

GlaStar N640DJ



PILOT'S OPERATING HANDBOOK

AND

AIRPLANE FLIGHT MANUAL

Airplane Serial No: 5682

Airplane Registration No: N640DJ

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Section 1

General

Introduction

This Handbook is designed as an operating guide for the pilot of the **Experimental Homebuilt GlaStar Aircraft #5682, registered as N640DJ**.

It is not designed to be a substitute for adequate and competent flight instruction, knowledge of required directives or federal air regulations and advisory circulars. It should not be used for any other aircraft.

The handbook is divided into numbered sections and organized to what is considered a priority sequence for information that may be required while in flight. (*Tabs should be installed on the 1st page of each section for quick reference*)

This aircraft has a Subaru auto engine that has been converted by Jan Eggenfellner and has his designed gear box and other innovations that make it a reliable, economic, smooth running engine. It is an electric dependent engine and therefore has two batteries and the wiring that provides for safe operation which will be described in this manual.

1.1 Engine

| | | |
|------------------------|--------------------------------------|--------|
| A. Number of Engines | 1 | |
| B. Engine Manufacturer | Subaru converted by Jan Eggenfellner | |
| C. Engine Model Number | EJ25 SOHC Phase II | |
| | From 1999 Legacy Subaru | |
| D. Rated Horsepower | 165 | |
| E. Rated Speed (RPM) | 5600 | |
| F. Bore | 99.6mm | 3.917" |
| G. Stroke | 79.0mm | 3.110" |
| H. Displacement | 2.457L | 150" |
| I. Compression Ratio | 10.0 | |

J. Engine Type Four Cylinder, Gear Drive
Opposed, Water Cooled
Fuel Injected, Computer
Controlled

1.2 Propeller

A. Number of Propellers 1
B. Propeller Mfg. Quinti Hub with
Warp Drive Blades
C. Number of Blades 3
D. Diameter 75"
E. Pitch Electric Adjustable
(15 degrees)
F. Type Warp Drive Carbon Fiber

1.3 Fuel

A. Total Fuel Capacity 30 US Gal
B. Usable Fuel 28 US Gal
C. Fuel Grade Minimum Octane 82 Auto
Fuel
Maximum Octane 100 LL
with TCP or Marvel
Mystery Oil added

1.4 Oil

A. Engine Oil Capacity 4 US Quarts
B. Engine Oil Spec 5W30 Synthetic when
used
with auto fuel
50/50 mix synthtic and
regular oil when burning
100 LL fuel
C. Gear Box Oil Capacity 12 to 14 Oz Note oil level
D. Gear Box Oil Spec 75W90 Synthetic

1.5 Maximum Weight

A. Maximum Takeoff Weight 1960 lbs
B. Maximum Landing Weight 1900 lbs
C. Maximum Aft Baggage 95 lbs

D. Maximum Forward Baggage 155 lbs

1.6 Airplane Weights

A. Standard Empty Weight 1300 lbs

B. Maximum Useful Load 660 lbs

1.7 Baggage

A. Compartment Volume 15.3 cu ft

1.8 Specific Loadings

A. Wing Loading 15.3 lb/sq ft

B. Power Loading at Gross 11.9 lbs/HP

Section 2

Limitations

2.1 Airspeed Limitations

Speeds (KIAS)

| | | |
|-----|---------------------------|-----|
| Vx | Best angle of climb | 65 |
| Vy | Best rate of climb | 78 |
| Vs | Stall at gross-no flaps | 52 |
| Vso | Stall at gross-full flaps | 46 |
| Vfe | Max Flap extension | 75 |
| Va | Maneuvering | 105 |
| Vno | Maximum Structural Cruise | 133 |
| Vne | Never exceed | 149 |

2.2 Airspeed Indicator Markings (KIAS)

| | |
|------------|---------|
| White Arc | 46-75 |
| Green Arc | 52-133 |
| Yellow Arc | 133-149 |
| Red Line | 149 |

