VAN'S AIRCRAFT RV-7A

PILOT'S OPERATING HANDBOOK - N12VD

WARNING

The aircraft described in this handbook is amateur built and certified in the Experimental category. While believed to be complete and accurate at the time of publication/revision, this handbook may not contain all of the information necessary for the pilot to safely operate the aircraft. It is also not a substitute for competent flight and/or aerobatic instruction. The Pilot in Command alone is responsible for ensuring the initial and continuing airworthiness of the aircraft and for its operation within the limits detailed herein. All persons entering the aircraft do so at their own risk.

CONSTRUCTION INFO

Builder	Ryan Drake
Model	RV-7A
Serial number	74583
Registration	N12VD
Kit manufacturer	Van's Aircraft
Construction start date	9-Nov-2016
Date of initial registration	11-Jan-2022
Date of initial airworthiness	23-Jun-2022

RECORD OF REVISIONS

Revision	Revision Date	Description
A	19-Nov-2022	Initial Print
B	25-Oct-2023	Corrected Vs and VsO. Corrected Va. Modified checklists. Updated EIS warning thresholds. Added more explanation to electrical system description. Updated preflight checklist. Updated V-speeds

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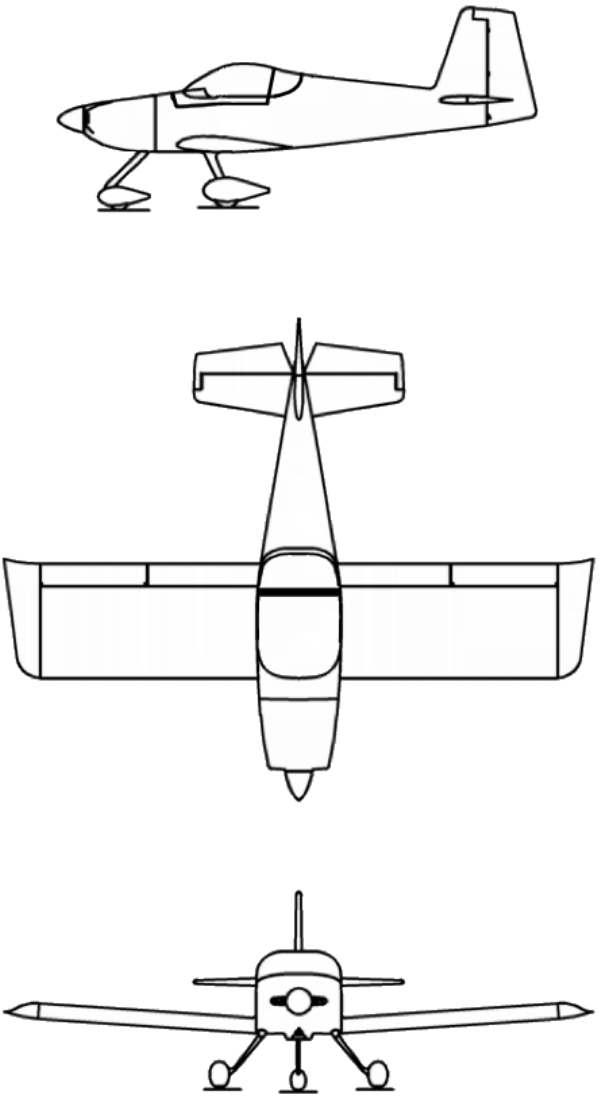
GENERAL

THREE VIEW



INTRODUCTION

Section 1 provides basic data and information of general interest. It also contains definitions or explanations of symbols, abbreviations, and terminology commonly used.

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DESCRIPTIVE DATA

ENGINE

Number of Engines:	1
Engine Manufacturer:	Lycoming
Engine Model:	YIO-360-M1B
Engine Type:	Normally-aspirated, direct-drive, air-cooled, horizontally-opposed, fuel-injected, four-cylinder engine
Rated power:	180 BHP
Rated speed:	2,700 RPM
Bore:	5.125 in
Stroke:	4.375 in
Displacement:	361 in^3
Compression Ratio:	8.5:1
Time between overhaul:	2,000 hours

PROPELLER

Propeller Manufacturer:	Hartzell
Propeller Model:	HC-C2YR-1BFP
Blade Model:	F7497-2
Number of blades:	2
Diameter:	72 in
Type:	Hydraulically actuated constant speed
Time between overhaul:	2,400 hours or 72 months

FUEL

Fuel type:	91/96 or 100LL
Fuel Capacity (total)	42 gal
Fuel Capacity (usable)	41.7 gal

OIL

Oil filter: Champion CH48110
Oil sump capacity: 8 qts
Oil grade:

MIL-L-6082B Aviation Grade Straight Mineral Oil	Use to replenish supply during first 25 hours and at the first 25-hour oil change. Continue to use until a total of 50 hours has accumulated or oil consumption has stabilized.
MIL-L-22851 Ashless Dispersant Oil	This oil must be used after first 50 hours or oil consumption has stabilized.

Avg Ambiant Air Temp	MIL-L-6082B	Ashless Dispersant
All Temperatures		SAE 15W-50 or 20W-50
Above 80°F	SAE 60	SAE 60
Above 60°F	SAE 50	SAE 40 or SAE 50
30° to 90°F	SAE 40	SAE 40
0° to 70°F	SAE 30	SAE 40, 30 or 20W-40
Below 10°F	SAE 20	SAE 30 or 20W-30

MAXIMUM WEIGHTS

Maximum weight	1,800 lbs
Empty weight	1,159 lbs
Maximum useful load	641 lbs
Baggage allowance	100 lbs

AIRFRAME SPECIFICATIONS

Wing Span		25 ft 0 in
Length		20 ft 4 in
Height		7 ft 10 in
Main Gear Track		6 ft 8 in
Cabin Height		41 in
Cabin Width		43 in
Cabin Length		51 in
Wing Area		121 ft^2
Flap Travel		44° down
Elevator Travel		29° up / 23° down
Aileron Travel	(left) 30° up / 17° down, (right)	29° up / 16° down
Rudder Travel		35° left / 35° right
Nose Wheel Breakout Force		26 lbs

SPECIFIC LOADINGS

Wing Loading	14.8 lbs/ft^2
Power loading	10 lbs/HP

TERMINOLOGY

GENERAL AIRSPEED TERMINOLOGY

KIAS	Knots Indicated Airspeed is the speed shown on the airspeed indicator assuming no instrument error, expressed in knots.
KCAS	Knots Calibrated Airspeed is indicated airspeed corrected for position and instrument error, expressed in knots. Calibrated airspeed is equal to true airspeed in standard atmosphere at sea level.
KTAS	Knots True Airspeed is the airspeed relative to undisturbed air, expressed in knots, which is KCAS corrected for altitude, temperature and compressibility.
GS	Ground Speed is the speed of the aircraft relative to the ground.
V_A	Maneuvering Speed is the maximum speed at which abrupt full control deflection will not over-stress the aircraft.
V_{NO}	Maximum Structural Cruising Speed is the speed that should not be exceeded except in smooth air, and then only with caution.
V_{NE}	Never Exceed Speed is the speed limit that may not be exceeded at any time.
V_S	Stalling Speed is the minimum steady flight speed at which the aircraft is controllable.
V_{SO}	Stalling Speed in the landing configuration at the most forward center of gravity.
V_X	Best Angle of Climb Speed is the speed which results in the greatest altitude gain in a given horizontal distance.
V_Y	Best Rate of Climb Speed is the speed which results in the greatest altitude gain in a given time.

ENGINE POWER TERMINOLOGY

BHP	Brake Horsepower is the power developed by the engine.
RPM	Revolutions Per Minute is engine speed.
MP	Manifold Pressure is the absolute pressure measured in the engine's induction system, expressed in inches of mercury (in. Hg).

METEOROLOGICAL TERMINOLOGY

OAT	Outside Air Temperature is the free static air temperature. It is obtained from meteorological sources or in-flight instruments adjusted for instrument error and compressibility effects.
Standard Temperature	Standard Temperature is 15°C at sea level pressure altitude and decreases by 2°C for each 1,000 ft of altitude.
Pressure Altitude	Pressure Altitude is the altitude read from an altimeter when the altimeter's barometric scale has been set to 29.92 in. Hg, assuming zero position and instrument error

AIRCRAFT PERFORMANCE TERMINOLOGY

Climb Gradient	Climb Gradient is the ratio of the change in height during a climb, to the horizontal distance covered in the same time interval.
Demonstrated Crosswind Velocity	Demonstrated Crosswind Velocity is the velocity of the crosswind component for which adequate control of the aircraft during takeoff and landing has been demonstrated during flight tests. The value shown is not considered to be limiting.
Usable Fuel	Usable Fuel is the fuel that can be safely used in flight.
Unusable Fuel	Unusable Fuel is the fuel that can not be safely used in flight.
GPH	Gallons Per Hour is the amount of fuel (in US gallons) consumed per hour.
QPH	Quarts Per Hour is the amount of oil (in quarts) consumed per hour.
NMPG	Nautical Miles Per Gallon is the distance (in nautical miles) which can be expected per gallon of fuel consumed at a specific engine power setting and/or flight configuration.
g	g is acceleration due to gravity.

WEIGHT AND BALANCE TERMINOLOGY

Reference Datum	Reference Datum is an imaginary vertical plane from which all horizontal distances are measured for balance purposes.
Station	Station is a location along fuselage given in terms of distance from the reference datum.
Arm	Arm is the horizontal distance from the reference datum to the center of gravity of an item.
Moment	Moment is the product of weight of an item multiplied by its arm.
C.G.	Center of Gravity is the point at which an aircraft, or item, would balance if suspended.
C.G. Arm	Center of Gravity Arm is the arm obtained by adding the aircraft individual moments and dividing the sum by the total weight.
C.G. Limits	Center of Gravity Limits are the extreme center of gravity locations within which the aircraft must be operated at a given weight
Empty Weight	Empty Weight is the weight of the aircraft, including unusable fuel, full operating fluids, and full engine oil.
Useful Load	Useful Load is the difference between takeoff weight and empty weight.
Payload	Payload is the weight of occupants, cargo, and baggage.
Gross Weight	Gross Weight is the loaded weight of the aircraft.
Maximum Takeoff Weight	Maximum Takeoff Weight is the maximum weight approved for start of the takeoff run.
Maximum Landing Weight	Maximum Landing Weight is the maximum weight approved for the landing touch-down.
Tare	Tare is the weight of chocks, blocks, stands, etc. used when weighing an aircraft, and is included in the scale readings. Tare is deducted from the scale readings to obtain the actual (net) aircraft weight.

LIMITATIONS

INTRODUCTION

Section 2 includes airspeed limitations, instrument markings, and basic placards necessary for the safe operation of the aircraft, its engine, systems, and equipment.

AIRSPEED LIMITATIONS

	SPEED	VALUE	REMARKS
V_{NE}	Never Exceed Speed	**200 KTAS**	Do not exceed this speed in any operations.
V_{NO}	Maximum Structural Cruising Speed	**168 KIAS**	Exceed this speed only in smooth air.
V_A	Maneuvering Speed	**127 KIAS**	Do not make full control movements above this speed. Full elevator deflection will result in a 6g load at this speed.
V_{FE}	Maximum Flap Extended Speed	**96** - 20° **87** - Full	Do not exceed this speed with flaps down

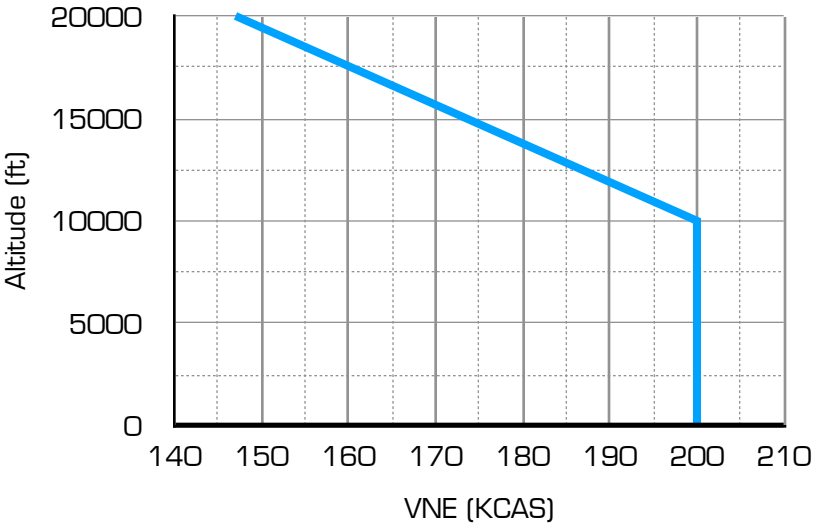


Figure 2.1: V_{NE} vs. Altitude

AIRSPEED INDICATOR MARKINGS

MARKING	VALUE	SIGNIFICANCE
White Arc	**50-87 KIAS**	Full Flap Operating Range Lower limit is Van's estimated V_{so} of 50 KIAS. Actual demonstrated V_{so} is 48 KIAS. Upper limit is maximum speed with flaps extended
Green Arc	**56-168 KIAS**	Normal Operating Range Lower limit is Van's estimated V_s of 56 KIAS. Actual demonstrated V_s is 52 KIAS. Upper limit is maximum structural cruising speed
Blue Line	**123 KIAS**	Van's estimated maximum maneuvering speed
Yellow Arc	**168-200 KIAS**	Operations must be conducted with caution and only in smooth air
Red Line	**200 KIAS**	Maximum speed for all operations. Note, Van's V_{NE} is specified in KTAS

NOTES

The analog airspeed indicator markings are based on estimates provided by Van's Aircraft.

These markings do not account for the analog ASI instrument error.

EIS WARNING THRESHOLDS

Manifold Pressure	Redline (if RPM is below 2,450)	24 in. Hg.
Oil Temperature	Redline	245°F
	High Warning	200°F
Oil Pressure	Redline	95 psi
	Low Warning (if RPM is 1,300 or more)	55 psi
	Low Warning (if RPM is less than 1,300)	25 psi
Fuel Pressure	High Warning	45 psi
	Low Warning	14 psi
CHT	Redline	500°F
	High Warning	435°F
RPM	Redline	2,700 RPM
	Limit when oil temperature < 100°F	2,200 RPM
	Limit when oil temperature < 75°F	1,300 RPM
Main Voltage	High Warning	14.7V
	Low Warning	12.7V
	Redline	11V
Backup Voltage	High Warning	14.7V
	Low Warning	9.5V
	Redline	9V
Fuel Quantity	Low Level Warning	6 gal
	Critical Level Warning	3 gal

POWER PLANT LIMITATIONS

Maximum Engine Speed:	2,700 RPM
Oil Temperature:	
Maximum	245°F
Desired	165°F-200°F
Minimum for continuous operation	140°F
Minimum for takeoff	100°F
Minimum for engine run-up (2,200 RPM, 50-65% power)	75°F
Cylinder Head Temperature (CHT):	
Maximum	500°F
75% power cruise maximum	435°F
Economy cruise maximum	400°F
Recommended minimum	150°F
Oil Pressure:	
Maximum for Start, Warm-up, Taxi, and Take-off	115 psi
Maximum (normal operations)	95 psi
Minimum (normal operations)	55 psi
Minimum (idle)	25 psi
Oil Sump Capacity:	
Maximum	8 qts
Minimum safe quantity	4 qts
Fuel Pressure:	
Maximum	45 psi
Minimum	14 psi
Fuel Pump Operation:	
Maximum	32 psi
Minimum	26 psi
Tachometer:	
Green Arc (normal operating range)	500 to 2,70(RPM
Red Arc (if oil temperature is less than 100°F)	2,200 to 2,70(RPM
Red Arc (if oil temperature is less than 75°F)	1,300 to 2,70(RPM
Red line (maximum RPM)	2,70(RPM

WEIGHT LIMITS

Maximum takeoff gross weight	1,800 lbs
Maximum landing gross weight	1,800 lbs
Maximum aerobatic gross weight	1,600 lbs
Maximum weight in baggage compartment	100 lbs

CENTER OF GRAVITY LIMITS

Forward C.G. limit	15% of wing chord OR 78.7" aft of datum
Aft C.G. limit	29% of wing chord OR 86.82" aft of datum
Aerobatic aft C.G. limit	25% of chord OR 84.5" aft of datum

NOTE

The datum is 70 inches forward of wing leading edge.

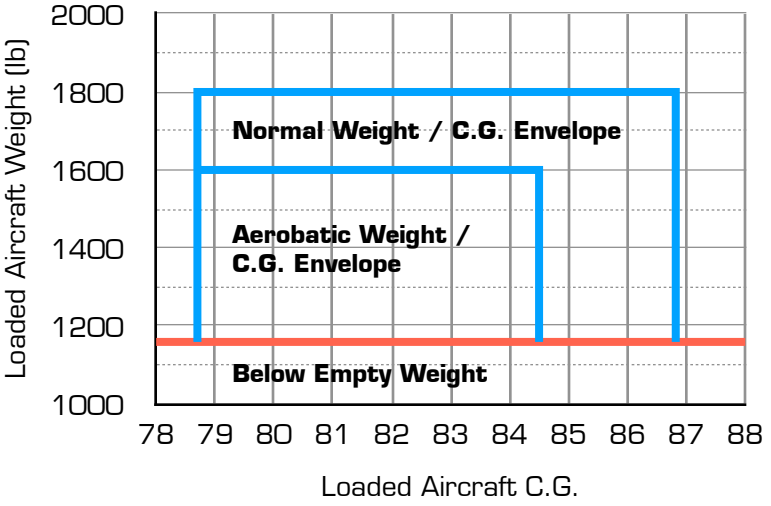


Figure 2.2: Center of Gravity Limits

LOAD FACTOR LIMITS

Flaps Up, weight 1,600 lbs and below:	+6g to -3g
Flaps Up, weight 1,800 lbs	+3.8g to -1.5g
Flaps Down	+2g to 0g

NOTES

The load factor limit varies linearly between 1,800 lbs and 1,600 lbs.

The load factor limits for weights above 1,600 lbs are not published by Van's aircraft.

The load factor limits for flaps down are based on FAR 23 structural design criteria.

CAUTION

While the airframe is stressed for negative G, the fuel system uses flop tube pickups, and the brake fluid reservoir is fitted with a check valve to prevent fluid escape, the engine does not have an inverted oil system, therefore sustained negative G maneuvers must be avoided.

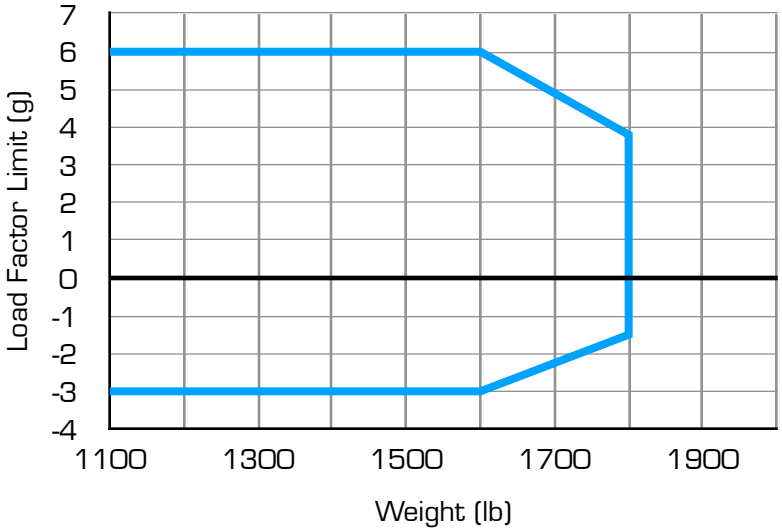


Figure 2.3: Load Factor Limit vs. Weight

MANEUVER LIMITS

Aerobatic Weight limitation	1,600 lbs
Recommended Entry Speeds:	
Loops, Horizontal Eights	122 – 165 KIAS
Immelman Turns	130 – 165 KIAS
Aileron Rolls, Barrel Rolls	104 – 165 KIAS
Snap Rolls	70 – 96 KIAS
Vertical Rolls	156 – 165 KIAS
Split-S	87 – 96 KIAS

STARTER CRANKING LIMITATIONS

The following limitations are for the SkyTec 149-12LS starter. Starter cranking is limited to six 10 second cranking cycles with 20 second cool down between cranking attempts, then 30 minutes cooling.

PLACARDS

The following information is displayed by placards:

LOCATION	PLACARD
Panel, Right side	PASSENGER WARNING: THIS AIRCRAFT DOES NOT COMPLY WITH FEDERAL SAFETY REGULATIONS FOR STANDARD AIRCRAFT
Baggage bulkhead	CAUTION: MAXIMUM BAGGAGE WEIGHT:100 POUNDS

KINDS OF OPERATION LIMITS

The aircraft is equipped for day VFR and night VFR operations. FAR Part 91 establishes the minimum required instrumentation and equipment for these operations. The aircraft is NOT equipped for day IFR or night IFR operations, and flight into known icing conditions is prohibited.

FUEL LIMITATIONS

Fuel Capacity (total)	42 gal
Fuel Capacity (usable)	41.7 gal
Fuel Capacity (unusable)	0.3 gal
Fuel types:	91/96 (brown) or 100LL (blue)

EMERGENCY PROCEDURES

INTRODUCTION

Section 3 provides procedures to address emergencies that may occur. Should an emergency arise, the basic guidelines in this section should be considered and applied as necessary to correct the problem.

