. Oil change is recommended every 25 to 30 hours of operation, or every 4 months. No oil filter is used on the AeroVee engine.

The aircraft is equipped with a fuel gascolator attached to the lower right side of the firewall. Inside the gascolator is a fine-mesh wire screen designed to filter out debris and contaminants. This screen should be inspected and cleaned every 100 hours, or annually. Replace screen as needed.

Spark Plugs

Spark plugs (Autolite MP4163) should be cleaned, tested, and re-gaped every 100 hours, or annually. Ensure CHT probe ring terminals are properly placed between the plug body and the sealing crush washer, not between the washer and the head. Apply anti-seize lubricant and re-torque plugs to 240 in-lbs. Using 100LL avgas may result in lead deposits forming on the plug electrodes. Replace plugs as needed, or every 200 hours.

Carburetor Air Filter

Replace the carburetor air filter every 50 hours, or as needed. To remove the air filter, remove the engine cowl and unscrew the retaining bolt on the filter housing. Replacement filter elements are available from Sonex Aircraft (PN ACV-C10-33). Alternately, a K&N high performance filter (PN E-3120) may be directly substituted.

XI. Equipment List

Updated September 29, 2006

Engine:	**AeroVee 2180** SN: 258
Starter:	**Sky-Tech** Model: 122-12AV SN: A2X-140524
Oil Cooler:	**B&M Supercooler** Model: 15K GVW Jegs PN: 130-70265
Carburetor:	**AeroCarb** Model: ACV-C03 SN: 5541P
Air Filter:	**K&N** Model: E-3120
Propeller:	**Sensenich 55x44** Model: W54LVG-44G SN: AG-1605
Battery:	**Odyssey PC625** Catalogue Number: 0768-0001
ELT:	**AmeriKing – AK-450 ELT**
Air-Oil Separator:	**Aircraft Spruce Oil Breather** PN: 10570

Airspeed Indicator: **UMA**

UMA 3-1/8 ASI, 40-200MPH
Aircraft Spruce PN: 10-01029

Altimeter: **Falcon**

Falcon Sensitive Altimeter
Barometric Pressure Correction
20,000 ft, Inches, 3 1/8”
Model: ALT20INF-3
SN: 05010008

Compass: **Danforth Quest**

Low Profile Dome
Model: C100

Comm: **Narco 11A**

Fuel Probe: **Princeton Electronics**

Capacitance Fuel Probe
Model: FL-PE-05

Engine Info System: **Grand Rapids Technologies**

Model: 4000
SN:
SW Version:

Parameter	HI	LO
Oil Pressure psi	80 psi	20
Oil Temp	220F	160F
Voltage	14.0	12.4
Fuel Qty	----	3 gal
RPM	3600	----
EGT	1400	----
CHT	430	----

Tach EMP setting 5

XII. Passenger Disclaimer Form

[To be read and signed by all passengers before flight]

I, _____ acknowledge having been informed that:

1. The Sonex aircraft, N604X, is an Experimental aircraft; Airworthiness of this aircraft cannot be certified. However, but maintained by the owner to the best of his knowledge and ability.

2. The aircraft is for recreational use only, and may not be operated for remuneration. Passengers are taken as an act of friendship and courtesy, and at their own risks.

3. Risks are inherent to experimental aircraft operation.

I hereby:

4. Indemnify the owner/operator and his next of kin for any loss or damage occurred during operation.

5. Declare that I have not made any financial arrangement with the owner/operator with regards to payment of the flight, except for voluntary sharing of the aircraft operating cost, which is limited to fuel cost and airport fees.

Made at_____, this _____ day of _____

_____

[Signed]

XII. Revisions List

Rev #	Description	Date
1	Revised W&B	17 Dec 06
2	Revised Electrical System Diagram	20 Jan 07
3	Added EIS 400 Connector Diagrams	22 Apr 07
4	Revised Service Requirements, Equipment List (added EIS settings), and minor formatting changes	22 Sep 07
5	EIS description and functions added to Systems section, revised performance section, adjusted desired CHT & EGT temps, added approved 15W-50 synthetic oil, updated approved fuel and grade, and minor formatting changes; Aerobatic Gross weight adjusted to 950 lbs as per Sonex LLC.	04 Jan 08
6	Updated Performance Graphs	26 Mar 08
7	Added Section IV: Engine Operation; revised performance figures	03 May 08
8	Updated "time, Distance, and Fuel to Climb" performance table.	19 Aug 08

Notes

Notes

Notes