2.3 Power Plant Limitations and EIS (Engine Information System)

Alarm Set Points (Flashing Red Light)

| | |
|-------------------|-----------|
| Max RPM | 5400 |
| Min Coolant Temp | 100 Deg F |
| Max Coolant Temp | 220 Deg F |
| Min Oil Temp | 100 Deg F |
| Max Oil Temp | 230 Deg F |
| Max Gear Box Temp | 220 Deg F |
| Min Oil Pressure | 20 psi |
| Max Oil Pressure | 90 psi |
| Min Fuel Pressure | 28 psi |
| Max Fuel Pressure | 44 psi |

2.4 Weight Limits

| | |
|-----------------|----------|
| Maximum Weight | 1960 lbs |
| Maximum Baggage | 250 lbs |

2.5 CG Limits

| | |
|-----------------------------|-------------------|
| Weight | 1960 lbs |
| Forward Limit aft of Datum | 14.0% MAC - 94.7" |
| Rearward Limit aft of Datum | 32.0% MAC - |

102.6"

The Datum used is 58 inches ahead of the Cowling Mounting Joggle. It is the responsibility of the airplane owner and the pilot to insure that the airplane is properly loaded. See Section 6 (Weight and Balance) for proper loading instruction.

2.6 Maneuver Limits

All acrobatic maneuvers including spins are prohibited.

2.7 Service Life Limits

Certain Engine components require replacement at specified time intervals. See Annual Condition Inspection sheets for the proper replacement schedule or check Preventive Maintenance section 9.2 of this manual.

2.8 Types of Operations

Day VFR Night VFR Non Icing Conditions

2.9 Fuel Limitations

Total Capacity 30 US Gal

Unusable Fuel 2 US Gal

Usable Fuel 28 US Gal

The header tank behind the seats is about 2 gallons
And is included in this capacity.

2.10 Noise Levels

The noise level of this aircraft has not been measured.

2.11 Placards

All required Experimental Category placards are in full

view of the pilot and passenger.

Section 3 Emergency Procedures

3.1 **Emergency Procedures Checklist Speeds (KIAS)**

| | |
|---------------------------|-----|
| Stall at gross-no flaps | 52 |
| Stall at gross-full flaps | 46 |
| Maneuvering at 1960 lbs | 105 |
| Maneuvering at 1300 lbs | 90 |
| Never exceed | 149 |
| Power off Glide Speed | 70 |

3.2 **Engine Emergency Checklist**

The pilot is expected to follow good training practices and decision making should be clear and prompt.

3.3 **Engine failure:**

The first actions should be to turn on the backup fuel pump and switch on the alternate electrical supply. If the engine has stopped and time allows, a restart can be attempted. If this fails, all fuel and electric should be turned off and the emergency landing will be the primary concern of the pilot. The ELT can be manually activated and/or an emergency transmission made.

3.4 **EIS Emergency Indication**

High/Low Oil Pressure, High Oil Temperature, High Coolant Temperature - Reduce power and begin slow decent. If conditions improve, continue to next airport, check for cause and correct. If conditions do not improve, land as soon as possible, find cause and correct.

Low Fuel Pressure - Switch on the backup fuel pump. If pressure returns to normal the first fuel pump should be replaced. If pressure does not return, land immediately and check for fuel leaks or failed fuel pressure regulator.

3.5 Alternator Failure

Alternator failure will be indicated by four lights, the EIS low voltage light, Nuckolls LV light, the regular “check engine” light, and a blinking small LED on the LVWAABMM (Low Voltage Warning And Aux Battery Management Module) The LVWAABMM handles the failure automatically by turning off the main bus and all nonessential equipment and taking one battery off line. You will be left with one battery that should be nearly fully charged, one nav and one com radio as well as the essential engine electrical systems [the ECM (engine Control Module), ECM memory, fuel pumps, the transponder and the turn coordinator which is electric.]