AIRSPEEDS FOR EMERGENCY OPERATION

Engine Failure After Takeoff:	
Flaps UP	89 KIAS
Flaps DOWN	70 KIAS
Maneuvering Speed (V_A):	127 KIAS
Maximum Glide (10:1 zero-wind ratio)	
Solo weight (1,600 lbs)	84 KIAS
Max Gross weight (1,800 lbs)	89 KIAS
Minimum Rate of Descent	
Solo weight (1,600 lbs), 746 ft/min	64 KIAS
Max Gross weight (1,800 lbs), 791 ft/min	68 KIAS

EMERGENCY CHECKLISTS

ENGINE FAILURE DURING TAKEOFF RUN

a. Throttle - IDLE
b. Brakes - APPLY
c. Flaps - UP
d. If insufficient runway remains:
    a. Fuel Selector Valve - OFF
    b. Magneto Switches - OFF
    c. Backup Power Switch - OFF
    d. Main Power Switch - OFF

ENGINE FAILURE IMMEDIATELY AFTER TAKEOFF

a. Best Glide Speed - 89 KIAS
b. Mixture - IDLE CUT-OFF
c. Prop - MINIMUM RPM
d. Fuel Selector Valve- OFF
e. Magneto Switches - OFF
f. Backup Power Switch - OFF
g. Main Power Switch - OFF

ENGINE FAILURE DURING FLIGHT

a. Best Glide Speed - 89 KIAS

b. Fuel Pump Switch - ON

c. Fuel Selector Valve- SWITCH TANKS

d. Mixture - RICH

e. Alternate Air - PULL ON

f. Magneto Switches - CHECK

g. Magneto Switches - HOLD both to START if prop is stopped

h. Transponder - SET to 7700

WARNING: If engine failure is accompanied by fuel fumes in the cockpit, or if internal engine damage is suspected, move Mixture to IDLE CUTOFF and do not attempt a restart.

ENGINE ROUGHNESS OR PARTIAL POWER LOSS

a. Fuel Pump Switch - ON

b. Fuel Selector Valve - SWITCH TANKS

c. Mixture - ADJUST

d. Throttle - SWEEP

e. Alternate Air - PULL ON

f. Magneto Switches - CHECK

WARNING: Be prepared for a complete engine failure if the above actions do not correct engine roughness or power loss. Land as soon as practical.

LOW FUEL PRESSURE

a. Fuel Pump Switch - ON

b. Fuel Selector Valve- SWITCH TANKS

WARNING: Be prepared for a complete engine failure if the above actions do not correct fuel pressure. Land as soon as practical.

LOW OIL PRESSURE

a. Oil Pressure Annunciator - CHECK

b. EIS Oil Pressure Indication - CHECK

Land as soon as possible. Prepare for potential engine failure.

HIGH OIL PRESSURE

a. EIS Oil Pressure Indication - CHECK

b. Throttle - REDUCE to minimum for sustained flight

Land as soon as possible. Prepare for potential engine failure.

LOSS OF MANIFOLD PRESSURE

a. Throttle - REDUCE

b. Engine Instruments - CHECK

c. Altitude - DESCEND

CAUTION: Set power to minimum setting required for continued flight. Remain alert for the possibility of an engine out or fire in the engine compartment. Maintain a safe altitude from which a landing may be most safely and expeditiously accomplished.

AIR-START

a. Throttle - OPEN to ¼ of travel
b. Prop - HIGH RPM
c. Fuel Pressure - CHECK
d. If fuel pressure is less than 14 psi
    a. Fuel Pump Switch - ON
    b. Fuel Selector Valve - SWITCH tanks
e. Magneto Switches - HOLD both to START
f. Mixture - IDLE CUT-OFF
g. Mixture - MOVE slowly to RICH as engine starts
h. Fuel Pump Switch - OFF after engine starts

EMERGENCY DESCENT

a. Throttle - IDLE
b. Mixture - AS REQUIRED
c. Max Airspeed - 200 KTAS

WARNING: If significant turbulence is expected do not descend at indicated airspeeds greater than Vno (168 KIAS)

EMERGENCY LANDING WITHOUT ENGINE POWER

a. Best Glide Speed - 89 KIAS
b. Throttle - IDLE
c. Mixture - IDLE CUT-OFF
d. Prop - MINIMUM RPM
e. Fuel Pump Switch - OFF
f. Fuel Selector Valve- OFF
g. Magneto Switches - OFF
h. Radio - TRANSMIT 121.5 MHz MAYDAY
i. Transponder - SET to 7700
j. E.L.T. - ACTIVATE if off airport
k. Flaps - AS REQUIRED when landing is assured
l. Backup Power Switch - OFF
m. Main Power Switch - OFF
n. Restraints - ADJUST and SECURE

EMERGENCY LANDING WITH ENGINE POWER

a. Best Glide Speed - 89 KIAS
b. Selected Field - FLY OVER
c. Flaps - AS REQUIRED
d. Trim
e. Radio - TRANSMIT 121.5 MHz MAYDAY
f. Backup Power Switch - OFF
g. Main Power Switch - OFF
h. Magneto Switches - OFF after touchdown

DITCHING

a. Radio - TRANSMIT 121.5 MHz MAYDAY
b. Flaps - DOWN
c. Airspeed - 70 KIAS
d. Throttle - SET for 300 ft/min descent
e. Approach - INTO WIND if high wind, otherwise PARALLEL TO SWELLS
f. Face - CUSHION with folded coat

FIRE DURING START ON GROUND

a. Mixture - IDLE CUT-OFF
b. Fuel Pump Switch - OFF
c. Fuel Selector Valve - OFF
d. Cabin Heat - OFF
e. Cabin Air Vents - CLOSE
f. Magneto Switches - OFF
g. Backup Power Switch - OFF
h. Main Power Switch - OFF
i. Fire Extinguisher - UNLATCH
j. Aircraft - EVACUATE
k. Fire - EXTINGUISH

ENGINE FIRE DURING FLIGHT

a. Mixture - IDLE CUT-OFF

b. Fuel Pump Switch - OFF

c. Fuel Selector Valve - OFF

d. Cabin Heat - OFF

e. Cabin Air Vents - CLOSE

f. Backup Power Switch - ON

g. Main Power Switch - OFF

h. Forced Landing - EXECUTE

NOTE: If fire is not extinguished, increase glide speed to find an airspeed - within airspeed limitations - which will provide an incombustible mixture

ELECTRICAL FIRE DURING FLIGHT

a. Magneto Switches - ON

b. All Other Switches - OFF

c. Cabin Heat - OFF

d. Cabin Air Vents - CLOSE

e. Fire Extinguisher - UNLATCH and ACTIVATE if fire visible

f. Forced Landing - EXECUTE

WARNING: After ascertaining the fire has been extinguished, ventilate the cabin and land as soon as possible.

CARBON MONOXIDE MONITOR ALARM

a. Throttle - REDUCE

b. Mixture - LEAN OF PEAK

c. Cabin Heat - OFF

d. Cabin Air Vents - OPEN

e. Carbon Monoxide Warning Light - MONITOR

f. If Carbon Monoxide Warning Light remains red:

    a. Airspeed - 80 KIAS MAX

    b. Canopy - OPEN SLIGHTLY

CAUTION: Be prepared to land if problem does not correct.

AUTOPILOT MALFUNCTION OR RUNAWAY TRIM

a. AP Disconnect Button - PUSH

b. Autopilot Switch - SET to DISABLE

ALTERNATOR FAILURE

a. Backup Power Switch - ON

b. Main Power Switch - SET to MASTER then to ALT+MASTER

c. Alternator Field Circuit Breaker - PULL then RESET

d. If failure continues:

    a. Main Power Switch - OFF

    b. Voltage - MONITOR

BACKUP POWER

The following equipment are operative on Backup Power:

- Engine Monitor
- Primary Flight Display
- Comm Radio
- ADAHRS
- GPS
- Magnetometer
- Transponder

The following equipment are inoperative on Backup Power:

- Fuel Pump
- Pitch and Roll Trim
- Flaps
- Pitot Heat
- Multi-Function Display
- AFCS Controller
- Autopilot Servos
- All Internal and External Lights
- XM Receiver
- Carbon Monoxide Detector
- Panel USB Charger

NORMAL PROCEDURES

INTRODUCTION

Section 4 provides procedures for the conduct of normal operation.

AIRSPEEDS FOR NORMAL OPERATION

	SPEED	VALUE	REMARKS
V_Y	Best Rate of Climb	**87 KIAS**	Calculated using bootstrap method
V_X	Best Angle of Climb	**66 KIAS**	Derived from test at 1,600 lbs
V_Z	Best Cruise Climb	**103 KIAS**	Calculated using bootstrap method
V_G	Best Glide	**89 KIAS**	Derived from test at 1,600 lbs
V_{MROD}	Minimum Rate of Descent	**68 KIAS**	Calculated from V_G
V_{CRUS}	Optimum Cruise (Carson)	**118 KIAS**	Calculated from V_G
V_S	Stall Speed Clean	**52 KIAS**	Verified in flight
V_{SO}	Stall Speed Landing Config	**48 KIAS**	Verified in flight

PREFLIGHT INSPECTION

1. CABIN
    a. Documentation - AVAILABLE in aircraft
    b. Charts - CURRENT and APPROPRIATE TO FLIGHT
    c. Gust Lock Securing Control Stick - RELEASE
    d. Passenger Control Stick - CHECK SECURE
    e. Camera - CHECK SECURE
    f. Magneto Switches - OFF
    g. Alternator Circuit Breaker - IN
    h. All Switches - OFF
    i. Main Power Switch - SET to MASTER
    j. Flaps - DOWN
    k. Pitot Heat - CHECK, if needed
    l. Position and Strobe Lights - CHECK, if needed
    m. Taxi Lights - CHECK, if needed
    n. Landing Lights - CHECK, if needed
    o. Engine gages - ON
    p. Fuel Quantity - CHECK quantity
    q. All Switches - OFF
2. EMPENNAGE
    a. Left Static Source - CHECK for blockage
    b. Rudder, Elevators - CHECK movement and security
    c. Rudder Cables - CHECK attachment and condition
    d. Trim Tab - CHECK SECURE
    e. Tail light and Strobe - CHECK condition
    f. Tail Tie-Down - DISCONNECT
    g. OAT Probe - CHECK security
    h. Right Static Source - CHECK for blockage
    i. E.L.T. antenna - CHECK security
    j. GPS antenna - CHECK security

3. RIGHT WING
    a. Flap - CHECK security
    b. Aileron - CHECK movement and security
    c. Wingtip hinge - CHECK security
    d. Nav and Strobe Light and Lens - CHECK condition
    e. Landing/Taxi Light and Lens - CHECK condition
    f. Leading Edge - CHECK
    g. Wing Tie-Down - DISCONNECT
    h. Main Wheel Tire - CHECK for proper inflation: 35 PSI
    i. Chock - REMOVE
    j. Tank - SUMP
    k. Fuel Quantity - CHECK VISUALLY
    l. Fuel Filler Cap - SECURE
4. NOSE
    a. Oil Level - CHECK, don't operate with less than 4 quarts
    b. Cowl Hinge Pins - CHECK for security
    c. Ground Power - CLOSED
    d. Access Door - CLOSED
    e. Exhaust - SECURE
    f. Fuel Tank Vents - CHECK for blockage
    g. Nose Wheel Tire - CHECK for proper inflation: 35 PSI
    h. Chock - REMOVE
    i. Tow Bar - REMOVE
    j. Propeller and Spinner - CHECK for nicks and security, grease & oil leaks. (Gently shake each blade to feel for movement up to 1/8th inch allowed, check screws)
    k. Air Inlet - CHECK for restrictions
    l. Air Filter - CHECK condition

5. LEFT WING
    a. Tank - SUMP
    b. Fuel Quantity - CHECK VISUALLY
    c. Fuel Filler Cap - SECURE
    d. Main Wheel Tire - CHECK for proper inflation: 35 PSI
    e. Chock - REMOVE
    f. Wing Tie-Down - DISCONNECT
    g. Pitot Tube Cover - REMOVE and check for blockage
    h. Stall Warning - CHECK
    i. Leading Edge - CHECK
    j. Landing/Taxi Light and Lens - CHECK condition
    k. Nav and Strobe Light and Lens - CHECK condition
    l. Wingtip hinge - CHECK security
    m. Aileron - CHECK movement and security
    n. Flap - CHECK security

BEFORE STARTING ENGINE

a. Preflight Inspection - COMPLETE

b. Tow Bar - IN PLANE

c. Passenger - BRIEF
   NOTE: Describe restraints, canopy, passenger flight safety information
   NOTE: Advise each person carried of the experimental nature of the aircraft [14 CFR 91.327 (d) (1)]

d. Restraints - ADJUST and LOCK

e. Fuel Selector Valve - SWITCH to FULLEST TANK

f. Parking Brake - DISENGAGE

g. Backup Power Switch - ON

h. Main Power Switch - SET to MASTER

i. Autopilot Switch - SET to ENABLE

j. Fuel Pump Switch - OFF

k. Pitot Heat Switch - OFF

l. Ext Lights Switch - SET to NAV+STROBE

m. Taxi Lights Switch - OFF

n. Landing Lights Switch - OFF

o. Flaps - UP

p. Canopy - CLOSE

q. EFIS - CURRENT DATA

STARTING ENGINE

a. Throttle Friction - ADJUST

b. Throttle - OPEN to ¼" of travel

c. Prop - HIGH RPM

COLD START ONLY

d. Mixture - RICH

e. Fuel Pump Switch - ON for 5 SECONDS

f. Fuel Pump Switch - OFF

---

g. Mixture - IDLE CUT-OFF

h. Propeller Area - CLEAR

i. Brakes - ENGAGED

j. Magneto Switches - HOLD both to START
CAUTION: Starter cranking is limited to six 10 second cranking cycles with 20 second cool down between cranking attempts, then 30 minutes cooling.

k. Mixture - MOVE slowly to RICH as engine starts

l. Throttle - OPEN to max 1,000 RPM

m. Oil Pressure - CHECK 25 psi at idle
CAUTION: After starting engine, if the oil gauge does not begin to show pressure within 30 seconds in warm weather and about 60 seconds in very cool weather, shut down engine and investigate cause. Lack of oil pressure indicates loss of lubrication, which can cause severe engine damage.

n. Main Power Switch - SET to ALT+MASTER

o. Alternator Amps - CHECK charging

TAXI

a. Weather Briefing - OBTAIN

b. Taxi Clearance - OBTAIN if required

c. Taxi Lights Switch - ON

d. Brakes - CHECK

e. Cabin Heat and Vents - AS REQUIRED

BEFORE TAKEOFF

a. Canopy Primary Latch - CHECK

b. Canopy Secondary Latch - CHECK

c. Flight Controls - FREE and CORRECT

d. Elevator and Aileron Trim - NEUTRAL

e. Altimeters (G5, G3X, Steam) - CORRECT PRESSURE

f. EFIS - PROGRAMMED

g. Fuel Selector Valve - SWITCH to FULLEST TANK

h. Mixture - RICH
NOTE: If above 3,000 ft MSL, lean to obtain maximum RPM

i. Brakes - HOLD

j. Throttle - 50-65% Power
CAUTION: Ensure oil temperature is at least 75°F before increasing power

k. Magnetos - CHECK
NOTE: 175 RPM max drop, 50 RPM max difference between mags

l. Prop - CYCLE (3X) CHECK operation

m. Engine Instruments - CHECK

n. Annunciators - CHECK NONE

o. Throttle - CHECK IDLE

p. Throttle - 1,000 RPM

q. Radio - SWITCH to TOWER/CTAF if required

r. Radio - SET standby frequency

s. Transponder - SET squawk code

t. Landing Lights Switch - SET to STEADY

u. Taxi Lights Switch - OFF

v. Ext Lights Switch - SET to NAV+STROBE

w. Pitot Heat Switch - AS REQUIRED

x. Fuel Pump Switch - ON

y. Departure - REVIEW
CAUTION: Ensure oil temperature is at least 100°F before applying takeoff power

z. Passenger - READY and willing

NORMAL TAKEOFF

a. Flaps - UP

b. Brakes - RELEASE

c. Mixture - RICH
   NOTE: If above 3,000 ft MSL, lean to obtain maximum RPM

d. Prop - HIGH RPM

e. Throttle - FULL OPEN
   NOTE: Use GENTLE and SMOOTH motion when opening throttle

f. Engine Instruments - CHECK

g. Elevator Control - HOLD weight off NOSE WHEEL

h. On Takeoff: Best Rate (V_Y) - 87 KIAS

i. Throttle - 25 in. MP

j. Prop - 2,500 RPM

k. Trim

WARNING: Due to high power and decreased cooling the Cylinder Head Temperatures (CHT) must be managed diligently during initial climb. Reduced power settings and a shallow climb will help manage these. Failure to diligently monitor these can cause damage to the engine.

SHORT FIELD TAKEOFF

a. Flaps - 10°

b. Brakes - APPLY

c. Mixture - RICH
   NOTE: If above 3,000 ft MSL, lean to obtain maximum RPM

d. Prop - HIGH RPM

e. Throttle - FULL OPEN
   NOTE: Use GENTLE and SMOOTH motion when opening throttle

f. Brakes - RELEASE

g. On Takeoff: Best Angle (V_X) - 66 KIAS
   NOTE: When clear of obstacles, transition to 87 KIAS (V_Y)

h. Throttle - 25 in. MP

i. Prop - 2,500 RPM

j. Flaps - UP

k. Trim

ENROUTE CLIMB

a. Airspeed - (V_Z) 103 KIAS

b. Throttle - 25 in. MP, or full throttle

c. Prop - 2,500 RPM

d. Fuel Pump Switch - OFF at 1,000 ft AGL

e. Fuel Pressure - CHECK

f. Mixture - LEAN above 3,000 ft MSL

g. Trim

h. Landing Lights - OFF

i. Engine Instruments - CHECK
   CAUTION: Maintain CHT < 420°F and Oil Temp < 220°F during climb.

CRUISE

a. Throttle - 23 in. MP

b. Prop - 2,300 RPM

c. Mixture - LEAN
   CAUTION: Due to higher engine compressions and tight cowling engine settings should be managed to maintain CHT < 380°F and Oil Temp < 210°F during cruise.

d. Trim

DESCENT

a. Altimeter - SET

b. Throttle - AS REQUIRED

c. Prop - AS REQUIRED

d. Mixture - RICHEN AS REQUIRED

BEFORE LANDING

a. Restraints - ADJUST and SECURE

b. Autopilot - DISENGAGE

c. Fuel Selector Valve - SWITCH to FULLEST TANK

d. Mixture - RICH

e. Fuel Pump Switch - ON

f. Ext Lights Switch - SET to NAV+STROBE

g. Landing Lights Switch - SET to WIGWAG

h. Brakes - CHECK FIRM

LANDING

a. Throttle - IDLE

b. Prop - HIGH RPM

c. Flaps - SET 20° degrees below 86 KIAS
NOTE: Momentary switch down

d. Slow to 75 KIAS approach speed

e. Throttle - 1,800 - 2,000 RPM

f. Trim

g. Flaps - FULL on Base
NOTE: Momentary switch down

h. Throttle - 1,800 RPM

i. Trim

j. Throttle - IDLE when threshold is made
NOTE: Touch down on mains, hold nose up until impossible

k. Brakes - AS REQUIRED

GO AROUND

a. Throttle - FULL

b. Climb attitude - ESTABLISH

c. Flaps - UP

d. Best Rate (V_Y) - 87 KIAS

e. Trim

AFTER LANDING

a. Flaps - UP

b. Fuel Pump Switch - OFF

c. Taxi Lights Switch - ON

d. Landing Lights Switch - OFF

e. Mixture - LEAN

f. Radio - SWITCH to GROUND if required

ENGINE SHUTDOWN

a. Flaps - DOWN

b. Throttle - IDLE

c. Prop - HIGH RPM
   NOTE: Wait for CHT decidedly dropped

d. Mixture - IDLE CUT-OFF
   NOTE: Wait for shut down

e. Magneto Switches - OFF

SECURING AIRCRAFT

a. All switches - OFF

b. Fuel Selector Valve - SWITCH to LEFT

c. Parking Brake - ENGAGE

d. Gust Lock - SECURE CONTROL STICK

e. Cockpit - ORGANIZE

f. Canopy - SECURELY CLOSE

g. Wheel Chocks - INSTALL

h. Wing and Tail Tie-Down - CONNECT

i. Pitot Tube Cover - INSTALL

PERFORMANCE

INTRODUCTION

Section 5 provides performance data, and is preliminary, based on data provided by kit manufacturer Van's Aircraft.

PERFORMANCE SPECIFICATIONS

ADVERTISED

Speed

Max at sea level	180 KTAS
Cruise, 75% Power at 8,000 ft	171 KTAS
Cruise, 55% Power at 8,000 ft	154 KTAS

Range (includes 3 gal. for taxi, takeoff & climb)f

75% @ 8,000 ft, no reserve	665 nm
55% @ 8,000 ft, no reserve	817 nm
75% @ 8,000 ft, 1 hour (10 gal.) reserve	494 nm
55% @ 8,000 ft, 1 hour (10 gal.) reserve	663 nm

Rate of climb at sea level	1,600 fpm
Service ceiling	19,500 ft
Takeoff distance	575 ft
Landing distance	500 ft

DEMONSTRATED

Speed

Cruise, 75% Power at 8,000 ft	166 KTAS
Cruise, 55% Power at 8,000 ft	138 KTAS

Range (includes 3 gal. for taxi, takeoff & climb)f

75% @ 8,000 ft, no reserve	589 nm
55% @ 8,000 ft, no reserve	791 nm
75% @ 8,000 ft, 1 hour (10 gal.) reserve	423 nm
55% @ 8,000 ft, 1 hour (10 gal.) reserve	653 nm

Rate of climb at sea level	1,600 fpm
Service ceiling	19,500 ft
Takeoff distance	575 ft
Landing distance	500 ft

OTHER

Fuel consumption:	11.0 gph@75%, 8.5 gph@65%
Oil consumption:	0.8 qph, 0.45 qph@75%, 0.39 qph@65%
Brake fluid type:	MIL-PRF-5606, MIL-PRF-83282, or equiv.
Brake fluid quantity:	Approx. 1 qt, bleed to top of reservoir
Spark Plug type:	Champion REM38E

FUEL FLOW

The following fuel flow performance data was collected during two tests in January and February 2022:

Level (0°) Attitude	**Qty (Gal)**	**Time (min)**	**Fuel Flow (GPH)**	**Req FF (GPH)**	**Fuel Flow Margin**
Right Tank	2	1:41	71.3	14.4	395%
Left Tank	2	1:40	72.0	14.4	400%
Climb (17.5°) Attitude	**Qty (Gal)**	**Time (min)**	**Fuel Flow (GPH)**	**Req FF (GPH)**	**Fuel Flow Margin**
Right Tank	2	1:42	70.6	14.4	390%
Left Tank	2	1:43	69.9	14.4	385%

NOTES

Tests performed with tank caps in place; tank vents only.

