Revision 1 Transmittal

May 15, 2011

TO:
Holders of Cirrus Design SR22T Pilot's Operating Handbook for Aircraft Serials SR22T-0001 & Subsequent with Teledyne Continental Motors Turbocharged Engine, P/N 21400-003.

SUBJECT:
Revision 1 dated 09 May 2011.

Revision 1 to the Model SR22T Pilot's Operating Handbook revises Sections 1, 2, 3, 3A, 4, 5, 7, 8, and 9.

Revise sections by inserting revised pages and removing superseded pages in accordance with the List of Effective Pages. After incorporating revision pages, discard superseded pages and this transmittal.

Direct questions concerning change of address to the following:

fieldservice@cirrusdesign.com
or
(800) 921-2737

Revision 1 Transmittal (Cont.)

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Revision 1 Highlights

Page	Revision Description
Section 1	Corrected error in Maximum Certificated Weights.
Section 2	Revised Perspective Integrated Avionics System Limitations Added Air Conditioning (AC) System Limitation.
Section 3	Revised Cabin Fire In Flight Checklist. Revised Smoke and Fume Elimination Checklist for AC. Revised Engine Partial Power Loss Checklist for AC. Revised Oil Pressure Out of Range Checklist. Revised Oil Temperature High Checklist.
Section 3A	Corrected Page Numbering Error Revised Door Open In Flight Checklist. Revised Fuel Quantity Advisory Checklists.
Section 4	Revised Before Takeoff Checklist for AC. Added Ground Operation of Air Conditioning System Checklist. Revised Propeller Certificated Noise Levels.
Section 5	Added AC information to Notes Section of Takeoff Distance, Rate of Climb, Enroute Rate of Climb, Cruise, and Range/Endurance Performance data tables.
Section 7	Revised Wing Flaps System Description. Revised Environmental System Description for AC. Revised Pitot Heat Annunciation Description.
Section 8	Revised Brake Temperature Indicator Inspection
Section 9	Revised Log of Supplements. AFM Supplement 13772-127 Air Conditioning System obsoleted. All content moved into Basic SR22 POH (PN 21400-003) to facilitate ease of use.

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List of Effective Pages

Use this page to determine the current effective date for each page in the POH. Supplements are issued individually and are controlled by the Log of Supplements Page in Section 9.

Dates of original issue and revised pages are:

Original Issue..... ..... 15 Jun 2010
Revision .....1 ..... 27 Jun 2011

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FAA Approved Joseph C Mieos Jun 27, 2011 **Date** _____
On Behalf of
ANAC Brazil
for Charles Smalley, Manager
Chicago Aircraft Certification Office, ACE-115C
Federal Aviation Administration

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The Airplane

Engine

Number of Engines..... 1

Engine Manufacturer .....Teledyne Continental

Engine Model TSIO-550-K

Engine Type.....Turbocharged, direct drive, fuel injected, air cooled, horizontally opposed 6 cylinder engine with 550 cubic inch displacement.

Horsepower Rating..... 315 bhp @ 2500 rpm

Propeller

Hartzell Compact Series Lightweight Hub with Composite Blades

Propeller Type .....Constant Speed, Three Blade

Model Number.....PHC-J3Y1F-1N/N7605(B)

Diameter.....78.0"

Fuel

Total Capacity .....94.5 U.S. Gallons (358.0 L)

Total Usable .....92.0 U.S. Gallons (348.0 L)

Approved Fuel Grades:

100 LL Grade Aviation Fuel (Blue)

100 (Formerly 100/130) Grade Aviation Fuel (Green)

Oil

Oil Capacity (Sump) .....8 U.S. Quarts (7.6 L)

Oil Grades:

All Temperatures ..... 15W-50, 20W-50 or 20W-60

Above 40°F (4°C) .....SAE 50, 20W50, or 20W60

Below 40°F (4°C)..... SAE 30, 10W30, 15W50, or 20W50

Maximum Certificated Weights

Maximum Gross for Takeoff..... 3400 lb (1542 Kg)

Maximum Baggage Compartment Loading..... 130 lb (59 Kg)

Standard Empty Weight..... 2348 lb (1065 Kg)

Maximum Useful Load..... 1052 lb (477 Kg)

Full Fuel Payload ..... 512 lb (232 Kg)

Cabin and Entry Dimensions

Refer to the preceding figures for dimensions of the cabin interior and entry door openings.

Baggage Spaces and Entry Dimensions

Dimensions of the baggage area and baggage door opening are illustrated in detail in Section 6.

Specific Loadings

Wing Loading.....23.5 lb per square foot

Power Loading.....11.0 lb per hp

2
Limitations

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Taxi Power

Maximum continuous engine speed for taxiing is 1000 RPM on flat, smooth, hard surfaces. Power settings slightly above 1000 RPM are permissible to start motion, for turf, soft surfaces, and on inclines. Use minimum power to maintain taxi speed.

Fuel Limits

Approved Fuel ..... Aviation Grade 100 LL (Blue) or 100 (Green)

Total Fuel Capacity..... 94.5 U.S. Gallon (358.0 L)

Total Fuel Each Tank ..... 47.25 U.S. Gallon (179.0 L)

Total Usable Fuel (all flight conditions)..... 92.0 U.S. Gallon (348.0 L)

Maximum Allowable Fuel Imbalance .....10.0 U.S. Gallon (¼ tank)

The fuel pump must be set to BOOST for takeoff, climb, landing, and for switching fuel tanks.

Altitude Limits

Maximum Takeoff Altitude .....10,000 Feet MSL

Maximum Operating Altitude .....25,000 Feet MSL

The operating rules (FAR Part 91 and FAR Part 135) require the use of supplemental oxygen at specified altitudes below the maximum operating altitude.

Environmental Conditions

Do not operate the airplane below an outside air temperature of -40°F (-40°C).

Maximum Occupancy

Occupancy of this airplane is limited to four persons (the pilot and three passengers).

Systems and Equipment Limits

Cirrus Perspective Integrated Avionics System

1. The appropriate revision of the Cirrus Perspective Cockpit Reference Guide (p/n 190-00821-XX, where X can be any digit from 0 to 9) must be immediately available to the pilot during flight. The system software version stated in the reference guide must be appropriate for the system software version displayed on the equipment.
2. The Avionics System integrates with separately approved sensor installations. Adherence to limitations in appropriate installation POH supplements is mandatory.
3. IFR enroute and terminal navigation is prohibited unless the pilot verifies the currency of the database or verifies each selected waypoint for accuracy by reference to current approved data.
4. Instrument approach navigation predicated upon the GPS Receiver must be accomplished in accordance with approved instrument approach procedures that are retrieved from the GPS equipment database. The GPS equipment database must incorporate the current update cycle.
    a. Receiver Autonomous Integrity Monitoring (RAIM) must be available at the Final Approach Fix for instrument approach procedures that do not use the integrity information from Satellite Based Augmentation Systems (SBAS). For flight planning purposes, in areas where SBAS coverage is not available, the pilot must check RAIM availability.
    b. Accomplishment of ILS, LOC, LOC-BC, LDA, SDF, MLS or any other type of approach not approved for GPS overlay with the GPS receiver is not authorized.
    c. Use of the VOR/ILS receiver to fly approaches not approved for GPS require VOR/ILS navigation data to be present on the display.
    d. Vertical Navigation information for approach procedures that do not meet the ICAO Annex 10 requirements for precision approaches may be utilized for advisory information only. Use of Vertical Navigation information for Instrument Approach Procedures does not guarantee step-down fix altitude protection, or arrival at approach minimums in normal position to land.

e. IFR non-precision approach approval is limited to published approaches within the U.S. National Airspace System. Approaches to airports in other airspace are not approved unless authorized by the appropriate governing authority.

f. RNAV approaches must be conducted utilizing the GPS sensor.

g. Except when GFC 700 with system software 0764.09 or later installed, when conducting missed approach procedures, autopilot (if installed) coupled operation is prohibited until the pilot has established a rate of climb that ensures all altitude requirements of the procedure will be met.

h. The Perspective Integrated Avionics System is compliant with AC 90-100A. As such, the Cirrus Perspective system is eligible to fly RNAV 'Q' or 'T' routes, RNAV SID/STAR/ODPs and eligible to use RNAV substitution or RNAV alternate means of navigation (US Only). Refer to AC 90-100A for additional operator requirements and limitations.

i. The Perspective Integrated Avionics System includes dual, independent navigation sensors that meet the standards set forth in TSO-C145a/ETSO-C145 (Sensors) and TSO-C146a/ETSO-C146 (Display Units) for Class 3 systems.

j. The Perspective Integrated Avionics System has been installed in accordance with AC 20-138A and is approved for navigation using GPS and SBAS (within the coverage of a Satellite Based Augmentation System complying with ICAO annex 10) for IFR enroute, terminal and approach operations.

k. The Perspective Integrated Avionics System complies with the standards set forth in AC 90-96A and JAA TGL-10 (rev 1) for BRNAV and PRNAV operations.

l. The navigation databases employed by the Perspective Integrated Avionics System meet the requirements set forth in AC 20-153 for database integrity, quality and database management practices. The data in the navigation databases are referenced to the WGS-84 reference system.

m. The Perspective Integrated Avionics System complies with the standards set forth in AMC 20-27 and NPA 2009-04 (AMC 20-28) for RNAV operations including LNAV/VNAV and LPV approach operations.

5. Navigation using the Perspective Integrated Avionics System is not authorized in the following geographic areas:
   a. north of 70°North latitude (northern polar region),
   b. south of 70°South latitude (southern polar region),
   c. north of the 65°North latitude between longitude 75°W and 120°W (Northern Canada),
   d. south of 55°south latitude between longitude 120°E and 165°E (region south of Australia and New Zealand).
6. The MFD checklist display supplements the Pilot Operating Handbook checklists and is advisory only. Use of the MFD checklists as the primary set of on-board airplane checklists is prohibited.
7. The NAVIGATION MAP is intended only to enhance situational awareness. Use of the NAVIGATION MAP page for pilotage navigation is prohibited.
8. The TERRAIN PROXIMITY MAP is intended only to enhance situational awareness. Use of the TERRAIN PROXIMITY information for primary terrain avoidance is prohibited.
9. LTNG information on the NAVIGATION MAP or WEATHER MAP is approved only as an aid to hazardous weather avoidance. Use of the WEATHER MAP for hazardous weather penetration is prohibited.
10. The SYNTHETIC VISION SYSTEM (SVS) cannot be used for flight guidance, navigation, traffic avoidance, or terrain avoidance. Maneuvering the airplane in any phase of flight such as taxi, takeoff, approach, landing, or roll out shall not be predicated on SVS imagery. The synthetic vision system is not intended to be used independently of traditional attitude instrumentation. Consequently, SVS is disabled when traditional attitude instrumentation is not available. Otherwise, the traditional attitude instrumentation will always be visible in the foreground with SVS features in the background.
11. Use of the TRAFFIC ADVISORY SYSTEM (TAS) to maneuver the airplane to avoid traffic is prohibited. The TAS is intended for advisory use only. TAS is intended only to help the pilot to visually located traffic. It is the responsibility of the pilot to see and maneuver to avoid traffic.

12. Use of use of portable electronic devices during takeoff and landing is prohibited.

L-3 Skywatch Traffic Advisory System (Optional)

1. Traffic information shown on the Perspective Integrated Avionics System displays is provided as an aid in visually acquiring traffic. Pilots must maneuver the aircraft based only upon ATC guidance or positive visual acquisition of conflicting traffic.
2. If the pilot is advised by ATC to disable transponder altitude reporting, Traffic Advisory System must be turned OFF.
3. When option installed, the appropriate revision of the L-3 Avionics Systems SkyWatch Traffic Advisory System Model SKY497 Pilot's Guide (p/n 009-10801-001) must be available to the pilot during flight.

L-3 Stormscope Weather Information System (Optional)

1. Use of the Weather Information System is not intended for hazardous weather penetration (thunderstorm penetration). Weather information, as displayed on the Perspective Integrated Avionics System, is to be used only for weather avoidance, not penetration.
2. When option installed, the appropriate revision of the L-3 Avionics Systems WX500 Stormscope Series II Weather Mapping Sensor User's Guide, (p/n 009-11501-001) must be available to the pilot during flight.

Max Viz Enhanced Vision System (Optional)

1. The Enhanced Vision System (EVS) cannot be used for flight guidance, navigation, traffic avoidance, or terrain avoidance. Maneuvering the airplane in any phase of flight such as taxi, takeoff, approach, landing, or roll out shall not be predicated on EVS imagery. The EVS shall only be used as an aide to assist the flight crew to visually acquire objects normally viewed through the cockpit windows.
2. The appropriate revision of the Max Viz Enhanced Vision System Information Manual, (p/n 309100024) must be available to the pilot during flight.

Air Conditioning System (Optional)

The use of Recirculation Mode during flight is prohibited.

Inflatable Restraint System

Use of a child safety seat with the inflatable restraint system is prohibited.

Flap Limitations

Approved Takeoff Settings.....UP (0%) or 50%

Approved Landing Settings .....0%, 50%, or 100%

Do not use flaps above 17,500 feet MSL.

Paint

To ensure that the temperature of the composite structure does not exceed 150°F (66°C), the outer surface of the airplane must be painted in accordance with the paint colors and schemes as specified in the Airplane Maintenance Manual. Refer to Airplane Maintenance Manual (AMM), Chapter 51, for specific paint requirements.

Cirrus Airframe Parachute System (CAPS)

VPD Maximum Demonstrated Deployment Speed.....133 KIAS

• Note •

Refer to Section 10 – Safety Information, for additional CAPS guidance.

Other Limitations

Smoking

Smoking is prohibited in this airplane.

Placards

Engine compartment, inside oil filler access:

TIPO DE ÓLEO DO MOTOR
ACIMA DE 4° C (40° F): SAE 50, 20W50 OU 20W60
ABAIXO DE 4° C (40° F): SAE 30 OU 10W30, 15W50 OU 20W50
CONSULTE O AFM PARA ÓLEOS APROVADOS

Wing, adjacent to fuel filler caps:

Upper fuselage, either side of CAPS rocket cover:

ATENÇÃO!
FOGUETE PARA LANÇAMENTO DE PARAQUEDAS NO INTERIOR DA FUSELAGEM
MANTENHA-SE AFASTADO QUANDO EXISTIREM PESSOAS NA CABINE

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Figure 2-2
Placards (Sheet 1 of 6)

Elevator, Rudder, & Elec. Trim Tab (if installed), both sides:

NÃO EMPURRE

Left fuselage, on external power supply door:

ENERGIA
EXTERNA
28 V DC

FLUÍDO ANTI-GELO
CONSULTE O AFM PARA
FLUÍDOS ANTI-GELO
APROVADOS

Serials 0334 & subs w/ Ice Protection.

Doors, above and below latch:

EMPURRE
PARA
ABRIR

Serials 0821 & subs.

Serials 0334 & subs w/ Ice Protection.

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Figure 2-3
Placards (Sheet 2 of 6)

Engine control panel:

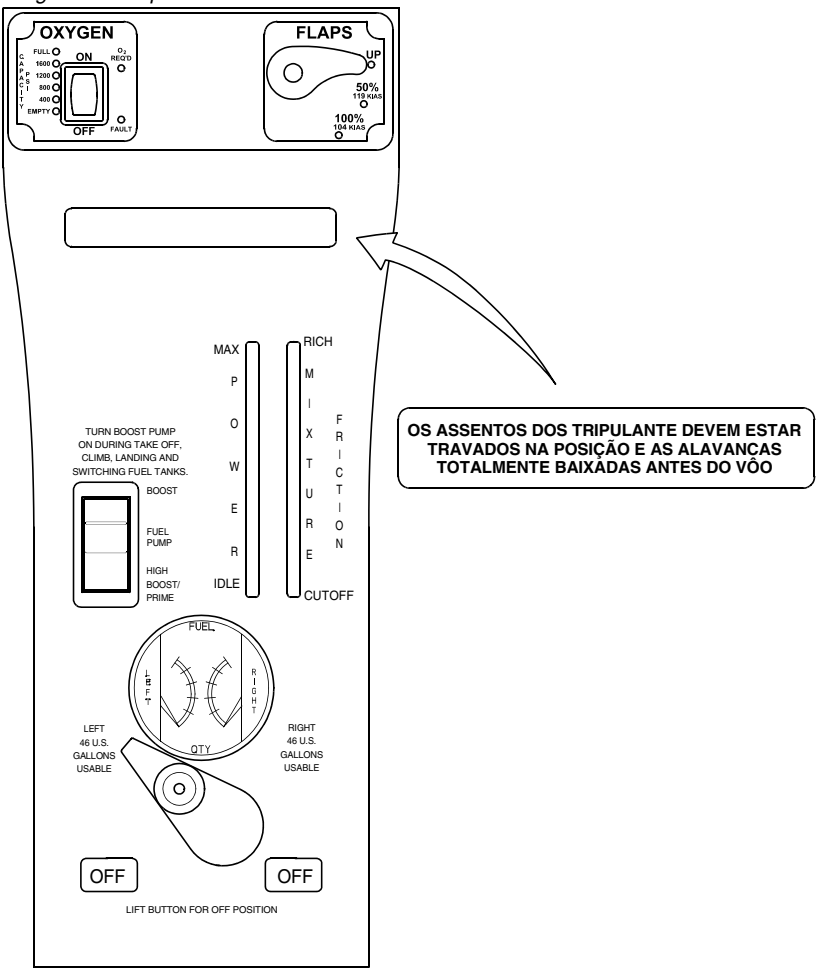

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Figure 2-4
(Sheet 3 of 6)

Wing, flap aft edge and fuselage vortex generator:

NÃO PISE

Cabin Door Window, lower edge, centered, applied upside down:

PARA SALVAMENTO: QUEBRE E REMOVA A JANELA

Bolster Switch Panel, left edge:

THIS AIRCRAFT IS CERTIFIED FOR THE FOLLOWING FLIGHT OPERATIONS:
DAY - NIGHT - VFR - IFR
(WITH REQUIRED EQUIPMENT)

FLIGHT INTO KNOWN ICING IS PROHIBITED

OPERATE PER AIRPLANE FLIGHT MANUAL

Instrument Panel, left :

NORMAL CATEGORY AIRPLANE
NO ACROBATIC MANEUVERS, INCLUDING SPINS, APPROVED

ABOVE 17,500 V_{NE} AND V_{NO}
REDUCE LINEARLY WITH ALTITUDE:

	V_{NE}	V_{NO}	
17,500	200	177	KIAS
25,000	170	151	KIAS

MANEUVERING SPEED: Vo 133 KIAS

BR_SR22_FM02_3303

Figure 2-5
(Sheet 4 of 6)

Instrument Panel:

NÃO FUME
APERTE OS CINTOS
EXTINTOR DE INCÊNDIO
DEBAIXO DO ASSENTO DO PILOTO

OR

NÃO FUME
EXTINTOR DE INCÊNDIO DEBAIXO DO ASSENTO DO PILOTO
APERTE OS CINTOS

Serials 22-0002 thru 22-1862.

