AVIDYNE

Entegra Integrated Flight Display System
Release 9.0 for Cirrus SR20/SR22

PILOT GUIDE

PAGE CHANGE LIST   Page   Change

TABLE OF CONTENTS

1 System Overview

FUNCTIONAL OVERVIEW

The Avidyne Entegra 9.0 flight display system supports the following functions:

- Primary Flight Display
- Flight Management System
- WAAS GPS Navigation
- VHF Radio Nav/Com
- Attitude and Air Data Sensors
- Moving Map
- Weather Datalink
- Traffic
- Lightning
- Electronic Approach Plates
- Engine Display
- Electronic Checklist
- Data Logging
- Caution-Warning System

The system has been designed for single-pilot IFR operation and features a **Page and Tab** user interface.

Functions revolve around the five **Page Function Keys** that appear across the bottom edge of the bezel. Each of the five functional pages has associated tabs, which contain related data, often in different views. These functions and tabs are covered in detail throughout this reference manual. The primary method for accomplishing a task will be outlined, and if applicable, alternative methods will be explained in the appendices. One consistent message that will be emphasized is the method and position of displaying data does not change between these different views and tabs. Avidyne strongly believes in the concept "Fly like you train and train like you fly". In other words, the same views used on a daily basis are identical to what is available during emergency and reversionary conditions.

The reversionary capability is inherent to the redundancy of the Integrated Flight Displays (IFD) and the dual-databus architecture. The system architecture allows selection of five separate display functions on any display. This eliminates the need for special reversionary display modes with reduced functionality, and reduces complexity and training requirements for the pilots.

BASIC CONCEPTS

PAGE FUNCTION KEYS

The 5 buttons along the bottom of the IFD bezel are called Page Function Keys. Each key is labeled by function:

- PFD (Primary Flight Display)
- FMS (Flight Management System)
- Map (Moving Map)
- SYS (System Pages)
- CHKL (Electronic Checklist)

Each page has a number of associated **tabs**. Each Page Function key has a left and right rocker nature to it. Select the page of interest by pressing the middle of the Page Function Key and navigate through the available tabs by pressing the left or

right side of the Page Function Key. Continue pressing one side of the function key to automatically step through the tabs.

Page Function Keys and Tabs

LINE SELECT KEYS

Line Select Keys, typically abbreviated to **LSK** in this manual, are the buttons found along the left and right sides of the bezel. A label, just inside the bezel – adjacent to the physical LSK, indicates the function of the LSK. Each LSK is capable of being individually backlit to help the pilot identify the correct LSK. Pressing the LSK either performs the labeled action or changes the state, which is indicated by the left and right arrows. These LSKs function by rocking left or right on the key. For the cases where there is a list of selectable options, browse the list in either direction by pressing the left or right side of the LSK. This becomes a time saving technique when trying to rapidly navigate a large list and minimizes time recovering from list overshoots by providing the ability to back up one selection.

LSK Types

- **State LSKs** – Right and left arrows indicate a list of choices. Traverse the list by rocking left or right on the line select key.

- **Action LSKs** – Pressing the LSK enables the action indicated on the label.

Addressable Line Select Keys On any given page only LSKs that can perform the labeled function are backlit. Keys that are non-functional are intentionally unlit. This is to visually "quiet" the display, reduce time searching for a desired button and also minimize extra pilot actions caused by inadvertently pressing the wrong button. This feature is especially useful at night in a darkened cockpit.

DISPLAY FORMATS

- **Half format** – The PFD attitude indicator, airspeed, altimeter and vertical speed indicators are always on the top half of the page. The bottom half of the page is dependent on which Page Function Key and tab are selected. Whenever the bottom half of the page is not a traditional HSI, the lower edge of the ADI has a perspective compass and Horizontal Deviation Indicator (HDI).

- **Full format** – The function selected (e.g. Map or Chart) takes up the entire screen. Associated line select keys can be pilot-selected to time out in preset durations or never.

- **Datablock format** – The left and right sides of the IFD are populated with various pilot-selectable datablocks.

- **Split format** – The IFD is split vertically, down the center, allowing two distinct functions to be displayed at the same time. Examples include Map-Chart and Map-FLP.

The **ND box** concept refers to the rectangular section on the lower half of the PFD pages. It is most noticeable on the PFD where the upper half is always a PFD view. The ND box is filled based on which Page Function Key is pressed along the bottom edge of the IFD bezel,

All pages are available at all times with only one key press.

ADI UPPER HALF

The system has been configured to recognize in which position each display is located in the cockpit. This means that the PFD will always display an ADI on the upper half of the display, regardless of which page function keys are pressed along the bottom of the bezel.

PRIMARY NAVIGATION SOURCE

The means of selecting which nav source is driving the deviation indicators on the PFD and HSI as well as the source driving the autopilot when the autopilot is in NAV mode comes from the Primary Nav LSK on the PFD. Choices are FMS, Nav1, Nav2.

The FMS will automate the Primary Nav LSK mode change from FMS to Nav 1-2 and automatically toggle the autopilot from GPSS to NAV on intercepting a localizer and conversely, toggle the autopilot from NAV to GPSS and change the Primary Nav LSK when going missed after an approach.

FULL ALPHA-NUMERIC KEYBOARD WITH DISPLAY

The system comes equipped with an alpha-numeric keyboard to assist control of navigation and communication. It has two rows of dedicated function keys along to the top edge that are grouped together in logical functions to include:

- Com Radio Selection
- Nav Radio Selection
- Auxillary Radio Functions
- Transponder Mode Selection
- FMS Shortcuts (Direct-To, Nearest, Procedures, Vectors)
- Map panning and control

The keyboard is the primary location to conduct all Com Tuning. It is also the primary location for autopilot target setting using the dedicated knob controls along the bottom edge. Nav tuning is automatic in this system in that the FMS automatically tunes all navaids that are part of the active flight plan. As a means of backup, manual nav tuning can be conducted from the keyboard.

The keypad is a QWERTY layout with a few special function buttons along the outer edges and a row of number keys along the top of the keypad.

Just above the keypad is a display that is split into two distinct areas: a semi-permanent display of the com and nav frequencies on the left half of the display and a set of user-configurable datablocks in the right half. This datablock area is temporarily replaced by a display that is relevant to the operation being performed on the keyboard (e.g. com tuning, transponder code input, autopilot target setting, FMS data entry, etc).

Keyboard

LIVE EDITS

All edits are "live edits" in that they are immediately applied. Examples include:

- Course Entry on PFD
- Com tuning on keyboard (new frequency becomes the active radio standby freq)
- Nav tuning on keyboard (new frequency becomes the active radio standby freq)
- Waypoint name entries in flight plans
- Autopilot targets (Altitude, Heading, Vertical Speed)
- Waypoint deletions in flight plans

OVERLAYS

The system supports overlays of data are controlled via the LSKs. Examples on the Map pages include being able to turn on or off:

- Datalink NOWrad weather displays
- Datalink Icing displays
- AIRMETS/SIGMETS
- METAR flags
- Flight Plan (on PFD HSI)
- CDI (on PFD HSI)

PANNING

The map pages support a panning capability. Using a joystick on the keyboard, any map page on the MFD provides the ability to pan anywhere on the map, zoom in or out as desired, hover over hotspots and see information boxes pop-up.

INTEGRATION WITH OTHER SYSTEMS

Integration is provided with other systems such as traffic awareness system (TAS), transponder, audio select panels and autopilot.

Traffic sensor data is permanently displayed on all map pages, the ND box and in a dedicated traffic thumbnail display. Traffic sensor modes and display ranges can be controlled through various LSK options.

The level of transponder integration depends on which transponder the airplane is equipped. If equipped with a remote-mounted Mode C or Mode S transponder, all transponder mode and code changes are commanded through the keyboard and this data is displayed prominently on the displays. If equipped with a panel mount transponder, most of the transponder mode and code control, as well as display, remain on the panel mount transponder.

The level of audio select panel integration depends on which audio panel the airplane is equipped. If equipped with an Avidyne-compatible PS Engineering PMA8000B Audio Select

Panel, the PFD displays the frequency and station identifier of the active com frequency just below the VSI in the primary field of view.

There are additional capabilities controlling the S-TEC 55X over previous Avidyne flight displays. In this system, the FMS will issue autopilot mode commands to/from NAV and GPSS as it follows along the active flight plan. This eliminates the need for manually pressing the autopilot control head buttons and reduces pilot workload in many flight scenarios.

CAUTION-WARNING SYSTEM

A caution warning system is provided in this system, comprising of a set of Master Caution "Warning" and "Caution" lamps in the primary field of view of the PFD; a system of Warning (red), Caution (amber), and Advisory (cyan) alert messages that are displayed to the pilot, and a dedicated page for display of all active alerts.

DATABLOCKS

As noted earlier in this section, many pages are presented in a datablock format on the MFD and keyboard. Data such as waypoint and nav data, com/nav frequencies, transponder codes, UTC or Local time, and engine parameters are all selectable for display in these datablock fields. The keyboard display is also configured to allow display of pilot-selectable datablock fields.

REDUNDANCY

Since both IFDs are identical pieces of hardware, running identical software, they are 100% interchangeable. These IFDs and keyboards are all interconnected via a dual, digital Databus. This means all sensor data is available to all IFDs, all the time.

External sensors (e.g. traffic, lightning, datalink, etc.) are connected to the basic system via one or both of the I/O "blades" and all IFDs have access to that information. The more sensors that talk directly on the digital Databus, the less the wiring required to support it, which translates directly to less weight and less complexity.

MODULAR DESIGN

This system was designed to be modular; modular in the overall architecture, hardware, software and from a packaging perspective. This approach produces future extensibility and provides Avidyne with flexibility in adapting the system to meet future needs.

DATABUS

One of the key modularity components employed in this system is the databus. This dual, digital databus is peer-to-peer, meaning it is not reliant on a single designated bus controller passing data serially to every component on board. Instead, every component individually passes data to the bus during a given time slot and selects the data it is only interested in seeing from other components.

For additional information on databuses and how they are relevant to the behind-the-scenes operation of the system, see this article "What's Next in Avionics" accessible via this hyperlink: http://www.avidyne.com/news/coverage.asp

A true dual-redundant peer to peer databus improves critical sensor and computation modules are not "daisy-chained" together in a manner that can create cascading failures. With a true dual redundant databus, single-point failures remain just that, single point failures. They do not adversely affect other vital, otherwise operational functionality.

A true dual redundant databus design means true reliability and redundancy. Unlike other systems that require complex, limited, and unfamiliar reversionary modes this offers double critical function redundancy via the dual redundant databus architecture.

HARDWARE MODULARITY

There is one spare modular avionics slot available for future functions. When new requirements emerge or hardware technology advances, a new module can be added or an existing module may be replaced with an updated one. This enables an easy upgrade path for existing aircraft in the field. The hardware modules have considerable unused processing, memory and communication bandwidth allowing for maximum functional

expansion without changing the existing hardware. In many cases, software upgrades may be accomplished without removing units from the aircraft.

The image below shows the back of an IFD and a close up view of the LRU blades that slide in.

The basic system consists of a FMS900w control panel, or "keyboard" (not shown), and two 10.4" IFD5000i Integrated Flight Displays ("IFDs") that are self-contained units with an internal card cage for LRUs; that means they are built with a number of slots designed to fit individual component LRUs. These LRUs can slide in and out of the IFD and include the ADAHRS, the WAAS GPS, the digital VHF radios, and the I/O interface.

LRU modules as part of an integral chassis

SOFTWARE MODULARITY

The software architecture is specifically designed to be partitioned and promote the advantages of higher levels of integration without compromising safety by generating the unwanted side effects of failure propagation.

DISPLAY ENHANCEMENTS

These new displays are a second-generation display system with enhanced characteristics over first generation displays systems and include:

- 768 x 1024 display resolution
- LED backlight technology
- 1000 nit brightness

CLEANING THE DISPLAY

If the IFD screen should become dirty due to fingerprints or dust, clean the screen using the following materials and methods:

- A clean, soft lint-free cloth such as 3M Ultra-Brite Cloth #2011 or similar
- A cleaning solution composed of de-ionized water or isopropyl alcohol (IPA). Use caution, as it is flammable. Always apply the cleaning solution directly on the cloth. Never spray cleaner directly on the screen.

AIRCRAFT CONFIGURATION MODULE

An Aircraft Configuration Module (ACM) stores all aircraft-specific avionics configuration information.

The ACM plugs directly into the back of an Integrated Flight Display and remains with the aircraft harness. This means if an entire IFD needs to be removed for service, or a replacement is re-installed, calibrations, aircraft configuration, and pilot preferences are automatically loaded into the replaced unit. This saves significant maintenance time and reduces the likelihood of data loss.

HOW TO USE THE REST OF THIS MANUAL

2 IFD configuration reference

When describing a function or behavior for a specific IFD, the term PFD and MFD will frequently be used. In this context, the left-most IFD will be referred to as the "PFD" and the right-hand IFD will be referred to as the "MFD".

Starting with Section 2, the manual is organized in a phase-of-flight order. Alerts, Failures and Setup chapters follow, ultimately ending with a number of appendices, which are organized by Page Function Keys.

When viewing the electronic version of this reference manual, there are several hyperlinks embedded in the text that provide easy links to more detailed material. Double clicking the hyperlink (indicated by underlined text) will automatically launch your computer browser to the appropriate location.

Similarly, there are several short videos embedded in the electronic version that add visual descriptions to the task or feature being discussed. These are indicated by the movie camera symbol in the proximity of the task or feature.

   The electronic version of this guide contains a video clip.

2 Normal Startup Sequence

SYSTEM POWER

The IFDs and keyboard will automatically start when the aircraft bus power is applied. BAT 1 will power the MFD and BAT 2 will power the PFD and keyboard.

After power application, the keyboard display will be visible as well as the Brt/Dim rocker key on the IFDs. Several seconds later, the IFD displays will begin to have indications.

There are no On or Off controls for the equipment, each IFD is regulated by a pair of circuit breakers. Both units would need to be disconnected in order to remove power and is not something expected to be performed for normal operations. The keyboard is regulated by a single circuit breaker and fed by the essential bus.

BRIGHTNESS CONTROLS

Each IFD has its own brightness control on the bezel to control the individual display brightness. Power-on brightness of both the IFD displays and the keyboard display will be 100% – there will be no need to increase display brightness. Bezel background lighting is controlled via the cockpit dimming controls/rheostats.

STARTUP INDICATIONS

During normal start up conditions, there are no special startup screens or displays that appear. The PFD will present an AHRS alignment box in the upper half of the display and the MFD will present the Initial Fuel view of the Engine tab. In these cases, the system has taken a "no news is good news" approach to startup.

The electronic version of this guide contains a video clip of a **Nominal Alignment**.

AHRS alignment time is approximately 2 minutes and 45 seconds from the time the AHRS alignment box is displayed on the PFD. The alignment state is updated during that process to provide

information on alignment status and indications of completeness. While early taxi is permitted prior to alignment for flexibility, Avidyne highly recommends that the aircraft remain stationary until the alignment of all AHRS are complete and the alignment boxes are replaced by the ADI.

Until an initial fuel state has been entered, all other bezel controls for the MFD are locked out. In other words, until an initial fuel value has been entered via one of the labeled line select keys along the right side of the bezel or via the right hand knob, no other pages or tabs can be accessed on the display. The image below describes the fuel entry options.

Fuel entry options
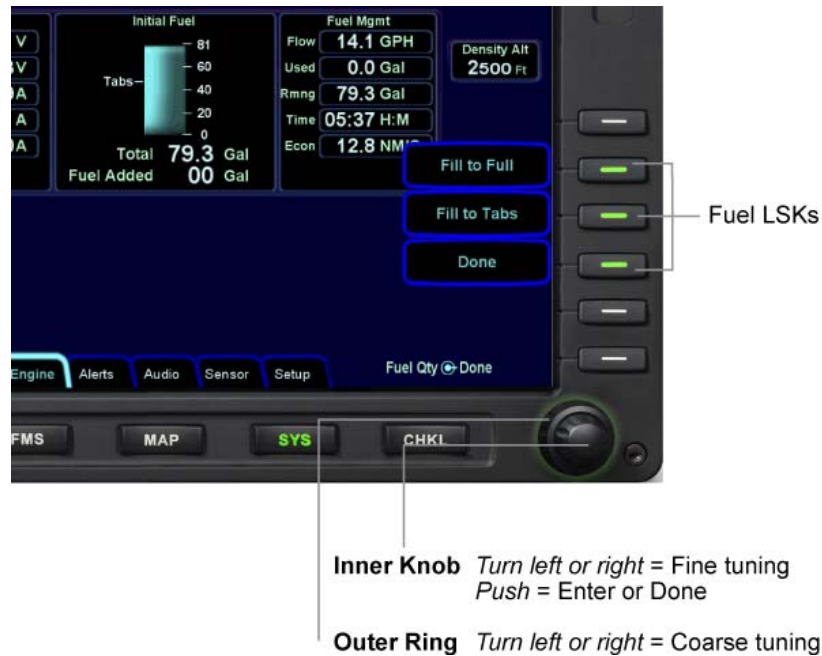
In the event that one or more of the displays has:

- An out of date data (e.g. expired Nav data, expired Charts data, expired Obstacle data) or
- A software mismatch between the IFDs

an information screen is displayed in place of the Initial Fuel view Engine tab. This behavior is covered in more detail in the System Alerts section of this guide.

COOL FEATURE

Home and Persisted Tabs As soon as the pilot has made the initial fuel entry, all tabs become "persisted". This means that the last tab selected on any given page will be retained, even if a different page is selected. For example, if the Split Map-FPL tab of the FMS Page Function Key is selected and then the SYS Page Function Key is selected, when the FMS Page Function Key is pressed again, the Map-FPL tab will still be the active tab. Each Page Function Key also has a Home tab that is automatically accessed if the Page Function Key is pressed and held for a few seconds. In this case, no matter what the active tab was, the page home tab will become the new active tab and the displays may re-format a little. Definitions of the page home tabs can be found in the SYS appendix.

---

3 Ground Operations

This section covers cockpit tasks that are typically performed during ground operations. Included are input of the local altimeter setting, performing start, taxi, and pre-takeoff checklists, proper monitoring of the engine and electrical systems, entering intended flight plan into the FMS and setting up the autopilot, radios and transponder in order to begin your flight.

All of the tasks mentioned can be done in several locations in this system. While things like the electronic checklist page and tabs, engine tab and FMS page and tabs can be fully accessed and performed on any IFD, this guide will cover the recommended method or location. A few alternative locations or methods will be described if they considered common or likely used by a large percentage of system users.

ELECTRONIC CHECKLIST

In single pilot operations, it is not practical to simultaneously run through the various checklists and perform navigational planning such as entering a flight plan. Therefore, pressing the "CHKL" Page Function Key on MFD will bring up a full-page electronic checklist page. Press the left or right side of the Page Function Key to select the appropriate tab. Use the right-hand bezelknob to scroll the checklist directory for the desired checklist (e.g. Preflight, Before Start, Start, Before Taxi, and Before Takeoff). Keep your hand on the right knob – use the knob rotation to scroll through the directory list and then push the knob to select the desired checklist.

Keep your hand on the knob and use the push action to complete or "un-complete" a step. This gives you a clear visual indication that all required checklist steps have been accomplished.

For planning purposes, a Performance tab provides exact wind components and aircraft performance data can be computed.

ENTERING A FLIGHT PLAN

Ground operations are the ideal time to enter the intended flight plan into the FMS. Enter your plan into only one of the IFDs. The data is automatically shared between them.

FMS BASIC CONCEPTS

Each leg of a flight plan has its own color-coded background designed to make the overall flight plan easier to read at a glance.

The origin and all airport waypoints are depicted with a blue background. The active leg of the active flight plan is always depicted with a magenta background. All other legs of a flight plan are depicted with a gray background.

Flight Plan Detail

There are two types of cursors – an insert cursor and an edit cursor. Rotate the "FMS" knob in the lower right corner of the keyboard to see the visual difference. The insert cursor will appear as a thin blue horizontal line that appears between flight plan legs. This allows you to insert new legs. The edit cursor appears as a wrap-around blue box that encircles the entire leg and allows you to edit an existing leg.

Insert Cursor

Insert Cursor –
Thin blue line

Edit Cursor

Edit Cursor –
Wrap-around
blue box
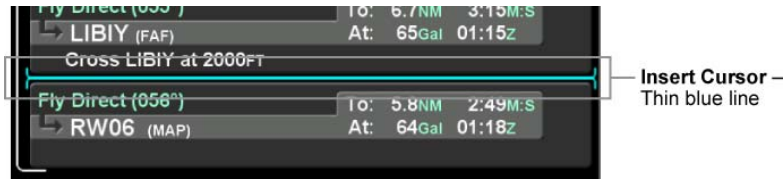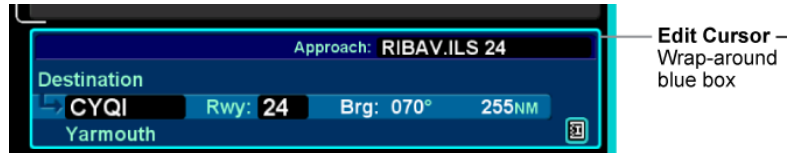
Individual fields within a leg can be edited by rotating the "FMS" knob that highlights each editable field within the flight plan. When the desired field is highlighted with reverse video, push the "FMS" knob to get into edit mode. Turn the knob as required to edit the value or type via the keyboard, then push the knob again to exit edit mode.