Flow measured at input to fuel servo.

Fuel flow margin is the capacity beyond maximum FF required by the engine.

Required fuel flow of 14.4 GPH per Lycoming Operation and Installation Manual 60297-36 (2700 RPM, 180 HP, 86.7 LB/HR, 6 LB/gal)

FUEL CONSUMPTION

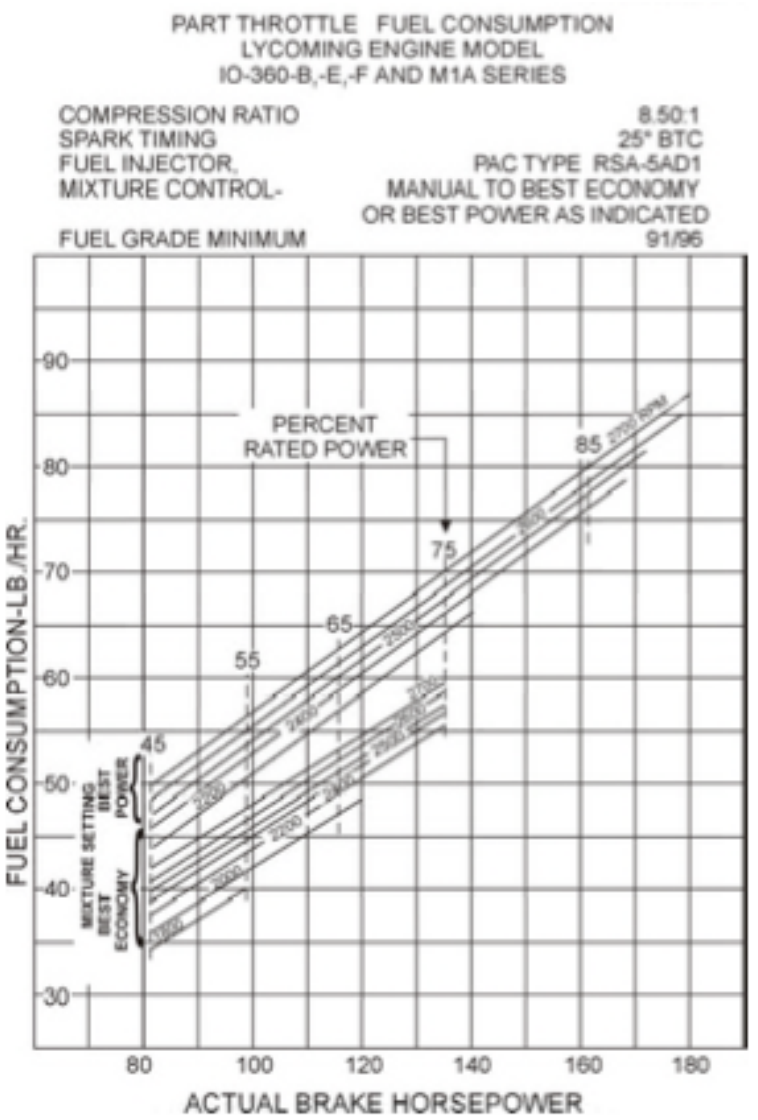


Figure 5.1: Fuel Consumption (Lycoming IO-360)

WEIGHT AND BALANCE

INTRODUCTION

This section describes the procedure for establishing the basic empty weight and moment of the aircraft. Sample forms are provided for reference. Procedures for calculating the weight and moment for various operations are also provided.

AIRCRAFT WEIGHING PROCEDURES

1. Preparation:
    a. Inflate tires to recommended operating pressures.
    b. Drain all usable fuel from the fuel tanks.
    c. Ensure the oil sump is filled to 8 US quarts.
    d. Remove all items from baggage area and cockpit.
    e. Raise flaps to the fully retracted position.
    f. Place all control surfaces in the neutral position.
2. Levelling:
    a. Place scales under each wheel (minimum capacity, 500 lbs.).
    b. Place shims under main wheels as necessary to level aircraft.
    c. Close and lock the canopy.
3. Weighing:
    a. With the aircraft level, record weight shown on each scale. Deduct the tare weight from each reading.
4. Measuring:
    a. Drop a plumb bob from the wing leading edge in front of each main gear and mark the floor. Measure 70 inches forward of this line and mark the floor for the location of the datum.
    b. Measure the distance from the datum (parallel to the aircraft center line) to each main wheel center.
    c. Measure the distance (along the aircraft center line) from the datum to the center of the nose wheel axle.
5. Using weights from item 3 and measurements from item 4, the aircraft weight and C.G. can be determined.
6. Basic Empty Weight may be determined by summing the weights obtained from item 3.

EMPTY WEIGHT AND C.G.

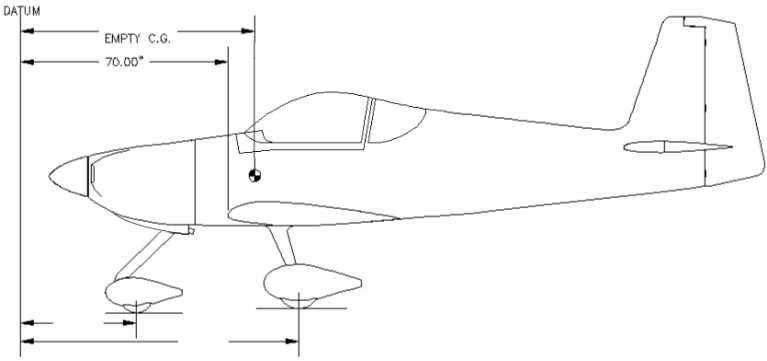


Figure 6.1: RV-7A Datum Measurements

	WEIGHT	ARM	MOMENT
Right wheel	424 lbs	93.96 in	39842.75
Left wheel	422 lbs	93.96 in	39654.8125
Nose wheel	313 lbs	41.875 in	13106.875
Empty Weight	1,159 lbs		92604.4375
Empty C.G.	79.90 in		

Figure 6.2: N12VD initial Weight and Balance

WEIGHT AND BALANCE

The following information will explain how to load and operate the aircraft so that the weight and center of gravity remain with the prescribed limits. The weight and balance is determined as follows:

1. Take the basic empty weight and moment from the appropriate weight and balance records and enter them in the Loading Problem.

NOTE

In addition to the basic empty weight and moment noted on the these records, the C.G. arm (fuselage station) is also shown, but need not be used on the Loading Problem.

2. Use the Loading Graph to determine the moment for each additional item to be carried, then list these on the loading problem.

NOTE

Loading Graph information for the pilot, passenger, and baggage is based on the load being located in the center of these areas, as shown on the Loading Arrangements Diagram.

3. Total the weights and moments and plot the values for zero fuel on the Center of Gravity Moment Envelope to determine whether the point falls within the envelope.
4. Add the fuel weight and moment and plot the values for the loaded aircraft on the Center of Gravity Moment Envelope to determine whether the point falls within the envelope.

ITEM	WEIGHT (lb)	MOMENT	ARM (in)
Empty Aircraft	1,159	92604.4375	
Fuel (6 lbs./gal.)			80.00
Pilot			97.48
Passenger			97.48
Baggage Area			126.78
TOTAL			
C.G. $\frac{\text{Total moment}}{\text{weight}}$			

Figure 6.3: Loading Problem

WEIGHT AND BALANCE RECORD

(Continuous History of Changes in Structure or Equipment Affecting Weight and Balance)

DATE	In	Out	DESCRIPTION OF ARTICLE OR MODIFICATION	ADDED WEIGHT (+)			REMOVED WEIGHT (-)			RUNNING EMPTY WEIGHT	
				Wt. (lb.)	Arm (in.)	Moment	Wt. (lb.)	Arm (in.)	Moment	Wt. (lb.)	Moment

Figure 6.4: Weight and Balance Record

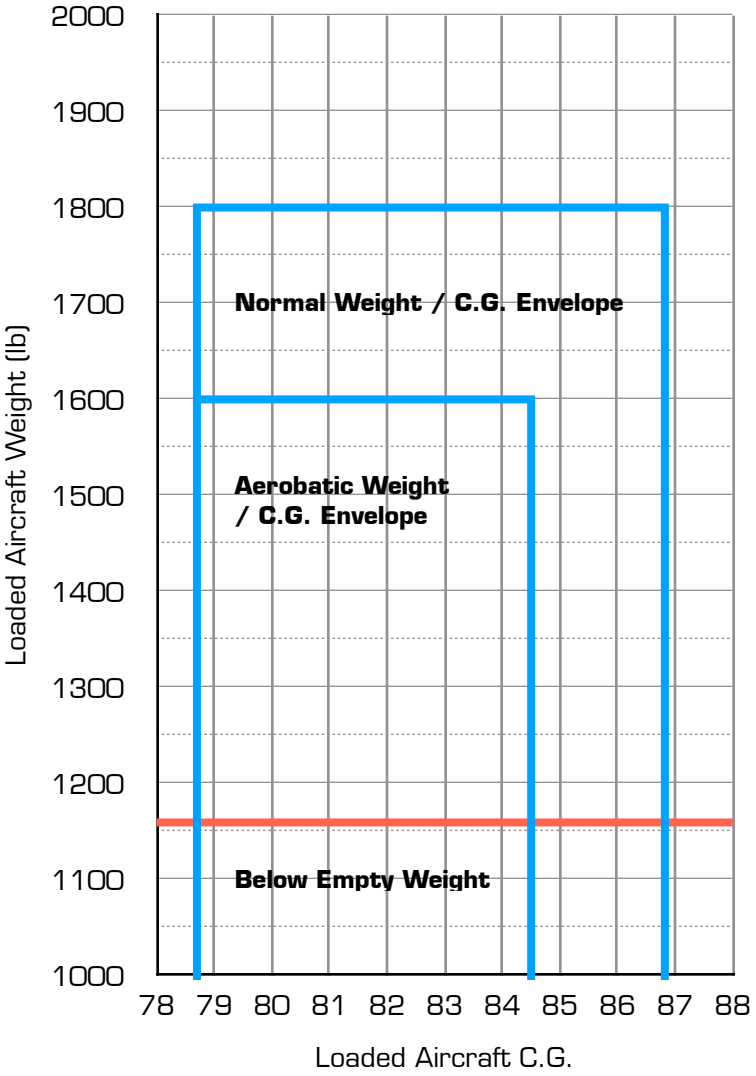


Figure 2.2: Center of Gravity Limits

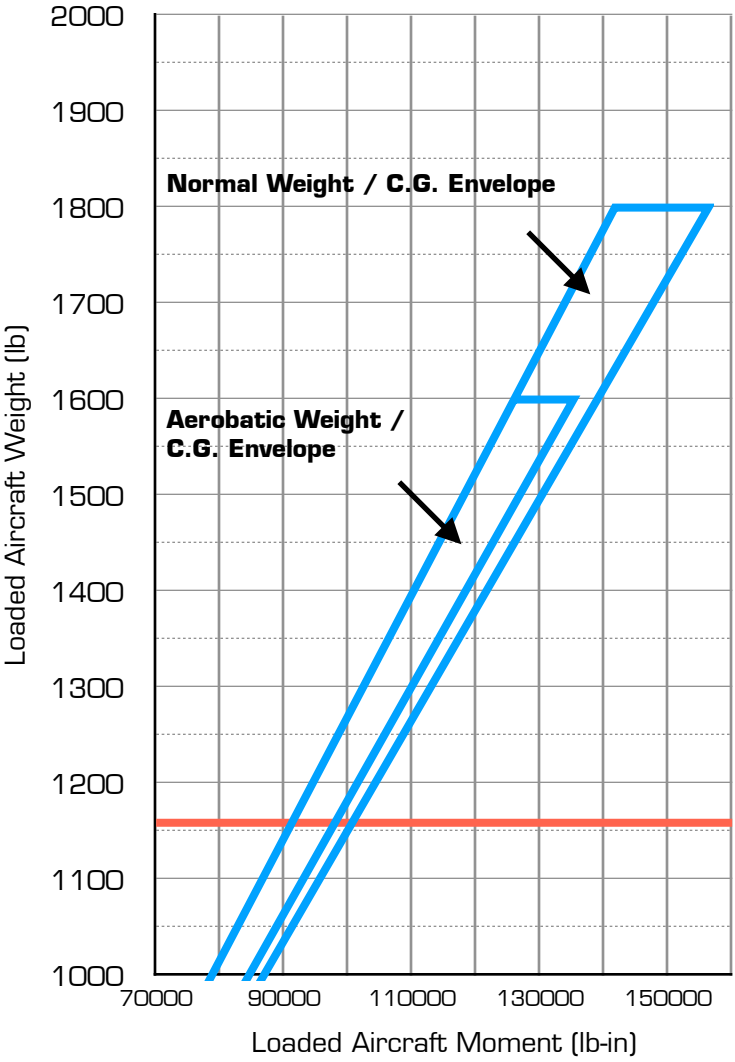


Figure 6.5: C.G. Moment Envelope

SYSTEMS INFORMATION

INTRODUCTION

Section 7 provides description and operation of the aircraft and its systems.

AIRFRAME

The airframe is aluminum alloy construction except for steel components comprising: engine mount, landing gear, landing gear mounts, elevator control horns and other miscellaneous items. The tips of the wings and tail surfaces as well as cowling, landing gear fairings, empennage fairings are fabricated from fiberglass. The canopy is a single sheet of plexiglass, divided into a fixed aft window and tip-up forward windscreen. Light auto filler or fiberglass filler may be used to correct minor cosmetic blemishes.

FLIGHT CONTROL SYSTEM

The aircraft's flight control system consists of conventional aileron, rudder, and elevator control surfaces. Elevator and ailerons are operated through a system of adjustable push rods. The rudder is operated through a cable system to the rudder pedals. Dual controls are fitted. The passenger's control stick is removable via a button on the base of the stick.

TRIM SYSTEM

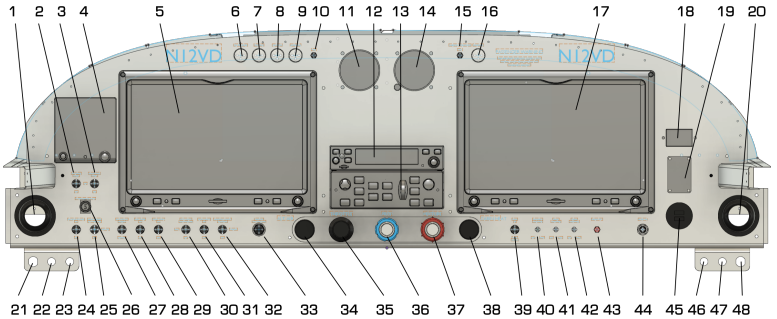
Pitch trim is controlled by a single tab on the left elevator actuated by an electric servo. Roll trim is by a spring bias system actuated by an electric servo located in the center tunnel between the seats. Pitch and roll trim are selected by a set of four switches on the pilot's and passenger's control stick grips. Trim positions are read and displayed on the EFIS.

WING FLAP SYSTEM

Flaps are operated electrically and are controlled by a switch on the pilot's control stick grip and a FLAPS switch mounted to the right of the engine control knobs. The flaps are actuated by a motor positioned between the seats. The flap position is read and displayed on the EFIS. Additionally, flap limit sensors are installed which cut off power to the flap motor when flaps are at their full up and full down positions.

INSTRUMENT PANEL

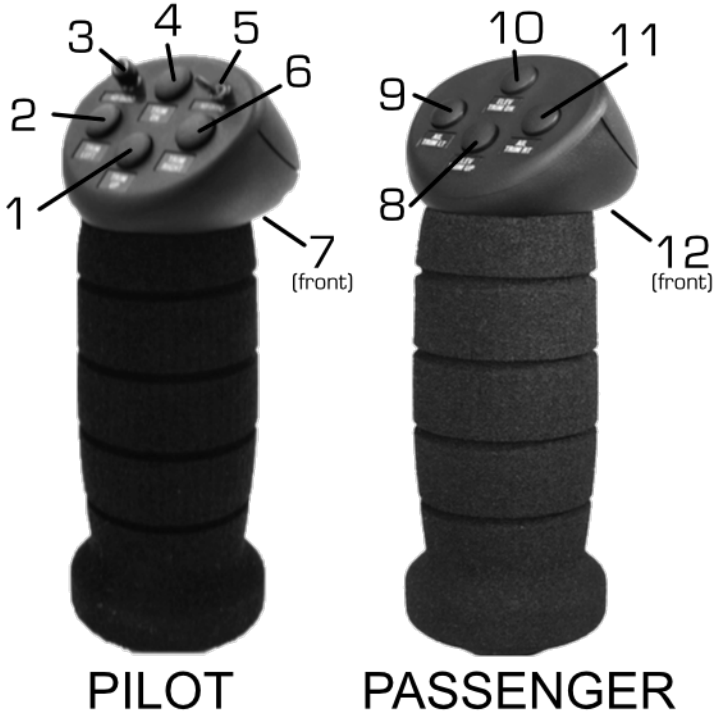
The instrument panel houses two side-by side Electronic Flight Information Systems (EFIS), consisting of a 10" primary flight display located in front of the pilot and 10" secondary flight display located in front of the passenger. MASTER CAUTION, MASTER WARNING, OIL PRESSURE and VOLTAGE annunciator lights are located on the panel above the primary flight display. A pushbutton located next to these annunciator lights can be used to test these lights. Backup airspeed and altimeter gauges are located on the top-center of the panel. A Carbon monoxide (C.O.) detection indicator light is located on the panel above the secondary flight display. A pushbutton located next to this light can be used to test the C.O. detection system. A backup flight instrument is mounted on the pilot side of the panel and can be used in the event of failure of the primary EFIS. Magneto/starter switches are located below the backup flight instrument. The alternator field circuit breaker is located below the magneto/starter switches. A "hobbs" hour meter is installed on the passenger side of the panel and is activated by positive oil pressure (greater than 4 PSI) read from a pressure-activated switch mounted on the engine side of the firewall. The E.L.T. control panel is located below the hour meter. A USB charging system is located below the E.L.T. control panel. The center stack consists of the single comm radio and an autopilot controller. The throttle, propeller, and mixture controls are located on the bottom center of the panel. Engine alternate air and cabin heat controls are located on either side of the engine controls. Various other switches, knobs, and buttons used to control the aircraft's systems are located towards the bottom of the panel, on both sides. Headset jacks (both traditional and LEMO style) are located below the panel, next to the sides of the aircraft.



1. Fresh air vent
2. Left magneto/ starter switch
3. Right magneto/ starter switch
4. Backup flight instrument
5. Primary Flight Display
6. Oil Pressure light
7. Low Voltage light
8. EFIS Caution light
9. EFIS Warning light
10. Annunciator test button
11. Backup airspeed indicator
12. Comm radio
13. Autopilot controller
14. Backup altimeter
15. C.O. detector test button
16. Carbon Monoxide detector light
17. Secondary Flight Display
18. Hobbs hour meter
19. E.L.T. control panel
20. Fresh air vent
21. Pilot LEMO headset jack
22. Pilot microphone jack
23. Pilot headphone jack
24. Backup Power switch
25. Main Power switch
26. Alternator Field circuit breaker
27. Autopilot Enable switch
28. Fuel Pump switch
29. Pitot Heat switch
30. External Lights switch
31. Taxi Lights switch
32. Landing Lights switch
33. Takeoff/Go-around button
34. Alternate Air control
35. Throttle control
36. Prop RPM control
37. Mixture control
38. Cabin Heat control
39. Flaps control switch
40. Avionics lighting knob
41. Panel lighting knob
42. Cabin lighting knob
43. Passenger push-to-talk button
44. Music input jack
45. USB charger
46. Passenger headphone jack
47. Passenger microphone jack
48. Passenger LEMO headset jack

STICK GRIP SWITCHES

The pilot control stick grip is a Ray Allen G407 model with a PTT switch, four SPST buttons, an auxiliary button and auxiliary SPDT switch. The passenger control stick grip is a Ray Allen G405 model with a PTT switch and four SPST buttons.



1. Trim Up button
2. Trim Left button
3. Autopilot Disconnect button
4. Trim Down button
5. Flap control switch
6. Trim Right button
7. Pilot PTT button
8. Trim Up button
9. Trim Left button
10. Trim Down button
11. Trim Right button
12. Passenger PTT button

GROUND CONTROL SYSTEM

Effective ground control while taxiing is accomplished through differential braking. Note: This aircraft does not provide nose wheel steering. Care must be taken during taxiing to keep weight off the nose wheel. This is typically accomplished by applying full nose-up elevator input during taxiing. Moving the aircraft by hand is most easily accomplished by attaching a tow bar to the large socket head screws accessible through holes in the nose wheel fairing. Do not push the vertical or horizontal surfaces, fiberglass fairings or any control surface to move the aircraft on the ground.

LANDING GEAR

The landing gear is a tricycle configuration with steel landing gear legs. The nose wheel is free castering and set to 26 lbs of breakout force. The engine mount/nose gear assembly consists of a mount that accepts a pivoting nose gear arm, which articulates at the base of the mount and is attached using elastomer discs and retention hardware. The nose wheel tire is size 5.00-5 and is 6-ply. The main gear tires are size 11x4.00-5 8-ply. All three tires are inflated to 35 PSI.

BRAKE SYSTEM

The brake system consists of toe brakes attached to both the pilot and passenger side rudder pedals operating two brake master cylinders. The left and right brake master cylinders share a common fluid reservoir installed on the top right forward face of the firewall. A parking brake is installed inline to the system, and a control cable located on the left side of the cabin below the air vent. The parking brake is engaged by applying and holding the brakes while pulling the parking brake control cable. The status of the parking brake is read and displayed on the EFIS. The brake system is filled with approximately 1 quart of Royco 782 brake fluid.

