

Revision History		
Date	Revision	Description
Jul 22, 2003	00	Released per ECO 03-188
Sep 11, 2003	01	Updated per ECO 03-225
Mar 31, 2004	02	Updated Per ECO 04-042

<p>System Configuration</p> <p>When contacting your dealer or Avidyne technical support, and when logging onto myavidyne.com for the first time, please have your FlightMax EX5000 serial number and Subscriber Communicator serial number available:</p> <p>FlightMax EX5000 S/N_____</p> <p>Datalink Subscriber Communicator S/N_____</p>

Page Intentionally Left Blank

Table of Contents

Introduction	2
Operation	3
Map Page	4
Controls	4
Symbology	6
Traffic Mode	8
Map Orientation Control	10
Using Datalink	10
Trip Page	12
Nearest Page	14
Engine Instruments	16
Gauges	17
Fuel Usage	18
Temperatures	19
Lean Assist	20
Data Blocks	24
Data Blocks on Map Page	24
Data Log	25
Setup Pages	26
Main	26
Airport Filter	27
Declutter	28
Data Block Edit	29
System Time	30
Datalink Setup	31
Database Updates	33
Appendix	34
Tables	34
Data Base Update Procedures	45
Data Base Region Map	45
Failure Indications	46

An approved Flight Manual Supplement (FMS) will be provided by your installer. The FMS contains information specific to your installation. It contains any operating limitations that may apply.

Introduction

The FlightMax EX5000 Multi-Function Displays (MFD) provide a pictorial view of your flight situation based on input from your GPS navigator. It utilizes on-board database information for mapping off-route navigation data such as nearby airports, VORs, NDBs, special-use and restricted airspace, etc., as well as extensive terrain, interstate highways, water, and obstacle databases.

The EX5000 uses RS-232 to interface to external sensors such as GPS, Goodrich WX-500 Stormscope Sensor, and Ryan TCAD Traffic Sensor. The EX5000 additionally offers ARINC 429 data bus capability. When interfaced via ARINC 429 to a Garmin GNS 430-series GPS, the EX5000 will display the curved paths associated with instrument approaches including DME arcs, holds, and procedure turns. The EX5000 will also provide traffic display capability when interfaced with the Goodrich Skywatch® traffic sensor or a compatible TIS-capable transponder.



The controls on the bezel of the FlightMax EX5000 are placed to allow you quick and intuitive access to the information you need, when you need it.

Operation

General

The EX5000 startup is automatic once power is applied. The system performs a brief hardware self-test, then systematically initializes its functions. After the system has been initialized (less than a minute after power-on), the title screen appears on the system page. Database currency information is also presented. It is here that the pilot is warned of any expired databases.

When the MFD is ready for use, the message "Press any bezel key to continue" is displayed.

Operational Controls

- 1.) **PhotoCell Light Sensor** - Automatically compensates display brightness for varying lighting conditions.
- 2.) **Brightness Control** - Adjusts display brightness level.
- 3.) **Data Port** - Provides a front panel access point for loading database updates.
- 4.) **Buttons** - Used to select modes or change the display as indicated. Active when label appears on the screen adjacent to the key.
- 5.) **Page Control** - Left knob provides quick access to the Trip Page, Nearest Page, Setup Pages, and the Engine Page (when so equipped). Current page is highlighted in lower left corner of screen.
- 6.) **Range & Cursor Control** - Right knob controls the Map's range. When other pages are in view, the right knob provides selection control.
- 7.) **Message Bar** - The message bar is used to keep the pilot informed about critical as well as routine information from the MFD. When information needs to be conveyed the message bar appears as the lowest right button.

The message bar can display only one message at a time. If more than one message is available, the message bar will display the highest priority message on top. The bezel key associated with the message must be depressed to clear messages and view those underneath.

Map Page - Controls

Line select keys on the left side of the bezel provide access to sensor modes. Line select keys on the right side of the bezel access the mapping functions, and control how the map is viewed.



Map Page - Controls

1.) Sensor Functions - Control overlay and modes of installed sensors.

Traffic button with TIS installations cycles between DSPLY ON and DSPLY OFF. When the display of TIS traffic is selected off, the MFD will still display traffic alert messages if any Traffic Advisories (TAs) are received.

Traffic button with TAS (SkyWatch or BendixKing) cycles through traffic sensor modes and overlay in the following order: Above ->Normal ->Below ->Unlimited (UNLIMITD) ->Traffic Overlay Off (DSPLY OFF)

Traffic button, with Ryan TCAD, cycles through traffic sensor modes and overlays based on the phase of flight as calculated from the TCAD. The modes are: Ground, Terminal, Standard, Enroute, Unlimited, Approach, Departure and Display off.

Intruders are displayed as they are received from and identified by the sensor. The threat level assigned to an intruder is the threat level specified by the sensor when it transmits the intruder data. Threat data, range, bearing, altitude, ID and closing direction are defined by the sensor and the type of sensor used in your system.

Lightning button cycles through lightning sensor modes and overlay in the following order: Strike ->Cell ->Lightning Overlay Off (DSPLY OFF). See the Pilot's Guide for the lightning sensor for details of strike and cell modes.

The lightning sensor maps thunderstorm activity by monitoring electrical discharge activity within a 200-mile radius of the aircraft. Lightning strikes are not displayed if the display range is set to less than 25NM. If the display range is set to greater than 25NM, all lightning strikes will be displayed.

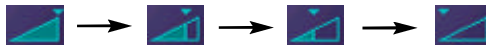
Clear Strikes button removes lightning symbols to allow for the refresh of lightning data.

Weather button cycles through Datalink weather modes and overlay based on the Datalink data requested from the Datalink Setup Page. With all data requested, the order is: ALL (Nexrad, METARS and Airmets) ->REPORTS (METARS and Airmets) -> NEXRAD -> Datalink Weather Display Off.

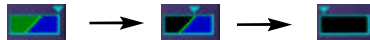
2.) Map Functions - Control the basic look of the map in terms of map orientation, number of elements, and base map.

View line select key orients the map for either Heading Up or North Up. FORWARD view orients the map with Heading Up, CENTER view orients the map with Heading Up, and NORTH UP orients the map with True North Up.

Declutter line select key allows you to quickly choose from four levels of database Nav Map detail from most to least:



Base Map line select key selects from three levels of map detail, starting with contoured terrain with interstate highways, water base map, and political boundaries. Pressing the key removes contoured terrain with Interstates, while leaving water and political boundary references. Push again to view the flight plan on a traditional EFIS-style black background.



3.) Range Control - Controls the map's range and allows you to range down to 1NM scale and out to 1500NM scale. The nineteen selectable ranges are 1, 2, 5, 10, 15, 20, 30, 40, 50, 75, 100, 150, 200, 300, 400, 500, 750, 1000, 1500.

(Note: Terrain base map is automatically removed and Nav database information is fully decluttered at 750NM and higher ranges).




Map Page - Symbology




The MFD's map presentation depicts your aircraft's position in relation to flight plan, nearby airports, terrain, traffic, lightning, weather, special use airspace and other nav aids.



- 1.) **Data Blocks (Left & Right)** - View navigation and engine (when equipped with EMax) data in data blocks in the upper corners of the display. See Data Block Edit (page 29) for options.
- 2.) **Sensor Status Box** - Displays the status of the lightning and traffic sensors installed on the aircraft. A third status box informs the pilot of the Nexrad data status and age.
- 3.) **Heading/Track Indicator** - Three triangles around the compass rose provide actual track, desired track, and heading indications. The H/T Block provides digital readout of the current heading, or actual track. Map orientation is indicated in the triangle to the right of the H/T Block.

H/T Block 031

 Desired Track
 Actual Track
 Heading

 Track Up
 Heading Up
 North Up

Map Page - Symbology

4.) **Obstacles** - The MFD's database contains towers and other obstacles greater than 200 feet AGL. Obstacles can be displayed with MSL altitude label. Symbols for Obstacles:



5.) **Compass Rose/Range Ring** - Displays a 360-degree or 120-degree compass circle or arc and also indicates current range setting. The range number is the distance from the airplane symbol to the compass arc.

6.) **Terrain Scale** - Shows highest and lowest limits of terrain in displayed area. Legend colors in between these numerics represent terrain elevations. Blue obstacle clearance number shows the top of the highest obstacle, when greater than the highest displayed terrain. Terrain data is not displayed when your aircraft's latitude is greater than 75 degrees (north or south).

7.) **Special Use Airspace** - The MFD uses several different line styles to convey special use and class airspaces. Class B is solid blue line, Class C is solid magenta line. Class D is dashed blue line, MOA, Warning, and Alert areas are solid yellow lines, and restricted and prohibited areas are solid red lines. Reference Table 5 and associated note (Page 37).

8.) **Airport Runway Diagrams** - Runway layouts of your destination airport and nearby airports are displayed. As you range in, the scaled runway diagram with heading labels shows the field orientation in relation to your position.

9.) **Flight Plan** - The active flight plan from the GPS is displayed on the map. The current leg is displayed in magenta and all remaining legs are shown in white. When you select an approach procedure on the Garmin 430, all approach segments including holds, DME arcs, procedure turns, etc., are shown.

