



Avidyne MFD

Cirrus Transition Course



10/20/04

The system information, procedures and guidelines found in this presentation are for Reference Only.

The information & procedures in this presentation have been taken from the FAA Approved Airplane Flight Manual and Pilot's Operating Handbook (POH). The Information & Procedures in this presentation DO NOT SUPERSEDE the Information & Procedures in the POH. In the event of conflict, the POH shall take precedence.



Avidyne FlightMax MFD

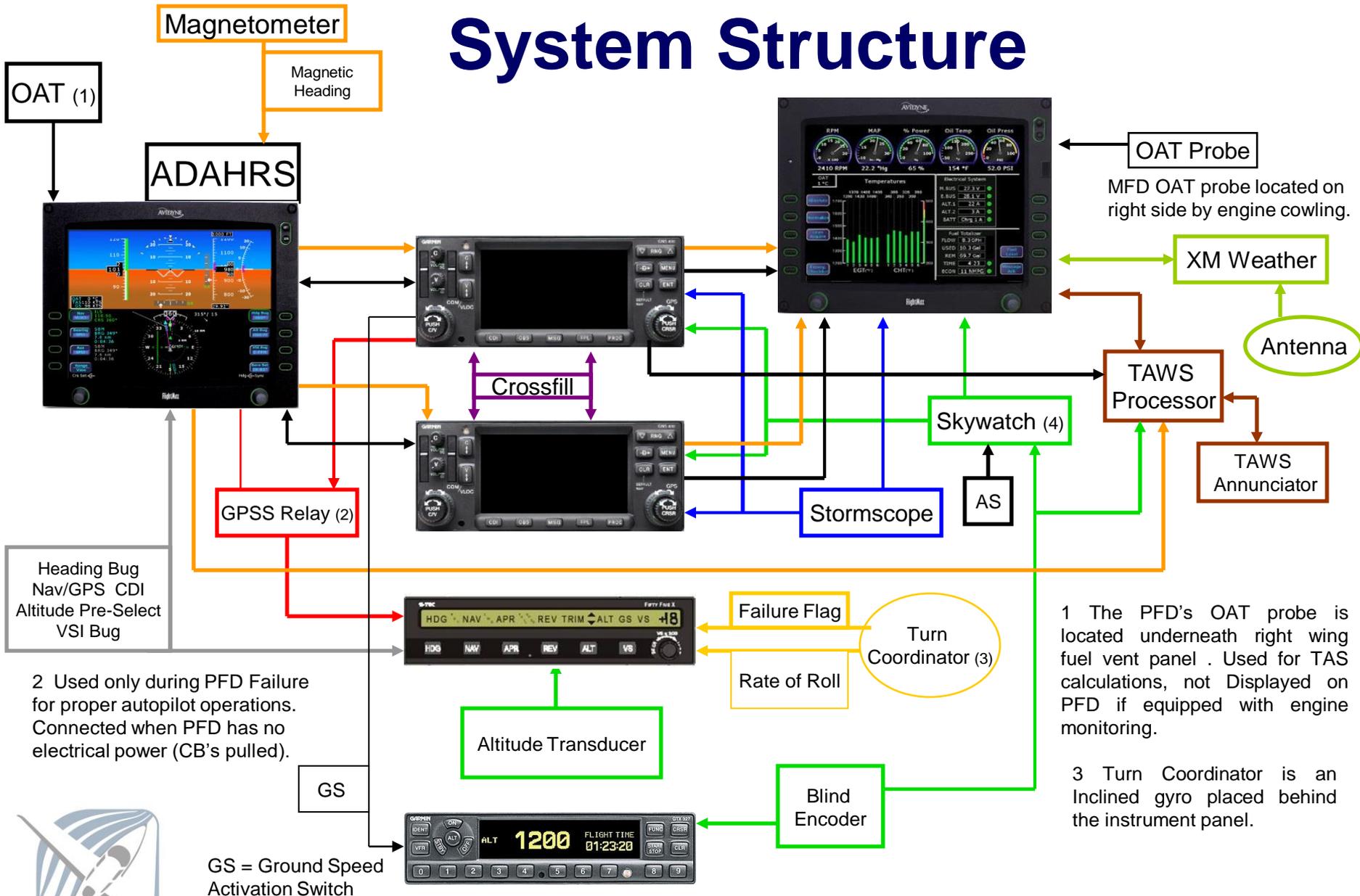
The Multi-Function Display (MFD) is a 10.4 inch landscape orientated LCD mounted in the center of the instrument panel.

The MFD Provides a supplemental display of situational and navigational information to the pilot.

The MFD accepts data from a variety of sources: GPS sensors, Stormscope, SkyWatch Traffic Advisory System, Terrain Awareness Warning System, CMax Jeppesen Charts and XM Weather Downlink.



System Structure



2 Used only during PFD Failure for proper autopilot operations. Connected when PFD has no electrical power (CB's pulled).

1 The PFD's OAT probe is located underneath right wing fuel vent panel . Used for TAS calculations, not Displayed on PFD if equipped with engine monitoring.

3 Turn Coordinator is an Inclined gyro placed behind the instrument panel.

4 Skywatch has an Airspeed switch for automatic activation that is located in the pitot tube. Approximately set for 30 KIAS

GS = Ground Speed Activation Switch



Avidyne FlightMax MFD

Standard MFD Functions

[The MAP page](#)

[The TRIP page](#)

[The NEAREST page](#)

[The CHECKLIST pages](#)

[The SYSTEM SETUP](#)

Optional Installed Equipment

[The Terrain Awareness Warning System page](#)

[XM Weather System](#)

[CMax Approach and Airport Charts System](#)

[Skywatch Traffic Avoidance System](#)

[Strikefinder Lightning Detector](#)

[EMax Engine Monitoring](#)



MFD MAP Page

The MAP page is the primary page and presents the pilot with a pictorial of the aircraft position, flight plan, and nearby lightning and WX Data as well as traffic.

The moving map display must not be used as the primary navigation instrument.

Use of Map page during IFR flight requires an IFR approved GPS receiver installation operated in accordance with applicable limitations.





MFD Map Page Symbology

- 1.) Data Blocks (Left & Right)** - View navigation and engine (when equipped with engine monitor) data in data blocks in the upper corners of the display.
- 2.) Sensor Status Box** - Displays the status of the lightning and traffic sensors installed on the aircraft.
- 3.) Heading/Track Indicator** - Three triangles around the compass rose provide actual track, desired track, and heading indications.



H/T Block



Desired Track

Actual Track

Heading



Track Up

Heading Up

North Up

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



200' AGL to <1000' AGL



1000' AGL or higher



Groups of obstacles within 1NM of each other



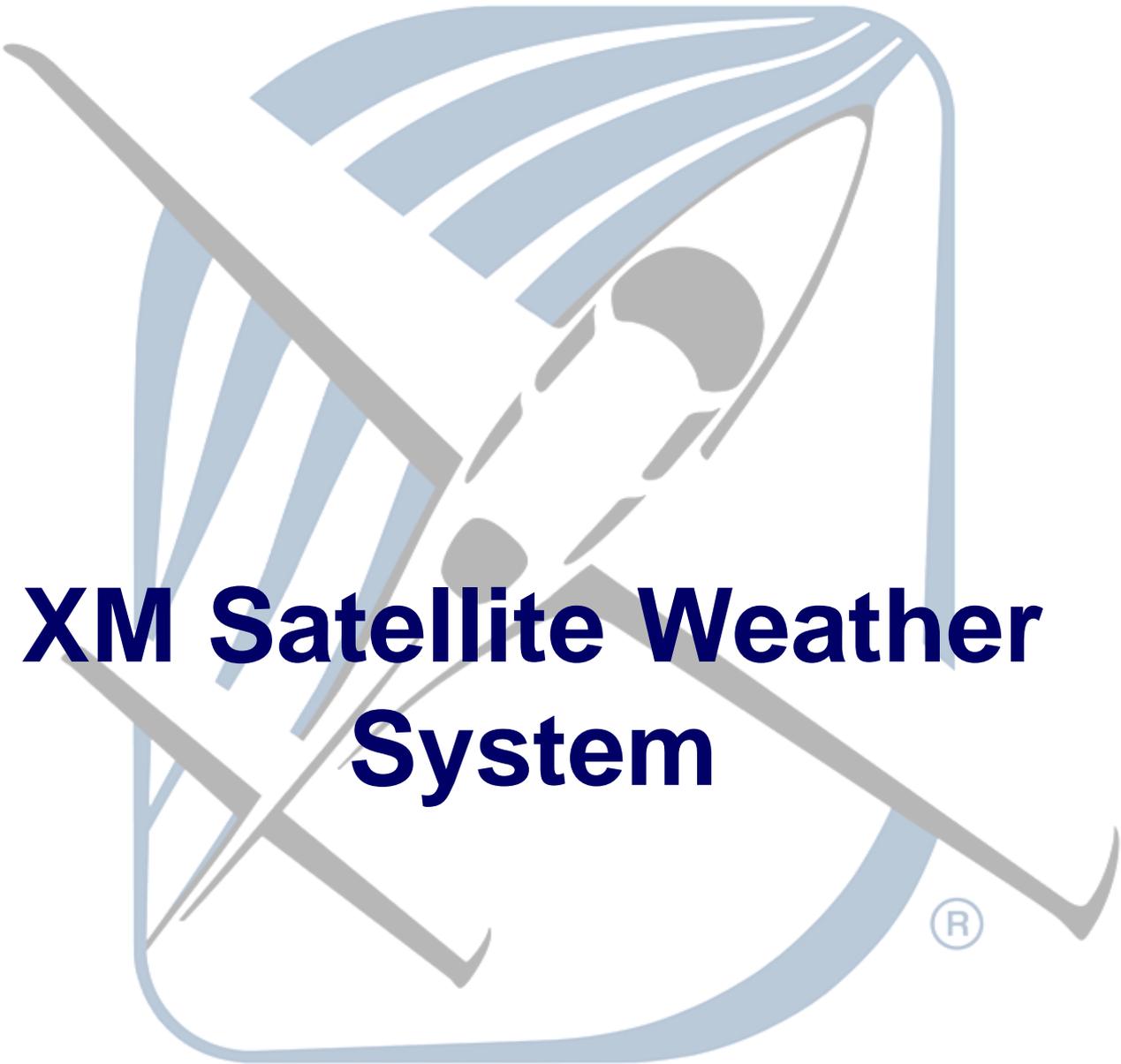
Groups of obstacles 1000' AGL or higher and within 1NM of each other.