NÃO FUME • APERTE OS CINTOS
EXTINTOR DE INCÊNDIO A ESQUERDA
E A FRENTE DO ACENTO DO PILOTO

Serials 22-1863 & subs, 22T-0001 & subs.

Cabin Window, above door latch:

SAÍDA DE EMERGÊNCIA
REMOVA O MARTELO DO INTERIOR
DO COMPARTIMENTO ENTRE OS BANCOS.
QUEBRE O CANTO DA JANELA. CHUTE OU
EMPURRE DEPOIS DE QUEBRADO.

Serials 22-0169 & subs, 22T-0001 & subs.

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Figure 2-6
(Sheet 5 of 6)

CAPS Deployment Handle Cover, above pilot's right shoulder:

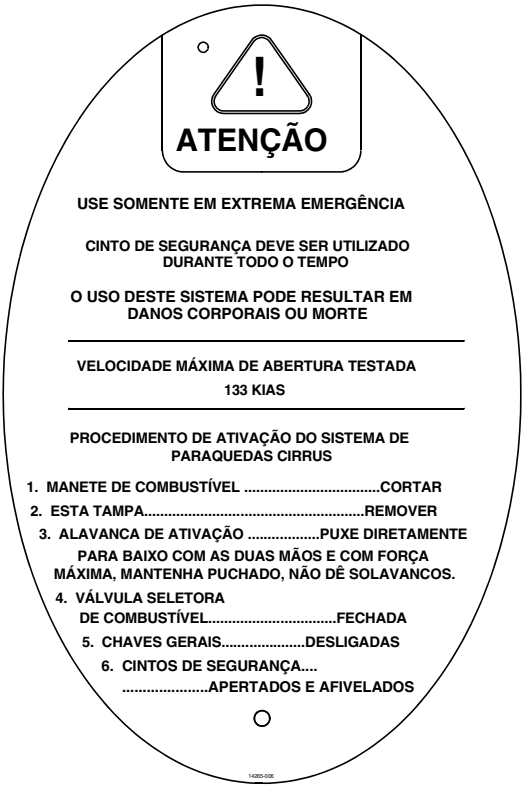

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Figure 2-7
(Sheet 6 of 6)

Smoke and Fire

Cabin Fire In Flight

1. Bat-Alt Master Switches ..... OFF, AS REQ'D
2. Fire Extinguisher ..... ACTIVATE

If airflow is not sufficient to clear smoke or fumes from cabin:

3. Cabin Doors ..... PARTIALLY OPEN
4. Avionics Power Switch ..... OFF
5. All other switches ..... OFF
6. Land as soon as possible.

If setting master switches off eliminated source of fire or fumes and airplane is in night, weather, or IFR conditions:

7. Airflow Selector ..... OFF
8. Bat-Alt Master Switches ..... ON
9. Avionics Power Switch ..... ON
10. Required Systems ..... ACTIVATE one at a time
11. Temperature Selector ..... COLD
12. Vent Selector ..... FEET/PANEL/DEFROST POSITION
13. Airflow Selector ..... SET AIRFLOW TO MAXIMUM
14. Panel Eyeball Outlets ..... OPEN
15. Land as soon as possible.

Amplification

With Bat-Alt Master Switches OFF, engine will continue to run. However, no electrical power will be available.

If the airplane is in IMC conditions, turn ALT 1, ALT 2, and BAT 1 switches OFF. Power from battery 2 will keep the Primary Flight Display operational for approximately 30 minutes. If airplane is in day VFR conditions and turning off the master switches eliminated the fire situation, leave the master switches OFF. Do not attempt to isolate the source of the fire by checking each individual electrical component.

(Continued on following page)

If the cause of the fire is readily apparent and accessible, use the fire extinguisher to extinguish flames and land as soon as possible. Opening the vents or doors may feed the fire, but to avoid incapacitating the crew from smoke inhalation, it may be necessary to rid cabin of smoke or fire extinguishant.

If required to re-activate systems. Pause several seconds between activating each system to isolate malfunctioning system. Continue flight to earliest possible landing with malfunctioning system off. Activate only the minimum amount of equipment necessary to complete a safe landing.

Engine Fire In Flight

1. Mixture ..... CUTOFF
2. Fuel Pump ..... OFF
3. Fuel Selector ..... OFF
4. Airflow Selector ..... OFF
5. Power Lever ..... IDLE
6. Ignition Switch ..... OFF
7. Cabin Doors ..... PARTIALLY OPEN
8. Land as soon as possible.

Amplification

If an engine fire occurs during flight, do not attempt to restart the engine.

Wing Fire In Flight

1. Pitot Heat Switch ..... OFF
2. Navigation Light Switch ..... OFF
3. Landing Light ..... OFF
4. Strobe Light Switch ..... OFF
5. If possible, side slip to keep flames away from fuel tank and cabin.
6. Land as soon as possible.

Amplification

• Caution •

Putting the airplane into a dive may blow out the fire. Do not exceed V_{NE} during the dive.

Engine Fire During Start

1. Mixture ..... CUTOFF
2. Fuel Pump ..... OFF
3. Fuel Selector ..... OFF
4. Power Lever ..... ADVANCE
5. Starter ..... CRANK
6. If flames persist, perform *Emergency Engine Shutdown on Ground* and *Emergency Ground Egress* checklists.

Amplification

A fire during engine start may be caused by fuel igniting in the fuel induction system. If this occurs, attempt to draw the fire back into the engine by continuing to crank the engine.

Smoke and Fume Elimination

1. Oxygen Masks or Cannulas ..... DON
2. Oxygen System ..... ON
3. Oxygen Flow Rate ..... MAXIMUM
4. Air Conditioner (if installed) ..... OFF
5. Temperature Selector ..... COLD
6. Vent Selector ..... FEET/PANEL/DEFROST POSITION
7. Airflow Selector ..... SET AIRFLOW TO MAXIMUM

   If source of smoke and fume is firewall forward:

   a. Airflow Selector ..... OFF
8. Panel Eyeball Outlets ..... OPEN
9. Prepare to land as soon as possible.

   If airflow is not sufficient to clear smoke or fumes from cabin:

10. Cabin Doors ..... PARTIALLY OPEN

Amplification

• WARNING •

Use Oxygen System only if flames and heat are not present.

In addition to the procedures described above, pilot and passengers should don masks and use the oxygen system at the maximum flow rate until smoke and fumes have cleared.

If smoke and/or fumes are detected in the cabin, check the engine parameters for any sign of malfunction. If a fuel leak has occurred, actuation of electrical components may cause a fire. If there is a strong smell of fuel in the cockpit, divert to the nearest suitable landing field. Perform a *Forced Landing* and shut down the fuel supply to the engine once a safe landing is assured.

Ditching

1. Radio ..... Transmit (121.5 MHz) MAYDAY giving location and intentions
2. Transponder ..... SQUAWK 7700
3. CAPS ..... ACTIVATE
4. Airplane ..... EVACUATE
5. Flotation Devices ..... INFLATE WHEN CLEAR OF AIRPLANE

Amplification

If available, life preservers should be donned and life raft should be prepared for immediate evacuation upon touchdown.

Consider unlatching a door prior to assuming the emergency landing body position in order to provide a ready escape path.

It may be necessary to allow some cabin flooding to equalize pressure on the doors. If the doors cannot be opened, break out the windows with the egress hammer and crawl through the opening.

Landing Without Elevator Control

1. Flaps ..... SET 50%
2. Trim ..... SET 80 KIAS
3. Power ..... AS REQUIRED FOR GLIDE ANGLE

Amplification

The pitch trim spring cartridge is attached directly to the elevator and provides a backup should you lose the primary elevator control system. Set elevator trim for a 80 KIAS approach to landing. Thereafter, do not change the trim setting until in the landing flare. During the flare, the nose-down moment resulting from a power reduction may cause the airplane to hit on the nosewheel. At touchdown, bring the power lever to idle.

Engine System Emergencies

Engine Partial Power Loss

1. Air Conditioner (if installed) ..... OFF
2. Fuel Pump ..... HIGH BOOST/PRIME
3. Fuel Selector ..... SWITCH TANKS
4. Mixture ..... CHECK appropriate for flight conditions
5. Power Lever ..... SWEEP
6. Ignition Switch ..... BOTH, L, then R
7. Land as soon as practical.

Amplification

• WARNING •

If there is a strong smell of fuel in the cockpit, divert to the nearest suitable landing field. Fly a forced landing pattern and shut down the engine fuel supply once a safe landing is assured.

Indications of a partial power loss include fluctuating RPM, reduced or fluctuating manifold pressure, low oil pressure, high oil temperature, and a rough-sounding or rough-running engine. Mild engine roughness in flight may be caused by one or more spark plugs becoming fouled. A sudden engine roughness or misfiring is usually evidence of a magneto malfunction.

If for any reason the aircraft experiences an unexpected loss of normal manifold pressure perform *Unexpected Loss Of Manifold Pressure* checklist

Low oil pressure may be indicative of an imminent engine failure. See *Oil Pressure Out of Range - OIL PRESS Warning* in this section for special procedures with low oil pressure.

A damaged (out-of-balance) propeller may cause extremely rough operation. If an out-of-balance propeller is suspected, immediately shut down engine and perform *Forced Landing* checklist.

If the power loss is due to a fuel leak in the injector system, fuel sprayed over the engine may be cooled by the slipstream airflow which may prevent a fire at altitude. However, as the Power Lever is reduced during descent and approach to landing the cooling air may not be sufficient to prevent an engine fire.

Selecting HIGH BOOST/PRIME may clear the problem if vapor in the injection lines is the problem or if the engine-driven fuel pump has partially failed. The electric fuel pump will not provide sufficient fuel pressure to supply the engine if the engine-driven fuel pump completely fails.

Selecting the opposite fuel tank may resolve the problem if fuel starvation or contamination in one tank was the problem.

Cycling the ignition switch momentarily from BOTH to L and then to R may help identify the problem. An obvious power loss in single ignition operation indicates magneto or spark plug trouble. Lean the mixture to the recommended cruise setting. If engine does not smooth out in several minutes, try a richer mixture setting. Return ignition switch to the BOTH position unless extreme roughness dictates the use of a single magneto.

If a partial engine failure permits level flight, land at a suitable airfield as soon as conditions permit. If conditions do not permit safe level flight, use partial power as necessary to set up a forced landing pattern over a suitable landing field. Always be prepared for a complete engine failure and consider CAPS deployment if a suitable landing site is not available. Refer to Section 10, Safety Information, for CAPS deployment scenarios and landing considerations.

Oil Pressure Out of Range

OIL PRESS Warning

OIL PRESS

1. Oil Pressure Gage ..... CHECK

   If pressure low:

   a. Power..... REDUCE to minimum for sustained flight

   b. Land as soon as possible.

      (1) Prepare for potential engine failure.

   If pressure low and oil temperature normal:

   a. Engine ..... MONITOR OIL PRESS/TEMP

   b. Land as soon as practical.

   If pressure high:

   a. Power..... REDUCE to minimum for sustained flight

   b. Land as soon as possible.

      (1) Prepare for potential engine failure.

Amplification

If oil pressure is low, the engine has probably lost a significant amount of its oil and engine failure may be imminent.

If oil pressure is suddenly high, a blockage or obstruction may have developed in the oil circulation system and engine failure be imminent.

Oil Temperature High

OIL TEMP Warning

OIL TEMP

1. Power ..... REDUCE
2. Airspeed..... INCREASE
3. Mixture .....ADJUST fuel flow to top of green arc
4. Oil Temperature Gage..... MONITOR

   If temperature remains high:

5. Land as soon as possible.

3A
Abnormal Procedures

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Introduction

This section provides procedures for handling abnormal system and/or flight conditions which, if followed, will maintain an acceptable level of airworthiness or reduce operational risk. The guidelines described in this section are to be used when an abnormal condition exists and should be considered and applied as necessary.

• Caution •

If a Warning annunciation is illuminated in combination with any of the following Abnormal annunciations, the Warning annunciation takes precedents and shall be performed first.

Abnormal Procedures Guidance

Although this section provides procedures for handling most abnormal system and/or flight conditions that could arise in the aircraft, it is not a substitute for thorough knowledge of the airplane and general aviation techniques. A thorough study of the information in this handbook while on the ground will help you prepare for time-critical situations in the air.

Sound judgement as well as thorough knowledge of the aircraft, its characteristics, and the flight manual procedures are essential in the handling of any abnormal system and/or flight condition. In addition to the outlined items in the Abnormal Procedures, the following steps are considered part of all abnormal situations:

- ***Maintain Aircraft Control***
- ***Analyze the Situation***
- ***Take Appropriate Action***

Circuit Breakers

Many procedures involve manipulating circuit breakers. The following criteria should be followed during “Circuit Breaker” steps:

- Circuit breakers that are “SET” should be checked for normal condition. If the circuit breaker is not “Set”, it may be reset only once. If the circuit breaker opens again, do not reset.
- Circuit breakers that “PULL” should only be pulled and not reset.
- Circuit breakers that “CYCLE” should be pulled, delayed for several seconds, and reset only once. Allow sufficient cooling time for circuit breakers that are reset through a “CYCLE” procedure.

Flight Environment

Inadvertent Icing Encounter

1. Pitot Heat .....ON
2. Exit icing conditions. Turn back or change altitude.
3. Cabin Heat .....MAXIMUM
4. Windshield Defrost..... FULL OPEN

Amplification

Flight into known icing conditions is prohibited.

Alternate induction air door will automatically open if required.

Inadvertent IMC Encounter

1. Airplane Control ..... ESTABLISH straight and level flight
2. Autopilot .....ENGAGE to hold heading and altitude
3. Heading ..... RESET to initiate 180° turn

Amplification

Upon entering IMC, a pilot who is not completely proficient in instrument flying should rely upon the autopilot to execute a 180° turn to exit the conditions. Immediate action should be made to turn back as described above:

Door Open In Flight

1. Airplane Control ..... MAINTAIN

Amplification

The doors on the airplane will remain 1-3 inches open in flight if not latched. If this is discovered on takeoff roll, abort takeoff if practical. If already airborne do not allow efforts to close the door interfere with the primary task of maintaining control of the airplane. Do not attempt to hold door closed. Upon landing flare door may swing open - do not attempt to close door.

Abnormal Landings

Landing With Failed Brakes

One brake inoperative

1. Land on the side of runway corresponding to the inoperative brake.
2. Maintain directional control using rudder and working brake.

Both brakes inoperative

1. Divert to the longest, widest runway with the most direct headwind.
2. Land on downwind side of the runway.
3. Use the rudder for obstacle avoidance.
4. Perform *Emergency Engine Shutdown on Ground* checklist.

Amplification

Rudder effectiveness will decrease with decreasing airspeed.

Landing With Flat Tire

Main Gear

1. Land on the side of the runway corresponding to the good tire.
2. Maintain directional control with the brakes and rudder.
3. Do not taxi. Stop the airplane and perform a normal engine shutdown.

Nose Gear

1. Land in the center of the runway.
2. Hold the nosewheel off the ground as long as possible.
3. Do not taxi. Stop the airplane and perform a normal engine shutdown.

Amplification

If a flat tire or tread separation occurs during takeoff and you cannot abort, land as soon as conditions permit.

Engine System

Low Idle Oil Pressure

OIL PRESS Caution

OIL PRESS

1. If In-Flight ..... LAND AS SOON AS PRACTICAL

Amplification

Oil pressure between 10 psi and 30 psi at or above 1000 RPM

This message will appear prior to engine start and should clear after engine start.

Manifold Pressure High

MAN PRESSURE Caution

MAN PRESSURE

1. Power Lever ..... REDUCE to less than 36.5"
2. Flight ..... CONTINUE

   If noticeable surging is present:

3. Complete *Overboost / Pressure Relief Valve* Emergency Checklist

Amplification

Manifold Pressure has exceeded caution limits. High Manifold Pressure may be a result of cold oil and the affect of high associated oil pressure on the wastegate controller. Maintain power at or below 36.5" by power lever management. If High Manifold Pressure persists when oil temperatures are greater than 150°F, MAP controller requires a maintenance adjustment. If engine surges are associated, MAP may be exceeding pressure relief valve (pop-off valve) threshold. Relief valve will protect induction manifolds from excessive pressure, but it may be a sign of a failed closed wastegate; if this is observed or suspected, complete the Overboost / Pressure Relief Valve emergency checklist.

Starter Engaged

STARTER ENGAGED Caution

START ENGAGE

On-Ground

1. Ignition Switch ..... DISENGAGE prior to 20 Seconds
2. Battery Switches .....Wait 20 seconds before next start attempt

If starter does not disengage (relay or solenoid failure):

3. BAT 1 Switch .....OFF
4. Engine .....SHUTDOWN
5. STARTER Circuit breaker..... PULL

In-Flight

1. Ignition Switch ..... Ensure not stuck in START
2. STARTER Circuit breaker..... PULL
3. Flight ..... CONTINUE
   Engine start will not be available at destination.

Amplification

• WARNING •

Use extreme caution after shutdown if STARTER circuit breaker required pull (failed relay or solenoid). If breaker is unknowingly or unintentionally reset, starter will instantly engage if Battery 1 power is supplied; creating a hazard for ground personnel.

Starter has been engaged for more than 15 seconds (starter limit is 20 seconds); if not manually engaged, such as during difficult start, this annunciation may indicate a failure of the starter solenoid or a stuck keyswitch.

Alternate Air Door Open Annunciation

ALT AIR OPEN Caution

ALT AIR OPEN

1. Manifold Pressure ..... CHECK

   If environment suspect as cause (icing or visible debris):

2. Flight Conditions .....CHANGE/EXIT
3. Power ..... Reduce to 30.5 in.Hg when practical
4. Flight ..... CONTINUE

Amplification

Alternate induction door has automatically opened, indicating an obstructed air filter. Potential environmental causes are ice contamination (icing conditions) or particles (visible debris, heavy bugs, smoke or ash).

- If ice contamination was cause, unfiltered air won't pose an operating hazard for the engine, but conditions significant enough to ice obstruct filters are not suitable conditions for long duration flight of light aircraft.
- If flying through conditions that have obvious debris contamination sources, exit those conditions as able; engine induction is unfiltered when alternate air door is open.
- Reduction to cruise power when able will reduce engine air consumption, and likely close the alternate air door (restoring filer protection to induction air).
- Filters likely require maintenance.

When alternate induction door is open, expect 3-5% power loss due to increased manifold air temperatures and expect lower critical altitude in climb. Percent Power indication will be accurate, reflecting actual (reduced) power.

Fuel System

Low Fuel Quantity

FUEL QTY Caution

FUEL QTY

1. Fuel Quantity Gages ..... CHECK

   If fuel quantity indicates less than or equal to 14 gallons:

   a. Land as soon as practical.