ENGINE AND PROPELLER

The aircraft is powered by a Lycoming YIO-360-M1B, 4 cylinder, fuel injected, horizontally opposed, direct drive, air cooled engine rated at 180 BHP. Ignition is provided by a conventional dual Slick magneto system, model 4370. Each magneto is activated by a switch on the panel. LEFT MAG for the left magneto and RIGHT MAG for the right magneto. The magneto is active when set to the ON position, and grounded when set to the OFF position. Both magnetos are cooled by air ducted from the baffling. The starter is a Sky-Tec model 149-12LS. The starter is engaged by simultaneously holding both magneto switches to the START position. The engine incorporates a mechanical fuel pump and a horizontal induction system. The exhaust system is a crossover configuration with no mufflers. Cooling air positive pressure is produced by an aluminum baffle system and rubber seals which seal against the top cowl. Oil temperature is maintained by an oil cooler mounted onto the baffling aft of the #4 cylinder. Oil pressure is measured by a transducer on a manifold mounted to the firewall, and read and displayed on the EFIS. An annunciator light on the panel will activate if oil pressure is not greater than 4 PSI. Oil temperature is measured by a probe installed in the engine, and read and displayed on the EFIS. Engine manifold pressure is measured by a transducer on a manifold mounted to the firewall, and read and displayed on the EFIS. Engine RPM is measured by a tachometer installed in the engine, and read and displayed on the EFIS. Cylinder head temperature for each cylinder is measured by engine mounted probes and read and displayed on the EFIS. Exhaust gas temperature are measured by probes installed in each exhaust pipe and are read and displayed on the EFIS. Two auxiliary temperature sensors are available to measure temperature inside the engine compartment, which are read and displayed on the EFIS.

ENGINE CONTROLS

Engine controls consist of throttle, propeller, mixture, and alternate air door. The throttle, propeller and mixture controls are pull cables centrally located in between the pilot and passenger positions. The alternate air door push-pull control is mounted to the left of the engine controls.

PROPELLER

The engine drives a Hartzell HC-C2YR-1BFP 72 in. two-blade constant speed propeller. The propeller is capable of blade angles between a low positive pitch and high positive pitch. A pilot-controlled prop governor supplies hydraulic oil pressure to set the blade pitch.

PITOT STATIC SYSTEM

The pitot system provides pitot ram pressure and angle-of-attack (AOA) to the ADAHRS. The heated pitot tube is located under the left wing, outboard of the aileron bellcrank. The pitot heat, unregulated and powered from the Main Bus, is controlled by the PITOT HEAT switch on the panel. The static pressure ports are on both sides of the rear of the fuselage. Pitot and static pressure are also routed to an altimeter and airspeed indicator on the panel, and to a backup flight instrument mounted on the panel.

CANOPY LATCHING SYSTEM

The canopy is secured closed using a latch on the pilot side of the aircraft. To close the canopy, push the round end of the aft handle forward and lock it in place against the forward spring-loaded catch. To open the canopy, push the forward spring-loaded catch such that it releases the aft handle, then pull the handle aft. A secondary latch on the top-aft part of the canopy provides extra security. To close, pull the handle downward and rotate under the roll bar. To open, rotate the handle such that it is parallel with the roll bar. The secondary latch is spring loaded to prevent accidental engagement while outside of the aircraft. The open status of the canopy is read and displayed on the EFIS.

FUEL SYSTEM

Fuel is stored in two 21 US gallon tanks secured to the leading edge of the left and right main wing spars and wing skins. Fuel drains are fitted to the lowest point of each tank and should be opened prior to the first flight of the day and after each refueling to check for sediment and water. Both tanks are fitted with inverted fuel pickups, which are weighted lengths of flexible line.The wing tank fuel is routed to the fuel selector valve which is located on the center tunnel in between the pilot and passenger positions. A knob on the valve handle must be lifted to change the selection to or from the OFF position. Left/Right may be selected without lifting the lever. Fuel that leaves the selector valve is routed to the fuel filter which is located in the center tunnel. Fuel then flows through an electric pump which is used during takeoff and landing. The pump is controlled by a FUEL PUMP switch on the panel and operates at 26-32 psi. On the engine side of the firewall, fuel flows to the engine driven pump. From the pump outlet, fuel flows to the servo and then up to the fuel flow transducer on top of the engine. Fuel also flows to a manifold on the upper left firewall which houses the fuel pressure transducer. The fuel flow and pressure transducers are read by and displayed on the EFIS. Fuel quantity is measured by a pair of capacitive plates installed inside each fuel tank. The quantity signals are processed by converter units mounted on the sub-panel, and the processed voltage is read and displayed on the EFIS.

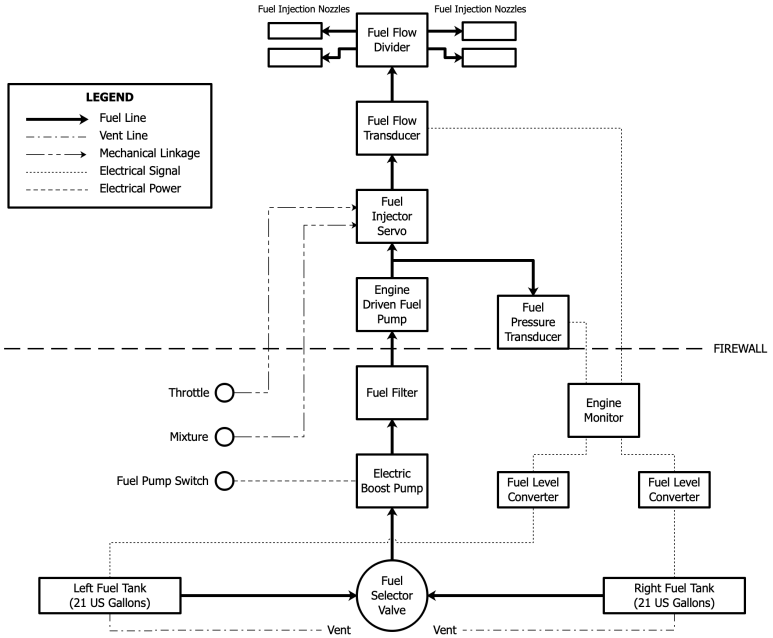


Figure 7.1: Fuel System

ELECTRICAL SYSTEM

The power distribution system consists of a 16 amp hour PC680 battery, a 6 amp hour backup battery, a main bus, a battery backup bus, a keep-alive bus, and an always-on bus. See schematic diagrams for details on the electrical system.

ALTERNATOR

The engine is fitted with a 40 amp 14 volt main alternator. This battery is charged by the alternator. Alternator field power is activated by switching the MAIN POWER switch on the panel to MASTER+ALT. The alternator field circuit is also protected by a resettable circuit breaker on the panel. The alternator is paired with an external voltage regulator, with over-voltage protection which opens the circuit breaker if main voltage rises past 16.25 volts. OV protection is tested by pushing the OV TEST button on the sub panel. OV protection should not be tested in flight! Alternator output current is measured by an ammeter mounted on the firewall, and read and displayed on the EFIS.

GROUND POWER

For ground operations, power can be provided through a socket located under the cowl next to the oil fill tube. A GROUND POWER switch on the sub-panel enables this socket. Two USB sockets are available on the panel for supplying 5V electrical power to peripheral devices.

FUSES

All devices powered by the main bus are protected by fuses installed in one of four Blue Sea 5046 ST Blade Compact Fuse Blocks.

Fuse Block 1		Fuse Block 2		Fuse Block 3		Fuse Block 4	
Device	**Fuse**	**Device**	**Fuse**	**Device**	**Fuse**	**Device**	**Fuse**
Pitot Heat	10A	Starter	7.5	Battery BU	5A	Flap Servo	10A
Fuel Pump	10A	Comm	7.5	XM Receiver	3A	Keep Alive	5A
Landing Lights	10A	Panel USB	5A	EMS	3A	Electronics	3A
Strobe Lights	10A	PFD	3A	CO & Audio	3A	ADAHRS	3A
Nav Lights	5A	MFD	3A	Voltage Reg.	3A	GPS	3A
Taxi Lights	5A	G5	3A	Internal Lights	3A	Magnetometer	3A
Pitch Servo	3A	Autopilot	3A	Pitch Trim	3A	Transponder	3A
Roll Servo	3A	Headsets	3A	Roll Trim	3A	Aft Power	5A

Figure 7.2: Fuse block description

ELECTRICAL BUSSES

The battery is connected to the main bus via the main battery solenoid, which is activated by switching the MAIN POWER switch on the panel to either MASTER or MASTER+ALT. Main bus electrical load is measured by an ammeter mounted on the firewall, and read and displayed on the EFIS. An annunciator light on the panel will activate when main voltage drops below 12.7 volts. The backup battery is installed on the forward avionics shelf. It is enabled by the BACKUP POWER switch on the panel, and should be enabled during all phases of flight. It provides power to critical systems during cranking and when the main voltage drops below 11 volts. A keep-alive circuit provides power to secondary systems during cranking only. The always-on bus is directly connected to the battery, through an inline 3A fuse, and is always energized.

Device	Main Bus	Backup Power	Keep-Alive	Always-On
Engine Monitor	✓	✓		
Primary Flight Display	✓	✓		
Comm Radio	✓	✓		
ADAHRS	✓	✓		
GPS	✓	✓		
Magnetometer	✓	✓		
Transponder	✓	✓		
Multi-Function Display	✓		✓	
Standby Display	✓		✓	
AFCS Controller	✓		✓	
Cabin courtesy Light	✓			✓
Hobbs Hour Meter	✓			✓
Fuel Pump	✓			
Pitch and Roll Trim	✓			
Flaps	✓			
Pitot Heat	✓			
Autopilot Servos	✓			
Internal and External Lights	✓			
XM Receiver	✓			
Panel USB Charger	✓			
Cabin Camera	✓			

Figure 7.3: Devices powered by each electrical bus

CABIN LIGHTING

Cabin lighting is provided through three dimmable circuits. EFIS and radio lighting can be dimmed with the AVIONICS LIGHTING knob on the panel. An LED strip attached to the underside of the glare shield provides panel lighting, and can be dimmed with the PANEL LIGHTING knob on the panel. An LED strip in the footwell provides cabin lighting, and can be dimmed with the CABIN LIGHTING knob. Lights above the baggage compartment provide additional cabin lighting. These lights are controlled with a switch next to the upper canopy latch. The switch middle position turns the lights on, while the main bus is energized. The switch left position operates the light as a "courtesy" light and remains on for two minutes after the main bus is deactivated.

EXTERNAL LIGHTING

Landing and taxi lights are mounted in the leading edges of both wings behind plexiglass lenses. Each light cluster consists of three landing lights aimed forward, and a single taxi light angled downward. The landing lights are activated by setting the LANDING LIGHTS switch on the panel to STEADY. The landing lights also have a "wig wag" function, which is activated by setting the LANDING LIGHTS switch on the panel to WIGWAG. The taxi lights are activated by setting the TAXI LIGHTS switch on the panel to ON. Position lights are mounted in both wing tips behind plexiglass lenses and on the aft edge of the vertical stabilizer. Position lights are activated by setting the EXT LIGHTS switch on the panel to NAV or NAV+STROBE. Strobe lights are mounted in both wing tips behind plexiglass lenses. Strobe lights are activated by setting the EXT LIGHTS switch on the panel to NAV+STROBE. A control board mounted below the passenger's seat facilitates control of landing lights, position lights and strobe lights.

HEATING AND VENTILATION

Cabin heat is provided via a heat muff attached to the #1 exhaust pipe and fed with high pressure air taken from the baffling. The heated air is ducted through the firewall into the center tunnel to the cabin footwell. The CABIN HEAT pull cable on the panel controls the operation of this duct. Ventilation air is supplied from two NACA inlets located on the sides of the fuselage forward of the canopy. The inlets are ducted to eyeball vents on the left and right sides of the instrument panel.

SEATS

The aircraft's seating arrangement consists of two side-by-side seats, for the pilot and passenger. The seats consist of the cabin floor and upright seat backs attached to the floor with two hinges per seat. Each seat can be moved forward and aft by removing the seat cushions, removing the two hinge pins securing the seat back to the cabin floor, and moving the seat back to one of three rows of hinges. The seats' recline angles can also be adjusted using the metal support behind the seat back.

BAGGAGE COMPARTMENT

The single baggage compartment is located aft of the seats. The compartment may be loaded up to a maximum of 100 lbs.

CABIN CAMERA

A cabin camera is mounted below the aft window, facing forward. Intercom audio input is supplied to the camera, and a video signal outputs from the camera for preview display on the passenger side EFIS.

AVOINICS

This aircraft is equipped with a Garmin G3X Electronic Flight Instrument System (EFIS), consisting of two main displays, a standby display, a single radio/intercom, an autopilot system controlling pitch and roll, a transponder providing Mode S ES ADS-B "Out", and a WAAS GPS receiver. Connected to the EFIS system are several supporting electronic devices: A Air Data Attitude Heading Reference System (ADAHRS), magnetometer for compass direction, temperature probe, engine information unit, and an electronics/flap/lighting controller. All system communication is handled through CANbus and RS-232 connections. See system schematics for detailed connectivity information.

MAIN DISPLAYS

Two 10.6" displays are installed side-by-side in the panel, in front of each occupant. Each display is operated via two dual-control knobs on each side, a number of buttons, and a touch-sensitive screen. Each display can display flight instruments, engine instruments, moving map, traffic, checklists, weather, and an abundance of airport and navigation information. For detailed information on the operation of these devices, see the manufacturer's documentation.

Garmin GDU 470 Display

STANDBY DISPLAY

A 3.5" standby display is installed to the left of the pilot's main display. In the case of aircraft power loss, the battery back-up sustains this flight display with up to 4 hours of emergency power The display can be used as a primary EFIS attitude indicator, or Directional Gyro / Horizontal Situation Indicator (DG/HSI) display, or as a fully integrated back-up flight instrument. For detailed information on the operation of this device, see the manufacturer's documentation.

Garmin G5 Standby Display

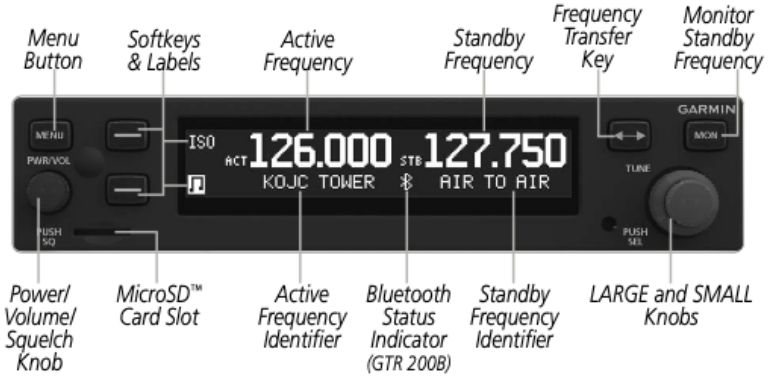
ENGINE, ELECTRONICS, AND SYSTEM CONTROL

Sensing and control of engine and other systems are managed by an engine management computer mounted on the forward avionics shelf. The engine management computer reads the following sensors: fuel level, trim position, flap position, fuel flow, fuel pressure, manifold pressure, oil pressure, oil temperature, CHT and EGT, alternator output current, main bus electrical load, main bus and backup battery bus voltage, tachometer, two auxiliary engine compartment temperature sensors, battery backup status, C.O. detector status, starter engagement status.

External sensing and control of electronics systems are managed by an electronics adapter mounted below the pilot's seat. The electronics adapter reads and controls the following sensors and systems: stall warning status, parking brake status, canopy open/closed status, flap up/down limit sensors, cabin lighting and dimming, landing light operation, stick grip inputs, pitch and roll trim operation, and flap operation.

RADIO/INTERCOM/AUDIO

A single COM radio is mounted in the center stack on the panel. The COM antenna is mounted on the underside of the aircraft near the left gear leg. Radio frequencies can be tuned from the physical radio device or from the EFIS. The radio also contains an intercom to enable cabin conversation. Radio voice transmission is activated by Push To Talk (PTT) buttons on both control stick grips, and by a RADIO PTT button on the panel. An XM radio/ weather receiver is installed on the forward avionics shelf, allowing the receipt and playback of music through the intercom. The XM antenna is mounted on the glare shield and connects to the receiver through a bulkhead connector on the sub-panel. XM weather is displayed on the EFIS. Alternatively, music can be supplied by the passenger through the MUSIC IN 1/4" barrel socket on the panel. Headset jacks are located on the lower left and right sides of the panel. Both barrel sockets and LEMO-style plugs are available. For detailed information on the operation of this device, see the manufacturer's documentation.



Garmin GTR 200B Radio

ATTITUDE/ORIENTATION

The aircraft is equipped with a single Air Data Attitude Heading Reference System (ADAHRS) mounted in the tail. Outside air temperature is measured by a probe attached to the aft right access plate on the tail, under the empennage, and supplied to the ADAHRS. A solid state magnetometer is mounted to the aft deck below the vertical stabilizer, supplying magnetic heading information to the ADAHRS.

AUTOPILOT

An autopilot controller is mounted in the center stack on the panel, which controls the autopilot system. A pitch autopilot servo is mounted in the mid-fuselage, attached to the elevator pushrod system. A roll autopilot servo is mounted in the right wing behind the outboard access panel, attached to the aileron pushrod system. The autopilot servos are powered by the AUTOPILOT switch on the panel. When set to ENABLE, power to the servos is energized, and when set to DISABLE, power is removed. A remote AP DISCONNECT button on the pilot's control stick grip allows for quick disengagement of the autopilot. A TAKEOFF/GO AROUND button on the panel selects the flight director Takeoff (on ground) or Go Around (in air) mode. For detailed information on the operation of this device, see the manufacturer's documentation.

Garmin GMC 507 AFCS Mode Controller

STALL WARNING

In addition to the Angle of Attack (AOA) indication on the EFIS, a mechanical stall warning switch is installed on the leading edge of the left wing, which is indicated aurally and on the EFIS.

GPS

The aircraft is equipped with a WAAS GPS receiver, mounted in the left side of the tail, aft of the baggage compartment. The GPS receiver meets WAAS/SBAS position source requirements for ADS-B "Out" and provides that signal directly to the ADS-B transponder. The GPS antenna is located on top of the aircraft, aft of the canopy. Three alternate GPS antennas are located on the glare shield and provide backup GPS signals to the EFIS and backup flight instrument.

TRANSPONDER

The aircraft is equipped with a Mode S ES ADS-B "Out" transponder, and dual-link ADS-B "In" receiver, mounted in the left side of the tail, aft of the baggage compartment. The ADS-B "Out" function transmits on 1,090 MHz and the ADS-B "In" function receives on both 978 MHz and 1,090 MHz. The unit reads both TAS/TCAS traffic and weather information, which is displayed on the EFIS.

SAFETY SYSTEMS

SEAT BELTS

Both seat positions are equipped with five point harnesses consisting of a shoulder harness, lap belts and a crotch strap. The seat belts latch by inserting each buckle into the central Kam Lock. Each belt can be adjusted for fit and comfort. To unlatch the seat belt, rotate the handle on the central Kam Lock in either direction.

E.L.T.

The aircraft is equipped with an Emergency Locator Transmitter (E.L.T.) mounted in the right side of the tail, aft of the baggage compartment. The E.L.T. transmits on 406 MHz and 121.5 MHz frequencies while providing GPS position accuracy. A panel-mounted remote switch assembly includes a status LED and control switch. The switch allows the operator to manually activate and reset the E.L.T. for testing The self-test checks certain critical functions in the beacon. Results of the test are displayed by a series of indications (flash codes), where the status LED, remote switch LED and buzzer(s) activate for 1/2 second ON, followed by 1/2 second OFF. See the E.L.T. manufacturer's documentation for details on testing this device.

CARBON MONOXIDE DETECTOR

A carbon monoxide detector is installed on the forward avionics shelf, which provides an aural indication and illuminates a panel light when dangerous levels of carbon monoxide are present. The carbon monoxide detector can be tested by pressing the CARBON MONOXIDE TEST button on the panel. The following two tests can be conducted:

Test 1: PRESS and HOLD the button, RELEASE the button when the LED begins to flash RED and GREEN. Confirm the following occurs:

- The Red LED should flash for 20 seconds.
- "Danger Carbon Monoxide" will be played over the audio system.
- The EFIS should report a CO warning and a level of 500PPM for 20 seconds.
- The "RLY" connection will be connected to ground (pulled low).

Test 2: PRESS and RELEASE the button to perform the following tests:

- The green LED should flash several times.
- If Test 1 is in progress, the EFIS warning will be cancelled and the RLY switch connection will be opened.

FIRE EXTINGUISHER

A 1.4 lb Halotron Class B/C Fire Extinguisher is installed between the seats. See Emergency Procedures for activation instructions and cautionary notes.

AIRPLANE HANDLING, SERVICE & MAINTENANCE

INTRODUCTION

Section 8 describes ground handling, service, and maintenance for this aircraft.

GROUND HANDLING

Ground motion is best accomplished by pushing or pulling on the propeller as near to the spinner as possible. The following are recommended additional pushing locations to help move the airplane:

- Moving forward: Canopy deck (canopy open).
- Moving rearward: Wing leading edges and roots of horizontal stabilizer.

A suitable tow-bar may be fitted over the bolts on the nose wheel axle, under the wheel fairing. The tow bar must only be used for steering. Do not pull the aircraft using the tow bar.

Wing tie down mounting points are located centrally under each wing. Use a 3/8" diameter x 16 TPI eyebolt to attach tie down rope to airplane. Secure a third line to the tail tie down.

COWLING REMOVAL

The upper cowl must be removed first. First, remove the six screws inside the front air inlets near the spinner. Next, remove the cowl hinge pin covers near the front air inlets. Then, remove the hinge pins securing the upper cowl to the lower cowl. Open the oil dipstick access door to provide access to the aft upper cowl hinge pins. Unhook and remove each aft upper cowl hinge pin. The upper cowl slides upward to remove.

To ease removal of the lower cowl, remove the six screws securing the cowl baffle material to the front air inlets, and remove the baffle material. Next, remove six screws holding the front nose gear plate to the lower cowl, and the four screws holding the aft nose gear plate to the lower cowl. Remove both plates. Remove the six screws securing the lower cowl to the fuselage. Finally, remove the left and right aft hinge pins. The lower cowl slides downward to remove. Take care to not damage the nose gear fairing during removal.

