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FAA Approved AIRPLANE FLIGHT MANUAL SUPPLEMENT

G1000 Integrated Avionics System and GFC 700 AFCS In Hawker Beechcraft C90A and C90GT King Air Aircraft

Dwg. Number: 190-00682-02 Rev. C

This Supplement must be attached to the FAA Approved Airplane Flight Manual when the Garmin G1000 Integrated Avionics System is installed in accordance with STC SA01456WI-D. The information contained herein supplements the information of the basic Airplane Flight Manual. For Limitations, Procedures, and Performance information not contained in this Supplement consult the basic Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

Only the Limitations Section of this AFMS is FAA APPROVED.

Airplane Serial Number: _____

Airplane Registration Number: _____

FAA Approved By: _____

Robert G. Murray
Lead DAS Administrator
Garmin International, Inc
DAS-240087-CE

Date: 3/13/2008

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Log of Revisions

Pilot's Operating Handbook and FAA Approved Airplane Flight Manual Supplement for

G1000 Integrated Avionics System and GFC 700 AFCS In Hawker Beechcraft C90A and C90GT King Air Aircraft

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C	17, 24	Added Non-essential equipment list to DUAL GENERATOR FAILURE procedure, added GDU cooling fans to minimum equipment list, editorial updates.	See Cover	See Cover

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Section 1 - General

The information in this supplement is FAA-approved material and must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual (POH/AFM) when the airplane has been modified by installation of the Garmin G1000 Integrated Avionics System and GFC 700 Digital Automatic Flight Guidance System in accordance with Garmin International, Inc. approved data.

The information in this supplement supersedes or adds to the basic POH/AFM only as set forth below. Users of the manual are advised to always refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

The Garmin G1000 system installed in the Hawker Beechcraft C90A and C90GT King Air Aircraft provides a fully integrated Display, Communications, Navigation and Flight Control system. Functions provided by the G1000 system include: Primary Flight Information, Powerplant Monitoring, Navigation, Communication, Traffic Surveillance, TAWS, Weather Avoidance, and a three-axis automatic flight control / flight director system.

OPERATIONAL APPROVALS

G1000 GPS/SBAS NAVIGATION SYSTEM

The Garmin G1000 GPS/SBAS receivers incorporating SW version 3.0 or later approved version and Comant CI 428-410 and CI 428-200 antennas are approved under TSO-C145a Class 3 and installed in accordance with AC 20-138A. The Garmin G1000 system has been demonstrated capable of, and has been shown to meet the accuracy requirements for the following operations provided it is receiving usable navigation data:

> The G1000 Integrated Avionics system as installed in this aircraft complies with AC 20-138A for navigation using GPS and WAAS (within the coverage of a Space-Based Augmentation System complying with ICAO Annex 10) for IFR en route, terminal area, and non-precision approach operations (including those approaches titled "GPS", "or GPS", and "RNAV (GPS)" approaches). The G1000 Integrated Avionics system installed in this aircraft is approved for approach procedures with vertical guidance including "LPV", "LNAV/VNAV", and "LNAV + V" within the U.S. National Airspace System.
>
> The G1000 Integrated Avionics system as installed in this aircraft has been found to comply with the requirements for GPS as a Primary Means of Navigation for oceanic and remote navigation – RNP-10, (per FAA AC 20-138A, FAA Order 8400-12A, and FAA Order 8700-1), when used in conjunction with Garmin WAAS Fault Detection/Exclusion (WFDE) Prediction Program, part number 006-A0154-01 or later approved version with Comant CI 428-200 or Comant CI 428-410 antennas selected. This does not constitute an operational approval. Both GPS/SBAS receivers are required to be operating and receiving usable signals except for routes requiring only one Long Range Navigation (LRN) sensor.
>
> The G1000 WFDE predication program works in combination with the Garmin AT, Inc. Route Planning Software, version 1.2, or later approved version. The route planning and WFDE prediction program can be downloaded from Garmin G1000 website on the internet. For information on using the WFDE Prediction Program, refer to Garmin WAAS FDE Prediction Program, part number 190-00643-01, 'WFDE Prediction Program Instructions'.

North Atlantic (NAT) Minimum Navigational Performance Specifications (MNPS) Airspace per AC 91-49 and AC 120-33. Both GPS/SBAS receivers are required to be operating and receiving usable signals except for routes requiring only one Long Range Navigation sensor.

NOTE

Each display computes an independent navigation solution based on the on-side GPS sensor. However, either display will automatically revert to the cross-side sensor if the on-side sensor fails or if the cross-side sensor is determined to be more accurate. A “BOTH ON GPS1” or “BOTH ON GPS2” message does not necessarily mean that one GPS has failed. Refer to the MFD AUX-GPS STATUS page to determine the state of the unused GPS.

Enroute and Terminal including RNP5/BRNAV and PRNAV (RNP-1) - In accordance with JAA TGL-10 Rev 1, ACJ 20X4, AC 90-96A, and AC 90-100A provided the FMS is receiving usable navigation information from one or more GPS/SBAS receivers.

The G1000 Integrated Avionics system as installed in this is aircraft is eligible for B-RNAV in accordance with AMJ20X2.

The G1000 Integrated Avionics system as installed in this aircraft is eligible for PRNAV in accordance with PRNAV requirements: JAA Administrative & Guidance Material Section One: General Part 3: Temporary Guidance Leaflets, Leaflet No 10: Airworthiness and Operational Approval for Precession RNAV Operations in Designated European Airspace 7.1 Required Functions.

Navigation information is referenced to WGS-84 reference system, and should only be used where the Aeronautical Information Publication (including electronic data and aeronautical charts) conform to WGS-84 or equivalent.

ELECTRONIC FLIGHT BAG

The G1000 Integrated Avionics System as installed in this aircraft supports approval of AC 120-76A Hardware Class 3, Software Type C Electronic Flight Bag (EFB) electronic aeronautical chart applications when using current FliteChart or ChartView data. Additional operational approvals may be required.

For operations under part 91, it is suggested that a secondary or back up source of aeronautical information necessary for the flight be available to the pilot in the aircraft. The secondary or backup information may be either traditional paper-based material or displayed electronically. If the source of aeronautical information is in electronic format, operators must determine non-interference with the G1000 system and existing aircraft systems for all flight phases.

Section 2 - Limitations

INTRODUCTION

The G1000 Cockpit Reference Guide for Hawker Beechcraft C90A/GT (CRG) must be immediately available to the flight crew. Use the G1000 Cockpit Reference Guide for Hawker Beechcraft C90A/GT, Garmin part number 190-00664-00, revision C or later approved revision when System Software Version 0636.01 is installed. The System Software Version number is displayed at the top right side of the MFD Power-up page.

AIRSPEED LIMITATIONS AND INDICATOR MARKINGS

No change to the airplane's airspeed limitations. The airspeed indicators on the Primary Flight Displays (PFDs) and the standby airspeed indicator are marked in accordance with the airplane's POH/AFM.

A low speed awareness band is marked on the PFDs in red from 20 – 78 KIAS. While the airplane is on the ground, the low speed awareness band is suppressed. It displays in flight two seconds after main gear liftoff.

The standby airspeed indicator is marked in accordance with the airspeed markings called out in the airplane's AFM/POH. The standby airspeed indicator is not marked with a low speed awareness band.

POWER PLANT LIMITATIONS AND INDICATOR MARKINGS

No change to the airplane's powerplant operating limitations. The engine gauges are marked in accordance with the airplane's POH/AFM or, if an engine modification has been installed, in accordance with the AFMS for the engine modification.

NOTE

The gauge indicator pointer and digital display will flash inverse red/white video for 5 seconds and then remain steady red if the indicated engine parameter exceeds its established limit.

G1000 INTEGRATED AVIONICS SYSTEM

These limitations apply to Garmin G1000 system software version 0636.00

The Garmin G1000 Cockpit Reference Guide P/N 190-00664-00, Rev A, or later FAA approved revision, must be immediately available to the flight crew.

Required flight crewmembers must wear and use headsets when the overhead cockpit speaker audio is selected OFF.

Do not take off unless all display units are installed and operational.

Do not take off with any display in reversionary mode.

Do not take off with any of the following messages displayed in the ALERTS window:

GPS1 FAIL and GPS2 FAIL simultaneously	PFD1 SERVICE
GPS NAV LOST	PFD2 SERVICE

GIA1 SERVICE	GMA1 SERVICE
GIA2 SERVICE	GMA2 SERVICE
MFD SERVICE	GEO LIMITS

Do not take off if MFD FAN FAIL is displayed in the ALERTS window **AND** the Outside Air Temperature is greater than 33^{O}C (91^{O}F).

Do not takeoff if PFD1 FAN FAIL or PFD2 FAN FAIL is displayed in the ALERTS window **AND** the Outside Air Temperature is greater than 47^{O}C (116^{O}F).

Ground operation of the G1000 system is limited to 25 minutes when the Outside Air Temperature is greater than 49^{O}C (120^{O}F) **AND** air conditioning is inoperative.

The G1000 system must be turned on and operated for at least 30 minutes before takeoff if ground outside air temperature is -40^{O}C (-40^{O}F) or below.

Use of VNAV is prohibited during the intermediate segment of an approach that includes a teardrop course reversal. VNAV will become 'Unavailable' at the beginning of the teardrop segment of the course reversal.

The fuel quantity, fuel required, fuel remaining, and gross weight estimate functions of the G1000 are supplemental information only and must be verified by the flight crew.

SafeTaxi and Chartview airport moving map display with own-ship position symbol is designed to assist flight crews in orienting themselves on the airport surface to improve pilot positional awareness during taxi operations. The airport moving map display function is not to be used as the basis for ground maneuvering.

G1000 GPS/SBAS NAVIGATION SYSTEM

SBAS AUGMENTED GPS SYSTEM LIMITATIONS

GPS/SBAS based IFR enroute, oceanic, and terminal navigation is prohibited unless the pilot verifies and uses a valid, compatible, and current Aviation database or verifies each waypoint for accuracy by reference to current approved data.

"GPS", "or GPS", and "RNAV (GPS)" instrument approaches using the G1000 System are prohibited unless the pilot verifies and uses the current Aviation database. GPS based instrument approaches must be flown in accordance with an approved instrument approach procedure that is loaded from the Aviation database.

IFR non-precision approach approval using the GPS/SBAS sensor 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.

Use of the Garmin G1000 GPS/SBAS receivers to accomplish ILS, LOC, LOC-BC, LDA, SDF, MLS or any other type of approach not approved for "or GPS" is not authorized. Use of the G1000 VOR/LOC/GS receivers to fly approaches not approved for "or GPS" requires that VOR/LOC/GS navigation data is selected and presented on the CDI of the pilot flying (i.e. proper CDI source selection).

NOTE

Not all published approaches are in the AVIATION database. The flight

crew must ensure that the planned approach is in the database.

RNP operations are not authorized except as noted in the Operational Approvals section.

When an approach being flown requires a course reversal and is being flown referenced to GPS/SBAS navigation, the initial approach fix must be crossed at a ground speed of 200 KT or less.

AHRS AREAS OF OPERATION

Flight operations with the G1000 Integrated Avionics installed are prohibited north of 70° North latitude or south of 70° South Latitude due to unsuitability of the magnetic fields near the Earth's poles. In addition, operations are prohibited in the following two regions:

North of 65° North latitude between longitude 75° W and 120° W (Northern Canada).

South of 55° South latitude between longitude 120° E and 165° E (region south of Australia and New Zealand).

NOTE

The Garmin G1000 system is not designed for use as a polar navigator and operation outside the approved operating area is prohibited. The GRS-77 AHRS internally monitors the magnetic field and will display a GEO LIMITS system message when the magnetic field becomes unsuitable for AHRS operation. When the AHRS can no longer reliably compute heading, heading information will be removed from the HSI.

AUTOPILOT OPERATION LIMITS

One pilot must remain seated at the controls, with seatbelt fastened, during all autopilot operations.

Do not use autopilot or yaw damper during takeoff and landing.

The GFC 700 AFCS preflight test must be successfully completed prior to use of the autopilot, flight director or manual electric trim. Use of the autopilot or manual electric trim system is prohibited if the preflight test is not satisfactorily completed.

When conducting missed approach procedures, autopilot coupled operation is prohibited until the pilot has established a rate-of-climb that ensures all altitude requirements of the procedure will be met.

Minimum speed for autopilot operation is 100 KIAS.

Maximum speed limit for autopilot operation is unchanged from the airplane's maximum airspeed limit (V_{MO}/M_{MO}).

Do not use autopilot below the following altitudes:

(1) On takeoff, do not engage the autopilot below ..... 400 feet Above Ground Level
(2) Enroute ..... 800 feet AGL
(3) Approach (GP or GS Mode) ..... 200 feet AGL
(4) Approach (FLC, VS, PIT or ALT Mode)..... Higher of 400 feet AGL or Approach MDA

TAWS AND TERRAIN SYSTEM LIMITS

Pilots are authorized to deviate from their current ATC clearance to the extent necessary to comply with TAWS warnings.

The TAWS databases have an area of coverage as detailed below:

a) The terrain database has an area of coverage from North 75° Latitude to South 60° Latitude in all longitudes.

b) The Airport Terrain Database has an area of coverage that includes airports from North 75° Latitude to South 60° Latitude in all longitudes.

c) The Obstacle Database has an area of coverage that includes the United States and Europe.

Use of the TAWS for navigation or terrain and/or obstacle avoidance is prohibited.

NOTE

The MAP - TAWS page and terrain display is intended to serve as a situational awareness tool only. It may not provide either the accuracy or fidelity, or both, on which to solely base decisions and plan maneuvers to avoid terrain or obstacles.

To avoid unwanted alerts, TAWS should be inhibited when landing at an airport that is not included in the airport database.

TRAFFIC AVOIDANCE SYSTEM LIMITS

Use of the MAP - TRAFFIC MAP to maneuver the airplane to avoid traffic without outside visual reference is prohibited. The Traffic Information System (TIS) or optional Skywatch HP Traffic Alert/Advisory System is intended as an aid for the pilot to visually locate traffic. It is the responsibility of the pilot to see and manually maneuver the airplane to avoid other traffic.

DATA LINK WEATHER (XM WEATHER)

Datalink weather information displayed by the G1000 system is limited to supplemental use only. XM weather data is not a source of official weather information. Use of the NEXRAD and LTNG (XM Lightning) data on the MAP – NAVIGATION MAP and/or MAP - WEATHER DATA LINK page (XM Weather) for hazardous weather, e.g., thunderstorm penetration is prohibited. NEXRAD, and LTNG information on the MAP - NAVIGATION or MAP – WEATHER DATA LINK page is intended only as an aid to enhance situational awareness of hazardous weather, not penetration. It is the pilot's responsibility to avoid hazardous weather using official weather data sources and the airplane's in-flight weather radar.

OPTIONAL L3 COMMUNICATIONS AVIONICS SYSTEM WX-500 STORMSCOPE

Stormscope lightning information displayed by the G1000 system is limited to supplemental use only. The use of the Stormscope lightning data on the MAP – NAVIGATION MAP and/or MAP – STORMSCOPE page for hazardous weather (thunderstorm) penetration is prohibited. Stormscope lightning data on the MAP - NAVIGATION or MAP – STORMSCOPE page is intended only as an aid to enhance situational awareness of hazardous weather, not penetration. It is the pilot's responsibility to avoid hazardous weather using official weather data sources and the airplane's weather radar.

PLACARDS

On some aircraft, placards “On Instrument Panel Adjacent to Each Gyroscopic Instrument (Except for Flight Director)” were installed to identify the power source for the instrument (ref. AFM limitations section). With the installation of the G1000, these placards are removed and not required.

On Instrument Panel above the Standby Attitude Indicator:

STANDBY ALT/AS	
ALTITUDE – FEET	V_{MO}-KIAS
S.L TO 16,000	226
16,000 TO 20,000	209
20,000 TO 25,000	189
25,000 TO 30,000	169

KINDS OF OPERATION LIMITS

The Hawker Beechcraft models C90A and C90GT are approved for the following types of operations when the required equipment, as shown in the airplane AFM/POH Kinds of Operations Equipment List, supplemented by the Kinds of Operations Equipment List from other applicable Airplane Flight Manual Supplements, and the Kinds of Operations Equipment List contained in this Airplane Flight Manual Supplement, is installed and operable.

1. VFR Day
2. VFR Night
3. IFR Day
4. IFR Night
5. Icing Conditions

KINDS OF OPERATIONS EQUIPMENT LIST

This airplane may be operated in day or night VFR, day or night IFR, and icing conditions when the required systems and equipment are installed and operable.

The following equipment list identifies the systems and equipment upon which type certification for each kind of operation was predicated. The system and equipment listed must be installed and operable for the particular kind of operation indicated unless:

The airplane is approved to be operated in accordance with a current Minimum Equipment List (MEL) issued by the FAA.

Or:

An alternate procedure is provided in the Pilots Operating Handbook and FAA Approved Flight Manual for the inoperative state of the listed system or equipment and all limitations are complied with.

Numbers in the Kinds of Operations Equipment List refer to quantities required to be operative for the specified condition. The list does not include all equipment that may be required by specific operating rules. It also does not include components obviously required for the airplane to be airworthy such as wings, empennage, engines, etc.

System and/or Equipment	VFR Day	VFR Night	IFR Day	IFR Night	Icing Conditions	Remarks and/or Exceptions
ELECTRICAL POWER						
Inverter	**0**	**0**	**0**	**0**	**0**	**Removed by G1000 modification**
INVERTER Annunciator	**0**	**0**	**0**	**0**	**0**	**Removed by G1000 modification**
Standby Battery	**0**	**1**	**1**	**1**	**1**	
ENGINE INDICATIONS **No Changes - Refer to Aircraft Flight Manual**						
ENGINE OIL **No Changes - Refer to Aircraft Flight Manual**						
ENVIRONMENTAL						
Air Conditioning System	**0**	**0**	**0**	**0**	**0**	**Temperature limits reduced to 49°C (120°F) with inoperative air conditioner or air conditioner not used.**
FLIGHT CONTROLS **No Changes - Refer to Aircraft Flight Manual**						
FUEL **No Changes - Refer to Aircraft Flight Manual**						
ICE AND RAIN PROTECTION **No Changes - Refer to Aircraft Flight Manual**						
LANDING GEAR **No Changes - Refer to Aircraft Flight Manual**						
LIGHTS **No Changes - Refer to Aircraft Flight Manual**						
NAVIGATION INSTRUMENTS						
Magnetic Compass	**1**	**1**	**1**	**1**	**1**	
Outside Air Temperature	**1**	**1**	**1**	**1**	**1**	
G1000 Integrated Avionics						
Garmin G1000 Cockpit Reference Guide	**1**	**1**	**1**	**1**	**1**	
Autopilot	**0**	**0**	**0**	**0**	**0**	
Yaw Damper	**0**	**0**	**0**	**0**	**0**	
Control Wheel Autopilot Disconnect/Trim Interrupt Switches	**1**	**1**	**1**	**1**	**1**	**Left side is required. Both side required for two-crew operation.**
VHF Communications System	**0**	**0**	**1**	**1**	**1**	**Or as required by operating regulation.**

System and/or Equipment	VFR Day	VFR Night	IFR Day	IFR Night	Icing Conditions	Remarks and/or Exceptions
Audio Control Panel	**1**	**1**	**1**	**1**	**1**	**Pilot's audio panel required for single pilot operation. Both sides required for two-crew operation.**
Primary Flight Display	**2**	**2**	**2**	**2**	**2**	
Multi Function Display	**1**	**1**	**1**	**1**	**1**	
Air Data Computer	**2**	**2**	**2**	**2**	**2**	
Attitude/Heading Reference System (AHRS)	**2**	**2**	**2**	**2**	**2**	
Standby Attitude Indicator	**0**	**0**	**1**	**1**	**1**	
Standby Altimeter	**1**	**1**	**1**	**1**	**1**	
Standby Airspeed Indicator	**1**	**1**	**1**	**1**	**1**	
ATC Transponder	**0**	**0**	**1**	**1**	**1**	**Or as required by operating regulation.**
VHF Navigation Receiver	**0**	**0**	**0**	**0**	**0**	**Or as required by operating regulation.**
GPS/SBAS Receiver	**1**	**1**	**2**	**2**	**2**	**Or as required by operating regulation.**
Automatic Direction Finder (ADF)	**0**	**0**	**0**	**0**	**0**	**Or as required by operating regulation.**
Distance Measuring Equipment (DME)	**0**	**0**	**0**	**0**	**0**	**Or as required by operating regulation.**
Marker Beacon Receiver	**0**	**0**	**0**	**0**	**0**	**Or as required by operating regulation.**
Terrain Awareness and Warning System (TAWS)	**0**	**0**	**0**	**0**	**0**	**Or as required by operating regulation.**
Weather Radar	**0**	**0**	**0**	**0**	**0**	**Or as required by operating regulation.**
XM Datalink Weather	**0**	**0**	**0**	**0**	**0**	
GDU Cooling Fans (3 total)	**2**	**2**	**2**	**2**	**2**	**MFD fan is required if OAT is above 33°C (91°F). All fans are required if OAT is above 47°C (116°F).**
OXYGEN						
No Changes - Refer to Aircraft Flight Manual						
PROPELLER						
No Changes - Refer to Aircraft Flight Manual						
VACUUM SYSTEM						
Gyro Suction Gage	**0**	**0**	**0**	**0**	**1**	
Instrument Air System	**0**	**0**	**0**	**0**	**1**	

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Section 3 - Emergency Procedures

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Bolded checklist steps in the EMERGENCY PROCEDURES section indicate pilot memory action items. The pilot shall perform these items without reference to the checklist in this section.