NOTE: The Garmin GNS 430 does not differentiate curved flight path segments from straight segments when interfaced with the MFD via an RS232 interface. Therefore, the MFD will connect the beginning and end waypoints of a curved segment, such as a DME arc, with a straight line. Under these circumstances, the straight line must be ignored. Approach procedures should be flown using the GNS 430 navigator's CDI as the primary reference. Consult your avionics installation facility to determine if your MFD is interfaced to the GNS 430 via ARINC 429 or RS232.

10.) **Traffic Indications** - Shows traffic symbol relative to current position and includes relative altitude (when available) with respect to airplane symbol. When available, TIS installations will show a ground track "stinger" for each intruder, indicating the intruder's track as measured by ground radar. See traffic sensor user's manual for further details.



11.) **Lightning Indications** - Shows lightning strikes geographically referenced if configured. Strikes are represented by yellow "X" in Strike Mode, and by yellow "+" in Cell Mode. Lightning strikes are displayed for three minutes.



12.) **Airplane Symbol** - Shows the position of your aircraft in relation to the moving map and the selected view.



Map Orientation Control

The pilot can control the orientation of the map and sensor data displayed on the MFD with the Map View button. MFD traffic and lightning symbols are positioned relative to the aircraft symbol nose. When the Map View is North-Up extra pilot effort may be needed to locate traffic outside the aircraft. Set Map View to Center or Forward to display this data consistent with typical dedicated traffic and lightning sensor displays.

Traffic Mode

When a Traffic Advisory (TA) is reported from the traffic sensor, the MFD displays a traffic alert message in the Message Bar.

- 1.) **Traffic Alert (TA)** message bar is displayed if the traffic sensor detects traffic within its alert zone. Acknowledging the TA message displays a dedicated traffic page designed to give the pilot maximum traffic situational awareness. The Traffic Mode page is a specially configured Map page with the following settings:

View - center, with heading (or track) up

Range - 5 NM

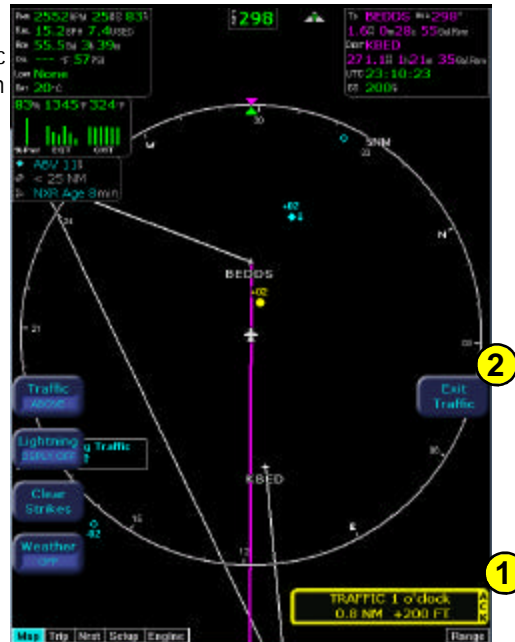
Base Map - no terrain or political boundaries

Declutter - no symbol or airspace depictions

DL Weather - not displayed

Lightning - not displayed

Flight Plan - displayed



EX5000 MFD in Traffic Mode

Up to 5 non-bearing intruders (traffic threats reported by the traffic sensor without valid bearing) are listed below the airplane symbol.




Acknowledging the TA message will remove it from the message bar, allowing other messages to be displayed. The TA message will be automatically removed when the threat is reduced or the intruder is no longer present.

- 2.) **Exit Traffic** button restores the Map page to the previous settings. If the Map page is restored prior to acknowledging a TA, the message will remain displayed and acknowledging it will once again bring up the dedicated traffic display.

Note: Traffic information is provided to the pilot as an aid to visually acquiring traffic. Pilots should maneuver their aircraft based only on ATC guidance or positive acquisition of conflicting traffic.

Traffic Mode

Aircraft traffic detected by a Traffic Sensor are referred to as intruders and are displayed as one of three symbols. If a compatible TIS system is installed and intruder track information is available, the appropriate symbol will be shown with a "stinger" which depicts the current ground track of the intruder, as detected by ATC radar systems. It should be noted that the traffic sensor intruder track information is known to an accuracy within 45° of true intruder track. This should be taken into account when visually acquiring the reported traffic. Also note that intruder traffic could maneuver at any time, and the current intruder track direction does not guarantee the intruder will continue along that track. For traffic sensors without track information (e.g. TAS), traffic symbols are shown without the track symbology. The traffic symbols are:

Symbol	Type	Meaning
	Traffic Alert (TA) [shown with intruder track]	Traffic that is within the alert zone defined by the traffic sensor.
	Proximate Traffic [shown without intruder track]	Traffic that is not within an alert zone, but is close to your position.
	Other Traffic [shown with intruder track]	Traffic that is detected by the traffic sensor, but determined to be not currently significant.

Consult the Pilot's Guide for the installed traffic sensor for specific information on sensor ranges and traffic alert zone definitions.

If the intruder altitude and vertical speed are known, they are displayed alongside the intruder symbol. The number immediately above or below the traffic symbol indicates the relative altitude of the intruder to your position, in hundreds of feet. An arrow next to an intruder symbol shows the direction of any vertical movement of the intruder that is in excess of 400 feet per minute. For example, in the Traffic Alert example shown above, the intruder is 500 feet below and is climbing. In addition, this example with an intruder track shows the intruder is moving along a track approximately 45 degrees to the right of our current map alignment. (i.e. if the MFD map is set for North Up, the intruder is flying a track somewhere between 023 and 067. This is the accuracy limit of the intruder track data.)

For TIS installations, the following may be reported in the Traffic status block on the Map page:

OPER - the TIS sensor is operating normally.

CST 00:00 - the TIS sensor has temporarily lost the information feed from ground-based radar and is in "coast" mode. The MFD will continue to display the traffic last received, while the CST timer will count up the seconds since the last valid data.

RMV 00:00 - after approximately 12 seconds of coasting, the TIS sensor will remove the traffic information and display RMV, and continue to count the time since the last valid data.

UNAVAIL - more than 60 seconds have passed since valid data was received, or TIS data is not available at the current aircraft location.

SBY - the TIS sensor is in standby mode.

DATA FAIL - the TIS sensor has reported an internal fault. Traffic information will be removed from display.

Using Datalink

Your EX5000 comes equipped with an integrated datalink function that allows you to stay completely tuned in to the current weather, SUA, and TFR conditions along your route of flight. Since this function is completely integrated, there is nothing "special" or new that you need to learn to make it work for you.

You will need to log on to *MyAvidyne.com* and follow the account setup instructions in order to establish an Avidyne datalink account. Be sure to have your datalink Subscriber Communicator (SC) serial number handy. You will need it to open your account. You can view your SC s/n on the EX5000 Datalink Setup Page (Figure 11). Once your account is activated, you may immediately begin enjoying the advantages of the EX5000's satellite-based datalink capability. In addition, your *MyAvidyne.com* datalink account provides you with access to your billing and usage statements, as well as providing pre-flight weather links and planning tools. You can set your datalink user preferences online prior to your flight, and they will be downlinked to your EX5000 via satellite the next time you fly.

When you power up the EX5000, it will immediately begin sending position data to tell the satellite network where you are and that you are about to begin a flight. Weather data will begin transferring to your airplane based upon your user preferences. No action is required to begin receiving weather (You will have to pull your airplane out of the hangar so that the satellite receiver can locate a satellite).

Upon entry of a flight plan, your EX5000 will automatically download the weather for your route of flight without any additional action required. Additional updates will be provided while enroute based upon the update rate that you have selected online or on the EX5000's datalink setup page.



Datalink Setup Page

Using Datalink

The Weather Overlay button allows you to add Nexrad Graphical METARs and Airmets weather images onto the map display.



NEXRAD data is displayed in a four-color format consistent with weather radar data. The NEXRAD age is displayed in the sensor status box. The displayed age is calculated based on the time the national NEXRAD composite image is created. The actual radar data may be slightly older than the displayed NEXRAD age. Graphical METARs are displayed as small upright flags. These offer you a chance to look at the "bigger picture" for weather along your route of flight. Airmet/Sigmet data is overlaid with lines that alternate between single and triple thick. The thick side of the line indicates the inside of the affected region. The regions are labeled according to the type of Airmet/Sigmet, and the label is located in the interior of the depicted region. (see table 6)

Map with NEXRAD & Graphical METARs

The boundary of the available weather coverage area is shown by hash marks. The intent of the datalink weather boundary is to clearly show when there is actual weather in the area, versus when there may be weather in a given area but it is not displayed. If you would like to expand the amount of data displayed (and therefore move the boundary farther from your flight plan) you can do this on the Datalink Setup Page or at MyAvidyne.com.

Datalink weather should only be used for strategic planning purposes. Datalink weather should not be used for tactical weather avoidance. Local conditions may have changed since your last weather update.

The National Weather Service only provides NEXRAD for the Continental United States (CONUS). The EX5000 will not depict NEXRAD images for areas outside of CONUS.

Trip Page

The Trip Page is continuously updated during flight. The distance and the time values are updated with each new positive fix from the GPS. The route legs advance with each waypoint message. Turning the left knob one detent to the right brings up the Trip Page, which shows the remaining legs in the current flight plan and other data being received by the MFD from the GPS. If the flight plan doesn't fit on the screen, an ellipse (...) is shown in the next to last line. The last line is still displayed. All flight plans are from the GPS. A "No Flightplan Available" message is displayed if there is no flight plan entered or if the GPS has failed.