A second type of alternator failure is known as over voltage. This is handled with what is known as a crowbar OV protection and has a 5 Amp CB which is tripped when an overvoltage is detected by the circuit and turns off the alternator field circuit. This prevents burning out the electronic equipment onboard with the overvoltage.

After being notified of alternator failure the pilot can decide to continue to the planned destination if it is a reasonable distance. Remember that you have a second fully charged battery that can be switched back into the system to complete landing tasks with lights or additional radio needs.

3.6 Last Resort, Power off Landing

1. Trim for best glide at 70 KIAS with no flaps
2. Check chart for approximate ground elevation
3. Locate suitable landing area
4. Establish spiral pattern
5. Check that all switches and fuel valves are off
6. Manually activate the ELT
7. At about 1000 AGL position for a normal approach
8. Pull full flaps and establish a glide at 67 KIAS
9. Be sure that seat belts and harness are tight
10. Unlatch doors and remove headsets prior to touchdown
11. Use a full stall touchdown

3.7 Open Door in Flight

If latches are open, the door will trail slightly open and airspeed will be reduced slightly.

To close the door, slow the airplane to 90 KIAS, close the vents, pull on the door handle and latch the door.

3.8 Spin Recovery Checklist (unintentional spin)

| | |
|----------|--|
| Ailerons | Neutral |
| Rudder | Full opposite to direction of rotation |
| Stick | Full Forward |
| Throttle | Closed |
| Rudder | Neutral when rotation stops |
| Stick | Smoothly recover to level flight |

3.9 Fire in Flight

The possibility of an engine fire in flight is extremely remote. This procedure is general and pilot judgment is very important. If an engine fire is indicated, the fuel must be shut off immediately and if a cabin fire is indicated, it will most likely be electrical and the batteries must be disconnected from the electrical system by turning off the battery contactors. The pilot must then fly the aircraft in the best way possible to avoid injury and land the aircraft to escape the fire or put it out.

Section 4

Normal Procedures

4.1 Preflight Checklist

Remove aircraft cover, chocks, pitot cover, control locks.
Check the security and integrity of controls and surfaces.
Check tires and check for brake fluid leaks.
Check pitot, static, and cooling inlets are clear.
Check propeller for nicks and security.
Check baggage door for security.
Visually check fuel level.
Draw fuel sample from each wing and under pilot side.
Drain water from pitot system under pilot door
Drain water from AOA on right wing

4.2 Startup

Check door latches.
Turn on master 1 and check intercom levels.
Turn on master 2, fuel pump 1.
CLEAR PROP.
Start.
Adjust throttle for smooth idle at about 1300 rpm.
Turn on transponder, radios as needed.

4.3 Taxi, Pre-takeoff

WATCH FOR TRAFFIC
Check turn coordinator, radio communication, brakes.
Check coolant temp to at least 150 degrees.
Check fuel pressure to at least 33 psi.
Check oil pressure to at least 30 psi.
Check oil temperature to at least 150 degrees.
Check propeller to FULL FINE.

4.4 Take off

Transponder to ALTITUDE.
Monitor temperatures.
Do not exceed 5400 RPM engine speed
WATCH FOR TRAFFIC.

4.5 Cruise

Adjust prop pitch to 3600 to 4800 RPM.

Use full throttle or adjust throttle as needed.

4.6 Approach

Return prop pitch to FULL FINE.

Monitor throttle as needed - do not exceed 5400 RPM.

4.7 Landing

Slow aircraft to 80 KIAS on downwind

Pull flaps as desired at or below 75 KIAS

Adjust trim for 70 KIAS

Adjust throttle for proper decent

4.8 Engine Stop

Retract flaps during rollout

Turn radios and transponder off

Turn all lights off

Turn fuel pump off

Turn master 1 and 2 off

4.9 Parking

Place wheel chock on main tire

Place control lock on rudder

Lock ailerons with seat belt

Secure tie downs

Place cover on cabin

Lock the doors

Section 5 Performance

Many conditions affect the performance of an aircraft. Air density and the setting of the propeller and throttle affect the power available to the aircraft. Pavement conditions, weight and tire conditions affect the ground roll on takeoff and landing. Air density, skin friction and weight will affect the cruise, climb and glide of the aircraft. To improve the performance the aircraft should be kept clean and waxed and as light as possible for each flight.