AUTOMATIC FLIGHT CONTROL SYSTEM

AUTOPILOT MALFUNCTION / ELEVATOR TRIM RUNAWAY

If the airplane deviates unexpectedly from the planned flight path:

1. **Control Wheel.....GRIP FIRMLY**

2. **AP/YD DISC / TRIM INTRPT Button.....PRESS AND HOLD**
   (Be prepared for possible high elevator control forces)

3. **Aircraft Attitude.....MAINTAIN/REGAIN AIRCRAFT CONTROL**
   use standby attitude indicator if necessary

NOTE

Do not release the AP/YD DISC / TRIM INTRPT Button until after pulling the AFCS SERVOS Circuit Breaker.

4. Elevator Trim..... RETRIM if necessary using Elevator Tab Wheel

5. AFCS SERVOS Circuit Breaker.....PULL
   (Right circuit breaker panel)

6. AP/YD DISC / TRIM INTRPT Button ..... RELEASE

WARNING

IN FLIGHT, DO NOT OVERPOWER THE AUTOPILOT. THE TRIM WILL OPERATE IN THE DIRECTION OPPOSING THE OVERPOWER FORCE, WHICH WILL RESULT IN LARGE OUT-OF-TRIM FORCES.

DO NOT ATTEMPT TO RE-ENGAGE THE AUTOPILOT OR USE MANUAL ELECTRIC PITCH TRIM UNTIL THE CAUSE OF THE MALFUNCTION HAS BEEN CORRECTED.

NOTE

The maximum altitude lost during malfunction tests was:

Climb – 0 Feet
Cruise – 50 Feet
Descent – 320 Feet
Maneuvering – 0 Feet
Approach – 54 Feet
One-engine inoperative approach – 45 Feet

MANUAL AUTOPILOT DISCONNECT

If necessary, the autopilot can be manually disconnected using any one of the following methods.

1. AP/YD DISC / TRIM INTRPT Button ..... PRESS and RELEASE
   (Pilot's or Copilot's control wheel)

2. AP Button (Autopilot mode control panel)..... PRESS
   (Yaw damper remains engaged)

3. Pitch Trim Switch (Pilot's or, if installed, Copilot's control wheel)..... ACTIVATE
   (Yaw damper remains engaged)

4. Go-Around (GA) switch..... PRESS
   (Left power lever) (Yaw damper remains engaged)

5. AFCS SERVOS Circuit Breaker..... PULL
   (Right circuit breaker panel)

AUTOPILOT ABNORMAL DISCONNECT

(Red 'AP' flashing on PFD, Continuous high-low aural tone)

1. A/P DISC/TRIM INTRPT Button .....PRESS AND RELEASE
   (to cancel disconnect tone)

2. Aircraft Attitude..... MAINTAIN/REGAIN AIRCRAFT CONTROL

NOTE

The autopilot disconnect may be accompanied by a red boxed PTCH (pitch), ROLL, or AFCS on the PFD, indicating the axis which has failed, or that the automatic flight control system has failed. The autopilot cannot be re-engaged with any of these annunciations present.

AUTOPILOT FAILURE

(Red AFCS annunciator on PFD, Red 'AP' flashing on PFD, Continuous high-low aural tone)

1. AP/YD DISC / TRIM INTRPT Button ..... PRESS
   (to cancel disconnect tone)

   If red 'AFCS' is displayed, the autopilot, yaw damper, and manual electric pitch trim will be inoperative.

PITCH AXIS FAILURE

(Red PTCH annunciator on PFD)

- Indicates a failure of the pitch axis of the autopilot. The autopilot will be inoperative.

ROLL AXIS FAILURE

(Red 

annunciator on PFD)

- Indicates a failure of the roll axis of the autopilot. The autopilot will be inoperative.

YAW AXIS FAILURE

(Red 

annunciator on PFD)

- Indicates a failure of the yaw axis of the autopilot. The pitch and roll axes of the autopilot will remain operative. DO NOT pull and reset the AFCS SERVOS circuit breaker. Resetting the AFCS SERVOS circuit breaker could cause the entire autopilot to become inoperative when no fault exists in the pitch and roll axes.

PITCH TRIM FAILURE

(Red 

annunciator on PFD)

1. CONTROL WHEEL ..... GRIP FIRMLY
2. AP/YD DISC / TRIM INTRPT Button ..... PRESS and RELEASE
   (Be prepared for possible high elevator control forces)
3. Elevator Trim ..... AS REQUIRED USING ELEVATOR TAB WHEEL

If Red 

Message Clears

- Autopilot ..... RE-ENGAGE

If Red 

Message Remains

4. Autopilot ..... DO NOT RE-ENGAGE
5. Elevator Trim ..... CONTINUE TO USE ELEVATOR TAB WHEEL

AUTOPILOT PRE-FLIGHT TEST FAIL

(Red 

annunciator on PFD)

- Indicates the AFCS system failed the automatic Pre-Flight test. The autopilot, yaw damper and electric elevator trim is inoperative. Flight Director should still function.

AUTOPILOT OVERSPEED RECOVERY

(Yellow MAXSPD 

on PFD)

1. **Throttle ..... REDUCE**

When overspeed condition is corrected:

2. Autopilot ..... RESELECT VERTICAL MODE (if necessary)

NOTE

Overspeed recovery mode provides a pitch up command to decelerate the airplane at or below the maximum autopilot operating speed (226 KIAS / 0.46 M). Overspeed recovery is not active in altitude hold (ALT), glideslope (GS), or glidepath (GP) modes.

ENGINE FAILURE (AUTOPILOT ENGAGED)

1. **AP/YD DISC / TRIM INTRPT Button ..... PRESS and RELEASE**

2. **Engine Failure Procedure in EMERGENCY PROCEDURES Section of AFM ..... COMPLETE**

3. Trim Tabs ..... MANUALLY ADJUST ELEVATOR, AILERON, AND RUDDER TABS

4. Autopilot ..... PRESS ‘AP’ BUTTON (if desired) to RE-ENGAGE

5. Rudder Tab ..... MANUALLY ADJUST AS REQUIRED AFTER POWER AND CONFIGURATION CHANGES

ELECTRICAL SYSTEM

DUAL GENERATOR FAILURE [L GEN OFF] [R GEN OFF]

1. Gen1 and Gen2 Generator Switches ..... OFF

2. Gen1 Switch ..... GEN RESET, THEN ON

3. Operating Generator ..... DO NOT EXCEED 100% LOAD

If Left Generator Will Not Reset:

4. Gen1 Switch ..... OFF

5. Gen2 Switch ..... GEN RESET, THEN ON

6. Operating Generator ..... DO NOT EXCEED 100% LOAD

If Neither Generator Will Reset:

7. Avoid IFR conditions if possible and LAND AT THE NEAREST SUITABLE AIRPORT.

8. Standby Battery Switch ..... INDICATES ARM or ON

9. Non-essential equipment:

    a. Left and Right BOOST PUMP……OFF

    b. Left and Right TRANS. PUMP OVERRIDE……..OFF

    c. ENG AUTO IGNITION……..OFF

    d. PROP ICE PROTECTION……...OFF

    e. All Exterior Lights……...OFF

    f. Cabin Lights……OFF

    g. VENT BLOWER……AUTO

    h. CABIN TEMP MODE selector……OFF

    i. INSTRUMENT EMERG LIGHTS……ON (if required)

    j. INSTRUMENT INDIRECT lights……ON (if required)

10. The following equipment will be functional while the G1000 is powered from the aircraft's battery power, Avionics Master Power Switch is ON, and the [L GEN TIE OPEN] and [R GEN TIE OPEN] annunciators are illuminated.

    Pilot's Attitude, Heading, Air Data, and Nav CDI
    Copilot's Attitude, Heading, Air Data, and Nav CDI
    Engine Gauges
    Com1, Pilot's Audio Panel
    GPS 1, GPS 2, VHF Nav1, VHF Nav2 (Nav2 Audio Inop)
    MFD, Flight Director, Transponder 1

NOTE

Inoperative G1000 equipment items will be displayed in the ALERTS window on both PFDs.

The aircraft's battery will continue to power the G1000 equipment for 30 minutes following complete loss of normal electrical power generation. Once the aircraft's battery can no longer power the G1000, the standby battery will automatically power the standby attitude indicator, altimeter vibrator, and the internal lighting of the three standby instruments for an additional 30 minutes.

11. Consider a Flaps UP Landing and Landing Gear Manual Extension to conserve battery power for an instrument approach if needed.

TAWS

TAWS WARNING

(Red PULL UP on PFD and aural “PULL UP”)

1. **AP/YD DISC / TRIM INTRPT Button ..... PRESS and RELEASE (To disconnect the autopilot)**
2. **Aircraft Attitude ..... PULL BACK ON CONTROL WHEEL**
3. **Power ..... MAXIMUM ALLOWABLE**
4. **Airspeed ..... BEST ANGLE OF CLIMB SPEED**

After Warning Ceases

5. Power ..... MAXIMUM CONTINUOUS
6. Altitude ..... CLIMB AND MAINTAIN SAFE ALTITUDE
7. Advise ATC of Altitude Deviation, if appropriate

NOTE

Only vertical maneuvers are recommended, unless either operating in visual meteorological conditions (VMC), or the pilot determines, based on all available information, that turning in addition to the escape maneuver is the safest course of action, or both.

TAWS FAIL

(Red TAWS FAIL on PFD and MFD)

Indicates the G1000 will no longer provide TAWS alerting or display relative terrain elevation. The crew must maintain compliance with procedures that ensure minimum terrain and obstacle separation.

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Section 3A - Abnormal Procedures

Table of Contents

AUTOMATIC FLIGHT CONTROL SYSTEM

AILERON MISTRIM (amber ←AIL or AIL→ annunciation on PFD)

Indicates a mistrim of the ailerons while the autopilot is engaged. The autopilot cannot trim the airplane in roll. During large changes in airspeed, engine failure, or single engine operation, illumination of this message may occur. If the autopilot is disconnected while this message is displayed, high roll forces are possible. The following procedure should be followed:

1. Control Wheel ..... GRIP FIRMLY

2. Aileron Tab Knob ..... ROTATE SLOWLY IN DIRECTION OF INDICATED MISTRIM UNTIL THE ANNUNCIATION EXTINGUISHES

IF THE ANNUNCIATOR STAYS EXTINGUISHED AND NO OTHER ANNUNCIATIONS ILLUMINATE

- Continue to operate the autopilot in a normal manner after the annunciation extinguishes.

IF THE ANNUNCIATOR REMAINS ILLUMINATED OR REAPPEARS WITH NO CHANGE IN AIRSPEED OR CONFIGURATION FROM THE PREVIOUS TRIMMED CONDITION:

3. Control Wheel ..... GRIP FIRMLY

4. Aileron Tab Knob ..... ROTATE SLOWLY IN THE DIRECTION OF INDICATED MISTRIM UNTIL ANNUNCIATION EXTINGUISHES

5. AP/YD DISC / TRIM INTRPT Button ..... PRESS and RELEASE (Pilot's or Copilot's control wheel)

6. Roll Trim ..... USING AILERON TAB KNOB, MANUALLY RETRIM AIRPLANE

Autopilot should be considered inoperative until the cause of the mistrim has been investigated and corrected. Yaw damper may be re-engaged and used normally

ELECTRIC PITCH TRIM INOPERATIVE

NOTE

This condition may be accompanied by a red AFCS or PTRM annunciation on the PFDs.

1. Move both halves of pilot and copilot pitch trim switches to check for stuck switch

2. AFCS SERVOS Circuit Breaker..... PULL and RESET (Right circuit breaker panel)

The autopilot will enter Pre-Flight Test (PFT) mode when the AFCS SERVOS circuit breaker is reset. If the autopilot successfully completes the Pre-Flight Test, re-engage the autopilot, reselect the desired autopilot modes, and continue to use normally. If the Pre-Flight Test fails, indicated by a red PFT on the PFDs, the autopilot, yaw damper, and electric pitch trim will be inoperative for the remainder of the flight.

IF STILL INOPERATIVE

- Pitch Trim ..... MANUALLY TRIM AIRPLANE IN PITCH
  (Using Elevator Tab Wheel)

NOTE

Autopilot and yaw damper may also be inoperative.

IF OPERATIVE

- Use as required

ELEVATOR MISTRIM (amber ↓ELE or ↑ELE annunciation on PFD)

Indicates a mistrim of the elevator tab while the autopilot is engaged. The autopilot will normally trim the airplane as required. However, during rapid acceleration, deceleration, or configuration changes, momentary illumination of this message may occur accompanied by minor fluctuations in flight path. If the autopilot is disconnected while this message is displayed, high elevator control forces are possible. In the event of sustained illumination, the following procedure should be followed:

1. Control Wheel ..... GRIP FIRMLY

2. Elevator Tab Wheel..... ROTATE SLOWLY IN THE DIRECTION OF INDICATED MISTRIM UNTIL ANNUNCIATION EXTINGUISHES

IF THE ANNUNCIATOR STAYS EXTINGUISHED AND NO OTHER ANNUNCIATIONS ILLUMINATE

- Continue to operate the autopilot in a normal manner after the annunciation extinguishes.

IF THE ANNUNCIATOR REMAINS ILLUMINATED OR REAPPEARS WITH NO CHANGE IN AIRSPEED OR CONFIGURATION FROM THE PREVIOUS TRIMMED CONDITION:

3. Control Wheel ..... GRIP FIRMLY

4. Elevator Tab Wheel..... ROTATE SLOWLY IN THE DIRECTION OF INDICATED MISTRIM UNTIL ANNUNCIATION EXTINGUISHES

5. AP/YD DISC / TRIM INTRPT Button ..... PRESS and RELEASE
   (Pilot's or Copilot's control wheel)

6. Pitch Trim ..... USING ELEVATOR TAB WHEEL, MANUALLY RETRIM AIRPLANE

   Autopilot should be considered inoperative until the cause of the mistrim has been investigated and corrected. Yaw damper may be re-engaged and used normally.

RUDDER MISTRIM (amber ←RUD or RUD→ annunciation on PFD)

Indicates a mistrim of the rudder while the autopilot is engaged. During large changes in airspeed, engine failure, or single engine operation, illumination of this message may occur. If the autopilot is disconnected while this message is displayed, high rudder pedal forces and yawing motion are possible. The following procedure should be followed:

1. Rudder Pedals ..... HOLD FIRMLY
2. Rudder Tab Knob ..... ROTATE SLOWLY IN THE DIRECTION OF INDICATED MISTRIM UNTIL ANNUNCIATION EXTINGUISHES

IF THE ANNUNCIATOR STAYS EXTINGUISHED AND NO OTHER ANNUNCIATIONS ILLUMINATE

- Continue to operate the autopilot in a normal manner after the annunciation extinguishes.

IF THE ANNUNCIATOR REMAINS ILLUMINATED OR REAPPEARS WITH NO CHANGE IN AIRSPEED, CONFIGURATION, OR ENGINE POWER FROM THE PREVIOUS TRIMMED CONDITION:

3. Rudder Pedals ..... HOLD FIRMLY
4. Rudder Tab Knob ..... ROTATE SLOWLY IN THE DIRECTION OF INDICATED MISTRIM UNTIL ANNUNCIATION EXTINGUISHES
5. YD Button ..... PRESS on Mode Controller
6. Rudder Tab Knob ..... MANUALLY RETRIM AIRPLANE

   Yaw Damper should be considered inoperative until the cause of the mistrim has been investigated and corrected. The Autopilot can continued to be used normally without the Yaw Damper.

FLASHING AMBER MODE ANNUNCIATION

NOTE

Abnormal mode transitions (those not initiated by the pilot or by normal sequencing of the AFCS) will be annunciated by flashing the disengaged mode in amber on the PFD. Upon loss of a selected mode, the system will revert to the default mode for the affected axis, either ROL or PIT. After 10 seconds, the new mode (PIT or ROL) will be annunciated in green.

Loss of selected vertical mode (FLC, VS, ALT, GS)

1. Autopilot mode controls.....SELECT ANOTHER VERTICAL MODE

If on an instrument approach, disconnect autopilot and continue manually or execute missed approach:

2. AP/YD DISC / TRIM INTRPT Button ..... PRESS and RELEASE

Loss of selected lateral mode (HDG, VOR, GPS, LOC, VAPP, BC):

1. Autopilot mode controls.....SELECT ANOTHER LATERAL MODE

If on an instrument approach, disconnect autopilot and continue manually or execute missed approach:

2. AP/YD DISC / TRIM INTRPT Button ..... PRESS and RELEASE

YAW DAMPER AUTOMATIC DISCONNECT (Amber Flashing 'YD')

Flashing amber 'YD' in flight indicates that yaw damper has disconnected. If the disconnect was not pilot initiated, the yaw servo has failed. Do not reset the AFCS SERVOS circuit breaker in an effort to reset the yaw servo. The autopilot pitch and roll modes will continue to function without the yaw damper engaged.

G1000 INTEGRATED AVIONICS SYSTEM

ALTITUDE MISCOMPARE ALT MISCOMP

This message is displayed when the G1000 detects a difference of 200 feet or greater between the pilot's and copilot's altitude information. Refer to the G1000 Cockpit Reference Guide for additional information.

1. Altitude Settings ..... VERIFY both pilot and copilot have the correct barometric altimeter setting.

2. Pilot's and Copilot's Altitude ..... COMPARE with Standby Altimeter

WARNING

THE STANDBY ALTIMETER USES THE SAME STATIC SOURCE AS THE COPILOT'S SIDE AIR DATA COMPUTER (ADC2). DO NOT USE STANDBY ALTIMETER AS SOLE SOURCE IN DETERMINING CORRECT ALTITUDE.

➢ **IF PILOT PFD AND STANDBY ALTIMETER AGREE (COPILOT PFD DIFFERS)**

3. SENSOR Softkey (Copilot PFD) ..... PRESS
4. ADC1 Softkey ..... PRESS
5. PFD Displays ..... CONFIRM BOTH ON ADC1 annunciator is displayed on both PFDs.

➢ **IF COPILOT PFD AND STANDBY ALTIMETER AGREE (PILOT PFD DIFFERS)**

3. Pilot's Static Air Source ..... SELECT ALTERNATE

   A sudden sustained change in rate-of-climb indication accompanied by abnormal indicated airspeed and altitude changes beyond normal calibrated differences observed on the Pilot's PFD would indicate a blockage of the pilot's static system.

   - If Pilot's PFD and Copilot's PFD agree within normal calibrated differences with Pilot's Alternate Static Air Source in the ALTERNATE position:

     Refer to Section 5, PERFORMANCE in the airplanes AFM for Airspeed Calibration and Altimeter Correction.