1.) Current ground speed and track

2.) Flight Plan information from your GPS. Active waypoint is shown in magenta.

Displayed data:

WPT - Waypoint identifier as received from the GPS

BRG - Bearing to current waypoint

DTK - Desired track to waypoint

DIST (NM) - Cumulative great circle distance of each flight plan leg

ETE - Cumulative estimated time en route to waypoint in H:MM format for each flight plan leg at current ground speed.

ETA - Estimated time of arrival to waypoint in HH:MM formatted for airplane local time.

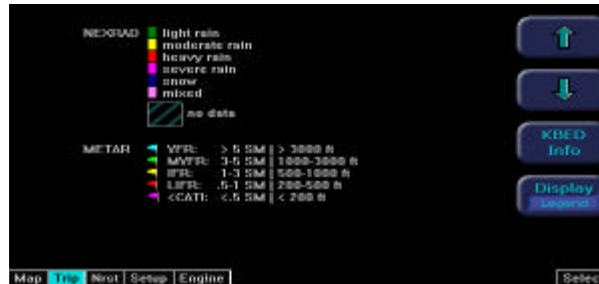
Fuel Remaining - Available with Engine and Fuel Monitor function. Displays remaining fuel at each waypoint in gallons.

Nrst METAR - Available with Datalink enabled. Displays Graphical METAR and reporting point identifier.

Trip Page

NOTE: When the MFD is interfaced to a Garmin GNS-430/GNC-420 via RS-232, the GPS may send duplicate waypoints while in approach mode. These duplicate waypoints may affect the distance and time readings on the trip page. Approach procedures should be flown using the GPS as the primary source of navigation information. Consult your avionics installation facility to determine if your MFD is interfaced to the Garmin GNS-430/GNC-420 via ARINC 429 or RS-232.

- 3.) **Course Deviation Indicator (CDI)** - Shows lateral distance (Crosstrack deviation) from desired course, providing continuous navigation reference when viewing the Trip page.
- 4.) **Local and UTC time** in HH:MM:SS using a 24-hour clock format.
- 5.) **Destination Airport Information** - Provides quick access to airport information for the destination airport, when available.
- 6.) **Display Button** - By pressing the adjacent button, you can toggle through Textual METARS, NEXRAD/METAR Legend, and Datalink Status. The Satellite Status values have been normalized to values between 0 and 10 to allow easy determination of the satellite link.



Trip Page NEXRAD/METAR Legend



Trip Page Satellite Status

Satellite in View - Displays the name of the satellite the system is currently using.

Signal Strength/Signal Quality - Signal Status represents the overall health of the satellite signal. The higher these value are, the better the signal strength. You should normally see values between 4 and 10.

Message Quality - Even when the signal strength is good, messages may be dropped if the local interference level is too high. You should see values between 7 and 10 during normal operation.

7.) **Select Knob** - Moves the cursor over the desired waypoint in the flight plan, which selects the plain-English textual METAR to be displayed along the bottom half of the screen.

Nearest Page (NRST)

From the Trip page, turning the left knob one detent to the right brings up the NRST Page. The Nearest Page brings up the nearest airports within 60NM of your present position. Through the line select keys, you will also have access to detailed information about each airport. The line select keys also allow you to view the nearest VORs, NDBs, Intersections, and Obstacles.

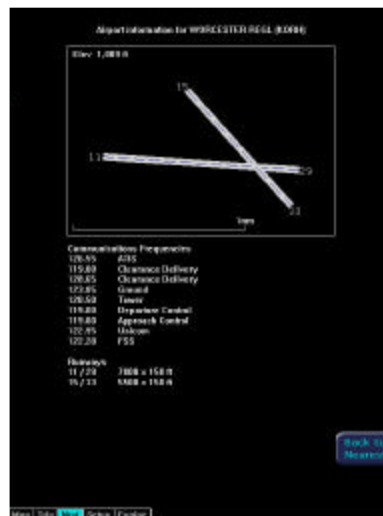


Nearest Page (NRST)

- 1.) **TYPE** - Cycles through the various data types in the following order:
Airports ->VORs ->NDBs ->Intersections ->Obstacles



- 2.) **NRST List** - Shows a list of the nearest data including identifier, bearing, distance, frequency and name for airports, VORs, and NDBs. Identifier, bearing and distance are displayed for intersections, and MSL (and AGL) height, bearing and distance are displayed for obstacles.



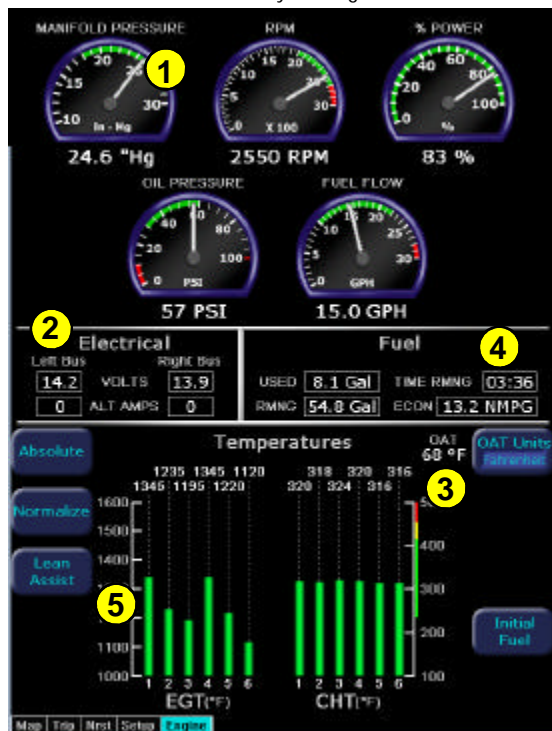
- 3.) **Selection Control** - Use line select keys or right knob to move the cursor up or down to highlight a specific airport or other data type.

- 4.) **FILTER** - Press to see all airport types (SHOW ALL) or only the airport types as defined on the Airport filter page (ON) (Reference Set Up Pages - Airport Filter, Page 27). The Filter line select is only visible on the Nearest Airport page.

- 5.) **Airport Info** - Provides quick access to airport information for the airport highlighted. Airport Info line select only appears when viewing the Nearest Airport page.

Engine Instruments - Engine Page

When equipped with Engine Instrumentation capability, the MFD provides an Engine page which is accessed by turning the left knob all the way to the right. This page is used to display the health and performance status of the aircraft engine. Most of the engine indications are transmitted to the MFD via a remotely mounted sensor interface unit (SIU) while the remainder are calculated by the FlightMax EX5000.



The Engine page is divided into four main sections plus an OAT gauge:

- 1.) **Gauges** - Provides analog and digital readouts of Manifold Pressure, RPM, Percent Power, Oil Temperature (if available), Oil Pressure and Fuel Flow.
- 2.) **Electrical** - Monitors electrical buses and alternator output currents.
- 3.) **OAT** - Monitors the outside air temperature (OAT).
- 4.) **Fuel** - Provides Fuel Used, Fuel Remaining, Time Remaining, and Fuel Economy.
- 5.) **Cylinder Temperatures** - Full display of Exhaust Gas Temperature (EGT) and Cylinder Head Temperature (CHT) for all six cylinders, as well as Turbine Inlet Temperature (TIT) for turbo-equipped engines.

Engine Instruments - Cautions and Warnings - In order to assist the pilot in monitoring engine health, the MFD will highlight any engine parameters that are not within normal operating conditions. "Caution zone" readings will cause the appropriate annunciation to turn yellow while "Warning zone" readings will cause a red indication.

Engine Instruments - Gauges, Electrical, & OAT



1.) Gauges

The picture above shows the engine gauges for the Columbia 350. Gauges for the Columbia 400 are similar.

MANIFOLD PRESSURE - Displays current engine manifold pressure in inches of mercury as measured at the engine's induction system and reported by the SIU.

RPM - Displays current engine speed in revolutions per minute as reported by the SIU.

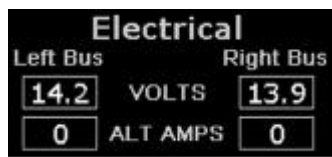
% POWER - Indicates the current percent power being made by the engine. This indication is calculated by the MFD based on engine RPM, manifold pressure, outside air temperature, and pressure altitude. The Percent Power is not displayed below 40% power.

OIL TEMP - Displays the current engine oil temperature in degrees Fahrenheit as reported by the SIU. (when available)

OIL PRESSURE - Displays the current engine oil pressure in pounds per square inch (PSI) as reported by the SIU.

Fuel Flow - Displays the current engine fuel consumption as a fuel flow in gallons per hour (GPH) as reported by the SIU.

2.) Electrical



LEFT/RIGHT BUS - Indicates the current voltage of the left and right buses in volts as reported by the SIU.

LEFT/RIGHT ALT AMPS - Indicates the amount of current in Amps being produced by the left and right alternators as reported by the SIU.



3.) Outside Air Temperature (OAT) - Indicates the ambient air temperature as reported by the SIU (or Avidyne PFD, if installed). This will either be displayed in degrees Fahrenheit or degrees Celsius as selected by the pilot using the temperature units control.