Using a combination of the push and rotation actions of the "FMS" keyboard knob, along with the dropdown boxes, an entire flight plan can be entered within seconds.

CREATING A NEW FLIGHT PLAN

The first time the "Flight Plan" tab of the FMS page is accessed on any given flight, an empty flight plan page is presented with the origin waypoint pre-populated. The origin will be the closest airport to the current GPS position, or the airport from the previous power down if GPS position has not locked on yet.

In almost every case, your hand can stay on the "FMS" knob. Through a combination of pushes and turns, you can enter the entire flight plan.

The electronic version of this guide contains the video clip for
Creating A New Flight Plan.

COOL FEATURE

Geofill™ is a geographic-based prediction algorithm
that significantly reduces the number of pilot actions
for entering waypoints. Usually after the first
character entry, the system uses existing characters
to determine the closest, and most likely, waypoint
based on your geographic position or existing flight
plan.

For those flight plans that have more legs than can be displayed
on a single page, a scroll bar is presented along the right edge of
the flight plan. It indicates where the viewable window is with
respect to the entire flight plan as well as where the active leg in
the flight plan is. In the image above, the magenta vertical
rectangle in the scroll bar indicates the active leg is just below the

origin. There are a number of flight plan legs out of sight below the bottom of the display.

COOL FEATURE

Expanding and Compacting the Flight Plan The "Flight Plan" tab of the FMS page provides a means to show every leg of the flight plan ("Expanded") or an abbreviated version of the flight plan ("Compact") via the "View" LSK. The compact view hides all intermediate legs of an airway between the entry and exit point. It also hides intermediate legs of published departures, arrivals and approaches such as step down fixes. The active procedure or airway is always expanded.

ACTIVATING A FLIGHT PLAN

While you always have the option to manually activate the flight plan via a LSK on the Flight Plan tab, the created plan on the Flight Plan tab will automatically activate on takeoff roll when a threshold groundspeed is achieved (which is approximately 40 knots). If you built the flight plan on the "Routes" tab, then you will need to manually activate it via the "Activate Flight Plan" LSK on the right side of the display.

SAVING/NAMING A FLIGHT PLAN

From the Routes tab of the FMS page, the current route, labeled Current Route, will be highlighted in magenta. If a valid origin and destination have been created in the flight plan (e.g. "KBED – CYQI"), the title will include these.

To edit the name of a flight plan, use the outer ring of the right bezel knob. Scroll up or down the flight plan list until the desired flight plan is highlighted by a surround cursor. By pushing the knob, the selected route will load and the route name field will be shown in reverse video. Using the keyboard, type the desired name. To accept the new route name press either the Enter LSK or the Enter button on the keyboard.

Saving a Flight Plan

COPYING A FLIGHT PLAN

From the "Routes" tab of the "FMS" page, first select the route
you wish to copy via the right-hand knob then press the "Copy"
LSK on the right side of the bezel. This will present the route
name in reverse video. You can either retain the pre-filled name
or type a new one via the keyboard. Follow by pressing "Enter".
Now use the "FMS" knob on the keyboard to scroll up or down the
flight plan and edit it as required. If no editing is required, you
have successfully saved or copied a flight plan.

INVERTING A FLIGHT PLAN

From the "Routes" tab of the "FMS" page, use the "FMS" knob on
the keyboard to scroll up or down the list of routes to the desired
flight plan. Press the "Invert" LSK. This automatically inverts the

flight plan and leaves the route name field highlighted in reverse video, allowing you type a new flight plan name, if desired.

USE OF THE ENGINE TAB

The engine tab of the SYS Page Function Key is designed to provide all necessary engine, electrical and related system information to enable safe operations. This page is commonly used during engine start and before takeoff run-up operations.

There are two typical techniques during engine start and pre-takeoff run-up. Putting the electronic checklist data on the lower half of the PFD via the "CHKL" Page Function Key and viewing the engine data in full screen format on the MFD via the "Engine" tab of the "SYS" Page Function Key. OR, reverse that setup and put the engine data on the lower half of the PFD and the electronic checklist data in full screen format on the MFD. The technique chosen is pilot preference.

Technique 1

Technique 2

In addition to the Engine tab, a datablock can be set to continuously display engine information from any datablock-format page-tab combination (e.g. Map+, Chart+, all FMS tabs, all Checklist tabs, etc.) on the MFD.

Engine exceedences are constantly monitored regardless of which pages and tabs are selected. If an exceedance occurs, the Caution Warning system will present a Master Caution Alert in the Primary Flight Display as well as an associated textual alert in the bottom right corner of each IFD. There is more information on this in later sections.

SETTING UP THE RADIOS AND TRANSPONDER

The keyboard is designed to be the primary location to perform all Com radio tuning and Transponder code input. Assuming you have entered your flight plan into the FMS, Nav tuning is automatically done for you via the FMS. Alternatively, all tuning can be done via the MFD but the system has been designed and optimized for keyboard operations.

As a constant reminder of the frequencies loaded into the radios, the top left and right corners of the MFD permanently display the active and standby frequencies (Com 1 in the left corner, Com 2 in the right corner). Similarly, the left half of the Keyboard display is reserved for permanent display of the active and standby frequencies.

COM TUNING VIA THE KEYBOARD

The top edge of the keyboard has two rows of function keys. The system will time out to the default "COM 1" function key within a maximum of 10 seconds. For those aircraft equipped with the PS Engineering PMA8000B audio select panel, the keyboard will time out to the same "COM x" function key as the active radio on the audio select panel. For example, if COM2 is selected in the audio panel, the keyboard com tuning button mirrors the timeout behavior. As long as one of the COM function keys is active on the keyboard, typing a com frequency via the alpha-numeric keys will populate the standby channel of the selected radio with that value. Shortcuts are provided to aid speed and ease of entering a frequency. For example, there is no need to type the leading "1" for frequencies, the decimal point, trailing zeros or the thousandths digit.

There are two quick ways to get the standby frequency into the active slot. Press either the "up & down arrows" key on the left side of the keyboard display or press the left knob of the MFD.

There are dedicated volume controls for each radio along the left edge of the keyboard display. Rotate the knob for volume and push the knob to toggle the squelch on or off.

TRANSPONDER MODE & CODE INPUT VIA THE KEYBOARD

When integrated with a remote mounted transponder (no dedicated transponder head in the instrument panel), the keyboard is the primary location for transponder squawk code selection. Start all transponder code changes by pressing the "XPDR" function key along the top edge of the keyboard. Use the keypad to type the desired squawk code. Once entered, the value will automatically become the active transponder value after a few seconds or press the "Enter" button on the keypad. Transponder

mode, IDENTand VFR functions all have their own dedicated function keys on the keyboard.

The transponder mode will automatically toggle to "ALT" on takeoff roll when a specific groundspeed is achieved and back to Standby or Ground on landing. The "Mode" button is only needed if you want to manually change the mode.

SETTING UP THE AUTOPILOT

Avidyne recommends setting up your autopilot target bugs before takeoff.

The keyboard has a dedicated knob along the bottom edge for Altitude and another for Heading. When integrated with a S-TEC 55X autopilot, the knob on the autopilot control head becomes your dedicated Vertical Speed control. This is a change from previous Entegra systems.

Setting up the Autopilot
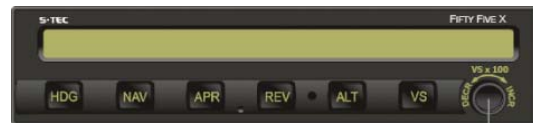
Designed primarily for speed, the keyboard knobs for Heading and Altitude have several useful behaviors. Rotating the knobs results in coarse control of that bug. For example, coarse control for Altitude means that each click of the Altitude knob changes the Altitude bug incrementally by 500'. Coarse control of Heading means that each click of the Heading knob changes the Heading bug incrementally by 10 degrees. In each case, pushing the knob and rotating it activates fine control (100' increments for altitude and 1 degree increments for heading). Pushing the knob without rotating syncs to the current aircraft state (altitude syncs to the nearest 100'). Finally, when the Altitude target knob on the keyboard has been activated, you can also type a specific number via the keyboard, enabling a specific Decision Height (e.g. 384').

Verify the autopilot is initialized as indicated by the "AP RDY" annunciation on the PFD and the "RDY" annunciation on the autopilot. if there are plans to use the autopilot in flight, per the S-TEC 55X manual, an autopilot test should be conducted.

Setting the Altitude Bug

Rotate to set Altitude Bug
– Rotate = 500ft increments
– Push and rotate = 100ft increments
– Rotate and then type numeric keys for 1ft increments

TAXI CHARTS

World-wide airfield diagrams are provided via the "Charts" and "Charts +" tabs of the Map page. By using a combination of the right-hand LSKs and right-hand knob from either of those tabs, the airfield diagram (if it exists), can be selected for display. An ownship symbol will automatically be superimposed on the proper location of that airfield diagram to aid in surface navigation. Use the MFD knob to zoom in and out.

ALTIMETER SETTING

On any IFD that is currently displaying an ADI, the dedicated "Baro" knob along the right edge of the bezel can be used to set the system barometric altimeter correction. Regardless on which IFD the baro setting is made, all IFDs will automatically receive the input. If the PFD pages are not displayed on an IFD, the "Baro" knob on that IFD is inactive. Any on-board mechanical altimeters will still need to be individually set.

4 Departure

DEPARTURE PROCEDURES

If your origin has a published departure, that procedure can be loaded into the FMS flight plan. It can then be coupled to the autopilot for either automatic flight guidance or flight director guidance. The image below shows an example of a published departure being selected in the flight plan. Use the "FMS" knob on the keyboard to scroll the cursors until the Departure field is highlighted. Push the knob to produce the dropdown list of available published departures. Continue turning the knob to select the desired departure from the dropdown list. Pushing the knob again enters the data into the departure field.

Departure Dropdown Box
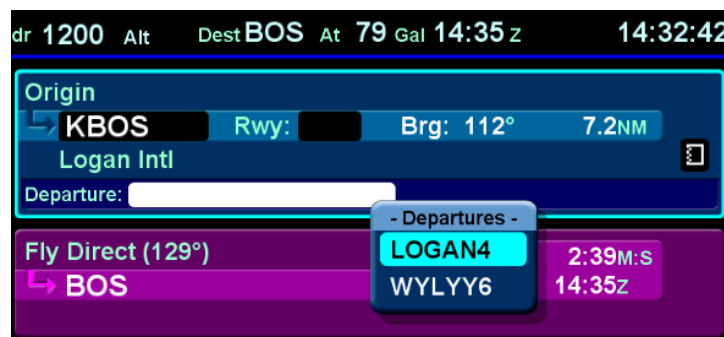
COOL FEATURE
Frequency List Pressing the "Freq List" function key on the keyboard will present a list of the most logical frequencies for your geographic position and phase of flight. If there isn't an active flight plan the list will use the nearest airport frequencies. The "FMS" rotary knob on the keyboard can be used to scroll through that list. By pushing the knob on your desired frequency, you've just nominated the frequency into the standby position of your active radio. Press the "up & down arrows" key on the

MFD, or press the "Swap" button on the keyboard, and it pushes that frequency into the active position of the selected radio.

Use either the "Freq List" function key to help find and tune the appropriate departure com frequencies or manually type the frequency in via the keyboard keypad and swap it into the desired radio.

Freq List

COOL FEATURE

Depiction of Traffic When connected to a traffic sensor, all traffic alerts and proximity alerts are depicted on the HSI view ("ND" tab) on the PFD, non-North Up map pages, and on the traffic thumbnail on all datablock format pages. Avidyne recommends selecting a datablock tab on the MFD. This ensures a dedicated traffic thumbnail is visible in a usable manner, no matter what the map range on the HSI or map pages may be set to. In all cases,

traffic alerts are also presented via the system
Master Caution alerting on the PFD and in a textual
format in the bottom right corner of each IFD.

Assuming your autopilot reference bugs were set up during
ground ops correctly, all that is required now is to activate the
autopilot in the desired mode after takeoff (e.g. HDG, ALT-VS for
climbing on an assigned heading to a desired altitude or
NAV/GPSS, ALT-VS for following GPSS guidance along the flight
plan while climbing to an assigned altitude, etc.).

Solid magenta bugs indicate the bug is coupled to, and being
used by, the autopilot or flight director. Hollow magenta bugs
indicate the bug is not coupled to, or being used by, the autopilot
or flight director.

COOL FEATURE

IFD integration with S-TEC 55X Autopilot The
integration with the S-TEC 55X autopilot has been
enhanced. As long as the desired flight plan is
entered into the FMS, autopilot mode toggling
between NAV mode and GPSS mode is automatic
on approaches and on published missed
approaches.

VSPEEDS ON ASI

Under high power conditions, the V_x and V_y labels are shown at the correct airspeeds for the Best Angle of Climb speed (V_x) and Best Rate of Climb speed (V_y). V_x and V_y are adjusted based on density altitude, as described in the Airspeeds for Normal Operations section of your aircraft Pilot Operating Handbook.

Under low power conditions, the V_G label displays the Best Glide airspeed as listed in the Airspeeds for Emergency Operations section of your aircraft Operating Handbook. If your aircraft POH lists Best Glide airspeeds for multiple gross weights, V_G is displayed as a range between the highest and lowest Best Glide airspeed. Consult the POH for the correct Best Glide airspeed for a particular gross weight.
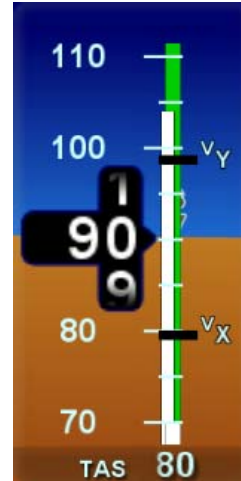
ENGINE INDICATION ON ADI

For reference, a % power indication of engine power is displayed on the left edge of the ADI. In aircraft still equipped with analog round dial engine gauges, this indication of power on the ADI is for reference only. In aircraft not equipped with analog round dial engine gauges, this indication of power on the ADI can be considered your primary engine power indication.

DEPARTURE SUMMARY

Your flight plan will automatically activate on departure roll, your transponder will automatically transition out of Ground (mode-S) Standby (mode-C) and into Alt mode and as soon you engage the autopilot, all mode transitions will automatically follow the FMS flight plan. The use of "Freq List" will allow you to quickly find the appropriate or assigned frequency and push it into the active com radio. There is no manual nav tuning required. When airborne with the flight plan loaded in the FMS, navigating should be as simple as "fly the magenta line".

Range to Altitude Indication A small green arc will be drawn on the map that depicts the geographic point where, at the current vertical speed, the aircraft will reach the altitude target (Alt Bug value). It will be removed from the map when current aircraft altitude is within 150' of the target altitude.

5 Cruise / Enroute

NAVIGATIONAL SITUATIONAL AWARENESS

A number of aids have been included in this system to assist your navigational situational awareness.

FLY THE MAGENTA LINE

From any of the Map or PFD page tabs and on half tabs, a moving map is presented that always contains a depiction of the entered FMS flight plan. The active or current leg is always shown in the color magenta and enables the "**fly the magenta line**" concept. By using the autopilot, this becomes a trivial task.

WIND VECTOR

A wind vector is displayed in the "ND box" of the "Nav Display" and "Bug Select" tabs of the PFD page and on half page maps. The arrow indicates the direction of the wind relative to the current aircraft heading. Expect a several second lag after coming out of a turn. The wind vector is useful in any phase of flight where you need to consider winds aloft. A combination of the wind vector and projected track line in navigation tasks can be used. Wind speeds less than 5 knots will be displayed as "Winds Calm".

PROJECTED TRACK LINE

The dashed gray line that originates from the aircraft's present position symbol on the HSI display and maps is a projection of the current ground track of the aircraft. By aligning the projected track line with the desired track, you remove the guesswork from determining proper crab angles for wind corrections.

HEADING HORIZON TICK MARKS

A series of heading indicators can be displayed along the horizon line of the ADI marking every 30 degrees. Cardinal directions are indicated by the letters N, E, S, W. The display of heading on the ADI can be turned on or off via the Display Setup tab.

BEARING POINTER

A bearing pointer can be turned on or off for display on the "Nav Display" or "Bug Select" tabs of the PFD page. It has it's own dedicated LSK for control of which nav source is used to drive the bearing pointer. It will also contain a snap vector (bearing or distance) to the waypoint or station selected. If you've selected a LOC or ILS for the source, a bearing pointer will not be displayed.

TOP DATA STRIP

The top of the MFD display contains a number of datablock fields, some of which are user-configurable. The top datablock is displayed on all but the PFD pages of that MFD. Therefore, one common technique is to select steering information to the current waypoint or next waypoint to be displayed in that datablock for continual navigational awareness. The setup and selection of the data to be displayed there is covered in Section 11, *System Setup and User Preferences*.

PRECISION FLYING

This section provides an overview of some of the features to produce precision flight performance.

OBTAINING LEVEL FLIGHT

If hand flying, you can obtain level flight by placing the apex of the yellow delta-shaped reference symbol on the horizon line in cruise conditions of approximately 6000' MSL and 160 KIAS. The pitch angle for level flight will vary with flight conditions such as speed, altitude, and weight. There is no manual adjust capability (i.e. parallax adjust).

ALTITUDE ALERTING

The altitude alerter provides an approach alert ("APPROACHING SEL ALT") when the aircraft altitude is within the approach limit (typically 1000') of the selected altitude. The approach alert includes approach limit and a highlighting of the selected altitude. At this point the altitude alerter considers the selected altitude to be captured and the deviation alert is armed.

The altitude alerter provides a deviation alert on the altimeter ("ALTITUDE DEVIATION") when the deviation alert is armed and then the aircraft deviates from the selected altitude by greater than the deviation limit. The deviation alert includes a text alert message near the altitude indicator while the deviation alert is active.

The behavior of the altitude alerter is the same whether the selected altitude is approached from below or above.

To reset the altitude alerter, set the altitude to the target altitude.

FLYING A CONSTANT RATE TURN

The proper technique for flying a constant rate turn involves using a combination of the turn indicator and the bank angle indicator.

Standard Rate Left Turn

Initiate the standard rate turn by banking to an initial angle of 20 degrees with reference to the bank indicator. Adjust the bank angle to standard rate by reference to the standard rate turn indicator. The tip of the blue rate of turn indicator displays the current rate of turn. The indicator is marked for ½ and full standard rate of turn. An arrowhead indicates a value beyond 1 ½ standard rate. Deviations from the intended bank angle are easy to notice with the wide horizon line.

USING TREND INDICATORS

Use the trend indicators to capture and maintain a desired airspeed and altitude by adjusting the pitch and/or power to the airspeed or altitude you want. This results in a smooth capture of the desired altitude or airspeed. The tip of the indicator displays

the predicted value to be reached in 6 seconds. An arrowhead indicates a value beyond the current tape field of view.

Trend Vectors

Rate of Change Tape
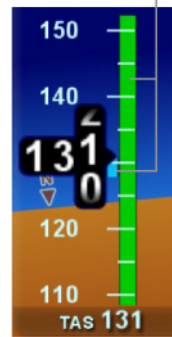
Normal   Excessive Rate of Change

ENGINE LEANING

For normally aspirated engines, select the "SYS" page and then "Engine" tab. From the Engine tab, select the "Start Lean Assist" LSK and follow the on-screen instructions for optimum engine leaning.

Engine Leaning

Lean Assist

USE OF THE MAP

The map has several formats and views. On the MFD, pages allow both a full map depiction as well as a datablock map depiction. In both cases, you have the ability to control the map feature density as well as the various overlays, all via the LSKs along the right edge of the bezel.

The active FMS flight plan is always overlaid on the map as are any traffic depictions.

COOL FEATURE

Next Leg Depiction on Map While the current leg of the active flight plan is always depicted in magenta on all moving maps, we've added an indication of the next leg using alternating magenta and white stripes. This "candy cane" indication can come in handy during such circumstances as teardrop entries into a hold pattern. It gives you a clear indication of what the system will do next. All future legs beyond the next leg will be depicted in white.

Turning the right-hand bezel knob (inner or outer ring) will result in a map range change. Pressing the knob cycles through the various map views. The map view selected is indicated at the top of the map next to the heading box. No indication means Heading Up. All other options are labeled next to that heading box.

DECLUTTERING THE MAP

The top LSK allows separate control of the information density of the land-based (Land) map features (e.g. terrain, political boundaries, rivers, lakes, oceans, roads, etc.) and the navigational-based (Nav) map features (e.g. airspace, Victor and Jet airways, airports, obstacles, navaids, etc.). Use the left and right sides of the governing LSK to select the preferred level of feature density. The level specified remains consistent across all map pages on the display on which it was set – each IFD can be configured differently.

PANNING THE MAP

There is a dedicated map panning joystick located in the top right corner of the keyboard. This 8-position joystick moves a cursor around the map and enables useful tasks such as panning ahead along your route, and determining bearing and distance of any object from your present position. Pop-up boxes offer information about an area of interest.