☐ ***If no change in rate-of-climb, airspeed, or altitude is observed:***

4. Pilot's Static Air Source ..... SELECT NORMAL
5. Compare indicated altitude to GPS altitude on MFD AUX-GPS STATUS page to aid in determining which primary system is most accurate.

NOTE

When comparing indicated altitude to GPS altitude, deviations from standard temperature or pressure can cause indicated altitude to deviate from GPS altitude. These errors are largest at high altitude. Below 10,000 feet with the correct local altimeter setting set, GPS altitude will usually be within 600 feet or better of the correct indicated altitude. Use the following guidelines to help estimate correct altitude from non-standard conditions:

- Temperatures WARMER than standard can cause GPS altitude to read HIGHER than indicated altitude.
- Pressures LOWER than standard can cause GPS altitude to read HIGHER than indicated altitude.

➢ **IF ABLE TO IDENTIFY ACCURATE ALTITUDE SOURCE**

6. Use SENSOR softkey to select most accurate ADC on both PFD's

➢ **IF UNABLE TO IDENTIFY ACCURATE ALTITUDE SOURCE**

6. Avoid IFR conditions if possible; consider diversion to visual conditions and LAND AS SOON AS PRACTICAL.
7. Maintain altitudes based on LOWEST indicated altitude.
8. ATC – Advise of inability to verify correct altitude
9. If unable to descend into visual conditions, plan an ILS, LPV, or RNAV (GPS) LNAV/VNAV approach with course intercept well outside the Final Approach Fix (FAF).
10. Once glideslope or glidepath is captured, determine most accurate altitude source when crossing FAF.
11. Reference ILS Decision Altitude or GPS based approach Minimum Descent Altitude to most accurate altimeter based on FAF crossing.

WARNING

TAWS ALERTS ARE BASED ON GPS ALTITUDE AND POSITION INFORMATION. TAWS WARNINGS AND CAUTIONS ARE INDEPENDENT OF ADC DATA. IF A TAWS WARNING OR CAUTION IS RECEIVED, CONSIDER IT ACCURATE AND TAKE IMMEDIATE AVOIDANCE ACTION.

AIRSPEED MISCOMPARE IAS MISCOMP

This message is displayed when the G1000 detects a difference of 7 KIAS or greater between the pilot's and copilot's airspeed indicators (10 KIAS difference during takeoff or landing roll). Refer to the G1000 Cockpit Reference Guide for additional information.

1. Pilot's and Copilot's Airspeed ..... COMPARE with Standby Airspeed Indicator.

WARNING

THE STANDBY AIRSPEED INDICATOR USES THE SAME PITOT-STATIC SOURCES AS THE COPILOT'S SIDE AIR DATA COMPUTER (ADC2). DO NOT USE STANDBY AIRSPEED INDICATOR OR STANDBY ALTIMETER AS SOLE SOURCE IN DETERMINING CORRECT AIR DATA INFORMATION.

➢ **IF PILOT PFD AND STANDBY AIRSPEED INDICATOR AGREE (COPILOT PFD DIFFERS)**

2. SENSOR Softkey (Copilot's PFD) ..... PRESS
3. ADC1 Softkey ..... PRESS
4. PFD Displays ..... CONFIRM BOTH ON ADC1 annunciator is displayed on both PFDs.

➢ **IF COPILOT PFD AND STANDBY AIRSPEED INDICATOR AGREE (PILOT PFD DIFFERS)**

2. Pilot and Copilot ALTITUDE ..... NOTE

☐ **IF PILOT'S AND COPILOT'S ALTITUDE AGREE**

3. Airspeed 120 KIAS MINIMUM on slowest indicator
4. Monitor all three airspeed indicators during changes in power or altitude to determine which indicators are inaccurate. Indications of inaccurate airspeed include:
   - No change in indicated airspeed when power change and altitude maintained.
   - Indicated airspeed increases when climbing or decreases when descending.
5. Use SENSOR softkey to select most accurate ADC on the affected PFDs
6. Airspeed ..... RESUME NORMAL SPEEDS

☐ **IF PILOT'S AND COPILOT'S ALTITUDE DO NOT AGREE**

3. Refer to Abnormal Procedures, ALT MISCOMP procedure to determine most accurate ADC.

PITCH MISCOMPARE PIT MISCOMP

This message is displayed when the G1000 detects a difference between the pilot's and copilot's pitch attitude (displayed in the upper right of the PFD). Refer to GARMIN G1000 Cockpit

Reference Guide for additional information.

1. Refer to STANDBY ATTITUDE indicator to determine which AHRS is providing the most accurate data.

2. Use SENSOR softkey to select the most accurate AHRS on the affected PFD.

ROLL MISCOMPARE ROLL MISCOMP

This message is displayed when the G1000 detects a difference between the pilot's and copilot's roll attitude (displayed in the upper right of the PFD). Refer to GARMIN G1000 Cockpit Reference Guide for additional information.

1. Refer to STANDBY ATTITUDE indicator to determine which AHRS is providing the most accurate data.

2. Use SENSOR softkey to select the most accurate AHRS on the affected PFD.

HEADING MISCOMPARE HDG MISCOMP

This message is displayed when the G1000 detects a difference between the pilot's and copilot's heading information (displayed in the upper right of the PFD). Refer to GARMIN G1000 Cockpit Reference Guide for additional information.

1. WSHLD ANTI-ICE Switches (PILOT and COPILOT) ..... OFF
2. CABIN TEMP MODE selector ..... OFF
3. ELEC HEAT ..... OFF
4. Refer to Magnetic Compass to determine which AHRS is providing the most accurate heading information.
5. Use SENSOR softkey to select the most accurate AHRS on the affected PFD.
6. WSHLD ANTI-ICE Switches ..... AS REQUIRED
7. CABIN TEMP MODE ..... AS DESIRED
8. ELEC HEAT ..... AS REQUIRED

NOTE

The magnetic compass is affected by windshield anti-ice, air conditioner, and electric heat. These items must be turned OFF prior to referencing magnetic compass heading, and then may be reselected ON. With windshield anti-ice OFF, windshield may form fog or frost on the inside surface. The windshield anti-ice should be turned off only long enough to reference magnetic compass or the pilot should descend to a warmer altitude if terrain, fuel, and endurance permit.

Display Unit Failure

PFD FAILURE

PFD failure is indicated by a complete loss of image on a display. The pilot should use the cross

side PFD and the standby flight instruments for information to fly the airplane. If only individual elements of the display are failed, refer to appropriate procedures for the individual failures.

To display a composite display of primary flight information and the engine instruments on the MFD:

1. DISPLAY BACKUP Button (on audio panel of affected side) ..... PRESS

   The DISPLAY BACKUP button can be pressed again to return the MFD to its normal presentation. With the MFD in its normal display presentation, the pilot has access to functions and pages unique to the MFD that are not accessible when the MFD is in the composite display.

NOTE

The CDI SYNC and BARO SYNC settings must be ON to allow the operating PFD's controls to affect settings on the MFD when the MFD is in the Display Backup mode. These settings are accessible on the MFD when in the normal display presentation on the AUX – SYSTEM SETUP page.

2. Autopilot Mode Panel ..... TRANSFER (XFR button) to operating PFD
3. Autopilot ..... RE-ENGAGE and select modes
4. Transponder ..... SELECT to operating transponder
5. Audio Panels ..... SELECT operating COM Radio

NOTE

Use the operating PFD to control Com frequency selection, Com and Nav volume, and Altimeter Barometric Pressure setting.

MFD FAILURE

MFD failure is indicated by a complete loss of image on the center display.

1. Pilot's Audio Panel DISPLAY BACKUP Button ..... PRESS
2. Copilot's Audio Panel DISPLAY BACKUP Button ..... PRESS

NOTE

Engine data will be displayed on both PFDs

3. Electronic Chart Data will not be available following an MFD failure. Use the following procedure if a secondary source of aeronautical information is not available in the airplane.

   a. Load approaches, arrivals, and departures into the Active Flight Plan using the PROC button on either PFD. The procedure's course can be displayed on either PFD's Inset Map window. Navigate using the course pointer and CDI on the PFDs.

   b. For instrument approach procedures, obtain altitude information from ATC using either COM radio.

DUAL GPS/SBAS FAILURE (AMBER “DR” OR “LOI” ON HSI)

LOSS OF GPS/SBAS NAVIGATION DATA

When both GPS/SBAS receivers are inoperative or GPS navigation information is not available or invalid, the G1000 system will enter one of two modes: Dead Reckoning mode (DR) or Loss Of Integrity mode (LOI). The mode is indicated on the HSI by an amber “DR” or “LOI”. Which mode is active depends on the distance from the destination airport in the active flight plan.

If the LOI annunciation is displayed, revert to an alternate means of navigation appropriate to the route and phase of flight or periodically cross-check the GPS guidance to other, approved means of navigation.

In Dead Reckoning mode, the MAP – NAVIGATION MAP will continue to be displayed with a ghosted aircraft icon in the center and an amber ‘DR’ overwriting the icon. Aircraft position will be based upon the last valid GPS position, then estimated by Dead Reckoning methods. Changes in true airspeed, altitude, or winds aloft can affect the estimated position substantially. Dead Reckoning is only available in Enroute mode; Terminal and Approach modes do not support DR.

➢ **IF ALTERNATE NAVIGATION SOURCES (ILS, LOC, VOR, DME, ADF) ARE AVAILABLE**

1. Navigation ..... USE ALTERNATE SOURCES

➢ **IF NO ALTERNATE NAVIGATION SOURCES ARE AVAILABLE**

□ **DEAD RECKONING (DR) MODE - ACTIVE WHEN THE AIRPLANE IS GREATER THAN 30 NM FROM THE DESTINATION AIRPORT.**

1. Navigation - Use the airplane symbol and magenta course line on the map display.

NOTE

- ALL INFORMATION NORMALLY DERIVED FROM GPS TURNS AMBER. ALL OF THIS INFORMATION WILL BECOME LESS ACCURATE OVER TIME.
- TAWS IS INOPERATIVE
- DR mode uses heading, true airspeed, last known wind data, and the last known GPS position to estimate the airplane’s current position.
- MAP – TRAFFIC MAP display is not dependent on GPS information. The position of displayed traffic relative to the airplane symbol on the map is still accurate.

□ **LOSS OF INTEGRITY (LOI) MODE - ACTIVE WHEN THE AIRPLANE IS WITHIN 30NM OF THE DESTINATION OR DEPARTURE AIRPORT (AS CALCULATED FROM THE PREVIOUS GPS OR DR POSITION).**

1. Navigation - Fly towards known visual conditions. Use ATC or other information sources as possible.

NOTE

- All information derived from GPS or DR will be removed from the displays
- TAWS IS INOPERATIVE.

- The airplane symbol is removed from all maps. The map will remain centered at the last known position. “NO GPS POSITION” will be annunciated in the center of the map.

GPS APPROACH ALARM LIMITS EXCEEDED

During a GPS LPV, LNAV/VNAV, or LNAV+V approach, if the Horizontal or Vertical alarm limits are exceeded, the G1000 System will downgrade the approach. This will be annunciated in the ALERTS window and by an annunciation change on the HSI from LPV, L/VNAV, or LNAV+V to LNAV. GPS glide path vertical guidance will be removed from the PFD. The approach may be continued using the LNAV only minimums.

During any GPS approach in which both precision and non-precision alarm limits are exceeded, the G1000 System will flag the lateral guidance and display a system message “ABORT APPROACH loss of navigation”. Immediately upon viewing the message, the unit will revert to Terminal navigation mode alarm limits. If the position integrity is within these limits lateral guidance will be restored and the GPS may be used to execute the missed approach, otherwise alternate means of navigation must be utilized.

LOSS OF RADIO TUNING FUNCTIONS

1. COM Frequency Toggle Button .....PRESS AND HOLD FOR 2 SECONDS.

NOTE

This procedure will tune the active COM field to the emergency frequency 121.5. Certain failures of the tuning system will automatically tune 121.5 without pilot action.

FAILED AIRSPEED, ALTITUDE, AND/OR VERTICAL SPEED

(RED "X" ON PFD AIRSPEED, ALTITUDE, AND/OR VERTICAL SPEED INDICATORS)

This indicates a loss of valid air data computer information to the respective system.

- **IF BOTH SIDES**

1. Airspeed and Attitude ..... MONITOR using standby indicators
2. Land as soon as practical

- **IF ONE SIDE ONLY**

1. Affected PFD SENSOR Softkey ..... PRESS
2. ADC Softkey ..... PRESS the ADC softkey to select the opposite ADC
3. Both PFDs ..... CONFIRM “BOTH ON ADC1” OR “BOTH ON ADC 2” annunciated on both PFDs.

FAILED ATTITUDE AND/OR HEADING

(ATTITUDE FAIL AND/OR RED "X" OVER HEADING DISPLAY ON PFD)

This indicates a loss of pitch, roll, and/or heading information from AHRS. Refer to GARMIN G1000 Cockpit Reference Guide for additional information. Interference from GPS repeaters operating inside nearby hangars or magnetic anomalies caused by nearby structures can cause an intermittent loss of attitude and heading displays while the aircraft is on the ground. This is usually accompanied by a BOTH ON GPS 1, BOTH ON GPS 2, or LOI annunciation. Moving the aircraft more than 100 yards away from the source of the interference should alleviate the condition.

Taxiing the aircraft before a valid GPS position has been acquired can cause attitude and/or heading display to indicate a failed condition. As soon as the aircraft acquires a valid GPS position, attitude and heading should return to normal.

WARNING

DO NOT TAKE OFF WITHOUT VALID, NORMAL ATTITUDE AND HEADING DISPLAYS

IN-FLIGHT, IF BOTH SIDES

1. Attitude ..... MONITOR using standby attitude gyro.
2. WSHLD ANTI-ICE Switches (Pilot and Copilot) ..... OFF

NOTE

The magnetic compass is erratic when either windshield anti-ice, air conditioner, or electric heat is on. With windshield anti-ice OFF, windshield may form fog or frost on the inside surface. The windshield anti-ice should be turned off only long enough to reference magnetic compass or the pilot should descent to a warmer altitude if terrain, fuel, and endurance permit.

3. ELEC HEAT ..... OFF
4. CABIN TEMP MODE switch ..... OFF
5. Heading ..... MONITOR using magnetic compass
6. Land as soon as practical

NOTE

- The autopilot will disconnect and will not re-engage.
- Reference the GPS track on MFD/PFD map to improve situational awareness. GPS will continue to display correct GPS based map, position, and track.
- Magnetic compass is influenced by windshield anti-ice, air conditioner, and electric heat. These items must be turned OFF prior to referencing magnetic compass heading. Leave these items OFF when maneuvering the aircraft by reference to the magnetic compass.

IN-FLIGHT, IF ONE SIDE ONLY

1. Standby Attitude Gyro ..... MONITOR
2. Affected PFD SENSOR softkey ..... PRESS
3. AHRS softkey ..... PRESS Opposite Side AHRS softkey
4. Both PFDs ..... CONFIRM VALID ATTITUDE AND HEADING ARE DISPLAYED
   CONFIRM “BOTH ON AHRS1” or
   “BOTH ON AHRS2” annunciated on both PFDs

NOTE

The autopilot will disconnect and will not re-engage.

ENGINE INDICATION SYSTEM (EIS) FAILURE

(RED 'X' ON ENGINE DISPLAY)

- **IF ALL ENGINE GAUGES ON ONE ENGINE RED 'X':**

  Indicates failure of the GEA for that engine

1. Check ENG INST circuit breaker ..... RESET once if tripped

If unable to restore engine gauges:

2. Move both throttles together using the engine with operating engine gauges to set power.

- **IF ONE OR MORE ENGINE PARAMETER INDICATIONS ARE FLAGGED ON ONLY ONE ENGINE**

1. Adjust power using the remaining indications and comparing to the opposite engine.

LOSS OF NAVIGATION DATA

(LATERAL DEVIATION BAR NOT PRESENT AND/OR GLIDESLOPE INDEX CLEARS)

This indicates a loss of data from the selected NAV source. Refer to GARMIN G1000 Cockpit Reference Guide for additional information.

1. CDI Softkey .....PRESS TO SELECT ALTERNATE NAVIGATION SOURCE
2. CONFIRM a valid navigation source is displayed giving valid navigation guidance.

INACCURATE FLIGHT DIRECTOR DISPLAY

Indicated by one or both flight directors commanding attitude contrary to intended flight path

1. AP/YD DISC / TRIM INTRPT Button ..... PRESS
   (Pilot's or Copilot's control wheel)
2. Attitude ..... CROSSCHECK BOTH PFDs with the Standby Attitude Indicator
3. Flight Director Modes ..... RESELECT AS DESIRED

NOTE

If continued use of the flight director is desired, it is recommended that only basic modes (i.e., ROL and PIT) be selected initially. If this proves satisfactory, HDG and ALT may then be selected. Ensure navigation systems are set up correctly prior to attempting to engage NAV mode.

4. Autopilot ..... ENGAGE AS DESIRED if flight director commands are appropriate

If unable to restore Flight Director:

5. FD Button ..... PRESS to remove Flight Director from PFDs

BOTH ON ADC1, BOTH ON ADC2  

This message is displayed on both PFDs and indicates that both pilot and copilot PFDs are displaying data from the same Air Data Computer. Normally the pilot's side displays ADC 1 information and the copilot's side displays ADC 2 information. Refer to GARMIN G1000 Cockpit Reference Guide for additional information.

1. PFD (displaying data from opposite ADC) SENSOR softkey ..... PRESS
2. ADC1 or ADC 2 softkey ..... SELECT on-side ADC (ADC1 for Pilot PFD, ADC2 for copilot PFD).
3. PFD Displays ..... CONFIRM "BOTH ON ADC 1" or "BOTH ON ADC 2" message clears on both PFDs.

BOTH ON AHRS 1, BOTH ON AHRS 2  

This message is displayed on both PFDs and indicates that both pilot and copilot PFDs are displaying data from the same Attitude Heading Reference System. Normally the pilot's side displays AHRS 1 information and the copilot's side displays AHRS 2 information. Refer to GARMIN G1000 Cockpit Reference Guide for additional information.

1. PFD (displaying data from opposite AHRS) SENSOR softkey ..... PRESS
2. AHRS1 or AHRS2 softkey ..... Select on-side AHRS (AHRS1 for Pilot PFD, AHRS2 for copilot PFD).
3. PFD Displays ..... CONFIRM "BOTH ON AHRS 1" or "BOTH ON AHRS 2" message clears on both PFDs

BOTH ON GPS 1, BOTH ON GPS 2  

This message is displayed on both PFDs and indicates that both pilot and copilot PFDs are displaying data from the same GPS/SBAS receiver. Normally the pilot's side displays GPS 1 and the copilot's side displays GPS 2 and is not pilot selectable. This may be caused by operation outside of WAAS satellite coverage in which case the non-selected GPS is still available in the event the active GPS fails. Refer to GARMIN G1000 Cockpit Reference Guide for additional information.

2. GPS/SBAS Status ..... CHECK
   a. Select AUX ..... GPS STATUS page on MFD
   b. Select GPS1 then GPS2 softkeys and verify sufficient satellite reception.

XSIDE ADC 

This message is displayed on both PFDs and indicates that both PFDs are displaying data from the opposite side Air Data Computer. Normally the pilot's side displays ADC 1 and the copilot's side displays ADC 2. Refer to GARMIN G1000 Cockpit Reference Guide for additional information.

1. PILOT'S PFD SENSOR Softkey ..... PRESS
2. PILOT'S PFD ADC1 Softkey ..... PRESS
3. PFD Displays ..... CONFIRM "BOTH ON ADC1" message displayed on both PFDs
4. COPILOT'S PFD SENSOR Softkey ..... PRESS
5. COPILOT'S PFD ADC2 Softkey ..... PRESS
6. PFD Displays ..... CONFIRM "BOTH ON ADC 1" message clears on both PFDs

XSIDE AHRS 

This message is displayed on both PFDs and indicates that both PFDs are displaying data from the opposite side Attitude Heading Reference System. Normally the pilot's side displays AHRS 1 and the copilot's side displays AHRS 2. Refer to GARMIN G1000 Cockpit Reference Guide for additional information.