MFD Map Page Symbology

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 6 and associated note





XM Satellite Weather System

XM Satellite Weather System

The XM Satellite Weather System enhances situational awareness by providing the pilot with real time, graphical weather information.

The XM antenna is integrated with the COM1 antenna it receives weather information from dual-redundancy satellites, that broadcasts in the S-Band frequency range. The signal is sent to the XM receiver, installed in the co-pilot side of the instrument console.

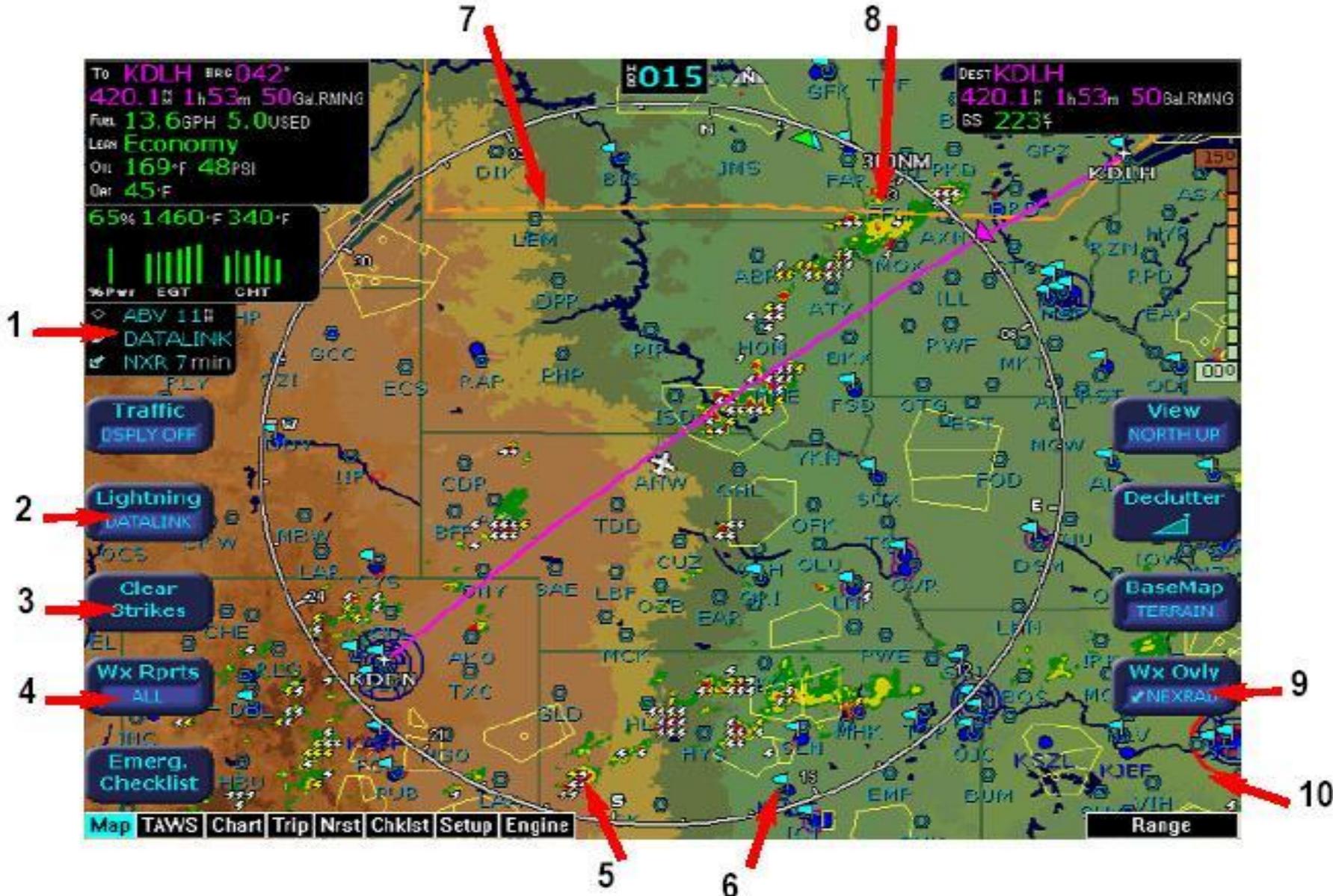
The XM Satellite Weather System is powered by 28 VDC supplied through the 3-amp Weather/Stormscope breaker on the Non-Essential Bus.

Subscription to a XM Satellite Weather System Service Package is required for operation. Once activated, the XM Satellite Weather System will overlay the

- NEXRAD Radar
- METARs
- SIGMETs
- AIRMETs
- TFRs
- Lightning Strikes



XM Weather



XM Weather

1. Sensor Status Block - with Broadcast datalink installed, the Sensor Status Block gives the status of the weather information presented.

The Lightning sensor status will reflect if the lightning information displayed on the Map is from the broadcast datalink, or from the on-board lightning sensor, if installed.

The broadcast datalink sensor status is shown on the bottom line of this block, and indicates if the external broadcast satellite receiver is reporting a good operational status.

The age of the most recent NEXRAD radar image is also listed.



XM Weather

The screenshot displays the XM Weather interface with the following callouts:

- 1:** Points to the flight data panel on the left, showing trip information such as "To KDLH BRG 042°", "Fuel 13.6 GPH 5.0 USED", and "Oil 169°F 48 PSI".
- 2:** Points to the "Lightning" button in the left-hand menu.
- 3:** Points to the "Clear Strikes" button in the left-hand menu.
- 4:** Points to the "Wx Rpts ALL" button in the left-hand menu.
- 5:** Points to the "Map" button at the bottom of the left-hand menu.
- 6:** Points to the "Chart" button at the bottom of the left-hand menu.
- 7:** Points to the "Traffic" button in the left-hand menu.
- 8:** Points to the "View NORTH UP" button in the right-hand menu.
- 9:** Points to the "Wx Ovly" button in the right-hand menu.
- 10:** Points to the "Range" button at the bottom right of the interface.



XM Weather

2. **Lightning button** - controls the display of lightning information on the Map page. Pressing the button toggles between Datalink and Display Off, or if a WX-500 lightning sensor is installed, between Strike, Cell, Datalink, and Display Off.

Lightning will not be displayed from both Datalink and WX-500 at the same time.

2. **Clear Strikes button** - clears the current lightning strike symbols from the screen for WX-500, if installed. Does not clear datalink Lightning

3. **Wx Rprts button** - controls the display of METAR symbols, AIRMETs, and SIGMETs on the Map page. Pressing the button toggles through All, METARS, SIGMET, AIRMET, and Display Off.



XM Weather Symbology

5. **Lightning strike symbols** - Lightning information from the XM broadcast satellite is matched to grid coordinates with a resolution of approximately 2 NM. Overlapping lightning symbols may be decluttered for clarity. The lightning strike symbols for datalink lightning are shaded according to their age, with strikes older than 15 minutes removed from display.

- ⚡ Datalink strikes within 5 minutes
- ⚡ Datalink strikes between 5 to 10 minutes
- ⚡ Datalink strikes between 10 to 15 minutes



XM Metar Symbology

6. **METAR symbols** - Each METAR reporting station shown on the Map page will have a METAR condition flag displayed. The color of the METAR flag indicates the current conditions at that airport:

METARS			
		VFR:	> 5 SM > 3000 ft
		MVFR:	3-5 SM 1000-3000 ft
		IFR:	1-3 SM 500-1000 ft
		LIFR:	.5-1 SM 200-500 ft
		<CATI:	<.5 SM < 200 ft



XM Radar Symbology

7. **AIRMETS/SIGMETs** - AIRMETS and SIGMETs are shown as ribbed lines enclosing the area of the advisory and are color coded and labeled as to their type. For more details, see Table 6 in the Pilots Guide Appendix.
8. **NEXRAD radar images** - The XM broadcast NEXRAD images are delivered with a resolution of approximately 1 NM. The MFD smoothes the edges of the NEXRAD images, so that the images are not distracting at smaller zoom ranges.



XM Weather Symbology

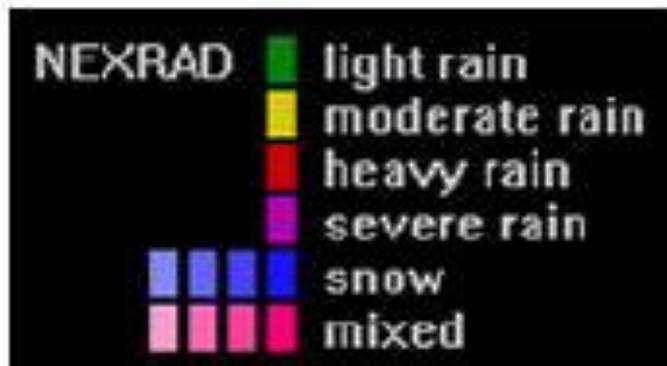
9. **Wx Ovly button** - controls the display of the NEXRAD overlay on the Map page. Pressing the button toggles between Broadcast NEXRAD radar images and Display Off.
10. **TFR** - Temporary Flight Restrictions are also reported over the Broadcast datalink. TFRs are shown with solid **RED** lines on the Map page.