Keyboard Map Panning Joystick

These "hot spots" are all over the map and include every depicted Navaid, airport, and airspace, including TFRs. When the panning cursor is positioned over a hot spot for a few seconds, an informational pop-up box appears and contains relevant information about that hot spot. A few examples are depicted in the images on the next page. Note that in every case, there is a page count in the bottom right corner of each pop-up box. For those boxes that indicate more than one page, twisting the joystick switches between the various pages of the pop-up box.
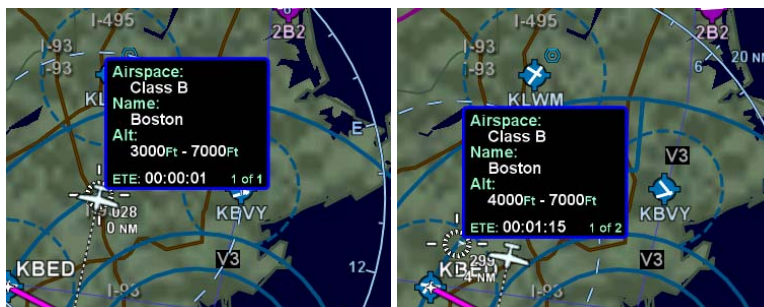
To enhance situational awareness during panning operations, a dashed line, or range ring, is drawn around the panning cursor and a read-out of the cursor's bearing and distance from ownship is immediately adjacent to the cursor. As long as there is no "hot spot" pop-up box displayed, twisting the joystick will result in a map range change. This is true regardless if you are in panning mode or not. Pushing the joystick removes the panning pop-up.

The electronic version of this guide contains a video clip of **Map Panning**.

Exit panning mode by either pushing the panning joystick or letting it automatically time out, which is approximately 20 seconds after the last joystick input.

COOL FEATURE

Fuel Range Ring The green fuel range ring depicted on the map provides a visual indication of the max range of the aircraft, allowing a 45-minute reserve. Winds are indirectly taken into account. The calculation uses groundspeed to compute the size of the circle and is based on the value of the fuel totalizer. The solid green circle indicates the total range without reserve. A wider dashed green circle indicates the extra range the reserve fuel should provide. The circle turns yellow indicating that only reserve fuel remains. The rings are always displayed and cannot be turned off.

FMS OPERATIONS

MODIFYING A FLIGHT PLAN

You can modify an existing flight plan in the FMS or create a new route while you are flying an existing one without affecting the existing active route. Several of the more common tasks are described below.

<table>
<tr><td>COOL FEATURE</td></tr>
<tr><td>

Vectors Mode Vectors mode can be used to temporarily divert off your flight plan (e.g. to fly around a weather buildup, airspace, or traffic, etc.) without having to modify your flight plan or come out of autopilot-controlled flight. When the "-V->" function key on the keyboard is pressed and the Heading knob is activated, a dashed magenta line is depicted on your moving map. The autopilot will follow that dashed line Vectors mode until the flight plan is re-intercepted or Vectors mode is deactivated. In skirting weather build-up or airspace scenario mentioned above, press the "-V->" button, and turn the Heading knob until the graphical depiction of the Vectors mode (the magenta dashed line) avoids the threat area, continue along that route of flight until it is time to dial in a new target Vector that re-intercepts your original solid magenta flight plan line. Notice an automatic curvature of the dashed Vectors line as it builds an "on-ramp" back to your solid magenta active leg line.

If vectors is commanded via the keyboard without an active flight plan, a message displays on the keyboard informing the unavailability of vectors mode until an active flight plan has been added.

</td></tr>
</table>

INSERTING A WAYPOINT

From any tab where the flight plan is displayed (e.g. "FMS" Page on PFD, "FPL" tab of FMS Page on MFD), a new waypoint can be inserted. Use the "FMS" knob on the keyboard to scroll up or down the flight plan until the insert cursor is positioned where the new waypoint is to be inserted. At that point, push the "FMS" knob to generate a drop-down box from the cursor position. Scroll up and down in that drop down box until you find the option you seek. Press the knob again on the desired option. If it involves typing in a waypoint identifier, start typing on the keypad. Note that Geofill™ will typically find the correct waypoint by the 2nd character.

The electronic version of this guide contains the **Inserting A Waypoint** video clip**.**

DELETING A WAYPOINT

From any tab where the flight plan is capable of being edited, use the "FMS" knob on the keyboard to scroll up and down the flight plan until the edit cursor surrounds the waypoint to be deleted. Press the "CLR" button on the keypad to delete the waypoint. Continue pressing the "CLR" button and it will walk up the flight plan deleting waypoints as you go. The other method is to press the Delete Waypoint LSK on the Flight Plan Tab.

The electronic version of this guide contains the **Deleting A Waypoint** video clip.

EDITING A WAYPOINT

From any tab where the flight plan is displayed, the "FMS" knob on the keyboard can be used to edit an existing waypoint. Using the MFD knob scroll up or down the flight plan until an edit cursor surrounds the waypoint to be modified. Use the inner ring of that knob to highlight one of the editable fields with reverse video. Pushing the knob provides a drop down box from which the changes can be made.

The electronic version of this guide contains the **Editing A Waypoint** video clip.

ADDING A VERTICAL CONSTRAINT

On virtually every waypoint, you can elect to assign a vertical constraint (e.g. cross the waypoint at or above a specific altitude, be at a specific altitude a specified distance prior to the waypoint, etc). This is accomplished by ensuring an edit cursor surrounds the waypoint of interest. Use the inner ring of the MFD knob or the "FMS" knob of the keyboard to highlight one of the vertical constraint fields of the flight plan leg. Push the knob and enter the desired value.

Vertical Constraint Fields

The only waypoints that do not permit vertical constraints are:

- Origin
- Destination, provided there is an approach loaded for it
- Missed Approach Point
- Altitude Terminated Legs

The electronic version of this guide contains the **Adding A Vertical Constraint** video.

CREATING A USER WAYPOINT

There are 4 methods of creating a user waypoint from the "User Wpts" tab of the "FMS" page:

- **Present Position** – Press the "PPOS" LSK to take snapshot of your current position. No further action is required.
- **Enter Lat/Lon** – Press the "NEW" LSK then use the "FMS" knob on the keyboard to select the lat/lon fields and

type in your desired coordinates via the keypad. Press the "Confirm" LSK to save that new waypoint.

- **Enter Place/Bearing/Distance** – Press the "NEW" LSK then use the "FMS" knob on the keyboard to select the place, bearing and distance fields. Type in your desired values via the keypad. This one allows you to pick an offset from a known waypoint as a new user waypoint. Press the "Confirm" LSK to save the new waypoint.

- **Use the Map Cursor** (pointer) – Ensure the PFD is displaying the "User Waypoints" tab of the FMS page and MFD is displaying one of the Map pages. Activate the map pointer by moving the keyboard joystick. At that point, a "Pointer" LSK will be displayed on PFD. Press that LSK when your map pointer is in the spot you want. As soon as the "Pointer" LSK is pressed, you will have made a new user waypoint.

Each user waypoint can be assigned a 5 character identifier that can be used in the FMS anywhere a nav database waypoint can be used. A longer description can also be attached to each user waypoint.

ENTERING AND INTERCEPTING A RADIAL

From the "Nav Display" or "Bug Select" tabs of the PFD page, the FMS Course function will allow the pilot to navigate To or From the active waypoint while the FMS is selected as the Primary Nav source. When the FMS is selected as the Primary Nav source the left IFD knob legend will be titled as 'Course'. Rotating the inner or outer ring will provide a new intercept course to the active waypoint. The DTK readout within the Primary Nav datablock will be replaced with CRS XXX, for entry of desired intercept course. Rotating the inner or outer ring while the course legend is displayed will activate the FMS course function. Pushing the center knob while in the course function will turn off the course function and return to desired track navigation.

Rotating the inner ring provides fine control, adjusting the course bearing by single degrees (1 deg/detent) and rotating the outer ring will incrementally change the course bearing by a factor of ten degrees (10 deg/detent).

Course mode makes the current waypoint act like a VOR. Select the desired radial to fly inbound or outbound. Adjusting the course

to or from the active waypoint will be reflected by the To/From flag as in a traditional HSI. The course deviation indicator will be presented in relation to the selected course.

The FMS Course function will always be armed (i.e. it will always intercept the flight plan) in a To intercept. If the airplane is in a From course, it will intercept only if the dialed course trajectory intercepts the flight plan. If the dialed course does not intercept the flight plan the airplane will fly that course indefinitely.

The FMS Course function will be exited when the airplane intercepts the active waypoint in a To intercept or when intercepting a downpath leg in the From case. Pressing the center knob while the course function is active will also cancel change to CRS. The FMS Course will remain active if a From course is dialed and the airplane does not intercept the FPL.

Vectors mode may be used in conjunction with Course mode. A To or From course can be intercepted on a selected heading using Vectors mode.

The electronic version of this guide contains the **Entering and Intercepting A Radial** video clip.

DELETING A FLIGHT PLAN

Select the "Routes" tab of the FMS page. By pressing the "Delete Current" LSK, a green dialog box pops up. Press "Enter" (or "Cancel") and the IFD will revert to the "Flight Plan" tab displaying no flight plan with an insert cursor flashing at the top of the page.

The electronic version of this guide contains the **Deleting A Flight Plan** video clip.

PERFORMING A DIRECT-TO

Direct-To can be accomplished at any time from any Page and Tab combination. Press the "-D->" Direct-To function key on the keyboard. This will automatically call up the "Flight Plan" tab of the FMS page on the MFD. A green Direct-To dialog box is displayed along the right edge of that page. Geofill™ provides the most logical choice of destinations in that dialog box. If that is the desired point, press the "Enter" LSK and that point automatically

becomes the active system waypoint. If that is not the desired point, start by either typing the intended Direct-To destination identifier into the keypad or use either the "FMS" knob on the keyboard or the right-hand knob on the IFD to scroll up or down the flight plan until the intended Direct-To destination is present in the green Direct-To dialog box. Press the "Enter" LSK.

Direct-To Technique 1

Direct-To Technique 2

There is also a Direct-To (-D->) LSK on most of the FMS tabs (Flight Plan, Info, User Waypoints, Nearest). Press the corresponding LSK, the green Direct-To dialog displays. Options are the same when using the -D-> on the keyboard.

Canceling a Direct-To is as easy as placing the edit cursor over the Direct-To waypoint of interest and pressing the "Delete Waypoint" LSK. Once a Direct-To entry has been accepted, it becomes a standard waypoint in the plan. Canceling it is the equivalent of deleting any other waypoint.

CREATING A HOLDING PATTERN

A hold can be put on any waypoint that has a fix terminated leg – waypoints that terminate with a lat or lon position such as navaids, enroute waypoints, user waypoints, airports, etc. Legs that terminate at an altitude, DME distance, radial crossings, etc. do not support attaching a hold.

By using an edit cursor on the flight plan, push the "FMS" knob on the keyboard, or the right-hand knob on the IFD with FMS displayed in to generate a drop down list of options. Near the top of that list, you will see "Hold at <waypoint name>". Scroll to highlight that drop down list entry and push the knob again. You have just added a holding leg, populated with standard hold data.

Alternatively, you can use an insert cursor by positioning it where you want to insert a hold in your flight plan. Push either the "FMS" knob or the righ-hand MFD knob. Note that a hold is available via the drop down list. Scroll up or down the dropdown list as required and push one of the knobs to insert a hold flight plan leg.

The electronic version of this guide contains the **Creating A Holding Pattern** video clip.

DELETING A HOLDING PATTERN

To delete a holding pattern in your flight plan, use the "FMS" keyboard knob or the right MFD knob to scroll as required to create an edit cursor surrounding the holding leg, then press the "Delete Hold" LSK.

EDITING A HOLDING PATTERN

Position an edit cursor around the holding leg of interest in your flight plan. Use the inner ring of the MFD knob or the "FMS" knob on the keyboard to highlight the desired field (e.g. turn direction, leg length, leg units, inbound leg course) and make your edit. Any changes made will immediately be applied.

Procedure Turn with Course Reversal

FLIGHT PLAN SEQUENCING

The FMS assumes that the pilot will attempt to fly the flight plan
as defined. If that does not occur, legs may not sequence as
expected. Therefore, to manually sequence the desired leg,
select it and press "Activate Leg".

LATERAL OFFSETS

The system supports a capability to create and fly a lateral offset
from your flight plan. From the "Flight Plan" tab of the FMS page,
press the "Offset Route" LSK and use the right-hand knob on the
IFD to dial in the desired offset. Use the outer ring for coarse
control (1 nm increments) and the inner ring for fine control (0.1
nm increments). Rotate the knob left for left offsets and right for
right offsets. Once the intended offset has been entered, press
the "Confirm Right/Left x.x NM" LSK. At that point, the original
LSK will indicate "Offset Route Right/Left X.X NM". To delete a
lateral offset, press the "Delete Offset" LSK. The maximum offset
that can be dialed in is 20 NM. Lateral offsets are not available
when in OBS mode.

The electronic version of this guide contains the **Lateral Offsets** video clip.

GAPS OR DISCONTINUITIES IN FLIGHT PLANS

A "Gap In Route" will appear within the flight plan when there is a discontinuity between legs. A discontinuity is an informative row that appears when the FMS cannot compute the guidance to the next leg due to an invalid leg type combination based on a preset guidance rules. The objective is to inform the pilot that the Gap must be manually closed if you wish to sequence to the next waypoint. Otherwise, the leg before the Gap will not be sequenced and guidance will not be provided to the next waypoint. If desired, close the gap by placing the cursor on it. Press the CLR key or the R5 LSK on the Flight Plan tab, "Connect <wpt1> & <wpt2>". Closing a Gap connects the waypoint prior to the Gap with waypoint that follows by a direct (straight) leg.

Connecting Gap and Route
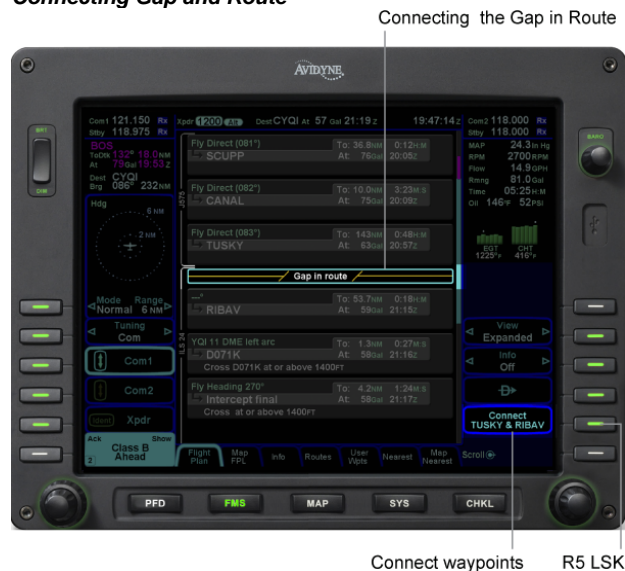
USE OF NEAREST FUNCTION

Nearest is available as a button with keyboard or one of two FMS pages.

Method one is to press the "NRST" function key on the keyboard. By doing so, the MFD will switch to the split Map-Nearest tab of the FMS page. The left side of the split page is the map and the right side is the Nearest list of Airports. As that list is scrolled up or down via the right-hand bezel knob, the associated airport or fix is highlighted in reverse video blue on the map. This provides a powerful graphical indication of the element in relation to ownship and other map features. Each subsequent push of the "NRST" function key cycles through the list of nearest elements in the following order:

- Airports nearest to present position
- Airports nearest to destination
- Nearest VORs
- Nearest NDBs
- Nearest Intersections
- Nearest ARTCCs
- Nearest FSS

You may also manually select either the "Nearest" or "Map Nearest" tabs of the FMS page and cycle through the list from those tab/pages.

If GPS position is not available, an error message is displayed.

DATALINK OPERATIONS

BROADCAST DATALINK

The Broadcast link is a transmission to your aircraft via the WSI/Sirius system to the integrated Avidyne MLB700. Broadcast Datalink requires a fixed monthly subscription and the receiver receives WSI-provided weather data continuously. You can control display of the received data on the various moving map pages.

WSI provides US RADAR, METARS, TAFs. Product availability depends on the level of WSI subscription chosen.

DATALINK RADAR

Diagonal stripes show the Datalink radar data coverage area. In normal operation the boundary follows the outline of CONUS. If, however, Datalink radar is unavailable in a particular area for any reason, the hatched lines appear in that area. In the mountains and off the coast, hatched lines may represent no coverage below 10,000 feet. If there are radar returns in that region above 10,000 feet, the returns will be displayed as "islands of precipitation" surrounded by the hatched lines.

The Datalink radar is a composite image depicting precipitation as seen by multiple ground-based weather radar sites. The image is color-coded to show intensity levels and precipitation types.

Weather Data Legend
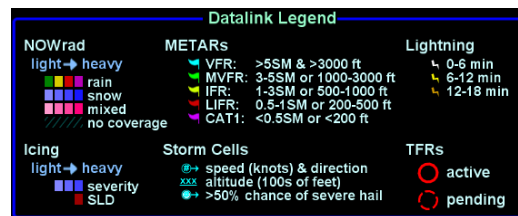
At large map ranges beyond 250nm from the aircraft, small areas of high-intensity NOWRad returns may not be displayed; instead, larger areas of surrounding lower-intensity NOWRad returns will be shown.

The "Wx Overlay" key in the map pages cycles through the layer combinations that can be "turned on or off". The options are "NOWrad"," NOWrad +", "Icing", "Icing +", and "Off". The "NOWrad" term is the WSI-branded name that represents an enhanced NEXrad image. The "+" suffixes indicates display of storm cell information that include cloud tops, directional and speed vectors, and hail prediction.

When either of the Icing options is selected, another LSK is presented from which the desired altitude slice of icing data can be selected.

Depending on your Broadcast Datalink subscription, Broadcast Datalink may provide lightning strike data, allowing the Map page to add "Datalink" as a source of strike data that is controlled by the "Lightning" key. The actual weather products delivered depend on your satellite weather subscription plan and your region of the world.

Icing and Lightning LSKs
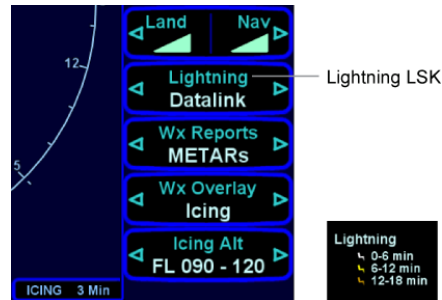
When Datalink lightning data is available, the "Lightning" key on the map pages cycle through the options, "Datalink", "Strike", (and "Cell" if WX500 is installed) and "Off". These are intended to represent the lightning data source ("Datalink" indicates satellite broadcast data source, "Strike" indicates an on-board lightning sensor source, and "Off" turns those layers off from display).

Note that when there is an on-board lightning sensor selected (Avidyne TWX670 Tactical Weather System or L3 WX500 Stormscope), the "Lightning" key becomes a split labeled LSK. The left side of the LSK is the "Clear Strikes" function and the right side of the LSK is used to change the source between onboard Datalink or Off.

Lightning Key Splits to Clear Strikes and Ltning Strike
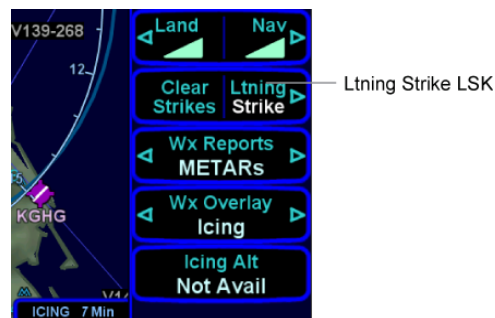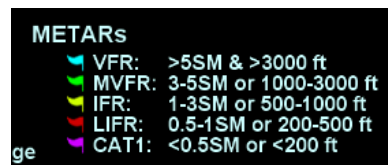
WEATHER REPORTS

The "Wx Reports" key provides a means to control display of other weather-related data on the Map. The choices include "METARS", "AIR/SIGMETS", "All", "Off".

- **METARs** – These are available in both text and graphical formats and represent recent surface weather observations. Text METARs are presented on the "Info" tab of the "FMS" page. The graphical METARs are color-coded flag symbols that summarize a recent surface weather observation and can appear as overlays on the Map and embedded in the flight plan on the Flight Plan tabs and Nearest tabs. These flags allow an overview of general weather conditions in an area.

Graphical Metar Legend

- **AIRMETs and SIGMETs** (US only) – These are areas which the National Weather Service has issued advisories for various types of hazardous weather. They are depicted on the Map page along with an abbreviated description of the hazard, such as "ICE" (icing), "MTN" (mountain obscuration), or "IFR" (instrument flight conditions).

COOL FEATURE

METAR Flags in Flight Plan The right edge of each leg in a flight plan presents a METAR flag for the closest reporting station, if the station is different from the previous leg's station. The station for which the METAR flag applies is decoded immediately beneath the flag and may not be exactly the same location as the leg itself.

TFRS

TFR data is also transmitted via Broadcast Datalink. There are two types of TFRs depicted – active and pending. Active TFRs are depicted as solid red lines and Pending TFRs are depicted as dashed red lines, which become solid when the TFR transition time rolls from pending to active. TFRs are always displayed.

INDICATIONS OF DATA AGE

As noted above, there are multiple products that are transmitted as part of the Broadcast Datalink. They can come in at different rates and so to provide an easy to use indication of data age, two indications are provided at the bottom of each map. The bottom left corner of each map depiction provides a METAR data age and the bottom right corner provides radar (NOWrad) age. If a Datalink Icing product was selected for map display via the "Wx Overlay" key, the radar age is replaced by the icing altitude age that is currently being displayed.