1. PILOT'S PFD SENSOR Softkey ..... PRESS
2. PILOT'S PFD AHRS1 Softkey ..... PRESS
3. PFD Displays ..... CONFIRM "BOTH ON AHRS1" message displayed on both PFDs
4. COPILOT'S PFD SENSOR Softkey ..... PRESS
5. COPILOT'S PFD AHRS2 Softkey ..... PRESS
6. PFD Displays ..... CONFIRM "BOTH ON AHRS 1" message clears on both PFDs

TAWS ABNORMAL PROCEDURES

TAWS CAUTION TERRAIN

When a TAWS CAUTION occurs, take positive corrective action until the alert ceases. Stop descending or initiate either a climb or a turn, or both, as necessary, based on analysis of all available instruments and information.

TAWS INHIBIT TAWS INHB

The TAWS Forward Looking Terrain Avoidance (FLTA) and Premature Descent Alerts (PDA) functions may be inhibited to stop alerting for acceptable flight conditions. Refer to GARMIN G1000 Cockpit Reference Guide for additional information.

TO INHIBIT TAWS:

1. Display the MAP – TAWS page
2. INHIBIT Softkey ..... PRESS

TO ENABLE TAWS IF INHIBITED:

1. Display the MAP – TAWS page
2. ENABLE Softkey ..... PRESS

TAWS N/A TAWS N/A

1. If the white “TAWS N/A” status annunciator is displayed on the PFD, the system will no longer provide TAWS alerting or display relative terrain elevations. The crew must maintain compliance with procedures that ensure minimum terrain separation.
2. If the red “TAWS FAIL” status annunciator is displayed on the PFD, the system will no longer provide TAWS alerting or display relative terrain elevations. The crew must maintain compliance with procedures that ensure minimum terrain separation.

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Section 4 - Normal Procedures

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COM RADIO COMMUNICATIONS BEFORE STARTING ENGINES

To obtain an ATC clearance before starting the engines:

1. BAT Switch (Master Switch) ..... ON
2. Avionics Master Pwr Switch ..... ON

Use Pilot's Audio Panel and Com 1 to Obtain ATC Clearance, then:

3. Avionics Master Pwr Switch ..... OFF
4. BAT Switch (Master Switch) ..... OFF

BEFORE STARTING

1. Standby Battery Switch ..... PUSH
   [ON] illuminated if Aircraft Battery is OFF,
   [ARM] illuminated if Aircraft Battery is ON
2. Standby Attitude Gyro Fail Flag ..... NOT DISPLAYED
   (listen for standby altimeter vibrator operation)
3. Database ..... REVIEW FOR VALID OPERATING DATES AND CYCLE NUMBER
4. ENT key on the MFD Control Panel ..... PRESS to acknowledge the G1000 database information and activate the selected pilot profile.
5. AUX –Weight Planning ..... INPUT LOAD DATA

BEFORE TAXI

NOTE

Autopilot preflight test will not begin until both AHRS have aligned. Autopilot Pre-Flight test begins when the white PFT message is displayed on each PFD. Autopilot Pre-Flight test has successfully completed when the white PFT message extinguishes and the autopilot disconnect tone sounds.

CAUTION

A red PFT or AFCS annunciator indicates a malfunction within the autopilot system. The autopilot, yaw damper, and electric elevator trim will be inoperative.

1. Automatic Autopilot Preflight Test ..... COMPLETE
   a. Red AFCS Annunciator ..... ILLUMINATED WHILE AHRS ALIGNS
   b. Red AFCS Annunciator ..... EXTINGUISHES When Autopilot Preflight Test Begins
   c. White PFT Annunciator ..... ILLUMINATED (~ 5 Seconds)
   d. White PFT Annunciator ..... EXTINGUISHES when preflight test complete
   e. Autopilot Disconnect Tone ..... SOUNDS

2. Standby Attitude Indicator ..... CHECK
   a. PULL TO CAGE Knob ..... PULL KNOB TO ERECT GYRO
   b. Instrument Fail Flag ..... NOT DISPLAYED IN INSTRUMENT FACE
   c. PFD1, PFD2, and Standby Attitude Indicator ..... COMPARE and CROSS CHECK
3. Altimeters ..... SET and CROSS CHECK
   PFD 1, PFD 2, Standby Altimeter

   If barometric pressure settings on the PFD's altimeters differ by more than 0.03 in-Hg (1 HPa), the baro display on both PFDs will be amber.

TAXI

NOTE

Taxiing the aircraft before a valid GPS position has been acquired can cause attitude and/or heading display to indicate a failed condition. Interference from GPS repeaters or magnetic anomalies can cause an intermittent loss of attitude and heading displays while the aircraft in on the ground.

1. Flight Instruments..... CHECK
   a. Compare attitude displayed by PFD1, PFD2, and Standby Attitude Indicator
   b. Compare altitude displayed by PFD1, PFD2, and Standby Altimeter
   c. Verify the correct barometric pressure is set in the PFD1, PFD2, and Standby Altimeters
   d. Compare heading displayed by PFD1, PFD2, and Magnetic Compass

NOTE

The standby compass is erratic when windshield anti-ice, air conditioner, or electric heat is ON. Windshield anti-ice, air conditioner, and electric heat must be OFF for heading verification check.

   e. Verify turn rate and slip indicator display appropriately.

BEFORE TAKEOFF (RUN-UP)

1. Autopilot ..... CHECK, THEN OFF
   a. PUSH the AP Button on the Mode Control Panel.....VERIFY Autopilot Engages
   b. Verify ROL / AP YD / PIT annunciated in green on the PFDs
   c. Control Wheel PULL FULL AFT ..... Verify Elevator Tab Wheel moves in the DN direction
   d. Control Wheel, PUSH FULL FORWARD.....VERIFY Elevator Tab Wheel moves in the UP direction
   e. Pilot's Control Wheel, AP/YD DISC / TRIM INTRPT Button, PRESS ..... VERIFY Autopilot Disconnects
      - Autopilot Disconnect Tone Sounds
      - Amber AP and YD flashes for 5 seconds and then extinguishes
      - Servos disengaged
   f. PUSH the AP Button on the Mode Control Panel.....VERIFY Autopilot Engages
   g. Copilot's Control Wheel, AP/YD DISC / TRIM INTRPT Button, PRESS ..... VERIFY Autopilot Disconnects
   h. Manually Operate Elevator Tab Wheel.....VERIFY Pitch Trim Servo is Not Engaged

2. Electric Elevator Trim Control ..... CHECK
   a. Pilot's Control Wheel
      - Left and Right Segments ..... ACTUATE INDIVIDUALLY (Verify there is no elevator tab wheel movement)
      - Left and Right Segments ..... ACTUATE TOGETHER (Verify proper elevator tab wheel movement)
      - With Elevator Tab Wheel in Motion, AP/YD DISC / TRIM INTRPT Button ..... PRESS AND HOLD (verify elevator tab wheel motion stops)
      - Manually Operate Elevator Tab Wheel..... VERIFY Pitch Trim Servo is Not Engaged
   b. Copilot's Control Wheel (If Installed)
      - Left and Right Segments ..... ACTUATE INDIVIDUALLY (Verify there is no elevator tab wheel movement)
      - Left and Right Segments ..... ACTUATE TOGETHER (Verify proper elevator tab wheel movement)
      - With Elevator Tab Wheel in Motion, AP/YD DISC / TRIM INTRPT Button ..... PRESS AND HOLD (verify elevator tab wheel motion stops)

- Pilot's Trim Override..... CHECK

  Activate the copilot's Pitch Trim Switches nose down. Verify elevator tab wheel is moving nose down. While the tab wheel is moving in the DN direction, activate the pilot's Pitch Trim Switches nose up. Verify the elevator tab wheel begins to move in the UP direction. Release both pilot's and copilot's Pitch Trim switches and reset elevator tab as required.

- Manually Operate Elevator Tab Wheel..... VERIFY Pitch Trim Servo is Not Engaged

3. Press GA Button on Left Throttle..... VERIFY FD Command Bars show Takeoff Attitude 'TO / / TO' is Annunciated in Mode Window on Both PFDs

BEFORE TAKEOFF (FINAL ITEMS)

1. PFD Attitude and Heading .....NORMAL
2. GPS Position..... VALID, 'LOI' NOT ANNUNCIATED on HSI
3. Standby Attitude Indicator..... ERECT and NORMAL, Fail Flag not in view

ON TAKEOFF ROLL

1. Verify correspondence of PFD airspeed display and standby airspeed

CLIMB, CRUISE, AND DESCENT

Disengage autopilot and yaw damper and retrim the airplane in roll and yaw following a power change, change in airspeed, or if a slight wing rocking is observed. Re-engage the autopilot and yaw damper after trimming the airplane.

SHUTDOWN AND SECURING

1. Standby Battery Switch.....PRESS OFF
   a. Standby Battery Switch..... [ARMED] and [ON] EXTINGUISHED
   b. Standby attitude fail flag displayed after BAT – MASTER SWITCH is OFF
   c. Standby altimeter vibrator should not be heard (BAT – MASTER SWITCH OFF)

AUTOPILOT OPERATION

Autopilot/Flight Director mode annunciations on the PFDs displayed in green indicate active autopilot/flight director modes. Annunciations displayed in white indicate armed autopilot/flight director modes. Normal mode transitions will flash inverse video green/black for 10 seconds before becoming steady green. Abnormal mode transitions will flash amber for 10 seconds before the default mode is annunciated as the active mode.

Default autopilot/flight director modes are Pitch (PIT) and Roll (ROL) modes.

The XFR button on the mode control panel selects the Nav, attitude, and air data the autopilot / flight director uses. Pressing the XFR button transfers these selections to the opposite side and causes the autopilot / flight director to drop selected lateral and vertical modes and engage the default PIT and ROL modes. The pilot must re-select the desired modes.

Vertical Modes

Vertical Speed (VS) MODE:

1. Altitude Preselect..... SET to Desired Altitude
2. Press VS Button .....GREEN 'VS', White 'ALTS' annunciated on PFD
3. Vertical Speed Reference.....ADJUST using UP / DN Wheel
4. Green 'ALT; .....VERIFY UPON ALTITUDE CAPTURE

Flight Level Change (FLC) MODE:

1. Altitude Preselect..... SET to Desired Altitude
2. Press FLC Button .....GREEN 'FLC', White 'ALTS' annunciated on PFD
3. AIRSPEED Reference.....ADJUST using UP / DN Wheel
4. Green 'ALT; .....VERIFY UPON ALTITUDE CAPTURE

NOTE

If the altitude preselect is not changed before selecting FLC, the autopilot may re-capture the current altitude immediately after entering FLC mode. Always ensure that the altitude preselect is adjusted prior to selecting FLC.

Pressing the SPD button while in FLC Mode toggles the airspeed reference between KIAS and Mach. FLC will automatically transition from Mach to KIAS reference during a descent when the current Mach reference equals 220 KIAS. FLC will not automatically transition from KIAS to a Mach reference during a climb.

Altitude Hold (ALT) Mode, Manual Capture:

1. At the desired altitude.....PRESS ALT Button on Mode Controller
2. Green 'ALT'.....VERIFY on PFD

   If climbing or descending, the aircraft will overshoot the reference altitude and then return to it. The amount of overshoot will depend on the vertical speed when the ALT button is pressed.

VERTICAL NAVIGATION (VNAV)

VNAV Descent

Vertical navigation will only function when the navigation source is GPS navigation. VNAV will not function if the navigation source is VOR, Localizer, or ADF. The airplane's heading must be within 75^{O} of the desired GPS course and within 10 NM cross track error in order of VNAV to function.

VNAV functions only for enroute and terminal descents. Vertical navigation is not available during climbs or descents between the final approach fix (FAF) and the missed approach point (MAP). Refer to the G1000 Cockpit Reference Guide for additional information.

1. Once clearance from ATC has been received .....RESET Altitude Preselect to the vertical clearance limit.
2. VNV Button.....PRESS within 5 minutes of the top of descent (TOD)

NOTE

If the VNV button is pressed more than 5 minutes before the TOD or the altitude preselect is not reset to a lower altitude, VPTH will begin to flash inverse video, white/black, when the aural alert 'Vertical Track' annunciation sounds. Pressing the VNV button and/or resetting the altitude preselect to a lower altitude cancels the flashing and the AFCS will capture and track the vertical profile. If VNV button is not pressed, or the altitude preselect is not reset to a lower altitude, VPTH stops flashing at the TOD and the airplane will remain in ALT mode and not descend.

ALTV will be the armed vertical mode during the descent if the altitude preselect is set to a lower altitude than the VNAV reference altitude. This indicates the autopilot / flight director will capture the VNAV altitude reference. ALTS will be the armed mode during the descent if the altitude preselect is set at or above the VNAV reference altitude indicating that the autopilot / flight director will capture the altitude preselect altitude reference.

Vertical DIRECT TO

To descend from the present position to a waypoint:

1. Altitude Preselect..... RESET
2. VNV Button.....PRESS
3. VNV ⊣D⊢ Softkey (MFD Flight Plan Page).....PRESS
4. Waypoint..... SELECT desired waypoint and ACTIVATE

Lateral Modes

Heading Mode (HDG)

1. HDG Knob ..... PUSH to synch heading bug to current heading
2. HDG BUTTON..... PUSH , HDG mode annunciated
3. HDG Knob .....Rotate to set heading bug to desired heading

Navigation (VOR)

1. Navigation Source. ..... SELECT VOR1 or VOR2 using CDI softkey on PFD
2. Course Pointer.....SET using CRS knob
3. Intercept Heading .....ESTABLISH in HDG or ROL mode
4. Mode Controller ..... PRESS NAV on mode controller
5. VOR will be annunciated in WHITE if the mode is armed or in GREEN if the VOR is the active lateral mode.

NOTE

If the Course Deviation Indicator (CDI) is greater than one dot from center, the autopilot will arm the NAV mode and indicate VOR in white on the PFD. The pilot must ensure that the current heading will result in a capture of the selected course. If the CDI is one dot or less from center, the autopilot will enter the capture mode when the NAV button is pressed and annunciate VOR in green on the PFD.

Navigation (GPS DIRECT TO)

1. Navigation Source ..... SELECT GPS Using the CDI Softkey on PFD
2. Select Waypoint.....PRESS the ⊣D⊢ button on the PFDs or MFD
   From the DIRECT TO page, activate DIRECT TO a waypoint.
3. Mode Controller .....SELECT NAV on mode controller
   GPS will be annunciated in GREEN on the PFDs

Navigation (GPS OBS Mode)

1. Navigation Source .....SELECT GPS using the CDI softkey on PFD
2. Select Waypoint.....PRESS the ⊣D⊢ button on the PFDs or MFD
   From the DIRECT TO page, activate DIRECT TO a waypoint.
3. OBS Softkey .....ON PFD, PRESS OBS softkey
4. Course Pointer.....SET using CRS knob
5. Intercept Heading .....ESTABLISH in HDG or ROL mode
6. Mode Controller .....SELECT NAV on mode controller
7. GPS will be annunciated in WHITE if the mode is armed or in GREEN if the GPS is the active lateral mode.

NOTE

If the Course Deviation Indicator (CDI) is greater than one dot from center, the autopilot will arm the NAV mode and indicate GPS in white on the PFD. The pilot must ensure that the current heading will result in a capture of the selected course. If the CDI is one dot or less from center, the autopilot will enter the capture mode when the NAV button is pressed and annunciate GPS in green on the PFD.

APPROACHES

The G1000 is capable of performing many tasks for the pilot to reduce pilot workload during the approach and landing phases of flight. The G1000 system references the Flight Plan to predict the pilot's intended actions. Time permitting, the pilot should keep the Flight Plan updated with the destination airport and the instrument approach to be flown. This will keep the G1000 from performing tasks associated with the approach procedures entered in the flight plan if the approach plan changes.

ILS

1. Load the approach into the Active Flight Plan ..... VERIFY the G1000 tunes the proper ILS frequency
2. Approach Minimums ..... SET on TMR/REF page

IF Flying Vectors-To-Final

3. Airplane on Vectors-To-Final
   a. Mode Control Panel ..... PRESS HDG to fly ATC radar vectors
   b. PROC button on PFDs or MFD..... SELECT 'ACTIVATE VECTORS-TO-FINAL'

NOTE

SUSP may annunciate on the HSI when Vectors-To-Final is selected. The flight plan will automatically unsuspend when the airplane intercepts and turns inbound on the final approach course. When automatic flight plan waypoint sequencing resumes, SUSP will extinguish.

   c. HSI CDI ..... VERIFY CDI automatically changes to LOC Course pointer slews to the front course
   d. Mode Control Panel ..... PRESS APR, Verify LOC and GS armed

IF Flying Full Approach Including Transition

3. Airplane cleared to an initial approach fix
   a. ACTIVATE THE APPROACH from the PROC page,

      Or

      ACTIVATE a DIRECT TO (~~D~~>) the IAF
   b. HSI CDI ..... SELECT GPS Nav Source
   c. Mode Control Panel ..... PRESS NAV (GPS Mode)
   d. Mode Control Panel ..... PRESS APR, Verify LOC and GS armed

NOTE

Ensure groundspeed is less than 200 KTS within 1 minute of the IAF

Airplane will navigate in GPS mode throughout the intermediate portion of the approach procedure. When the airplane is inbound towards the final approach course, the CDI will automatically switch from GPS navigation to LOC navigation.

   e. VERIFY ..... Course pointer slews to the front course

4. Established inbound on Final Approach Course ..... SET Missed Approach Altitude In Altitude Preselect
5. Airspeed..... MAINTAIN 110 KIAS OR GREATER (Recommended)
6. VERIFY ..... Airplane Captures and Tracks LOC, captures and tracks GS

7. AT Decision Altitude (DA),

   a. A/P Y/D DISC TRIM INTRPT Switch ..... PRESS
   Continue visually for a normal landing

   Or

   b. GO AROUND button
   (on left throttle) ..... PRESS, Execute Missed Approach Procedure

ILS Glide Slope INOPERATIVE

1. Load the approach into the Active Flight Plan ..... VERIFY the G1000 tunes the proper ILS frequency
2. Approach Minimums ..... SET on TMR/REF page

IF Flying Vectors-To-Final

3. Airplane on Vectors-To-Final

   a. Mode Control Panel ..... PRESS HDG to fly ATC radar vectors
   b. PROC button on PFDs or MFD ..... SELECT 'ACTIVATE VECTORS-TO-FINAL'

NOTE

SUSP may annunciate on the HSI when Vectors-To-Final is selected. The flight plan will automatically unsuspend when the airplane intercepts and turns inbound on the final approach course. When automatic flight plan waypoint sequencing resumes, SUSP will extinguish.

   c. HSI CDI ..... VERIFY CDI automatically changes to LOC
   Course pointer slews to the front course
   d. Mode Control Panel ..... PRESS NAV, verify LOC armed

Pressing the NAV button will arm the autopilot / flight director to capture Localizer and prevent Glideslope from arming or capturing if the glideslope is inoperative or out of service

IF Flying Full Approach Including Transition

3. Airplane cleared to an initial approach fix

   a. ACTIVATE THE APPROACH from the PROC page,

   Or

   ACTIVATE a DIRECT TO (~~D~~>) the IAF

   b. HSI CDI ..... SELECT GPS Nav Source
   c. Mode Control Panel ..... PRESS NAV (GPS Mode)

NOTE

Ensure groundspeed is less than 200 KTS within 1 minute of the IAF

Airplane will navigate in GPS mode throughout the intermediate portion of the approach procedure. When the airplane is inbound towards the final approach course, the CDI will automatically switch from GPS/SBAS navigation to LOC navigation.

d. VERIFY ..... Course pointer slews to the front course

4. Established inbound on Final Approach Course (FAF Active Waypoint)
   a. VERIFY Course Pointer is set to the final approach course
   b. VERIFY LOC is annunciated on the HSI
5. Airspeed.....MAINTAIN 110 KIAS OR GREATER (Recommended)
6. At the FAF..... Use desired vertical mode to fly the approach's vertical profile
   Use Altitude Preselect to level off at intermediate altitudes and at the MDA

   Recommend descending at 1000 ft/min or less. Descending at a higher rate or reaching MDA too far before the Visual Descent Point (VDP) could cause TAWS alerts. If a TAWS WARNING is issued, immediately follow the TAWS WARNING procedure in the EMERGENCY PROCEDURES Section of this AFMS.