   If fuel quantity indicates more than 14 gallons:

   a. Flight ..... CONTINUE, MONITOR

Amplification

Annunciation indicates fuel totalizer quantity is less than or equal to 14 gallons.

Left Fuel Tank Quantity

L FUEL QTY Advisory

L FUEL QTY

1. Left Fuel Quantity Gage ..... CHECK

   If left fuel quantity indicates less than or equal to 14 gallons:

   a. Flight ..... CONTINUE, MONITOR

Right Fuel Tank Quantity

R FUEL QTY Advisory

R FUEL QTY

1. Right Fuel Quantity Gage ..... CHECK

   If right fuel quantity indicates less than or equal to 14 gallons:

   a. Flight ..... CONTINUE, MONITOR

Amplification

Fuel quantity is less than or equal to 14 gallons.

Electrical System

Low Voltage on Main Bus 1

M BUS 1 Caution

M BUS 1

1. Perform Alt 1 Caution (Failure) Checklist.

Amplification

Main Bus 1 Voltage is low, indicates Alt 1 failure; will typically be associated with low M1 voltage Alt 1 current indications, Battery 1 discharge and ALT 1 Caution message.

Low Voltage on Main Bus 2

M BUS 2 Caution

M BUS 2

1. Perform Alt 1 and Alt 2 Caution (Failure) checklists.

Amplification

Main Bus 2 Voltage is low, indicative of dual Alt 1 and 2 failures; will typically be associated with low M1 and M2 voltages, Alt 1 and Alt 2 current indications, Battery 1 discharge, ALT 1 & 2 and M BUS 1 & 2 Caution messages, and ESS BUS Warning message.

Battery 1 Current Sensor

BATT 1 Caution

BATT 1

1. Main Bus 1, 2 and Non-Essential Bus Loads..... REDUCE
2. Main Bus 1, 2 and Essential Bus Voltages ..... MONITOR
3. Land as soon as practical.

Amplification

Battery 1 discharge while Alt 1 is functioning normally, indicative of an internal power distribution failure within the MCU

Low Alternator 1 Output

ALT 1 Caution (Failure)

ALT 1

1. ALT 1 Circuit Breaker .....CHECK & SET
2. ALT 1 Master Switch .....CYCLE

   If alternator does not reset (low A1 Current and M1 voltage):

3. ALT 1 Master Switch .....OFF
4. Non-Essential Bus Loads.....REDUCE
   a. If flight conditions permit, consider shedding the following to preserve Battery 1:
      (1) Air Conditioning,
      (2) Landing Light,
      (3) Yaw Servo,
      (4) Convenience Power (aux items plugged into armrest jack)
5. Continue Flight, avoiding IMC or night flight as able (reduced power redundancy).

Amplification

• Caution •

Dependant on Battery 1 state (indicated by M1 voltage), landing light may be weak or inoperative for landing.

Alternator 1 output is low, indicative of alternator failure; will typically be associated with low M1 voltage, Battery 1 discharge and M BUS 1 Caution message.

Low Alternator 2 Output

ALT 2 Caution (Failure)

ALT 2

1. ALT 2 Circuit Breaker ..... CHECK & SET
2. ALT 2 Master Switch ..... CYCLE

   If alternator does not reset (low A2 Current and M2 voltage less than M1 voltage):

3. ALT 2 Master Switch ..... OFF
4. Continue Flight, avoiding IMC or night flight as able (reduced power redundancy).

Amplification

Alternator 2 output is low, indicative of alternator failure; isolated Alt 2 failure will not typically be associated with any other unusual indications, cautions or warnings (Alt 1 will pick up all loads).

Integrated Avionics System

Avionics Switch Off

AVIONICS OFF Caution

AVIONICS OFF

1. AVIONICS Switch.....ON, AS REQUIRED

Amplification

The AVIONICS master switch is off.

PFD Cooling Fan Failure

PFD 1 FAN FAIL Advisory

PFD 1 FAN FAIL

1. AVIONICS FAN 2 Circuit Breaker.....CYCLE

   If annunciation does not extinguish:

   a. Hot cabin temperatures .....LAND AS SOON AS PRACTICAL

   b. Cool cabin temperatures ..... CONTINUE, MONITOR

Amplification

The cooling fan for the PFD is inoperative.

MFD Cooling Fan Failure

MFD FAN FAIL Advisory

MFD FAN FAIL

1. AVIONICS FAN 1 Circuit Breaker.....CYCLE

   If annunciation does not extinguish:

   a. High cabin temperatures ....LAND AS SOON AS PRACTICAL

   b. Low cabin temperatures ..... CONTINUE, MONITOR

Amplification

The cooling fan for the MFD is inoperative.

Flight Displays Too Dim

1. INSTRUMENT dimmer knob..... OFF (full counter-clockwise)

   If flight displays do not provide sufficient brightness:

2. Revert to standby instruments.

Amplification

The instrument dimmer knob provides manual dimming control of the display screens, key and text backlighting, flap and Environmental Control System (ECS) status indicators, and standby instruments. Rotation of the dimmer knob fully counterclockwise disables the dimmer, and reverts to daytime lighting for all components.

In daytime lighting (knob OFF/full counterclockwise):

- Standby instruments, all Avionics system keypads and the bolster switch panel are unlit
- MFD and PFD screen illumination is controlled by automatic photocell (providing full brightness in high light conditions, only slightly reduced by darkness)
- ECS and control panels are backlight and their status lights at maximum intensity

With active dimming (knob moved clockwise), the full bright position (full clockwise) applies maximum illumination to keys and switches, to standby instruments and to status lights, but the PFD/MFD screen illumination is at a substantially reduced level (levels still appropriate for night flight). Maximum screen illumination (appropriate for daytime use) is with the dimmer OFF/full counterclockwise.

Pitot Static System

Pitot Static Malfunction

Static Source Blocked

1. Pitot Heat ..... ON
2. Alternate Static Source .....OPEN

Amplification

If erroneous readings of the static source instruments (airspeed, altimeter and vertical speed) are suspected, the alternate static source valve, on side of console near pilot's right ankle, should be opened to supply static pressure from the cabin to these instruments. With the alternate static source on, adjust indicated airspeed slightly during climb or approach according to the Airspeed Calibration (Alternate Static Source) table in Section 5 as appropriate for vent/ heater configuration.

Pitot Tube Blocked

1. Pitot Heat ..... ON

Amplification

If only the airspeed indicator is providing erroneous information, and in icing conditions, the most probable cause is Pitot ice. If setting Pitot Heat ON does not correct the problem, descend to warmer air. If an approach must be made with a blocked Pitot tube, use known pitch and power settings and the GPS groundspeed indicator, taking surface winds into account.

Pitot Heat Current Sensor Annunciation

PITOT HEAT FAIL Caution

PITOT HEAT FAIL

1. Pitot Heat Circuit Breaker ..... CYCLE
2. Pitot Heat ..... CYCLE OFF, ON

   If inadvertent icing encountered, perform Inadvertent Icing Encounter Emergency Checklist and:

   a. Airspeed ..... EXPECT NO RELIABLE INDICATION

   b. Exit icing conditions using attitude, altitude, and power instruments.

Amplification

Pitot heat failure. Displayed when Pitot heat switch is ON and Pitot heat current is not detected.

Pitot Heat Required Annunciation

PITOT HEAT REQUIRED Caution

PITOT HEAT REQD

1. Pitot Heat ..... ON

Amplification

Displayed 20 seconds after system detects OAT is less than 41°F (5°C) and Pitot Heat Switch is OFF.

Flight Control System

Electric Trim/Autopilot Failure

1. Airplane Control ..... MAINTAIN MANUALLY
2. Autopilot (if engaged) .....DISENGAGE

   If Problem Is Not Corrected:
3. Circuit Breakers..... PULL AS REQUIRED
   - PITCH TRIM
   - ROLL TRIM
   - YAW SERVO
   - AP SERVOS
4. Power Lever ..... AS REQUIRED
5. Control Yoke..... MANUALLY HOLD PRESSURE
6. Land as soon as practical.

Amplification

Any failure or malfunction of the electric trim or autopilot can be overridden by use of the control yoke. If runaway trim is the problem, deenergize the circuit by pulling the appropriate circuit breakers and land as soon as conditions permit.

Flap System Exceedance

FLAPS Caution

FLAPS

1. Airspeed.....REDUCE

   or
1. Flaps ..... RETRACT

Amplification

Flaps are extended beyond airspeed limitations.

Flaps at 100%, airspeed greater than 109 KIAS for 5 seconds or more,

OR

Flaps at 50%, airspeed greater than 124 KIAS for 5 seconds or more.

Landing Gear System

Brake Failure During Taxi

1. Engine Power ..... AS REQUIRED
   - To stop airplane - REDUCE
   - If necessary for steering - INCREASE
2. Directional Control ..... MAINTAIN WITH RUDDER
3. Brake Pedal(s) ..... PUMP

   If directional control can not be maintained:
4. Ignition Switch ..... OFF

Amplification

Ground steering is accomplished by differential braking. However, increasing power may allow some rudder control due to increased groundspeed and airflow over the rudder.

Left/Right Brake Over-Temperature

BRAKE TEMP Caution

BRAKE TEMP

1. Stop aircraft and allow the brakes to cool.

Amplification

Brake temperature is between 270°F and 293°F for more than 5 seconds. Refer to Section 10 - Safety Information: Taxiing, Steering, and Braking Practices for additional information.

Oxygen System

Oxygen Quantity Low

OXYGEN QTY Caution

OXYGEN QTY

1. Oxygen Pressure and Flow Rate ..... CHECK
2. Oxygen Duration ..... CALCULATE
   a. See Oxygen AFMS; calculate duration based on remaining pressure, number of occupants and type of device (mask or cannula).
3. Perform Normal Descent as necessary, dependant on duration calculation

Amplification

1. Annunciation indicated tank pressure is between 800 and 400 PSI, see Oxygen AFMS to determine remaining duration.

OXYGEN RQD Caution

OXYGEN RQD

1. Oxygen Masks or Cannulas ..... DON
2. Oxygen System ..... ON
3. Oxygen Flow Rate..... ADJUST as necessary for cruise altitude

Amplification

Annunciation indicates that aircraft is above 10000 ft and system is not ON.

OXYGEN QTY Advisory

OXYGEN QTY

On-Ground

1. Oxygen Supply .....REPLENISH if use of oxygen is anticipated

In-Flight

1. If use of oxygen is anticipated, verify adequate oxygen supply for flight duration. Refer to Duration chart in Oxygen System AFMS.

Amplification

Annunciation indicates oxygen tank pressure is below 800 PSI at pressure altitudes below 10,000 ft.

OXYGEN SYSTEM LEFT ON Advisory

OXYGEN LEFT ON

1. Oxygen System .....OFF

Amplification

Annunciation indicates that after oxygen system has been left ON after on-ground engine shutdown. If system is left ON and aircraft power is turned OFF, the solenoid valve will remain open and may result in unexpected leakage and pressure loss.

Other Conditions

Aborted Takeoff

1. Power Lever ..... IDLE
2. Brakes ..... AS REQUIRED

Amplification

Use as much of the remaining runway as needed to safely bring the airplane to a stop or to slow the airplane sufficiently to turn off runway.

• Caution •

For maximum brake effectiveness, retract flaps, hold control yoke full back, and bring the airplane to a stop by smooth, even application of the brakes.

After a high-speed aborted takeoff, brake temperatures will be elevated; subsequent aborted takeoffs or other high-energy use of the brakes may cause brake overheat, failure and possibly even fire. A 25-minute cooling time is recommended following high-energy use of the brake system before attempting to conduct operations that may require further high-energy braking. Brake temperature indicator should be inspected prior to flight following a high-energy brake event (refer to Preflight Walk-Around Checklist for detail).

Parking Brake Engaged Annunciation

PARK BRAKE Caution

PARK BRAKE

1. Parking Brake ..... RELEASE
2. Monitor CAS for BRAKE TEMP Caution. Stop aircraft and allow the brakes to cool if necessary.

Amplification

Parking brake is set.

Communications Failure

1. Switches, Controls ..... CHECK
2. Frequency .....CHANGE
3. Circuit Breakers ..... SET
4. Headset .....CHANGE
5. Hand Held Microphone ..... CONNECT

Amplification

If, after following the checklist procedure, communication is not restored, proceed with FAR/AIM lost communications procedures.

• Note •

In the event of an audio panel power failure the audio panel connects COM 1 to the pilot's headset and speakers. Setting the audio panel 'Off' will also connect COM 1 to the pilot's headsets and speakers.

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4
Normal Procedures

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Before Takeoff

1. Doors ..... LATCHED
2. CAPS Handle ..... Verify Pin Removed
3. Seat Belts and Shoulder Harness ..... SECURE
4. Air Conditioner ..... AS DESIRED

• Note •

If Air Conditioner is ON for takeoff roll, see Section 5, Performance for takeoff distance change. No takeoff distance change is necessary if system remains OFF for takeoff roll.

5. Fuel Quantity ..... CONFIRM
6. Fuel Selector ..... FULLEST TANK
7. Fuel Pump ..... BOOST
8. Mixture ..... FULL RICH
9. Flaps ..... SET 50% & CHECK
10. Transponder ..... SET
11. Autopilot ..... CHECK
12. Navigation Radios/GPS ..... SET for Takeoff
13. Cabin Heat/Defrost ..... AS REQUIRED
14. Brakes ..... HOLD
15. Power Lever ..... 1700 RPM
16. Alternator ..... CHECK
    a. Pitot Heat ..... ON
    b. Navigation Lights ..... ON
    c. Landing Light ..... ON
    d. Annunciator Lights ..... CHECK
    Verify both ALT 1 and ALT 2 caution lights out and positive amps indication for each alternator.
17. Voltage ..... CHECK
18. Pitot Heat ..... AS REQUIRED
19. Navigation Lights ..... AS REQUIRED
20. Landing Light ..... AS REQUIRED

(Continued on following page)

21. Magnetos ..... CHECK Left and Right RPM drop must not exceed 150 RPM for either magneto. RPM differential must not exceed 75 RPM between magnetos
    a. Ignition Switch ..... R, note RPM, then BOTH
    b. Ignition Switch ..... L, note RPM, then BOTH
22. Engine Parameters ..... CHECK
23. Power Lever ..... 1000 RPM
24. Flight Instruments, HSI, and Altimeter ..... CHECK & SET
25. Flight Controls ..... FREE & CORRECT
26. Trim ..... SET Takeoff
27. Autopilot ..... DISCONNECT

Amplification

• WARNING •

Do not takeoff with frost, ice, snow, or other contamination on the fuselage, wing, stabilizers, and control surfaces.

• Caution •

Because this aircraft has a turbocharged system that maintains 36.0 in.Hg manifold pressure for all takeoffs, the mixture should be full rich for takeoff, even at high elevation airports. Leaning for takeoff and during maximum performance climb may cause excessive cylinder head temperatures.

During cold weather operations, the engine should be properly warmed up before takeoff. In most cases this is accomplished when the oil temperature has reached at least 100°F (38°C). In warm or hot weather, precautions should be taken to avoid overheating during prolonged ground engine operation. Additionally, long periods of idling may cause fouled spark plugs.

Pitot Heat should be turned ON for flight into IMC, flight into visible moisture, or whenever ambient temperatures are 41° F (5° C) or less.

During the Magneto Check, if there is a doubt concerning operation of the ignition system, RPM checks at higher engine speeds will usually confirm whether a deficiency exists. An absence of RPM drop may indicate faulty grounding of one side of the ignition system or magneto timing set in advance of the specified setting.

2. Propeller ..... Hand TURN several rotations
3. External Power (If applicable) ..... CONNECT
4. Brakes ..... HOLD
5. Bat Master Switches ..... ON (check voltage)
6. Mixture ..... FULL RICH
7. Power lever ..... FULL FORWARD
8. Fuel Pump ..... HIGH BOOST/PRIME, then BOOST

• Note •

In temperatures down to 20°F, hold Fuel Pump switch to HIGH BOOST/PRIME for 15 seconds prior to starting.

9. Propeller Area ..... CLEAR
10. Power Lever ..... OPEN ¼ INCH
11. Ignition Switch ..... START (Release after engine starts)

• Caution •

Limit cranking to intervals of 20 seconds with a 20 second cooling period between cranks.

12. Power Lever ..... RETARD (to maintain 1000 RPM)
13. Oil Pressure ..... CHECK
14. Alt Master Switches ..... ON
15. Avionics Power Switch ..... ON
16. Engine Parameters ..... MONITOR
17. External Power (If applicable) ..... DISCONNECT
18. Amp Meter/Indication ..... CHECK
19. Strobe Lights ..... ON

Hot Weather Operation

Avoid prolonged engine operation on the ground. Fuel BOOST must be ON for engine start and takeoff, and should be ON during climb for vapor suppression which could occur under hot ambient conditions or after extended idle.

Ground Operation of Air Conditioning (If Installed)

• Note •

To facilitate faster cabin cooling, prior to engine start leave the cabin doors open for a short time to allow hot air to escape cabin.

1. Control Panel ..... SELECT Desired Mode and Temperature
2. Voltage ..... MONITOR

• Note •

Decrease electrical load if battery discharge is noted.

3. Annunciator Lights ..... CHECK
   a. Verify ALT 1 caution light out and positive amps indication.
4. Engine Parameters ..... CHECK

Noise Characteristics/Abatement

The certificated noise levels for the aircraft established in accordance with FAR 36 Appendix G are:

Configuration	Actual	Maximum Allowable
Hartzel 3-blade Propeller PHC-J3Y1F-1N/N7605(B)	80.8 dB(A)	88.00 dB(A)

No determination has been made by the Federal Aviation Administration that the noise levels of this airplane are or should be acceptable or unacceptable for operation at, into, or out of, any airport. The above noise levels were established at 3400 pounds takeoff weight and 2500 RPM.

Recently, increased emphasis on improving environmental quality requires all pilots to minimize the effect of airplane noise on the public. The following suggested procedures minimize environmental noise when operating the aircraft.

• Note •

Do not follow these noise abatement procedures where they conflict with Air Traffic Control clearances or instructions, weather considerations, or wherever they would reduce safety.

1. When operating VFR over noise-sensitive areas, such as outdoor events, parks, and recreational areas, fly not less than 2000 feet

above the surface even though flight at a lower level may be allowed.

2. For departure from or approach to an airport, avoid prolonged flight at low altitude near noise-sensitive areas.

Fuel Conservation

Minimum fuel use at cruise will be achieved using Lean-of-Peak Cruise Climb.

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Introduction

Performance data in this section are presented for operational planning so that you will know what performance to expect from the airplane under various ambient and field conditions. Performance data are presented for takeoff, climb, and cruise (including range & endurance).

Aircraft with optional Air Conditioning System; Brake Horsepower is reduced by approximately 6 BHP.