GEAR FAIRING REMOVAL

The wheel fairings must be removed first. All three fairings have front and aft sections. Remove the front sections first, then remove the aft sections. The main gear aft fairings are attached to each axle with a bolt that must be safety wired when re-assembled. After the wheel fairings are removed, remove the three screws and two bolts on each of the intersection fairings, and then remove the intersection fairings. Remove the two screws and one bolt holding the nose gear fairing to the nose gear. Remove the hinge pin holding the nose gear fairing halves together and then remove the nose gear fairing. Loosen the hose clamps securing the main gear leg fairings to the main gear legs. Remove the hinge pins holding the main gear fairing halves together and then remove the main gear fairings.

INSPECTION PANELS

In addition to the engine cowling, the aircraft has a number of inspection and access panels:

1. Oil dipstick access door on aft right side of upper cowl.
2. Avionics access panels on the top forward skin, forward of the canopy.
3. Three under-wing inspection panels on each wing provide access to fuel tank securing bolts, aileron bellcranks, pitot plumbing, wingtip wiring and roll servo.
4. Stall warn hardware access panel under the left wing leading edge.
5. Rear fuselage inspection panels on each side of the fuselage provide access to the elevator horns.
6. The empennage fairing is removable to provide access to the magnetometer. Remove screws and slide forward/upward.
7. Baggage compartment aft wall is removable, providing access to the rear fuselage.
8. Access panels in the baggage compartment provide access to the flap pushrods.
9. The upright between the seats is removable to provide access to the flap motor.
10. The seat floors are removable to provide access to the aileron pushrods, wiring, and avionics.
11. The wing tips are removable with hinges that slide aft.

INITIAL INSPECTIONS

The following inspections are required following first flight:

After first Flight

1. Complete firewall forward detailed visual inspection.
2. Check alternator belt tension (13 ft lbs per Lycoming SI-1129D).
3. Complete airframe visual detailed inspection.

10 Hours

1. Change oil, cut open oil filter and inspect, and inspect suction screen. Look for metal particles, shavings or flakes. Info from Lycoming SB-480.
2. Re-torque landing gear bolts.
3. Complete items from Condition Inspection, except for oil change, propeller lubrication, ELT.

25 Hours

1. Check alternator belt tension (13 ft lbs per Lycoming SI-1129D).

35 Hours

1. Change oil, cut open oil filter and inspect, and inspect suction screen. Look for metal particles, shavings or flakes. Info from Lycoming SB-480.
2. Complete items from Condition Inspection, except for oil change, propeller lubrication, ELT.

PERIODIC MAINTENANCE

This section includes all items specified in the Lycoming Owner's Manual and Hartzell Propeller Owner's manual. TBD: Add items from Slick mag service info. It is supplemented by recommendations from Van's Aircraft, other RV owners, and engineering judgement.

50 Hours or 4 months

The following items should be performed every 50 hours, or four months, whichever comes first:

1. Drain oil sump with oil hot. Send sample for analysis (see Lycoming Service Letter No. 171).
2. Replace oil filter. Cut open & inspect.
3. Inspect & clean suction oil screen.
4. Check & record brake fluid level.
5. Check integrity of:
    A. Fuel & oil hoses.
    B. Ignition system.
    C. Exhaust system & attachment hardware.
    D. Cylinders: check for oil leak at rocker box covers, and check for signs of overheating (burned paint).
    E. Baffling.
    F. Firewall forward wiring.
    G. Engine mount bolts.
    H. Firewall seals.
    I. Cowling hinge eyes.
6. Inspect & lubricate:
    1. Throttle, mixture & prop linkages.
    2. Alternate air door & control.
    3. Nose gear grease.
7. Inspect nose gear hardware and re-set breakout force to 25 lbs.
8. Check alternator belt condition & tension.
9. Check tires for wear, rotate/replace as necessary.

100 Hours or 12 months

The following items should be performed every 100 hours, or 12 months, whichever comes first:

1. Complete the items from the 50 hour inspection.
2. Remove, clean, inspect and regap spark plugs.
3. Inspect & clean fuel filter.
4. Conduct compression check on all cylinders.
5. Propeller:
    A. Remove spinner.
    B. Inspect spinner and back plate.
    C. Check propeller mounting bolts and safety wire.
    D. Inspect prop blades for nicks and cracks.
    E. Inspect prop hub for cracks or grease leakage.
    F. TBD: Add any items from Hartzell manuals.
    G. Check blade track:
        i. Chock the wheels securely.
        ii. Place a fixed reference point beneath the propeller, within 0.25" below the lowest point of the propeller arc. Fasten a sheet of paper to the reference point.
        iii. Rotate the propeller by hand (opposite the direction of normal rotation) until a blade points directly at the paper. Mark the position of the blade tip on the paper.
        iv. Repeat the procedure with the second blade.
        v. Tracking tolerance is 0.125" between the position of the two blades.
    H. Reinstall the spinner.
6. Check alternator belt tension (13 ft lbs per Lycoming SI-1129D).
7. TBD: Slick magneto maintenance.
8. Check cylinders visually for cracked or broken fins.
9. Check engine mounting bolts and bushings.
10. Check fuel injector nozzles for looseness, tighten to 60 in-lb torque.
11. Check fuel lines for dye stains at connections.
12. Re-install spark plugs with new washers.

400 Hours

The following items should be performed every 400 hours:

1. Replace spark plugs
2. Remove rocker box covers and check for freedom of valve rockers when valves are closed. Look for evidence of abnormal wear or broken parts in the area of valve tips, valve keeper, springs and spring seats.

500 Hours

The following items should be performed every 500 hours:

1. Perform magneto service.

2,400 Hours or 72 months

The following items should be performed every 2,400 hours or 72 months, whichever comes first:

1. Overhaul propeller.

1 month

The ELT Self Test must be performed every month:

1. Place the ELT control switch in the "ON" position.
2. Return the switch to the "ARM" position.
3. If the ELT is working properly, the LED will turn off.

12 Months

The following items must be performed every 12 months (the due date is exactly 12 months following the previous inspection):

1. Conduct compass swing of any non-stabilized magnetic compass and install dated compass card.
2. Inspect ELT (14 CFR § 91.207).

24 Months

The following items must be performed every 24 months (the due date is exactly 24 months following the previous inspection):

1. Calibrate altimeter and altitude encoder (14 CFR § 91.217).
2. Pitot and static system test (14 CFR § 91.411).
3. Transponder system test (14 CFR § 91.413).
4. Register ELT beacon.

ANNUAL CONDITION INSPECTION

See document *N12VD Condition Inspection* for the annual condition inspection required by 14 CFR § 91.319.

EQUIPMENT LIST

INTRODUCTION

Section 9 lists all equipment installed in the aircraft.

ENGINE

Item	Manufacturer	Part Number	Remarks
Engine	Lycoming	YIO-360-M1B	S/N: EL-38494-51E
Propeller	Hartzell	HC-C2YR-1BFP/ F74972	S/N: NS5261B
Propeller Governor	MT Propeller	P-860-4	S/N: 20G613-K
Oil Cooler	Stewart Warner style	20002A	
Left Magneto	Champion Slick	M-2983 LH	
Right Magneto	Champion Slick	M-2984 RH	
Spark Plugs	Unison	REM38E	
Air Filter	K&N	33-2060	
Oil Filter	Champion	CH48110-1	
Throttle Cable	ACS Products	A-800	Custom 53"
Mixture Cable	ACS Products	A-790	51.5"
Prop Cable	ACS Products	A-790	48"
Alternate Air Cable	ACS Products	A-740	Ratcheting
Cabin Heat Cable	ACS Products	A-740	Ratcheting
Fuel Selector Valve	Andair	20X7T	
Fuel Pump	Airflow Performance	2090255	
Fuel Tank Drains	SAF-AIR	CAV-110	
Oil Quick Drain	SAF-AIR	P5000	

Figure 9.1: Engine Equipment

ENGINE INSTRUMENTS

Item	Manufacturer	Part Number	Remarks
Engine Monitor	Garmin	GEA 24	
Tachometer	UMA	T1A9	
Manifold Pressure Sensor	Kavlico	P4055-30A-E4A	
Fuel Pressure Sensor	Kavlico	P4055-50G-E4A	
Oil Pressure Sensor	Kavlico	P4055-150G-E4A	
Oil Temperature Sensor	UMA	1B3-2.5R	
CHT Sensors	Alcor	86253	
EGT Sensors	Alcor	86255	
Fuel Flow Transducer	EI	FT-60	Mounted on top of engine
Fuel Level Converters	RED Avionics		Vans Plate Converters
Oil Pressure Switch	Honeywell	76579	Switches hobbs and oil pressure annunciator
Hour Meter	Honeywell	85094	

Figure 9.2: Engine Instruments

FLIGHT INSTRUMENTS AND AVIONICS

Item	Manufacturer	Part Number	Remarks
Airspeed Indicator	UMA	16-211-241D	2-¼"
Altimeter	UMA	5-410-20	2-¼"
EFIS Displays	Garmin	GDU 460	10"
ADAHRS	Garmin	GSU 25	
Magnetometer	Garmin	GMU 11	
Temperature Probe	Garmin	GTP 59	
Standby Display	Garmin	G5	
Autopilot Servos	Garmin	GSA 28	
Pitot Tube	Garmin	GAP 26	
GPS	Garmin	GPS 20A	
GPS WAAS Antenna	Garmin	GA 35	
GPS Secondary Antennas	Garmin	GA26C	
Comm Radio	Garmin	GTR 200B	
Comm Antenna	DeltaPop		
Transponder	Garmin	GTX 45R	
Transponder Antenna	DeltaPop		
Autopilot Control	Garmin	GMC 507	
Electronics Adapter	Garmin	GAD 27	
XM Weather Receiver	Garmin	GDL 51R	
XM Antenna	Garmin	GA 24TNC	

Figure 9.3: Flight Instruments and Avionics

ELECTRICAL SYSTEM

Item	Manufacturer	Part Number	Remarks
Battery	Odyssey	PC680	
Alternator	B&C	L-40	Boss mount
Alternator Belt	Gates	7360 V-Belt	
Voltage Regulator	B&C	LR3D-14	
Starter	Sky-Tec	149-12LS	
Backup Battery	TCW	IBBS-12v-6ah	
Ground Power Socket	Cole Hersee	11041	
Battery Contactor	Cole Hersee	24115	From Vans
Starter Contactor	Cole Hersee	24021	From Vans
Ground Power Contactor	White-Rodgers	70-942	
Fuse Blocks	Blue Sea	5046	
ANL Fuse Blocks	Blue Sea	5005	
Ground Block	B&C	GB48	
Ammeter Shunts	UMA	1C4	
Alternator CB	Klixon	7274-2-5	5A
USB Charger	EA Manufacturing	4.2ASMARTUSB	

Figure 9.4: Electrical System

FLIGHT CONTROLS

Item	Manufacturer	Part Number	Remarks
Flap Position Sensor	Ray Allen	POS-12	
Left Stick Grip	Ray Allen	G407	
Right Stick Grip	Ray Allen	G405	

Figure 9.5: Flight Controls

LIGHTING

Item	Manufacturer	Part	Remarks
Landing/Taxi Lights	FlyLEDs	18701	
Position/Strobe	FlyLEDs	15020	
Red Annunciators	VCC	PML50RFVW	20mA
Amber	VCC	PML50YFVW	20mA
CO Annunciator	VCC	PML50RGFVW	20mA
Dimmer Knobs	Honeywell	RV6	

Figure 9.6: Lighting

BRAKE SYSTEM

Item	Manufacturer	Part Number	Remarks
Brakes	Matco	WE51	
Brake Fluid Reservoir	Grove	067-054	
Brake Reservoir Check Valve	Reservoir Dog		
Parking Brake Valve	Matco	PVPV-D	
Parking Brake Control Cable	ACS Products	A-1840	
Jack Points	Flyboy Accessories	7211	

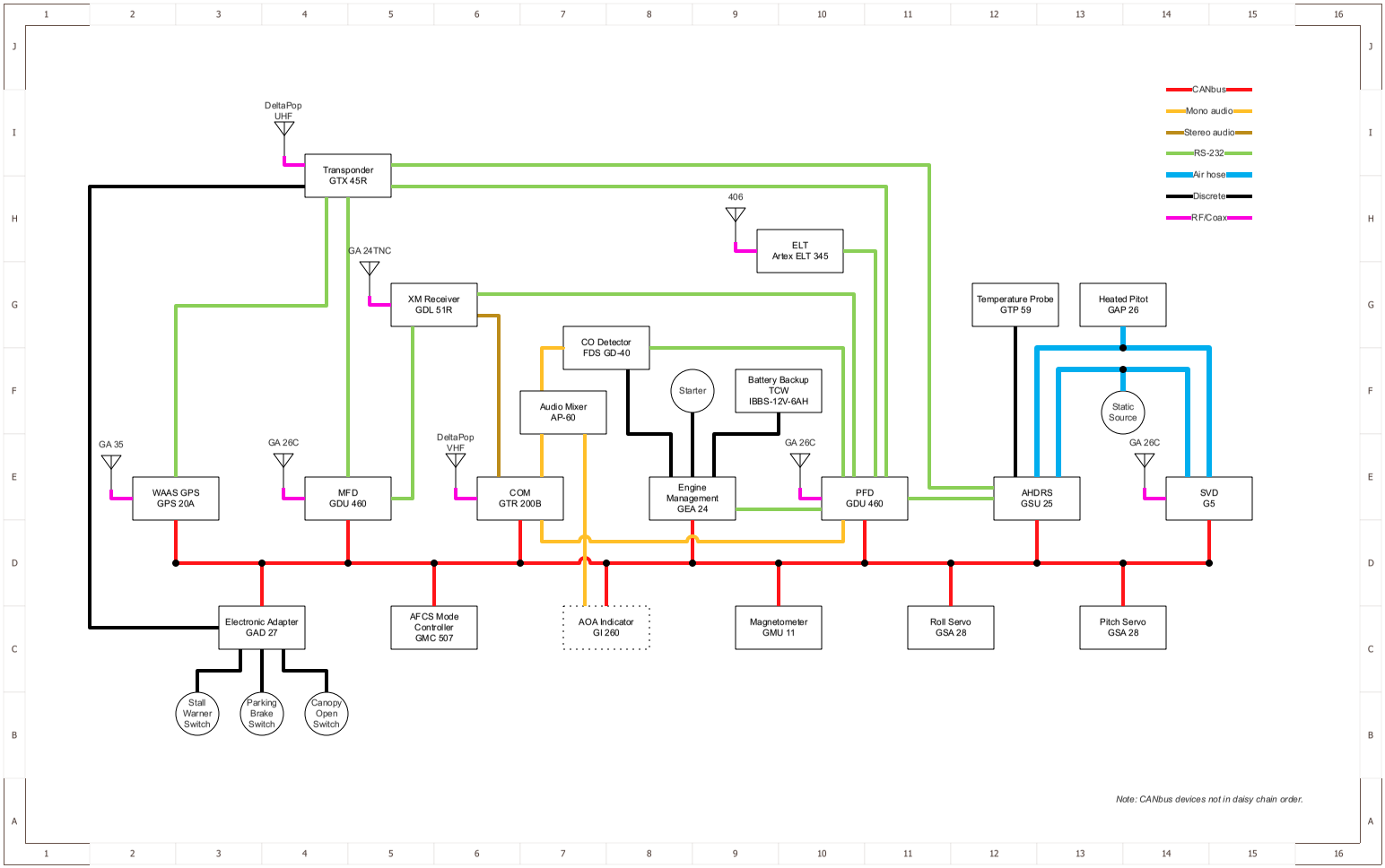
Figure 9.7: Brake System

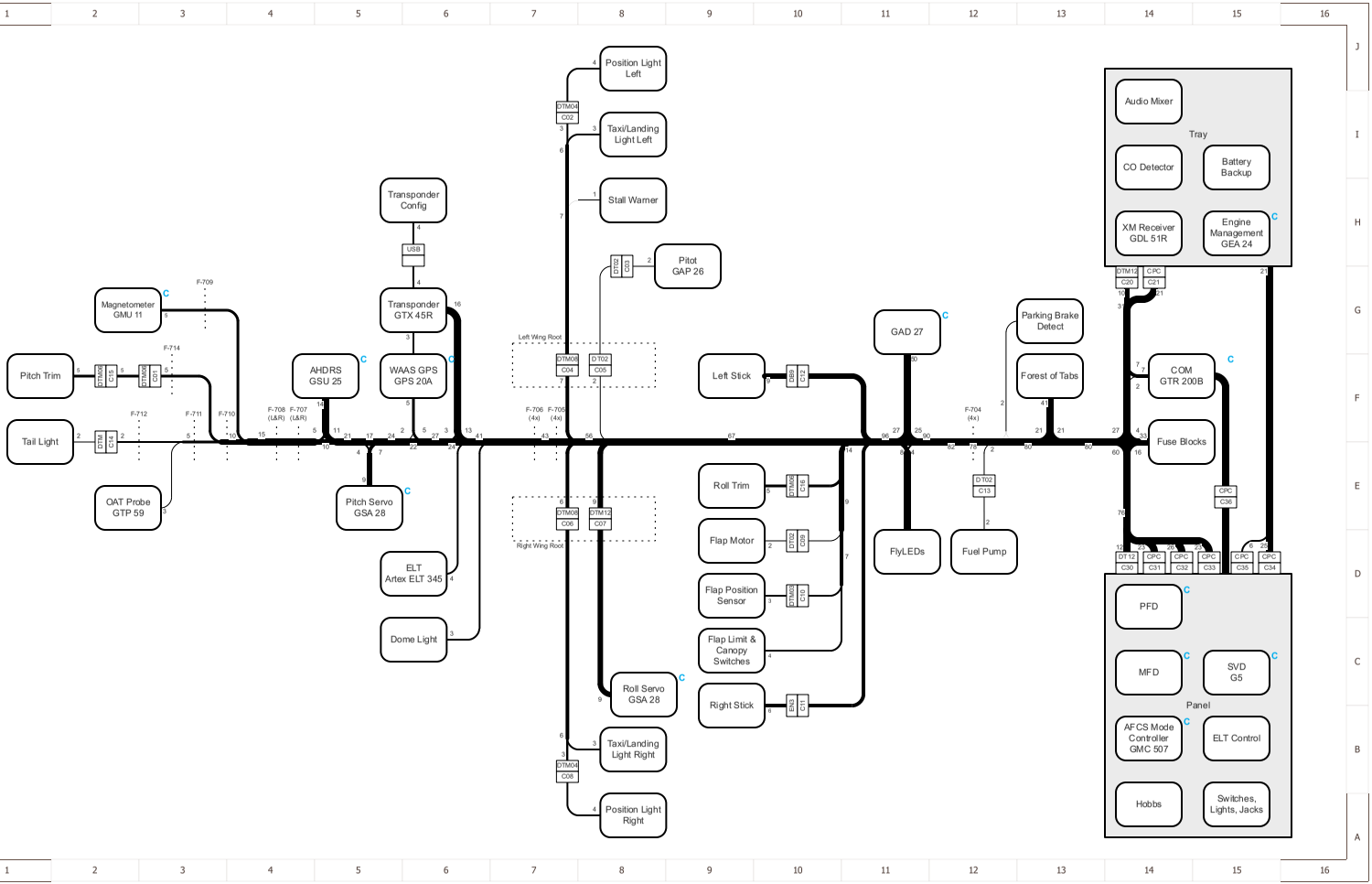
SAFETY SYSTEMS

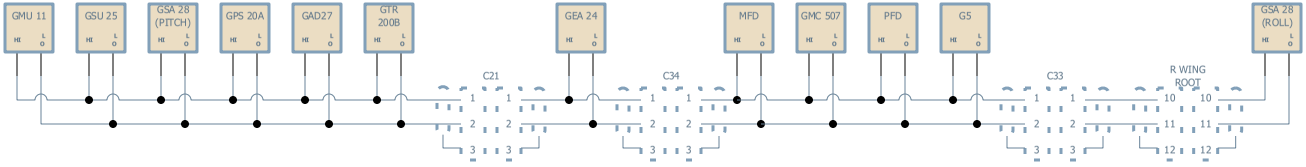
Item	Manufacturer	Part Number	Remarks
Seat Belts	Crow	Kam Lock	
E.L.T.	Artex	ELT 345	
C.O. Detector	Flight Data Systems	GD-40	
Fire Extinguisher	Amerex	A384T	Mounted between seats