7. After Leveling at MDA.....SET Missed Approach Altitude In Altitude Preselect

RNAV (GPS) (LPV or LNAV/VNAV)

1. Load the approach into the Active Flight Plan
2. Approach Minimums..... SET ON TMR/REF page

IF Flying Vectors-To-Final

3. Airplane on Vectors-To-Final
   a. Mode Control Panel .....PRESS HDG to fly ATC radar vectors
   b. PROC button on PFDs or MFD..... SELECT 'ACTIVATE VECTORS-TO-FINAL'

NOTE

SUSP may annunciate on the HSI when Vectors-To-Final is selected. The flight plan will automatically unsuspend when the airplane intercepts and turns inbound on the final approach course. When automatic flight plan waypoint sequencing resumes, SUSP will extinguish.

   c. VERIFY ..... Course pointer slews to the front course
   d. Mode Control Panel .....PRESS APR, Verify GPS and GP armed

IF Flying Full Approach Including Transition

3. Airplane cleared to an initial approach fix
   a. ACTIVATE THE APPROACH from the PROC page,

      Or

      ACTIVATE a DIRECT TO (~~D~~>) the IAF

   b. HSI CDI ..... SELECT GPS Nav Source
   c. Mode Control Panel ..... PRESS APR, Verify GPS mode active, GP armed

NOTE

Ensure groundspeed is less than 200 KTS within 1 minute of the IAF

   d. VERIFY ..... Course pointer slews to the front course

4. Established inbound on Final Approach Course
   a. VERIFY Course Pointer is set to the final approach course
   b. VERIFY LPV or L/VNAV is annunciated on the HSI
   c. VERIFY GP Indicator Displays
   d. VERIFY SUSP is not displayed on HSI
   e. SET Missed Approach Altitude In Altitude Preselect

5. Airspeed.....MAINTAIN 110 KIAS OR GREATER (Recommended)
6. VERIFY..... Airplane Captures and Tracks GPS Course, Captures and tracks GP
7. AT Decision Altitude (DA),
   c. A/P Y/D DISC TRIM INTRPT Switch ..... PRESS
      Continue visually for a normal landing

      Or

   d. GO AROUND button
      (on left throttle) ..... PRESS, Execute Missed Approach Procedure

RNAV (GPS) (LNAV, LNAV + V)

1. Load the approach into the Active Flight Plan
2. Approach Minimums..... SET ON TMR/REF page

IF Flying Vectors-To-Final

3. Airplane on Vectors-To-Final
   a. Mode Control Panel .....PRESS HDG to fly ATC radar vectors
   b. PROC button on PFDs or MFD..... SELECT 'ACTIVATE VECTORS-TO-FINAL'

NOTE

SUSP may annunciate on the HSI when Vectors-To-Final is selected. The flight plan will automatically unsuspend when the airplane intercepts and turns inbound on the final approach course. When automatic flight plan waypoint sequencing resumes, SUSP will extinguish.

   c. VERIFY ..... Course pointer slews to the inbound course

d. Mode Controller.....PRESS APR Button
GPS will be the active lateral mode,
GP will ARM if the procedure provides vertical guidance

IF Flying Full Approach Including Transition

3. Airplane cleared to an initial approach fix

   a. ACTIVATE THE APPROACH from the PROC page,

   Or

   ACTIVATE a DIRECT TO (~~D~~>) the IAF

   b. HSI CDI ..... SELECT GPS Nav Source

   c. Mode Controller.....PRESS APR Button
   GPS will be the active lateral mode,
   GP will ARM if the procedure provides vertical guidance

NOTE

Ensure groundspeed is less than 200 KTS within 1 minute of the IAF

4. Established inbound on Final Approach Course (FAF Active Waypoint)

   c. VERIFY Course Pointer is set to the final approach course
   d. VERIFY LNAV+V or LNAV is annunciated on the HSI
   e. VERIFY GP Deviation Scale Displays (if applicable)
   f. SET Minimum Descent Altitude (MDA) Altitude In Altitude Preselect

5. Airspeed.....MAINTAIN 110 KIAS OR GREATER (Recommended)

CAUTION

Some RNAV (GPS) approaches provide a vertical descent angle as an aid in flying a stabilized approach. These approaches are NOT considered Approaches with Vertical Guidance (APV). Approaches that are annunciated on the HSI as LNAV or LNAV+V are considered Nonprecision Approaches (NPA) and are flown to an MDA even though vertical glidepath (GP) information may be provided.

6. At the FAF.....Descend via GP if LNAV+V approach

   Use desired vertical mode to fly the approach's vertical profile if LNAV approach
   Use Altitude Preselect to level off at intermediate altitudes and at the MDA

Recommend descending at 1000 ft/min or less. Descending at a higher rate of descent or reaching MDA too far before the Visual Descent Point (VDP) could cause TAWS alerts. If a TAWS WARNING is issued, immediately follow the TAWS WARNING procedure in the EMERGENCY PROCEDURES Section of this AFMS.

CAUTION

Airplane will not capture ALT if descending in GP mode.

7. Level airplane in ALT mode at MDA..... PRESS NAV button 200 ft above MDA

   If airplane is descending via GP, GP will extinguish and PIT mode will be active and airplane will capture MDA.

8. AFTER LEVELING AT MDA.....SET Missed Approach Altitude In Altitude Preselect

VOR APPROACH

1. Load the approach into the Active Flight Plan..... VERIFY the G1000 tunes the proper VOR frequency
2. Approach Minimums..... SET ON TMR/REF page

IF Flying Vectors-To-Final

3. Airplane on Vectors-To-Final
   a. Mode Control Panel .....PRESS HDG to fly ATC radar vectors
   b. PROC button on PFDs or MFD..... SELECT 'ACTIVATE VECTORS-TO-FINAL'

NOTE

SUSP may annunciate on the HSI when Vectors-To-Final is selected. The flight plan will automatically unsuspend when the airplane intercepts and turns inbound on the final approach course. When automatic flight plan waypoint sequencing resumes, SUSP will extinguish.

   c. HSI CDI .....PRESS until VOR navigation source To be used for the approach displays
   d. Course Pointer .....Set to inbound course
   e. Mode Control Panel .....PRESS APR, verify VAPP armed

IF Flying Full Approach Including Transition

3. Airplane cleared to an initial approach fix
   a. ACTIVATE THE APPROACH from the PROC page,

      Or

      ACTIVATE a DIRECT TO (~~D~~>) the IAF
   b. HSI CDI .....SELECT GPS nav source
   c. Mode Control Panel ..... PRESS NAV (GPS mode)

NOTE

Ensure groundspeed is less than 200 KTS within 1 minute of the IAF

   d. When Established Inbound to the FAF ..... PRESS CDI softkey until VOR navigation source to be used for the approach displays (Autopilot / Flight Director Mode will automatically change to ROL)
   e. Course Pointer .....Set to inbound course

f. Mode Control Panel ..... PRESS APR, verify VAPP active or armed

4. Established inbound on Final Approach Course
   a. VERIFY Course Pointer is set to the inbound course
   b. VERIFY VOR is annunciated on the HSI

NOTE

If the Course Deviation Indicator (CDI) is greater than one dot from center, the autopilot will arm the VAPP mode and indicate VAPP in white on the PFD. The pilot must ensure that the current heading will result in a capture of the selected course. If the CDI is one dot or less from center, the autopilot will enter the capture mode when the APR button is pressed and annunciate VAPP in green on the PFD.

5. Airspeed.....MAINTAIN 110 KIAS OR GREATER (Recommended)
6. At the FAF..... Use desired vertical mode to fly the approach's vertical profile
   Use Altitude Preselect to level off at intermediate altitudes and at the MDA

   Recommend descending at 1000 ft/min or less. Descending at a higher rate or reaching MDA too far before the Visual Descent Point (VDP) could cause TAWS alerts. If a TAWS WARNING is issued, immediately follow the TAWS WARNING procedure in the EMERGENCY PROCEDURES Section of this AFMS.

7. AFTER LEVELING AT MDA.....SET Missed Approach Altitude In Altitude Preselect

Back Course (BC)

1. Load the approach into the Active Flight Plan..... VERIFY the G1000 tunes the proper LOC frequency
2. Approach Minimums..... SET ON TMR/REF page

IF Flying Vectors-To-Final

3. Airplane on Vectors-To-Final
   a. Mode Control Panel ..... PRESS HDG to fly radar vectors
   b. PROC button on PFDs or MFD..... SELECT 'ACTIVATE VECTORS-TO-FINAL'

NOTE

SUSP may annunciate on the HSI when Vectors-To-Final is selected. The flight plan will automatically unsuspend when the airplane intercepts and turns inbound on the final approach course. When automatic flight plan waypoint sequencing resumes, SUSP will extinguish.

   c. HSI CDI ..... PRESS until LOC Navigation Source to be used for the Approach Displays
   d. VERIFY .....Course Pointer is Set to the Front Course
   e. Mode Control Panel ..... PRESS BC, BC Armed

IF Flying Full Approach Including Transition

3. Airplane cleared to an initial approach fix

   a. ACTIVATE THE APPROACH from the PROC page,

   Or

   ACTIVATE a DIRECT TO (~~D~~>) the IAF

   b. HSI CDI .....GPS

   c. Mode Control Panel ..... PRESS NAV (GPS Mode)

NOTE

Ensure groundspeed is less than 200 KTS within 1 minute of the IAF

   d. When Established Inbound to the FAF ..... PRESS CDI softkey until LOC navigation source to be used for the approach displays (Autopilot / Flight Director Mode will automatically change to ROL)

   e. VERIFY ..... Course Pointer is set to the Front Course

   f. Mode Control Panel .....PRESS BC BC Mode, Armed or Active

4. Established inbound on Final Approach Course

   a. VERIFY Course Pointer is set to the front course

   b. VERIFY LOC is annunciated on the HSI

NOTE

If the Course Deviation Indicator (CDI) is greater than one dot from center, the autopilot will arm the BC mode and indicate BC in white on the PFD. The pilot must ensure that the current heading will result in a capture of the selected course. If the CDI is one dot or less from center, the autopilot will enter the capture mode when the APR button is pressed and annunciate BC in green on the PFD.

5. Airspeed.....MAINTAIN 110 KIAS OR GREATER (Recommended)

6. At the FAF..... Use desired vertical mode to fly the approach's vertical profile Use Altitude Preselect to level off at intermediate altitudes and at the MDA

   Recommend descending at 1000 ft/min or less. Descending at a higher rate or reaching MDA too far before the Visual Descent Point (VDP) could cause TAWS alerts. If a TAWS WARNING is issued, immediately follow the TAWS WARNING procedure in the EMERGENCY PROCEDURES Section of this AFMS.

7. AFTER LEVELING AT MDA.....SET Missed Approach Altitude In Altitude Preselect

GO AROUND (GA)

1. Control Wheel ..... GRASP FIRMLY
2. GO AROUND button (left throttle) ..... PUSH – Verify GA / / GA on PFD in lateral and vertical mode fields
3. Rotate to Go Around attitude ..... Follow Flight Director Command Bars
4. Balked Landing ..... EXECUTE
5. Mode Control Panel ..... PRESS NAV to Fly Published Missed Approach Procedure
   PRESS HDG to Fly ATC Assigned Missed Approach Heading

NOTE

The pilot is responsible for initial missed approach guidance in accordance with published procedure. The G1000 may not provide correct guidance until the aircraft is established on a defined leg of the procedure.

6. Altitude Preselect ..... VERIFY Set to appropriate altitude

At an appropriate safe altitude:

7. Mode Control Panel ..... AP to Engage Autopilot

NOTE

When the GA button is pressed, the autopilot disconnects, the Flight Director command bars will command 8^{O} nose up and wings level, the HSI nav source automatically switches to GPS, the flight plan sequences to the first published missed approach leg, and automatic leg sequencing resumes.

The AFCS will fly the published missed approach procedure once the aircraft is established on a segment of the missed approach procedure, the autopilot is engaged, and NAV mode is selected.

The flight plan can only contain one approach procedure at a time. If the pilot attempts to load another instrument approach at this time, the airplane will depart from the missed approach procedure and turn directly towards the first waypoint in the new approach. Do not attempt to load or activate a new approach while flying the missed approach procedure until ready to fly the new approach.

Recommended procedures following a missed approach

1. To repeat the instrument approach procedure currently loaded into the flight plan
   a. Activate Vectors-To-Final if being radar vectored by ATC,

   Or

   b. If flying the entire instrument approach procedure, activate a DIRECT TO the desired initial waypoint. Follow the appropriate procedure for the instrument approach being flown.

2. To proceed to an alternate airport. This procedure will allow the pilot to enter the route to the alternate before leaving the missed approach holding fix.
   a. Highlight the first enroute waypoint in the flight plan
   b. Begin entering waypoints in the desired route order. Do not attempt to load a new approach at this time.
   c. CLR all waypoints after the last waypoint in the route to the alternate and the currently loaded instrument approach header.

d. When ready to proceed to the alternate, highlight the first enroute waypoint in the route to the alternate airport. ACTIVATE a DIRECT TO that waypoint.

e. When enroute to the alternate, a new instrument approach can now be loaded into the flight plan.

Section 5 - Performance

No Change. Refer to basic Aircraft Flight Manual or appropriate supplement.

Section 6 - Weight and Balance

No Change. Refer to basic Aircraft Flight Manual or appropriate supplement

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Section 7 - Systems Description

Table of contents

GENERAL

This section supplements the Systems Description chapter in the airplanes original Pilot's Operating Handbook and FAA Approved Airplane Flight Manual. This section will follow the format and layout of the chapter in the original manual. Only topics changed by the installation of the G1000 integrated avionics system will be addressed in this supplement.

The G1000 system is an integrated system that presents flight instrumentation, navigation, communication, weather avoidance, engine instrumentation, and supplemental flight information to the pilot for enhanced situational awareness through large-format displays. The G1000 also incorporates an automatic flight control system that includes autopilot and flight director functions. Refer to the Garmin Cockpit Reference Guide, P/N 190-00664-00 Rev. A or later FAA approved revision for detailed descriptions of the Garmin G1000 system including its components, detailed descriptions of functions, and operating instructions.

G1000 INTEGRATED AVIONICS

SYSTEM OVERVIEW

The main components of the G1000 Integrated Avionics system consists of 14 Line Replaceable Units (LRU)s. Seven of those LRUs are mounted in the cockpit and interface the pilot to the G1000 system. There are two Primary Flight Displays (PFDs) that display primary flight information to the pilot such as attitude, airspeed, altitude, heading, vertical speed, navigation information, system information, and pilot situational awareness information. In the center of the cockpit, a 15 inch Multi-Function Display (MFD) displays engine gauges, flight plan data, various map displays, and access to aviation and weather information. Information access and data entry through the MFD is via the GCU 475 MFD controller mounted in the pedestal between the pilot's seats.

Communications is interfaced through the PFD's and two audio panels mounted outside each PFD. Radio tuning is through the PFDs and audio from the Com radios, Nav radios, ADF, intercom, and XM music is controlled by the two audio panels.

The G1000 incorporates a fully digital integrated autopilot and flight director. Pilot interface to the AFCS is through the GMC 710 Autopilot Mode controller mounted in the center of the cockpit just below the airplane's glareshield.

In addition to dual Primary Flight Displays, the system incorporates dual Air Data Computers (GDC), Dual AHRS (GRS), and Dual Integrated Avionics (GIA) units for system redundancy. Each GIA contains a VHF Com radio, a VHF Nav radio, Glide Slope receiver, Marker Beacon receiver, and a SBAS augmented GPS receiver.

Finally, the G1000 system includes weather radar and satellite downlinked weather information for weather avoidance and situational awareness.

INSTRUMENT PANEL

The G1000 Instrument Panel consists of two 10 inch LCD Primary Flight Displays, one 15 inch LCD Multi-Function Display, two audio panels, and autopilot / flight director mode control panel, an MFD controller, and three 2 ¼ inch standby instruments. The ADF control head has been relocated from the radio stack location on the instrument panel to the pedestal.