Associated Conditions Affecting Performance

Computed performance data in this section are based upon data derived from actual flight testing with the airplane and engine in good condition and using average piloting techniques. Unless specifically noted in the “Conditions” notes presented with each table, ambient conditions are for a standard day (refer to Section 1). Flap position as well as power setting technique is similarly noted with each table.

The charts in this section provide data for ambient temperatures from -4°F (–20°C) to 104°F (40°C). If ambient temperature is below the chart value, use the lowest temperature shown to compute performance. This will result in more conservative performance calculations. If ambient temperature is above the chart value, use extreme caution as performance degrades rapidly at higher temperatures.

Demonstrated Operating Temperature

Satisfactory engine cooling has been demonstrated for this airplane with an outside air temperature 23°C above standard. The value given is not considered an operating limitation. Reference should be made to Section 2 for engine operating limitations.

Airspeed Calibration: Normal Static Source

Conditions:

- Power for level flight or maximum continuous, whichever is less.

• Note •

Indicated airspeed values assume zero instrument error.

KIAS	KCAS		
	Flaps 0%	Flaps 50%	Flaps 100%
60	57	56	57
70	68	68	70
80	79	80	80
90	89	91	89
100	100	101	99
110	111	111	111
120	121	121	
130	132		
140	142		
150	152		
160	163		
170	173		
180	183		
190	193		
200	204		

Takeoff Climb Gradient

Conditions:

- Power ..... Full Throttle
- Mixture ..... Full Rich
- Flaps 50%
- Airspeed ..... Best Rate of Climb

• Note •

Climb Gradient values shown are the gain in altitude for the horizontal distance traversed expressed as Feet per Nautical Mile.

For operation in air colder than this table provides, use the coldest (left-most) data shown.

For operation in air warmer than this table provides, use extreme caution.

Weight	Press Altitude	Climb Speed	CLIMB GRADIENT ~ Feet per Nautical Mile				
			Temperature ~°C				
LB	FT	KIAS	-20	0	20	40	ISA
3400	SL	94	1054	925	802	686	832
	2000	94	1011	882	760	645	814
	4000	93	964	836	715	602	793
	6000	93	915	788	669	558	770
	8000	92	864	739	622	512	745
	10000	92	811	688	574	466	718
2900	SL	94	1303	1148	1002	864	1038
	2000	94	1251	1097	952	815	1016
	4000	93	1196	1043	900	765	991
	6000	93	1137	986	845	713	964
	8000	92	1077	928	790	660	935
	10000	92	1015	869	733	607	904

Takeoff Rate of Climb

Conditions:

- Power..... Full Throttle
- Mixture..... Full Rich
- Flaps..... 50%
- Airspeed ..... Best Rate of Climb

• Note •

Rate-of-Climb values shown are change in altitude in ft per unit time expressed in Feet per Minute

For operation in air colder than this table provides, use the coldest (left-most) data shown.

For operation in air warmer than this table provides, use extreme caution.

Aircraft with optional Air Conditioning System; Maximum rate of climb performance is reduced by approximately 50 feet per minute if system is ON. For maximum climb performance the air-conditioner should be off.

Weight	Press Altitude	Climb Speed	RATE OF CLIMB ~ Feet per Minute				
			Temperature ~°C				
LB	FT	KIAS	-20	0	20	40	ISA
3400	SL	94	1534	1402	1264	1119	1299
	2000	94	1520	1382	1237	1087	1303
	4000	93	1499	1354	1204	1049	1302
	6000	93	1472	1321	1165	1005	1298
	8000	92	1439	1282	1120	955	1290
	10000	92	1399	1236	1070	900	1277
2900	SL	94	1880	1730	1570	1404	1611
	2000	94	1867	1709	1542	1370	1618
	4000	93	1847	1681	1508	1329	1621
	6000	93	1819	1646	1466	1282	1619
	8000	92	1784	1604	1418	1228	1613
	10000	92	1742	1555	1364	1169	1602

Enroute Climb Gradient

Conditions:

- Power ..... Full Throttle
- Mixture ..... Maintain Fuel Flow in GREEN ARC
- Flaps ..... 0% (UP)
- Airspeed ..... 120 KIAS

• Note •

Climb Gradient values shown are the gain in altitude for the horizontal distance traversed expressed as Feet per Nautical Mile.

For operation in air colder than this table provides, use the coldest (left-most) data shown.

For operation in air warmer than this table provides, use extreme caution.

Weight	Press Altitude	Climb Speed	CLIMB GRADIENT - Feet per Nautical Mile					
			Temperature ~°C					
LB	FT	KIAS	-40	-20	0	20	40	ISA
3400	**S.L.**	120	964	817	697	596	505	620
	2000	120	888	761	655	561	475	602
	4000	120	828	716	618	529	445	586
	6000	120	779	677	584	497	413	570
	8000	120	737	639	549	461	377	553
	10000	120	697	602	511	422	334	533
	12000	120	657	561	468	376	286	509
	14000	120	614	516	420	324	230	482
	16000	120	566	464	364	264	166	449
	18000	120	512	406	300	196	94	410
	20000	120	450	339	228	120	13	365
	22000	120	380	263	148	35		314
	24000	120	302	179	59			257
	25000	120	259	133	11			226
2900	**S.L.**	120	1173	998	856	736	629	765
	2000	120	1083	932	806	695	594	744
	4000	120	1012	878	763	657	559	725
	6000	120	953	831	722	619	521	706
	8000	120	903	787	680	578	478	685
	10000	120	856	743	636	531	428	662
	12000	120	808	695	585	478	371	634
	14000	120	757	642	528	416	305	601
	16000	120	701	581	463	346	230	562
	18000	120	637	512	388	266	146	517
	20000	120	564	433	303	176	51	465
	22000	120	482	344	209	77		405
	24000	120	389	245	105			337
	25000	120	339	192	49			300

Enroute Rate of Climb

Conditions:

- Power..... Full Throttle
- Mixture..... Maintain Fuel Flow in GREEN ARC
- Flaps.....0% (UP)
- Airspeed ..... 120 KIAS

• Note •

Rate-of-Climb values shown are change in altitude in ft per unit time expressed in Feet per Minute.

For operation in air colder than this table provides, use the coldest (left-most) data shown.

For operation in air warmer than this table provides, use extreme caution.

Aircraft with optional Air Conditioning System; Maximum rate of climb performance is reduced by approximately 50 feet per minute if system is ON. For maximum climb performance the air-conditioner should be off.

Weight	Press Altitude	Climb Speed	RATE OF CLIMB ~ Feet per Minute					
			Temperature ~°C					
LB	FT	KIAS	-40	-20	0	20	40	ISA
3400	S.L.	120	1691	1498	1332	1181	1037	1218
	2000	120	1619	1450	1299	1155	1012	1219
	4000	120	1569	1416	1273	1130	984	1223
	6000	120	1534	1390	1248	1102	948	1226
	8000	120	1508	1366	1219	1064	898	1226
	10000	120	1483	1337	1180	1011	829	1220
	12000	120	1454	1297	1125	939	737	1204
	14000	120	1415	1242	1050	841	617	1176
	16000	120	1360	1164	949	715	464	1132
	18000	120	1282	1060	816	553	273	1070
	20000	120	1177	923	647	352	41	987
	22000	120	1038	749	438	108		879
	24000	120	860	532	182			744
	25000	120	754	405	36			665
2900	S.L.	120	2045	1822	1630	1456	1289	1498
	2000	120	1964	1768	1594	1427	1262	1502
	4000	120	1908	1731	1566	1401	1233	1508
	6000	120	1869	1704	1540	1370	1193	1515
	8000	120	1841	1677	1508	1329	1137	1517
	10000	120	1815	1646	1466	1271	1060	1512
	12000	120	1784	1603	1405	1189	956	1496
	14000	120	1742	1541	1320	1079	819	1466
	16000	120	1680	1454	1205	934	643	1418
	18000	120	1593	1336	1054	749	424	1348
	20000	120	1473	1180	860	517	156	1253
	22000	120	1314	979	618	235		1130
	24000	120	1109	729	323			975
	25000	120	988	583	154			884

Range / Endurance: Full Power Climb

Conditions:

- Mixture ..... Best Economy - Target Fuel Flow or less
- Weight ..... 3400 LB for Climb, Avg 3200 LB for Cruise
- Winds ..... Zero
- Total Fuel.....92 Gallons

• Note •

Fuel Remaining for Cruise is equal to 92.0 gallons usable, less 1.5 gallons (pre-takeoff fuel consumed), 11 gallons (45 minute IFR reserve at 65% power), and listed volume for fuel consumed in Full Power Climb.

Range is decreased by 5% if nose wheel pant and fairings removed.

Range is decreased by 15% of nose wheel and main wheel pants and fairings removed.

For aircraft with optional Air Conditioning System; range is decreased by 1% if system in operation.

Aircraft with optional Enhanced Vision System; range is decreased by ½%.

Range / Endurance: 85% Power Cruise - Full Power Climb							
Press Alt FT	Climb Fuel Gal	Fuel Remaining For Cruise Gal	Airspeed KTAS	Fuel Flow GPH	Endurance Hours	Range NM	Specific Range Nm/Gal
2000	**1.0**	78.6	170	18.3	4.3	734	9.3
4000	**2.0**	77.6	174	18.3	4.2	744	9.5
6000	**2.9**	76.6	178	18.3	4.2	753	9.7
8000	**3.9**	75.6	181	18.3	4.1	762	9.9
10000	**4.9**	74.6	185	18.3	4.1	770	10.1
12000	**5.9**	73.7	188	18.3	4.0	779	10.3
14000	**6.9**	72.6	192	18.3	4.0	787	10.5
16000	**8.0**	71.6	196	18.3	3.9	796	10.7
18000	**9.1**	70.5	200	18.3	3.8	804	10.9
20000	**10.2**	69.3	204	18.3	3.8	811	11.1
22000	**11.5**	68.1	208	18.3	3.7	819	11.3
24000	**12.9**	66.6	212	18.3	3.6	826	11.6
25000	**13.7**	65.8	214	18.3	3.6	829	11.7

Range / Endurance: 75% Power Cruise - Full Power Climb							
Press Alt FT	Climb Fuel Gal	Fuel Remaining For Cruise Gal	Airspeed KTAS	Fuel Flow GPH	Endurance Hours	Range NM	Specific Range Nm/Gal
2000	**1.0**	78.6	163	16.4	4.8	784	9.9
4000	**2.0**	77.6	166	16.4	4.7	792	10.1
6000	**2.9**	76.6	169	16.4	4.7	800	10.3
8000	**3.9**	75.6	173	16.4	4.6	808	10.5
10000	**4.9**	74.6	176	16.4	4.5	816	10.7
12000	**5.9**	73.7	179	16.4	4.5	824	10.9
14000	**6.9**	72.6	183	16.4	4.4	832	11.1
16000	**8.0**	71.6	186	16.4	4.4	841	11.3
18000	**9.1**	70.5	190	16.4	4.3	848	11.5
20000	**10.2**	69.3	193	16.4	4.2	856	11.8
22000	**11.5**	68.1	197	16.4	4.1	863	12.0
24000	**12.9**	66.6	201	16.4	4.1	870	12.2
25000	**13.7**	65.8	203	16.4	4.0	872	12.4

Range / Endurance: 65% Power Cruise - Full Power Climb							
Press Alt FT	Climb Fuel Gal	Fuel Remaining For Cruise Gal	Airspeed KTAS	Fuel Flow GPH	Endurance Hours	Range NM	Specific Range Nm/Gal
2000	**1.0**	78.6	154	14.6	5.4	834	10.6
4000	**2.0**	77.6	157	14.6	5.3	842	10.8
6000	**2.9**	76.6	160	14.6	5.3	850	11.0
8000	**3.9**	75.6	163	14.6	5.2	858	11.2
10000	**4.9**	74.6	166	14.6	5.1	866	11.4
12000	**5.9**	73.7	169	14.6	5.0	874	11.6
14000	**6.9**	72.6	172	14.6	5.0	882	11.8
16000	**8.0**	71.6	175	14.6	4.9	890	12.0
18000	**9.1**	70.5	178	14.6	4.8	897	12.2
20000	**10.2**	69.3	182	14.6	4.8	904	12.5
22000	**11.5**	68.1	185	14.6	4.7	911	12.7
24000	**12.9**	66.6	189	14.6	4.6	916	12.9
25000	**13.7**	65.8	190	14.6	4.5	918	13.1

Range / Endurance: 55% Power Cruise - Full Power Climb							
Press Alt FT	Climb Fuel Gal	Fuel Remaining For Cruise Gal	Airspeed KTAS	Fuel Flow GPH	Endurance Hours	Range NM	Specific Range Nm/Gal
4000	**2.0**	77.6	146	12.7	6.1	900	11.5
6000	**2.9**	76.6	149	12.7	6.0	907	11.7
8000	**3.9**	75.6	152	12.7	5.9	915	11.9
10000	**4.9**	74.6	154	12.7	5.9	922	12.1
12000	**5.9**	73.7	157	12.7	5.8	930	12.3
14000	**6.9**	72.6	160	12.7	5.7	937	12.5
16000	**8.0**	71.6	162	12.7	5.6	944	12.8
18000	**9.1**	70.5	165	12.7	5.5	950	13.0
20000	**10.2**	69.3	168	12.7	5.4	955	13.2
22000	**11.5**	68.1	171	12.7	5.3	960	13.4
24000	**12.9**	66.6	174	12.7	5.2	963	13.6
25000	**13.7**	65.8	175	12.7	5.2	964	13.8

Range / Endurance: Cruise Climb

Conditions:

- Mixture.....Best Economy - Target Fuel Flow or less
- Weight .....3400 LB for Climb, Avg 3200 LB for Cruise
- Winds.....Zero
- Total Fuel .....92 Gallons

• Note •

Fuel Remaining for Cruise in this table is based on AFM Cruise Climb: Lean of Peak Technique; if Full Power Climb: Rich of Peak Technique is performed, use Range/Endurance: Full Power Climb tables.

Fuel Remaining for Cruise is equal to 92.0 gallons usable, less 1.5 gallons (pre-takeoff fuel consumed), 11 gallons (45 minute IFR reserve at 65% power), and listed volume for fuel consumed in Full Power Climb.

Range is decreased by 5% if nose wheel pant and fairings removed.

Range is decreased by 15% of nose wheel and main wheel pants and fairings removed.

For aircraft with optional air conditioning System; range is decreased by 1% if system in operation.

Aircraft with optional Enhanced Vision System; range is decreased by ½%.

Range / Endurance: 85% Power Cruise - Cruise Climb							
Press Alt FT	Climb Fuel Gal	Fuel Remaining For Cruise Gal	Airspeed KTAS	Fuel Flow GPH	Endurance Hours	Range NM	Specific Range Nm/Gal
2000	**0.6**	78.9	170	18.3	4.3	738	9.3
4000	**1.3**	78.3	174	18.3	4.3	752	9.5
6000	**1.9**	77.7	178	18.3	4.2	766	9.7
8000	**2.5**	77.0	181	18.3	4.2	779	9.9
10000	**3.1**	76.4	185	18.3	4.2	793	10.1
12000	**3.8**	75.8	188	18.3	4.1	806	10.3
14000	**4.4**	75.1	192	18.3	4.1	820	10.5
16000	**5.1**	74.5	196	18.3	4.1	834	10.7
18000	**5.8**	73.7	200	18.3	4.0	848	10.9
20000	**6.6**	73.0	204	18.3	4.0	863	11.1
22000	**7.3**	72.2	208	18.3	3.9	878	11.3
24000	**8.2**	71.4	212	18.3	3.9	893	11.6
25000	**8.6**	70.9	214	18.3	3.9	900	11.7

7
Airplane and Systems Description

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Horizontal Situation Indicator

The horizontal situation indicator is displayed along the lower center of the PFD. Heading data is provided by the Attitude and Heading Reference System (AHRS) and the onboard magnetometers. The HSI displays a rotating compass card in a heading-up orientation. Letters indicate the cardinal points and numeric labels occur every 30°. Major tick marks are at 10° intervals and minor tick marks at 5° intervals. Reference index marks are provided at 45° intervals around the compass card. A circular segment scale directly above the rotating compass card shows half and standard rates of turn based on the length of the turn rate trend vector.

The HSI presents heading, turn rate, course deviation, bearing, and navigation source information in a 360° compass-rose format. The HSI contains a Course Deviation Indicator (CDI) with a course pointer arrow, a To/From arrow, a sliding deviation bar, and scale. The course pointer is a single line arrow (GPS, VOR1, and LOC1) or a double line arrow (VOR2 and LOC2) which points in the direction of the set course. The To/From arrow rotates with the course pointer and is displayed when the active NAVAID is received.

The HSI heading reference bug is set using the heading selection knob on the Flight Management System Keyboard. The selected heading is displayed in a window above the upper LH 45° index mark and will disappear approximately 3 seconds after the heading selection knob stops turning.

The Course Deviation Indicator (CDI) navigation source shown on the HSI is set using the CDI softkey to select GPS, NAV1, or NAV2 inputs. The course pointer is set using the course selection knob on the Flight Management System Keyboard. The selected course is displayed in a window above the upper RH 45° index mark and will disappear approximately 3 seconds after the heading selection knob stops turning.

Vertical Speed Indicator

Vertical Speed data is provided by the Air Data Computer and is shown as a vertical tape along the right side of the altimeter on the PFD. The VSI scale is graduated with major tick marks at 1000 and 2000 fpm in each direction and minor tick marks at intervals of 500 feet The vertical speed pointer moves up and down the fixed VSI scale and shows the rate of climb or descent in digits inside the pointer. A reference notch at the RH edge of the scale indicates 0 feet/min.

Vertical speed must exceed 100 feet/min before digits will appear in the VSI pointer. If the rate of ascent/descent exceeds 2000 fpm, the pointer appears at the corresponding edge of the tape and the rate appears inside the pointer.

Magnetic Compass

A conventional, internally lighted, liquid filled, magnetic compass is installed on the cabin headliner immediately above the windshield. A compass correction card is installed with the compass.