Engine Instruments - Fuel Usage

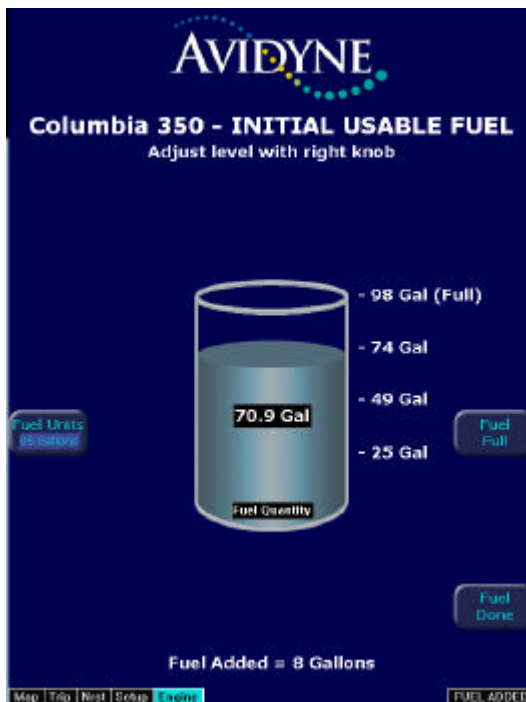
4.) Fuel Usage

Fuel Initialization Page

- Displayed on startup or when the "Initial Fuel" button is pressed. The MFD will display the fuel initialization page and ask the pilot to input the amount of fuel added to the aircraft.

Button for "Fuel Full" is available to quickly set the fuel level to a full tank. In addition the right knob can be used to fine tune the amount of fuel added.

When the desired amount has been entered, pressing the "Fuel Done" button will exit the fuel initialization page.



From the Engines Page, the MFD displays Fuel Used, Fuel Remaining, Time Remaining, and Fuel Economy.

USED - Displays the total amount of fuel used since the last engine start as reported by the SIU.

RMNG - Displays the total amount of fuel remaining in gallons. This indication is calculated by the MFD based on the starting fuel entered by the pilot on the fuel initialization page and fuel used as reported by the SIU.

TIME RMNG - Displays the amount of time remaining before the total useable fuel on board will be consumed. This indication is also calculated by the MFD based on the setting from the fuel initialization page, fuel remaining, and fuel flow as reported by the SIU. This value is only displayed when the GPS ground speed is greater than 50 knots.

ECON - Displays the current fuel economy in nautical miles per gallon. This indication is based on the fuel flow as reported by the SIU and the ground speed as reported by the GPS. This value is only reported if the GPS ground speed is greater than 50 kts.



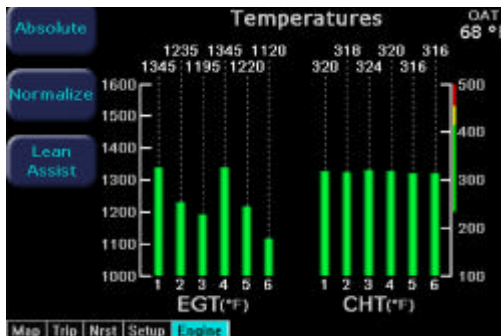
Engine Instruments - Temperatures

5.) Engine Page - Cylinder Temperatures

Turbine Inlet Temperature (TIT) - (Turbocharged Engines only) Indicates the exhaust temperature at the left turbocharger intake in degrees fahrenheit.

Exhaust Gas Temperature (EGT) - Indicates the exhaust gas temperature of each cylinder in degrees

Fahrenheit as a bar graph. The individual EGT of each cylinder is also displayed as a numeric indication above each bar. An up or down trend arrow will also appear below this numeric indication to indicate whether a cylinder's EGT is rising or falling.



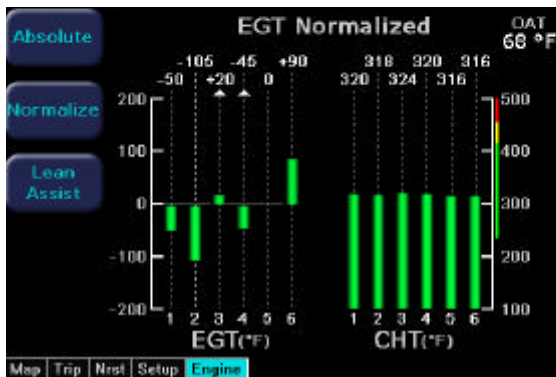
Cylinder Head Temperature (CHT) - Indicates the

temperature in degrees Fahrenheit of each engine cylinder head as reported by the SIU. The individual temperature of each cylinder is also displayed as a numeric indication above each bar. A white up or down trend arrow will also appear above or below this numeric indication to indicate whether a cylinder is rising or falling in temperature.

Absolute - Selects the "absolute" mode for EGT(+TIT) display. Absolute mode is the default display mode, which indicates the current overall temperatures for EGT and TIT, if applicable.

Normalize - Selects the "normalize" mode for the EGT(+TIT) display. Upon activation, the display will establish the current EGT's at a zero point, as well as TIT, if applicable.

Operating Ranges - The TIT and CHT bar graphs are white below normal operating temperatures, green for the normal range, and yellow or red for the caution and warning zones, respectively.



In Normalized mode, the bar graphs will indicate overall changes in EGT & TIT (if applicable) rather than displaying the actual temperature values as in absolute mode.

Lean Assist, turbocharged engines

Engine Instruments Lean Assist

The MFD Lean Assist function for turbocharged engines is similar to that for non-turbo engines, but has been specifically tailored to use Turbine Inlet Temperature (TIT) in place of EGT values for determining the proper Best Economy and Best Power leaning points.

Above 85% Power, operations must take place at Full Rich - leaning is not allowed.

Leaning for Best Power

Between 65% and 85% Power, leaning is only allowed to the Best Power point, which is rich of the peak TIT.

- 1.) Begin by pressing the "Lean Assist" button and smoothly leaning the mixture control.
- 2.) The MFD will announce "Looking for Peak" on the Engine Page.
- 3.) When the MFD has detected a peak in the TIT, it will announce "Best Power - Richen to -50°" and the TIT bar graph will turn cyan, showing a differential temperature from the peak.
- 4.) The pilot should then move the mixture control forward towards rich, until the TIT bar graph shows a differential temperature from the peak of -50°. When the pilot nears this condition, the MFD will announce "Best Power".
- 5.) After the desired setting has been achieved, the pilot can press the "Normalize" or "Absolute" buttons to exit the Lean Assist Function. The Lean State will continue to be provided in the "Lean" datablock on the Map Page.

Note that after detecting the peak, the mixture setting is just past the peak TIT on the lean side. Therefore, the initial movement upon starting to richen the mixture is for the TIT to return towards the peak, before declining once the peak has been passed over to the rich side. If the mixture is moved too far towards rich, the MFD will announce "Rich of Best Power" and if moved too far lean, "Too Lean, Richen Mixture". Also, as a precaution, the Lean Assist algorithm will not allow leaning past a TIT of 1700°. Therefore, if this temperature is reached during leaning, the MFD will instruct the pilot to richen to -50° from that point.



Lean Assist, turbocharged engines

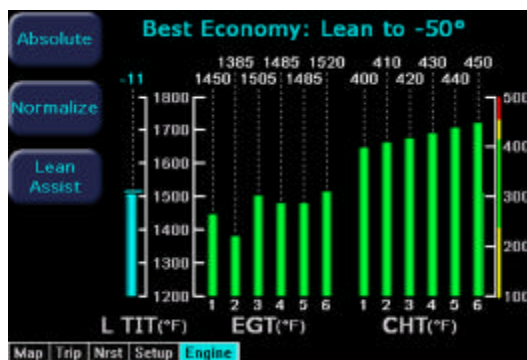
Leaning for Best Economy

Between 40% and 65% percent power, leaning is also allowed to the Best Economy point, which is lean of the peak TIT.

- 1.) Begin by pressing the "Lean Assist" button and smoothly leaning the mixture control.
- 2.) The MFD will annunciate "Looking for Peak" on the Engine Page.
- 3.) When the MFD has detected a peak in the TIT, it will annunciate "Best Economy - Lean to -50°" and the TIT bar graph will turn cyan, showing a differential temperature from the peak.
- 4.) The pilot should then continue to lean the mixture control, until the TIT bar graph shows a differential temperature from the peak of -50°. When the pilot nears this condition, the MFD will annunciate "Best Economy".
- 5.) After the desired setting has been achieved, the pilot can press the "Normalize" or "Absolute" buttons to exit the Lean Assist function. The Lean State will continue to be provided in the "Lean" datablock on the Map page.

If the pilot leans the mixture too far past the Best Economy Point, the MFD will annunciate "Too Lean". If the pilot richens the mixture back towards the TIT peak, the MFD will switch to Power mode and instruct the pilot to richen for best power. (see previous page)

As a precaution, the Lean Assist algorithm will not allow leaning past a TIT of 1700°. Therefore, if this temperature is reached during leaning, the MFD will instruct the pilot to richen to -50° from that point.