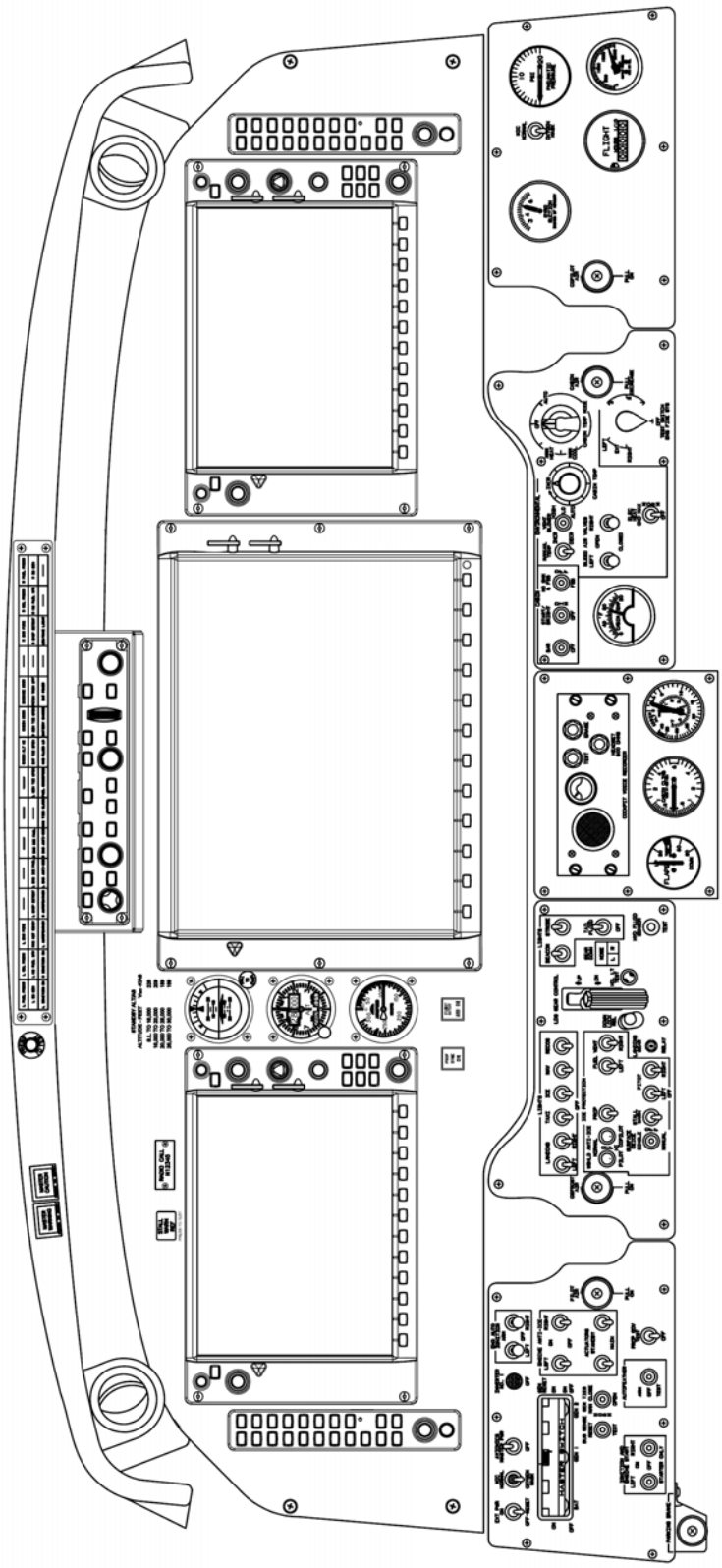


Figure 1, Instrument Panel

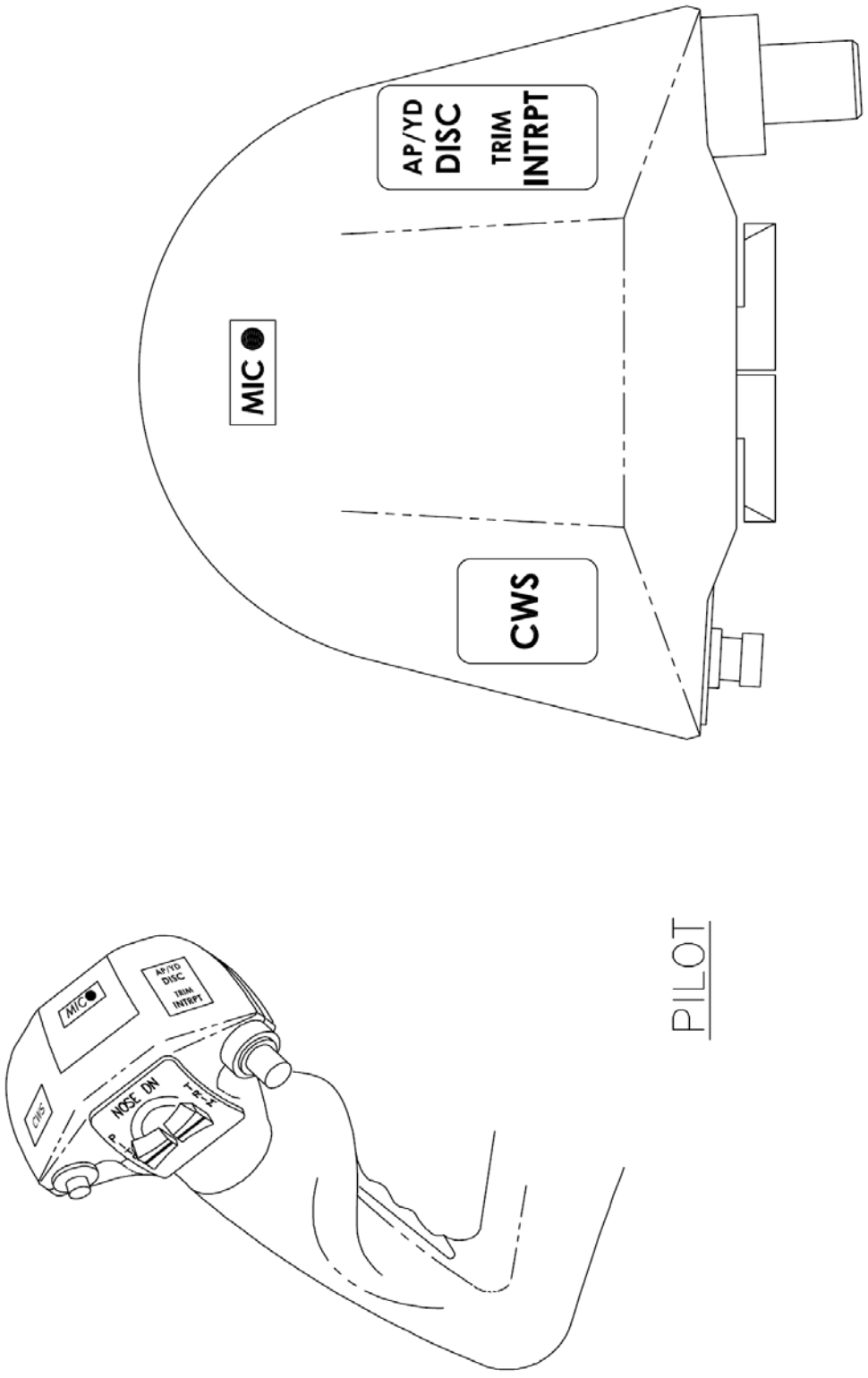


Figure 2, Pilot's Control Wheel

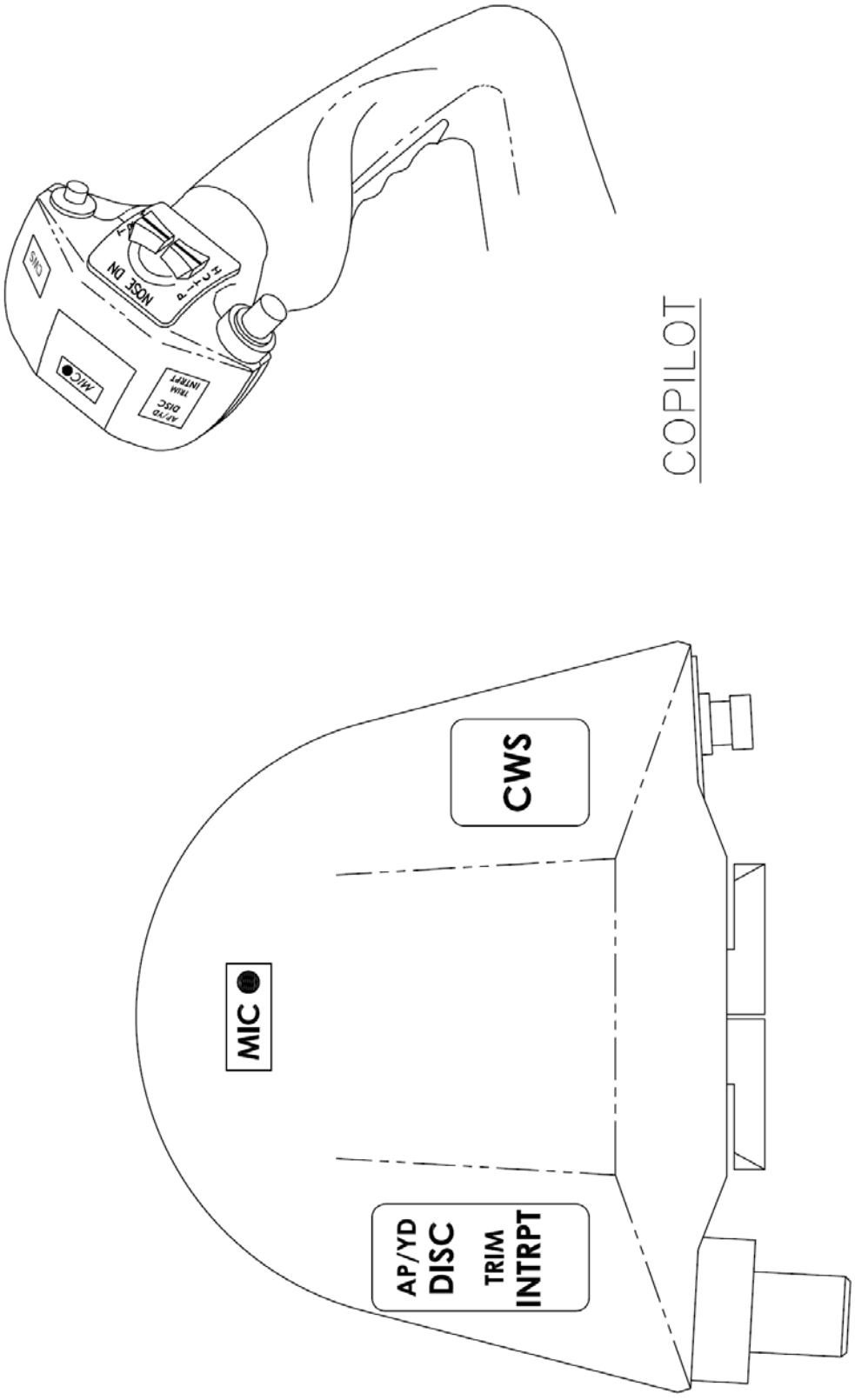


Figure 3, Copilot's Control Wheel With Trim Switches

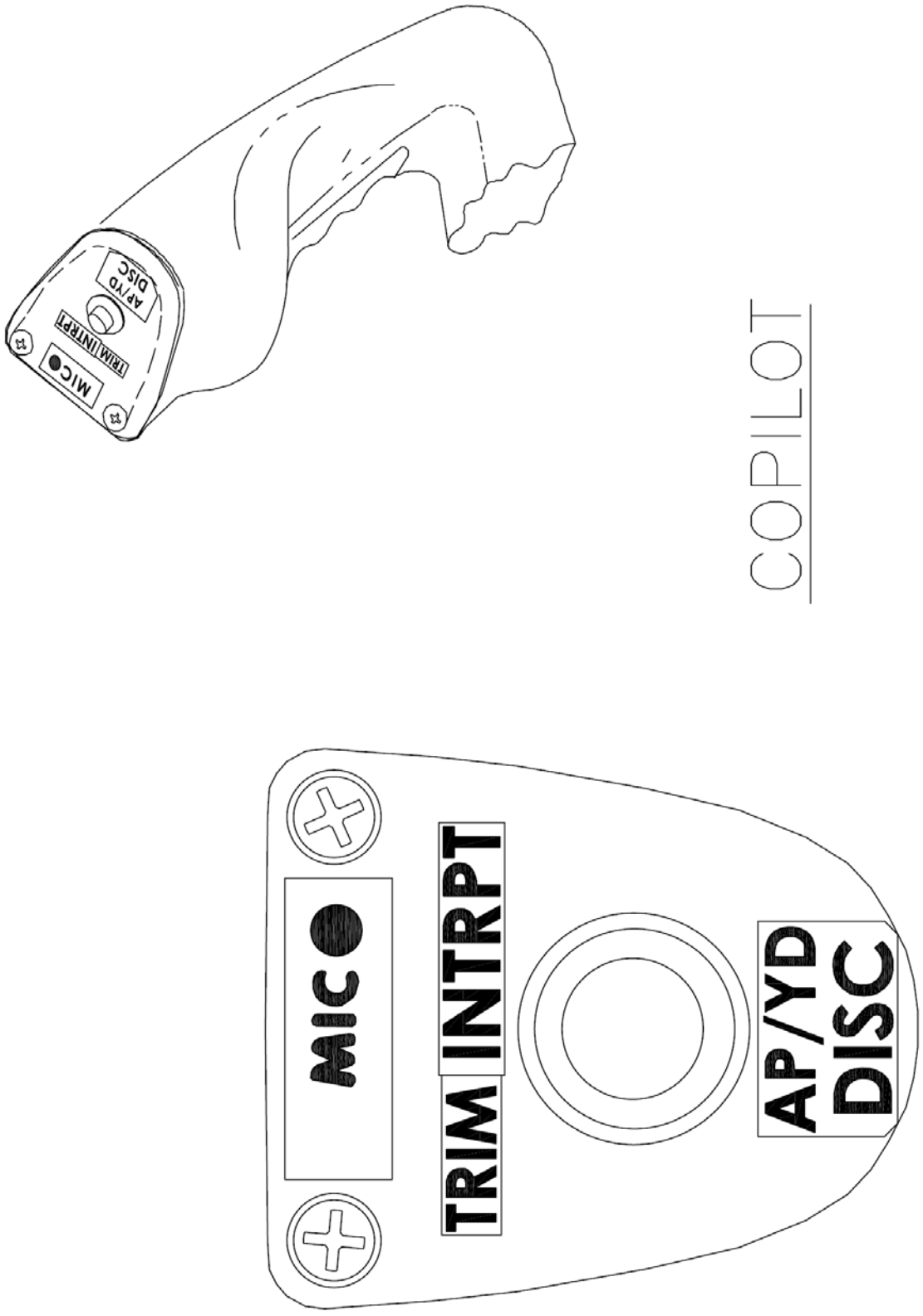


Figure 4, Copilot's Control Wheel Without Trim Switches

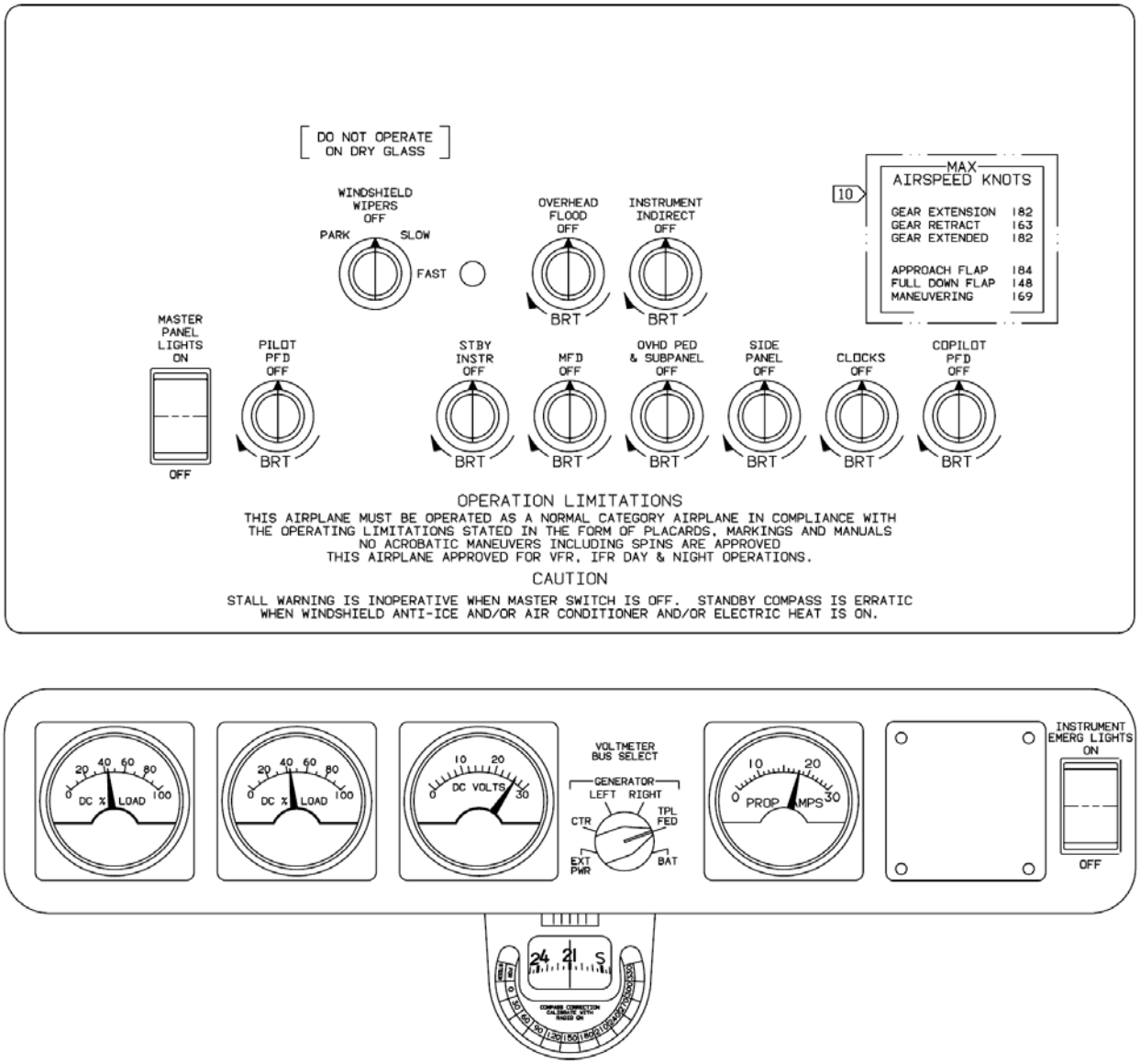


Figure 5, Overhead Light Control Panel

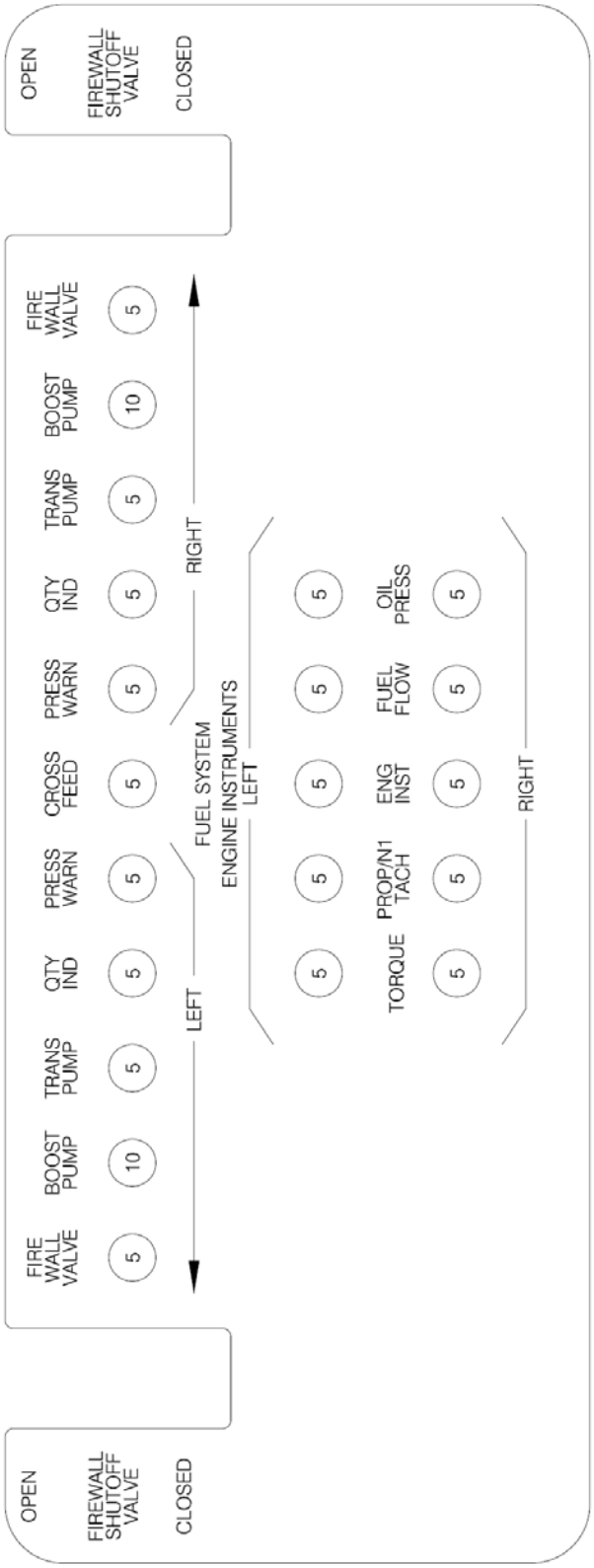


Figure 6, Left Side Circuit Breaker Panel

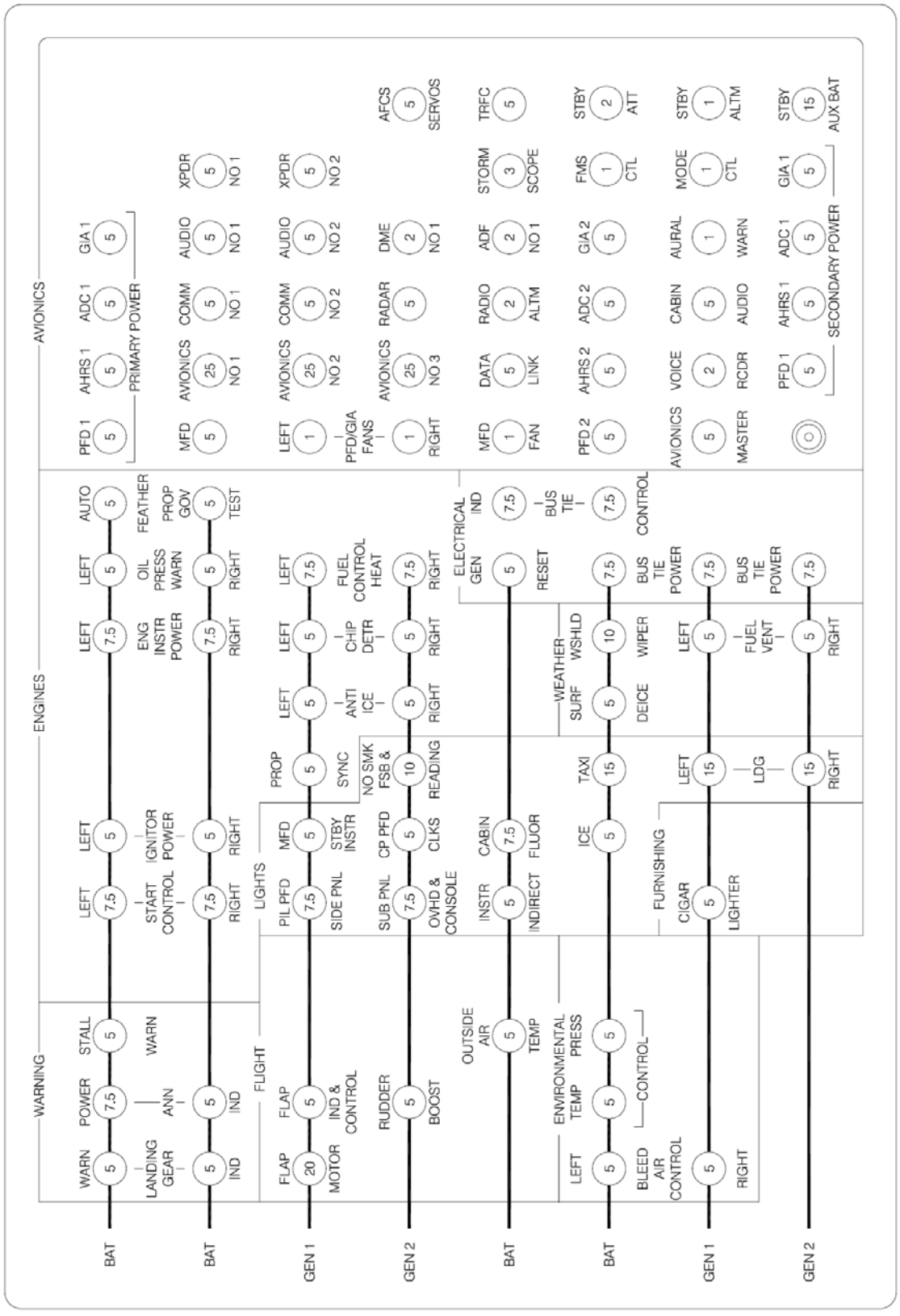


Figure 7, Right Side Circuit Breaker Panel (Typical)