Wing Flaps

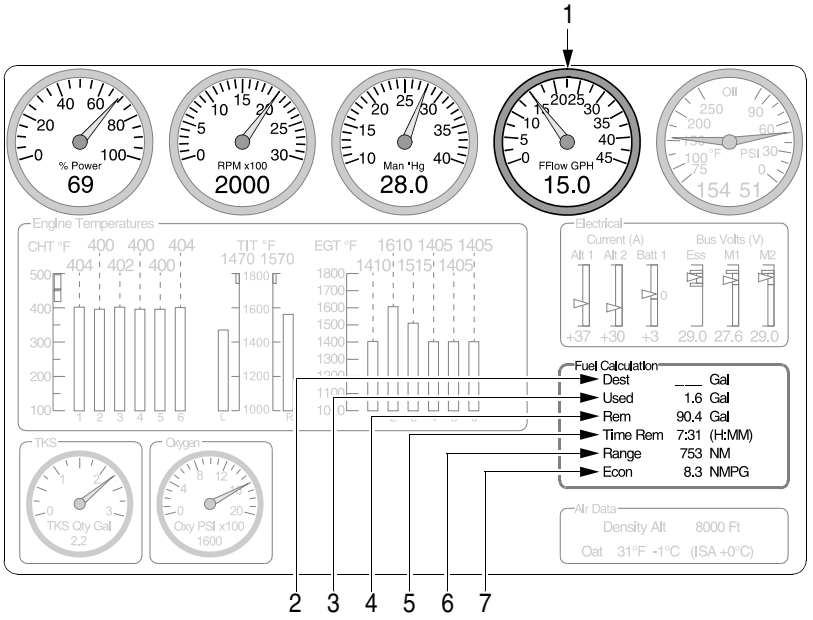
The electrically controlled, single-slotted flaps provide low-speed lift enhancement. Each flap is manufactured of aluminium and connected to the wing structure at three hinge points. Rub strips are installed on the top leading edge of each flap to prevent contact between the flap and wing flap cove. The flaps are selectively set to three positions: 0%, 50% (16°) and 100% (32°) by operating the FLAP control switch. The FLAP control switch positions the flaps through a motorized linear actuator mechanically connected to both flaps by a torque tube. Proximity switches in the actuator limit flap travel to the selected position and provide position indication.

The wing flaps are powered by 28 VDC through the 10-amp FLAPS circuit breaker on the NON ESS BUS.

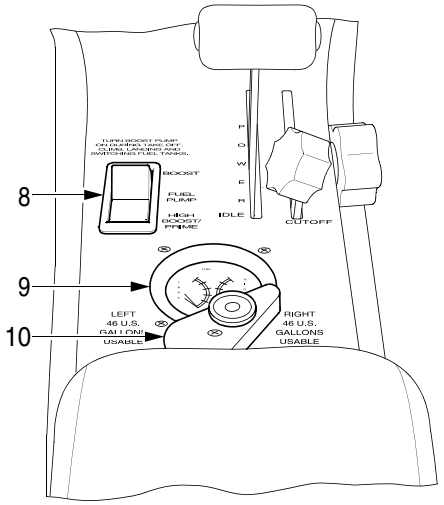
The flaps control switch and indicator lights are powered by 28 VDC through the KEYPADS/AP CTRL circuit breaker on MAIN BUS 1.

Flap Control Switch

An airfoil-shaped FLAPS control switch is located at the bottom of the vertical section of the center console. The control switch is marked and has detents at three positions: UP (0%), 50% and 100%. The appropriate V_{FE} speed is marked at the Flap 50% and 100% switch positions. Setting the switch to the desired position will cause the flaps to extend or retract to the appropriate setting. An indicator light at each control switch position illuminates when the flaps reach the selected position. The UP (0%) light is green and the 50% and 100% lights are yellow.



Fuel System Indication



Engine Controls

LEGEND

1. Fuel Flow
2. Fuel At Destination (Totalizer)
3. Fuel Used (Totalizer)
4. Fuel Remaining (Totalizer)
5. Time Remaining (Totalizer)
6. Fuel Range (Totalizer)
7. Nautical Miles Per Gallon (Totalizer)
8. Fuel Pump Switch
9. Fuel Quantity Gage (Float Sensor)
10. Fuel Selector Valve

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Figure 7-9
Fuel System Controls and Indicating

Fuel Quantity Gage

A dual reading 2¼" fuel quantity gage is installed on the console immediately forward of the fuel selector valve. The LEFT pointer indicates left tank fuel quantity and sweeps a scale marked from 0 to 46 U.S. gallons in 5-gallon increments. The RIGHT pointer sweeps an identical scale for the right tank. Each scale is marked with a yellow arc from 0 to 14 U.S. gallons. The indicators are calibrated to read 0 gallons when no usable fuel remains and are internally lighted.

The fuel quantity gage provides output signals to the Engine Airframe Unit based on the float sensor positions in the fuel tanks. The output signals are processed and transmitted to the CAS window for display.

- An white Advisory message is generated when either fuel tank goes below 14 gallons.
- A amber Caution message is generated when both fuel tanks go below 14 gallons.
- A red Warning message is generated when the *fuel totalizer* amount goes below 9 gallons. Note that the Warning message is generated based on the fuel totalizer which is dependent on correct input by the pilot.

28 VDC for fuel quantity system operation is supplied through the 3-amp FUEL QTY circuit breaker on MAIN BUS 1.

• Note •

When the fuel tanks are 1/4 full or less, prolonged uncoordinated flight such as slips or skids can uncover the fuel tank outlets. Therefore, if operating with one fuel tank dry or if operating on LEFT or RIGHT tank when 1/4 full or less, do not allow the airplane to remain in uncoordinated flight for periods in excess of 30 seconds.

Fuel Flow

Fuel Flow is shown in the upper mid right corner of the ENGINE page as both a simulated gage and as a digital value. The gage pointer sweeps a scale range from 0 to 45 Gallons Per Hour (GPH). The fuel flow value is displayed in white numerals below the gage. Fuel flow is measured by a transducer on the right side of the engine in the fuel line between the engine driven fuel pump and distribution block. The fuel flow signal is sent to the Engine Airframe Unit, processed, and transmitted to the Engine Indicating System for display.

The gage displays a green normal arc, which is dynamically updated to display the range of normal values appropriate to engine power settings.

- When manifold pressures is above 30.6 in.Hg, the green arc covers a narrow range depicting the full rich fuel flow appropriate for that power setting.
- For manifold pressures of 30.5 in.Hg and below, the normal arc extends from full rich limit to 10 gallons per hour (indicating that cruise leaning is permitted).

Target Fuel Flow is a cyan pointer placed on the fuel gage to indicate best economy target fuel flow. This pointer is displayed when cruise leaning is allowed (manifold pressure of 30.5 in.Hg or below), it will be presented after the green arc expands when power is reduced. This indicator provides guidance to aide in cruise leaning, it is calculated to provide a fuel flow closely corresponding with the best economy fuel to air ratio.

• Note •

Target Fuel Flow is removed from gage when resulting engine power would be less than 55% (intended for cruise, not descent leaning guidance).

Fuel Totalizer and Calculated Information

Fuel totalizer calculations are located in the lower right section of the ENGINE page and are separate and independent of the fuel quantity gage and float sensor system. The fuel totalizer monitors fuel flow and calculates fuel-to-destination, fuel used, fuel remaining, time remaining, fuel range, and nautical miles per gallon. Upon system startup, the fuel totalizer initial fuel screen appears and prompts the user to enter the total fuel on board at start. The option to enter the number of gallons added since last fuel fill and the ability to set fuel to “Full” or to “Tabs” buttons is also available.

Electrical System

The airplane is equipped with a two-alternator, two-battery, 28-volt direct current (VDC) electrical system designed to reduce the risk of electrical system faults. The system provides uninterrupted power for avionics, flight instrumentation, lighting, and other electrically operated and controlled systems during normal operation.

Power Generation

Primary power for the airplane is supplied by a 28-VDC, negative-ground electrical system. The electrical power generation system consists of two alternators controlled by a Master Control Unit (MCU) mounted on the left side of the firewall and two batteries for starting and electrical power storage.

Alternator 1 (ALT 1) is a gear-driven, internally rectified, 100-amp alternator mounted on the right front of the engine. Alternator 2 (ALT 2) is a belt-driven, internally rectified, 70-amp alternator mounted on the front left of the engine. ALT 1 is regulated to 28 volts and ALT 2 is regulated to 28.75 volts. Both alternators are self-exciting and require battery voltage for field excitation in order to start up - for this reason, the batteries should not be turned off in flight.

Storage

Battery 1 (BAT 1) is an aviation grade 12-cell, lead-acid, 24-volt, 10-amp-hour battery mounted on the right firewall. BAT 1 is charged from the Main Distribution Bus 1 in the MCU.

Battery 2 (BAT 2) is composed of two 12-volt, 7-amp-hour, sealed, lead-acid batteries connected in series to provide 24 volts. Both BAT 2 units are located in a vented, acid-resistant container mounted behind the aft cabin bulkhead (FS 222) below the parachute canister. BAT 2 is charged from the circuit breaker panel ESS BUS 1.

Environmental System

• Note •

To facilitate faster cabin cooling, prior to engine start leave the cabin doors open for a short time to allow hot air to escape.

Standard cabin heating and ventilation is accomplished by supplying conditioned air from the heat exchanger for heating and windshield defrost and fresh outside air for ventilation. The environmental system consists of a fresh air inlet in the RH cowl, a heat exchanger around the exhaust system crossover tube, an air mixing chamber, air ducting for distribution, a distribution manifold, a windshield diffuser, crew and passenger air vents, and associated plumbing, controls, actuators, wiring for system flow-selection and temperature control

An optional 3-speed blower fan is available to supplement airflow when ram air may be inadequate such as during ground operation.

28 VDC for Environmental System Control Panel operation is supplied through the 2-amp CABIN AIR CONTROL breaker on MAIN BUS 1.

The optional Blower Fan is powered by 28 VDC supplied through a 15-amp CABIN FAN breaker on A/C BUS 2.

Serials with Optional Air Condition System:

The optionally installed Air Conditioning System is designed to cool the cabin to desired temperature settings and maintain comfortable humidity levels. The system consists of an engine driven compressor, condenser assembly, evaporator assembly, exhaust heat exchanger, fresh air inlet, air-mixing chamber, blower fan, distribution manifold, ducting, windshield diffuser, vent outlets, associated plumbing, controls, actuators, wiring for system flow-selection and temperature control.

28 VDC for Air Conditioner Condenser operation is supplied through the 15-amp A/C COND breaker on A/C BUS 1.

28 VDC for Air Conditioner Compressor operation is supplied through the 5-amp A/C COMPR breaker on A/C BUS 2.

The airplane engine must be running for the air conditioner to operate.

Distribution

Ventilation and cooling is provided by ducting fresh air from a NACA inlet on the RH cowl to the mixing chamber located on the lower RH portion of the firewall. Depending on operating mode and temperature

selection, the air in the mixing chamber is ducted directly into the distribution system or, if in optional air conditioning mode, is further cooled as it passes through the evaporator assembly located under the front passenger seat. Heating is accomplished by mixing ventilation air from the fresh air inlet with heated air provided by the heat exchanger in the mixing chamber on the firewall. From the mixing chamber - which also controls airflow into the cabin compartment - the conditioned air is forced by ram air pressure or by blower fan into a distribution manifold mounted to the center, aft side of the firewall. The distribution manifold uses butterfly valves to control airflow to the floor and defrost vents. Airflow is ducted directly to all panel air vents.

Crew panel air vents are located inboard on the RH and LH bolster panels and on the outboard section of the instrument panel. The crew floor air vents are mounted to the bottom of each kick plate. The passenger panel air vents are chest high outlets mounted in the armrests integral to the LH and RH cabin wall trim panels. The passenger floor air vents are mounted to the bottom portion of the LH and RH cabin wall trim panels. The windshield diffuser, located in the glareshield assembly, directs conditioned air to the base of the windshield.

Heating

Ram air from the rear ports of the intercoolers is ducted to a heat exchanger surrounding the exhaust system crossover tube. The heated air is then routed to the hot air valve, mounted to the forward side of the firewall, which controls entry of hot air into the cabin distribution system. When the valve is open, the air flows into the cabin mixing chamber. When the valve is closed, the heated air exits into the engine compartment and is exhausted overboard with the engine cooling airflow.

Cabin heat is regulated by controlling the volume of hot air admitted into the distribution system's air mixing chamber. The proportion of heated air to fresh air is accomplished using the temperature selector mounted on the RH instrument panel. For over-temperature protection (the turbocharger bleed air is further heated, under some conditions the hot air source temperature may be in excess of 300°F), the controller monitors mixed air temperature through a sensor downstream of the mixing chamber. If mixed air temperature exceeds duct temperature limit, the hot air flow is reduced and fresh airflow increased until temperature is reduced. Valves are automatically

cycled to ensure supply temperature is maintained below duct temperature limits.

Conditioned air can be directed to passengers and/or the windshield diffuser by manipulating the cabin vent selector mounted on the RH instrument panel. The conditioned air enters the cabin through adjustable air vents located in each kick plate and through non-adjustable, floor level vents located in the rear cabin trim side panels. Conditioned air can also be distributed to the windshield diffuser in the glareshield.

Cooling

Standard cabin cooling is provided by ram air admitted through the NACA inlet on the RH cowl to the fresh air valve, mounted to the forward side of the firewall. When the fresh air valve is open, the air flows into the cabin mixing chamber. When the fresh air valve is closed, the cooled air exits into the engine compartment and is exhausted overboard with the engine cooling airflow.

For airplane with optionally equipped Air Conditioning System, R134A refrigerant enters the engine mounted compressor as a vapor and is pressurized until the heat-laden vapor reaches a point much hotter than the outside air. The compressor then pumps the vapor to the condenser where it cools, changes to a liquid, and passes to the receiver-drier. The receiver-drier's function is to filter, remove moisture, and ensure a steady flow of liquid refrigerant into the evaporator through the expansion valve - a temperature controlled metering valve which regulates the flow of liquid refrigerant to the evaporator. Inside the evaporator, the liquid refrigerant changes state to a gas and in doing so, absorbs heat. The evaporator then absorbs the heat from the air passing over the coils and the moisture from the air condenses and is drained overboard through the belly of the airplane. From the evaporator, the refrigerant vapor returns to the compressor where the cycle is repeated. During normal air conditioning operation, ram air from the fresh air intake flows into the evaporator assembly, is cooled as it passes through the evaporator coils, and is then ducted forward to the distribution manifold. During maximum air conditioning operation - or recirculation mode - the fresh air valve closes and valves in the evaporator assembly open allowing cabin air to be recirculated and further cooled as the air passes through the evaporator coils and ducted forward to the distribution manifold.

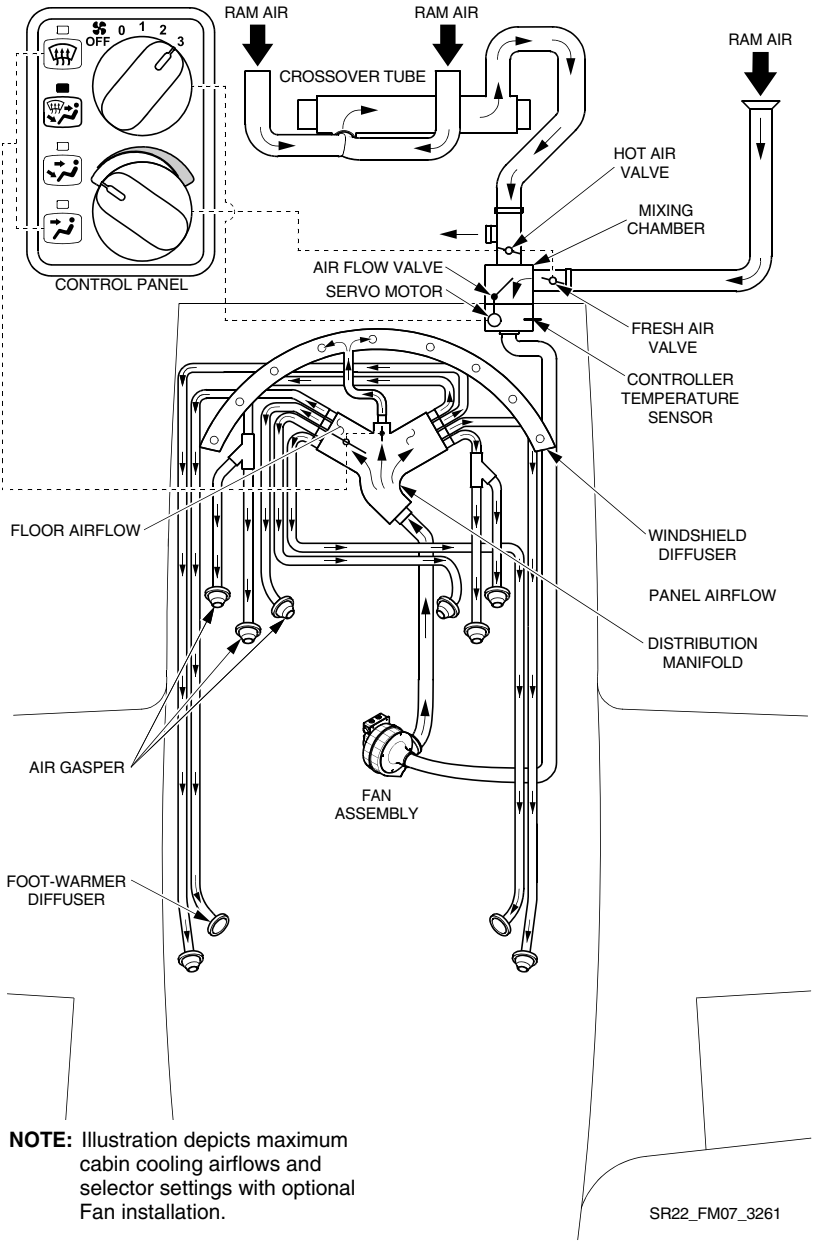
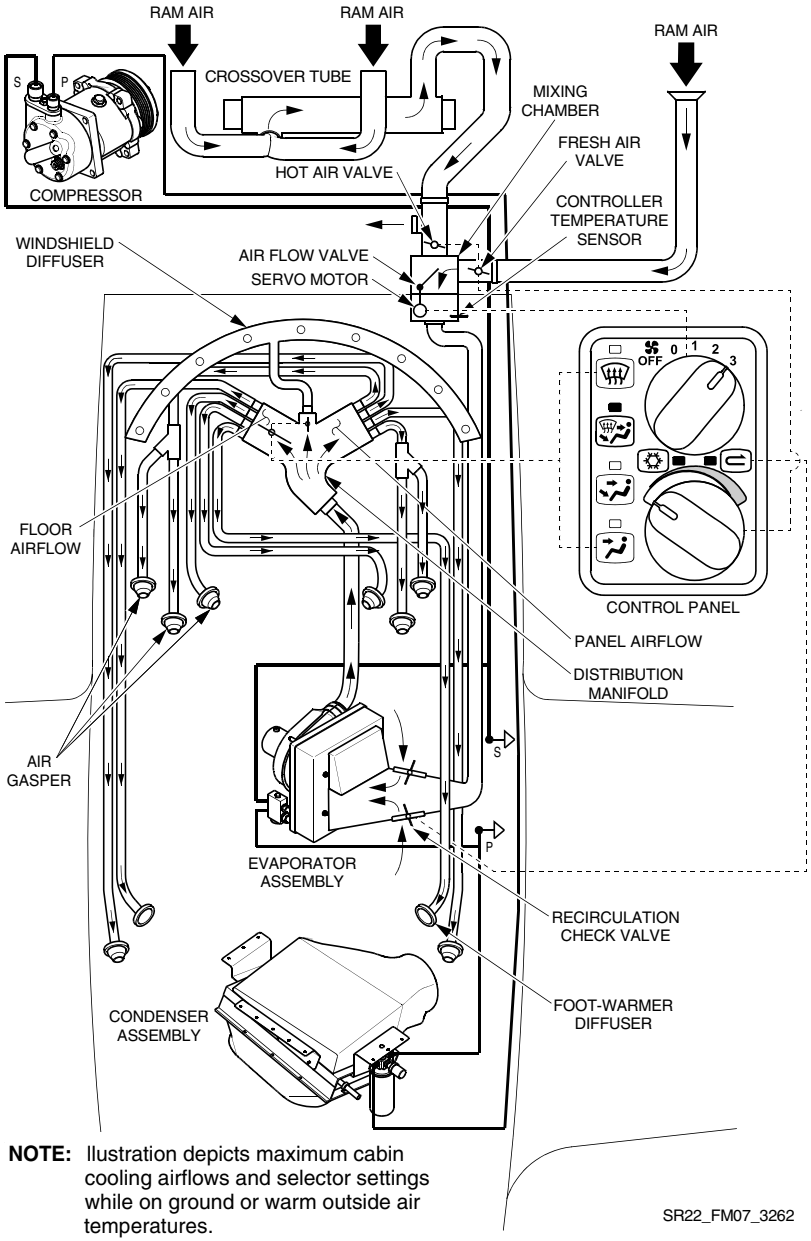


Figure 7-13
Standard Environmental System



NOTE: Ilustration depicts maximum cabin cooling airflows and selector settings while on ground or warm outside air temperatures.