Lean Assist, non-turbo engines

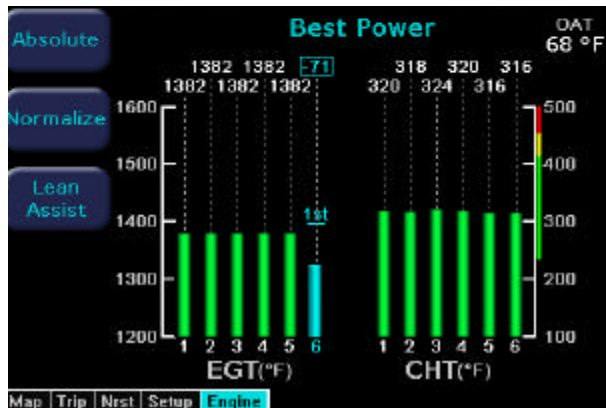
Engine Instruments Lean Assist

The MFD is equipped with a lean assist function which is used to set the optimum mixture for various operating conditions. The MFD will automatically detect whether the pilot is leaning for best power or best economy and provide visual messages to guide the pilot toward the correct mixture setting.

Leaning for Best Power

- 1.) In order to lean the engine for best power, begin by pressing the "Lean Assist" button and smoothly lean the mixture control.
- 2.) The MFD will announce "Looking for First Peak" at the top of the temperatures section of the display.
- 3.) When leaning for best power, the final mixture setting is based on first cylinder to peak. As the mixture is leaned look for a rise in EGT.

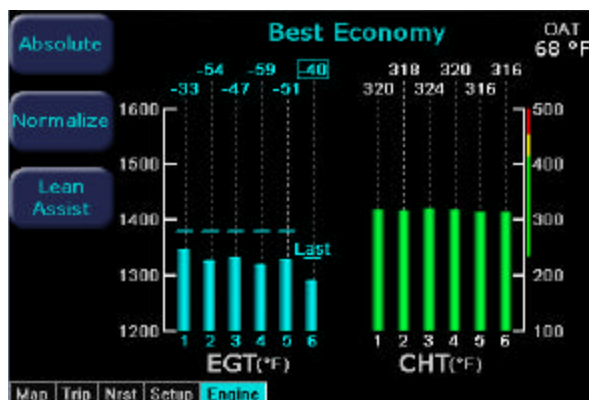
(For this example assume that cylinder #5 is the first to peak.)
- 4.) As cylinder #5 peaks the display will announce "Peak Detected" and the #5 cylinder bar graph will turn cyan.
- 5.) At this point the pilot should then begin to richen the mixture.
- 6.) As the mixture is richened the display will first announce "Looking for #5 to Peak (Rich)," and then "Peak Detected (Rich)" as it determines the peak temperature. Finally, it will display "Best Power" when the optimum best power mixture has been achieved.
- 7.) After the desired engine lean setting is achieved, press the "Normalize" or "Absolute" button to exit the "Lean Assist" function. The Lean State is provided in the "Lean" Map page Datablock.



Lean Assist, non-turbo engines

Leaning for Best Economy

- 1.) In order to lean the engine for best economy, begin by pressing the "Lean Assist" button and smoothly lean the mixture control.
- 2.) The MFD will announce "Looking for First Peak" at the top of the temperatures section of the display.
- 3.) As the EGT's rise the first cylinder will reach peak EGT followed by the second cylinder. Continue to slowly lean the mixture.
- 4.) After the third cylinder peaks, the annunciation will change to "Looking for Last Peak."
- 5.) When leaning for best economy, the final mixture setting is based on the last cylinder to peak. As the mixture is leaned further, the last cylinder will eventually peak, and the MFD will announce "Last Peak Detected."
- 6.) Continue leaning until the MFD announces "Best Economy" which will indicate that the best economy mixture has been achieved.
- 7.) After the desired engine lean setting is achieved, press the "Normalize" or "Absolute" button to exit the "Lean Assist" function. The Lean State is provided in the "Lean" Map page databook.



Engine Instruments - Data Blocks on Map Page

Data Blocks in the upper left and right corners of the Map page can be configured to show engine instrument information.



The "Lean" data block shows the status of the Lean function. After leaning to Best Economy or Best Power on the Engine Page, press the "Absolute" or "Normalize" button to exit the Lean Assist mode

On the Map Page, the Lean data block will show "Economy" or "Power" when the Lean Assist procedure is completed.

Other Lean data block states are:

Leaning... - Displayed when you switch back to the map page before the Lean Assist mode was exited.

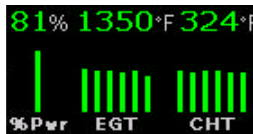
Incomplete - When the Lean Assist mode is exited prior to achieving Best Power or Best Economy

FF Change - When the lean state is changed by a fuel flow adjustment

Pwr Change - When the lean state is changed by a power adjustment.

Engine Instrument Graphical Data Block on Map Page

The Engine Instrument Graphical Data Block provides textual and graphical representation of the Percent Power, EGT, and CHT (for the hottest cylinder). For turbocharged engines, TIT is also available. If selected, this data block is positioned below the other left data blocks.



See the Data Block Setup section on Page 39 for additional information.

Engine Instruments - Data Log

The FlightMax EX5000 Engine Monitor provides full-time recording of time, position, pressure altitude and critical engine performance parameters. The MFD will log up to 30 hours of recorded data, which can be downloaded via the MFD's bezel-accessible data port.

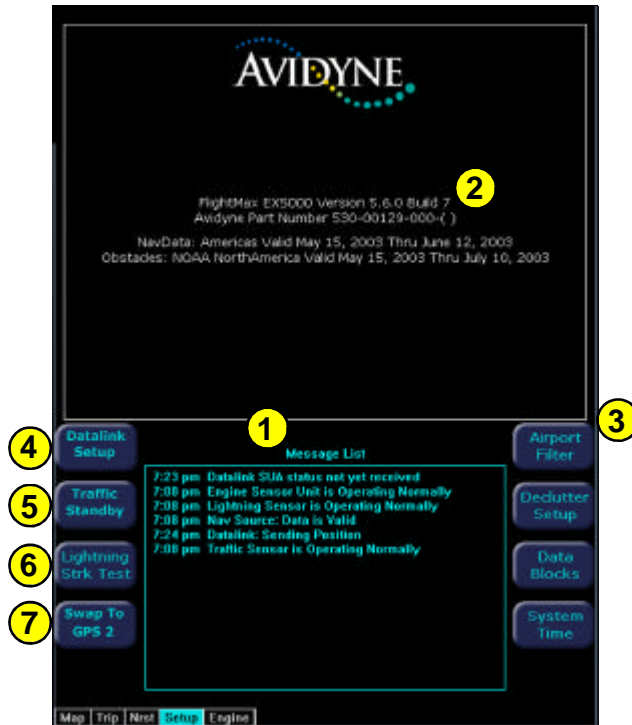
In order to download the stored engine data log files:

- 1.) Turn power OFF to the MFD
- 2.) Install compatible blank USB disk into the Data Loader drive
- 3.) Connect one end of the interconnect cable to the Data Loader and the other end to the MFD data port on the front panel.
- 4.) Apply power to the MFD by turning ON the avionics master switch.
- 5.) The Data Log Transfer screen is displayed.
- 6.) Press the "Proceed" button. Do not turn off the MFD or disconnect the interconnect cable during a data transfer.
- 7.) The data transfer is complete when disk is automatically ejected from the Data Loader drive and the "Press Any Bezel Key" message is displayed.
- 8.) Remove the Data Loader and interconnect cable and store in a safe place.

The disk will contain up to 30 hours of engine data in two file formats, an ASCII text file which can be opened in most spreadsheet programs (.log), and a Jeppesen Track file (.txt) which is compatible with Jeppesen FliteStar.

Setup Pages - Main

From the Nearest pages, turning the left knob one detent to the right brings up the Setup Pages, which are used to set user preferences and sensor settings.



- 1.) **Message List** including sensor status. This is a record of the messages displayed in the bottom right button of each page. The highest priority and most recent messages appear at the top of the list.
- 2.) **Software build number, software part number and release date** are displayed here. Expiration dates for on-board databases are also shown on this page.
- 3.) **Setup Menu** - Line select keys to select specific setup functions including: Airport Filter, Declutter Settings, Data Block Editing, System Time.
- 4.) **Datalink Setup** - To configure the Datalink function.
- 5.) **Traffic Standby** - Switches SkyWatch traffic sensor back into standby mode only while on the ground. To view traffic data while on the ground press Traffic button in Map page. When the traffic sensor is in standby mode the Traffic button will be **Traffic Self Test**. When selected, the MFD initiates a 30 second self test of the SkyWatch traffic sensor.
- 6.) **Lightning Strike Test** - Initiates a self test of the lightning sensor.
- 7.) **Swap to GPS X** - Swaps between GPS1 and GPS2 as to which unit is providing position information and flight plan data to the moving map. (Only available when EX5000 is wired for ARINC 429 to both GPS systems.)

Setup Pages - Airport Filter

The Airport Filter page allows you to set criteria for nearest airport searches of the database. You can select towered and/or non-towered airports, the type of surfaces you prefer to land on, and the minimum runway length based on your particular aircraft or type of flying. The values selected on this page also dictate the types of airports that get displayed on the map.



1.) **Airport Type** - Select Towered, Non-Towered, or both.

2.) **Surface** - Select between hard, soft and/or water surfaces.