It is the responsibility of the pilot to consider these conditions when deciding if the runway is long enough for takeoff or landing and to assure the proper fuel required for the flight. The pilot must also plan the cruise altitude, time to climb, time to descend, and desired cruise speed to fit the flight direction and distance.

Section 6

Weight and Balance

6.1 Moments:

| | |
|-------------------------|----------------|
| Datum | Station 0.0 |
| Cowling Mounting Joggle | Station 58.0 |
| Firewall | Station 60.5 |
| Wing Leading Edge | Station 88.5 |
| Pilot and Passenger | Station 101.0 |
| Fuel | Station 108.0 |
| Baggage, Forward Zone | Station 136.0 |
| Baggage, Aft Zone | Station 160.0 |
| Nose Landing Gear | Station 43.25 |
| Main Landing Gear | Station 111.25 |

6.2 Weights:

| | |
|-------------------------|----------|
| Nose Gear | 333 lbs |
| Left Main Gear | 470 lbs |
| Right Main Gear | 464 lbs |
| Total Weight | 1267 lbs |
| Maximum Takeoff Weight | 1960 lbs |
| Maximum Landing Weight | 1900 lbs |
| Maximum Aft Baggage | 95 lbs |
| Maximum Forward Baggage | 155 lbs |
| Empty Weight | 1267 lbs |
| Maximum Useful Load | 693 lbs |

6.3 Determination of Flight Weight and Balance

Complete the following calculations to determine the weight and balance of the aircraft.

| Location | Weight | Station | Moment (station X weight) |
|--------------------|--------|---------|---------------------------|
| Fuel (Gallons X 6) | _____ | 108.0 | _____ |
| Pilot & Passenger | _____ | 101.0 | _____ |
| Baggage Forward | _____ | 136.0 | _____ |
| Baggage Aft | _____ | 160.0 | _____ |
| Totals | _____ | | _____ |
| | Weight | | Moment |

To get the CG divide the total moment by the total weight.

The forward limit is at 14.0% MAC or station 94.7 and the aft limit is at 32.0% MAC or station 102.6

6.4 Equipment List

Flight Instruments

Airspeed Indicator in Knots
Altimeter
S-Tec 20 Turn Coordinator/Autopilot
AOA with voice link

Avionics

Apolo/UPS/Garmin SL70 Transponder
FlightCom Com
MicroAir Com
Adventure Pilot IFly 720 GPS
Samsung Galaxy Tab S2 running IFly software
with artificial vision capability
PMA 4000 Audio Panel
Porcine Smart Coupler (GPS to Autopilot signal)
ELT

Engine Instruments

GRT Engine Information System
Bus Monitor/Voltage/Amperage Meter
Hour Meter

Section 7

Aircraft Systems

7.1 Airframe

The wings, ailerons, flaps, horizontal stabilizer, elevator, rudder, and wing struts are aluminum. The fuselage is fiberglass with carbon fiber reinforcement in some bulkheads and under the brake mountings. The cabin area has a tube steel cage around it and the landing gear, engine, fuselage, and wings are bolted to the cage.

7.2 Engine

The engine is a four cylinder 2.5L SOHC Eggenfellner converted Subaru auto engine that was manufactured in 1999 and taken from a Subaru Legacy.

7.3 Propeller

The propeller is a Quinti manufactured hub with HP Warp Drive blades. It is electrically adjustable in flight with a switch in the cabin.

7.4 Landing Gear

The landing gear is steel and mounts into fittings in the steel tube cage.