Figure 7-14
Optional Air Conditioning System

Airflow Selection

The airflow selector on the system control panel regulates the volume of airflow allowed into the cabin distribution system. When the airflow selector is moved past the OFF position an electro-mechanical linkage actuates a valve in the mixing chamber on the forward firewall to the full open position. The air is then distributed by either ram air or by an optional blower fan to the distribution manifold mounted to the center, aft side of the firewall. The optional blower fan system includes 0 (ram air), 1 (low fan), 2 (med fan), and 3 (high fan) airflow settings.

Vent Selection

Air from the distribution manifold is proportioned and directed to passengers and/or the windshield by pressing the cabin vent selector buttons which electrically actuate butterfly valves at the entrances to the windshield diffuser and the cabin floor ducting.

When the Temperature Selector is in the blue “cool” zone, there is continuous ram airflow to the panel and armrest eyeball outlets. Each occupant can control the flow rate from 'off' to maximum by rotating the nozzle.

When the Panel selector button is pushed, both butterfly valves are closed providing maximum airflow to the instrument panel and armrest eyeball outlets.

Pressing the Panel-Foot selector button opens the cabin floor butterfly valve allowing airflow to the rear seat foot warmer diffusers and the front seat outlets mounted to the underside of each kickplate.

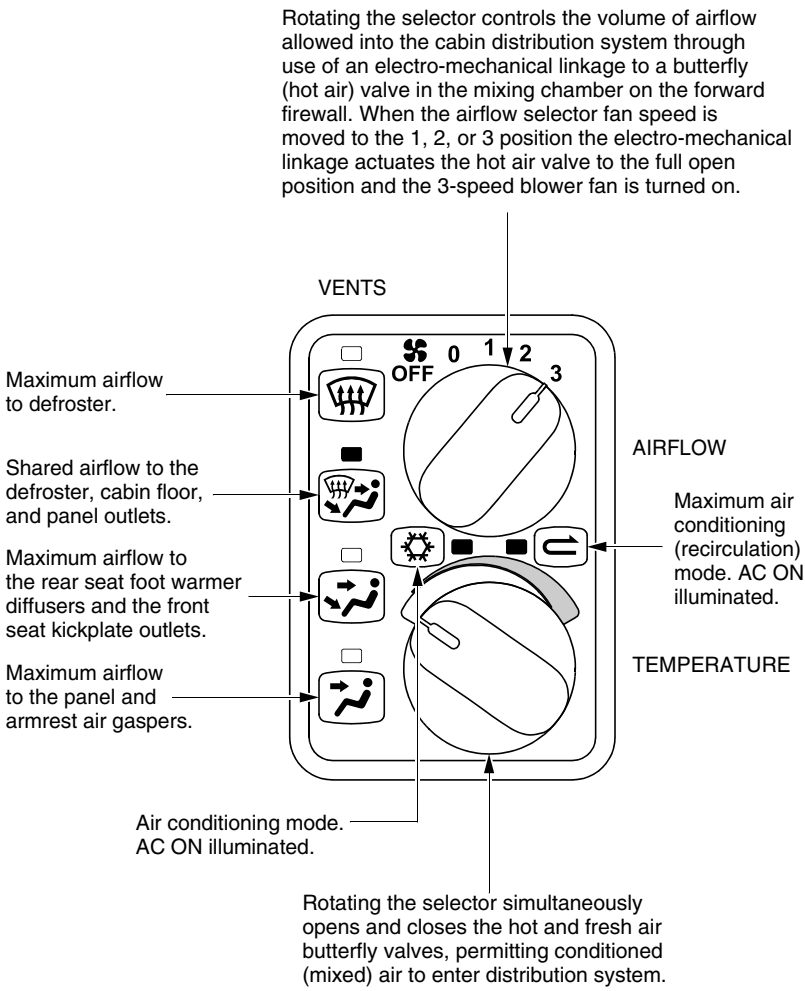
Selecting Panel-Foot-Windshield button opens the windshield diffuser butterfly valve which permits shared airflow to the defrosting mechanism and cabin floor outlets.

When the Windshield selector button is pushed the cabin floor butterfly valve is closed providing maximum airflow to the windshield diffuser.

Temperature Selection

The temperature selector is electrically linked to the hot and cold air valves. Rotating the selector simultaneously opens and closes the two valves, permitting hot and cold air to mix and enter the distribution system. Rotating the selector clockwise, permits warmer air to enter the system - counterclockwise, cooler air.

On airplane with the optional Air Conditioning System installed, when the air conditioning button (snowflake) is pushed, the valve on the firewall completely closes and the air-conditioner is activated. When recirculation button is pushed, the fresh air valve completely closes and cabin air is recirculated to provide for maximum air conditioning operation. When the air conditioning system is on and the temperature selector is rotated to the full cool position, recirculating mode can be activated to provide maximum cabin cooling. Air conditioning or recirculating mode is not available when the airflow fan selector is in the “0” position. Recirculating mode is not available unless the air conditioning system is operating.



NOTE: Illustration depicts settings for Emergency Procedures Smoke and Fume Elimination.
If source of smoke and fume is firewall forward, turn Airflow Selector OFF.

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Figure 7-15
Environmental System Operation

Stall Warning System

The airplane is equipped with an electro-pneumatic stall warning system to provide audible warning of an approach to aerodynamic stall. The system consists of an inlet in the leading edge of the right wing, a pressure switch and associated plumbing, and the avionics system aural warning system.

As the airplane approaches a stall, the low pressure on the upper surface of the wings moves forward around the leading edge of the wings. As the low pressure area passes over the stall warning inlet, a slight negative pressure is sensed by the pressure switch. The pressure switch then provides a signal to cause the warning horn to sound, the red STALL warning CAS annunciation to illuminate, and, if engaged, the autopilot system to disconnect.

The warning sounds at approximately 5 knots above stall with full flaps and power off in wings level flight and at slightly greater margins in turning and accelerated flight.

The system operates on 28 VDC supplied though the 2-amp STALL WARNING circuit breaker on the ESS BUS 2.

Preflight Check

With battery power on, the stall warning system preflight check is accomplished as follows:

Stall warning system preflight check:

1. Use small suction cup and apply suction. Am aural alert from the warning horn will confirm that the system is operative.

Pitot-Static System

The Pitot-Static system consists of a single heated Pitot tube mounted on the left wing and dual static ports mounted in the fuselage. The Pitot heat is pilot controlled through a panel-mounted switch. An internally mounted alternate static pressure source provides backup static pressure should that the primary static source becomes blocked. Water traps with drains, under the floor in the cabin, are installed at each Pitot and static line low point to collect any moisture that enters the system. The traps should be drained at the annual inspection and when water in the system is known or suspected.

Pitot Heat Switch

The heated Pitot system consists of a heating element in the Pitot tube, a rocker switch labeled PITOT HEAT, and associated wiring. The switch and circuit breaker are located on the left side of the switch and control panel. When the Pitot heat switch is turned on, the element in the Pitot tube is heated electrically to maintain proper operation in possible icing conditions. The Pitot heat system operates on 28 VDC supplied through the 7.5-amp PITOT HEAT circuit breaker on the NON-ESSENTIAL BUS.

Pitot Heat Annunciation

Illumination of the PITOT HEAT FAIL Caution indicates that the Pitot Heat switch is ON and the Pitot heater is not receiving electrical current. Illumination of PITOT HEAT REQD Caution indicates the system detects OAT is less than 41°F (5°C) and Pitot Heat Switch is OFF. A current sensor on the Pitot heater power supply wire provides current sensing.

Alternate Static Source

An alternate static pressure source valve is installed on the switch and control panel to the right of the pilot's leg. This valve supplies static pressure from inside the cabin instead of the external static port. If erroneous instrument readings are suspected due to water or ice in the pressure line going to the standard external static pressure source, the alternate static source valve should be turned on. Pressures within the cabin will vary with open heater/vents. Whenever the alternate static pressure source is selected, refer to Section 5 for airspeed calibration and altitude corrections to be applied.

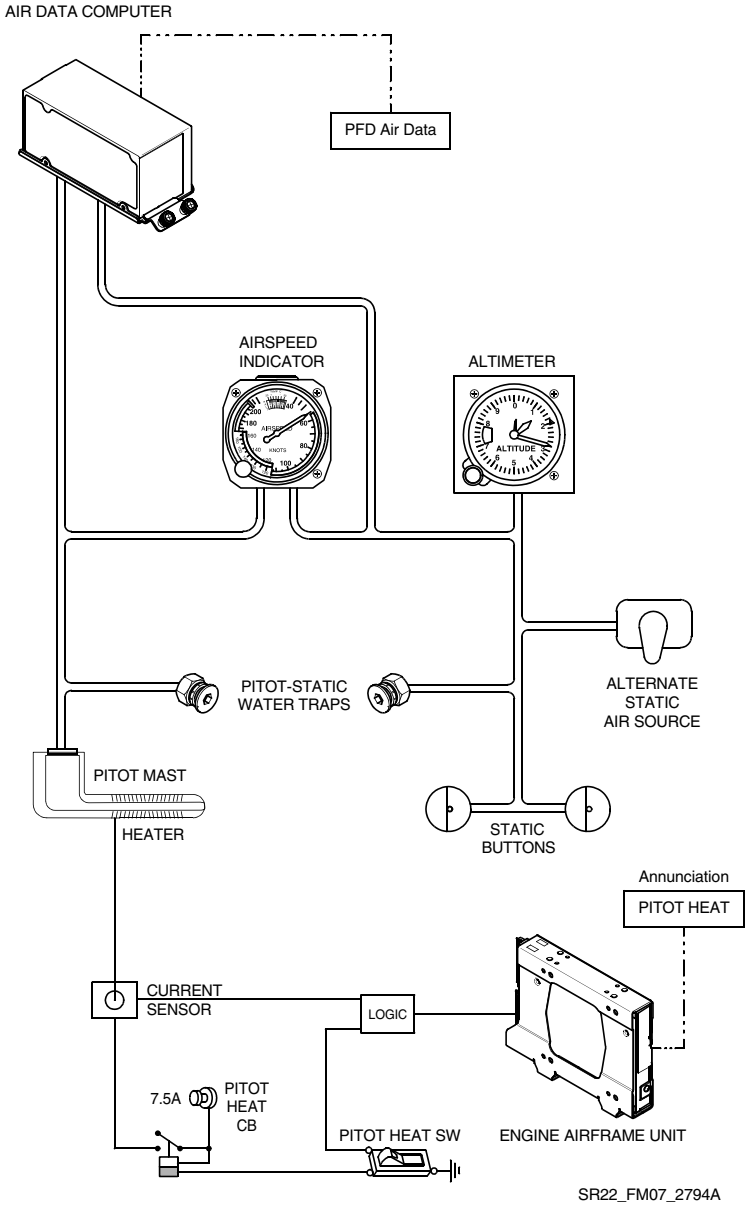


Figure 7-16
Pitot-Static System

Avionics

Perspective Integrated Avionics System

The Perspective Integrated Avionics System provides advanced cockpit functionality and improved situational awareness through the use of fully integrated flight, engine, communication, navigation and monitoring equipment. The system consists of the following components:

- GDU Primary Flight Display (PFD)
- GDU Multifunction Display (MFD)
- GCU 478 Flight Management System Keyboard
- GRS 77 Attitude and Heading Reference System
- GDC 74A Air Data Computer
- GIA 63W Integrated Avionics Units
- GEA 71 Engine Airframe Unit
- GTX 32 Mode A, C Transponder
- GMA 347 Audio Panel with Integrated Marker Beacon Receiver
- GFC 700 3-Axis Autopilot and GMC 705 Controller (Optional)
- GTX 33 Mode S Transponder (Optional)
- GDL 69/69A XM Satellite Weather/Radio Receiver (Optional)
  - GRT 10 XM Radio Remote Transceiver (Optional)
  - GRC 10 XM Radio Remote Control (Optional)
- S-Tec System 55X Autopilot (Optional)
- S-Tec System 55SR (Optional)
- Traffic Advisory System (Optional)
- Weather Information System (Optional)
- Bendix/King KR 87 Automatic Direction Finder (Optional)
- Bendix/King KN 63 Distance Measuring Equipment (Optional)
- Synthetic Vision System (Optional)
- Max Viz Enhanced Vision System (Optional)

Refer to the Perspective Integrated Avionics System Pilot's Guide for a detailed description of the system and it's operating modes.

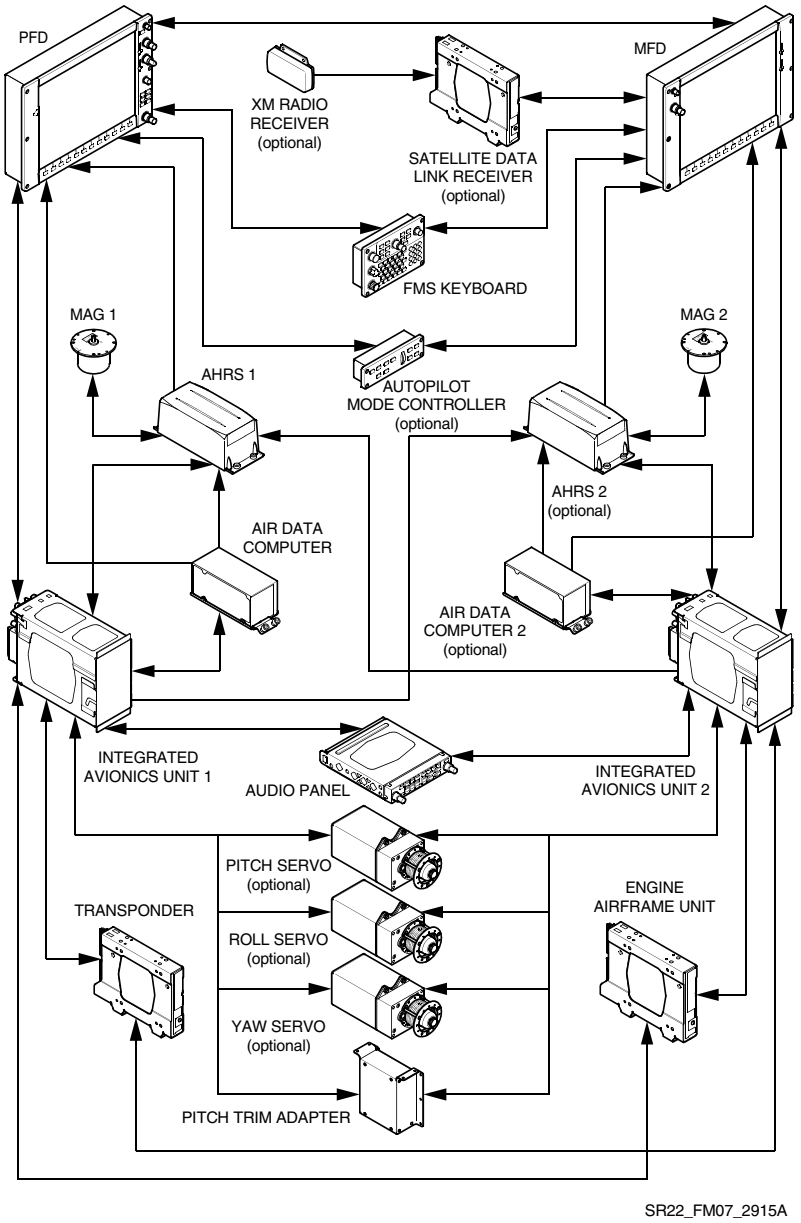


Figure 7-17
Perspective Integrated Avionics System Schematic

GDU Primary Flight Display

The Primary Flight Display, located directly in front of the pilot, is intended to be the primary display of flight parameter information (attitude, airspeed, heading, and altitude) during normal operations. The PFD accepts data from a variety of sources, including the MFD and the Integrated Avionics Units through a high-speed data bus connection. In conjunction with Flight Management System Keyboard, the PFD also controls and displays all communication and navigation frequencies as well as displaying warning/status annunciations on airplane systems. During engine start, reversionary operation (MFD failure), or when the DISPLAY BACKUP switch is selected, engine system information is displayed on the PFD.

Redundant power sources provide 28 VDC for PFD operation. Power is supplied through the 5-amp PFD 1 circuit breaker on the ESS BUS 1 and the 5-amp PFD 2 circuit breaker on MAIN BUS 2. Either circuit is capable of powering the PFD. System start-up is automatic once power is applied. Power-on default brightness is determined by ambient lighting and is user adjustable. Typical alignment time is 60 seconds from battery turn on.

Display Backup Mode

In the event of a detected display failure, the Integrated Avionics System automatically switches to Display Backup Mode. In Display Backup Mode, all essential flight information from the PFD is presented on the remaining display in the same format as in normal operating mode with the addition of the Engine Indicating System. The change to backup is completely automated and no pilot action is required. However, if the system fails to detect a display problem, Display Backup Mode may be manually activated by pressing the red DISPLAY BACKUP Button. Pressing this button again deactivates Display Backup Mode.

GDU Multifunction Display

The Multifunction Display, located above the center console, depicts navigation, terrain, lightning, traffic data, NAV/COM frequencies, and annunciation information. All engine data is displayed on a dedicated ENGINE page. When the ENGINE page is not shown, all essential engine information is shown on an engine strip at the edge of the display.