XM Weather Radar

1. **The Air/Sig button** - controls the display of AIRMETs and SIGMETs, and pressing it toggles between ALL, AIRMET, SIGMET, and OFF.
2. **The Metar button** - controls display of the graphical METAR symbols on the Map page, and pressing it toggles between ON and OFF.

The NEXRAD colors conform to aviation standards, with **Green**, **Yellow**, **Red**, and **Magenta** depicting varying intensities of rainfall. Shades of **Blue** for snow and shades of **Pink** for mixed precipitation.



XM Weather in Trip Page

Each waypoint on the current active Flt-plan can be associated with a METAR reporting point.

For non-airport waypoints, the nearest METAR is used.

The general conditions are reported with the same METAR flags as used on the Map page.

For legs on the Flt-plan that exceed 100nm in length, the MFD will select "intermediate waypoints" in between the waypoints of the leg.



XM Weather in Trip Page

GS 200 kts
TRK 012°

||||| 5nm
Scale

Time 15:01:37
UTC 19:01:37

WPT	BRG	DTK	NM	ETE	ETA	METAR
To: PLUMY	012°	012°	8.5	0:02	15:04	LAL
JENSN		066°	30.5	0:09	15:10	KGIF
KTZER		035°	71.0	0:21	15:22	KSFB
OMN		035°	97.4	0:29	15:30	KDAB
MLB		165°	173.4	0:52	15:53	KMLB
ODDEL		273°	201.8	1:00	16:02	KISM
Dest: LAL		266°	247.1	1:14	16:15	KLAL

Special Conditions at KLAL, Located 12nm SE of PLUMY
LAKELAND LINDER REGL

Age: 27 minutes
Wind: 090° at 10 kts
Gust: none
Visibility: 10SM
Weather: thunderstorm with light rain

Temp/Dew: 27°C / 23°C
Altimeter: 30.01 inches of Hg

Cloud cover: 3500 feet broken cumulonimbus
25000 feet overcast

Map Trip Nrst Setup

Select

KLAL Info
Display METAR

1
2
3
4



XM Weather in Trip Page

1. **METAR symbols** - Using the same METAR condition symbols as the Map page, a METAR report is shown for each Flt- plan waypoint.
2. **METAR text** - the METAR is translated into plain English and presented for the currently-selected waypoint. If the METAR report is for an airport near the waypoint, the distance and direction from the waypoint is shown.
3. **Display button** - controls the display in the bottom half of the Trip page. Pressing this button alternates between METAR, Legend, and Status.
4. **Select knob** - use the right Select knob to move the highlight up and down the waypoint list to view the text METAR for the waypoints on the route.



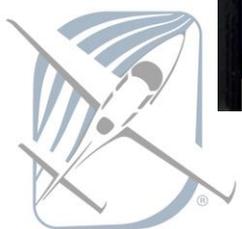
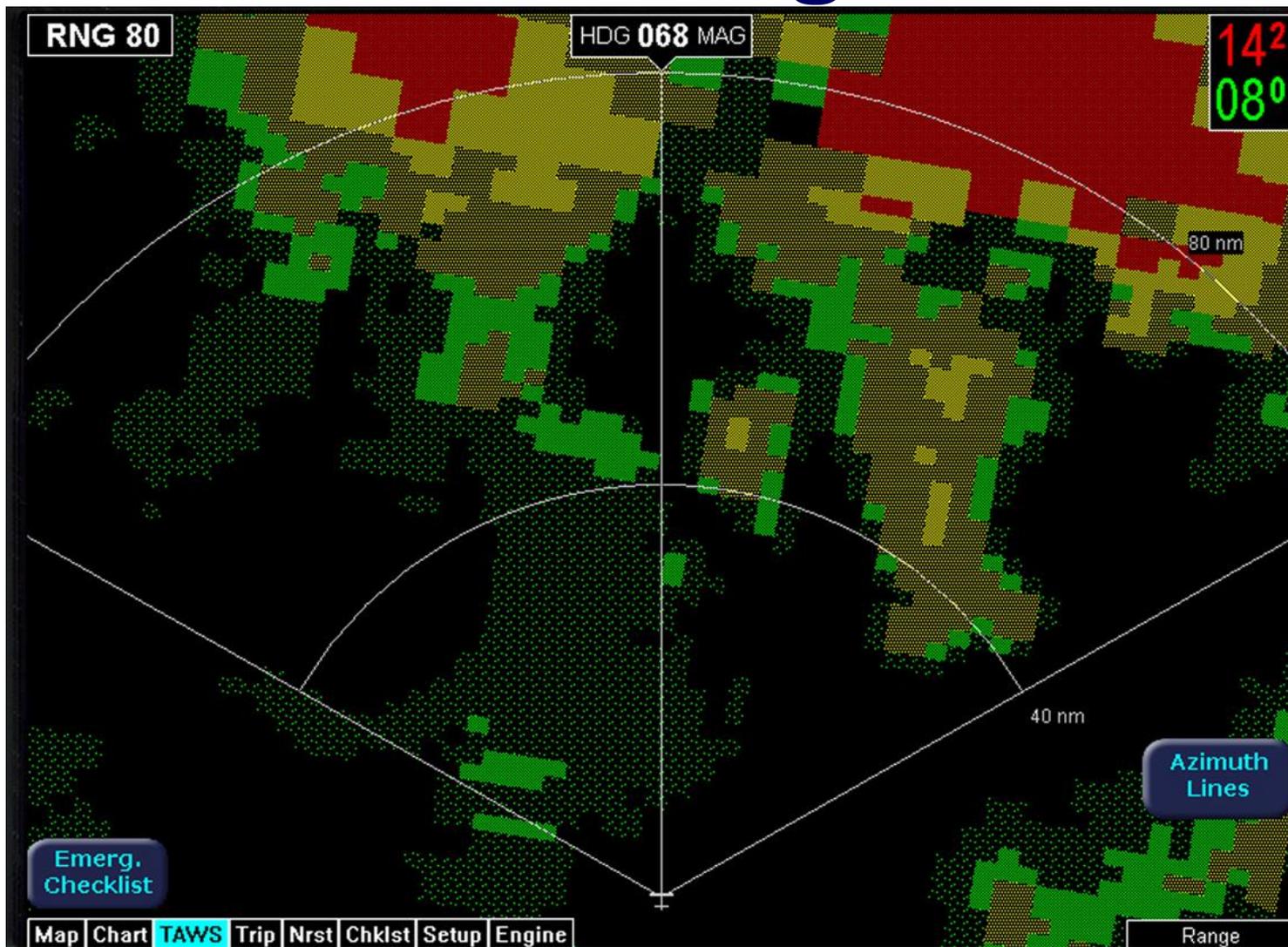


TAWS Page

DRAFT

10/07/04

TAWS Page



TAWS Colors

<p>Solid Red</p> 	<p>Terrain/Obstacle threat area, a warning is generated.</p>
<p>Solid Yellow</p> 	<p>Terrain/Obstacle threat area, a caution is generated.</p>
<p>50% Red Dots</p> 	<p>Terrain/Obstacle that is more than 2,000 feet above aircraft.</p>
<p>50% Yellow Dots</p> 	<p>Terrain/Obstacle that is between 1,000 and 2,000 feet above aircraft.</p>
<p>25% Yellow Dots</p> 	<p>Terrain/Obstacle that is 500 (250 with gear down) feet below to 1,000 feet above aircraft altitude.</p>
<p>Solid Green (Peaks Only)</p> 	<p>Shown only when no Red or Yellow Terrain/Obstacle areas are within range on the display. Highest Terrain/Obstacle not within 500 (250 with gear down) feet of aircraft altitude.</p>
<p>50% Green Dots</p> 	<p>Terrain/Obstacle that is 500 (250 with gear down) feet below to 1,000 feet below aircraft altitude.</p>



TAWS Colors

<p>50% Green Dots  (Peaks Only)</p>	<p>Terrain/Obstacle that is the middle elevation band when there is no Red or Yellow terrain areas within range on the display.</p>
<p>16% Green Dots </p>	<p>Terrain/Obstacle that is 1,000 to 2,000 feet below aircraft altitude.</p>
<p>16% Green Dots (Peaks Only)</p>	<p>Terrain/Obstacle that is the lower elevation band when there is no Red or Yellow terrain areas within range on the display.</p>
<p>Black </p>	<p>No significant terrain/obstacle.</p>
<p>16% Blue  (Peaks Only)</p>	<p>Water at sea level elevation (0 feet MSL).</p>
<p>Magenta Dots </p>	<p>Unknown terrain. No terrain data in the data base for the magenta area shown.</p>



TAWS Display



Peaks Elevation

Maximum elevation displayed over minimum elevation. Here maximum elevation is 14,200ft. and minimum is 8,000ft.

Range Rings

Outer ring is selected range, inner ring is half the selected range. Here outer ring is 80nm and the inner ring is 40nm.

Azimuth Lines

Small Dash's are 10° and lines are at 20° increments to max of 40°.



Measured Sea Level
Geometric Altitude
MSL-G

TAWS Page

Terrain and obstacle alerts are the most critical situations displayed by TAWS.