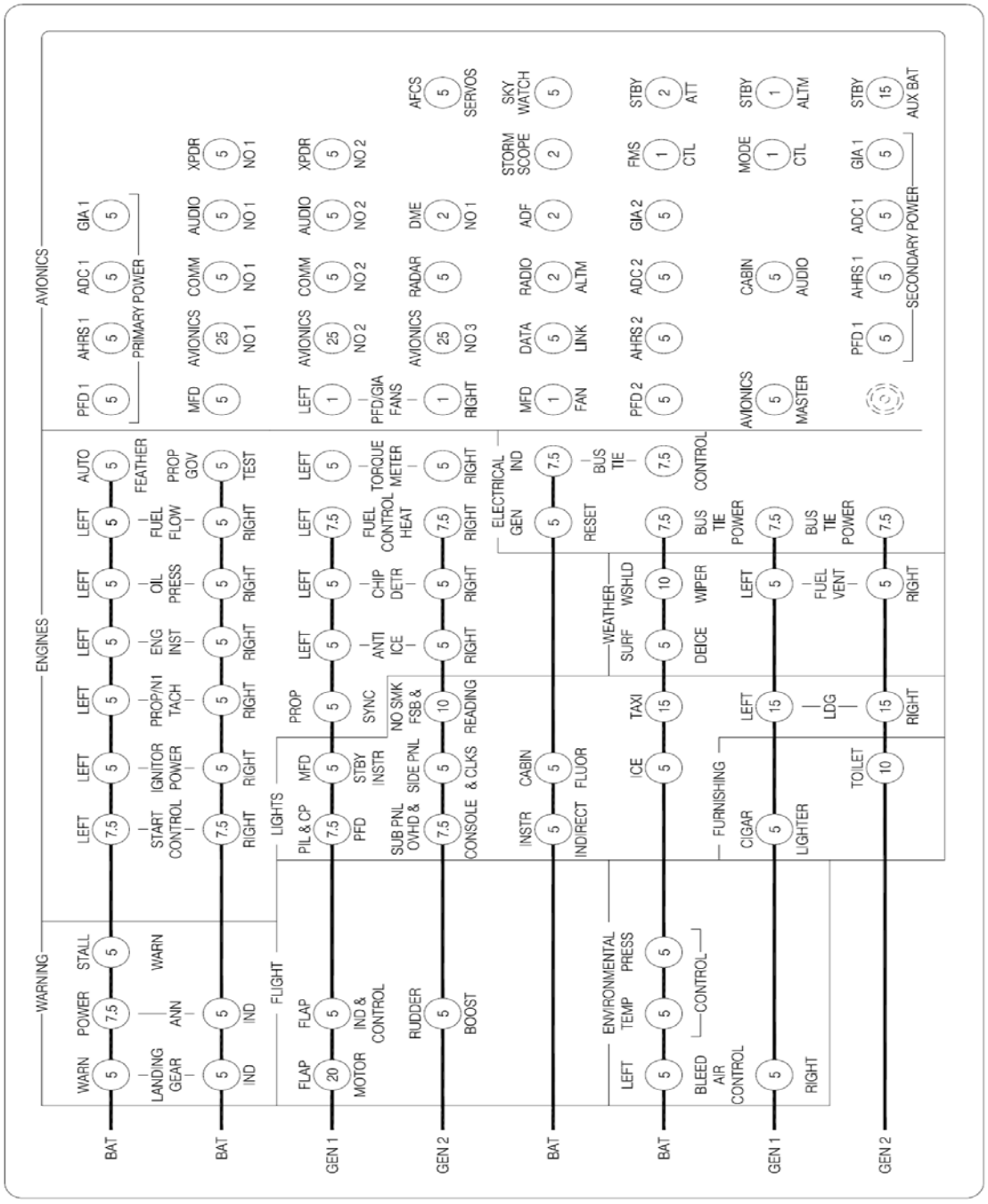


Figure 8, Right Side Circuit Breaker Panel (Optional Configuration)

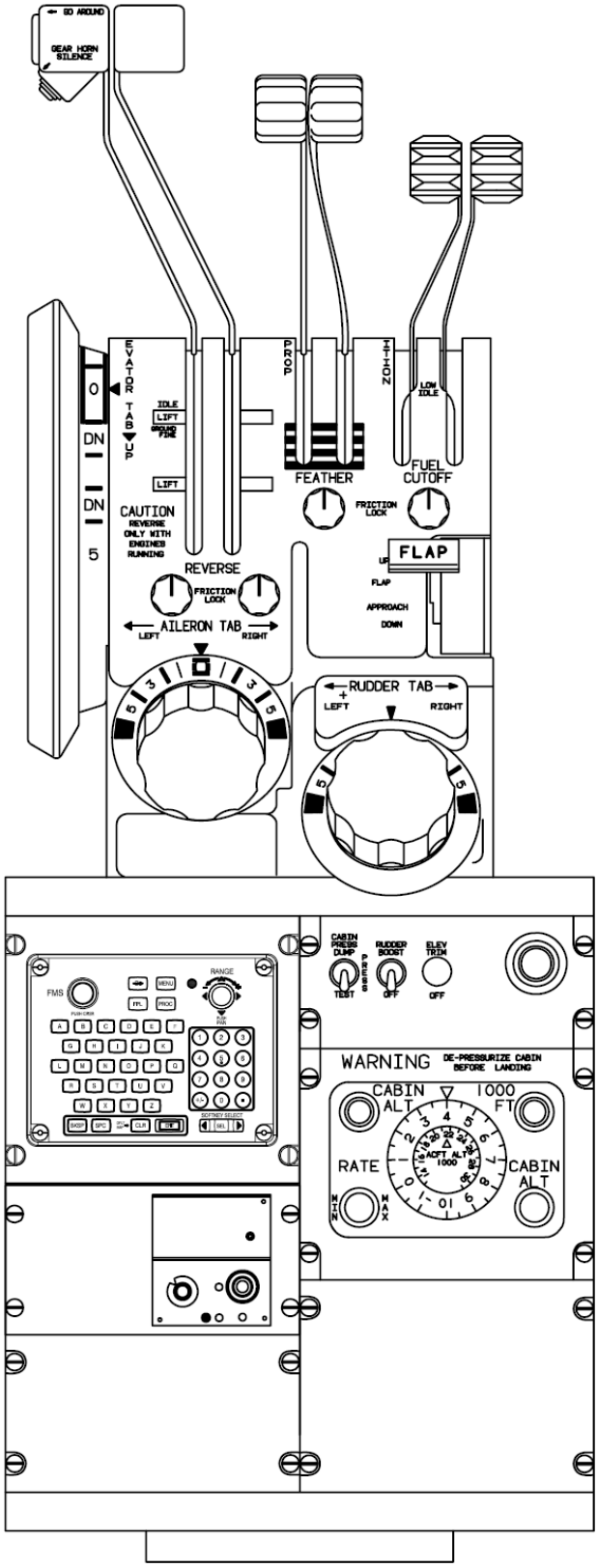


Figure 9, Pedestal

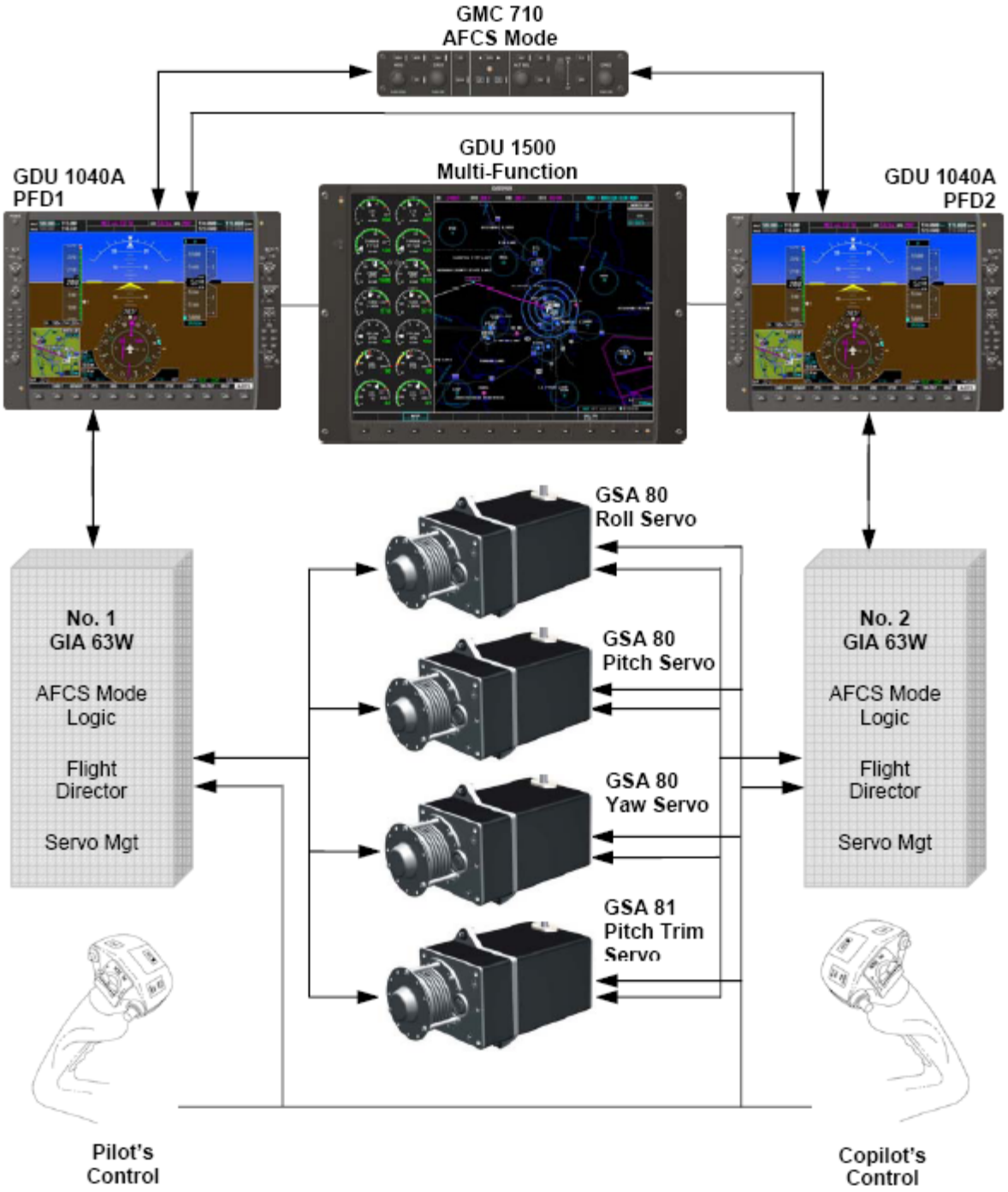


Figure 10, GFC 700 System Interface

FLIGHT CONTROLS

AFCS, AUTOPILOT AND FLIGHT DIRECTOR

The GFC 700 is a digital Automatic Flight Control System (AFCS), fully integrated within the G1000 System avionics architecture. The GFC 700 is a three axis autopilot and flight director system which provides the pilot with the following features:

Autopilot (AP) — Autopilot operation occurs within the pitch, roll, and pitch trim servos. It also provides servo monitoring and automatic flight control in response to flight director steering commands, AHRS attitude and rate information, and airspeed.

Flight Director (FD) - Two flight directors, each operating independently within their respective GIA and referred to as pilot-side and copilot-side. Commands for the selected flight director are displayed on both PFDs.

The flight director provides:

- Command Bars showing pitch/roll guidance
- Vertical/lateral mode selection and processing
- Autopilot communication

Yaw Damper (YD) — The yaw servo is self-monitoring and provides Dutch roll damping and turn coordination in response to yaw rate, roll angle, vertical acceleration, and airspeed.

Electric Pitch Trim — The pitch trim servo provides manual electric pitch trim capability when the autopilot is not engaged.

Pilot commands to the AFCS are entered through the GMC 710 Autopilot Mode Controller mounted in the center of the cockpit under the airplane's glareshield. The GMC 710 controller also controls the heading bug, navigation course selector on each PFD, and the altitude preselect.

Other components of the autopilot include four servos that also contain autopilot processor, control wheel-mounted elevator trim switches (copilot's side optional), control wheel-mounted autopilot/yaw damper disconnect and trim interrupt switch (A/P Y/D DISC/TRIM INTRPT), control wheel-mounted CWS (Control Wheel Steering) switch, and a go-around switch mounted in the left throttle knob.

The following conditions will cause the autopilot to disconnect:

- Electrical power failure, including pulling the AFCS circuit breaker
- Electrical power failure to the GMC 710 Autopilot Mode Controller, including pulling the MODE CTL circuit breaker
- Internal autopilot system failure
- Malfunction of either AHRS (two fully functional AHRS are required for the autopilot to function)
- Failure of the on side PFD
- Depressing the red A/P Y/D DISC/TRIM INTRPT button on the pilot's or copilot's (if installed) control wheel
- Actuating the left section of the manual electric trim split switch, pilot's and copilot's control wheel
- Pushing the AP button on the autopilot mode controller when the autopilot is engaged
- Pushing the GO AROUND button on the left throttle
- Turning OFF the Avionics Master Power Switch

CAUTION

Turning OFF the Avionics Master Power Switch will cause the autopilot to abnormally disconnect and the yaw damper to disconnect. An abnormal autopilot disconnect is normally annunciated visually by a red flashing 'AP' in the PFD FD mode window and a continuous high-low tone. However, when the Avionics Master Power Switch is turned OFF, electrical power is removed from the audio panels preventing the autopilot disconnect tone from being heard.

NOTE

Pressing and holding the CWS (control wheel steering) switch on the left grip of the pilot's control wheel will disconnect the autopilot servos from the airplane flight controls as long as the CWS switch is depressed. Upon release of the CWS switch, the system will synchronize to the existing pitch and roll modes selected. Review the GFC700 Cockpit Reference Guide for more information.

The following tables list the available AFCS vertical and lateral modes with their corresponding controls and annunciations. The mode reference is displayed next to the active mode annunciation for Altitude Hold, Vertical Speed, and Flight Level Change modes. The NOSE UP/DN Wheel can be used to change the vertical mode reference while operating under Pitch Hold, Vertical Speed, or Flight Level Change Mode. Increments of change and acceptable ranges of values for each of these references using the NOSE UP/DN Wheel are also listed in the table.

AFCS VERTICAL MODES

Vertical Mode	Control	Annunciation	Reference Range	Reference Change Increment
Pitch Hold	(default)	PIT	20^{O} Nose up 15^{O} Nose Down	0.5^{O}
Selected Altitude Capture	*	ALTS		
Altitude Hold	**ALT** Key	ALT nnnnn FT		
Vertical Speed	**VS** Key	VS nnnn FPM	-4000 to +4000 fpm	100 fpm
Flight Level Change, IAS Hold	**FLC** Key	FLC nnn KT	100 to 226 kt	1 kt
Flight Level Change, Mach Hold		FLC M 0.nn	M 0.25 to 0.46	M0.01
Vertical Path Tracking (VNAV)	**VNV** Key	VPTH		
VNV Target Altitude Capture	**	ALTV		
Glidepath	**APR** Key	GP		
Glideslope		GS		
Takeoff (on ground)	**GA** Switch	TO		
Go Around (in air)		GA		

* ALTS arms automatically when PIT, VS, FLC, TO, or GA is active, and under VPTH when the Selected Altitude is to be captured instead of the VNV Target Altitude.

** ALTV arms automatically under VPTH when the VNV Target Altitude is to be captured instead of the Selected Altitude.

AFCS LATERAL MODES

Lateral Mode	Control	Annunciation	Maximum Roll Command Limit
Roll Mode	(default)	ROL	25^{O} Left Bank 25^{O} Right Bank
Low Bank	**BANK** Key	*	15^{O} Left Bank 15^{O} Right Bank
Heading Select	**HDG** Key	HDG	25^{O} Left Bank 25^{O} Right Bank
Navigation, GPS Arm/Capture/Track	**NAV** Key	GPS	25^{O} Left Bank 25^{O} Right Bank
Navigation, VOR Enroute Arm/Capture/Track		VOR	25^{O} Left Bank 25^{O} Right Bank
Navigation, LOC Arm/Capture/Track (No Glideslope)		LOC	25^{O} Left Bank 25^{O} Right Bank
Backcourse Arm/Capture/Track	**BC** Key	BC	25^{O} Left Bank 25^{O} Right Bank
Approach, GPS Arm/Capture/Track (Glidepath Mode Automatically Armed, if available)	**APR** Key	GPS	25^{O} Left Bank 25^{O} Right Bank
Approach, VOR Arm/Capture/Track		VAPP	25^{O} Left Bank 25^{O} Right Bank
Approach, ILS Arm/Capture/Track (Glideslope Mode Automatically Armed)		LOC	25^{O} Left Bank 25^{O} Right Bank
Takeoff (on ground)	**GA** Switch	TO	Wings Level
Go Around (in air)		GA	Wings Level

* No annunciation appears in the AFCS Status Box. The commandable bank angle range is indicated by a green band along the Roll Scale of the Attitude Indicator.

The CWS Button does not change lateral references for Heading Select, Navigation, Backcourse, or Approach modes. The autopilot guides the aircraft back to the Selected Heading/Course upon release of the CWS Button.

The autopilot is capable of restoring the aircraft to the commanded attitude about the three axes throughout the following minimum ranges:

Pitch 25^{O} nose up to 20^{O} nose down

Roll ±45°

The Flight Director is not designed to perform unusual attitude recoveries from attitudes outside the following range:

Pitch 25^{O} nose up to 20^{O} nose down

Roll ±45°

ELECTRIC ELEVATOR TRIM

The electric elevator trim is standard with the G1000 system installation. The electric elevator trim can be operated manually by the pilot using the pitch trim switches on the control wheel, or, automatically by the autopilot. Electric Elevator trim switches are optional on the copilot's control wheel. If pitch trim switches are installed on the copilot's control wheel, the pilot's pitch trim inputs override those made by the copilot

The ON/OFF toggle switch on the pedestal has been removed. Electric elevator trim will function if the AFCS circuit breaker (right side circuit breaker panel) is set and the autopilot has satisfactorily completed a preflight test.