7.5 Fuel System

The fuel system consists of two aluminum tanks of 14 gallons each. These tanks are plumbed into a header tank of about two gallons in the fuselage just behind the seats. This header tank is secured to the fuselage steel tubing with plastic wire ties to prevent rupture in case of a rough (crash) landing. The tank can break free and not rupture or break the flexible lines on the tank. The header tank has a vent to the right wing tank. There is a feed to the engine on the left bottom of the tank and a return on the right bottom from the injected engine fuel rail through the fuel pressure regulator on the engine. The engine feed line also has a shut off valve at the pilot's left knee and the return line has a shutoff in the engine compartment to prevent feedback during servicing

the fuel filters. Each wing tank has a vent line on the outboard end to the wing tip and vents out the underside of the wing at the wingtip. The 3/8 inch engine feed tube goes to a low pressure fuel filter then on to a tee which supplies both high pressure injector fuel pumps. The high pressure side of the injector pumps also has a fuel filter and the fuel then goes to the fuel rails after passing the fuel pressure sensor.

The system operates as though there is only one tank and does not require any special valve operations. The only valves are the shut off valves.

7.6 Electrical System

The electrical system consists of two batteries, four buses and switching to control them. Each battery has a contactor to connect them to the system and the number 2 battery also has a fused 30 amp line directly to one bus which powers one fuel pump, the engine computer memory, and a cabin light. The essential bus is powered through a solid state relay or directly from the 30 amp direct bus. The essential bus also has one com radio and one GPS radio as well as a few other essential items for flight. The main bus has all other electrical equipment. The batteries are connected together to the starter and the alternator through the amp meter shunt and an 100 amp fuse. There are two grounding wires from the engine block to the ground block on the firewall which has a set of ground spades on both sides of the firewall - engine side and cabin side.

7.7 Instrument Panel

The instrument panel is cut from .025 aluminum and faced with a laminate

7.8 Vacuum System

There is no vacuum system.

The S-Tec 20 Gyro is electrically driven.

7.9 Pitot-Static System

The pitot tube is heated and on the left wing underside. The static system has two openings, one on each side of the fuselage in front of each door.

7.10 Heating and Cooling System

The engine is cooled with two coolant radiators which contain Evans NPG+ coolant which is a "permanent" propylene glycol mixture with no water in the system to reduce the chance of boil over. The boiling point of the NPG is 375 degrees F at sea level pressure. There is also an oil cooler radiator.

7.11 Cabin Features

The cabin ventilation is provided by two vents. One on each side that can be adjusted and it is heated with an engine coolant cabin heater with a three speed fan. The cabin fan also “defrosts” the windshield. The seats have temperature sensitive foam and the seat backs are adjustable fore and aft. The cabin doors are secured with four “dogs” that lock and unlock from one lever at the top front of the door frame.

7.12 Baggage Area's

There is a baggage door on the left side of the fuselage. The forward baggage area can hold 155 pounds and the aft area above the batteries can hold 95 pounds. These are maximum weights keeping in mind the gross weight of the aircraft and center of gravity calculations.

7.13 Stall Warning

Stall warning is accomplished with the AOA indicator and audio “*angle, angle, push*”. The application of “*flaps*” is also announced and different parameters are used to trigger the warning. This device must be properly calibrated and should be checked at altitude to determine accuracy.

7.14 Finish

The upper white finish is a urethane two part auto style finish. The red and blue are two part paints with a clear coat containing “Prizmatique” sparkle. The finish should be maintained with “Race Glaze” polish and Race Glaze maintenance products.

7.15 Serial Number Plate

The serial number plate is behind the left door near the wing.

Section 8

Aircraft Operation

8.1 General

This aircraft operates in the similar way as a certified single engine land aircraft such as a Cessna 172 or 152 except with greater speed.

8.2 Brakes

The brakes are toe operated. The pilot should use caution to move the feet down off the brakes during takeoff.

8.3 Flight Controls

All flight controls are normal to this type of aircraft.

8.4 Engine Controls

Engine control is accomplished by a throttle and a propeller control switch. Normal operation is to always use the throttle at full except during landing and use the propeller control to set the power level of the engine. The throttle is used for power adjustments during landings after the propeller is set to full fine. The engine is kept in proper fuel/oxygen mixture and ignition timing with a computer ECU regardless of the air density or altitude.