There are two levels of alerts:

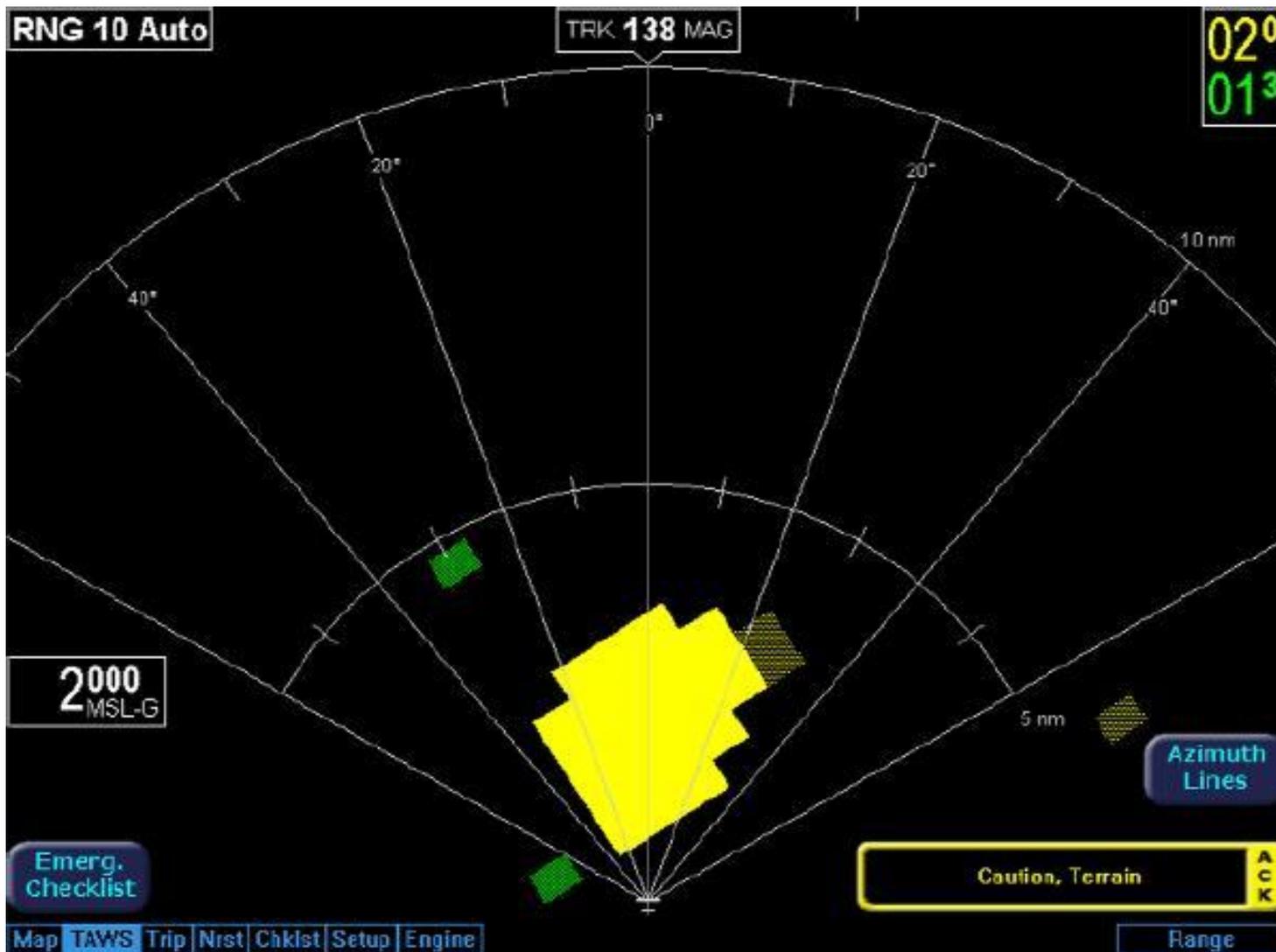
Caution - Possible terrain or obstacle conflict within 40-60 seconds.

Warning - Possible terrain or obstacle conflict within 30 seconds.

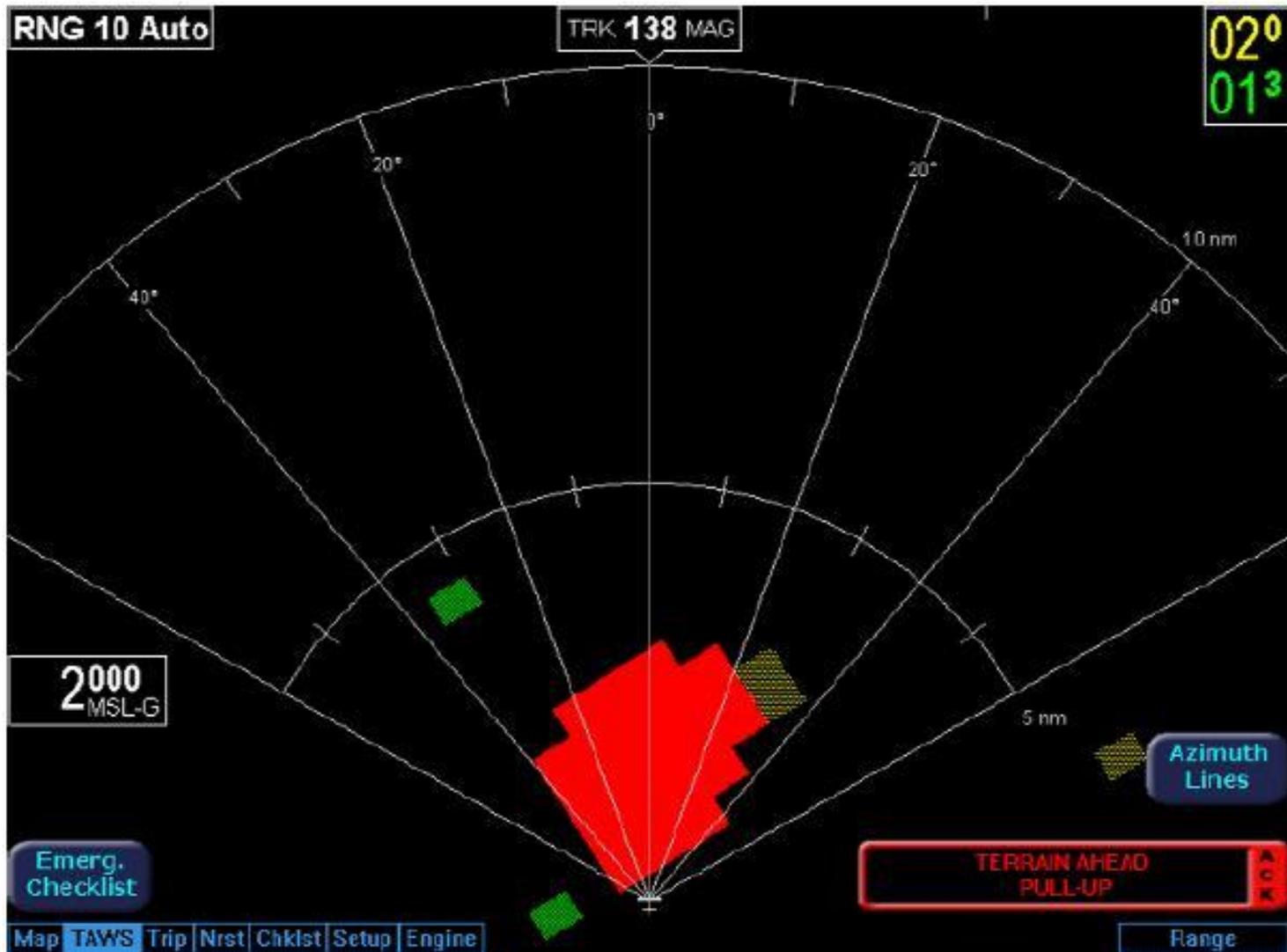
When a **CAUTION** alert is triggered, the terrain or obstacle that caused the alert is displayed in bright **YELLOW**. When a **WARNING** alert is triggered, the terrain or obstacle that caused the alert is displayed in **RED**. In addition, a message describing the nature of the alert is presented in the message bar.



Terrain Caution



Terrain Warning



TAWS

Please Refer to TAWS Powerpoint presentation, TAWS Pilots Guide and POH supplement for more system, operational and limitation information.





CMax Approach and Airport Charts

CMax

The CMax Approach Charts function allows the pilot to view terminal procedure chart data on the MFD.

Most approach charts and airport diagrams are geo-referenced; most arrival, departure, and miscellaneous charts are not.

The CMax installation is entirely software dependant. No additional hardware is required.



CMax

Do not use the CMax Approach Charts function for navigation of the aircraft.

The CMax Approach Charts function is intended to serve as a situational awareness tool only.

The electronic approach charts must not be used as the primary set of on-board approach charts.



CMax

The CMax function is found on the MFD as the "Chart" page.

The Chart page is capable of having 2 charts ready for viewing at any one time; Airport diagram and Procedure chart

Below 50kts. the MFD will automatically display the Airport diagram of the current flight plan airport.



CMax

Subscription to JeppView Electronic Airway Manual chart service is required for operation. Contact Jeppesen

The MFD Startup Screen reports the valid dates for the currently loaded chart data.

The date will be in **YELLOW** if the next update has passed.

If the chart data becomes more than 10 weeks out of date, access to the charts will not be allowed.

If no valid GPS position is available at start-up, the Chart page will default to the Chart Selection Page for manual selection of a chart.



CMax Chart Selection

The screenshot displays the CMax Chart Selection interface. At the top, the airport identifier 'KCAD' is highlighted with a red arrow labeled '1'. Below it, a list of chart types is shown, with 'ILS OR LOC RWY 7' selected and indicated by a red arrow labeled '2'. The interface includes several control buttons: 'FlightPlan Display' (3), 'Back to Active' (4), 'Auto Fill KCAD' (5), 'Select Chart' (6), 'Next Letter' (7), and 'Select' (8). A bottom menu bar contains 'Map', 'TAWS', 'Chart', 'Trip', 'Nrst', 'Chklist', 'Setup', and 'Engine', with 'Chart' currently selected.