Data Age: Metars and Icing

USE OF VECTORS MODE

Vectors mode can be used as a way to temporarily divert off your flight plan (e.g. fly around a weather buildup, fly around an airspace, etc) without having to modify your flight plan or change autopilot mode. When the "-V->" function key on the keyboard is pressed and the Heading knob is activated, a dashed magenta line is depicted on your moving map. The autopilot will follow that dashed line Vectors mode until the flight plan is re-intercepted or Vectors mode is deactivated. In the skirting weather build up or airspace scenarios mentioned above, press the "-V->" button, and

twist the Heading knob until the graphical depiction of the Vectors mode (the magenta dashed line) avoids the threat area: Continue along that route of flight until it is time to dial in a new target Vector that re-intercepts your original solid magenta flight plan line. Notice the automatic curvature of the dashed Vectors line as it builds an "on-ramp" back to your solid magenta active leg line.

The electronic version of this guide contains the **Diverting off Flight Plan with Vectors and Re-intercepting the Solid Line** video clip.

AUTOPILOT OPERATIONS

While all modes of the S-TEC 55X are available, Avidyne recommends maximizing use of the FMS and autopilot GPSS mode combination. Select a vertical mode such as Altitude Hold – let the automation reduce your workload and result in a safer, more enjoyable flight.

The top edge of the ADI will continually present annunciators that reflect the current state and mode of the autopilot.

PFD Autopilot Annunciator

6 Arrivals/Approaches/Landing

Avidyne recommends that you enter the arrival and approach for the destination airfield, and alternates into the FMS flight plan. Selecting a published arrival and/or approach will automatically load the procedure including all altitude constraints into the FMS.

Take advantage of the system to stay ahead of the airplane by using the Baro knob to set system altimeter setting, using the wind vector for arrival planning, and the electronic checklists and various map views.

ENROUTE DESCENTS

A top of descent marker (TOD) is drawn on the map, giving a clear visual cue when it is appropriate to begin the enroute descent. It is based on the vertical constraint associated with a downpath waypoint, or destination elevation if there is no vertical constraint.

Top of Descent Marker

Once the descent has begun, the Vertical Speed Required (VSR cue on the Vertical Speed Indicator (VSI) can be used.

VSR Green Diamond

> **COOL FEATURE**
>
> **Vertical Speed Required** When a vertical constraint has been added to the flight plan for the next leg, a green VSR cue is drawn on the VSI. By matching the actual VSI with the VSR, you can be assured of meeting the entered vertical constraint. This becomes trivial when using the vertical speed mode of the autopilot.

> **COOL FEATURE**
>
> **Enter Approaches for Multiple "Destinations"** The FMS will allow multiple airfields or destinations to be built into the flight plan. Each can have the published approach and missed approach as part of the plan. This is useful in pre-building your primary destination with a missed approach, expected alternate and its published approach. Similarly, a training flight with multiple intended approaches and locations can all be created in a single flight plan, before takeoff.

ENTERING AN ARRIVAL AND APPROACH

From any tab where the flight plan is capable of being edited, use the "FMS" knob on the keyboard to scroll up or down the flight plan as required until the edit cursor surrounds the waypoint that a published arrival and/or approach is to be entered. Twist the "FMS" knob until either the arrival or approach fields are reverse

video. Push the knob to generate a dropdown list from which to select the desired arrival and/or approach. As soon as one is selected, the arrival or approach field displays the name of the selected procedure and new legs are automatically added to the flight plan. A labeled white vertical line then brackets the procedure in the flight plan as another visual cue that the procedure is part of the flight plan.

Adding an Arrival
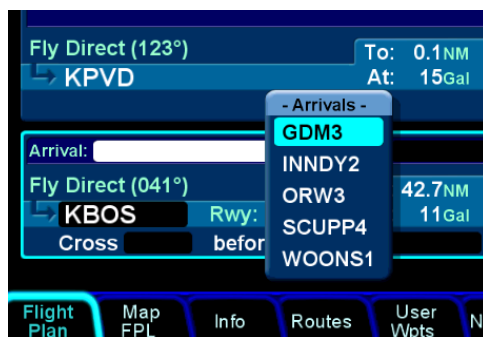
Approaches Dropdown Box

Procedures Brackets

The electronic version of this guide contains the **Entering An Arrival and Approach** video clip.

PROC button The "PROC" function key on the keyboard acts as a shortcut for attaching a published arrival or approach procedure to a waypoint in your flight plan. It can be used at any time. The first press of the function key results in the MFD displaying the "Flight Plan" tab of the FMS page with the Approach field of the next destination after the active leg highlighted in reverse video and a drop down box of available published approaches listed. Pressing it a 2nd time will step the reverse video over the Arrival field and present a drop down box of available published arrivals. Each subsequent press of the "PROC" key will step through all following destination airfields approaches and arrivals in the flight plan and wrap back around to the top of the flight plan. When you've got the drop down box over the intended field, use either the "FMS" knob on the keyboard or the right-hand knob on the IFD to scroll up or down the list until the desired procedure is selected then push that knob in to add that procedure to the flight plan.

If there is no flight plan, then pressing the "PROC" function key will present the "Flight Plan" tab on the MFD with an insert cursor at the top of the page but will not present any procedures.

The electronic version of this guide contains the **Proc Key Stepping Through Process** video clip.

USE OF THE SPLIT PAGES

While they can be extremely useful in many phases of flight and scenarios, the split pages are especially helpful during arrivals.

A chart extent box is drawn on the map and represents the geographic boundaries of an instrument approach plate

associated with a FMS destination. When the ownship symbol crosses the boundary of the chart extent box, this is a good time to switch over to the split Map-Chart tab.

Chart Extent Box

The Map-FPL split tab on the FMS page presents the moving map on the left and the FMS flight plan on the right. This can be most useful to instantly correlate your flight plan with the graphical depiction on the map. This aids in error reduction and helps visually see options for diverts, weather avoidance, etc.

COOL FEATURE

Hot Links to Charts in Flight Plan Whenever a flight plan leg (blue airfield legs) has at least one published approach associated with it, a chart icon is presented on the right edge of the flight plan leg. If there is a published precision approach, the icon will also contain an "I". By using the "FMS" knob on the keyboard, or the right-hand knob on the IFD, scroll through the flight plan elements until the chart icon is highlighted in reverse video. If, at that time, the knob is pushed in, the MFD will display either the specific

---

chart for that associated procedure or the directory
of possible procedures for that airfield.

Hot Links to Charts
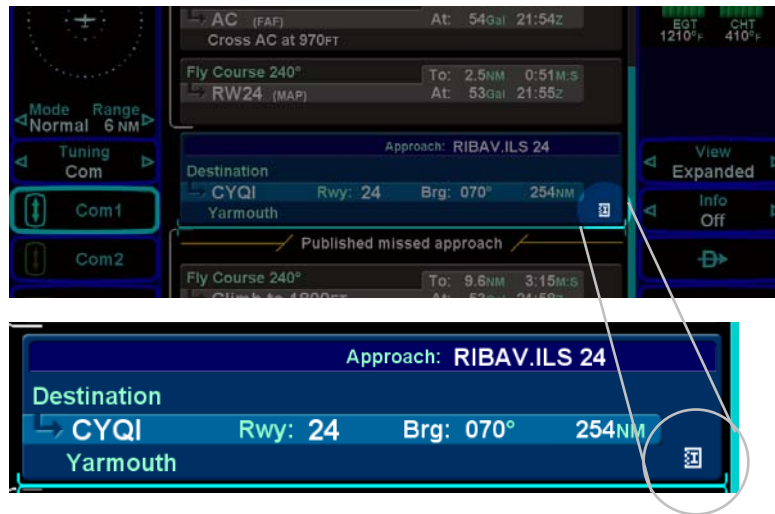
FLYING AN AUTOPILOT COUPLED APPROACH

Ensure the approach has been entered into the FMS flight plan
and that it is currently active. If the autopilot had been engaged in
either NAV or GPSS mode and one of the vertical modes (Alt
Hold, Alt Capture, VS Hold) prior to starting the published
approach, there is little extra you must do.

The inbound course will be automatically set for you, including on
localizer or ILS approaches where it is just for reference. In every
case, the CDI deflection will be driven by the localizer signal itself,
regardless of the course setting.

The HDI and VDI will automatically display on the ADI when the
appropriate localizer and glideslope signals are received.

On all approaches, upon reaching the Final Approach Fix (FAF),
ensure that the correct baro is entered in both the IFDs and
standby altimeter. Also verify the IFD and standby altimeter
indicate the same altitude.

PRECISION APPROACHES

The FMS will automate the Primary Nav LSK mode change from FMS to Nav 1-2 and automatically toggle the autopilot from GPSS to NAV on intercepting a localizer. Conversely, it will toggle the autopilot from NAV to GPSS and change the Primary Nav LSK when going missed after an approach.

Any step down fix altitudes associated with the approach will be published as a leg in the flight plan. Avidyne recommends that you set the Altitude Bug to the published approach decision height to serve as a visual reference during the approach.

NON-PRECISION APPROACHES

Non-precision approaches are just as easy with this system. As with the case in precision approaches, as long as the published approach is entered into the FMS as part of the active flight plan, the inbound course and all switching between NAV and GPSS is done automatically. Non-precision approaches can make good use of the VS mode of the autopilot. Set the VS Bug at the desired descent rate (the VSR can provide an accurate cue), and consider using the autopilot to generate a controlled descent to the MDA. The Altitude Bug can be set to a desired intermediate level off altitude or the MDA as a visual reminder. Use VS + ALT on descents.

BACK COURSE APPROACHES

This system is designed to fully support flying back course localizer approaches. To perform a back course approach, ensure the Primary Nav LSK has selected "Nav1" or "Nav2" and the front course value is set via the Course Set knob (left hand IFD knob). Alternatively, if the published back course approach is entered into the FMS, all of the above is done automatically.

As soon as the system determines that it is established on the back course localizer, the HDI source label indicates "LOC BCRS" and both the HDI and CDI display correct sensing. For autopilot-coupled approaches, the REV button will need to be pressed. There is no further pilot action required.

WAAS APPROACHES

When "FMS" has been selected as the source in the "Primary Nav" LSK, and one of the GPS approach types (LPV, L/VNAV, LNAV+V) is the selected approach, the ADI will provide horizontal and vertical guidance by means of the HDI and VDI.

There are several types of WAAS approaches:

- **LNAV (Lateral Navigation:** Provides lateral (horizontal) guidance only, with standard GPS precision of 0.3 NM full-scale deflection. This is essentially the same as a non-WAAS GPS approach. It is flown as any other non-precision approach – descend to MDA, drive at MDA altitude to the MAP, and execute the missed approach procedure if the runway is not seen from a position from which one can land using "normal maneuvers and a normal rate of descent.

- **LNAV+V (Lateral Navigation with Vertical Information** This mode provides the same lateral navigation as LNAV, but presents an ILS GS-like presentation on the VDI. The GPS draws a 3-D picture of the approach based on crossing the FAF at the depicted altitude. Then it follows a glidepath from the published approach, which is typically a 3 degree angle to the touchdown zone. This type of approach remains a non-precision approach and does not consider any step-down limitations.

  For this approach type, a manual coupling to the autopilot is permitted. Prior to FAF the NAV (or APR) button on AP must be pressed. After doing so, the AP switches from NAV GPSS to NAV/APR and GS will arm (if below GS and within 50% LOC beam). Then fly coupled to MDA.

- **LNAV/VNAV (Lateral Navigation with Vertical Navigation)** In this mode, the GPS provides lateral navigation, providing more accurate guidance than regular LNAV but easier to follow indications than a localizer. The vertical navigation is driven by GPS signals. LNAV/VNAV approaches are operationally different from LNAV+V in that the glide path is protected from obstructions and is no need to worry about step down fixes. Also, the minimum altitude presented is a decision altitude/height (DA/DH) – DA being what is on the altimeter, and DH being the

height of the DA above the touchdown zone elevation. This is not a MDA, thus, fly it just as though it were a precision approach. Follow the glide slope needle just as though it were an ILS GS and continue all the way to DA before initiating a missed approach.

This type of approach is automatically coupled to the autopilot meaning that somewhere in the vicinity of the FAF, the FMS will automatically toggle the autopilot mode from GPSS to NAV/APR and GS will arm (if below GS and within 50% LOC beam if in ALT).

- **LPV (Localizer Precision with Vertical Guidance)** The lateral guidance is significantly more precise than LNAV, equivalent to that of a localizer, except easier to fly. A vertical guidance is provided to minimums as low as 250' AGL above the touchdown zone. Lateral tolerance starts out at 0.3 NM full-scale (slightly tighter than a localizer at the FAF), transitioning to 350 feet either side at the runway threshold (slightly looser than a localizer). The steering remains linear all the way so you don't get the difficult to follow swings of a real localizer close in. The vertical guidance is precise and has a DA/DH (shown as "DA(H)" on Jepp charts) rather than a MDA.

  This type of approach is also automatically coupled to your autopilot. This means, in the vicinity of the FAF, the FMS will automatically toggle the autopilot mode from GPSS to NAV/APR and GS will arm (if below GS and within 50% LOC beam).

If the FMS has determined that satellite coverage is insufficient for use of GPS as the primary navigation source, a Caution is provided.

For non-precision GPS approaches, the ADI will provide horizontal guidance by means of the HDI:

- "FMS" will be annunciated next to the HDI to indicate that GPS is the navigation source
- Full scale deflection is 1.0 NM since the navigation mode is Terminal

To fly an autopilot-coupled GPS WAAS approach, do the following:

- Ensure the autopilot is in GPSS mode (if the WAAS approach were part of the flight plan, the FMS will automatically toggle the autopilot to GPSS mode)

- When established on final, the FMS will command the autopilot to change to NAV APPR (APR) mode with the GS mode armed for capture

- As the glide path is approached, GS mode will become active to follow the GPS generated glide path. This behavior is similar to the glide slope function of an ILS approach.

COOL FEATURE
PFD L5 LSK Think of the L5 LSK on the PFD as your "hook" into the FMS. The button changes functionality based on the phase of flight or instrument procedure you are on. This provides a short cut to accomplish actions per the table below.

L5 LSK Label	Comments
Fly Vectors	By pressing this LSK, Vectors mode is enabled. Vectors will not intercept approach legs past the FAF.
Arm Intercept	Appears when in Vectors mode and the intercept is not armed. Select this when you wish to use the automation to create a smooth intercept of the final approach course.
Disarm Intercept	Once an intercept has been armed while in Vectors mode, you can select this if ATC has not cleared you for the approach and you need to continue on the vector heading through final.
Activate Approach	Displayed if either the next downpath approach in the flight plan is preceded by a discontinuity (gap in flight plan) and the aircraft is within 40 nm of the FAF OR the next leg of the flight plan is the first leg of a published approach and there is a discontinuity or a Vectors-To-Final arrival selected.

Retry Approach	Displayed when the active leg of the flight plan is part of a published missed approach and you were conducting a Vectors-To-Final approach. Selecting this option will put the FMS back into Vectors mode to retry the Vectors-To-Final approach. This option will not be displayed if you were conducting a full published approach.
Enable Published Missed	Displayed when the next leg of the flight plan is the first leg of a published missed approach. Typically this occurs immediately after the FAF. Pressing the LSK will activate the published missed approach for that approach if it is in the flight plan.
Continue/Exit Hold	Displayed when the active leg of the flight plan is a hold and is not the last leg of the route.

USE OF THE TIMER

A manual count-up timer has been provided on the "Nav Display" and "Bug Select" tabs of the PFD page. While it can be used at any time for any purpose, it was principally designed as a means to provide instrument procedure timing (e.g. holding patterns, FAF to MAP, etc).

Using the Timer

Time a course or holding pattern

Time One Event

Time and Continue
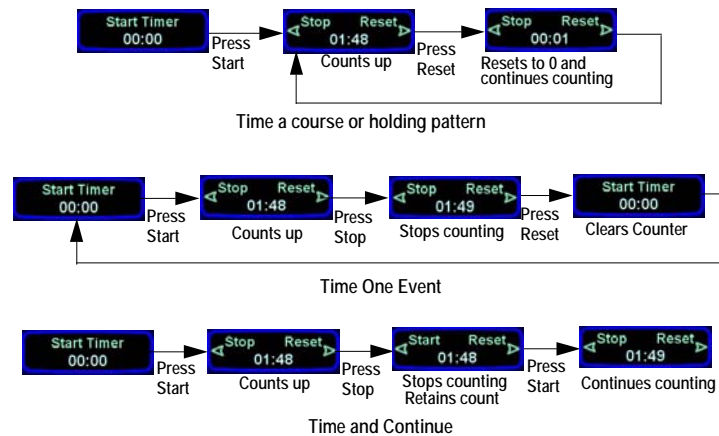
Until the timer has been activated, it displays the Start Timer state with 00:00 on the clock. Once it has been activated via the

adjacent LSK, the counter begins counting up and the display changes to allow you to Stop or Reset the timer clock.

Pressing the left side of the LSK will stop or "freeze" the timer and change the display state to allow a restart or a reset. Restarting will pick up where it was "frozen" and keep counting up from there.

In every case, pressing "Reset" will take the timer back to 00:00 and start counting from there.

TAXI CHARTS

If a published procedure was used via the Charts tab for the landing airport, the display chart will automatically switch over to the airfield diagram during post-landing roll out. Your ownship position on the airfield diagram chart will be displayed as an aid in surface navigation.

If you did not select or use a published approach via Charts, the local airfield diagram can still be accessed. Select "Charts" or "Charts+" tab of the Map page and then use the right-hand LSKs, MFD knob or keyboard to select the desired airfield diagram.

7 Diverts/Missed Approaches

MISSED APPROACH

The simplest and safest way to properly fly a published missed approach is to ensure it is part of the active flight plan. It can be activated anytime inside the FAF by pressing the L5 LSK on PFD that is labeled "Enable Published Missed".

After smoothly applying power for the go-around/missed approach, ensure the aircraft is trimmed for the power setting, establish a climb attitude and use the autopilot and the target bugs (e.g. Altitude Bug) to set a desired climb out/missed approach altitude. At that point, the flight director bars will be displayed to aid your climb-out.

The FMS will automatically toggle the Primary Nav LSK source from Nav 1-2 to FMS if the following conditions are met:

- Past MAP;
- Autopilot is disconnected;
- Enable Published Missed is pressed on the PFD L5 LSK.

All other conditions require a manual mode change from the pilot.

RETRY APPROACH

If you were flying a non-published climb-out instructions on vectors, or you didn't have a published missed approach as part of your flight plan, press the "Fly Vectors" LSK on the PFD or press the -V-> function key on the keyboard to activate Vectors mode then use the heading bug control to select the desired ground path.

8 Night Operations

There are several controls to assist selection of the proper and usable brightness level for night operations.

IFD DISPLAY BRIGHTNESS

Each IFD individually controls its own display brightness through the use of the manual BRT/DIM rocker key on the top left edge of the bezel. The displays can never be dimmed to be completely off. The lowest dimmable setting via that rocker key may appear to be off during daylight conditions but is actually set for a proper low setting in a dark environment after your eyes have fully dark adapted.

IFD BEZEL BRIGHTNESS

The backlighting of the bezel LSKs, function buttons and knobs is controlled via the cockpit dimming control for your aircraft. A typical configuration for this control is a cockpit-dimming rheostat located on the bolster or some other readily accessible cockpit location. This single rheostat controls the backlighting of all IFDs and keyboard.

KEYBOARD DISPLAY BRIGHTNESS

The keyboard is controlled via the same cockpit control that manages the IFD bezel keys/knobs backlighting.

KEYBOARD BEZEL BRIGHTNESS

The same control that controlled the IFD bezel keys/knobs backlighting controls the keyboard keys/knobs backlighting.

CHARTS LIGHTING SCHEME

Some pilots prefer to always use the Charts pages in the daytime lighting scheme and some prefer to always use the nighttime lighting scheme. In order to provide that flexibility, a separate Day/Night lighting LSK has been provided on the "Charts" and

"Charts +" tabs of the Map page. "Day" will always provide a bright white background for readability. "Night" will always turn the bright white backlighting off.

DISPLAY OF TERRAIN ON MAP

The display of terrain on the moving maps is not affected by the Day/Night lighting controls. For those pilots who prefer to remove the display of terrain from the map during night operations, use the "Land" part of the map declutter LSK to deselect terrain from being displayed.

9 System Alerts

CAS SYSTEM

A full caution-warning alerting system (CAS) has been included in this system. There are three levels of message alerting:

- **Warnings** – Immediate action should be performed
- **Cautions** – Immediate attention should be applied
- **Advisories** – A change in system state that you should be aware of

MASTER CAUTION LAMPS

A "Master Caution" system has been created where any active Warnings will trigger a red "WARNING" lamp near the top of the ADI and any active Cautions will trigger an amber (yellow) "CAUTION" lamp near the top of the ADI. These are two separate lamps with their own dedicated screen space. Each time a new Warning or Caution condition exists, the respective lamp will flash in the ADI until either it is acknowledged by the pilot or the condition goes away. The "Caution" lamp will extinguish when all active cautions have been acknowledged but the "Warning" lamp will stay lit when any warning remains active in the system.

Caution and Warning Lamps

WARNING-CAUTION-ADVISORY MESSAGE BAR

Two message bars are provided on every IFD to alert the pilot to what the CAS message is/are. Advisories are displayed on a cyan (blue) background in the lower left corner of each IFD. Warnings are displayed on red background in the lower right corner of each IFD. Likewise, Cautions are displayed on an amber background in the lower right corner of each IFD. Red warnings will always display on top of amber cautions.