Note: Display of airports with both hard surface and water runways requires that the hard surface box be checked.

3.) **Minimum Runway Length** - select the minimum runway length in hundreds of feet from 2000ft - 7000ft. or show all lengths.

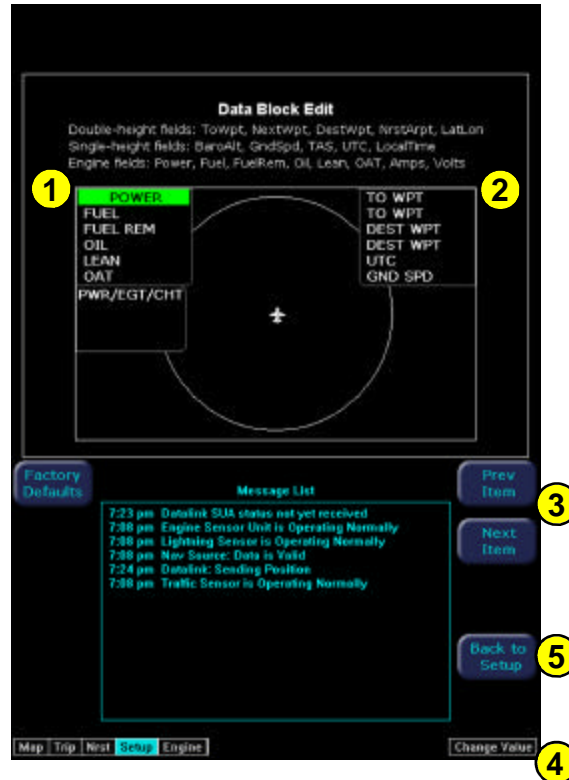
4.) **Prev & Next Item Buttons** - Press to move the selected field box.

5.) **Change Value** - Rotate knob to change the value of the setting within the selected field.

6.) **Back to Setup** - Press to go back to the Main Setup menu.

Setup Pages - Data Block Edit

Data blocks in the upper corners of the Map Page can be edited to display information from a list of available data types. A series of dashes represents data that is invalid or unavailable.



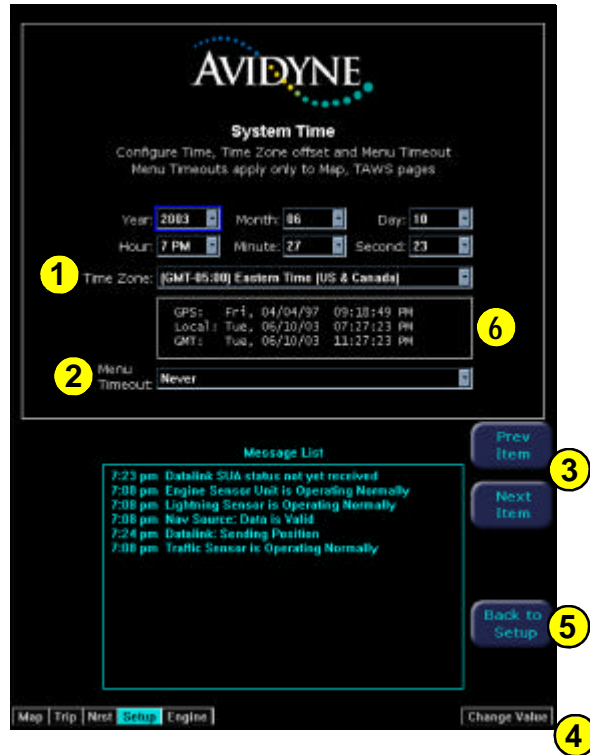
- 1.) **Left Data Block** - Allows up to 6 lines of data for display and 4 slots for PWR/EGT/CHT datablocks. Data block automatically resizes based on number of lines selected. Data block disappears if all lines are blank.
- 2.) **Right Data Block** - Allows up to 6 lines of data for display. Data block automatically resizes based on number of lines selected. Data block disappears if all lines are blank.
- 3.) **Prev & Next Item Buttons** - Press to move the selected field box.
- 4.) **Change Value** - Rotate knob to change the value of the setting within the selected field.
- 5.) **Back to Setup** - Press to go back to the Main Setup menu.

See Table 7 (Page 38) for full description of Navigation data available for display in Data Blocks.

See Table 8 (Page 39) for full description of Engine data available for display in Data Blocks.

Setup Pages - System Time

The System Time page allows you to set the EX5000 time, the current time zone offset and the amount of time the line select key menu labels stay up on the Map page before decluttering.



- 1.) **Time Zone** - Set the time zone based on your location.
- 2.) **Menu Timeout** - Set the amount of time that the line select menus stay on Map page from the following choices (in seconds): 5, 10, 20, 30, 40, 50, 60, Never.
- 3.) **Prev & Next Item Buttons** - Press to move the selected field box.
- 4.) **Change Value** - Rotate knob to change the value of the setting within the selected field.
- 5.) **Back to Setup** - Press to go back to the Main Setup menu.
- 6.) **Times** - GPS time is displayed if EX5000 is receiving a valid time from a connected GPS Receiver. Local time is the GMT time with the Time Zone correction. GMT time is Greenwich Mean Time either from the GPS Receiver or manual pilot entry.

Setup Pages - Datalink Setup



EX5000 Datalink Setup Page

The Datalink Setup page allows you to configure your datalink preferences, including the ability to enable or disable datalink. You can also configure these preferences on the internet by visiting *MyAvidyne.com*. Changes made to these settings will be processed 10 seconds after the "Back to Setup" button is pushed or the page knob is rotated. If the page is re-entered within 10 seconds, the settings return to their previous state.

- 1) **Datalink Enabled** - Gives the pilot the option of turning the Datalink system on or off.
- 2) **Coverage Area** - Switches weather coverage area between "Current Position" and "Flight Plan."
- 3) **Coverage Radius (NM)** - Selects 50, 100, 200, 300 or 400 nautical mile radius around the aircraft or flightplan as the display area for depicting weather.
- 4) **NEXRAD Resolution** - Selects High, Medium, Low, and Off NEXRAD resolution. The "Low" setting uses the least message units and "Off" setting turns the NEXRAD requests and overlay off.
- 5) **Request Interval** - Selects the time between weather updates. Options are: Maximum Rate, 10, 20, 30, and 60 minute update intervals. Maximum Rate provides weather updates as soon as they become available.
- 6) **METARs** - Turns graphical and textual METAR reporting on and off.
- 7) **AIRMETS / SIGMETs** - Turns AIRMET/SIGMET reporting on and off.
- 8) **SUA Status / TFRs** - Turns the Special Use Airspace (SUA) and Temporary Flight Restrictions (TFRs) reporting on or off.
- 9) **Factory Defaults** - Sets the Datalink Setup to the following values:
 Coverage area - Flight Plan
 Coverage Area - 200 NM
 NEXRAD Resolution - Medium
 Request Interval - 20 minutes
 METARs and AIRMETS/SIGMETs - "ON"
 SUA Status/TFRs - "ON"
- 10) **Request Refresh** - Initiates a request for a weather update.
- 11) **Change Value** - Rotate knob to change the value of the setting within the selected field.
- 12) **Back to Setup** - Press to go back to the Main Setup menu.
- 13) **Prev & Next Item Buttons** - Press to move the selected field box.

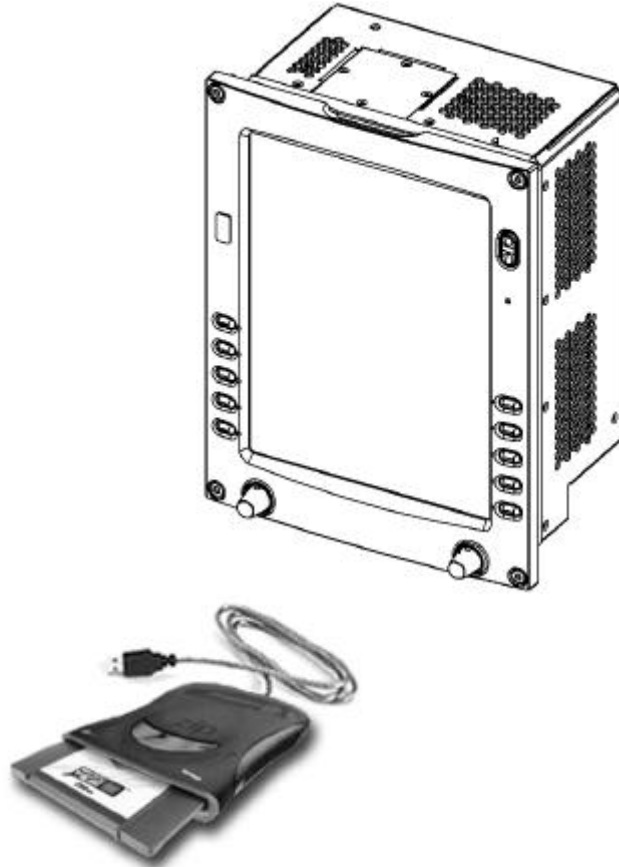
Page Intentionally Left Blank

Database Updates













The MFD is delivered with a current complete database of airports, nav aids, airways, navigational fixes and obstacles. This data is displayed on the moving map to provide navigational information and situational awareness.