KCAD ILS OR LOC RWY 7 WEXFORD CO

- ILS OR LOC RWY 7
- NDB OR GPS RWY 7
- NDB RWY 25
- GPS RWY 25
- VOR DME RNAV RWY 7
- VOR DME RNAV RWY 25
- AIRPORT

FlightPlan Display

Back to Active

Auto Fill KCAD

Select Chart

Next Letter

Emerg. Checklist

Map | TAWS | Chart | Trip | Nrst | Chklist | Setup | Engine

Select



CMax Chart Selection

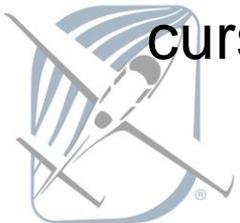
1. **Airport Entry Field** - The Airport Entry Field is used to enter an airport identifier in order to select a chart associated with that airport. The field will be pre-filled with the current position airport on startup. The field will be left blank if the MFD cannot determine a valid position.
2. **Chart Selection List** - All of the available charts for the airport in the Airport Entry Field are listed. The list of charts will not appear until the user has selected an airport in the entry field. Then the List Charts button should be pushed to switch from selecting an airport to selecting the desired chart.

Charts are only listed for those airports that are part of the user's subscription coverage area.

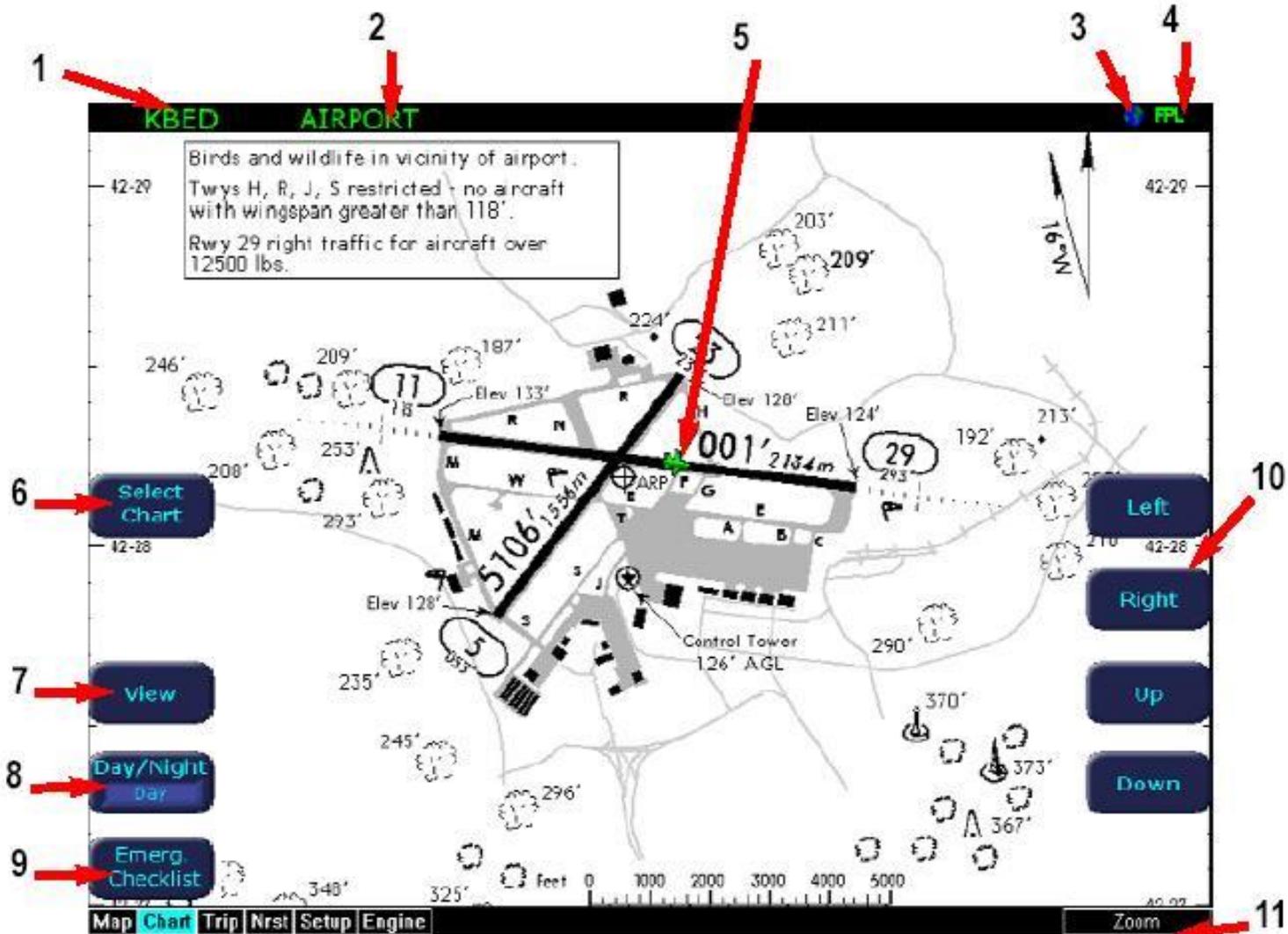


CMax Chart Selection

3. **FlightPlan button** - Toggles the display of the flight plan overlay on the chart Plan View between Display and Off. Changes to this selection are effective immediately.
4. **Back to Active button** - The Back to Active button returns the user to the chart display screen.
5. **Auto Fill button** - When pressed, moves the detected destination airport listed on the button into the Airport Entry Field.
6. **Select chart** - Moves the active selection cursor from the Airport Entry Field to the Chart Selection list.
7. **Next Letter button** - The Next Letter button moves the cursor within the Airport Entry Field to the next character location.
8. **Select knob** - Selects the character for the current cursor position when entering an airport identifier.



CMax Airport Page

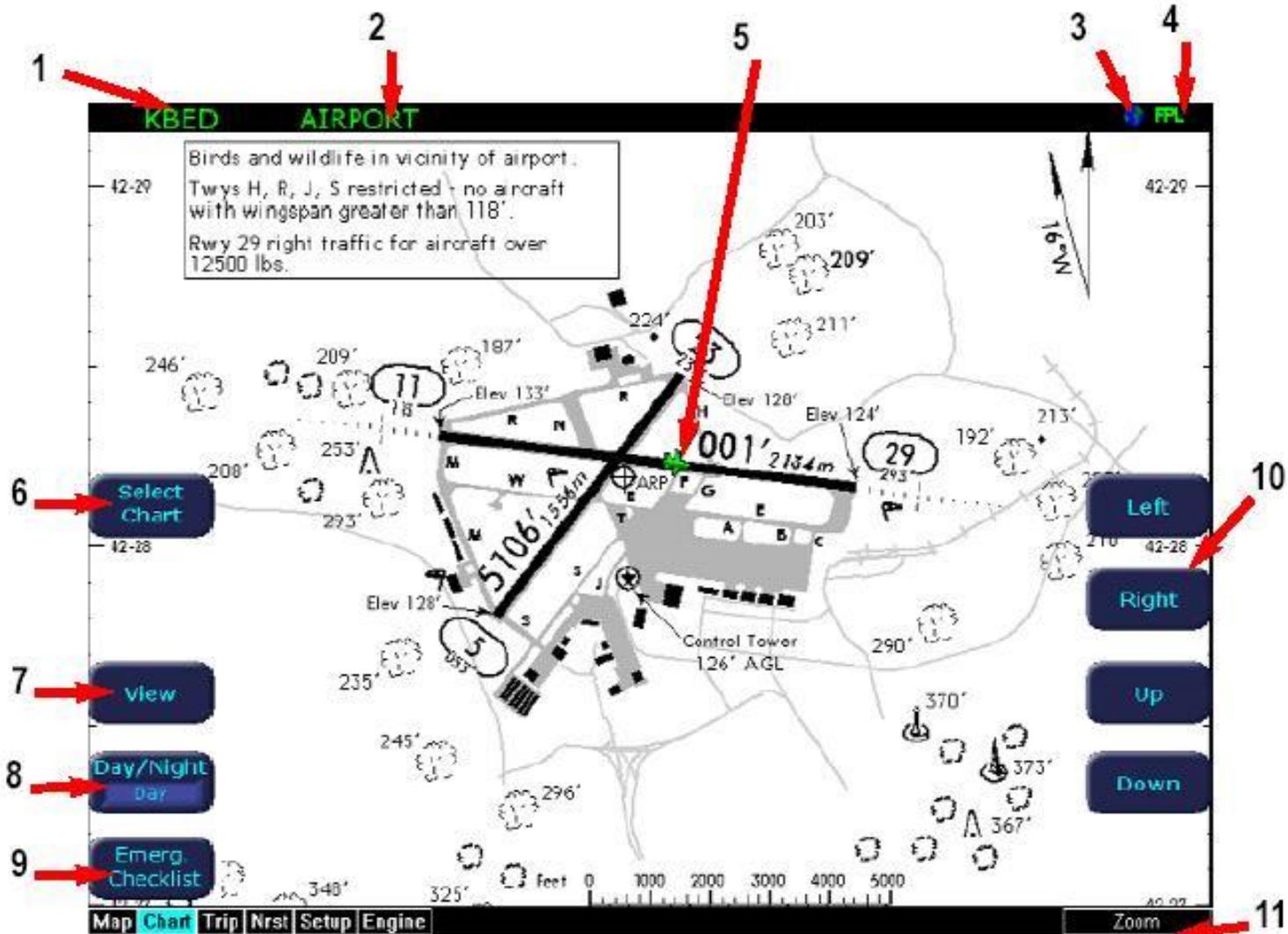


CMax Airport Page

1. **Airport Identifier** - the airport identifier for the current airport is displayed in green.
2. **Chart Name** - the name of the current chart being displayed, also in green.
3. **Geo-referenced Symbol** - a globe is shown when the displayed chart is geo-referenced. If the chart is not geo-referenced, the globe symbol is crossed out.
4. **Flight Plan Symbol** - an FPL symbol indicates the option to display the current flight plan is turned on. If the display of flight plan is turned off, the FPL symbol is crossed out. If a chart is not geo-referenced or no flight plan is received from the GPS, the flight plan cannot be displayed.
5. **Ownship** - displays the current position of the aircraft. The chart nominally remains fixed and the ownship symbol moves across the chart with aircraft movement.
6. **Select Chart button** - brings the user to the Selection Page for the selection of a new chart for display. See the description of the Selection Page below.