8.5 Propeller Controls

The propeller is controlled with a switch and is used to set the power level of the engine

8.6 Emergency Locator Transmitter

The ELT has a test and reset button directly on the ELT. The transmitter is located in the luggage compartment and the permanent antenna is behind the bulkhead at the back of the luggage compartment on the left side of the fuselage. There is also a portable antenna in the luggage compartment.

Section 9 Aircraft Handling And Maintenance

9.1 Inspection Periods

The aircraft must be inspected every year using the **GlaStar Annual Condition Inspection with Eggenfellner Subaru Engine and Quinti Propeller** check sheets.

9.2 Preventive Maintenance

The engine oil should be changed every 50 hours

The engine oil filter should be changed every 50 hours

The Evans NPG coolant should be changed every 7 years

The coolant thermostat should be changed every 5 years

The coolant hoses should be changed every 1000 hours

The water pump should be replaced every 1000 hours

The spark plugs should be changed every 200 hours

The alternator should be replaced every 1000 hours

High pressure fuel lines should be replaced every 250 hours

Fuel filters should be replaced yearly

The alternator belt should be replaced every 500 hours

The cam belt should be replaced every 500 hours

Valve clearance should be adjusted every 250 hours

Plastic wire ties in the engine compartment should be inspected and replaced as needed

9.3 Ground Handling

Ground handling is by differential braking and proper use of flight controls in windy conditions.

9.4 Air Filter

The air filter is a Chrysler Mini Van filter and should be replaced every 100 hours.

9.5 Brake Service

The brakes and wheel axles should be inspected yearly. The wheel axles should be repacked when reassembling.

9.6 Propeller Service

The propeller should be lubricated every year with synthetic grease. Set screws opposite the grease fittings should be removed then grease pumped into the fittings until grease appears at the set screw openings.

9.7 Oil Requirements and Service

Engine oil should be changed every 50 hours with a 50/50 mix of synthetic and regular oil of 10w30 or 10w40. The regular oil must be used when burning 100 LL fuel. Synthetic can be used when burning auto fuel only. Gear box oil should be replaced with 75w90 synthetic during yearly service.

9.8 Fuel System

The fuel system is described in section 7.5

9.9 Tire Inflation

Tires should be inflated to 40 to 45 psi

9.10 Battery Service

There are two sealed lead acid RG batteries of about 17 amp hour capacity each and one should be replaced every year.

9.11 Cleaning

The engine compartment should be kept clean of any oil deposits. The airframe should be “waxed” with Race Glaze and cleaned with Race Glaze products.

9.12 Lubrication

All moving parts and control horns should be lubricated with a spray grease and wiped clean every year.

9.13 Winterization

There are no special needs for winter operations.

Section 10

Supplements

Section 11

Revisions

Section 12

Notes

Start Up And Operation Of GlaStar N640DJ

Start

Turn SW1 to **ON** The primary, secondary and engine bus are now energized with battery 1

Turn SW2 to **ON** This adds the second battery for the start and the starter motor is on this buss.

Turn SW5 to **ON** This energizes fuel pump 1 (you could also close SW6 to add the second fuel pump)

Start the engine

Turn SW1 to **ALT** This energizes the alternator field

Turn SW2 to **AUTO** This puts battery 2 in the auto shut down system.

Everything is now up and running. The engine starts so quickly that the batteries will not lose much of their charge in the start. A misconception is that one battery will contribute to the recharge of the other battery. This never happens. A battery does not have enough voltage to do that - only the alternator or a battery charger can recharge the batteries.

Note: I have found that using both batteries for the start, the taxi time needed will usually bring both batteries to very near full charge - my amps have dropped back to normal use at takeoff.

To stop, first turn the fuel pumps off and then turn SW1 and SW2 off. This will turn off the fuel flow before the ignition and no fuel will be left in the cylinders.