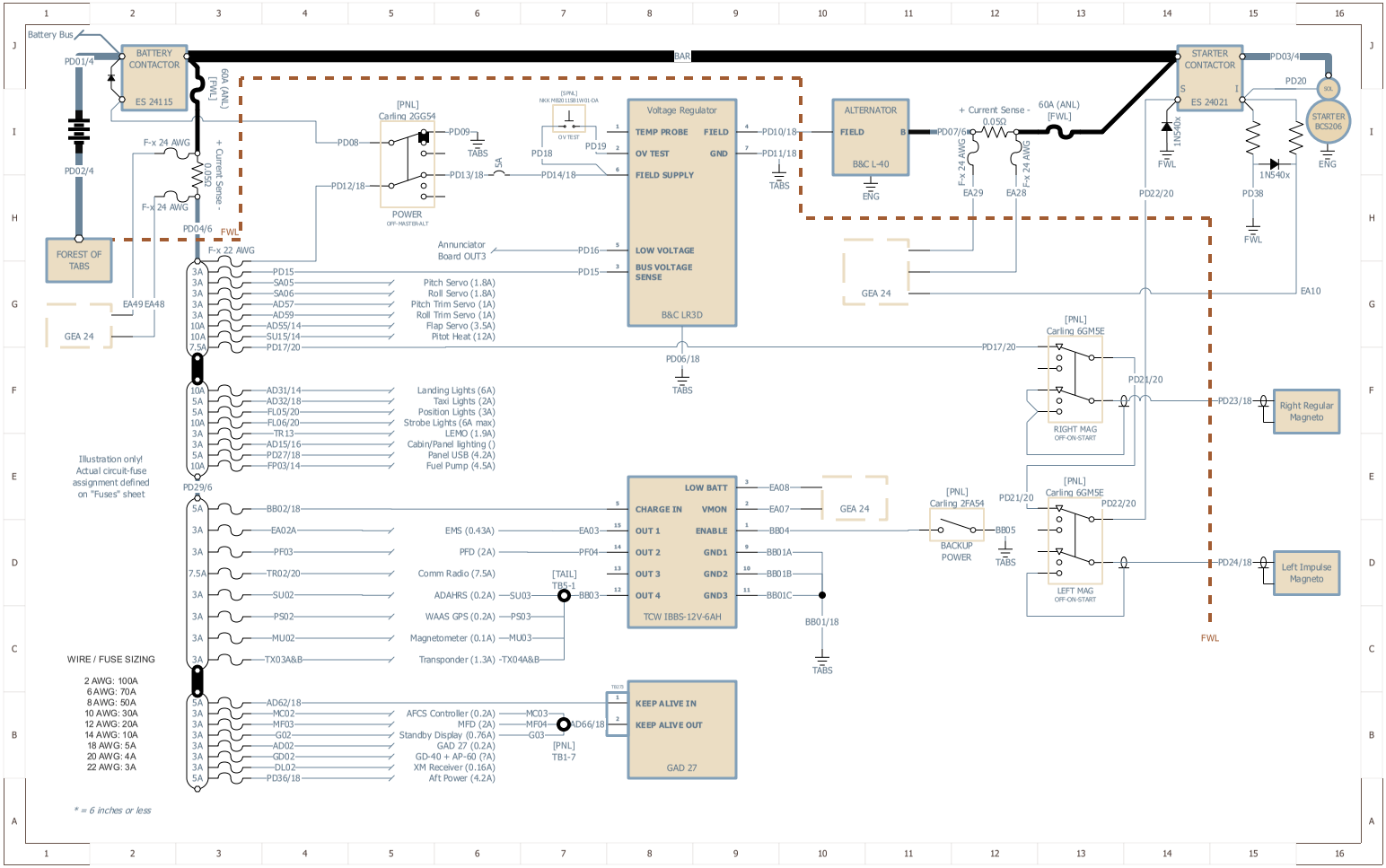
Figure 9.8: Safety Systems

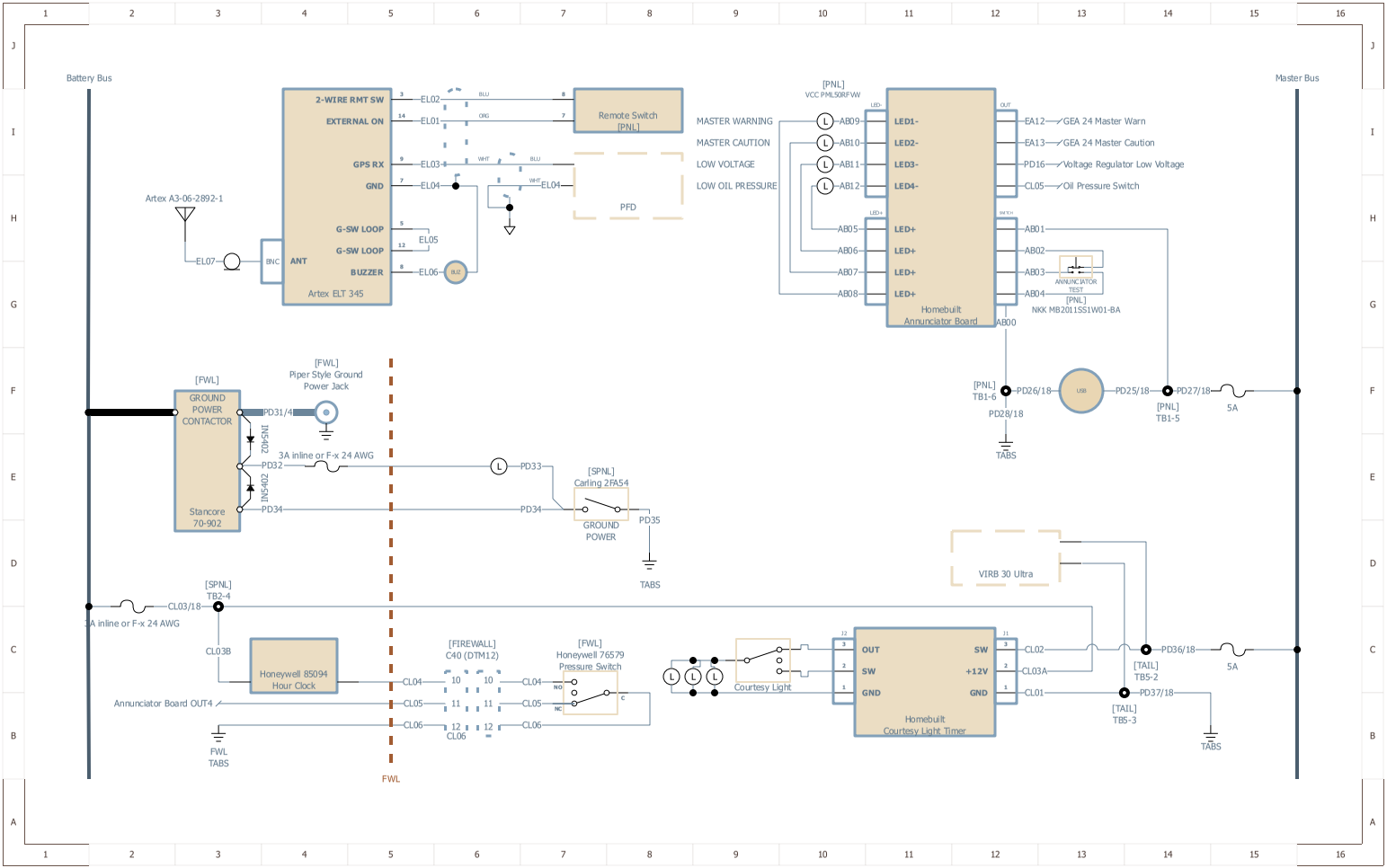
SYSTEMS SCHEMATICS

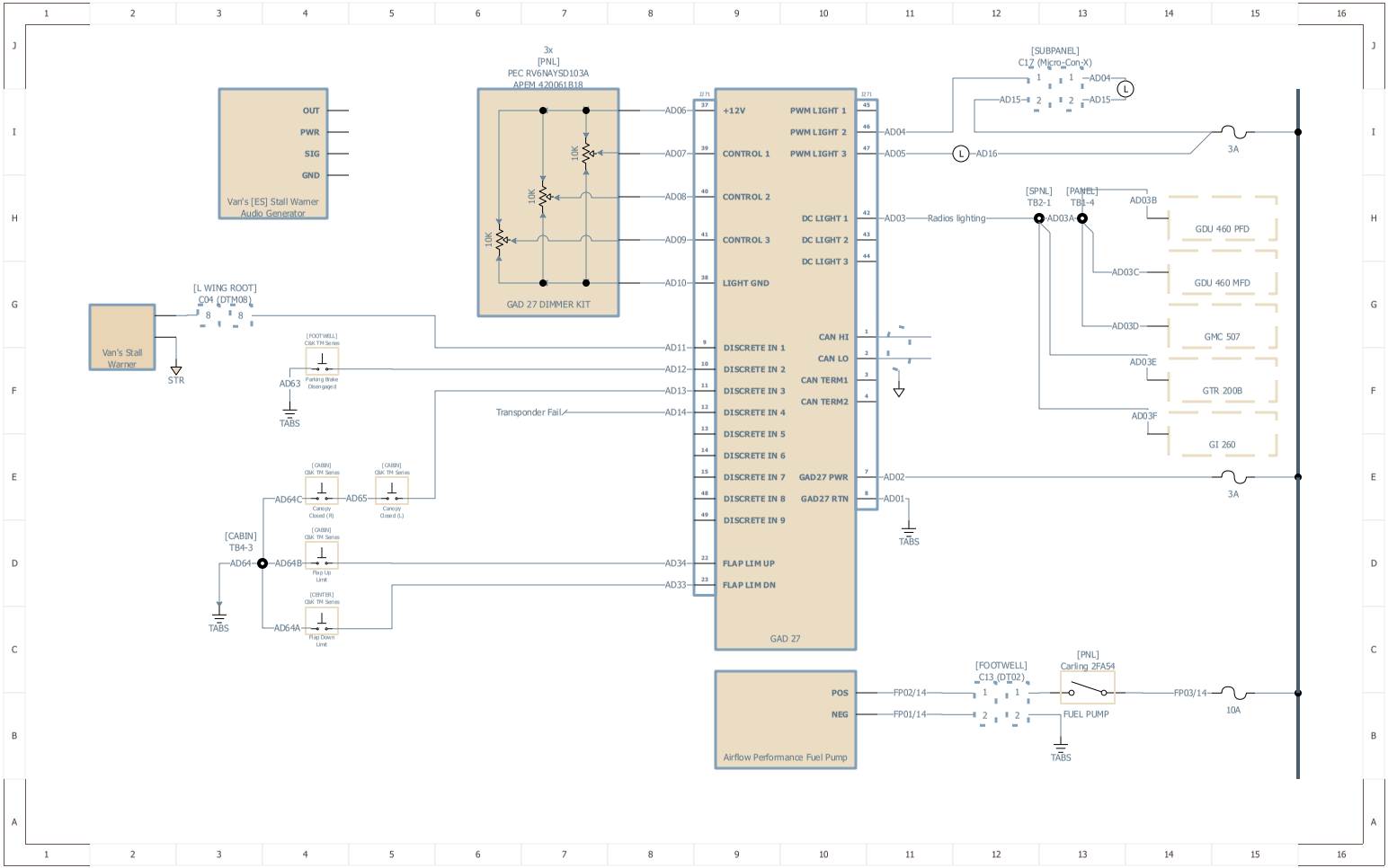

CANbus
Mono audio
Stereo audio
RS-232
Air hose
Discrete
RF/Coax
DeltaPop UHF
Transponder GTX 45R
406
ELT Artex ELT 345
GA 24TNC
XM Receiver GDL 51R
CO Detector FDS GD-40
Audio Mixer AP-60
Starter
Battery Backup TCW IBBS-12V-6AH
Temperature Probe GTP 59
Heated Pitot GAP 26
Static Source
GA 35
GA 26C
DeltaPop VHF
GA 26C
GA 26C
WAAS GPS GPS 20A
MFD GDU 460
COM GTR 200B
Engine Management GEA 24
PFD GDU 460
AHDRS GSU 25
SVD G5
Electronic Adapter GAD 27
AFCS Mode Controller GMC 507
AOA Indicator GI 260
Magnetometer GMU 11
Roll Servo GSA 28
Pitch Servo GSA 28
Stall Warner Switch
Parking Brake Switch
Canopy Open Switch
Note: CANbus devices not in daisy chain order.

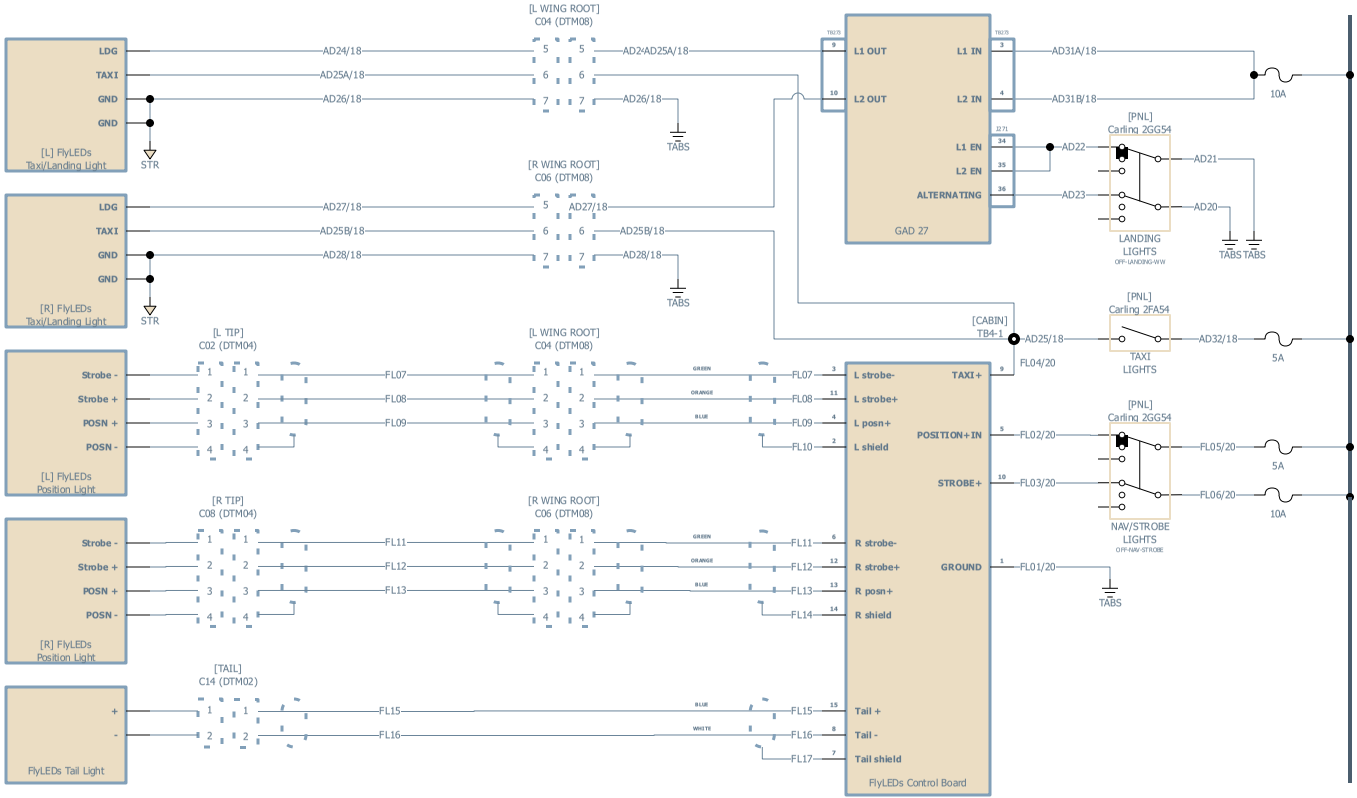

Position Light Left
Taxi/Landing Light Left
Stall Warner
Pitot GAP 26
Transponder Config
USB
Transponder GTX 45R
Magnetometer GMU 11
Pitch Trim
Tail Light
AHDRS GSU 25
WAAS GPS GPS 20A
Left Wing Root
OAT Probe GTP 59
Pitch Servo GSA 28
ELT Artex ELT 345
Dome Light
Right Wing Root
Roll Servo GSA 28
Taxi/Landing Light Right
Position Light Right
Left Stick
Roll Trim
Flap Motor
Flap Position Sensor
Flap Limit & Canopy Switches
Right Stick
GAD 27
FlyLEDs
Fuel Pump
Parking Brake Detect
Forest of Tabs
Audio Mixer
Tray
CO Detector
Battery Backup
XM Receiver GDL 51R
Engine Management GEA 24
COM GTR 200B
Fuse Blocks
PFD
MFD
SVD G5
Panel
AFCS Mode Controller GMC 507
ELT Control
Hobbs
Switches, Lights, Jacks

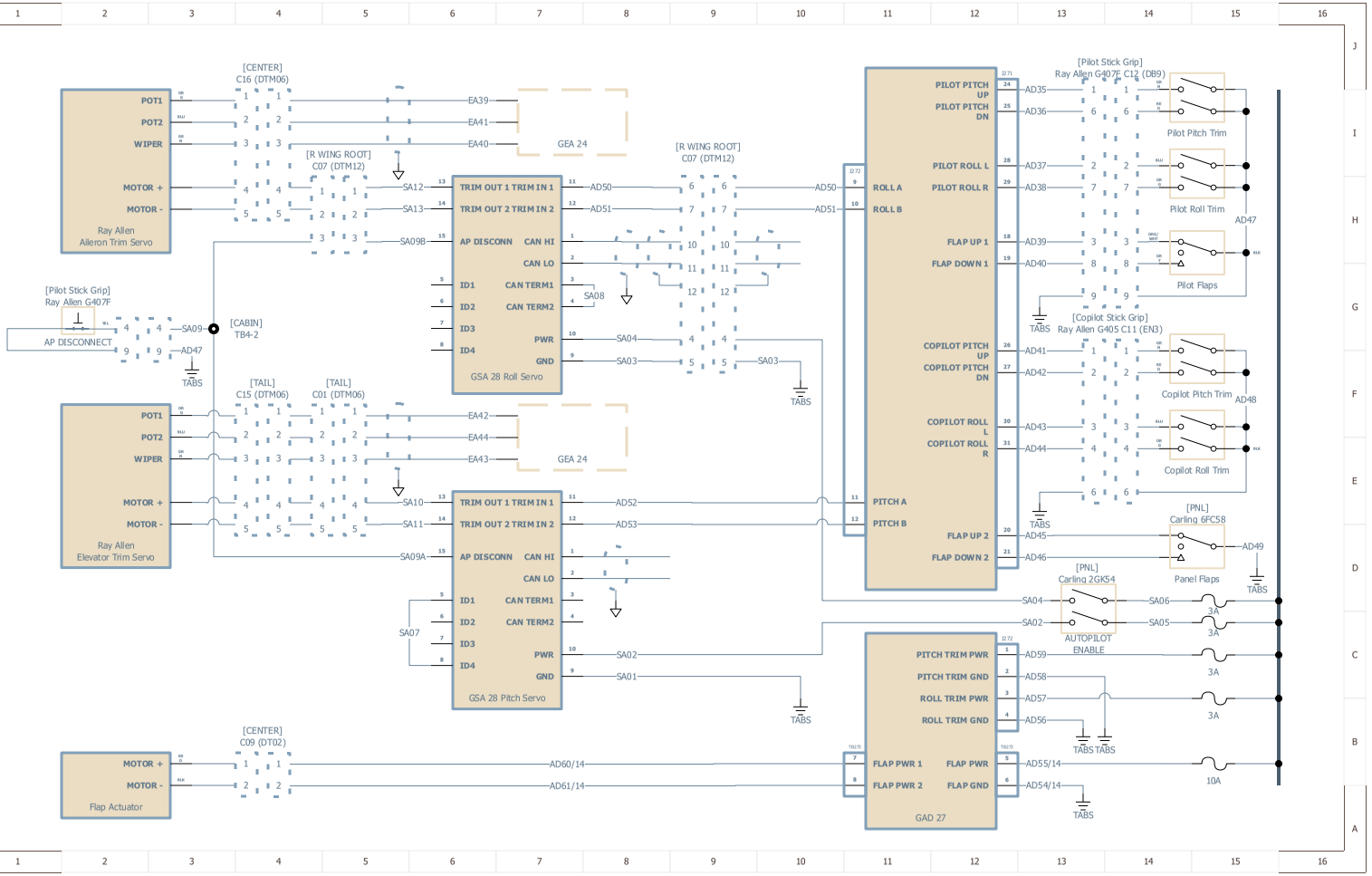

GMU 11
GSU 25
GSA 28 (PITCH)
GPS 20A
GAD27
GTR 200B
C21
GEA 24
C34
MFD
GMC 507
PFD
G5
C33
R WING ROOT
GSA 28 (ROLL)