CMax Airport Page



CMax Airport Page

7. **View button** - controls which portion of the chart is being displayed.
8. **Day/Night button** - Toggles the chart display mode between the Day and Night modes. The Day display is black text on a white background, while the Night display is white text on a black background. The MFD starts up with a default to Night mode.
9. **Emerg. Checklist. button** - provides one-touch access to the Emergency Checklist page.
10. **Pan Buttons** - The pan buttons manually move the chart on the screen. They only appear when the current view is able to be panned.
11. **Zoom control** - Zooms the chart for close-up examination of a specific area. The label only appears when the current view is able to be zoomed. If the user has panned the chart, using the right knob to zoom all the way out to the full-screen chart size will also re-center the chart on the screen.



CMax Approach Page



CMax Approach Page

1. **Display Airport button** - The Display Airport button is displayed when the current procedure chart is being displayed. Pressing the Display Airport button allows you to swap between display of the loaded procedure chart and display of the associated airport diagram.
2. **Flight Plan** - The flight plan is overlaid on the chart plan view when the flight plan display option is selected (on Selection page) and the chart is geo-referenced.
3. **Flight Plan active leg** - The active leg of the current flight plan, if it appears on the chart, is depicted in magenta. The non-active legs are shown in green.



CMax Approach Chart Views

KBED ILS RWY 11

KBED/BED HANSCOM **JEPPESEN** **BEDFORD, MASS ILS Rwy 11**

ASIS	ROSEH Approach (R)	HANSCOM Tower	Ground
124.6	124.4	118.5	121.7

LOC BED	Final Appch Crs	GS BEDDS	HS DA(H)	App Elev
111.15	113°	1456' (1338')	363' (250')	702ft 133'

MISSED APCH: Climb to 2000' direct SKR NDB and hold.

All Set INOHES Trans level: FL 100 Trans alt: 10000'

MSA #9 EOM

Header View

KBED ILS RWY 11

BEDDS
GS 7 1456'
GS 1456'

Min 1700' 113° 13° 702ft 133'

Ground Speed	20	90	180	270	360	450	540	630	720	810
GS	1.025	1.027	1.034	1.041	1.048	1.055	1.062	1.069	1.076	1.083
MAP at 01' AIBD	0.0	1.26	2.40	3.54	4.68	5.82	6.96	8.10	9.24	10.38

2000' 251

Profile View

KBED ILS RWY 11

STRATGIC (IN LANDING) RWY 11

IS		LOC (GS out)		CIRCLE TO LAND	
DA(H) 363' (250')		MDA(H) 660' (527')			
	NULL	FAIR W/ ALL OUT	FAIR OUT	ALL OUT	
A					680' (543') - 1
B					720' (587') - 1
C	RR 50 or 1	RR 50 or 1	1 1/2	1.48	720' (587') - 1 1/2
D		RR 60 or 1/4	1 3/4	1.62	780' (645') - 2

Minimums View

KBED ILS RWY 11

Map View Top Panel Setup Engine



CMax Approach Chart Views

View button

Pressing the View button toggles through the available views for that chart. For procedure charts, the views are generally Plan View, Header, Profile, and Minimums.

The Header view contains general chart information and appropriate communications frequencies, the Profile view includes the profile view of the approach procedure, and the Minimums view shows the descent minimums for the approach.

The Header, Profile, and Minimums views also feature a small "preview pane" of the Plan View, which, although too small to read all chart details, gives the user a general overview of the approach for situational awareness.

The flightplan and ownship symbol are also displayed on the preview pane.



Trip Page

1 GS 100 kts
TRK 281°

3 Scale Trim

4 Time 09:40:15
UTC 14:40:15

2

WPT	BRG	DTK	NM	ETE	ETA	Fuel (Gal)
To: PCM	281°	282°	6.9	0:04	09:44	74.3
PLUMY		012°	17.1	0:10	09:50	72.7
JENSN		066°	39.1	0:23	10:03	69.4
KIZER		035°	79.5	0:47	10:27	63.4
OMN		035°	106.0	1:03	10:43	59.4
MLB		165°	182.0	1:49	11:29	48.0
ODDEL		273°	210.3	2:06	11:46	43.7
Dest: LAL		266°	255.6	2:33	12:13	37.0

KLAL Info

Emerg. Checklist

Map TAWS Trip Nrst Chklist Setup Engine



Trip Page

Trip page provides the remaining legs of the active flight plan in tabular format

- 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

NM - Cumulative great circle distance of each flight plan leg in nautical miles.

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 local time.

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



Trip Page

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.



Nearest Page

Using the Jeppesen NavData data and the GPS-supplied position, the MFD can provide the pilot with the nearest 25 airports or navaids within 100 nm, depending upon pilot selection.

This information is presented on the Nearest page. More detail on a particular airport is also generated from the Jeppesen NavData data and is available for viewing on the Info page.



Nearest Page

AVIDYNE

Nearest Airports

ID	BRG	NM	Freq	Name
KFLD	334	6.8	123.05	FOND DU LAC CO
2T5	159	13.4	122.90	HAHN SKY RANCH
KHXF	179	19.4	123.00	HARTFORD MUN
KUNU	223	19.4	122.70	DODGE CO
KETB	142	19.5	122.80	WEST BEND MUN
KOSH	344	19.8	118.50	WITTMAN REGL
BD1	041	20.9	123.00	NEW HOLSTEIN MUN
KSBM	079	25.2	122.70	SHEBOYGAN CO MEML
79C	350	30.0	122.90	BRENNAND
KRYV	207	33.0	122.80	WATERTOWN MUN
KATW	355	35.4	119.60	OUTAGAMIE CO REGL
76C	164	35.6	122.90	AERO PARK
02C	166	36.5	122.70	CAPITOL
KMWC	156	37.5	120.50	TIMMERMAN
KUES	171	38.6	123.70	WAUKESHA CO
94C	253	38.8	122.90	GILBERT
KMTW	051	42.0	122.80	MANITOWOC CO
Y50	302	44.6	122.80	WAUTOMA MUN
95WI	166	45.8	---	WISERSKY
61C	205	46.0	122.90	FT ATKINSON MUN
W23	315	47.0	122.80	WILD ROSE IDLEWILD
W34	355	47.4	122.90	SHIOCTON
KPCZ	329	47.5	122.80	WAUPACA MUN

Emerg. Checklist

Map | TAWS | Trip | **Nrst** | Chkist | Setup | Engine

FlightMax Entegra

1: Select button
2: Table header
3: Filter ON button
4: Type AIRPORT button
5: Airport Info button



Nearest Page

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



Checklists Page

SR20 Normal Procedures
Before Takeoff Checklists

PRE-FLIGHT INSPECTION
BEFORE STARTING ENGINE
STARTING ENGINE
BEFORE TAXIING AND
BEFORE TAKEOFF
TAKEOFF (NORMAL AP)

Before Takeoff
In-Flight/Landing
Perf. Data
Emerg. Checklist

Map | LWS | Trip | Fuel | **CMD** | Setup | Engine

SR20 Normal Procedures
In-Flight and Landing Checklists

CLIMB
CRUISE
DESCENT
BEFORE LANDING
WHEELS LANDING / GO AROUND
AFTER LANDING
SHUTDOWN

Before Takeoff
In-Flight/Landing
Perf. Data
Emerg. Checklist

Map | LWS | Trip | Fuel | **CMD** | Setup | Engine

SR20 Normal Procedures
Performance Data

MINIMUMS CHART
MIND COMPONENTS CHART
TAKEOFF DISTANCE FOR LIGHT WEIGHT
TAKEOFF DISTANCE FOR HEAVY WEIGHT
CRUISE SETTING FOR ISA
CRUISE SETTING FOR ISA + 30 DEG C
LANDING DISTANCE

Before Takeoff
In-Flight/Landing
Perf. Data
Emerg. Checklist

Map | LWS | Trip | Fuel | **CMD** | Setup | Engine

Show Checklist

Select



Checklist Pages

The Avidyne electronic checklists display supplements the Pilot Operating Handbook checklists and is advisory only.

The electronic checklists must not be used as the primary set of onboard airplane checklists.



Checklist Pages

The Normal and Emergency Procedures Checklists in the MFD are interactive.

The pilot is able to check off each step as it is accomplished. Once a step is checked off, it will change color to show that a step has been completed. Checklist steps can be un-checked, the entire checklist can be reset, and confirmation of a completed checklist is indicated.

Normal Procedures checklist steps in the MFD are abbreviated from the POH procedures.