Pitch trim rocker switches on the pilot's control wheel manually control the electric elevator trim system. NOSE DN at the top of the rocker switch, when depressed causes the elevator pitch trim servo to move the trim tab in the upward direction resulting in the nose of the airplane pitching downward. The control column will move in the forward direction and the pitch trim wheel will move forward in the nose down direction. Depressing NOSE UP at the bottom of the rocker switch results in the opposite of the previous motions with the airplane nose pitching up.

Runaway or malfunctioning trim can be interrupted by pressing and holding the red A/P Y/D DISC TRIM INTRPT switch on either control wheel. Pulling the AFCS circuit breaker on the right side circuit breaker panel will disable the electric elevator trim so it will not move when the TRIM INTRPT switch is released.

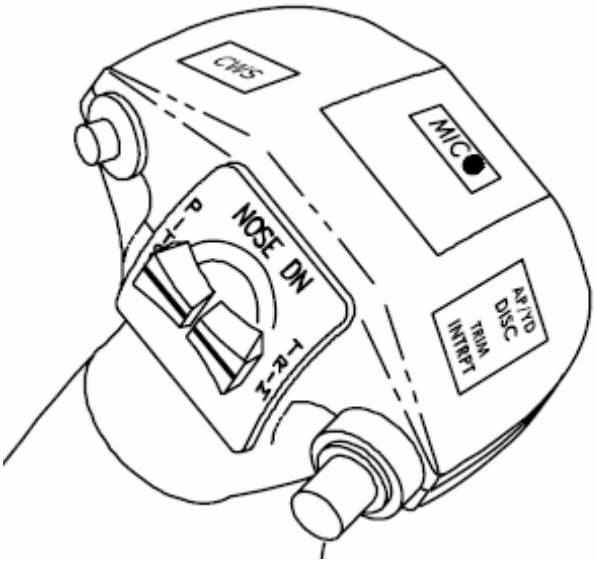


Figure 11, Electric Trim Switches, Pilot's Control Wheel

FLIGHT INSTRUMENTS

G1000 FLIGHT INSTRUMENTS

The flight instruments are an integrated part of the G1000 system. For system descriptions, operating instructions, and abnormal failure indication refer to the Cockpit Reference Guide.

STANDBY FLIGHT INSTRUMENTS

There are three 2 ¼ inch standby instruments that are located directly to the right of the pilot's Primary Flight Display arranged vertically, standby attitude indicator, standby altimeter, and standby airspeed indicator.

A standby attitude indicator located at the top of the stack is normally powered by the triple fed buss. In the event of total loss of aircraft electrical power, there is a standby battery that will power the standby attitude indicator for at least 30 minutes.

A standby altimeter is the next instrument in the stack. It is a mechanical instrument that requires no electrical power to operate. Electrical power is used to power an internal vibrator, used to minimize indicator pointer sticking, and instrument internal lighting. The vibrator is normally powered from the triple fed buss. In the event of total loss of normal aircraft electrical power, the vibrator and internal lighting is powered by the standby battery. The standby altimeter uses the copilot's static system for its source of static air pressure.

The bottom instrument is a mechanical airspeed indicator. It is a mechanical instrument that requires no electrical power to operate. Electrical power is used for internal lighting. In the event of a total loss of aircraft electrical power, the standby battery will power the instrument's internal lighting. The standby airspeed indicator uses the copilot's static system for its source of static air pressure, and the copilot's pitot system for its source of impact air pressure.

STANDBY ALT/AS

ALTITUDE - FEET	V_{MO} -KIAS
S.L. TO 16,000	226
16,000 TO 20,000	209
20,000 TO 25,000	189
25,000 TO 30,000	189

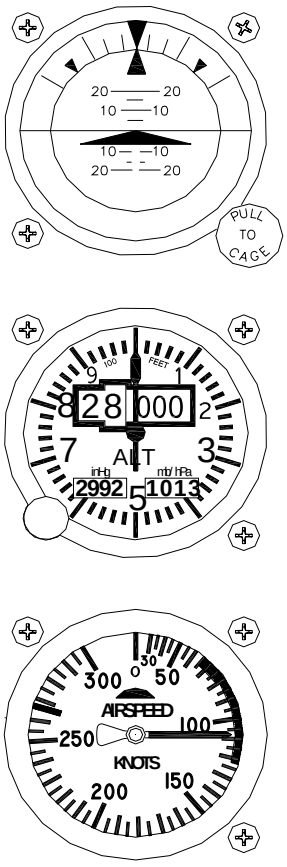


Figure 12, Standby Flight Instruments

ENGINE INSTRUMENTATION

Engine instruments, located in a window on the left side of the MFD, are grouped according to their function. The G1000 engine gauges are constructed and arranged to emulate the mechanical gauges they replaced. At the top, the ITT (Interstage Turbine Temperature) indicators and torquemeters are used to set take-off power. Climb and cruise power are established with the torquemeters and propeller tachometers while observing ITT limits. Gas generator (N_1) operation is monitored by the gas generator tachometers. The lower grouping consists of the fuel flow indicators and the oil pressure/temperature indicators.

The engine transducers send their signals to the Garmin GEA (Engine and Airframe LRU) where the analog signals are converted to digital signals where the engine parameters are displayed on the MFD. There are two GEAs, one for each engine. The GEAs operate on 28vdc power supplied by the triple fed bus and are protected by circuit breakers normally located on the left side circuit breaker panel labeled ENG INST. Some configurations will have the ENG INST circuit breakers located on the right side circuit breaker panel.

The ITT indicator gives a reading of engine gas temperature between the compressor turbine and the power turbines. A digital indication combined with the pointer gives a resolution of $1^{O}C$.

The torquemeters give an indication in foot-pounds of the torque being applied to the propeller. A digital indication combined with the pointer gives a resolution of 5 ft-lbs.

The propeller tachometer reads directly in revolutions per minute. A digital indication combined with the pointer gives a resolution of 10 rpm.

The N_1 or gas generator tachometer is in percent of rpm, based on a figure of 37,500 rpm at 100%. Maximum continuous gas generator speed is limited to 38,100 rpm or 101.5% N_1. A digital indication combined with the pointer gives a resolution of 0.1% rpm.

The fuel flow indicators give an indication of fuel consumption in pounds of fuel per hour. A digital indication combined with the pointer gives a resolution of 1 lb/hr.

The oil pressure indicator displays oil pressure (in PSI). A digital indication combined with the pointer gives oil pressure a resolution of 1 psi.

The oil temperature indicator displays oil temperature (in Degrees Celsius). A digital indication combined with the pointer gives oil temperature a resolution of $1^{O}C$

A propeller synchroscope located above and between the propeller tachometers, gives an indication of synchronization of the propellers. When the propellers are operating at the same rpm, the display will show stationary diamond symbols. As one propeller begins to turn faster than the other propeller, the diamonds will begin to move towards the faster turning propeller and transition into an arrowhead pointing towards the faster turning propeller. The transition to a full arrowhead is complete when the propeller speed difference is equal to 50 rpm. This instrument aids the pilot in obtaining synchronization of the propellers.

PROPELLER SYNCHROPHASER

A push button ON/OFF switch is located on the instrument panel below the pilot's PFD that turns the propeller synchrophaser ON and OFF. To turn the propeller synchrophaser ON, push the PROP SYNC switch. A green ON annunciator will illuminate when the system is on. To turn the propeller synchrophaser OFF, push the PROP SYNC switch.

Refer to the Systems Description section in the airplane's original Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for a description of the synchrophaser and its operation.

ELECTRICAL SYSTEM

INVERTERS

The two solid-state inverters are not needed with the G1000 system and have been removed.

POWER DISTRIBUTION

There are no changes to the electrical power generation, power feeders, control, or fault protection. Only the Avionics power distribution has changed.

AVIONICS/ELECTRICAL EQUIPMENT BUS CONNECTION

LEFT GENERATOR BUS (GEN No. 1)	CENTER BUS	RIGHT GENERATOR BUS (GEN No. 2)
AVIONICS	**AVIONICS**	**AVIONICS**
PFD1/ GIA 1 Cooling Fan	Avionics Annunciator	PFD2 / GIA 2 Cooling Fan
No. 2 Avionics Bus	PFD 1 – Secondary Power	No. 3 Avionics Bus
COM 2	AHRS 1 - Secondary Power	Data Link
AUDIO 2	ADC 1 - Secondary Power	Radio Altimeter (OPT)
XPDR 2	GIA 1 - Secondary Power	ADF
RADAR		WX-500 Stormscope (OPT)
DME		Skywatch Traffic (OPT)
AFCS SERVOS		
ELECTRICAL	**ELECTRICAL**	**ELECTRICAL**
L Gen Bus (Bus Tie & Meter Indication)	Generator Reset	R Gen Bus (Bus Tie & Meter Indication)
L Generator Control Panel (1)		R Generator Control Panel (1)
L Generator Field & Sense (1)		R Generator Field & Sense (1)
L Generator Loadmeter (1)		R Generator Loadmeter (1)
ENGINE		**ENGINE**
L Engine Fuel Control Heater		R Engine Fuel Control Heater
L Chip Detector		R Chip Detector
L Main Anti-ice (Ice Vane)		R Main Anti-ice (Ice Vane)
R Standby Anti-Ice (Ice Vane)		L Standby Anti-Ice (Ice Vane)

LEFT GENERATOR BUS (GEN No. 1)	CENTER BUS	RIGHT GENERATOR BUS (GEN No. 2)
ENVIRONMENTAL	**ENVIRONMENTAL**	
R Bleed Air Control	Air Conditioner Motor	
Vent Blower	Normal Heat (Electric)	
	Max Heat (Electric)	
FLIGHT CONTROL		**FLIGHT CONTROL**
Flap Indicator and Control		Rudder Boost
Flap Motor		
FUEL		**FUEL**
R Firewall Valve		L Firewall Valve
R Fuel Boost Pump		L Fuel Boost Pump
Crossfeed Valve		Crossfeed Valve
FURNISHINGS		**FURNISHINGS**
Cigarette Lighter		Refreshment Bar (Optional)
		Electric Toilet (Optional)
LIGHTS	**LIGHTS**	**LIGHTS**
Rotating Beacon Lights Tail	Taxi Light	Ovrhd, Subpanel &Pedestal Lights
L Landing Light	Icing Light	Recognition Lights (Optional, Center Bus or Right Gen Bus)
Tail Flood Lights (Optional)	Recognition Lights (Optional, Center Bus or Right Gen Bus)	Side Panel Lights
Standby Altimeter Internal Lighting		R Landing Light
Standby Attitude Indicator Internal Lighting		Strobe Lights (Optional)
Standby Airspeed Indicator Internal Lighting		Cabin Reading Lights & Sign Chime
	LANDING GEAR	
	Landing Gear Motor (1)	
PROPELLERS	**PROPELLERS**	
Prop Synchrophaser	Prop Deice	
		WARNING/ANNUNCIATORS
		NO SMOKING & FSB Signs
WEATHER	**WEATHER**	**WEATHER**
L Fuel Vent Heat	Pneumatic Surface Deice	R Fuel Vent Heat
Pilot Windshield Anti-ice(1)	Windshield Wiper	Copilot Windshield Anti-ice (1)
Prop Deice		R Pitot Heat
		Stall Warning Heat

LEFT GENERATOR BUS (GEN No. 1)	CENTER BUS	RIGHT GENERATOR BUS (GEN No. 2)
		(1) The circuit breaker in this circuit is not accessible to the pilot in flight.

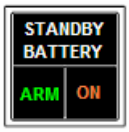
TRIPLE FED BUS	HOT BATTERY BUS	STANDBY BATTERY
AVIONICS		
PFD 1 – Primary Power		
AHRS 1 – Primary Power		
ADC 1 – Primary Power		
GIA 1 – Primary Power		
MFD – Power		
PFD 2 – Power		
AHRS 2 – Power		
ADC 2 – Power		
GIA 2 – Power		
MFD Controller		
Autopilot Mode Controller		
MFD Cooling Fan		
STBY Battery Charger		
Voice Recorder (OPT)		
Aural Warnings (OPT)		
Avionics Master Power		
Cabin Audio		
Avionics No. 1 Bus COM1 AUDIO 1 XPDR 1		
ELECTRICAL	**ELECTRICAL**	
Bus Tie Control	Battery Relay Power	
Bus Tie Indicator	Battery Voltmeter	
ENVIRONMENTAL		
Cabin Air Temperature Control		
Cabin Pressure Control		
L Bleed Air Control		

TRIPLE FED BUS	HOT BATTERY BUS	STANDBY BATTERY
ENGINE	**ENGINE**	
Autofeather (Optional)	L Engine Fire Extinguisher (Optional)	
Fire Detector (Optional)	R Engine Fire Extinguisher (Optional)	
L Igniter Power		
L Start Control		
R Igniter Power		
R Starter Control		
FLIGHT INSTRUMENTS		**FLIGHT INSTRUMENTS**
Standby Attitude Indicator Gyro		Standby Attitude Indicator Gyro
Standby Altimeter Vibrator		Standby Altimeter Vibrator
FUEL	**FUEL**	
L Fuel Qty Indicator	L Fuel Boost Pump	
L Fuel Transfer Pump	R Fuel Boost Pump	
L Firewall Valve	Fuel Crossfeed Valve	
L Boost Pump		
R Fuel Qty Indicator		
R Fuel Transfer Pump		
R Firewall Valve		
R Fuel Boost Pump		
Fuel Crossfeed Valve		
	FURNISHINGS	
	MOD (Stereo - Optional)	
LANDING GEAR		
Landing Gear Control		
LIGHTS	**LIGHTS**	**LIGHTS**
	Entrance & Aft Dome Lights	Standby Altimeter Internal Lighting
		Standby Attitude Indicator Internal Lighting
		Standby Airspeed Indicator Internal Lighting
Cabin Flour Lights		
Instruments Indirect Lights		
Navigation Lights		

TRIPLE FED BUS	HOT BATTERY BUS	STANDBY BATTERY
PROPELLERS		
Propeller Governor Test		
WARNING/ANNUNCIATORS		
Annunciator Indicator		
Annunciator Power		
L Oil Pressure Warning		
Landing Gear Position Indicator		
Landing Gear Warning Horn		
R Oil Pressure Warning		
Stall Warning		
L Fuel Pressure Warning		
R Fuel Pressure Warning		
L Auxiliary Fuel Quantity Warning		
R Auxiliary Fuel Quantity Warning		
WEATHER		
L Pitot Heat		

STANDBY BATTERY POWER SUPPLY

The G1000 installation incorporates a 24 vdc, 5 Ah JET model PS-835 Standby Battery that provides electrical power for the standby attitude gyro, standby altimeter vibrator, and internal lighting for the three standby instruments for a minimum of 30 minutes following a total loss of aircraft power including the aircraft's battery.



A push button switch located directly below the standby airspeed indicator controls the standby battery power system. The switch is a push ON (switch latches in), push OFF (switch pops out) type of switch.

The system has three modes: OFF, ON, and ARM.

OFF — The system is OFF when the Standby Battery switch is popped out. There are no internal switch annunciators illuminated in the switch when the system is OFF.

ON (Amber) — Illuminates when the standby battery is powering the standby instruments. The Standby Battery switch must be latched 'IN' and the airplane has no source of normal electrical power for the standby battery to power the standby instruments. When the ON annunciator is illuminated, the standby battery will provide electrical power for the three standby instruments for at least 30 minutes.

ARM (Green) — The system is ARMed for automatic operation when the Standby Battery switch is latched 'IN' and the airplane is being powered by a normal source of electrical power. Normal source of electrical power includes the airplane's battery, or, at least one generator, or external power.

During normal operations, the standby battery is kept in a fully charged state by its own trickle charger powered from the triple-fed bus through the STBY AUX BAT circuit breaker located on the right side circuit breaker panel.

LIGHTING SYSTEMS

COCKPIT

An overhead light control panel, accessible to both pilots, incorporates a functional arrangement of all lighting systems. Each light group has its own rheostat switch placarded BRT – OFF. The MASTER PANEL LIGHTS – ON – OFF switch is the master switch for: PILOT PFD, STBY INSTR, MFD, OVHD PED & SUBPANEL SIDE PANEL CLOCKS, and COPILOT PFD.

PILOT PFD – Controls the brightness of the pilot's PFD.

STBY INSTR – Controls the brightness of the internal lighting for the standby attitude indicator, standby altimeter, and standby airspeed indicator.

MFD – Controls the brightness of the Multi-Function Display (MFD).

OVHD PED & SUBPANEL - Controls the brightness of the backlighting of the overhead light control panel and internal lighting of the overhead electrical gauges, throttle quadrant backlighting, internal lighting for pedestal mounted gauges, and the MFD Controller panel backlighting, and the subpanel backlighting.

SIDE PANEL – Controls the brightness of the backlighting of the right side circuit breaker panel, the left side circuit breaker panel and the fuel gauge panel.

CLOCKS – Controls the brightness of the clocks mounted in the pilot's and copilot's control wheels.

COPILOT PFD – Controls the brightness of the copilot's PFD.

Separate rheostat switches individually control the instrument indirect lights in the glareshield and overhead map lights.

An INSTRUMENT EMERG LIGHTS switch is located on the right side of the overhead electrical gauge panel. This switch turns on indirect lights under the glareshield. These lights are separate from the Instrument Indirect lights. The brightness of the Emergency Lights is not controllable. These lights are powered from the Hot Battery bus.

PITOT AND STATIC SYSTEM

PITOT

The pitot heads are the sources of impact air for the operation of the flight instruments.

A heated pitot mast is located on each side of the lower portion of the nose. Tubing from the left pitot mast is connected to the pilot's Air Data Computer (ADC1), and tubing from the right pitot mast is connected to the copilot's Air Data Computer (ADC2) and the standby airspeed indicator. The switch for the PITOT – LEFT – RIGHT – OFF is located in the ICE PROTECTION group on the pilot's right subpanel.

STATIC

The normal static system has two separate sources of static air, one source is connected to the pilot's Air Data Computer (ADC1), and the other source is connected to the copilot's Air Data Computer (ADC2) and the standby instruments. Each of the normal static air lines opens to the atmosphere through two static air ports; one on each side of the aft fuselage; four ports total.

An alternate static air line is also provided for the pilot's Air Data Computer (ADC1). In the event of a failure of the pilot's normal static air source (e.g., if ice accumulations should obstruct the static air ports), the alternate source can be selected by lifting the spring-clip retainer off the PILOT'S EMERGENCY STATIC AIR SOURCE valve handle, located on the right side panel, and moving the handle aft to the ALTERNATE position. This will connect the alternate static air line to the pilot's Air Data Computer (ADC1). The alternate line is open to the unpressurized area just aft of the rear pressure bulkhead. When the alternate static air source is not needed, ensure that PILOT'S EMERGENCY STATIC AIR SOURCE valve handle is held in the forward (NORMAL) position by the spring-clip retainer.

WARNING

The pilot's airspeed and altimeter indications change when the alternate static air source is in use. Refer to the Airspeed Calibration – Alternate System, and the Altimeter Correction – Alternate System graphs in Section 5, PERFORMANCE, of the airplane's original Pilot's Operation Handbook and FAA Approved Airplane Flight Manual for operation when the alternate static air source is in use.

There are three drain petcocks for draining the static air lines located below the side panel on the right sidewall behind an access cover. These drain petcocks should be opened to release any trapped moisture at each inspection interval or after exposure to visible moisture on the ground, and must be closed after draining.

Ground Communications

Ground communications is provided by the G1000 system by turning ON the airplane's battery and the Avionics Master switch. Com1 and the pilot's audio panel will be powered. The pilot may use the airplane's speaker and hand microphone or a headset for communication.

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Section 8 – Handling, Service, and Maintenance

Refer to Garmin G1000 Instructions For Continued Airworthiness, P/N 190-00682-01 Rev. A or later FAA approved revision for maintenance requirements for the G1000 system and components.