A numeric indication is provided on each of the colored message bars that indicates the number of active messages of each type. In the image below, there is 1 active warning and 3 active cautions.

Warning Message

The top edge of each message bar will either display "Ack…..Ack" or "Ack……Show" which is intended to describe the behavior of each side of the adjacent LSK rocker key. Pressing the side of the LSK that is labeled "Ack" will acknowledge the message but will not do anything else. Pressing the side of the LSK that is labeled "Show" will change the MFD to display the most appropriate page available to provide more details about the given message. For example, if a red warning about RPM exceedence is present, pressing the "Show" side of the LSK will change the MFD to the Engine tab of the SYS page where a visual depiction of the engine gauges is presented.

After all active messages of a given color priority have been acknowledged, a "Reminder tab" is left displayed along with an indication of the number of active messages within that priority level.

Reminder Tabs

The IFDs remain synched so that each shows the same set of Warnings, Cautions and Advisories. Acknowledging a state on one IFD, will "ack" it for all IFDs.

If either the HIGH OIL PRESSURE or LOW VOLTS warnings are active, they will also show up in fixed locations in the data strip along the top of the MFD. They will be permanently displayed in this position for the duration of the event.

A full listing of the system Warnings, Cautions and Advisories is presented in Appendix D.

ALERTS TAB

Sometimes, there isn't a good page (e.g. Engine tab for RPM exceedences) to change to when the "Show" side of the LSK has been pressed. In those cases, the "Alerts" tab of the SYS page is presented. This tab can also be manually selected at any time via the page and tab structure along the bottom edge of each IFD.

MISCOMPARES

The IFDs share and compare much of their data for fault detection purposes. If a miscompare occurs, both IFDs will display the appropriate warning message adjacent to the affected instrument. The following parameters are constantly being compared:

- Pitch
- Roll
- Airspeed
- Altitude
- Heading
- Glideslope
- Localizer
- VOR deviation

VHF Cross Checking

If the Primary Nav source is either Nav1 or Nav2, a background cross-check is performed. If the indications are outside the IFR limits, an alert message is annunciated on both IFDs.

Miscompares

In the event a miscompare is annunciated, Avidyne highly recommends diligence in crosschecking all on-board data sources.

10 System Failures

POWER DISTRIBUTION

Each IFD draws a total of 4.25 amps in nominal operation and up to 8.25 amps under peak conditions. The keyboard draws a total of 0.25 amps. This means a combined system of 2 IFDs and 1 Keyboard draws a nominal load of 8.75 amps and a peak load of 16.75 amps. The system is designed to operate without degradation on a single power bus, including single functioning alternator.

Each IFD, is controlled by a pair of circuit breakers which need to be pulled out to remove power to an IFD. As noted earlier, there are no special reversionary modes or display formats. In many cases, an electronic checklist exists that covers the various system failures.

LOSS OF IFD

2-IFD CONFIGURATIONS

The simplest method of determining this condition has occurred is a loss of both the bezel backlighting and the display going black. The remaining IFD will also display some yellow caution messages such as loss of cross-side ADAHRS and VHF.

If a PFD is lost, the MFD will automatically begin behaving as if it is PFD. In other words, the ADI cannot be removed, no matter what buttons are pressed. This transfer of behavior may take several seconds following the loss of a PFD.

Loss of an IFD will have no effect on autopilot operations or your ability to command the autopilot into any mode or target value.

There may be some minor degradation of overall system functionality following a loss of an IFD as represented by the table below:

Lost Functionality following loss of PFD	Lost Functionality following loss of MFD
No control and display of Becker Mode C transponder	No control of L3 Skywatch (sensor stays in the mode it was in at time of IFD failure)
No communication with on-board EGPWS, therefore no EGPWS function	No ability to mute the aural alerts from the Avidyne TAS traffic sensor
Low fuel alerts do not work	No communication with the L3 WX 500 Stormscope
No Charts and no North-Up map depiction (FAA prohibition)	No remote tuning of the DME (must toggle the method of tuning from remote to manual on the DME control head)

Recommended Pilot Actions:

- No change in operations but be aware that some redundancy has been lost;

- If the left IFD (PFD) is operating in an anomalous way, press the PFD page function key on the right IFD (MFD);

- Consider cycling both circuit breakers of the affected IFD, depending on what the System Status tab indicates on the remaining IFD.

If a failure of an IFD is not recognized by the system and the automatic change has not happened, press the "PFD" Page Function Key then tab left or right to access the desired function.

LOSS OF DISPLAY

The first indication that an IFD has experienced a loss of the display (LCD) is the appearance of a black display but the bezel backlighting is still present. Assuming the BRT/DIM rocker key hasn't been activated to the dimmest setting and the display has actually failed, the easiest indication to determine just the display has failed is a continued backlighting of the BRT/DIM rocker key on the bezel and possibly some other bezel keys.

Some loss of display scenarios will be automatically detected and the system will visually behave as it would in a loss of IFD scenario but the system is still fully functional despite having no working display. This means you still have two functional ADAHRS, two functional GPS, VHF, I/O cards, etc. The Databus is still fully functional and all the system data is being shared amongst IFDs.

Recommended Pilot Actions:

- If the left IFD display has been lost, press the PFD page function key on the right IFD;

- No other change to operations is recommended.

LOSS OF KEYBOARD

Loss of keyboard is indicated by the keyboard display and backlighting going dark. Another indication is a yellow caution message, No Comm With KBD presented on the IFDs. A third indication is that com tuning and autopilot bug changing is not immediately displayed on the PFD page.

If the keyboard display or keypad becomes unusable, all functions can be accomplished through the displays.

- **AP Bugs** – Use the "Bug Select" tab of the PFD page and then the right side LSKs to set heading, altitude, and vertical speed bugs. Press the appropriate LSK and then select a value via the right-hand bezel knob. The LSK will time out to the Heading Set LSK 10 seconds after it is last used.

- **Com Tuning** – On any datablock page use the left side LSKs on the MFD to pick the desired Com radio. The outer ring of the left knob controls the numbers to the left of the decimal point and the inner ring controls the numbers to the right of the decimal point. A large display of the changing frequency is displayed just above the left-hand knob. Pressing the Com 1 or Com 2 LSKs when the button is active will swap the secondary and primary channels.

- **Nav Tuning** – On any datablock page press the "Tuning" LSK to make L3 and L4 become associated with Nav 1

and Nav 2. Then proceed as with Com tuning. The "Tuning" button will time out to "Com" in 10 seconds.

- **FMS Entry** – Ensure the edit cursor surrounds the leg of interest to make edits or an insert cursor to insert a new leg. Use the outer ring of the right-hand knob on either IFD to select an entire leg or the inner ring to select an individual field. If using the inner ring to select an individual field, push the knob to begin editing the field.

- **Transponder Codes and Modes** – On any datablock tab, use the "Xpdr" LSK along the left side to begin transponder code changing, identing or mode changing. Pushing the LSK a 2nd time will command an Ident. Use the outer ring of the left-hand knob to change the first two digits. The inner rings changes the second two digits. Pushing the knob enters the changes made.

- **Volume and Squelch Control** – From the "Audio" tab of the "SYS" page, use the outer ring of the right-hand knob to select a row that corresponds with the desired radio. Use the inner ring to change the volume level as indicated by the horizontal bar and percentage value. The push action of the right-hand knob toggles the squelch on or off (or ID, in the case of the Nav radios).

Recommended Pilot Actions:

- Use the "Bug Select" tab on the left IFD (PFD);

- Select a datablock view on the right IFD (MFD) for Com, Nav and transponder control;

- Use the right hand bezel knob on the right IFD (MFD) for FMS data entry;

- Use the Audio tab of the SYS page for volume and squelch control.

LOSS OF AHRS, AIR DATA OR ADAHRS

Under normal operating cases, each IFD displays its own ADAHRS information. In the event of an ADAHRS failure, normally the good ADAHRS is auto selected for display on all IFDs. Since the ADAHRS Source switch defaults to Auto at each power up, normally there is no action that will be required in this case. An ADAHRS Src LSK is provided in case you want to manually select an ADAHRS as the display source.

Loss of an ADAHRS is indicated by a yellow caution lamp and associated alert message.

From the "Sensors" tab of the "SYS" page, use the sensor status red light/green light indications to verify which ADAHRS is inoperative. Press the "ADAHRS Src" LSK to select the usable ADAHRS for display on all PFDs (options are "Auto", "1", "2"). Whenever a display is using a cross-side ADAHRS, a yellow message will be presented in the top left corner of the display as seen in the image below.

If, at any time, the ADAHRS source is different from what you want, use the ADAHRS Src LSK for each IFD to command the desired source.

Redundancy and ADAHRS cross checking will have been lost but there are no additional recommended actions to be taken.

Cross-side ADAHRS Selection Indication
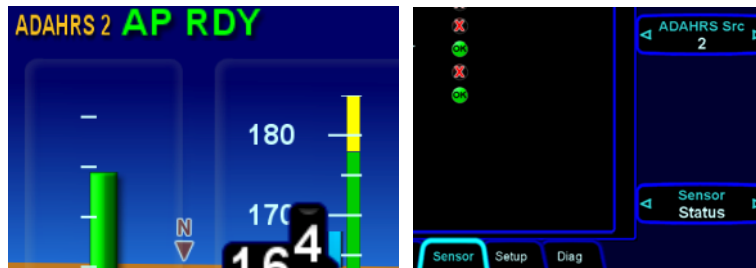
WARMSTART

Each IFD is capable of performing a warmstart from a fully aligned condition when subjected to a power loss of less than 30 seconds. In this event, a warmstart box is displayed on the ADI portion of the PFD page on the affected IFD. A "PLEASE

STANDBY" message in the warmup box is displayed for approximately 2 seconds followed by the "ATTEMPTING QUICK RESTART" message and its countdown. There is no requirement to limit dynamic maneuvering during this warmstart attempt.

Note: Two warmstart attempts in a row without a successful alignment between attempts will result in a full alignment attempt.

Warmstart Box

FAST ERECT

Some types of attitude problems are recoverable in flight. These can be considered the equivalent of a tumbled gyro. In most cases, the ADAHRS Source selection is set to Auto. This means that if one of the IFD ADAHRS experiences this type of attitude problem, the system automatically switches the display of attitude to the cross-side ADAHRS. In this case, the pilot is alerted via a yellow indication along to the top of the ADI indicating the PFD display is being driven by the cross-side ADAHRS and the system will carry on unaffected. If both IFD ADAHRS have experienced this same type of recoverable problem, then:

- All normal button labels on the PFD are removed.
- Attitude data is removed from the display and replaced with a Red-X and large dialog box.
- A "Start Fast Erect" button label and message box displays.

When you press "Start Fast Erect", the message box will change to "Maintain straight and level flight" until the 10-second count-down timer expires. As that point, all attitude data is restored.

Note: It is imperative that you obtain straight and level flight before pressing "Start Fast Erect". Use the second IFD or secondary instruments and/or outside visual references to obtain straight and level conditions.

LOSS OF ENGINE DATA

Loss of engine data can be indicated in several ways. A Caution message "No Comm with Eng Snsr" or "Eng Snsr Fault" will be displayed on all IFDs for the pilot to acknowledge. Also, the "Engine" tab of the SYS page and engine data blocks provide a clear indication that there is no usable data. Additionally, the primary power indication in the upper half of the ADI will stop displaying data.

KEYBOARD CONTRAST NEEDS ADJUSTING

The keyboard display provides a capability to adjust the screen contrast settings.   This is intended to be used to adjust for personal preference or eliminate vertical "streaking" that can occur over time.

Contrast adjust mode is accessed by simultaneously pressing the "A" and "D" buttons on the keyboard, then the "C" button. Once in the contrast adjust mode, use the "FMS" knob on the keyboard to adjust to desired contrast level. Press the "Enter" key to leave this adjust mode and return to flight mode.

11 System Setup / User Preferences

System setup and user preferences are all controlled through the "Setup" tab of the "SYS" page. The system information that can be set up is viewed in the middle of the page and a single LSK along the right side is used to control the type of data to setup. Aside from the Main choice in the list below, all others in the list are only accessed via the MFD. The "Setup" LSK has the following choices:

- Main
- Display
- FMS
- Map
- Datablocks
- Autopilot

SYS/Setup/Setup

MAIN

This tab is just an information display – there are no edits that can be made here. Found here are the aircraft type for which the IFD is configured to support, the various hardware and software part numbers, and database IDs and validity information.

DISPLAY

This tab is broken up into two areas, the Clock settings and Other Display settings control. Aside from the exceptions noted below, use the outer ring of the right-hand knob to select the row or field you want to change and use the inner ring to change the value. Use this tab to control:

- Clock time format (12 hour, 24 hour)

- Local time offset (convert to local time) (This is one of the exceptions. Once the row or field is selected via the outer knob, use the push action of the right knob to go into edit mode. Use the inner and outer rings to do edit and then use the push action again to exit edit mode.)

- VHF radio spacing (25 KHz, 8.33 KHz)

- Transponder default codes for your region (This is one of the exceptions. Once the row or field is selected via the outer knob, use the push action of the right knob to go into edit mode. Use the inner and outer rings to do edit and then use the push action again to exit edit mode.)

Optional display features (turn on or off)

- Labeled Vspeeds on airspeed tape

- Heading Horizon Tick marks on ADI

- Extra autopilot annunciators like CAP and SOFT

- Altitude Alerter on Altimeter (factory default set to Off)

- Temperature units (F, C)

- Fuel units (gallons, liters)

- Baro units (in Hg, hP, mB)

- Button timeout on full Map and Chart pages

- Switch Tanks alert timer duration

- Suppression of the timer from display on PFD page

- Aircraft flight ID (This is one of the exceptions. Once the row or field is selected via the outer knob, use the push action of the right knob to go into edit mode. Use the inner and outer rings to do edit and then use the push action again to exit edit mode.)

The electronic version of this guide contains a **Display setup options** video clip.

FMS

This is a page that Avidyne recommends be left alone. It is here where the algorithms of the FMS can be altered. Options available on this page include:

- Modifying the prediction models
- Descent rate editing
- Modifying the airspace alerts
- Controlled airspace
- TFRs
- Special Use Airspace (SUA)
- Modifying the list of selectable procedures for the FMS drop down boxes
- Airways
- Arrivals
- Departures
- Approaches
- Displaying the optional data associated with WAAS approaches
- Display channel #

From this tab, with a single keystroke on the labeled LSK, you can also delete all user waypoints, and delete all routes. If either of these actions is attempted, a Confirm/Cancel step must also be accomplished via the LSKs.

MAP

This tab provides detailed control of map elements including:

- **Airport Filters** – here you can specify the runway length, runway surface, airport tower status, and type of fuel

available. Airports that meet these various filter definitions will be displayed on the moving maps.

- **Map Detail** – there are rows of map features to specify map range limit when the element is no longer displayed. Options include feature labels on the map, select an altitude above when the feature is no longer displayed, and define the declutter priority levels.

Additionally from this tab, use the LSKs to select:

- Display of map compass rose – On or Off
- Use of altitude filter for display elements – On or Off
- Select a map default density setting – Factory, Custom, IFR, VFR (Definitions of the four settings is found in Appendix D).

DATABLOCKS

The datablock setup tab is a combination of graphical blocks and text lists. The graphical datablocks are arranged on this page in a pattern that represents how they are displayed on the MFD and the keyboard block is also displayed. Use the outer ring of the right-hand knob to select the datablock location you desire to change and use the inner ring to scroll through the text list of available options. All edits are live edits in that there is no further action required and the datablock fields immediately change. There are a few datablock fields that are not user editable and they are indicated with a subdued gray lettering. These include the transponder code in the left edge of the "Top Strip" datablock (if equipped with the remote mount transponder), time in the right edge of the "Top Strip" datablock and transponder code in the top of the keyboard datablock (if equipped with the remote mount transponder). There is a "Reset Defaults" LSK that can also be used as a shortcut.

AUTOPILOT

This tab is designed for avionics technicians to easily perform calibrations of the S-TEC 55X autopilot. Using this page in the non-prescribed method can seriously affect the performance and safety of your autopilot.

12 System Updates

DATA UPDATES

Periodic updates to your nav data, charts data, and obstacle data are all made through the USB port on the front of each IFD. Updates must be performed in accordance with FAR Part 43, Appendix A.

In the event the terrain data or checklist data ever need updating, this is also performed through the front panel USB port.

Use one of the three formatted fobs supplied by Avidyne (marked by the Avidyne logo printed on one side). In the event you no longer have those available, either call Avidyne for a replacement fob (a nominal fee will be charged) or purchase a replacement through other means. Acceptable alternative USB drives are FAT32 format, between 1-8 GB, and manufactured by PNY (http://www3.pny.com/homepage.aspx).

To perform a data update, ensure the data to be updated is placed onto one of the acceptable USB fobs. Insert the USB fob into the IFD USB slot while power is turned off. (Note: Carefully insert the fob. Insert Avidyne-issued fob logo side up. The logo should be on the display glass side.) When the IFD is powered up, select the "Setup" tab of the SYS page and then pick the "Update Databases" LSK. You will be prompted to "Confirm" or "Cancel". Assuming you selected "Confirm", you should see a dialog box presented in the middle of the screen and all uploadable files on that fob will be individually listed and check marks may be visible next to each file name.

Use the "Select All", "Un-select All" LSKs and the MFD knob as required to ensure check marks are associated with all the desired files to upload to the IFD. Now press the "Proceed" LSK to begin the file upload.

A progress bar will be presented to help provide an idea of how much longer the upload will take. Typical upload times are:

- US Obstacles (900 KB) – 10 sec
- US Charts (170 MB+) – 11 min
- Worldwide Charts (430 MB+) – 27 min
- US Nav Data (8 MB) – 4 ½ min
- Worldwide Nav Data (26 MB) – 15 min

Note that Charts data is not required to be uploaded to the PFD since that capability is not accessible from this position. Also note that the database uploads must be performed individually for each IFD to be updated. Due to some of the upload durations, Avidyne recommends creating a fob for each IFD to be updated so that the updates can happen in parallel and not stacked serially, thereby extending the overall time to accomplish a full update.

A clear indication is presented when the data uploads have been completed. Likewise, if the USB fob was removed prior to finishing the data upload, an error message will be presented and the entire process will need to be manually restarted once the fob is reinserted in the IFD.

When you are all done press the "Done" LSK, which will restart the IFD into flight mode. Remove the USB fob and perform a normal start up. It is highly recommended to verify the data was updated from the "Setup" tab of the "SYS" page.

 The electronic version of this guide contains the **Database Updating Process** video clip.

If an IFD is in normal operating mode (not maintenance mode), the presence of a USB fob is ignored and these pages cannot be accessed.

DATALOGS DOWNLOAD

There is extensive datalogging that is automatically done on all IFDs. These datalogs can be accessed post-flight and used for any number of purposes.

The contents of the data logs remain the property of Avidyne. However, you are free to download and use the data for your own training and safety improvement purposes. There are three types of datalogs employed in the IFDs:

- **System Logs** – This log provides an in-depth record of the navigation state. From this log, you can re-create all aspects of the FMS output and autopilot state
- **Flight Logs** – This log provides a detailed record of your aircraft state as measured by the on-board ADAHRS system
- **Engine Logs** – This log provides details on your engine and aircraft electrical state

A list of the detailed data contained in each follows.

The "Get Logs" tab on the "SYS" page provides two options for downloading this data via dedicated LSKs. The first option allows a download of all data logs onto the USB fob. The second option downloads the data logged since the last time a download was completed. Since the logs contain a large amount of data, the second option will be a quicker option in almost every case.

Typical download times for full logs are:

- **System Logs** – approximately 4 minutes
- **Flight Logs** – approximately 4½ minutes
- **Engine Logs** – approximately 1 minute

In order to provide an indication of download progress, a progress bar will be presented with both a symbolic aircraft indicating download in progress and a % complete estimate. The files to be downloaded can have one of three states – "Completed OK", "In progress…" and "Pending".

When downloaded to the USB fob, the data logs will be saved in .csv files. This can be imported into newer versions of Microsoft Excel into a table format. The data can then be plotted or analyzed by several 3rd party tools. Note that files can easily contain 50MB or more of data.

Data included in the files are as follows:

System Log

Date/Time stamp	Vertical Speed bug setting
Power On	Display mode
OAT	Nav mode
Autopilot mode	GPSS state
Localizer deviation	OBS value
Glideslope deviation	Desired track
Ground speed	Nav frequency
Ground track	Course select value
Crosstrack deviation	Nav type
Vertical deviation	VOR course
Baro setting	GPS altitude
Altitude bug setting	Distance to active waypoint
Heading bug setting	FMS course

Flight Log

Date/Time stamp	Flight director status and commands
Power on	Turn rate
Accelerations	Pressure altitude
AHRS status	Indicated airspeed
Heading	True airspeed
Pitch	Vertical speed
Roll	Lat/Lon

Engine Log

Date/Time stamp	Percent Power
Power on	Fuel Flow
RPM	Fuel Used
Manifold Pressure	Fuel Remaining
Oil Temperature	Fuel Time Remaining
Oil Pressure	Alternator 1
TIT	Alternator 2
CHT 1-6	Battery 1
EGT 1-6	Battery 2

Press the "Done" LSK after completing all downloads.