Redundant power sources provide 28 VDC for MFD operation. Power is supplied through the 5-amp MFD 1 circuit breaker on the MAIN BUS

3 and the 5-amp MFD 2 circuit breaker on MAIN BUS 1. Either circuit is capable of powering the MFD. System start-up is automatic once power is applied. Power-on default brightness is determined by ambient lighting and is user adjustable.

GCU 478 Flight Management System Keyboard

The Flight Management System Keyboard is found on the upper section of the center console and is the primary interface for avionics system data entry, PFD/MFD operation, NAV/COM tuning, and heading, course and altitude selection.

28 VDC for Flight Management System Keyboard operation is supplied through the 5-amp KEYPADS / AP CTRL circuit breaker on MAIN BUS 1.

GRS 77 Attitude and Heading Reference System (AHRS)

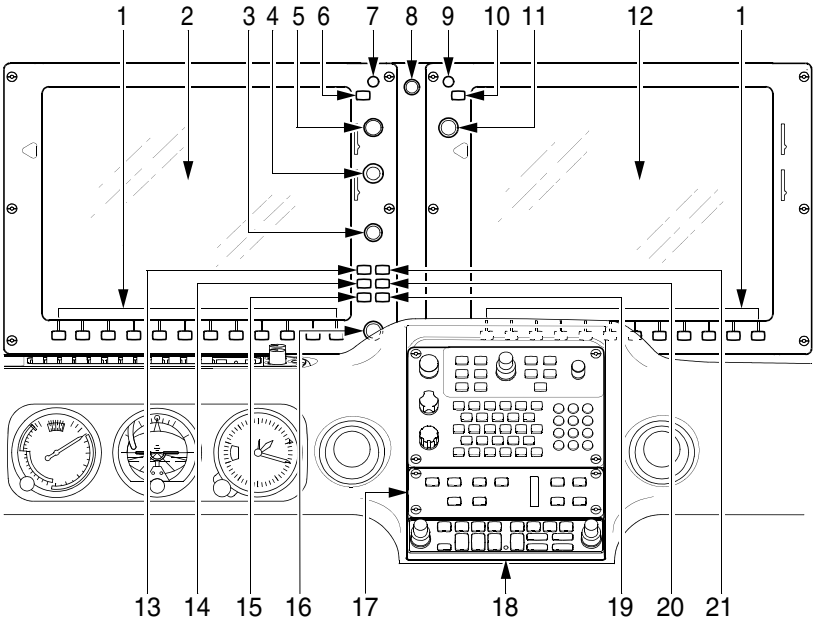
The Attitude and Heading Reference System (AHRS) unit(s), mounted behind the PFD, provide airplane attitude and heading information to both the PFD and the primary Air Data Computer. The AHRS units(s) contain advanced sensors (including accelerometers and rate sensors) and interfaces with the; primary Magnetometer to obtain magnetic field information, the Air Data Computer to obtain air data, and both Integrated Avionics Units to obtain GPS information.

28 VDC for AHRS 1 operation is supplied through the 5-amp AHRS 1 circuit breaker on the ESS BUS 1. If option installed, 28 VDC for AHRS 2 operation is supplied through the 5-amp AHRS 2 circuit breaker on the MAIN BUS 2.

GDC 74A Air Data Computer (ADC)

The Air Data Computer(s), mounted behind the instrument panel to the right of the MFD, process data from the Pitot/Static system and outside air temperature (OAT) sensor(s). This unit(s) provide pressure altitude, airspeed, vertical speed and OAT information to the Integrated Avionics System, and communicate with the primary PFD, Integrated Avionics Unit, and AHRS units. The Air Data Computer(s) is also connected directly to the Outside Air Temperature probe(s) and Pitot-Static System.

28 VDC for ADC 1 operation is supplied through the 5-amp ADC 1 circuit breaker on the ESS BUS 1. If option installed, 28VDC for ADC 2 operation is supplied through a 5-amp AHRS 2 / ADC 2 circuit breaker on the MAIN BUS 2.



Legend

1. Soft Keys
2. PFD
3. PFD Range/Pan Joystick
4. Barometric Pressure
5. COM Transceiver Selection & Tune
6. COM Frequency Transfer (& 121.5 Emer Tune)
7. COM Volume and Squelch
8. Display Backup Selection
9. NAV and ID Audio Volume
10. NAV Frequency Transfer
11. NAV Transceiver Selection & Tune
12. MFD
13. PFD Direct-to-Course
14. PFD Flight Plan Page
15. PFD Clear/Cancel Information
16. PFD Flight Management System
17. GFC 705 Mode Controller (opt)
18. Audio Panel
19. PFD Enter Key
20. PFD Procedures
21. PFD Menu Key

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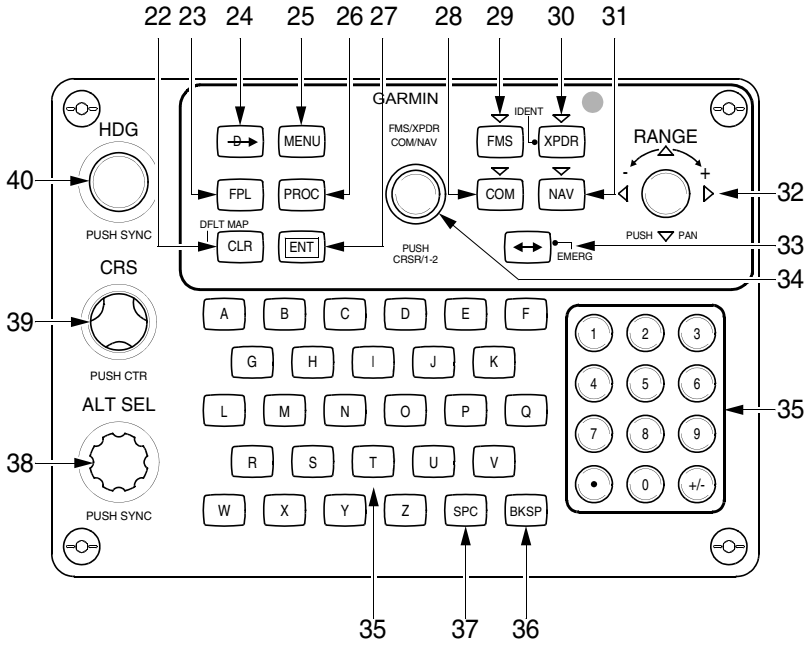
Figure 7-18
Perspective Integrated Avionics System (Sheet 1 of 2)



Flight Management System Keyboard

Legend

22. MFD Clear/Cancel Information (Default Map)
23. MFD Flight Plan Page
24. MFD Direct-to-Course
25. MFD Menu
26. MFD Procedures
27. MFD Enter Key
28. COM Tuning Mode
29. FMS Mode
30. Transponder Mode (Ident)
31. NAV Tuning Mode
32. MFD Range/Pan Joystick
33. Frequency Transfer (121.5 Tune)
34. MFD FMS XPDR/NAV/COM Control
35. Alphanumeric Keys
36. Backspace Key
37. Space Key
38. Altitude Selection (PFD)
39. Course Selection (HSI)
40. Heading Selection (PFD HSI)

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Figure 7-18
Perspective Integrated Avionics System (Sheet 2 of 2)

GIA 63W Integrated Avionics Units

The Integrated Avionics Units, located behind the MFD and instrument panel, function as the main communication hub, linking all Integrated Avionics System components with the PFD. Each Integrated Avionics Unit contains a GPS WAAS receiver, VHF COM/NAV/GS receivers, system integration microprocessors, and flight director if the optional AFCS is installed. The Integrated Avionics Units are not paired together and do not communicate with each other directly.

28 VDC for Integrated Avionics Unit 1 operation is supplied through the 7.5-amp COM 1 and 5-amp GPS NAV GIA 1 circuit breakers on the ESS BUS 1. 28 VDC for Integrated Avionics Unit 2 operation is supplied through the 7.5-amp COM 2 and 5-amp GPS NAV GIA 2 circuit breakers on the MAIN BUS 2.

GEA 71 Engine Airframe Unit

The Engine Airframe Unit, mounted behind the MFD, receives and processes analog signals from the fuel gaging system, CHT, EGT, MAP, RPM and other sensors and transmits this data to the Integrated Avionics Unit.

28 VDC for Engine Airframe Unit operation is supplied through the 3-amp ENGINE INSTR circuit breaker on the ESS BUS 2.

GTX 32 Transponder

The GTX 32 solid-state transponder communicates with the primary Integrated Avionics Unit and provides Modes A and C interrogation/reply capabilities. The transponder is controlled via the PFD or Flight Management System Keyboard and is located in the empennage avionics compartment.

28 VDC for Transponder operation is supplied through the 2-amp XPONDER circuit breaker on AVIONICS BUS. Refer to the Perspective Integrated Avionics System Pilot's Guide for a complete description of the system, its operating modes, and additional detailed operating procedures.

GMA 347 Audio Panel with Integrated Marker Beacon Receiver

The Audio Panel, installed on the center console below the Flight Management System Keyboard, integrates NAV/COM digital audio, intercom and marker beacon controls. The VHF communications portion of the unit interfaces with both Integrated Avionics Units to provide external radio communication, receive and demodulate VOR, Localizer, and Glide Slope signals.

28 VDC for Audio Panel operation is supplied through the 5-amp AUDIO PANEL circuit breaker on the AVIONICS bus.

• Note •

COM swap mode is not available in this installation.

For a detailed operating instructions, refer to the GMA 347 Audio Panel Pilot's Guide.

Annunciation and Alert System

Aircraft annunciations and alerts are displayed in the Crew Alerting System (CAS) window located to the right of the altimeter and VSI. Aircraft annunciations are grouped by criticality and sorted by order of appearance with the most recent message on top. The color of the message text is based on its urgency and required action:

- Warning (red) – Immediate crew awareness and action required.
- Caution (yellow) – Immediate crew awareness and future corrective action required.
- Advisory (white) – Crew awareness required and subsequent action may be required.

In combination with the CAS Window, the system issues an audio alert when specific system conditions are met and an expanded description of the condition is displayed in the Alerts Window located in the lower RH corner of the PFD.

• Note •

For specific pilot actions in response to System Annunciations, refer to Section 3 - Emergency Procedures and Section 3A - Abnormal Procedures.

For additional information on Engine Instrument Markings and Annunciations, refer to Section 2 - Limitations.

Optional Avionics

GFC 700 3-Axis Autopilot and GMC 705 Autopilot Controller

Refer to Section 9, Supplements for GFC 700 3-Axis Autopilot operating information.

GTX 33 Mode S Transponder

The GTX 33 Mode S solid-state transponder communicates with the primary Integrated Avionics Unit and provides Modes A, C, and S interrogation/reply capabilities. The transponder is controlled via the PFD or Flight Management System Keyboard and is located in the empennage avionics compartment.

28 VDC for Mode S Transponder operation is supplied through the 2-amp XPONDER circuit breaker on AVIONICS BUS. Refer to the Perspective Integrated Avionics System Pilot's Guide for a complete description of the system, its operating modes, and additional detailed operating procedures.

GDL 69/69A XM Satellite Weather and Radio

The Data Link Satellite Receiver, mounted in the empennage avionics compartment, receives and transmits real-time weather information to the MFD and PFD. If GDL 69A option is installed, this unit also provides digital XM audio entertainment to the cabin audio system via the GRT 10 XM Radio Remote Transceiver, mounted in the empennage avionics compartment and controlled by the GRC 10 Remote Control.

28 VDC for Satellite Data Link Receiver operation is supplied through the 3-amp WEATHER circuit breaker on AVIONICS BUS. Refer to the Perspective Integrated Avionics System Pilot's Guide for a complete description of the system, its operating modes, and additional detailed operating procedures.

S-Tec System 55X Autopilot with optional Flight Director System

Refer to Section 9, Supplements for S-Tec System 55X Autopilot operating information.

S-Tec System 55SR Autopilot

Refer to Section 9, Supplements for S-Tec System 55SR Autopilot operating information.

Traffic Advisory System

The Traffic Advisory System (TAS) advises the pilot of transponder-equipped airplane that may pose a collision threat. TAS information is displayed on the MFD and indicates the relative range, bearing, and altitude of intruder airplane. The Traffic Advisory System consists of a Transmitter Receiver Computer under the LH cockpit seat, and two directional antennas installed on the airplane exterior. The system utilizes inputs from the secondary Integrated Avionics Units via the primary Air Data Computer and is controlled via the MFD or Flight Management System Keyboard.

28 VDC for Traffic Advisory System operation is supplied through the 5-amp TRAFFIC circuit breaker on AVIONICS BUS. Refer to the Perspective Integrated Avionics System Pilot's Guide for a general description of the system and its operating modes.

Weather Information System

The Weather Information System detects electrical discharges associated with thunderstorms and displays the activity on the MFD. The system consists of an antenna located on top of the fuselage and a processor unit mounted under the aft baggage floor. The antenna detects the electrical and magnetic fields generated by intra-cloud, inter-cloud, or cloud to ground electrical discharges occurring within 200 nm of the airplane and sends the "discharge" data to the processor. The processor digitizes, analyzes, and converts the "discharge" signals into range and bearing data and communicates the data to the MFD every two seconds via the secondary Integrated Avionics Unit.

28 VDC for Weather Information System operation is supplied through the 3-amp WEATHER circuit breaker on AVIONICS BUS. Refer to the Perspective Integrated Avionics System Pilot's Guide for a general description of the system and its operating modes.

Bendix/King KR 87 Automatic Direction Finder (ADF)

The KR 87 ADF System is used as a means of identifying positions, receiving low and medium frequency voice communications, homing, tracking, and for navigation on instrument approach procedures. The system consists of an antenna installed on the airplane exterior and the KR 87 receiver which communicates with the Integrated Avionics System via the secondary Integrated Avionics Unit. The HSI Bearing Needle may be configured to indicate ADF tracking and homing information.

28 VDC for ADF System operation is supplied through the 3-amp DME/ADF circuit breaker on AVIONICS BUS. Refer to the Perspective Integrated Avionics System Pilot's Guide for a general description of the system and its operating modes. Refer to the Bendix/King ADF System Pilot's Guide for a detailed discussion of the system.

Bendix/King KN 63 Distance Measuring Equipment (DME)

The KN 63 DME determines airplane distance to a land-based transponder by sending and receiving pulse pairs - two pulses of fixed duration and separation. The ground stations are typically collocated with VORs. The system consists of an antenna installed on the airplane exterior and the KN 63 receiver which communicates with the Integrated Avionics System via the secondary Integrated Avionics Unit.

28 VDC for ADF System operation is supplied through the 3-amp DME/ADF circuit breaker on AVIONICS BUS. Refer to the Perspective Integrated Avionics System Pilot's Guide for a general description of the system and its operating modes. Refer to the Bendix/King DME System Pilot's Guide for a detailed discussion of the system.

Synthetic Vision System

The Synthetic Vision System (SVS) is intended to provide the pilot with enhanced situational awareness by placing a three dimensional depiction of terrain, obstacles, traffic and the desired flight path on the PFD so that proximity and location is more easily understood during instrument scanning. The SVS database is created from a digital elevation model with a 9 arc-sec (approx. 885 ft (270m)) horizontal resolution.

The synthetic vision system is not intended to be used independently of traditional attitude instrumentation. Consequently, SVS is disabled when traditional attitude instrumentation is not available. Otherwise, the traditional attitude instrumentation will always be visible in the foreground with SVS features in the background. The PFD with SVS installed includes:

- Perspective depiction of surrounding terrain,
- Zero pitch line,
- Perspective depiction of runways,
- Perspective depiction of large bodies of water,
- Perspective depiction of obstacles,
- Flight path marker,

- Terrain warning system,
- Field of view depiction on the MFD Navigation Page.

Refer to the Perspective Integrated Avionics System Pilot's Guide for a complete description of the system, its operating modes, and additional detailed operating procedures.

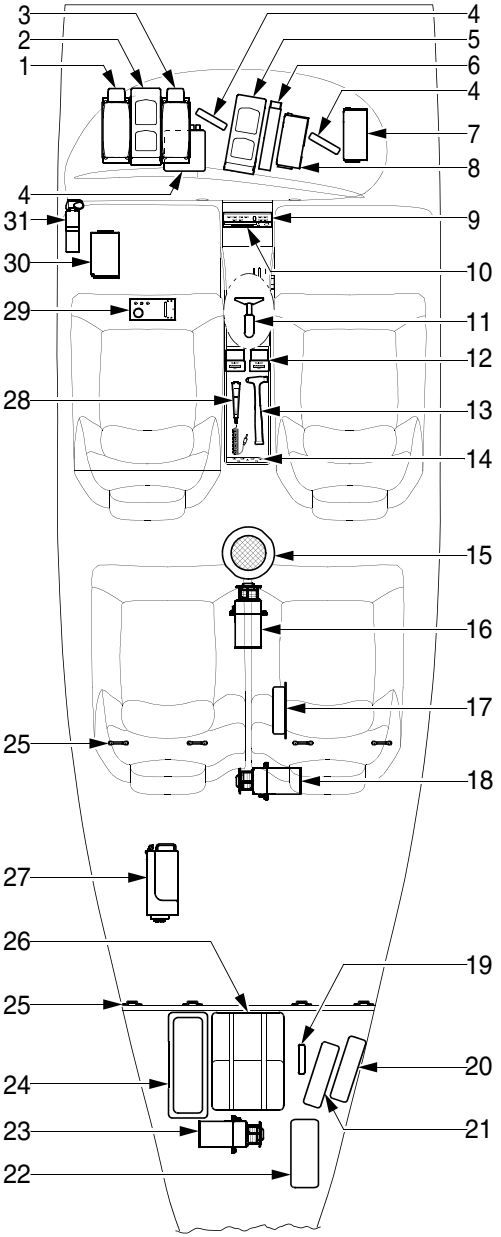
Max Viz Enhanced Vision System

The Enhanced Vision System is an electro-optical system that uses a Long-Wave Infrared (IR) camera. Infrared is particularly effective at night, smoke, haze, and smog in addition to a broad spectrum of rain, snow, and radiation-type fog. However, penetration is limited during certain environmental conditions associated with heavy rain, heavy snow, coastal fog and most cloud formations. Therefore the EVS is not intended for all atmospheric conditions and may only be used for acquisition of objects normally viewed through the cockpit windows. EVS is an aid to visual acquisitions of:

- Ground vehicles and other ground-based equipment/obstacles,
- Aircraft on taxi-ways and runways,
- Other traffic during takeoff, approach, and landing,
- Runway and taxi lights,
- Runway and terrain features during climb, descent, and low altitude maneuvering.

The EVS sensor, located on the underside of the LH wing, contains a long-wave infrared camera that produces a infrared image and a low-light CMOS camera that produces a visible image. The two images are then combined to produce a single fused image and transmitted directly to the MFD. Upon power-up the Sensor requires approximately 90 seconds to produce a usable image. The image generated is a monochrome image. The hotter an object is the whiter it appears on the display.