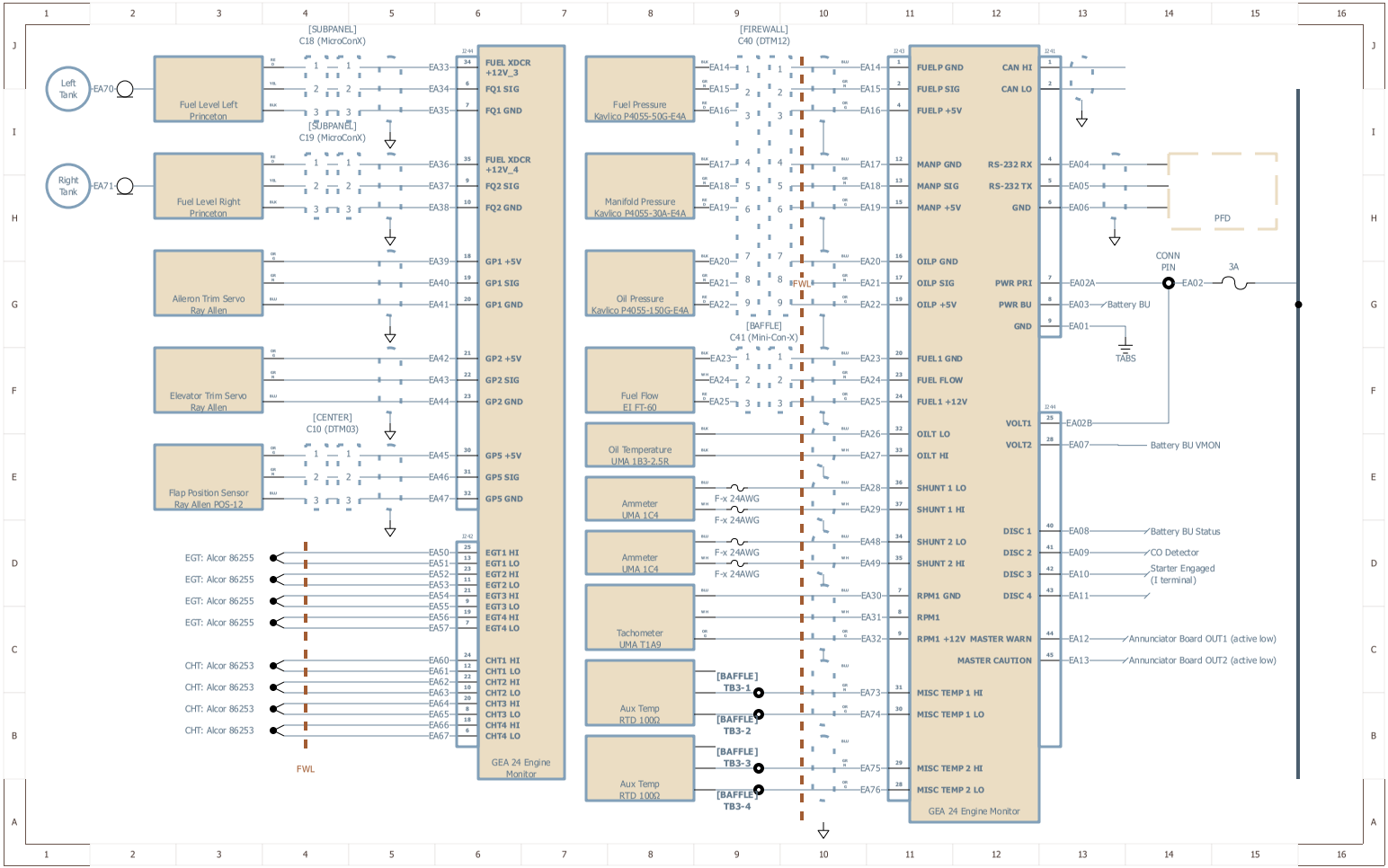

Battery Bus
PD01/4
BATTERY CONTACTOR
ES 24115
60A (ANL) [FWL]
BAR
STARTER CONTACTOR
S
I
ES 24021
PD03/4
PD20
STARTER BCS206
ENG
PD02/4
F-x 24 AWG
0.05Ω
+ Current Sense -
PD04/6
FWL
FOREST OF TABS
F-x 22 AWG
[PNL] Carling 2GG54
PD08
PD09
TABS
PD12/18
PD13/18
5A
PD14/18
POWER
OFF-MASTER-ALT
[SPAL] NKK H8201150W01-OA
OV TEST
PD18
PD19
Voltage Regulator
TEMP PROBE
FIELD
OV TEST
GND
FIELD SUPPLY
PD10/18
PD11/18
B&C LR3D
ALTERNATOR
FIELD
B
B&C L-40
PD07/6
+ Current Sense -
0.05Ω
60A (ANL) [FWL]
F-x 24 AWG
EA29
EA28
1N540x
PD38
PD22/20
Annunciator Board OUT3
PD16
PD15
LOW VOLTAGE
BUS VOLTAGE SENSE
GEA 24
EA10
EA49 EA48
3A PD15 Pitch Servo (1.8A)
3A SA05 Roll Servo (1.8A)
3A SA06 Pitch Trim Servo (1A)
3A AD57 Roll Trim Servo (1A)
3A AD59 Flap Servo (3.5A)
10A AD55/14 Pitot Heat (12A)
7.5A SU15/14
PD17/20
PD06/18
[PNL] Carling 6GM5E
RIGHT MAG
OFF-ON-START
PD21/20
PD23/18
Right Regular Magneto
10A AD31/14 Landing Lights (6A)
5A AD32/18 Taxi Lights (2A)
5A FL05/20 Position Lights (3A)
10A FL06/20 Strobe Lights (6A max)
3A TR13 LEMO (1.9A)
3A AD15/16 Cabin/Panel lighting ()
5A PD27/18 Panel USB (4.2A)
10A FP03/14 Fuel Pump (4.5A)
Illustration only! Actual circuit-fuse assignment defined on "Fuses" sheet
PD29/6
LOW BATT
CHARGE IN
VMON
OUT 1
ENABLE
OUT 2
GND1
OUT 3
GND2
OUT 4
GND3
TCW IBBS-12V-6AH
EA08
EA07
GEA 24
[PNL] Carling 2FA54
BACKUP POWER
BB04
BB05
BB01A
BB01B
BB01C
BB01/18
[PNL] Carling 6GM5E
LEFT MAG
OFF-ON-START
PD22/20
PD24/18
Left Impulse Magneto
FWL
5A BB02/18
3A EA02A EMS (0.43A) EA03
3A PF03 PFD (2A) PF04
7.5A TR02/20 Comm Radio (7.5A)
3A SU02 ADAHRS (0.2A) SU03
3A PS02 WAAS GPS (0.2A) PS03
3A MU02 Magnetometer (0.1A) MU03
3A TX03A&B Transponder (1.3A) TX04A&B
[TAIL] TB5-1
BB03
WIRE / FUSE SIZING
2 AWG: 100A
6 AWG: 70A
8 AWG: 50A
10 AWG: 30A
12 AWG: 20A
14 AWG: 10A
18 AWG: 5A
20 AWG: 4A
22 AWG: 3A
* = 6 inches or less
TB275
KEEP ALIVE IN
KEEP ALIVE OUT
GAD 27
5A AD62/18
3A MC02 AFCS Controller (0.2A) MC03
3A MF03 MFD (2A) MF04
3A G02 Standby Display (0.76A) G03
3A AD02 GAD 27 (0.2A)
3A GD02 GD-40 + AP-60 (?A)
3A DL02 XM Receiver (0.16A)
5A PD36/18 Aft Power (4.2A)
MD66/18
[PNL] TB1-7

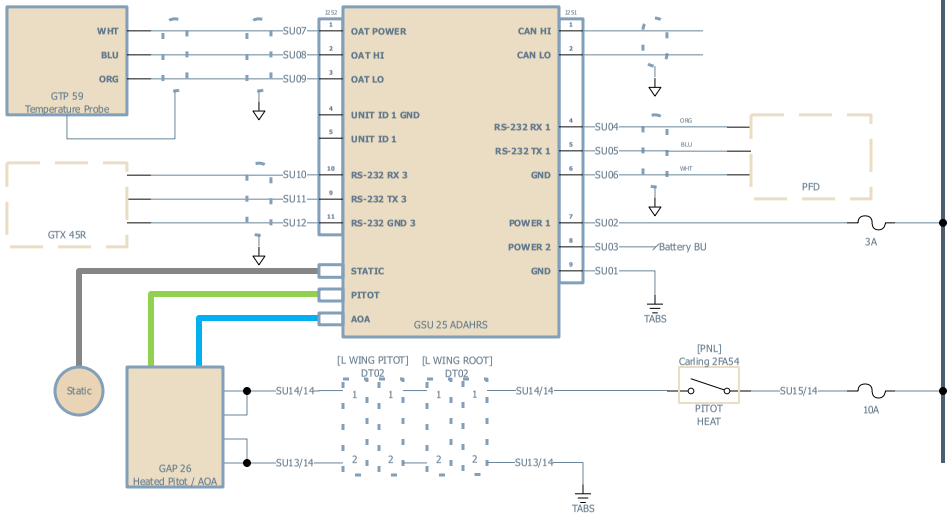

Battery Bus
Master Bus
Artex A3-06-2892-1
EL07
BNC
ANT
Artex ELT 345
2-WIRE RMT SW
EXTERNAL ON
GPS RX
GND
G-SW LOOP
G-SW LOOP
BUZZER
EL02
EL01
EL03
EL04
EL05
EL06
BUZ
BLU
ORG
WHT
Remote Switch
[PNL]
PFD
[PNL]
VCC PML50RFVW
MASTER WARNING
MASTER CAUTION
LOW VOLTAGE
LOW OIL PRESSURE
AB09
AB10
AB11
AB12
AB05
AB06
AB07
AB08
LED1-
LED2-
LED3-
LED4-
LED+
Homebuilt
Annunciator Board
EA12
EA13
PD16
CL05
GEA 24 Master Warn
GEA 24 Master Caution
Voltage Regulator Low Voltage
Oil Pressure Switch
AB01
AB02
AB03
AB04
AB00
ANNUNCIATOR TEST
[PNL]
NKK MB2011SS1W01-BA
[PNL]
TB1-6
PD26/18
PD28/18
TABS
USB
PD25/18
PD27/18
[PNL]
TB1-5
5A
[FWL]
Piper Style Ground
Power Jack
[FWL]
GROUND
POWER
CONTACTOR
Stancore
70-902
PD31/4
PD32
PD34
1N5402
1N5402
3A inline or F-x 24 AWG
PD33
[SPNL]
Carling 2FA54
GROUND
POWER
PD35
PD34
TABS
VIRB 30 Ultra
[SPNL]
TB2-4
CL03/18
3A inline or F-x 24 AWG
CL03B
Honeywell 85094
Hour Clock
Annunciator Board OUT4
FWL
TABS
[FIREWALL]
C40 (DTM12)
CL04
CL05
CL06
[FWL]
Honeywell 76579
Pressure Switch
NO
NC
C
FWL
Courtesy Light
OUT
SW
GND
+12V
Homebuilt
Courtesy Light Timer
CL02
CL03A
CL01
PD36/18
PD37/18
[TAIL]
TB5-2
[TAIL]
TB5-3
5A
TABS

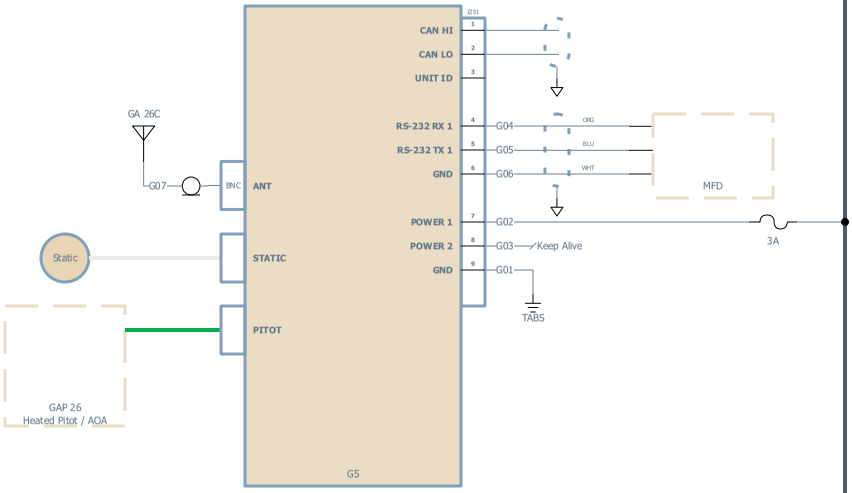

Van's [ES] Stall Warner Audio Generator
OUT
PWR
SIG
GND
3x
[PNL]
PEC RV6NAYSD103A
APEM 420061B18
10K
10K
10K
GAD 27 DIMMER KIT
J271
+12V
CONTROL 1
CONTROL 2
CONTROL 3
LIGHT GND
PWM LIGHT 1
PWM LIGHT 2
PWM LIGHT 3
DC LIGHT 1
DC LIGHT 2
DC LIGHT 3
CAN HI
CAN LO
CAN TERM1
CAN TERM2
DISCRETE IN 1
DISCRETE IN 2
DISCRETE IN 3
DISCRETE IN 4
DISCRETE IN 5
DISCRETE IN 6
DISCRETE IN 7
DISCRETE IN 8
DISCRETE IN 9
GAD27 PWR
GAD27 RTN
FLAP LIM UP
FLAP LIM DN
GAD 27
AD06
AD07
AD08
AD09
AD10
AD11
AD12
AD13
AD14
AD04
AD05
AD03
AD02
AD01
AD34
AD33
[SUBPANEL]
C12 (Micro-Con-X)
AD04
AD15
AD15
AD16
3A
[SPNL]
TB2-1
[PANEL]
TB1-4
AD03A
AD03B
AD03C
AD03D
AD03E
AD03F
Radios lighting
GDU 460 PFD
GDU 460 MFD
GMC 507
GTR 200B
GI 260
[L WING ROOT]
C04 (DTM08)
Van's Stall Warner
STR
[FOOTWELL]
C&K TM Series
Parking Brake Disengaged
AD63
TABS
Transponder Fail
[CABIN]
C&K TM Series
Canopy Closed (R)
Canopy Closed (L)
AD64C
AD65
[CABIN]
TB4-3
AD64
AD64B
AD64A
Flap Up Limit
Flap Down Limit
[CENTER]
TABS
TABS
TABS
[FOOTWELL]
C13 (DT02)
[PNL]
Carling 2FA54
FUEL PUMP
FP02/14
FP01/14
FP03/14
10A
POS
NEG
Airflow Performance Fuel Pump

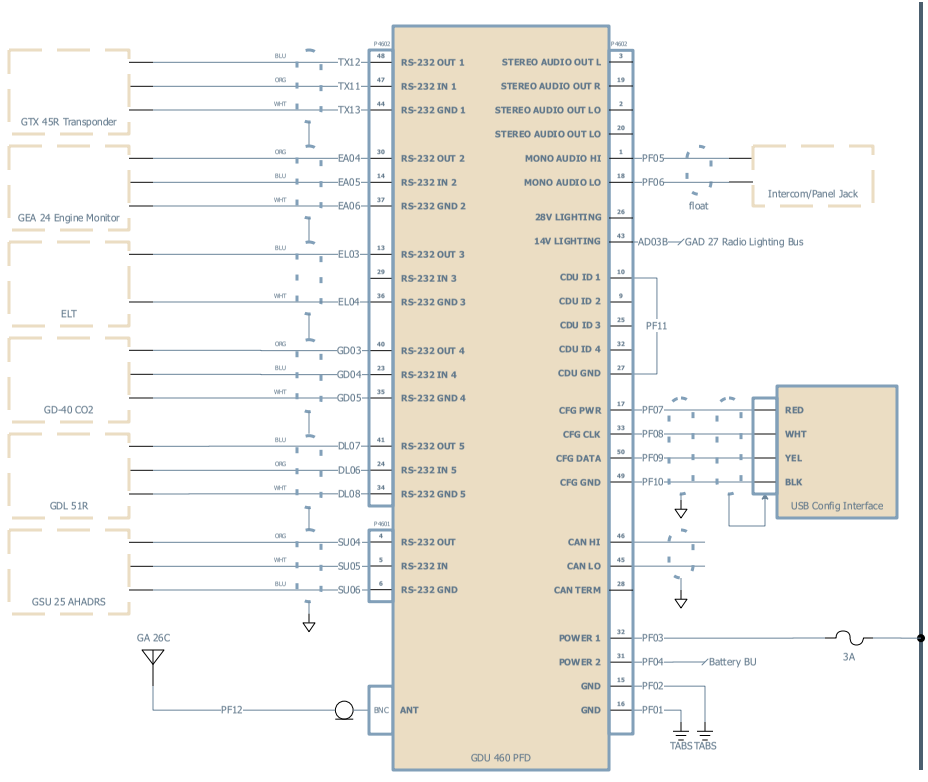

[L] FlyLEDs Taxi/Landing Light
LDG
TAXI
GND
GND
STR
AD24/18
AD25A/18
AD26/18
[L WING ROOT] C04 (DTM08)
AD24-AD25A/18
TABS
[R] FlyLEDs Taxi/Landing Light
AD27/18
AD25B/18
AD28/18
[R WING ROOT] C06 (DTM08)
[L] FlyLEDs Position Light
Strobe -
Strobe +
POSN +
POSN -
[L TIP] C02 (DTM04)
FL07
FL08
FL09
[R] FlyLEDs Position Light
[R TIP] C08 (DTM04)
FL11
FL12
FL13
FlyLEDs Tail Light
[TAIL] C14 (DTM02)
FL15
FL16
GAD 27
L1 OUT
L2 OUT
L1 IN
L2 IN
L1 EN
L2 EN
ALTERNATING
AD31A/18
AD31B/18
AD22
AD23
10A
[PNL] Carling 2GG54
AD21
AD20
LANDING LIGHTS
OFF-LANDING-WW
[CABIN] TB4-1
AD25/18
FL04/20
[PNL] Carling 2FA54
AD32/18
5A
TAXI LIGHTS
FlyLEDs Control Board
L strobe-
L strobe+
L posn+
L shield
R strobe-
R strobe+
R posn+
R shield
Tail +
Tail -
Tail shield
TAXI+
POSITION+IN
STROBE+
GROUND
FL02/20
FL03/20
FL01/20
FL05/20
FL06/20
NAV/STROBE LIGHTS
OFF-NAV-STROBE

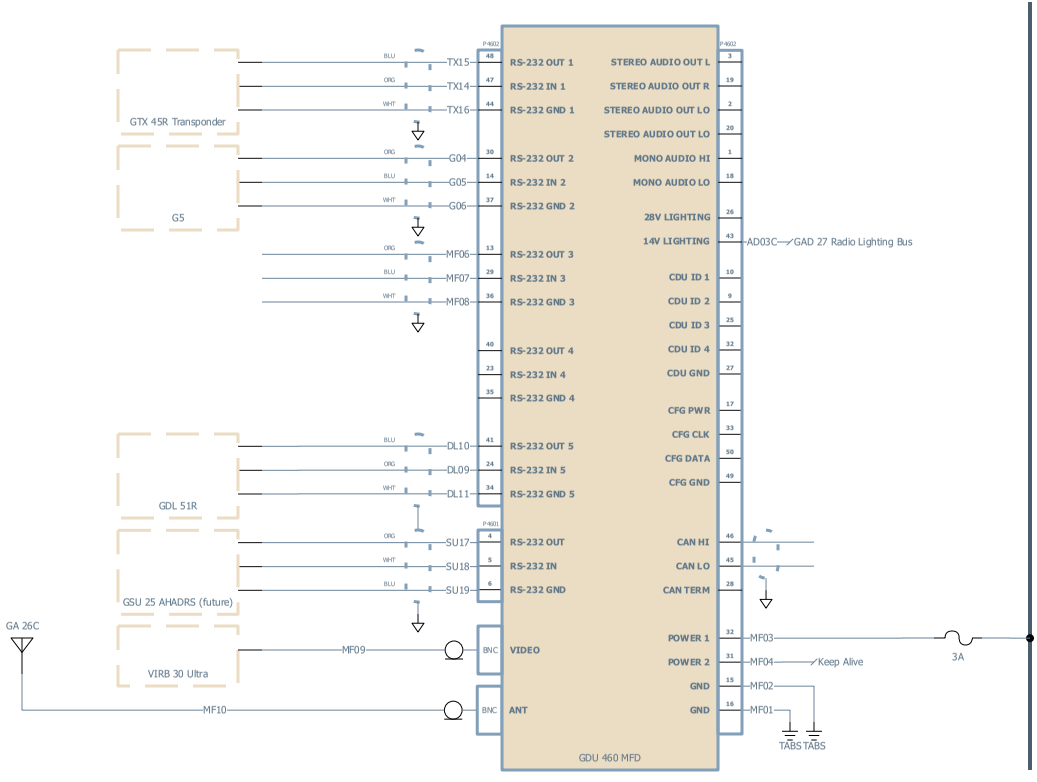

[CENTER]
C16 (DTM06)
POT1
POT2
WIPER
MOTOR +
MOTOR -
Ray Allen
Aileron Trim Servo
EA39
EA41
EA40
GEA 24
[R WING ROOT]
C07 (DTM12)
SA12
SA13
SA09B
TRIM OUT 1 TRIM IN 1
TRIM OUT 2 TRIM IN 2
AP DISCONN
CAN HI
CAN LO
ID1
ID2
ID3
ID4
CAN TERM1
CAN TERM2
PWR
GND
GSA 28 Roll Servo
AD50
AD51
SA08
SA04
SA03
[R WING ROOT]
C07 (DTM12)
AD50
AD51
[Pilot Stick Grip]
Ray Allen G407F
AP DISCONNECT
SA09
AD47
[CABIN]
TB4-2
TABS
[TAIL]
C15 (DTM06)
[TAIL]
C01 (DTM06)
POT1
POT2
WIPER
MOTOR +
MOTOR -
Ray Allen
Elevator Trim Servo
EA42
EA44
EA43
GEA 24
SA10
SA11
SA09A
SA07
TRIM OUT 1 TRIM IN 1
TRIM OUT 2 TRIM IN 2
AP DISCONN
CAN HI
CAN LO
ID1
ID2
ID3
ID4
CAN TERM1
CAN TERM2
PWR
GND
GSA 28 Pitch Servo
AD52
AD53
SA02
SA01
TABS
[CENTER]
C09 (DT02)
MOTOR +
MOTOR -
Flap Actuator
AD60/14
AD61/14
J271
PILOT PITCH UP
PILOT PITCH DN
PILOT ROLL L
PILOT ROLL R
FLAP UP 1
FLAP DOWN 1
COPILOT PITCH UP
COPILOT PITCH DN
COPILOT ROLL L
COPILOT ROLL R
FLAP UP 2
FLAP DOWN 2
AD35
AD36
AD37
AD38
AD39
AD40
AD41
AD42
AD43
AD44
AD45
AD46
J272
ROLL A
ROLL B
PITCH A
PITCH B
AD50
AD51
AD52
AD53
[Pilot Stick Grip]
Ray Allen G407F C12 (DB9)
Pilot Pitch Trim
Pilot Roll Trim
Pilot Flaps
AD47
[Copilot Stick Grip]
Ray Allen G405 C11 (EN3)
Copilot Pitch Trim
Copilot Roll Trim
AD48
[PNL]
Carling 6FC58
Panel Flaps
AD49
[PNL]
Carling 2GK54
AUTOPILOT
ENABLE
SA04
SA02
SA06
SA05
3A
PITCH TRIM PWR
PITCH TRIM GND
ROLL TRIM PWR
ROLL TRIM GND
AD59
AD58
AD57
AD56
FLAP PWR 1
FLAP PWR 2
FLAP PWR
FLAP GND
GAD 27
AD55/14
AD54/14
10A