SOFTWARE UPDATES

With very few exceptions, all software inside the IFDs is capable of being updated via the USB connections as well. This means the IFD does not need to be returned to the factory for any future software updates. This updating however requires that an authorized Avidyne Service Center perform the updates because of FAA conformity requirements. This is not a service that an individual owner is allowed to perform.

13 Release 7/8 to Release 9 Differences

This section highlights the differences from Release 7 or 8 Entegra 1 system to a Release 9 Entegra system. It is meant to be a quick reference section for upgrading customers. Each topic is covered in more detail elsewhere in the Pilot Guide. The FMS is a new section and is explained throughout this guide.

GENERAL DIFFERENCES

Page Navigation

The EXP5000 PFD doesn't have pages or sub-pages. The EX5000 MFD pages are indicated by a row of labeled rectangular page tabs along the bottom of the display. Scroll through the list by rotating the bezel knob left or right.

In the IFD5000i system pages are now viewed via the Page Function Keys – the 5 buttons along the bottom edge of the bezel. Navigate within the pages by pressing the left or right side of the Page Function Keys.

Interchangeability

The EX5000 MFD and EXP5000 PFD are not interchangeable units. If one fails, the other could not perform the same functions and serve as a backup. This is no longer the case with the IFD5000i systems as they contain identical hardware and software. They are fully redundant.

Display Brightness and Resolution

The IFD5000i displays are brighter and have a higher resolution than the EX5000 and EXP5000 displays. Display brightness at power up is now 100% as compared to 75% from the earlier displays. There are no ambient light sensors in the IFD5000i displays; all brightness controls are manual. Adjust using the dedicated BRT/DIM rocker key on the bezel.

PFD

"ND" Box

The Nav Display ("ND") box is a dedicated area located on the lower half of the PFD. The EXP5000 displays only HSI. The IFD5000i displays HSI, Map, FMS, Checklist, Engine, and System Setup in a "half page" format. Display the ND by pressing the "PFD" Page Function Key until Nav Display appears.

Dedicated Baro Knob

On the EXP5000 PFD, the baro correction setting control is a "modal" knob that depends on the line select keys to ensure it is active. On the IFD5000i there is a dedicated baro knob, located in the upper right corner of the bezel.

Dedicated Autopilot Target Controls

In the EXP5000 PFD, the autopilot target controls (Heading Bug, Altitude Bug, Vertical Speed Bug) are controlled via a modal knob that depends on the line select keys to determine which bug the knob controls. In the Release 9 system, each of these autopilot targets has their own dedicated control. The Heading and Altitude bugs are controlled via knobs on the keyboard and the Vertical Speed bug is controlled by the single knob on the S-TEC 55X autopilot control head.

Autopilot Integration

Integration with the S-TEC 55X autopilot has increased in the Release 9 system. As mentioned above, the knob on the S-TEC control head is a full-time control of the Vertical Speed target now. In previous implementations with the Avidyne EXP5000 PFD, the autopilot knob on the 55X control head would adjust altitude by 20'/click while in ALT mode. That function is removed in Release 9 (S-TEC code AR or later). The removed function is now accomplished by using ALT-VS mode to recapture the target altitude if an error develops. In the Release 9 system, autopilot mode will switch from GPSS to NAV on approach. As long as there is an active flight plan in the FMS, and the autopilot has been initially manually commanded into NAV or GPSS, the FMS will automatically switch between the two modes.

Altitude Alerting

Release 9 adds an Altitude Alerter indicating the aircraft is approaching the Altitude Bug target (from above or below), or, if on altitude, the aircraft is deviating from the selected altitude target. Turn this user selectable feature on or off via the setup pages.

Integration with PS Engineering Audio Select Panel

For aircraft equipped with an Avidyne-compatible PS Engineering PMA8000B Audio Select Panel, the active radio primary frequency will be displayed in a decoded format on the Release 9 PFD, just below the VSI gauge. Station Identifier (e.g. "Bedford Tower", "Bradley Approach", etc) and the associated frequency are both displayed.

Timer

A timer can be optionally selected on the PFD in Release 9. Toggle on or off in the SYS-Setup pages. Use the timer for several flight purposes, namely holding and instrument approach procedures.

Wind Vector (Winds Calm)

When computed winds are less than 5 knots, the wind direction and speed is displayed as "Winds Calm" in the Release 9 system.

MAP

Declutter controls

Map declutter is slightly different in Release 9. The feature density triangles are still used in Release 9 but now have separate declutter controls: one for the Land features (e.g. terrain, political boundaries, rivers, lakes, oceans, roads, etc.) and one for the Nav features e.g. airspace, Victor and Jet airways, airports, obstacles, navaids, etc.). These two controls share the same line select key. Press the left or right side of the button to determine the level of declutter.

Panning

A map-panning feature has been added to Release 9 and is controlled by the joystick on the keyboard. Any page on the MFD that displays Map supports this feature. This allows previewing the route as well as having more information on a map feature of interest (e.g. airspace, airport, etc) displayed in a pop-up box format.

Fuel Range Ring

New to Release 9, the fuel range ring is shown on the map as a green ring illustrating the maximum flight range based on the current estimated fuel, both state and reserve.

Chart Extent Box

This is a new feature in the Release 9 system. On the map the Chart Extent Box depicts the extent of the electronic approach chart selected in the active FMS flight plan. It is intended to serve as a visual cue reminding the pilot when to view the chart on one of the Chart tabs (Charts, Charts+, split Chart-FMS).

Datalink System

Release 9 supports the Sirius/WSI network and does not support the XM system. Sirius/WSI provides more capability, better weather products and a less expensive monthly subscription fee. WSI Weather provides higher levels of quality control. The Sirius satellite coverage extends further north and south. METARS and TAFs are available in the Caribbean, Mexico and parts of Central America as well as Canada.

No TAWS page

Release 9 does not provide a dedicated display page for the EGPWS systems. Aural alerts and Caution-Warning System messages are supported in Release 9.

TWX and Weather Datalink Features

Release 9 does not support the display of full color TWX670 weather features. Lightning strike data is displayed in Release 9.

The added weather Datalink features of Canadian and Caribbean weather reporting is not supported in Release 9.

CAUTION-WARNING SYSTEM

Release 9 adds an extensive caution-warning system. Master Caution lamps are provided in the PFD primary field of view as well as an Alerts Page for display of all current system alerts including Warnings, Cautions and Advisories.

MISCELLANEOUS

Switch Tanks Alerts

This is a new pilot preference feature in Release 9. The Switch Tanks Alert pops up on the display as a system advisory message when the preference has been turned on. Set this preference, as well as the duration between alerts, via the SYS key and the Setup Tab.

FAILURE MODES

Loss of IFD

There is no loss of function following loss of an IFD in Release 9. Since the displays are fully redundant, the loss of an IFD only results in the loss of redundancy.

Loss of ADAHRS

There is no loss of function following the loss of an ADAHRS in Release 9. The system will automatically switch to the cross-side ADAHRS that remains functional following the loss an either ADAHRS.

MAINTENANCE/SERVICE

Release 9 systems uses a Line Replaceable Unit (LRU) architecture where each subsystem (ADAHRS, VHF, GPS, I/O, etc) is its own self-contained hardware module.

On-aircraft troubleshooting

Release 9 systems add a more extensive on-aircraft troubleshooting capability. These are intended to provide a quick snapshot of the overall health of the system as well as each individual LRU.

LRU removal/replacement

In the event of a LRU failure or required upgrade, only the specific LRU, not the entire PFD, needs to be removed and/or replaced. In most cases, re-calibration and pitot-static leak checks are not required. Every qualified Avidyne Service Center is capable of these adjustments.

SW UPDATING

Field Loadable Software

Software updates can now be performed in the field instead of returning the units to Avidyne for each new update.
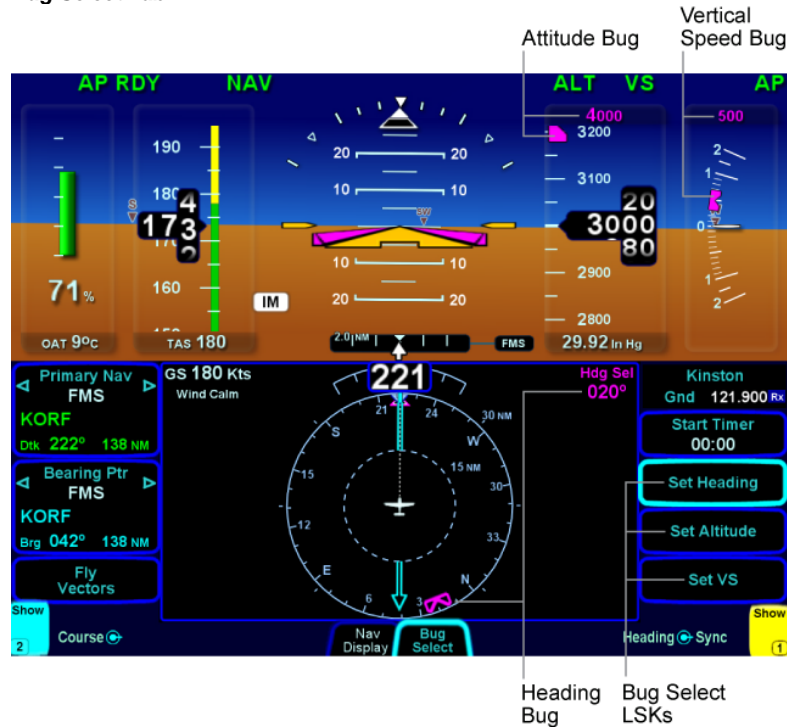
Appendix A – PFD

NAV DISPLAY TAB

The Nav Display tab provides the Primary Flight instruments, controls, and indicators.

BUG SELECT TAB

The Bug Select tab provides access to set the VS (Vertical Speed), Altitude, and Heading bugs. The primary location for setting these values is the keyboard. If the keyboard is unavailable, then use this tab.

Bug Select Tab

SETTING BUGS

Bug icons on the PFD page display as follows depending on how they are used:

- A solid magenta Heading, Altitude, or VSI bug indicates that the bug is coupled-to and being used by the Autopilot or Flight Director.

- A hollow magenta Heading, Altitude, or VSI bug indicates that the bug is not coupled to or being used by the autopilot or flight director.

The Bug Select tab enables you to set the following bugs: Heading, Altitude, and Vertical Speed. It looks like the Nav Display tab except that the right hand LSKs allow you to set Autopilot Targets, Heading and Altitude.

| **Setting Heading bug from the Bug Select Tab**	Press Set Heading LSK	
	Rotate the right-hand knob	
	As you rotate the knob, the bug repositions and the new heading value displays in the Hdg Sel datablock.	Outer knob 10 degree increments Inner Knob 1 degree increments
Setting Vertical Speed bug from the Bug Select tab	Press Set VS	
	Rotate the right-hand knob	Outer ring = 100ft increments
	As you rotate the knob, the bug repositions and the new vertical speed value displays on the vertical speed tape.	Inner knob = 50ft increments
Setting Altitude bug from the Bug Select tab	Press Set Altitude LSK.	
	Rotate the right-hand knob	
	As you rotate the knob, new target altitude value displays above the altimeter.	Outer ring = 500ft increments Inner knob = 100ft increments.

AIRSPEED INDICATOR

The airspeed indicator provides Indicated Airspeed (IAS) as well as the True Airspeed (TAS).

AIRSPEED RANGE TAPE

The Airspeed Range Tape indicates the aircraft airspeed ranges as defined for your aircraft.

Airspeed Color Bands

Airspeed Range Tape

Airspeed Zero   Normal   Below V$_{SO}$ Above V$_{NE}$
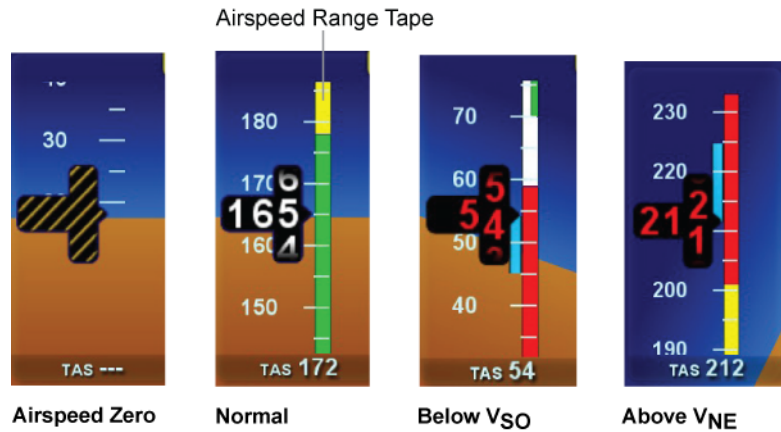
The color bands represent the airspeed ranges for your aircraft:

- **Green** – Normal range V$_{S1}$ to V$_{no}$
- **Yellow** – Caution range V$_{no}$ to V$_{re}$
- White – Flap range V$_{S0}$ to V$_{fe}$
- **Red** – Structural failure range or stall above V$_{ne}$ or below V$_{S0}$ Never exceed or fly in Red range.

Attitude Indicator

The Attitude Reference Symbol (ARS) indicates the aircraft and provides a reference from which you can determine the aircraft attitude. The ARS position is fixed.

Attitude Indicator

Bank Angle Indicator   Roll Pointer

PitchLadder

ARS

Marker Beacon Indication
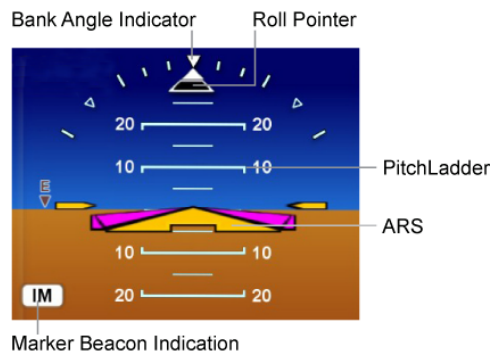
The Attitude Indication contains reference ticks at 10, 20, 30, 45, 60 degrees roll

Unusual Attitude – Chevrons

The Excessive Pitch Chevrons display at pitch values:

- Nose Up attitude greater than 50 degrees
- Nose Down attitude greater than 30 degrees

Chevrons always point toward the horizon and indicate how to correct your attitude:

- Down Chevrons – Fly down toward the horizon; lower the nose and add power.
- Up Chevrons – Fly up toward the horizon; Reduce power and raise the nose.

Unusual Attitude
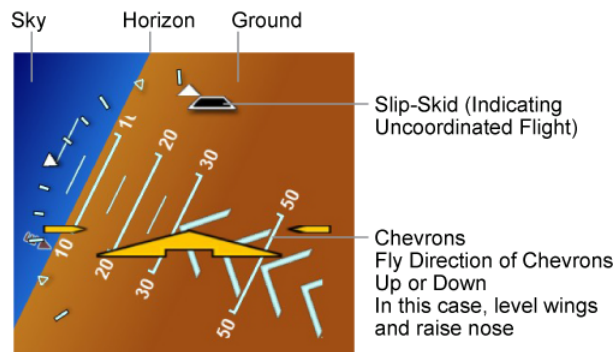
Skid-Slip Indicator

The Skid-Slip Indicator consists of a trapezoid that ideally is centered under the Roll Pointer in the Altitude Indicator. Besides leveling the wings and returning to level flight, you would press the right rudder to coordinate the aircraft, "step on the trapezoid".

Flight Director

The Flight Director (FD) command bars, located immediately above the ARS symbol on the Altitude Indicator, are controlled by the autopilot. The FD is a command instrument that indicates the flight path being used by the autopilot.

Flight Director Command Bars
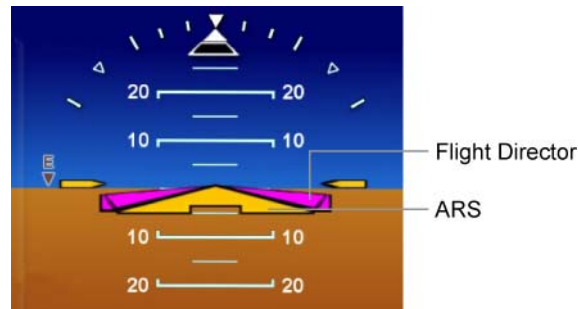
Flight Director Colors

- **Magenta** – FD is coupled to the AP. The command bars of the flight director are magenta, indicating that the AP and FD are coupled. The autopilot flies the aircraft as directed by the flight director.
- **Green** – FD is *NOT* coupled to the AP. Hand fly the aircraft as commanded by the flight director.

If the autopilot fails, disengage it. You may want to engage the Flight Director, and hand fly the aircraft as commanded by the flight director.

If the FD command bars do not appear, verify that both horizontal and vertical modes on the autopilot are engaged.

The autopilot couples to the command bars if the Autopilot Master switch is set to **AP/FD**.

Horizontal Situation Indicator (HSI)

The Horizontal Situation Indicator (HSI) displays as either a 360 degree circle or 200 degree arc on the bottom half of PFD pages or as a 120-degree arc in the top half of PFD pages. The HSI is not synchronized between IFDs, therefore the pilot and copilot can have different HSI presentations.

HSI Depiction

Perspective Compass Rose

The HSI contains the following components:

- **Magnetic Heading Indicator** – A numeric indication of the current magnetic heading of the aircraft.

- **Rate of Turn Indicator** – Indicates current rate of turn.
  - A blue tape which indicates the current rate of turn
  - Rate of turn scale with the following markers
    - Half-standard rate
    - Standard rate
  - The rate of turn tape becomes an arrow when the rate of turn exceeds 1 ½ times the standard rate
- **To-From Flag** – Indicates position relative to either the VOR radial or the current flight plan leg.
- **HSI Map Range** – The compass rose and the half-way ring of the HSI are labeled with ranges in nautical miles to indicate the distance from the center of the HSI to the ring or compass rose. The compass rose scale can be set to any of the following values in NM: 2, 4, 10, 20, 30, 40, 50, 80, 100, 160, and 240 NM.
- **Compass Rose** – In both the 360-degree view and the 200-degree arc view, the graduation marks represent 10 degrees, with every 30 degrees labeled. The outer edge of the 360-degree compass rose contains reference marks every 45 degrees.
- **CDI** – The Course Deviation Indicator (CDI), also known as a deviation bar, is the movable section of the Course Pointer, which indicates angular deviation or horizontal displacement from the set or desired course.
- **CDI Deviation Scale** – The deviation scale specifies the course deflection in degrees. The dots indicate half-scale and full-scale deflection in either direction. The actual deviation depends on the type of navigation being used; for example VOR, NDB, ILS, or GPS (FMS). The CDI is green if the deflection is equal to or less than a full deflection. A yellow CDI indicates that the deflection is greater than full deflection.
- **Heading Bug** – In HDG (Heading) Mode or Vectors Mode the heading bug provides the flight path to the autopilot.
- **FMS Leg** – The current leg of the flight plan is indicated as a magenta line.

The HSI pointers are depicted using different colors:

- Primary Nav is **Green**.
- Bearing Ptr is **Light Blue**.

Horizontal Deviation Indicator (HDI)

The **Horizontal Deviation Indicator** (**HDI**) displays immediately above the HSI. The HDI indicates the course deviation and displays the deviation scale indicated in the HDI display (for example, 2.0 NM).

Course Capture Sequence

More than Full
Scale Deviation

HDI Source

Deviation Scale

Deviation
> Full scale deflection

Flight PLan Leg

Capturing Course
HDI

Deviation
< Full scale deflection

CDI

Course Captured
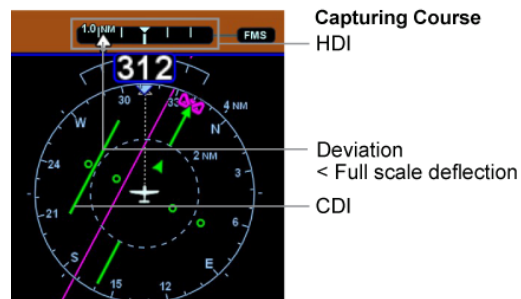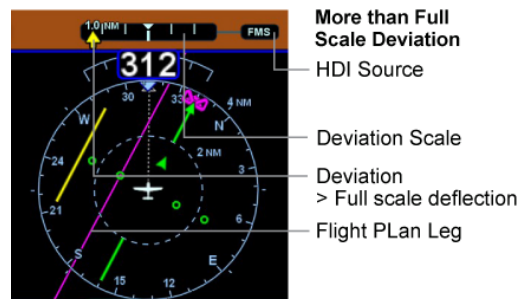
The HDI indicates your deviation from an FMS leg or VOR course, or your horizontal deviation on an ILS glidepath. The CDI moves along the HDI scale to indicate the deviation from the desired course. In this depiction, the actual course is to the right of the desired course. The deflection is depicted as follows:

- **Yellow** arrow – Deviation is greater than the Deviation Scale.
- **White** arrow – Deviation is indicated by the Deviation Scale.

If the CDI is turned on, it reflects the HDI indications.

COURSE DEVIATION INDICATOR (CDI)

The Course Deviation Indicator (CDI), which is part of the HSI, indicates your course deviation. As you approach an active FMS course or VOR radial or localizer, the CDI comes into range so that you can intercept the course. The CDI moves along the CDI scale to indicate the deviation from the desired course. The CDI scale has the following VOR markers:

- 5 degree deviation marker
- 10 degree deviation marker

If not VOR half and full-scale deflection applies. Also, the CDI color changes as follows to provide further deviation information:

- **Green** CDI – Deviation is 10 degrees or less.
- **Yellow** CDI – Deviation is greater than 10 degrees.