The navigation data for the MFD includes copyrighted data compilations owned by Jeppesen Sanderson, Inc., for which Avidyne has been granted a limited, non-exclusive license to use. The copyrighted subject matter may be used only in connection with the ordinary and intended use of the MFD as described in this manual. Use for any other purpose, or reproduction or copying of any portion of said copyrighted subject matter, is strictly prohibited.

The database region map and Update Procedures are on Page 45.



Appendix - Tables

Symbol	Status
Traffic  Lightning  Datalink 	If the symbol is filled in with blue, the system is reporting a healthy status and is being displayed in the mode listed in the sensor status block.
Traffic  Lightning  Datalink 	If the symbol is empty (outline only) and blue, that function is reporting a healthy status, but is turned off for display on the Map page.
Traffic  Lightning  Datalink 	If the symbol is filled with yellow, the system is unable to display data from that particular sensor. This may be due to a communication error, the sensor is not healthy, or there is a configuration problem.
Traffic  Lightning  Datalink 	If the symbol is empty (outline only) and yellow, that function is not able to display data due to the same reasons as above, and is turned off from display on the map page.

Appendix - Tables

Symbols




The MFD's Map uses symbols contained in its navigational database, based on your navigational mode and flight situation. Map can display the following database items:

- Airports
- Nav aids (VORs, NDBs and Waypoints)
- Airways (Victor and jet)
- Intersections, waypoints and other named fixes
- Class B and Class C controlled airspace
- Tower Zone Airspace
- Obstacles (>200' AGL)

- Certain classes of special use airspace (Prohibited, Restricted, Warning, Alert and Military Operating Areas)

Navigational symbols used by Map are shown in Table 2 through Table 6.













Table 2: Map Symbols - Navigational Fixes

Symbol	Item	Description
	NDB	All NDBs
	VOR	All VORs
	Intersection	Terminal, Jet, and Victor airway waypoints (intersections)

Appendix - Tables










Note: The various airport types are derived directly from the Jeppesen navigation database.

Table 3: Map Symbols - Airports

Fuel			Airport Type
Hard	Soft	Water	
			Towered
			Towered
			Non-Towered
			Non-Towered

NOTE: The larger airport symbols are displayed as the map scales are reduced to the smaller ranges.












Table 4: Map Symbols - Other

Symbol	Item	Symbol	Item
	Flight Plan (inactive leg)*		Single Low Obstacle >= 200' AGL <1000' AGL
	Flight Plan (active leg)		Low Obstacles within 1NM of each other >= 200' AGL <1000' AGL
	Map Orientation		Single Obstacle >=1000' AGL
	Ownship Symbol		Obstacles within 1NM of each other >=1000'AGL
	Flight Plan, Course Waypoints		

* -If all legs are shown in white, the GPS is not reporting the active leg of the flight plan.







Appendix - Tables

Table 5: SUA and TFR Status

Region Type	Status							
	Inactive		Unknown		Pending		Active	
	Line	Label	Line	Label	Line	Label	Line	Label
Prohibited, Restricted	Dashed	Inact	Single	Unk	Single	Pend	Triple	Act
								
Warning, Alert, MOA	Dashed	Inact	Single	Unk	Single	Pend	Triple	Act
								
TFR	Dashed	N/A	N/A	N/A	Single	N/A	Triple	N/A
			N/A					

Note: For adjacent or overlaying types of Special Use Airspace (e.g. Restricted Areas or Prohibited Areas within larger MOAs), some masking of the border lines may occur. Pilots must reference current aeronautical charts for accurate boundaries.

Table 6 : AIRMET and SIGMET Boundaries

Line Color	Type	Label
	Bright blue	Mountain AIRMET MTN
	Dark yellow	IFR AIRMET IFR
	Orange	Turbulence AIRMET TURB
	Blue	Icing AIRMET ICE
	Dark red	SIGMET AIRMET SIG
	Blue gray	Convective SIGMET CSIG

Appendix - Tables

Table 7: Data Block Information

Name	Descriptions	Range
TO WPT	Name of, bearing and distance to the "To" waypoint in the active flight plan. Note that the bearing is from your present position directly to the fix. If you are off course, it will differ from your planned course. Also displays ETE (Estimated Time En route)	5 characters (Name) 1 to 360 degrees 0.0 to unlimited NM.
NEXT WPT	Name of, bearing and distance to the "To" waypoint in the active flight plan. Also displays ETE (Estimated Time En route)	5 characters (Name) 1 to 360 degrees 0.0 to unlimited NM. H:MM:SS
DEST WPT	Name of and distance to final destination waypoint in system distance units. Distance is measured along planned route.	5 characters 0.0 to unlimited NM.
NRST ARPT	Identifier of, bearing and distance to the nearest airport.	5 characters (Name)
LAT/LON	Current latitude and longitude in degrees and decimal minutes.	N/S 0 to 90° 0' E/W 0 to 180° 0'
BARO ALT	Barometric Altitude	Based on data from FMS or GPS (see Note)

NOTE: The Baro Altitude is received from the FMS or GPS (via 429). The FMS/GPS calculates the altitude based on the barometric pressure entered into the FMS by the pilot. This display is used to verify what has been put into the FMS/GPS. Do not rely on this display for terrain separation.

Appendix - Tables

Table 7: Data Block Information (continued)

Name	Descriptions	Range
GND SPD	Current ground speed in system speed units.	0.0 to 999.9 knots
TRUE AIRSPD	Actual airspeed	From FMS
UTC TIME	UTC (or "Zulu") time	0 to 23h 59m 59s
LOCAL TIME	Local data and time. Derived from UTC time with time zone setting applied.	0 to 23h 59m 59s
blank	Blank space	

Table 8: Engine Instrument Data Block Information

Name	Descriptions	Range
POWER	RPM Manifold Pressure (MP) Percent Power (%)	0 - 3,000 RPM 0- 30 Inches of Hg 0 - 200%
FUEL	Fuel Flow & Gallons Used	0.0 to 30 GPH 0.0 to 99.9 Gallons
FUEL REM	Fuel Amount & Time Remaining	0.0 to 98.0 Gallons 0 to 23h 59m
OIL	Oil Temperature & Oil Pressure	0 - 250° 0 - 100 PSI
LEAN STATE	Status of "Lean" setting: Best Economy Best Power In process of leaning Leaning interrupted Power change after lean Throttle change after lean Not leaned	Economy Power Leaning... Incomplete Pwr Change FF Change --- (blank)
OAT	Outside Air Temperature	-40°F to 140° F -40°C to 60°C
AMPS	Ammeter - Left and Right Alternator outputs	0 to 100 Amperes
VOLTS	Voltmeter - Monitors left and right buses.	0.0 to 18.0 VDC

Appendix - Nav Messages

NAV Messages & Colors	Meaning	Recommended Pilot Action
Nav Source Data is valid	GPS/FMS indicates that the computed position data is valid.	Acknowledge
Nav Source Data is NOT valid (err=x)	Your GPS/FMS has not computed a valid position or is not supplying valid data. Flight Plan will not be presented on the Radar display.	Check GPS for valid position. Have maintenance check GPS/FMS and installation
Nav Source :Can't Open Port	The GPS/FMS interface cannot open the assigned port. Generally indicates a configuration error.	Have maintenance check configuration and installation
Nav Source Reconnecting...	EX5000 is attempting to reconnect to the port that is connected to the GPS/FMS.	Acknowledge
Nav Source is Not Communicating	EX5000 does not detect any data being sent from the GPS/FMS.	Have maintenance check configuration and installation
Nav Source Data Format Error	Invalid data is coming from your GPS/FMS. If persistent, generally indicates a configuration error.	Have maintenance check configuration and installation
Heading Data is NOT Valid	GPS/FMS is configured as the Map heading source and that data ceases to be available or becomes invalid.	Have maintenance check configuration and installation
Heading Data is Valid	GPS navigator is configured as the Map heading source and that data becomes valid following an acknowledgement of an invalid message.	Acknowledge

Appendix - Traffic Messages

Traffic Messages & Colors	Meaning	Recommended Pilot Action
Traffic Sensor is Operating Normally	Traffic sensor is operating in a normal state from a recoverable fault that was previously acknowledged.	Acknowledge
Traffic <Bearing> / <Distance > / <Relative Altitude>	Traffic Advisory	Acknowledge to go to dedicated traffic page and begin looking for traffic.
Traffic <Distance> / <Relative Altitude>	Traffic Advisories with no bearing information.	Acknowledge to go to dedicated traffic page and begin looking for traffic.
Traffic <Bearing> / <Distance>	Traffic Advisories with no relative altitude information.	Acknowledge to go to dedicated traffic page and begin looking for traffic.
Traffic <Distance>	Traffic Advisories with no bearing and no relative altitude information.	Acknowledge to go to dedicated traffic page and begin looking for traffic.
Traffic Sensor is in Stand- By	MFD receives a "Stand- By" transmission from the traffic sensor.	Pressing "Traffic" button to select a traffic mode. Have maintenance check configuration and installation if message persists.
Traffic Sensor is in Self- Test	Traffic sensor is in self test mode.	Acknowledge
Traffic Sensor is Not Communicating	Traffic sensor is not transmitting data.	Have maintenance check configuration and installation
TCAD Altitude Unavailable	TCAD sensor is not receiving altitude information.	Have maintenance check configuration and installation
Traffic Heading Source Failed	TAS is configured as the Map Heading source and a "fatal heading fault" is received.	Have maintenance check configuration and installation
Traffic Heading Source is Valid	Traffic sensor is configured as the Map Heading source and is valid.	Acknowledge
Traffic Sensor has FAILED	The Traffic Sensor is reporting an internal failure.	If fault does not clear, have maintenance inspect traffic sensor.