Notes, Cautions, and Warnings have been removed. The following Normal Procedures Checklists are provided in the Checklist Pages of the MFD:

Airspeeds for Normal Operations

- Before Takeoff
- In Flight
- Landing/Shutdown



Checklist Pages

Preflight Walk-Around

1. Cabin

- a. Required Documents On Board*
- b. Avionics Power Switch OFF
- c. Bat Master Switch ON
- d. Fuel Quantity Check
- e. Fuel Selector Select Fullest Tank
- f. Flaps 100%(Down)
- g. Vacuum and Oil Annunciators On
- h. Lights Check Operation
- i. Bat Master Switch OFF
- j. Vacuum and Oil Annunciators Out
- k. Alternate Static Source NORMAL
- l. Circuit Breakers IN
- m. Fire Extinguisher Charged and Available
- n. Emergency Egress Hammer Available

2. Left Fuselage

- a. Com 1 Antenna (top) Condition and Attachment
- b. Wing/fuselage Fairing Check
- c. Com 2 Antenna (underside) Condition and Attachment
- d. Baggage Door Closed and Secure
- e. Static Button Clear
- f. Parachute Cover Sealed and Secure

3. Empennage

- a. Tiedown Remove
- b. Horizontal and Vertical Stabilizers Condition
- c. Elevator Freedom of Movement
- d. Rudder Freedom of Movement
- e. Attachment hinges, bolts and cotter pins Secure

4. Right Fuselage

CHECKLIST CONTINUED BELOW

Before Takeoff

In-Flight/Landing

Perf. Data

Emerg. Checklist

Next Checklist

Done

Back

Map | TAWS | Trip | Nrst | **Chklist** | Setup | Engine

Select



Performance Checklist Pages

Performance data in the MFD are derived directly from the POH data. The following Performance data and Charts are provided in the Checklist Pages of the MFD:

- Crosswind Chart
- Takeoff Distance Chart
- Selected Cruise Settings
- Landing Distance Chart



Performance Checklist Pages

Airspeeds for Normal Operation

Takeoff Rotation

Normal, Flaps 50%	70	KIAS
Short Field, Flaps 50%	65	KIAS
Obstacle Clearance, Flaps 50%	75	KIAS

Enroute Climb, Flaps UP

Normal, S.L.	100	KIAS
Normal, 10000 FT.	90	KIAS
Dist. Rate of climb, S.L.	94	KIAS
Best Rate of Climb, 10000 FT.	89	KIAS
Best Angle of Climb, S.L.	81	KIAS
Best Rate of Climb, 10000 FT.	85	KIAS

Wind Components

Note:
Maximum demonstrated crosswind is 19 knots. This is not considered limiting.

Examples: ●

Takeoff Distance

Lift-off Airspeed: 65 KT
50' Obstacle Airspeed: 71 KT

Weight 2500 LB

		Temperature ~ C					
		0	10	20	30	40	ISA
S.L.	R01	813	878	946	1016	1090	912
50 FT		1212	1303	1398	1496	1597	1350

Takeoff Distance

Lift-off Airspeed: 69 KT
50' Obstacle Airspeed: 76 KT

Weight 2900 LB

		Temperature ~ C					
		0	10	20	30	40	ISA
S.L.	R01	1195	1261	1331	1405	1609	1341
50 FT		1737	1850	2027	2169	2316	1958

Cruise Performance

ISA +30°C Conditions

Pres. Alt.	RPN	MAP	Power	KTAS	GPH
2000	2700	22.8	91%	157	14.2
2500	2500	24.4	72%	151	11.9
ISA+30(41°C)	2500	22.9	62%	145	10.9
4000	2700	25.8	89%	166	13.4
2500	2500	24.0	72%	156	11.2

Cruise Performance

ISA Conditions

Pres. Alt.	RPN	MAP	Power	KTAS	GPH
2000	2700	22.8	96%	165	15.0
2500	2500	24.4	75%	151	11.9
ISA (11°C)	2500	22.9	62%	149	10.6
4000	2700	25.8	89%	164	14.0
2500	2500	24.0	75%	154	11.9
ISA (7°C)	2500	22.3	60%	146	10.5
6000	2700	24.9	89%	169	13.1
2500	2500	24.0	74%	156	11.5
ISA (3°C)	2500	21.0	65%	148	10.6
8000	2700	22.2	79%	160	11.6
2500	2500	21.2	62%	151	10.5
ISA (-1°C)	2500	18.9	55%	141	9.2
10000	2700	20.6	72%	160	11.2
2500	2500	21.9	69%	153	10.6
ISA (-5°C)	2500	18.5	55%	144	9.5
12000	2700	19.0	67%	159	10.7
2500	2500	19.0	59%	151	9.9
ISA (-9°C)	2500	16.6	50%	140	8.9
14000	2700	17.6	62%	156	10.2
2500	2500	17.6	55%	149	9.9
ISA (-13°C)	2500	16.5	50%	145	9.0



Emergency Checklist

Emergency Procedures checklist steps in the MFD are abbreviated from the POH procedures and Notes, Cautions, and Warnings have been removed. The Emergency Checklist soft key is always displayed on the MFD. The following Emergency Procedures Checklists are provided in the Checklist Pages of the MFD:

- Emergency Airspeeds
- Ground Emergencies
- In-Flight Emergencies
- Landing Emergencies
- System Malfunctions



Emergency Checklist



Emergency Checklist

1. **Normal Checklist** - Press the Normal Checklist button to return to the selection of normal operating checklists.
2. **Checklist Types** - Provides access to the top-level Emergency checklists for each phase of flight including: Ground Emergency, In-Flight Emergency, Landing Emergency, and System Malfunctions.
3. **Available Checklists** - Menu of checklists within each type. Pushing the Show Checklist key takes you directly to the desired list.
4. **Selection Control** - Use right knob to move the blue outlined box up or down to highlight a specific checklist within each menu for viewing.
5. **Show Checklist** - Press “Show Checklist” to view the highlighted checklist.



System Set-up

Various System Setup pages allow the pilot to set user preferences for system operation. The software version identification information and database validity dates will also be displayed. The System Setup pages allow access to several pages for preference selection. The System Setup pages provide a means to initiate self test of the traffic and lightning sensors. The following preferences can be set:

- **Airport Settings page** – selections for displaying airport type, runway surface type, minimum runway lengths on moving map.
 - **Declutter Settings page** – selections for defining the base map detail when changing display range.
 - **System Time** – selection of system time zone and map page menu timeout options.
 - **DataBlock Edit page** – selection of data to be displayed in the datablock window of the Map page.
- Swap GPS B** – Selecting this soft key in Setup will swap data display from GPS A to GPS B in the event of a failure of GPS 1.



System Set-up

The screenshot displays the Avidyne system setup interface. At the top center is the AVIDYNE logo. Below it, the following information is shown:

- FlightMax EX5000 Serial Number: 12345678
- Avidyne Part Number: 530-00162-000 (Rev 00)
- Chart: (c) Jeppesen Sanderson, Inc: UPDATE REQUIRED July 30, 2004
- NavData: Americas Valid Aug 5, 2004 Thru Sep 2, 2004
- Obstacles: NOAA NorthAmerica EXPIRED Aug 4, 2004
- Checklists: Cirrus SR22 Version 1.04

In the center is a **Message List** box containing the following messages:

- 11:25 pm Lightning Sensor is Not Communicating
- 11:25 pm TAWS Not Communicating
- 11:25 pm Heading Data is NOT Valid
- 11:25 pm Engine Sensor Unit is Operating Normally
- 11:25 pm Traffic Sensor is Operating Normally
- 11:25 pm Nav Source Data is Valid
- 11:25 pm Broadcast Receiver Is Operating Normally

On the left side, there is a vertical menu with the following buttons:

- Lightning Strk Test (Callout 4)
- Traffic Standby (Callout 5)
- Nav Src GPS A (Callout 6)
- Emerg. Checklist

On the right side, there is a vertical menu with the following buttons:

- Airport Filter (Callout 3)
- Dedutter Setup
- Data Blocks
- System Time

At the bottom of the screen, there is a status bar with the following tabs: Map | TAWS | Chart | Trip | Nrst | Chklist | Setup | Engine. A notification box at the bottom right displays "Lightning Sensor is Not Communicating" with "ACK" buttons.



System Setup

1. **Message List** including sensor status. This is a record of the messages displayed in the message bar. If more messages are active than space allows, the right knob will allow scrolling.
2. **Software build number, system 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. **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.
5. **Lightning Strike Test** - Initiates a self test of the lightning sensor.
6. **Nav Src** - Swaps between GPS A and GPS B as to which unit is providing position information and flight plan data to the moving map.



A stylized, light blue and grey graphic of an engine or aircraft component, overlaid with a large, dark grey 'X' that spans the entire width of the image. The engine part is composed of several curved, overlapping shapes that suggest a turbine or compressor section.

Engine Monitoring

Engine Monitoring

The Engine Monitoring page provides the pilot with engine parameters depicted on simulated gauges and electrical system parameters located in a dedicated region within in the Avidyne MFD display.

An Engine Sensor Unit interfaces with engine-mounted sensors, some of which are shared with the standard airplane gauges, and provide data to the MFD for display.



Engine Monitoring Fuel Page

Fuel Initialization Page

Displayed on startup or when the "Initial Fuel" button is pressed in the engine monitoring page.