In the following illustration, the aircraft is east of the desired course and on a heading that will intercept the course. You can turn the CDI On or off using the CDI LSK. This is only for FMS, otherwise, it is always on.

HDI SOURCE

Indicates which primary navigation source (FMS, NAV1, NAV2) is providing navigation data to the HDI.

PFD CONTROLS AND INDICATORS

All PFD pages contain the primary flight controls and indicators, described here.

Primary Nav LSK

Primary Nav determines and indicates which source is driving the CDI within the HSI. The sources can be:

- **FMS** – A flight plan
- **Nav 1** – A VHF (VOR or ILS Localizer) radio facility whose frequency is tuned in the Nav 1 radio's active channel.
- **Nav 2** – VHF (VOR or ILS Localizer) radio facility whose frequency is tuned in the Nav 2 radio's active channel.

Because you want only one active flight path, the primary Nav source is synchronized across all IFDs. This means that a primary nav change from any IFD is replicated on all IFDs. This applies to primary nav source, mode, and course changes.

The autopilot navigation source can be either NAV or HDG, therefore the autopilot and CDI sources can be different. If they are not using the same navigation source, a cyan "AP not in GPSS is displayed when in Vectors mode. Selecting NAV or GPSS on the autopilot assures that this autopilot flies the Primary Nav source, not the Heading Bug. Therefore, the autopilot will capture and hold the nav source as indicated on the HSI and CDI.

Bearing Ptr LSK

The **Bearing Ptr** (Pointer) LSK turns the bearing pointer **Off** or selects the bearing pointer source. The sources can be:

- **Off** – No bearing pointer displayed.
- **FMS** – The bearing to the next FMS facility, intersection, or waypoint is displayed.
- **Nav 1** – The bearing to the Nav 1 VOR is displayed.
- **Nav 2** – The bearing to the Nav 2 VOR is displayed.
- **ADF** – The bearing to the NDB is displayed. (if installed)

The bearing pointer color is light blue. There is not a bearing pointer for localizer or ILS sourced Nav 1 or NAV 2.

Because the bearing pointers are informational, the bearing pointers are not synchronized between the IFDs. Each IFD can have its bearing pointer(s) set to any of the available choices.

"Hook to the FMS" LSK

The L5 LSK is your hook into the FMS and the specific label and function of this key is variable dependent on the state of the FMS flight plan. The specific function and label is defined in the table in Chapter 6.

CDI LSK

The **CDI** LSK, located on the PFD-Nav Display page, displays (CDI On) and clears (CDI Off) the Course Deviation Indicator (CDI). This assumes that a flight plan or Nav facility is selected as the Primary Nav source. The CDI indicates the off-course angular deviation (in degrees) from the selected (desired) course. The CDI LSK defaults to "Off" (no CDI). The entire LSK will not appear if there is no active flight plan or course.

Flight Plan LSK

The **Flight Plan** LSK, located on the PFD-Nav Display page, engages (Flight Plan On) and disengages (Flight Plan Off) the flight plan that is activated in the FMS. The Flight Plan LSK does not appear if there is no active flight plan.

While not strictly associated with the PFD page or functions, there are secondary means to tune com radios, transponder modes and codes.

Com Tuning Via the IFD

As noted above, all tuning can be conducted via the IFD as well. This is intended to be a secondary means and is accomplished by using the left LSKs of MFD. LSK L2 is a toggle switch to allow switching between Com and Nav tuning. In each case, use the outer and inner rings of the left bezel knob to select your desired frequency. The frequency you've just tuned is displayed in large font just above the knob until it times out or you select a different action via the LSKs.

Transponder Mode and code input Via the IFD

As noted above, transponder tuning can be conducted via the IFD as well. This is intended to be a means of backup and is accomplished by using the left LSKs of MFD. LSK L4 is the

means by which to activate transponder tuning mode. In each case, use the outer and inner rings of the left bezel knob to select your desired value. The transponder code you've just tuned is displayed in large font just above the knob until it times out or you select a different action via the LSKs. Mode selection and IDENT are also selectable via the labeled LSKs.
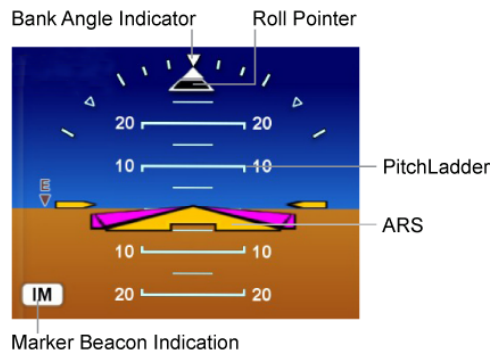
Marker Beacon Integration

For those systems that integrate with a PS Engineering PMA8000B Audio Select Panel, the marker beacon lamps are repeated on the PFD.

Appendix B – FMS Pages

FMS Tab	FMS Major Function
Flight Plan	The Flight Plan tab enables you to view and edit a flight plan. View Expanded or Compact – Expand or compress the selected procedures or Victor airway legs. If there is a Gap in route, you can Connect the waypoints
Map FPL MFD only	The Map/FPL tab contains both a map and flight plan. The Map/FPL page does not contain any LSKs. Use the keyboard to interact with the flight plan or the right knob.
Info	The Info tab displays airport information, including runway information, frequencies, and METAR data. You can Select and view: Frequencies (Freq), Weather (Wx), Runways (Runway), and Calculations (Calc).
Routes	The Routes tab enables you to Create a new route, Copy a route, Invert a route, and Activate a route. Once a route is selected on the routes tab, it can be edited in the same way that a flight plan can be edited on the FPL tab. Build alternate routes or save favorite routes for future use.
User Wpts	The User Wpts tab enables you to create New user waypoints using the present position (PPOS), map cursor (Pointer) or place, brg, distance.
Nearest	The Nearest page describes the nearest waypoints of a given type (Airports near present position, airports near destination, VORs, NDBs, Intersections, and Obstacles).
Map Nearest MFD only	The Map Nearest page contains both map and nearest. Map Nearest does not contain LSKs.

FMS FLIGHTPLAN TAB

ACTIVE TAB

LSKS CHOICES

(L1)	*Traffic Mode: Normal, Above, Unlimited, Below Range: 2NM, 6NM
(L2)	Tuning Com, Nav
(L3)	Com 1 Nav 1
(L4)	Com 2 Nav 2
(L5)	Transponder Ident
(L6)	Advisories

LEFT KNOB
Tune/Tune/Swap (all but L5)
Squawk/Squawk/Mode (L5 only)

* Also includes "Standby" or "Ground" depending on TAS or Skywatch. "Unlimited" is unrestricted with Skywatch.

LSKS CHOICES

(R1)	Activate Route Offset Route
(R2)	View Expanded, Compact
(R3)	Info Off, METAR, Nav Data
(R4)	"-D->"
(R5)	Delete Waypoint
(R6)	Caution and Warnings Message Bar

RIGHT KNOB
Scroll coarse/Scroll fine/Select

The Flight Plan tab contains the most detailed breakdown of the Flight Plan elements within a Route or Flightplan. Add, edit, and delete waypoints within a current flight plan route by using the LSKs along the right side of the IFD.

This screen indicates access to the NAV, COM, and Transponder control LSKs. The alternative selection method is using the

keyboard. There also is a traffic depiction thumbnail and a dedicated LSK, which controls the TAS mode function.

DELETING A FLIGHT PLAN

An alternative method of deleting a flight plan is accomplished from the "Flight Plan" tab of the FMS page. While on that tab, place the edit cursor over the last leg of the flight plan by using either the right-hand knob or the "FMS" knob on the keyboard and then press the "Delete Waypoint" LSK. Note that if you have an insert cursor instead of an edit cursor, the "Delete Waypoint" LSK will actually read "Insert". Repeatedly press the "Delete Waypoint" LSK to work your way up the flight plan, deleting as you go.

FMS MAP FLIGHTPLAN TAB

The Map FPL tab combines both a map and elements of the Flightplan route, allowing the ability to see both at the same time. This is useful to monitor progress along the route. Notice the lack of active LSKs on this page. Switch back to the Map+ or Map tab to change map overlays, declutter settings, etc.

FMS INFO TAB

ACTIVE TAB

LSKS CHOICES		LSKS CHOICES	
L1	**Traffic** Mode: Normal, Above, Unlimited, Below Range: 2NM, 6NM	R1	**Show** Frequencies, Weather, Runway, Calculator
L2	**Tuning** Com, Nav	R2	(**Paste** Current Destination)
L3	**Com 1** Nav 1	R3	**Charts for Selected Airport**
L4	**Com 2** Nav 2	R4	**"-D->"**
L5	**Transponder** Ident	R5	Blank
L6	*Advisories*	R6	*Caution and Warnings Message Bar*

LEFT KNOB
Tune/Tune/Swap (all but L5)
Squawk/Squawk/Mode (L5 only)

RIGHT KNOB
Scroll Coarse/Scroll Fine/Select

The FMS Info tab enables you to view aeronautical and Datalink weather data for waypoints stored in the database. Information such as frequencies, runways, elevations and geodetic location, normally found in the Airport Facility Directory (AFD), is found on this page. It also can display METARs and provide the sunrise and sunset times as well as the latest density altitude data for the waypoint.

Press the Show key to view the following detail categories:

- **Frequencies** – displays all related frequencies
- **Weather** – displays METARs
- **Runway** – enables you to select runways and display runway data
- **Calc** – calculates and displays either sunrise/sunset data or density altitude

Also, you can automatically tune frequencies. Any frequency that is displayed may be nominated to the selected standby COM by using the right knobs to select and pressing the knob to nominate.

The pilot enters a waypoint in the IDENT field by moving the cursor there with the outer knob then pressing alphanumeric keys from the keyboard. There is a dedicated LSK for sending the selected waypoint from the 'Flight Plan' to the IDENT field called "Paste". Once the waypoint is entered then the outer knob can be used to move to the lower area of the display. Based on the "Show" LSK, both the inner and outer right knobs are used to select frequencies, runways, weather data and calculators. Additional information on the selected data is shown in the lower right box based on the cursor selection (e.g. frequency type, decoded METARs, runway surface type).

For airports there is a Charts LSK that will change tabs to the chart selection tab for the Info airport.

On this screen, the pilot also has access to the NAV, COM, and Transponder control LSKs. This screen also features a traffic depiction thumbnail and a dedicated LSK that controls the view modes of the TAS function.

FMS ROUTES TAB

ACTIVE TAB

LSKS CHOICES

L1	**Traffic** Mode: Normal, Above, Unlimited, Below
	Range: 2NM, 6NM
L2	**Tuning** Com, Nav
L3	**Com 1** Nav 1
L4	**Com 2** Nav 2
L5	**Transponder** Ident
L6	*Advisories*

LEFT KNOB
Tune/Tune/Swap (all but L5)
Squawk/Squawk/Mode (L5 only)

LSKS CHOICES

R1	Blank	R1 Blank
R2	**New**	R2 **View** Expanded, Compact
R3	**Copy**	R3 **Info** Off, Nav Data, METAR
R4	**Invert**	R4 **Back to Routes List**
R5	**Delete Waypoint**	R5 Blank
R6	*Caution & Warnings Message Bar*	R6 Blank

RIGHT KNOB
Scroll/Scroll/Select

The FMS Routes tab is where flight plans or routes are stored within the system. Up to 128 routes can be stored for later pilot use, which is useful for frequently traveled routes. Any Trip can be stored in this Route Tab section of the database, regardless of simplicity or complexity. In order to activate a stored route, it must be first be "Activated" from the route list, which moves it into the Flight Plan tab.

FMS USER WAYPOINTS TAB

ACTIVE TAB

LSKS CHOICES		LSKS CHOICES	
L1	**Traffic** Mode: Normal, Above, Unlimited, Below Range: 2NM, 6NM	R1	**New**
L2	**Tuning** Com, Nav	R2	**PPOS** (sometimes)
L3	**Com 1** Nav 1	R3	Blank
L4	**Com 2** Nav 2	R4	**"-D->"**
L5	**Transponder** Ident	R5	**Delete Waypoint**
L6	*Advisories*	R6	*Caution and Warnings Message Bar*

LEFT KNOB
Tune/Tune/Swap (all but L5)
Squawk/Squawk/Mode (L5 only)

RIGHT KNOB
Scroll coarse/Scroll fine/Select (if using fine scroll inner ring)

The FMS Routes tab enables you to create, edit, and delete custom waypoints that are meaningful to you, the pilot, but are not present in the aeronautical database; for example, a private, uncharted airport or a recurring flyover of a non-descript landmark.

There are 4 types of User waypoints: Present Position, Enter Lat/Lon, Enter Place/Bearing/Distance and Use the Map Cursor (pointer). You can assign names which are 20 characters or less to your user waypoints.

FMS NEAREST TAB

The **keyboard NRST function key** serves as the toggle that switches the Nearest display between the closest airport to present position, airport to destination, VOR, NDB intersection, User Defined waypoints, ARTCC centers and FSS stations. The major advantage to the Release 9 system handling of the Nearest displayed information is that any item displayed on the screen can be highlighted with the curser and submitted directly to the system by pressing enter. This is called **Nomination**. Examples

of common and useful Nomination tasks include COM frequencies, NAV frequencies, and a Direct-To waypoint.

The Info LSK is a key that allows the pilot to quickly call up Airport Facility Directory (AFD) information about the waypoint that is currently highlighted on the Nearest screen.

The Direct-To LSK is a key that allows the pilot to quickly direct the FMS to calculate a direct route to the waypoint that is currently highlighted on the Nearest screen. The pilot can also initiate the Direct-To function by pressing the key on the keyboard.

The Filter key enables you to quickly apply Nearest Airport filtering to the list of airports that is currently highlighted on the Nearest screen. This Filter applies to both Nearest Position and Nearest Destination listings. The actual filter criterion is set in the SYS Setup tab.

In this screen, the pilot also has access to the NAV, COM, and Transponder control LSKs.

FMS MAP NEAREST TAB

ACTIVE TAB

LSKS CHOICES		LSKS CHOICES	
L1	Blank	R1	Blank
L2	Blank	R2	Blank
L3	Blank	R3	Blank
L4	Blank	R4	Blank
L5	Blank	R5	Blank
L6	*Advisories*	R6	*Caution and Warnings Message Bar*

LEFT KNOB
Range/Range/View

RIGHT KNOB
Scroll coarse/Scroll fine/Select

This tab provides the pilot with a convenient way to present both a map of the current flight plan and a list of Nearest items. Since there are no LSKs available in this screen tab mode, the pilot must navigate the tab with the right knobs and the keyboard. The Nearest type of waypoint must be adjusted with NRST keyboard button. Continually press NRST function key on the keyboard to move through the possible NRST display types.

When a waypoint is selected in the list a solid, cyan circle is displayed on the map indicating relative location from the

Ownship symbol. Direct-to must be performed with the key on the keyboard and confirmation with the Enter key. The inner knob moves the cursor within the selected waypoint. A highlighted frequency may be nominated by pressing the knob and pressing a highlighted chart icon will change the display to the charts tabs.

Notice that this screen has no access to the NAV, COM, and Transponder control LSKs. In this screen mode, the pilot must use the keyboard to control access to these functions.

Appendix C – Map Pages

MAP MAP+ TAB

LSKS CHOICES

L1	**Traffic** Mode: Normal, Above, Unlimited, Below Range: 2NM, 6NM
L2	**Tuning** Com, Nav
L3	**Com 1** Nav 1
L4	**Com 2** Nav 2
L5	**Transponder** Ident
L6	*Advisories*

LSKS CHOICES

R1	**Land	Nav (**3-states/declutter)
R2	**Lightning** Off, Datalink, Strike, WX-500
R3	**Wx Reports** METARs, AIR/SIGMETs, All, Off
R4	**Wx Overla** NOWradR2y, NOWrad+, Icing, Icing+, Off
R5	**Icing Alt** (only if Icing or Icing+ selected in R4)
R6	*Caution and Warnings Message Bar*

LEFT KNOB
Tune/Tune/Swap (all but L5)
Squawk/Squawk/Mode (L5 only)

RIGHT KNOB
Range/Range/View

Pressing "Clear Strikes" when equipped with an Avidyne TWX670 Lightning system will clear strikes from all IFDs. Pressing it with a L3 WX500 Stormscope installed however will only clear strikes from the IFD on which the button was pressed.

MAP MAP TAB

ACTIVE TAB

LSKS CHOICES		LSKS* CHOICES	
L1	Blank	R1	**Detail** Land, Nav: 3-state triangle showing level of declutter
L2	Blank	R2	**Lightning** Off, Datalink, Strike, WX-500
L3	Blank	R3	**Wx Reports** METARs, AIR/SIGMETs, All, Off
L4	Blank	R4	**Wx Overlay** NOWrad, NOWrad+, Icing, Icing+, Off
L5	Blank	R5	**Setup:** Main, Display, FMS, Map, Datablocks, Autopilot
L6	*Advisories*	R6	**Icing Alt** (only if Icing or Icing+ selected in R4)

LEFT KNOB	**RIGHT KNOB**
Blank	Range/Range/View

*NOTE: ALL LSKS CAN TIMEOUT

MAP SPLIT TAB

ACTIVE TAB

LSKS CHOICES		LSKS CHOICES	
L1	Blank	R1	Blank
L2	Blank	R2	Blank
L3	Blank	R3	Blank
L4	Blank	R4	Blank
L5	Blank	R5	Blank
L6	*Advisories*	R6	*Caution and Warnings Message Bar*

LEFT KNOB
Range/Range/View

RIGHT KNOB
Range/Range/View

MAP CHART TAB

LSKS CHOICES		LSKS* CHOICES	
L1	Blank	R1	**Chart** Airport, Procedure
L2	Blank	R2	**View** Plan, Header, Profile, Minimums, All
L3	Blank	R3	**Mode** Day, Night
L4	Blank	R4	**Select Chart**
L5	Blank	R5	**Flight Plan** On, Off
L6	*Advisories*	R6	*Caution and Warnings Message Bar*

R1 Chart NOTAMs
R2 Blank
R3 Back to Active Chart
R4 Display Chart
R5 Select Airport

LEFT KNOB
Blank

RIGHT KNOB
Range/Range/View
Scroll/Scroll/Select

*NOTE: ALL LSKS CAN TIMEOUT

MAP CHART+ TAB

LSKS CHOICES

(L1) **Traffic** Mode: Normal, Above, Unlimited, Below
Range: 2NM, 6NM

(L2) **Tuning** Com, Nav

(L3) **Com 1** Nav 1

(L4) **Com 2** Nav 2

(L5) **Transponder** Ident

(L6) *Advisories*

LEFT KNOB
Tune/Tune/Swap (all but L5)
Squawk/Squawk/Mode (L5 only)

LSKS CHOICES

(R1) **Chart** Airport, Procedure

(R2) **View** Plan, Header, Profile, Minimums, All

(R3) **Mode** Day, Night

(R4) **Select Chart** ——

(R5) **Flight Plan** On, Off

(R6) *Caution and Warnings Message Bar*

R1 Chart NOTAMs
R2 Blank
R3 Back to Active Chart
R4 Display Chart
R5 Select Airport

RIGHT KNOB
Range/Range/View
Scroll/Scroll/Select

*NOTE: ALL LSKS CAN TIMEOUT

BROADCAST PRODUCT STATISTICS

Product	WSI Data Rate (nominal)
NEXRAD	5 min
METARs	5 min
TAFs	10 min
TFRs	15 min
Winds	30 min
Temps	30 min
AIR/SIGMETs	5 min
Lightning	5 min
Echo Tops	5 min

Appendix D – System Pages

"HOME" KEYS DEFINED

Function Key Home	Definition
PFD	"Nav Display" tab
	HSI 360 View, 10 NM range
	Bearing Ptr = "Off"
	Flight Plan is "on"
FMS	"Flight Plan" tab
	View = "Expanded"
	Info = "Off"
	Active leg selected in flight plan
Map	"Map+" tab (Map tab on PFD)
	Land Declutter = Low, Nav Declutter = Medium
	Lightning = "Off"
	Wx Reports = "METAR"
	Wx Overlay = "NOWrad"
	Arc View, 40 NM range
SYS	"Engine" tab
	Absolute View
CHKL	First Emergency tab

EXCEEDANCES | WARNINGS RED

Short Text	Long Text	Applicable Aircraft
Terrain Pull-Up	Terrain Pull-Up	Any equipped with EGPWS
Obstacle Pull-Up	Obstacle Pull-Up	Any equipped with EGPWS
High RPM	High RPM	SR20, SR22, SR22T
High MAP	High manifold pressure	SR22T
High Oil Temp	High oil temperature	SR20, SR22, SR22T
High Oil Press	High oil pressure	SR20, SR22, SR22T
Low Oil Press	Low oil pressure	SR20, SR22, SR22T
High CHT	High CHT cylinder [1/2/3/4/5/6]	SR20, SR22, SR22T
High MBUS	High main bus volts	SR20, SR22, SR22T
High EBUS	High essential bus volts	SR20, SR22, SR22T
Low EBUS	Low essential bus volts	SR20, SR22, SR22T
High Fuel Flow	High fuel flow	SR20, SR22, SR22T
Low Fuel Rmng	Low fuel remaining	SR20, SR22, SR22T
High TIT	High Turbine Inlet Temperature	SR22T