Appendix - Lightning Messages

Lightning Messages & Colors	Meaning	Recommended Pilot Action
Lightning Sensor is Operating Normally	Lightning source is operating in a normal state from a recoverable fault that was previously acknowledged.	Acknowledge
Lightning Sensor is in Noise- Monitor Mode	Lightning source is in Noise- Monitor Mode.	Have maintenance check configuration and installation.
Lightning Sensor is in Demo Mode	Lightning source is in Demo Mode.	Have maintenance check configuration and installation.
Lightning Sensor is in Test Mode	Lightning sensor in a self- test mode.	Acknowledge
Lightning Sensor ERROR	MFD receives a "recoverable fault" notification.	Have maintenance check configuration and installation.
Lightning Sensor has FAILED	MFD receives a "fatal fault" notification.	Have maintenance check configuration and installation.
Lightning Sensor is Not Communicating	MFD receiving no data from the lightning sensor.	Have maintenance check configuration and installation.
Lightning Ahead	Stormscope is indicating discharge activity horizontally within $\pm 22^\circ$ of the aircraft nose and within 75nm.	Determine location of lightning and avoid.
Lightning Heading Source Failed	Stormscope is configured as a heading source and a "fatal heading fault" is received.	Have maintenance check configuration and installation.
Lightning Heading Source OK	Stormscope is configured with heading input.	Acknowledge
Lightning Antenna Location Changed	Stormscope antenna location disagrees with MFD setting.	Have maintenance check configuration and installation.

Appendix - Datalink Messages

Datalink Messages & Colors	Meaning	Recommended Pilot Action
Datalink Sensor is Operating Normally	Satellite communicator is operating normally after a recoverable fault was previously acknowledged.	Acknowledge
Datalink Sensor is NOT Communicating	Satellite communicator has stopped communicating.	Restart system. If problem persists, contact Avidyne.
Datalink Sensor Configuration Error	COMM port is configured incorrectly.	Restart system. If problem persists, contact Avidyne.
Datalink Sensor Data is Invalid	MFD receives a "recoverable fault" notification.	Have maintenance check configuration and installation.
Datalink METAR symbols > 90 minutes	METARs are older than 90 minutes from their time of reception.	Go to Datalink Setup page and request refresh.
Datalink AIRMETS/ SIGMETs > 90 minutes	AIRMETS/ SIGMETs are older than 90 minutes.	Go to Datalink Setup page and request refresh.
Datalink SUA Status > 90 minutes	SUA Status data are older than 90 minutes.	Go to Datalink Setup page and request refresh.
Datalink TFRs > 90 minutes	TFR data are older than 90 minutes.	Go to Datalink Setup page and request refresh.
Datalink Data not yet received	Datalink is Enabled and no Datalink data has been received within 10 minutes of MFD initialization complete.	Acknowledge
Datalink Airmets/ Sigmets not yet received	AIRMETS/ SIGMETs are selected and they are not received within 15 minutes of the initial datalink update.	Acknowledge
SUA Status not yet received	SUA Status/ TFRs are selected and SUA Status is not received within 15 minutes of the initial datalink update.	Acknowledge
TFRs not yet received	UA Status/ TFRs are selected and TFRs are not received within 15 minutes of the initial datalink update.	Acknowledge
METARs Symbols not yet received	METARs are selected and they are not received within 15 minutes of the initial datalink update.	Acknowledge
Datalink: Idle	No data being sent or recieved.	None necessary.
NXR Invalid	NEXRAD temporarily not able to be displayed.	Wait for next NEXRAD update. Check system in Setup pages.

Appendix - Engine Messages

Engine Messages & Colors	Meaning	Recommended Pilot Action
Engine Sensor Unit is Operating Normally	Engine siu is operating in a normal state from a recoverable fault that was previously acknowledged.	Acknowledge
Engine Sensor Unit is Not Communicating	MFD receiving no data from Engine siu.	Have maintenance check configuration and installation.
Engine Sensor Unit Configuration Error	MFD receiving invalid data from the Engine siu.	Have maintenance check configuration and installation.

PFD Messages

PFD Messages & Colors	Meaning	Recommended Pilot Action
PFD is Operating Normally	PFD is operating in a normal state from a recoverable fault that was previously acknowledged.	Acknowledge
PFD is Not Communicating	MFD receiving no data from PFD.	Have maintenance check configuration and installation.

Appendix - Navigation Database Update Procedure

The MFD utilizes a Jeppesen NavData™ database of airports, navaids, airways, and navigational fixes. Navigation data is updated on 28-day cycles, and it is recommended that the database should be kept current.

To perform a data update:

1. Turn power OFF to the MFD.
2. Install data disk into the dataloader.

Connect one end of the interconnect cable to the dataloader and the other end to the MFD data port on the front panel.

Note: Ensure that the dataloader is supported and not dangling by the cable. This may cause an intermittent connection, which will result in an unsuccessful data update.

3. Apply power to the MFD by turning ON the avionics master switch.

The Data Loader screen is displayed.

Note: If the "Press Any Bezel Key" message is displayed, the dataloader drive was not detected by the MFD. Check the connection between the dataloader drive and the MFD. Restart procedure at step 1.

4. Press the "Proceed" button. Do not turn off the MFD or disconnect the interconnect cable during a data load.

The data load is complete when the "Press Any Bezel Key" message is displayed.

Remove the dataloader drive and interconnect cable and store in a safe place.



Databases are available for two regions of the world.

Region I - Americas

Region II - International (does not include Americas)

Appendix - Failure Indications

Loss of Position

If the position source becomes unavailable or invalid, the following conditions will occur:

- all traffic, and lightning data is removed from the display.
- the aircraft symbol is removed from the display.
- the compass labels (N,S, E, and W) are removed from the display.
- the map will remain static, centered on last known good position.
- the map orientation annunciation is removed from the display.
- the map is oriented True North Up.

Recommended course of action:

- For aircraft equipped with dual GPS, select the Setup Page and press the "Swap to GPS X" button.
- For aircraft equipped with a single GPS, follow the GPS supplier troubleshooting guide.

When position data is restored, Map will resume normal operations.

Loss of Heading/Track

If the heading/track source becomes unavailable or invalid, the following conditions will occur:

- all traffic, and lightning data is removed from the display.
- the aircraft symbol is replaced by a direction-less symbol (a white + symbol).
- the compass labels (N,S, E, and W) are removed from the display.
- the map and flight plan data will continue to be displayed.
- the map orientation annunciation is removed from the display
- the heading/track indicator will display a series of dashes ("----")
- the map is oriented True North Up.

Recommended course of action:

- Call your Avidyne Customer Service representative.

When heading/track is restored, Map will resume normal operations.

Appendix - Failure Indications

Unhealthy Sensor

Map monitors the "health" of the sensors (traffic and lightning) by means of a signal pulse. Map looks for a signal every three seconds from each sensor. If it doesn't see this signal it assumes the sensor has failed in some way. When this happens, the following occurs on the display:

- sensor data is removed from the overlay display.
- the word "FAIL" is displayed in the sensor's status line in yellow.
- the sensor symbol changes from cyan to yellow (if the sensor was on).

Recommended course of action:

- Select the Setup Page and perform Self-Test for the applicable sensor.

Engine Sensor Not Communicating

In the event of an engine sensor unit, or SIU, failure, any affected indicators will show a failure indication by:

Dial Gauges: Needle Pointer removed
Numeric Readouts: Displayed as three white dashes
Bar Graphs: Disappear

Recommended Action: For failure of single indicators, land as soon as practical and consult a maintenance facility. If all indicators have failed, check and/or cycle the circuit breaker for the engine sensor interface unit (SIU). If the function is not restored, land as soon as practical and have a maintenance facility inspect the system.

CMOS Battery Failure

In the event of an internal battery failure, the following message will occur after system start-up:

WARNING: CMOS battery failure. Check database expiration date. Press any bezel key to continue.

This message indicates that the internal battery that maintains system date and time settings has failed, in which case the following system defaults are used:

Date - Jan 01, 2000
Time- 00:00:00 (local)

These defaults will be overridden when GPS date and time are sent to the MFD via ARINC 429 from the GPS navigator.

This message alerts the pilot to check the navigation database expiration date and verify that the database has not expired, since the system will not automatically recognize it. The system should be returned to Avidyne for CMOS battery replacement.

FlightMax EX5000

Multi-Function Display

Pilot's Guide





AVIDYNE CORPORATION
55 Old Bedford Road
Lincoln, MA 01773
Telephone: 781-402-7400
Toll Free: 800-AVIDYNE (800-284-3963)
FAX: 781-402-7599
www.avidyne.com

P/N 600-00102-000 Rev 02 03/04

© 2003 Avidyne Corporation All Rights Reserved. Avidyne® and FlightMax™ are trademarks of Avidyne Corp.
SKYWATCH® and STORMSCOPE® are trademarks of Goodrich Corp.