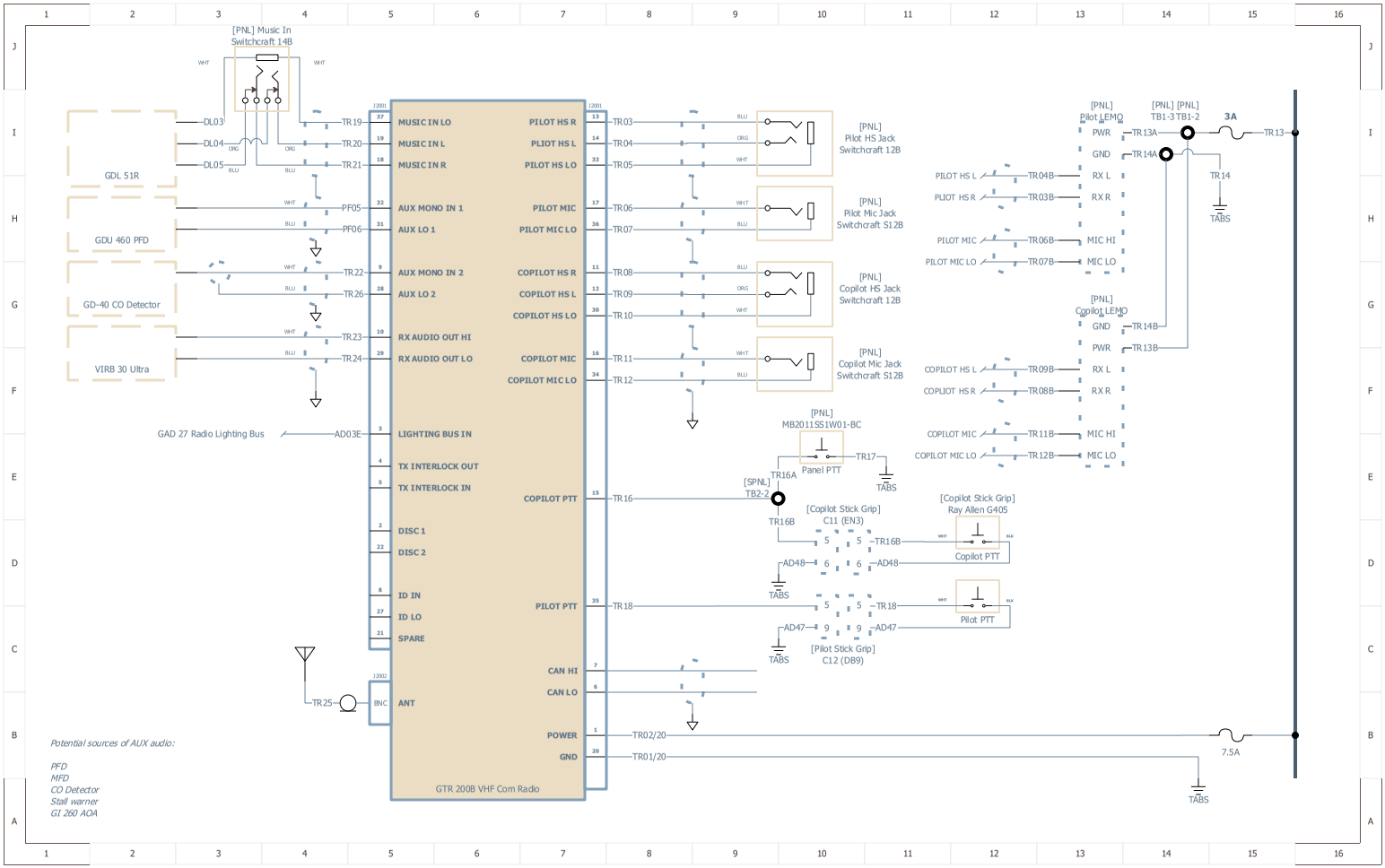

[SUBPANEL]
C18 (MicroConX)
[SUBPANEL]
C19 (MicroConX)
[CENTER]
C10 (DTM03)
[FIREWALL]
C40 (DTM12)
[BAFFLE]
C41 (Mini-Con-X)
Left Tank
Right Tank
EA70
EA71
Fuel Level Left Princeton
Fuel Level Right Princeton
Aileron Trim Servo Ray Allen
Elevator Trim Servo Ray Allen
Flap Position Sensor Ray Allen POS-12
EA33
EA34
EA35
EA36
EA37
EA38
EA39
EA40
EA41
EA42
EA43
EA44
EA45
EA46
EA47
FUEL XDCR +12V_3
FQ1 SIG
FQ1 GND
FUEL XDCR +12V_4
FQ2 SIG
FQ2 GND
GP1 +5V
GP1 SIG
GP1 GND
GP2 +5V
GP2 SIG
GP2 GND
GP5 +5V
GP5 SIG
GP5 GND
EGT: Alcor 86255
CHT: Alcor 86253
EA50
EA51
EA52
EA53
EA54
EA55
EA56
EA57
EA60
EA61
EA62
EA63
EA64
EA65
EA66
EA67
EGT1 HI
EGT1 LO
EGT2 HI
EGT2 LO
EGT3 HI
EGT3 LO
EGT4 HI
EGT4 LO
CHT1 HI
CHT1 LO
CHT2 HI
CHT2 LO
CHT3 HI
CHT3 LO
CHT4 HI
CHT4 LO
FWL
GEA 24 Engine Monitor
Fuel Pressure Kavlico P4055-50G-E4A
Manifold Pressure Kavlico P4055-30A-E4A
Oil Pressure Kavlico P4055-150G-E4A
Fuel Flow EI FT-60
Oil Temperature UMA 1B3-2.5R
Ammeter UMA 1C4
Ammeter UMA 1C4
Tachometer UMA T1A9
Aux Temp RTD 100Ω
Aux Temp RTD 100Ω
EA14
EA15
EA16
EA17
EA18
EA19
EA20
EA21
EA22
EA23
EA24
EA25
EA26
EA27
EA28
EA29
EA48
EA49
EA30
EA31
EA32
EA73
EA74
EA75
EA76
F-x 24AWG
[BAFFLE] TB3-1
[BAFFLE] TB3-2
[BAFFLE] TB3-3
[BAFFLE] TB3-4
FWL
FUELP GND
FUELP SIG
FUELP +5V
MANP GND
MANP SIG
MANP +5V
OILP GND
OILP SIG
OILP +5V
FUEL1 GND
FUEL FLOW
FUEL1 +12V
OILT LO
OILT HI
SHUNT 1 LO
SHUNT 1 HI
SHUNT 2 LO
SHUNT 2 HI
RPM1 GND
RPM1
RPM1 +12V
MISC TEMP 1 HI
MISC TEMP 1 LO
MISC TEMP 2 HI
MISC TEMP 2 LO
GEA 24 Engine Monitor
CAN HI
CAN LO
RS-232 RX
RS-232 TX
GND
PWR PRI
PWR BU
GND
VOLT1
VOLT2
DISC 1
DISC 2
DISC 3
DISC 4
MASTER WARN
MASTER CAUTION
EA04
EA05
EA06
EA02A
EA03
EA01
EA02B
EA07
EA08
EA09
EA10
EA11
EA12
EA13
PFD
CONN PIN
3A
Battery BU
TABS
Battery BU VMON
Battery BU Status
CO Detector
Starter Engaged (I terminal)
Annunciator Board OUT1 (active low)
Annunciator Board OUT2 (active low)

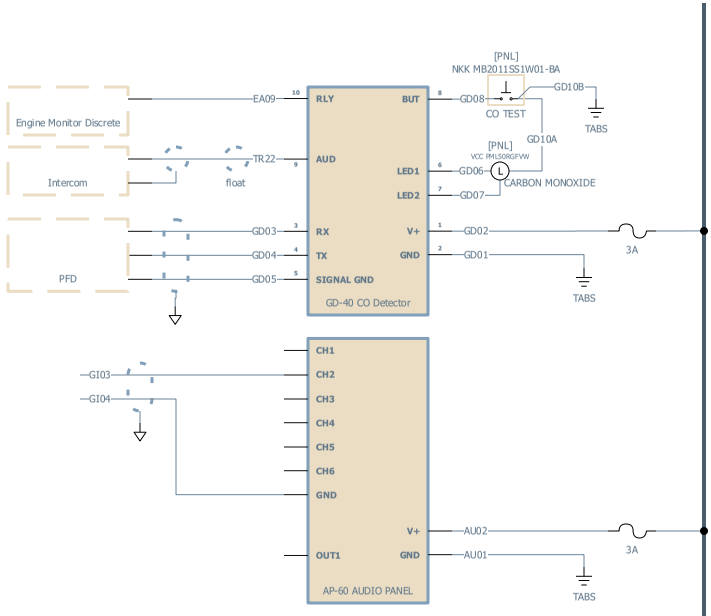

GTP 59
Temperature Probe
WHT
BLU
ORG
SU07
SU08
SU09
J252
OAT POWER
OAT HI
OAT LO
UNIT ID 1 GND
UNIT ID 1
RS-232 RX 3
RS-232 TX 3
RS-232 GND 3
STATIC
PITOT
AOA
GSU 25 ADAHRS
CAN HI
CAN LO
RS-232 RX 1
RS-232 TX 1
GND
POWER 1
POWER 2
GND
J251
SU04
SU05
SU06
SU02
SU03
SU01
Battery BU
PFD
3A
TABS
GTX 45R
SU10
SU11
SU12
Static
GAP 26
Heated Pitot / AOA
[L WING PITOT]
DT02
[L WING ROOT]
DT02
SU14/14
SU13/14
[PNL]
Carling 2FA54
PITOT
HEAT
SU15/14
10A
TABS

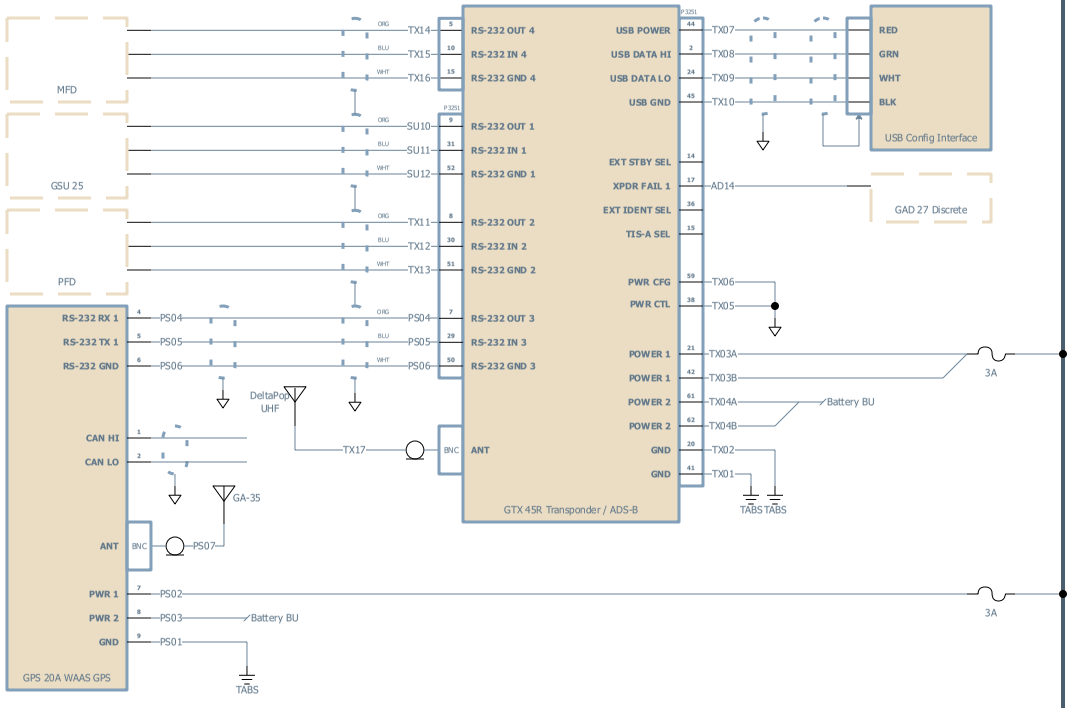

J251
CAN HI
CAN LO
UNIT ID
RS-232 RX 1
RS-232 TX 1
GND
POWER 1
POWER 2
GND
G04
G05
G06
G02
G03
Keep Alive
G01
ORG
BLU
WHT
MFD
3A
TABS
GA 26C
G07
BNC
ANT
Static
STATIC
PITOT
GAP 26
Heated Pitot / AOA
G5

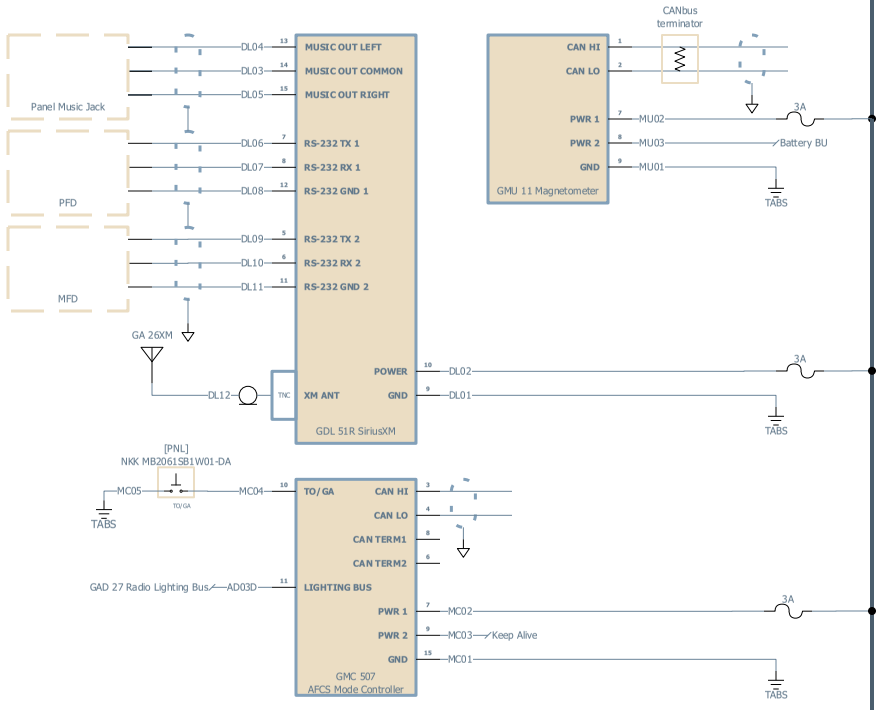

GTX 45R Transponder
GEA 24 Engine Monitor
ELT
GD-40 CO2
GDL 51R
GSU 25 AHADRS
GA 26C
TX12
TX11
TX13
EA04
EA05
EA06
EL03
EL04
GD03
GD04
GD05
DL07
DL06
DL08
SU04
SU05
SU06
PF12
RS-232 OUT 1
RS-232 IN 1
RS-232 GND 1
RS-232 OUT 2
RS-232 IN 2
RS-232 GND 2
RS-232 OUT 3
RS-232 IN 3
RS-232 GND 3
RS-232 OUT 4
RS-232 IN 4
RS-232 GND 4
RS-232 OUT 5
RS-232 IN 5
RS-232 GND 5
RS-232 OUT
RS-232 IN
RS-232 GND
ANT
STEREO AUDIO OUT L
STEREO AUDIO OUT R
STEREO AUDIO OUT LO
STEREO AUDIO OUT LO
MONO AUDIO HI
MONO AUDIO LO
28V LIGHTING
14V LIGHTING
CDU ID 1
CDU ID 2
CDU ID 3
CDU ID 4
CDU GND
CFG PWR
CFG CLK
CFG DATA
CFG GND
CAN HI
CAN LO
CAN TERM
POWER 1
POWER 2
GND
GND
PF05
PF06
float
Intercom/Panel Jack
AD03B
GAD 27 Radio Lighting Bus
PF11
PF07
PF08
PF09
PF10
RED
WHT
YEL
BLK
USB Config Interface
PF03
3A
PF04
Battery BU
PF02
PF01
TABS
TABS
GDU 460 PFD

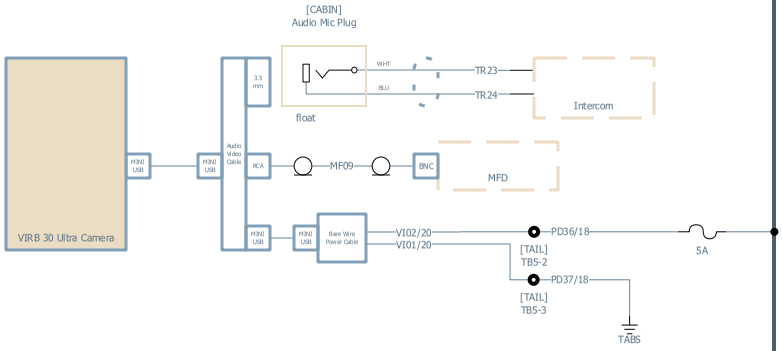

GTX 45R Transponder
G5
GDL 51R
GSU 25 AHADRS (future)
VIRB 30 Ultra
GA 26C
P-9902
P-9901
TX15
TX14
TX16
G04
G05
G06
MF06
MF07
MF08
DL10
DL09
DL11
SU17
SU18
SU19
MF09
MF10
RS-232 OUT 1
RS-232 IN 1
RS-232 GND 1
RS-232 OUT 2
RS-232 IN 2
RS-232 GND 2
RS-232 OUT 3
RS-232 IN 3
RS-232 GND 3
RS-232 OUT 4
RS-232 IN 4
RS-232 GND 4
RS-232 OUT 5
RS-232 IN 5
RS-232 GND 5
RS-232 OUT
RS-232 IN
RS-232 GND
VIDEO
ANT
STEREO AUDIO OUT L
STEREO AUDIO OUT R
STEREO AUDIO OUT LO
STEREO AUDIO OUT LO
MONO AUDIO HI
MONO AUDIO LO
28V LIGHTING
14V LIGHTING
CDU ID 1
CDU ID 2
CDU ID 3
CDU ID 4
CDU GND
CFG PWR
CFG CLK
CFG DATA
CFG GND
CAN HI
CAN LO
CAN TERM
POWER 1
POWER 2
GND
GND
AD03C
GAD 27 Radio Lighting Bus
MF03
MF04
Keep Alive
MF02
MF01
3A
TABS
TABS
GDU 460 MFD


[PNL] Music In
Switchcraft 14B
GDL 51R
GDU 460 PFD
GD-40 CO Detector
VIRB 30 Ultra
GAD 27 Radio Lighting Bus
MUSIC IN LO
MUSIC IN L
MUSIC IN R
AUX MONO IN 1
AUX LO 1
AUX MONO IN 2
AUX LO 2
RX AUDIO OUT HI
RX AUDIO OUT LO
LIGHTING BUS IN
TX INTERLOCK OUT
TX INTERLOCK IN
DISC 1
DISC 2
ID IN
ID LO
SPARE
ANT
PILOT HS R
PILOT HS L
PILOT HS LO
PILOT MIC
PILOT MIC LO
COPILOT HS R
COPILOT HS L
COPILOT HS LO
COPILOT MIC
COPILOT MIC LO
COPILOT PTT
PILOT PTT
CAN HI
CAN LO
POWER
GND
GTR 200B VHF Com Radio
[PNL] Pilot HS Jack
Switchcraft 12B
[PNL] Pilot Mic Jack
Switchcraft S12B
[PNL] Copilot HS Jack
Switchcraft 12B
[PNL] Copilot Mic Jack
Switchcraft S12B
[PNL] MB2011SS1W01-BC
Panel PTT
[SPNL] TB2-2
[Copilot Stick Grip]
C11 (EN3)
Copilot PTT
[Copilot Stick Grip]
Ray Allen G405
Pilot PTT
[Pilot Stick Grip]
C12 (DB9)
[PNL] Pilot LEMO
[PNL] [PNL]
TB1-3 TB1-2
3A
7.5A
[PNL] Copilot LEMO
PWR
GND
RX L
RX R
MIC HI
MIC LO
TABS
Potential sources of AUX audio:
PFD
MFD
CO Detector
Stall warner
GI 260 AOA


[PNL]
NKK MB2011SS1W01-BA
GD10B
TABS
CO TEST
GD10A
[PNL]
VCC PML50RGFVW
CARBON MONOXIDE
Engine Monitor Discrete
Intercom
PFD
EA09
TR22
float
GD03
GD04
GD05
RLY
AUD
RX
TX
SIGNAL GND
BUT
LED1
LED2
V+
GND
GD08
GD06
GD07
GD02
GD01
3A
TABS
GD-40 CO Detector
GI03
GI04
CH1
CH2
CH3
CH4
CH5
CH6
GND
V+
OUT1
GND
AU02
AU01
3A
TABS
AP-60 AUDIO PANEL


P3252
MFD
GSU 25
PFD
ORG
BLU
WHT
TX14
TX15
TX16
SU10
SU11
SU12
TX11
TX12
TX13
PS04
PS05
PS06
RS-232 OUT 4
RS-232 IN 4
RS-232 GND 4
RS-232 OUT 1
RS-232 IN 1
RS-232 GND 1
RS-232 OUT 2
RS-232 IN 2
RS-232 GND 2
RS-232 OUT 3
RS-232 IN 3
RS-232 GND 3
P3251
USB POWER
USB DATA HI
USB DATA LO
USB GND
EXT STBY SEL
XPDR FAIL 1
EXT IDENT SEL
TIS-A SEL
PWR CFG
PWR CTL
POWER 1
POWER 1
POWER 2
POWER 2
GND
GND
TX07
TX08
TX09
TX10
AD14
TX06
TX05
TX03A
TX03B
TX04A
TX04B
TX02
TX01
RED
GRN
WHT
BLK
USB Config Interface
GAD 27 Discrete
3A
3A
Battery BU
TABS
TABS
TABS
RS-232 RX 1
RS-232 TX 1
RS-232 GND
CAN HI
CAN LO
ANT
PWR 1
PWR 2
GND
GPS 20A WAAS GPS
BNC
PS07
PS02
PS03
PS01
Battery BU
GA-35
DeltaPop UHF
TX17
BNC
ANT
GTX 45R Transponder / ADS-B


CANbus terminator
Panel Music Jack
PFD
MFD
DL04
DL03
DL05
DL06
DL07
DL08
DL09
DL10
DL11
DL12
MUSIC OUT LEFT
MUSIC OUT COMMON
MUSIC OUT RIGHT
RS-232 TX 1
RS-232 RX 1
RS-232 GND 1
RS-232 TX 2
RS-232 RX 2
RS-232 GND 2
XM ANT
POWER
GND
GDL 51R SiriusXM
GA 26XM
TNC
CAN HI
CAN LO
PWR 1
PWR 2
GND
GMU 11 Magnetometer
MU02
MU03
MU01
Battery BU
TABS
3A
DL02
DL01
[PNL]
NKK MB2061SB1W01-DA
MC05
MC04
TO/GA
CAN TERM1
CAN TERM2
LIGHTING BUS
GAD 27 Radio Lighting Bus
AD03D
MC02
MC03
MC01
Keep Alive
GMC 507
AFCS Mode Controller


[CABIN]
Audio Mic Plug
WHT
BLU
TR23
TR24
Intercom
3.5 mm
float
VIRB 30 Ultra Camera
MINI USB
Audio Video Cable
RCA
MF09
BNC
MFD
MINI USB
MINI USB
Bare Wire Power Cable
VI02/20
VI01/20
PD36/18
[TAIL]
TB5-2
PD37/18
[TAIL]
TB5-3
TABS
5A