EXCEEDANCES | CAUTIONS <mark>YELLOW</mark>

Short Text	Long Text	Applicable Aircraft
Caution Terrain	Caution Terrain	Any equipped w/ EGPWS
Caution Obstacle	Caution Obstacle	Any equipped w/ EGPWS
High MAP	High manifold pressure	SR22T
High Oil Press	High oil pressure	SR20, SR22, SR22T
Low Oil Press	Low oil pressure	SR20, SR22, SR22T
High CHT	High CHT cylinder [1/2/3/4/5/6]	SR20, SR22, SR22T
Low MBUS	Low main bus volts	SR20, SR22, SR22T
Low ALT [1/2]	Low alternator [1/2] amps	SR20, SR22, SR22T
Low BATT	Low battery amps	SR20, SR22, SR22T
Low Fuel Rmng	Low fuel remaining	SR20, SR22, SR22T
Invalid RPM	Invalid RPM	SR20, SR22, SR22T
Invalid MAP	Invalid manifold pressure	SR22T
Invalid Oil Temp	Invalid oil temperature	SR20, SR22, SR22T

Short Text	Long Text	Applicable Aircraft
Invalid Oil Press	Invalid oil pressure	SR20, SR22, SR22T
Invalid CHT	Invalid CHT cylinder [1/2/3/4//5/6]	SR20, SR22, SR22T
Invalid MBUS	Invalid main bus volts	SR20, SR22, SR22T
Invalid EBUS	Invalid essential bus volts	SR20, SR22, SR22T
Invalid ALT [1/2]	Invalid alternator [1/2] amps	SR20, SR22, SR22T
Invalid BATT	Invalid battery amps	SR20, SR22, SR22T
Invalid Fuel Flow	Invalid fuel flow	SR20, SR22, SR22T
Invalid Fuel Rmng	Invalid fuel remaining	SR20, SR22, SR22T
No Comm With Eng Snsr	No communication with engine sensor unit	SR20, SR22, SR22T
Eng Snsr Fault	Eng sensor unit misconfigured	SR20, SR22, SR22T
Alt Ind Door Open	Alternate induction door open	SR22T
Pitot Heat Inop	Pitot Heat Inoperative	All
ADAHRS [1/2] In Fast Erect	ADAHRS [1/2] In Fast Erect	All
ADAHRS [1/2] Aligning	ADAHRS [1/2] Aligning	All
ADAHRS [1/2] Fault	ADAHRS [1/2] Fault: [Attitude | Heading | Altitude | Airspeed]	All
Perform Mag [1/2] Cal	Perform Calibration on Magnetometer [1/2]	All
Below Minimum AP Speed	Below minimum autopilot engagement speed	Any equipped w/ S-TEC 55X
GPS Miscompare	GPS Miscompare	All
GPS Integrity Lost	GPS Integrity Lost Crosscheck Nav	All
GPS [1/2] Fault Dead Reckoning	Position updated via dead reckoning	All
GPS [1/2] Fault No Position	No position available	All
Dual GPS Fault Dead Reckoning	Position updated via dead reckoning	All
Dual GPS Fault No Position	No position available	All
LPV Unavailable Use L/VNAV DA	GPS integrity is insufficient for LPV Approach	All
LPV Unavailable Use LNAV MDA	GPS integrity is insufficient for LPV Approach	All
LP Unavailable Use LNAV MDA	GPS integrity is insufficient for LP Approach	All

Short Text	Long Text	Applicable Aircraft
L/VNAV Unavail. Use LNAV MDA	GPS integrity is insufficient for L/VNAV Approach	All
VNAV Lost Use LNAV MDA	Excessive XTK or Low GPS Integrity for Vertical Guidance	All
Check Altitude Too Low	Aircraft is below the glide slope altitude at FAF	All
TAWS Sensor Fault	Loss of communication with TAWS sensor OR TAWS sensor internal fault	Any equipped with EGPWS
Traffic	[Brg (e.g. 1:00)] [dist (e.g. 2 NM)] [alt (e.g. 200 ft)]	Any equipped with Avidyne TAS 6XX or Skywatch
Traffic Sensor Fault	No communication with traffic sensor OR Traffic sensor has failed	Any equipped with a traffic system or Skywatch
No Comm with Xpdr	No communication with Mode-[C/S] Transponder	Any equipped with Becker Remote Mount Mode C or Mode S transponder
No Comm with VHF [1/2]	No communication with the VHF radio	All
COM [1/2] TX Fault	Transmitter Fault, No TX Ability	All
COM [1/2] Stuck TX	Stuck Mic Timeout, Transmitter Disabled	All
Pitot Heat Required	Pitot Heat Required	All
Right Tank Fuel Low	Right tank fuel low	SR20, SR22, SR22T
Left Tank Fuel Low	Left tank fuel low	SR20, SR22, SR22T
Both Tanks Fuel Low	Both tanks fuel low	SR20, SR22, SR22T
Right Tank Fuel Low	Right tank fuel low	SR20, SR22, SR22T
No Comm With KBD	No communication with keyboard	All

EXCEEDANCES | ADVISORIES CYAN

Short Text	Long Text	Applicable Aircraft
High Oil Temp	High oil temperature	SR20, SR22, SR22T
Switch Tanks	Switch Tanks	All
No Com with AP	No communication with autopilot	Any aircraft equipped with S-TEC 55X
Datalink Receiver Fault	Broadcast Datalink receiver failure	All
Datalink Persist Fault	Broadcast Datalink persist read error	All
Datalink Data Not Recvd	Datalink products not receive: [Product Names]	All
AIR/SIGMETs Stale	Datalink [Product Name] age is greater than [x] minutes	All
Datalink [Product Name] State	Datalink [Product Name] age is greater than [x] minutes	All
TFR Ahead	TFR Ahead	All
Invalid Keyboard Input	<Additional info is displayed on the keyboard >	All
Vectors Not Available	<Additional info is displayed on the keyboard >	All
Procedure Unavailable	<Additional info is displayed on the keyboard >	All
Route Not Loaded	Route Not Loaded	All
Route Not Stored	Route Not Stored	All
Intercept Too Sharp	Must Intercept Within 45° of Final Approach Course	All
Gap in Route Ahead	Gap in Route Ahead	All
Lateral Offset End Ahead	Approaching End of Flight Plan Lateral Offset	All
Exiting Hold At Fix	Exiting Hold At Fix	All
GPS Overlay Not Authorized	Approach Not Authorized for GPS	All
Autopilot not in GPSS	Autopilot not in GPSS	S-TEC 55X equipped aircraft
Next Leg [Leg Course]	Next Leg [Leg Course]	All
Begin Descent [Time to Top of descent in seconds]	[Approaching/Sequenced] Top Of Descent	All

Short Text	Long Text	Applicable Aircraft
Density Altitude [Density Altitude in feet]	Density Altitude [Density Altitude in feet]	All
Check ILS Identifier	Decoded ILS Identifier did not match approach navaid	All
GPS [1/2] Fault	GPS [1/2] Fault	All
Lightning Sensor Fault	No communication with lightning sensor OR Lightning sensor fatal fault: [fault codes]. Try cycling lightning sensor power OR No lightning sensor data: [Heading fault | GPS fault]	Stormscope equipped aircraft
Lightning Sensor Error	Lightning sensor recoverable fault: [fault codes]	Stormscope equipped aircraft
Lightning Sensor Fault	No communication with lightning sensor OR No lightning sensor data: [Horz antenna | Vert antenna | Sense antenna | Sensor fault | Stuck mic | Antenna config | Heading Fault | GPS Fault]	Avidyne TWX equipped aircraft
Lightning Sensor Error	Lightning sensor non-fatal error: [GPS device | GPS data | Noise | Protocol | Heading]	Avidyne TWX equipped aircraft
TAWS Not Available	TAWS Not Available	KGP-560 equipped aircraft
Traffic Sensor Fault	Traffic sensor loss of redundancy (TAS only) OR Traffic sensor altitude unavailable	Traffic-equipped aircraft
COM [1/2] Stuck TX	Stuck Mic Warning, Release PTT	All
Datalink Function Lost	Datalink Function is not responding	All
Stormscope Function Lost	Stormscope Function is not responding	Stormscope equipped aircraft
TWX Function Lost	TWX Function is not responding	TWX equipped aircraft
Traffic Function Lost	Traffic Function is not responding	Traffic equipped aircraft
Fixing Setup [x] of [y]	Fixing [x] of [y] setup errors: do not power off IFDs	All
Class [B | C | D] Ahead	[Airspace name][Lower Altitude Limit] - [Upper Altitude Limit]	All

Short Text	Long Text	Applicable Aircraft
Controlled Airspace Ahead	[Airspace name][Lower Altitude Limit] - [Upper Altitude Limit]	All
[Prohibited | Restricted | Warning | Alert | Caution | Danger] Area Ahead	[Airspace name][Lower Altitude Limit] - [Upper Altitude Limit]	All
[MOA | ADIZ] Ahead	[Airspace name][Lower Altitude Limit] - [Upper Altitude Limit]	All

SYS ENGINE TAB

LSKS CHOICES

L1 Blank
L2 Blank
L3 Blank
L4 Blank
L5 Blank

L6 *Advisories*

LEFT KNOB
Blank

LSKS CHOICES

R1 Blank
R2 Blank
R3 Blank
R4 Blank
R5 **Display** Absolute, Normalized, Initial Fuel — R2 Fill to Full / R3 Fill to Tabs / R4 Done
R6 *Caution and Warnings Message Bar*

RIGHT KNOB
Coarse Fuel (10's)/Fine Fuel (1's)/Done
(If R5 is active: choice is Initial Fuel)

USING LEAN ASSIST

This feature is intended to aid you in setting the optimum mixture for various operating conditions. When in Lean Assist mode, the system will automatically detect whether you are leaning for best power or best economy and provide visual indications to guide you toward the correct mixture setting.

Note: It is very important that you adjust the mixture slowly and continuously. Leaning the mixture too quickly can disrupt the system's ability to accurately track the peak EGT, and could result in a mixture setting that can damage the engine. Always be sure to monitor Oil Temperature and CHT readings to ensure they stay within specified limits. If, at any time during the Lean Assist process, the engine begins to run roughly, richen the mixture slightly until the roughness abates.

To lean the engine for ***Best Power***, begin by pressing the "Start Lean Assist" (LSK R4) and smoothly lean the mixture control. The engine tab displays "Looking for First Peak" at the top of the temperatures section of the display. When leaning for best power, the final mixture setting is based on the first cylinder to peak, indicated by a message. When this happens, you can begin to richen the mixture. As the mixture is richened, the display first annunciates "Looking for #x to Peak (Rich)", then "Peak Detected (Rich)" as it determines the peak temperature. Finally, "Best Power" displays when the optimum best power mixture has been achieved. Exit the Lean Assist function by pressing the "End Lean Assist" (LSK R4).

To lean the engine for ***Best Economy***, ensure the engine is below 75%, press the "Start Lean Assist" (LSK R4), and smoothly lean the mixture control. The same "Looking for First Peak" message is displayed which will eventually change to "Looking for Last Peak" as the leaning continues. Continue slowly leaning after "Last Peak Detected" is displayed until "Best Economy" has been achieved. At that point, exit the Lean Assist function by pressing the "End Lean Assist" (LSK R4).

SYS ALERT TAB

ACTIVE TAB

LSKS CHOICES		LSKS CHOICES	
L1	**Traffic** Mode: Normal, Above, Unlimited, Below Range: 2NM, 6NM	R1	Blank
L2	**Tuning** Com, Nav	R2	Blank
L3	**Com 1** Nav 1	R3	Blank
L4	**Com 2** Nav 2	R4	Blank
L5	**Transponder** Ident	R5	Blank
L6	*Advisories*	R6	*Caution and Warnings Message Bar*

LEFT KNOB
Tune/Tune/Swap (all but L5)
Squawk/Squawk/Mode (L5 only)

RIGHT KNOB
Scroll/Scroll/---

SYS AUDIO TAB (MFD ONLY)

ACTIVE TAB

LSKS CHOICES	LSKS CHOICES
L1 **Traffic** Mode: Normal, Above, Unlimited, Below Range: 2NM, 6NM	**R1** Blank
L2 **Tuning** Com, Nav	**R2** Blank
L3 **Com 1** Nav 1	**R3** Blank((If Nearest to Airports is active / R1)
L4 **Com 2** Nav 2	**R4** Blank
L5 **Transponder** Ident	**R5** Blank
L6 *Advisories*	**R6** *Caution and Warnings Message Bar*

LEFT KNOB
Tune/Tune/Swap (all but L5)
Squawk/Squawk/Mode (L5 only)

RIGHT KNOB
Scroll/Adjust/Toggle

SYS SENSOR TAB

LSKS CHOICES		LSKS CHOICES	
L1	**Traffic** Mode: Normal, Above, Unlimited, Below Range: 2NM, 6NM	R1	**ADAHRS Src** Auto, 1, 2
L2	**Tuning** Com, Nav	R2	**GPS Source** (If R5 GPS is active) Auto, 1, 2
L3	**Com 1** Nav 1	R3	Blank
L4	**Com 2** Nav 2	R4	Blank
L5	**Transponder** Ident	R5	**Sensor** Status, GPS, Datalink
L6	*Advisories*	R6	*Caution and Warnings Message Bar*

LEFT KNOB
Tune/Tune/Swap (all but L5)
Squawk/Squawk/Mode (L5 only)

RIGHT KNOB
Blank

SYS SETUP TAB

ACTIVE TAB

LSKS CHOICES

(L1) **Traffic** Mode: Normal, Above, Unlimited, Below
  Range: 2NM, 6NM

(L2) **Tuning** Com, Nav

(L3) **Com 1** Nav 1

(L4) **Com 2** Nav 2

(L5) **Transponder** Ident

(L6) *Advisories*

LSKS CHOICES

(R1) Blank

(R2) Blank

(R3) Blank

(R4) Blank

(R5) **Setup** Main, Display, FMS, Map, Datablocks, Autopilot

(R6) *Caution & Warnings Message Bar*

LEFT KNOB
Tune/Tune/Swap (all but L5)
Squawk/Squawk/Mode (L5 only)

RIGHT KNOB
Blank

(R5) is active selection

MAIN	**FMS**	**MAP**
R1 **Update Databases**	R1 Blank	R1 **Compass Rose:** On, Off
R2 Blank	R2 **Delete All User Waypoints**	R2 **Alt Filter** On, Off
R3 **Download Logs**	R3 **Delete All Routes**	R3 **Default** Factory, Custom, VFR, IFR
R4 Blank	R4 Blank	R4 Blank
R5 **Setup**	R5 **Setup**	R5 **Setup**

DATABLOCKS	**AUTOPILOT**
R1 Blank	R1 Blank
R2 Blank	R2 Blank
R3 Blank	R3 **Run Calibration**
R4 **Reset Defaults**	R4 Blank
R5 **Setup**	R5 **Setup**

Appendix E – Checklist Pages

You can display checklists on all IFDs as shown below.

Before Takeoff Checklist
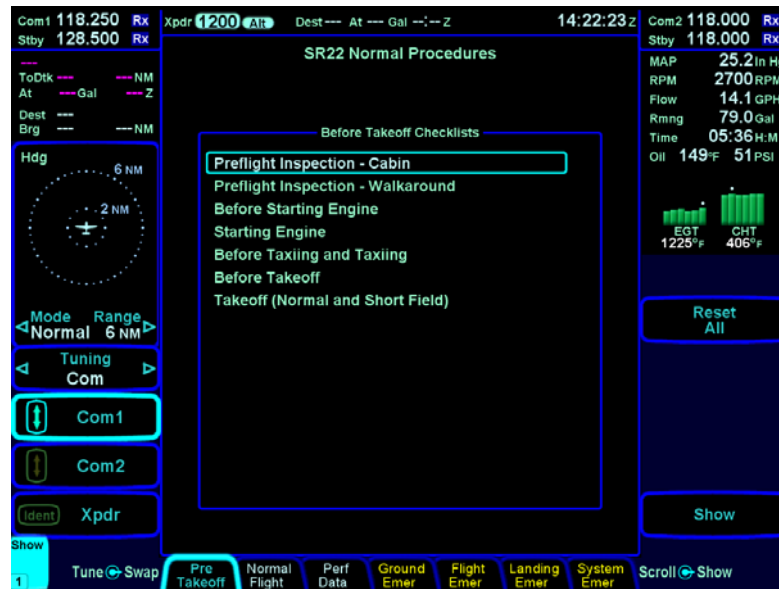
TYPES OF CHECKLISTS

- **Normal** – Provides step-by-step information on performing normal tasks such as pre-flight inspection, taxi, take-off, cruise, descent, and Go-around.

- **Performance Data** – Provides performance data derived directly from the aircraft POH.

- **Emergency** – Provides procedures for aircraft emergency situations and abnormal procedures. The Emergency checklist tabs are bright yellow.

Within each type of checklist, there is a Checklist Directory listing all checklists related to a specific topic, such as the Before Takeoff Directory.

CHECKLIST VERSIONS

The Setup Main tab displays the currently loaded checklist version. Consult your aircraft POH or manufacturer to confirm the correct checklist data version is loaded on your Entegra IFD.

If, during startup, the Entegra IFD determines the checklist data is not valid, the following message will display when you open a Checklist tab. "No Checklist data available. Consult your dealer or service center for checklist data update."

VIEWING CHECKLISTS

On a PFD-enabled IFD, pressing **CHKL** opens and scrolls through the main checklist categories. You can view primary flight instruments and checklists on the same page. From the PFD, if you press CHKL and open any checklist screen, the HSI appears as an arc in the upper half of the screen below the Attitude Indicator.

Each category may contain a number of checklists for your aircraft. Using the right knob, you can select a checklist and then press the knob or you can use the labeled LSKs along the right edge and/or the right hand bezel knob to complete or un-complete the checklist steps.

The following figure illustrates a CHKL screen on both IFDs.

CHKL Pages

CHECKLIST DIRECTORIES

Each checklist directory page has a set of keys that are defined below. You can use it to check, uncheck, reset the checklist, and proceed to the next checklist.

Checklist Directory and LSKs

- **Checklist Directory** – The list of checklists available in this category. Selecting a new checklist tab displays a directory.

- **Reset All** – Press to reset all checklists in the highlighted directory to "Not done."

- **Show** – Press to display the highlighted checklist.

- **Sel knob** – Scrolls up and down the directory list. Pressing Show displays the highlighted checklist.

CHECKLISTS

Each Checklist (CHKL) tab has a set of keys which are defined below. Use them to check, uncheck, reset the checklist, and proceed to the next checklist.

Checklist LSKs

- **Reset Checklist** – Resets all items in the checklist to "not done." The color returns to the "not done" state and the checkmark is removed.

- **Check All** – Sets all items in the checklist to Done. The color changes and a checkmark is added to each item. This may be most useful for, for example, the pre-flight walk-around. Rather than pressing Item Done for each step.

- **Next Checklist** – If you are using a set of checklists (such as the Before Takeoff Checklists), press Next Chkl to open the next checklist in the directory.

- **Directory** – Opens the current checklist directory.

- **Check/Uncheck** – When you complete an item, press Check. The item color changes, a checkmark is added to that item, and the LSK text changes to *Uncheck*. Press Undo Item and the item returns to its original state and the LSK text changes back to Item Done.

- **Sel knob** – Rotate to scroll up and down the checklist. The currently selected checklist item is highlighted. Push the knob to check or uncheck.

Index

Website There is a dedicated website that provides training material, videos, and more information on this product at www.Release9.com.

FAQs www.Release9.com/FAQs

Service Hotline A dedicated hotline has been established to service questions or issues regarding this product. The U.S. Toll Free number is 1-877-MyAviR9 (1-877-692-8479)

When calling or emailing for product-related help, please have the following information available:

- Customer Name/Account Information IFD(s) Serial Numbers – either read it from the label physically attached to back of IFD (need to partially remove the IFD to see it), or get it from the aircraft maintenance records.

- IFD(s) Software Part Numbers – press the "SYS" page function key and then tab over to the "Setup" tab. Record the "Software Version" and the "Flight Software Part Number". Also make a note of any other yellow text on that page.

- Be prepared to download the aircraft flight logs and email/transmit them to Avidyne Customer Service. See Chapter 13 for procedures.

REPORT ANY OBSERVED DISCREPANCIES IN CHART OR NAV DATA TO AVIDYNE VIA 1-877-692-8479.

WARRANTY AVIDYNE WARRANTS THE PRODUCT MANUFACTURED BY IT AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP FOR A PERIOD OF TWENTY-FOUR (24) MONTHS FROM DELIVERY TO THE INSTALLER. A COMPLETE COPY OF THE WARRANTY DATA IS PRINTED ON THE PILOT GUIDE INSERT AND IS ALSO ACCESSIBLE VIA THIS WEB ADDRESS: WWW.RELEASE9.COM/WARRANTY

SOFTWARE LICENSE AVIDYNE CORPORATION ("AVIDYNE") IS WILLING TO LICENSE THIS SOFTWARE, PILOT'S GUIDE, AND RELATED MATERIALS (THE "SOFTWARE") ONLY ON THE CONDITION THAT YOU AGREE TO THE TERMS OF THE PUBLISHED SOFTWARE LICENSE PRINTED ON THE PILOT GUIDE INSERT AND WHICH CAN BE ACCESSED VIA THIS WEB ADDRESS: WWW.RELEASE9.COM/LICENSES