28 VDC Enhanced Vision System operation is supplied through the 5-amp EVS CAMERA circuit breaker on MAIN BUS 3. Refer to the Max Viz Enhanced Vision System Pilot's Guide for a detailed discussion of the system. For maintenance information and special precautions to be followed, refer to Section 8, Ground Handling, Servicing, and Maintenance



LEGEND

1. AHRS 1
2. Integrated Avionics Unit 1
3. AHRS 2
4. Avionics Cooling Fan
5. Integrated Avionics Unit 2
6. Engine Airframe Unit
7. Air Data Computer 2 (opt)
8. Air Data Computer 1
9. GFC 705 Mode Controller (opt)
10. ADF (Opt)
11. CAPS Activation Handle (Cabin Ceiling)
12. Hour Meters
13. Egress Hammer
14. Telephone and Audio Jacks
15. Cabin Speaker
16. Roll Servo (opt)
17. Pitch Trim Adapter (opt)
18. Pitch Servo (opt)
19. XM Radio Transceiver (Opt)
20. Transponder
21. Satellite Data Link Receiver (Opt)
22. ELT
23. Yaw Servo (opt)
24. Battery 2
25. Tiedown Loops
26. CAPS Parachute
27. WX Information Receiver (Opt)
28. Microphone
29. TAS Receiver (Opt)
30. DME (Opt)
31. Fire Extinguisher

SR22_FM07_2786C

Figure 7-19
Equipment Locations

Avionics Support Equipment

Antennas

Two rod-type COM antennas are mounted to the airplane's exterior; COM 1 is mounted directly above the passenger compartment, COM 2 is mounted directly below the baggage compartment. These antennas are connected to the two VHF communication transceivers contained in the Integrated Avionics Units.

The optional blade-type DME antenna is mounted on the airplane underside just aft, right of the firewall.

The optional combined loop/sense ADF antenna is mounted to the underside of the airplane just aft of the main wing spar. The antenna combines antenna signals into a single signal input to the ADF receiver.

A sled-type marker beacon antenna is mounted to the underside of the airplane below the baggage compartment and provides a signal to the marker beacon receiver located in the GMA 347 audio panel. If the optional air conditioning system is installed this antenna is located below the baggage floor inside of the airplane.

The transponder antenna is located on the bottom side of the airplane, just aft of the baggage compartment bulkhead on the RH side of the airplane.

GPS 1 antenna is mounted directly above the passenger compartment. If the optional XM system is installed, a combination GPS1/XM antenna is installed in this location. GPS 2 antenna is mounted just forward of the baggage compartment window. These antennas are connected to the two GPS receivers contained in the Integrated Avionics Units.

The optional Traffic System antenna is mounted just above the pilot/copilot compartment.

If the Garmin GTS 800 Series Traffic Advisory System is installed, a second blade-type antenna is located on the bottom RH side of the airplane just forward of the baggage compartment.

The optional Weather Information System antenna is mounted directly above the passenger compartment.

The Navigation antenna is mounted to the top of the vertical fin. This antenna provides VOR and glidescope signals to the VHF navigation receivers contained in the Integrated Avionics Units.

Headset and Microphone Installation

The airplane is equipped with provisions for four noise-canceling headsets with integrated microphones. The forward microphone-headsets use remote Push-To-Talk (PTT) switches located on the top of the associated control yoke grip. The rear headsets do not have COM transmit capabilities and do not require PTT switches. The microphone (MIC), headset, and automatic noise reduction (ANR) power jacks for the pilot and front seat passenger are located in the map case and similar jacks for the aft passengers are located on the aft portion of the center console. Audio to all four headsets is controlled by the individual audio and volume selectors on the audio control panel.

Audio Input Jack

Two 3.5 mm audio input jacks (AUDIO INPUT) are provided on the aft portion of the center console. One jack is located near the convenience outlet for use by the pilot and forward passenger, and another is located further aft by the rear passenger ANR power jacks. These jacks can be used to plug in personal entertainment devices such as portable radios, cassette players, or CD players. Audio volume through these jacks is controlled by connected individual entertainment device.

Cell Phone Input Jack

One 2.5 mm cell phone jack (CELL PHONE INPUT) is provided on the aft portion of the center console near the convenience outlet. This jack provides full-duplex telephone interface with intercom isolation and disable capability. Cabin audio volume through this jack is controlled by the volume selector on the audio control panel.

Avionics Cooling Fans

Electric fans provide forced ambient-air cooling for the Integrated Avionics System. A fan located forward of the instrument panel provides ambient air cooling directly to the Integrated Avionics Units. Two additional fans blow air directly onto the heat sinks located on the forward sides of the PFD and MFD.

28 VDC for MFD Fan operation is supplied through the 5-amp AVIONICS FAN 1 circuit breaker on NON-ESSENTIAL BUS. 28 VDC for PFD and Integrated Avionics Unit Fan operation is supplied through the 5-amp AVIONICS FAN 2 circuit breaker on MAIN BUS 2.

Cabin Features

Emergency Locator Transmitter

The airplane is equipped with a self-contained emergency locator transmitter (ELT). The transmitter and antenna are installed immediately behind the aft cabin bulkhead, slightly to the right of the airplane centerline. The main transmitter control switch, labeled ON-OFF-ARMED, on the transmitter is in the armed position for normal operations. A remote switch and indicator panel is installed on the left console near the pilot's right knee. If rapid deceleration is detected, the transmitter will repeatedly transmit VHF band audio sweeps at 121.5 MHz and 243.0 MHz approximately 0.5 seconds apart.

The transmitter and antenna are accessible through the avionics bay access panel along the aft portion of the RH fuselage or the lower aft center access panel of baggage compartment The ELT can be removed from the airplane and used as a personal locating device if it is necessary to leave the airplane after an accident. Eight dated "D" cell alkaline batteries contained within the transmitter unit power the ELT transmitter. The batteries must be replaced at specified intervals based upon the date appearing on the battery (Refer to Airplane Maintenance Manual).

ELT Remote Switch and Indicator Panel

The ELT remote switch and indicator panel, located on the left console near the pilot's right knee, provides test and monitoring functions for the ELT. The panel contains a button labeled ON, a button labeled RESET, and a red LED (light). The red light flashes when the ELT is transmitting. The ON button is used to test the unit in accordance with the maintenance manual procedures. The RESET button can be used to cancel an inadvertent transmission. A 6-volt Lithium battery mounted in the panel powers the LED. The battery must be replaced at regular intervals (Refer to Airplane Maintenance Manual).

In the event of an accident:

1. Verify ELT operation by noting that the ELT indicator light on the remote panel is flashing.
2. If possible, access the unit as described below and set the ELT main transmitter control switch ON.

   Portable use of ELT:

   a. Remove access at lower aft center of baggage compartment.

b. Disconnect fixed antenna lead from front of unit.

c. Disconnect lead from remote switch and indicator unit.

d. Loosen attach straps and remove transmitter unit and portable antenna.

e. Attach portable antenna to antenna jack on front of unit.

f. Set main control switch to ON.

g. Hold antenna upright as much as possible.

Fire Extinguisher

A liquefied-gas-type fire extinguisher, containing Halon 1211/1301 extinguishing agent, is mounted on the forward outboard side of the pilot-side footwell. The extinguisher is approved for use on class B (liquid, grease) and class C (electrical equipment) fires. The Halon 1211/1301 blend provides the best fire extinguishing capability with low toxicity. A pin is installed through the discharge mechanism to prevent inadvertent discharge of extinguishing agent. The fire extinguisher must be replaced after each use.

To operate the extinguisher:

1. Loosen retaining clamp and remove the extinguisher from its mounting bracket.
2. Hold the extinguisher upright and pull the pin.
3. Get back from the fire and aim nozzle at base of fire at the nearest edge.
4. Press red lever and sweep side to side.

The extinguisher must be visually inspected before each flight to assure that it is available, charged, and operable. The preflight inspection consists of ensuring that the nozzle is unobstructed, the pin has not been pulled, and the canister has not been damaged. Additionally, the unit should weigh approximately 1.5 lb (0.7 kg). For preflight, charge can be determined by ‘hefting’ the unit.

Hour Meters

The airplane is equipped with two hour meters located inside the armrest storage compartment between the pilot and copilot seats. The #1 hour meter, labeled HOBBS begins recording when the BAT 1 switch is ON and either the ALT 1 or ALT 2 switch is ON. The #2 hour meter records flight time and is labeled FLIGHT. Recording begins when the airplane reaches a speed of approximately 35 KIAS and is controlled by the Engine Airframe Unit.

28 VDC for hour meter operation is supplied through the 5-amp FUEL QTY circuit breaker on MAIN BUS 1.

Emergency Egress Hammer

An eight-ounce ball-peen type hammer is located in the center armrest accessible to either front seat occupant. In the event of a mishap where the cabin doors are jammed or inoperable, the hammer may be used to break through the acrylic windows to provide an escape path for the cabin occupants.

Convenience Outlet

A 12-volt convenience outlet is installed in the center console. The receptacle accepts a standard cigarette-lighter plug. The outlet may be used to power portable entertainment equipment such as CD players, cassette players, and portable radios. Amperage draw through the outlet must not exceed 3.5 amps. Power for the convenience outlet is supplied through the 5-amp 12V DC OUTLET circuit breaker on the MAIN BUS 3.

Cirrus Airplane Parachute System

The airplane is equipped with a Cirrus Airplane Parachute System (CAPS) designed to bring the airplane and its occupants to the ground in the event of a life-threatening emergency. The system is intended to save the lives of the occupants but will most likely destroy the airplane and may, in adverse circumstances, cause serious injury or death to the occupants. Because of this it is important to carefully read the CAPS descriptions in this section, section 3 Emergency Procedures and Section 10, Safety and consider when and how you would use the system.

• WARNING •

The parachute system does not require electrical power for activation and can be activated at any time. The solid-propellant rocket flight path is upward from the parachute cover. Stay clear of parachute canister area when airplane is occupied. Do not allow children in the airplane unattended.

System Description

The CAPS consists of a parachute, a solid-propellant rocket to deploy the parachute, a rocket activation handle, and a harness imbedded within the fuselage structure.

A composite box containing the parachute and solid-propellant rocket is mounted to the airplane structure immediately aft of the baggage compartment bulkhead. The box is covered and protected from the elements by a thin composite cover.

The parachute is enclosed within a deployment bag that stages the deployment and inflation sequence. The deployment bag creates an orderly deployment process by allowing the canopy to inflate only after the rocket motor has pulled the parachute lines taut.

The parachute itself is a 2400-square-foot round canopy equipped with a slider, an annular-shaped fabric panel with a diameter significantly less than the open diameter of the canopy. The slider has grommets spaced around its perimeter. The canopy suspension lines are routed through these grommets so that the slider is free to move along the suspension lines. Since the slider is positioned at the top of the suspension lines near the canopy, at the beginning of the deployment sequence the slider limits the initial diameter of the parachute and the

rate at which the parachute inflates. As the slider moves down the suspension lines the canopy inflates.

A three-point harness connects the airplane fuselage structure to the parachute. The aft harness strap is stowed in the parachute canister and attached to the structure at the aft baggage compartment bulkhead. The forward harness straps are routed from the canister to firewall attach points just under the surface of the fuselage skin. When the parachute deploys, the forward harness straps pull through the fuselage skin covering from the canister to the forward attach points.

Activation Handle

CAPS is initiated by pulling the CAPS Activation T-handle installed in the cabin ceiling on the airplane centerline just above the pilot's right shoulder. A placarded cover, held in place with hook and loop fasteners, covers the T-handle and prevents tampering with the control. The cover is be removed by pulling the black tab at the forward edge of the cover.

Pulling the activation T-handle will activate the rocket and initiate the CAPS deployment sequence. To activate the rocket, two separate events must occur:

1. Pull the activation T-handle from its receptacle. Pulling the T-handle removes it from the o-ring seal that holds it in place and takes out the slack in the cable (approximately two inches (5 cm) of cable will be exposed). Once the slack is removed, the T-handle motion will stop and greater force will be required to activate the rocket.
2. Clasp both hands around activation T-handle and pull straight downward with a strong, steady, and continuous force until the rocket activates. A chin-up type pull works best. Up to 45.0 pounds (20.4 Kg) force, or greater, may be required to activate the rocket. The greater force required occurs as the cable arms and then releases the rocket igniter firing pin. When the firing pin releases, two primers discharge and ignite the rocket fuel.

   • Note •

   Jerking or rapidly pulling on the activation T-handle greatly increases the pull forces required to activate the rocket.

   Attempting to activate the rocket by pushing the activation T-handle forward and down limits the force that can be applied.

Pulling the activation T-handle straight down generates the greatest force.

A maintenance safety pin is provided to ensure that the activation handle is not pulled during maintenance. However, there may be some circumstances where an operator may wish to safety the CAPS system; for example, the presence of unattended children in the airplane, the presence of people who are not familiar with the CAPS activation system in the airplane, or during display of the airplane.

The pin is inserted through the handle retainer and barrel locking the handle in the “safe” position. A “Remove Before Flight” streamer is attached to the pin.

• WARNING •

After maintenance has been performed or any other time the system has been safetied, operators must verify that the pin has been removed before further flight.

Deployment Characteristics

When the rocket launches, the parachute assembly is extracted outward due to rocket thrust and rearward due to relative wind. In approximately two seconds the parachute will begin to inflate.

When air begins to fill the canopy, forward motion of the airplane will dramatically be slowed. This deceleration increases with airspeed but in all cases within the parachute envelope should be less than 3 g's. During this deceleration a slight nose-up may be experienced, particularly at high speed; however, the rear riser is intentionally snubbed short to preclude excessive nose-up pitch. Following any nose-up pitching, the nose will gradually drop until the airplane is hanging nose-low beneath the canopy.

Eight seconds after deployment, the rear riser snub line will be cut and the airplane tail will drop down into its final approximately level attitude. Once stabilized in this attitude, the airplane may yaw slowly back and forth or oscillate slightly as it hangs from the parachute. Descent rate is expected to be less than 1700 feet per minute with a lateral speed equal to the velocity of the surface wind. In addition, surface winds may continue to drag the airplane after ground impact.

• Caution •

Ground impact is expected to be equivalent to touchdown from a height of approximately 13 feet. While the airframe, seats and landing gear are designed to accommodate this stress, occupants must prepare for it in accordance with the CAPS Deployment procedure in Section 3 - Emergency Procedures.

• Note •

The CAPS is designed to work in a variety of airplane attitudes, including spins. However, deployment in an attitude other than level flight may yield deployment characteristics other than those described above.

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Brake Inspection

The brake assemblies and linings should be checked at every oil change (50 hours) for general condition, evidence of overheating, and deterioration.

The aircraft should not be operated with overheated, damaged, or leaking brakes. Conditions include, but are not limited to:

- Leaking brake fluid at the caliper. This can be observed by checking for evidence of fluid on the ground or deposited on the underside of the wheel fairing. Wipe the underside of the fairing with a clean, white cloth and inspect for red colored fluid residue.
- Overheated components, indicated by discoloration or warping of the disk rotor. Excessive heat can cause the caliper components to discolor or cause yellowing of the part identification label.

To inspect the brake assemblies:

1. Remove main gear fairing. (Refer to AMM 32-10)
2. Wipe off any debris from brake caliper assembly that may obstruct inspection.
3. Check brake linings for deterioration and maximum permissible wear. Replace lining when worn to 0.100 inch (2.54 mm).
4. Inspect temperature indicator(s):
   a. Clean and inspect temperature indicators installed to brake caliper assembly.
   b. Verify temperature indicators are firmly adhered to piston housing.
   c. If either temperature indicator is black, the brake assembly has overheated. The brake linings must be inspected and the O-rings replaced.
5. Check brake assemblies for evidence of overheating and/or deterioration.
6. Install main gear fairing. (Refer to AMM 32-10)

Tire Inflation

For maximum service from the tires, keep them inflated to the proper pressure. When checking tire pressure, examine the tires for wear, cuts, nicks, bruises and excessive wear.

To inflate tires:

1. Remove inspection buttons on wheel pants to gain access to valve stems. It may be necessary to move airplane to get valve stem aligned with the access hole.
2. Remove valve stem cap and verify tire pressure with a dial-type tire pressure gage.
3. Inflate nose tire to 30 psi (207 kPa) and main wheel tires to 62 psi (427kPa).
4. Replace valve stem cap and inspection buttons.

All wheels and tires are balanced before original installation and the relationship of tire, tube, and wheel should be maintained upon reinstallation. In the installation of new components, it may be necessary to rebalance the wheels with the tires mounted. Unbalanced wheels can cause extreme vibration in the landing gear.

Propeller Servicing

The spinner and backing plate should be cleaned and inspected for cracks frequently. Before each flight the propeller should be inspected for nicks, scratches, and gouges. If found, they should be repaired as soon as possible by a rated mechanic, since a nick or scratch causes an area of increased stress which can lead to serious cracks or the loss of a propeller tip.

Propeller blades are painted with a durable specialized coating that is resistant to abrasion. If this coating becomes eroded, it is necessary to repaint the blades to provide proper erosion protection. Painting should be performed by an authorized propeller repair station.

It is permissible to perform a blade touch-up with aerosol paint in accordance with the appropriate revision of the Hartzell Propeller Owner's Manual (p/n 145).

Oil Servicing

The oil capacity of the Teledyne Continental IO-550-N engine is 8 quarts. It is recommended that the oil be changed every 50 hours and

Section Section 9
Log of Supplements

Part Number	Title	Date
___ 13772-109 R2	Approved Oxygen Systems	01-06-10
___ 13772-114 R1	SR22 / SR22T Airplanes Registered in Canada	07-07-10
___ 13772-115 R9	Basic Ice Protection System	12-17-10
___ 13772-122 R1	SR22 / SR22T Airplanes Registered in European Union	07-07-10
___ 13772-131 R2	Artex ME406 406 MHz ELT System	01-06-10
___ 13772-134 R4	TKS Anti-Ice System	12-17-10
___ 13772-135 R3	GFC 700 Automatic Flight Control System	12-14-10
___ 13772-136 R1	Garmin Terrain Awareness/Warning System	01-06-10
___ 13772-140 R1	S-Tec Fifty Five X Autopilot w/ Optional Flight Director	01-06-10
___ 13772-141 R1	S-Tec Fifty Five SR Autopilot	01-06-10
___ 13772-143 R2	Part 135 Electrical Loading Shedding Procedure	01-06-10
___ 13772-146	SR22T Airplanes Registered in South Africa	11-16-10
___ 13772-147	SR22 / SR22T Airplanes Registered in Colombia	10-07-10

FAA Approved POH Supplements must be in the airplane for flight operations when the subject optional equipment is installed or the special operations are to be performed.

This Log of Supplements shows all Cirrus Design Supplements available for the aircraft at the corresponding date of the revision level shown in the lower left corner. A mark (x) in the Part Number column indicates that the supplement is installed in the POH.