A Look At Possible Failure Modes

Alternator Failure - voltage drop This is the most probable failure in the electrical system.

At alternator failure, the LVWAABMM will detect the drop of voltage from the alternator voltage to the battery voltage and turn off battery 2 and the secondary bus and give you a light to notify you that this has been done (your EIS will also give you a low voltage light) You then continue flight, as you decide, knowing that you have a fully charged battery 2 and a near fully charged battery 1 to complete the flight to a landing. Simply add battery 2 back to the system when needed by turning SW2 from **AUTO** to **ON**.

Alternator Over Voltage

The OVP (over voltage protection) will disconnect the alternator field and give you an OV light - then you will also get the LV lights from the EIS and LVWAABMM. You can try a reset of the circuit breaker or leave the alternator off and proceed as with a failed alternator.

Fuel Pump Failure

Each of the fuel pumps are wired to an SPST switch. During critical flight times (takeoff and landing) SW6 can be “guarded” to allow quick action on the switch if a power “blip” is detected. Both pumps can also be run during critical flight times as a routine matter.

The Emergency Direct Switch

This emergency mode is to be used if you have smoke in the cabin. Turn on SW3 and turn off SW1 and SW2. SW3 is labeled “Emergency Direct” This switch will power your engine bus and battery bus direct from battery 1 bypassing all electronic devices. You will only have power to the ECM, ECM Memory, fuel pump 1, and fuel pump 2. I also have a cabin light, and the prop

attached to the engine bus. All electronic devices on your panel will be electrically dead. This is a good action to take if you have smoke in the cabin which is most likely caused by a malfunctioning electrical device. You can then land the aircraft (do it soon since you only have the battery 1 power) and sort out what went wrong. **Do not try to repair the system while flying.** If you have fire in the engine compartment, shut off the fuel and do your best to get it down without power. You have a different problem and SW3 will not help! Armageddon was yesterday. Today you have a serious problem.

The following equipment is on each buss

| | |
|-----------------------------------|---|
| Primary Buss - (E-Buss) | FL760 Com radio I-Fly 720 GPS Turn Coordinator Transponder |
| Secondary Bus - | MicroAir Com radio S-Tec 20 Auto Pilot Lights Pitot heat Everything else that is electrical |
| Battery Bus ----- | ECM memory (this must always be on) Fuel Pump 2 (is on an SPST switch) Cabin lights (on an SPST switch) |
| Engine Bus ----- | ECM (engine control module) Fuel Pump 1 (is on an SPST switch) Prop Control (on an DPDT switch) |

Electrical Bus Assignments

Battery Bus

| | | |
|-------------|---|-------------|
| | 1 | |
| ECM Memory | 2 | |
| Cabin Light | 3 | Fuel Pump 1 |

Engine Bus

| | | |
|--------------|---|---|
| ECM | 1 | |
| Fuel Pump 2 | | 2 |
| Prop Control | 3 | |

Essenti al Bus

| | | |
|--------------------------|---|-------------------------------------|
| Audio Panel | 1 | Smart Coupler (GPS to S-Tec 20) |
| Transponder (SL70) | 2 | FL760 Com 1 Radio |
| Bat 1 Alt on | 3 | USB Outlets |
| Auto Pilot (S-Tec 20) | 4 | Starter Solenoid |
| I-Fly 720 GPS | 5 | Emergency to Engine Bus when Off |

Electrical Bus Assignments

| | | |
|------------------------------|----------|--|
| | 1 | |
| Micro Air Com 2 | 2 | |
| Auto Pilot (S-Tec 20) | 3 | |
| Hour Meter | 4 | |
| AOA | 5 | |
| Instrument Lights | 6 | |
| WigWag Lights | 7 | EIS Power |
| Landing/Taxi Lights | 8 | Manifold Pressure Sensor/Trim Power |
| Navigation Lights | 9 | Strobe Lights |
| Heater Fan | 0 | Pitot Heat |