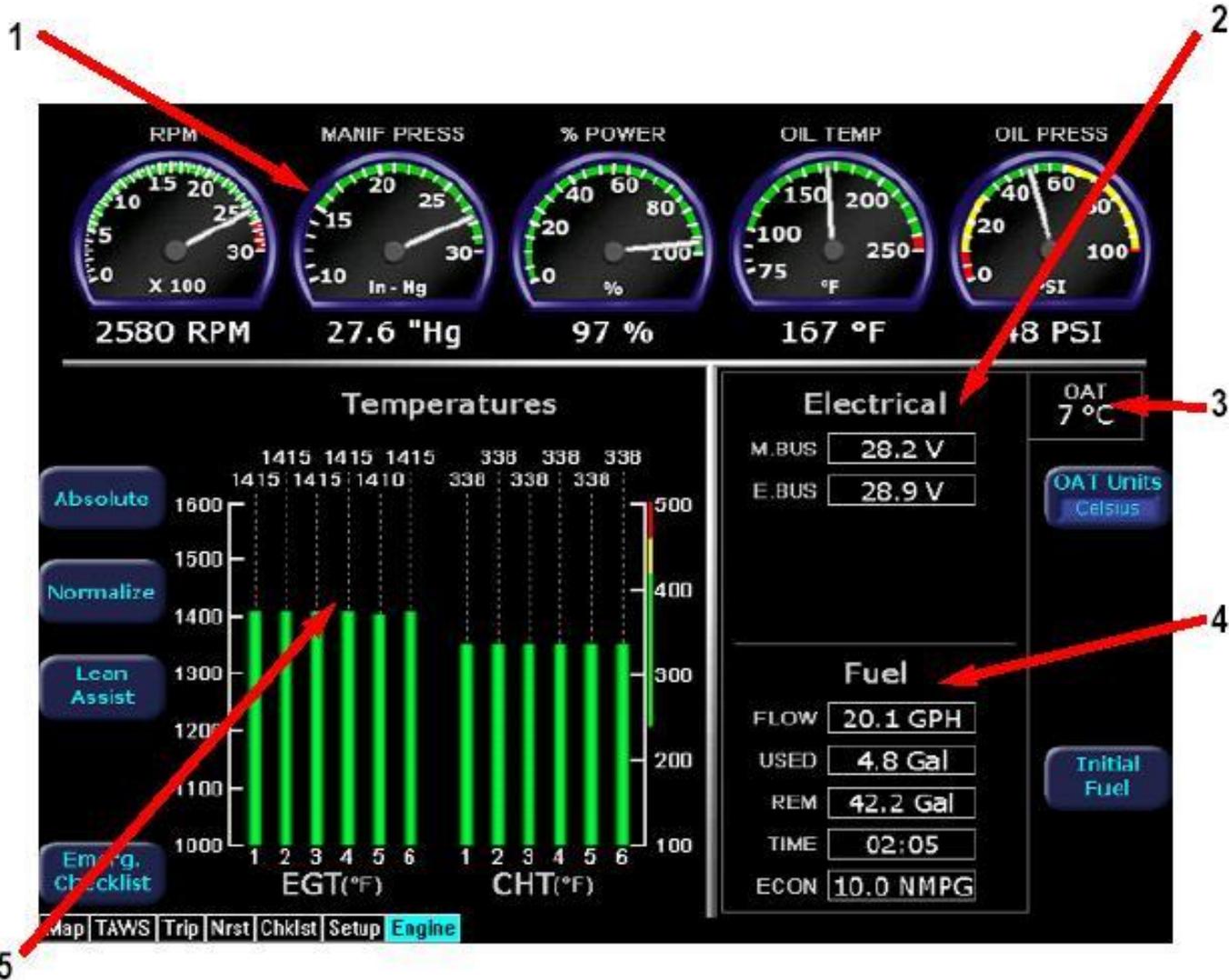
The MFD will display the fuel initialization page and ask the pilot to input the amount of fuel added to the aircraft.

Buttons for "**Fuel Full**" and "**Fuel to Tabs**" are available to quickly set commonly used fuel amounts. In addition the right knob can be used to fine tune the amount of fuel added per gallon.

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



Engine Instruments



Engine Instruments

1. **Gauges** - Provides analog and digital readouts of RPM, Manifold Pressure, Percent Power, Oil Temperature, and Oil Pressure.
2. **Electrical** - Monitors electrical bus voltages and battery current (where applicable).
3. **OAT**- Digital outside air temperature (OAT) gauge.
4. **Fuel** - Provides Fuel Flow, Fuel Used, Fuel Remaining, Time Remaining, and Fuel Economy information.
5. **Cylinder Temperatures** - Full display of Exhaust Gas Temperature (EGT) and Cylinder Head Temperature (CHT) for all six cylinders.

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.



Fuel Information

Flow - Displays the current fuel flow in gallons per hour as reported by the SIU.

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

Rem - 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 flow as reported by the SIU.

Time - Displays the amount of time remaining before the total useable fuel on board will be consumed. This value is only displayed when the GPS ground speed is greater than 50 knots.

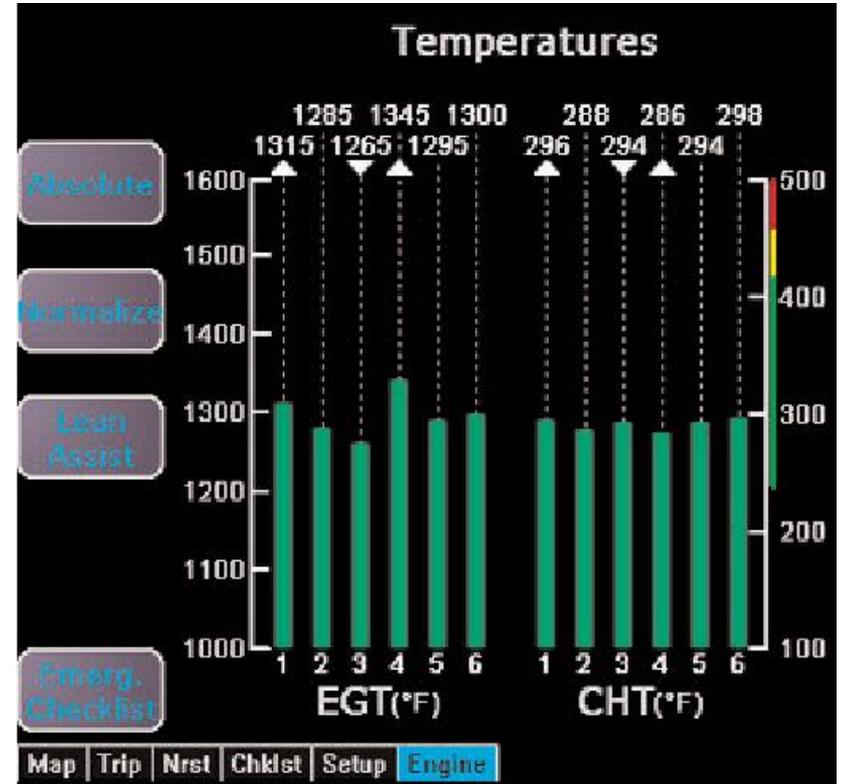
Econ - Displays the current fuel economy in nautical. This value is only displayed when the GPS ground speed is greater than 50 knots.

Fuel	
FLOW	16.7 GPH
USED	5.3 Gal
REM	41.7 Gal
TIME	02:29
ECON	12.0 NMPG



EGT/CHT

EGT/CHT of each cylinder is displayed as a numeric indication above each bar. An up or down trend row will also appear below this numeric indication to indicate whether a cylinder's EGT/CHT is rising or falling.



* The EGT indications are reported by the SIU and in combination with the Lean Assist function are used to aid the pilot in leaning the aircraft's engine for desired performance.

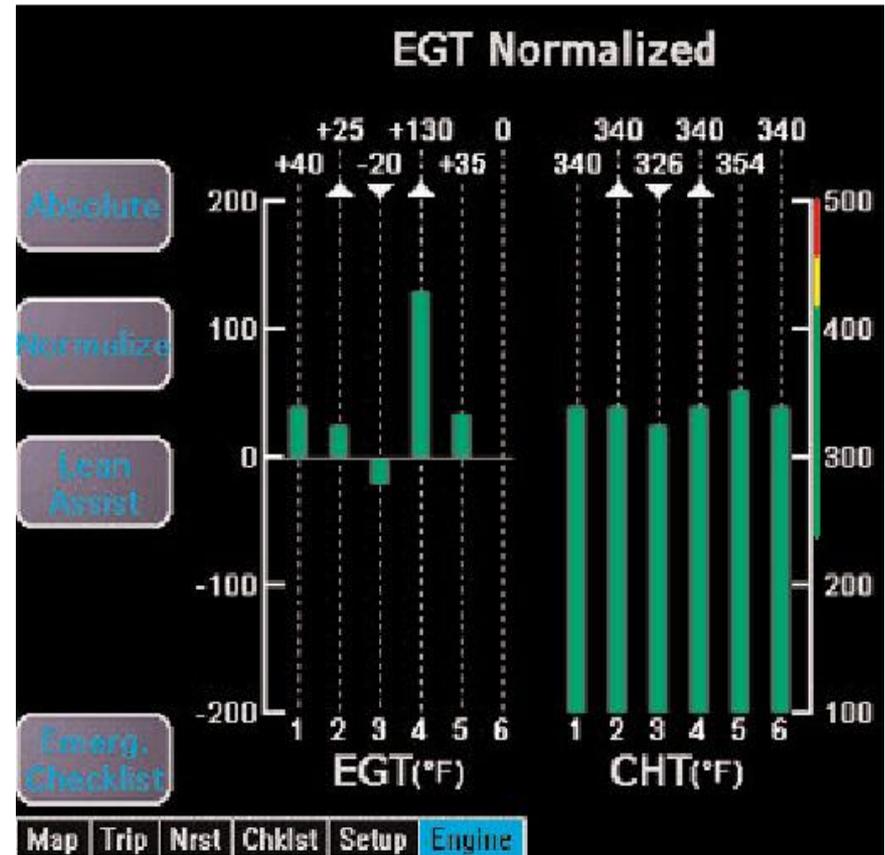


EGT

Absolute - Selects the “Absolute” mode for EGT display. Absolute mode is the default display mode, which indicates the current exhaust gas temperature for each cylinder.

Normalize

- Selects the “Normalize” mode for the EGT display. Upon activation, the display will establish all of the current EGT's at a zero point.



* EGT in Normalized mode, the bar graphs will indicate overall changes in EGT rather than displaying the actual temperature values as in absolute mode.



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 (-65°F to -85°F Rich of Peak).
7. After the desired engine lean setting is achieved, press the "**Normalize**" or "**Absolute**" button to exit the "**Lean Assist**" function.



Leaning for Best Power

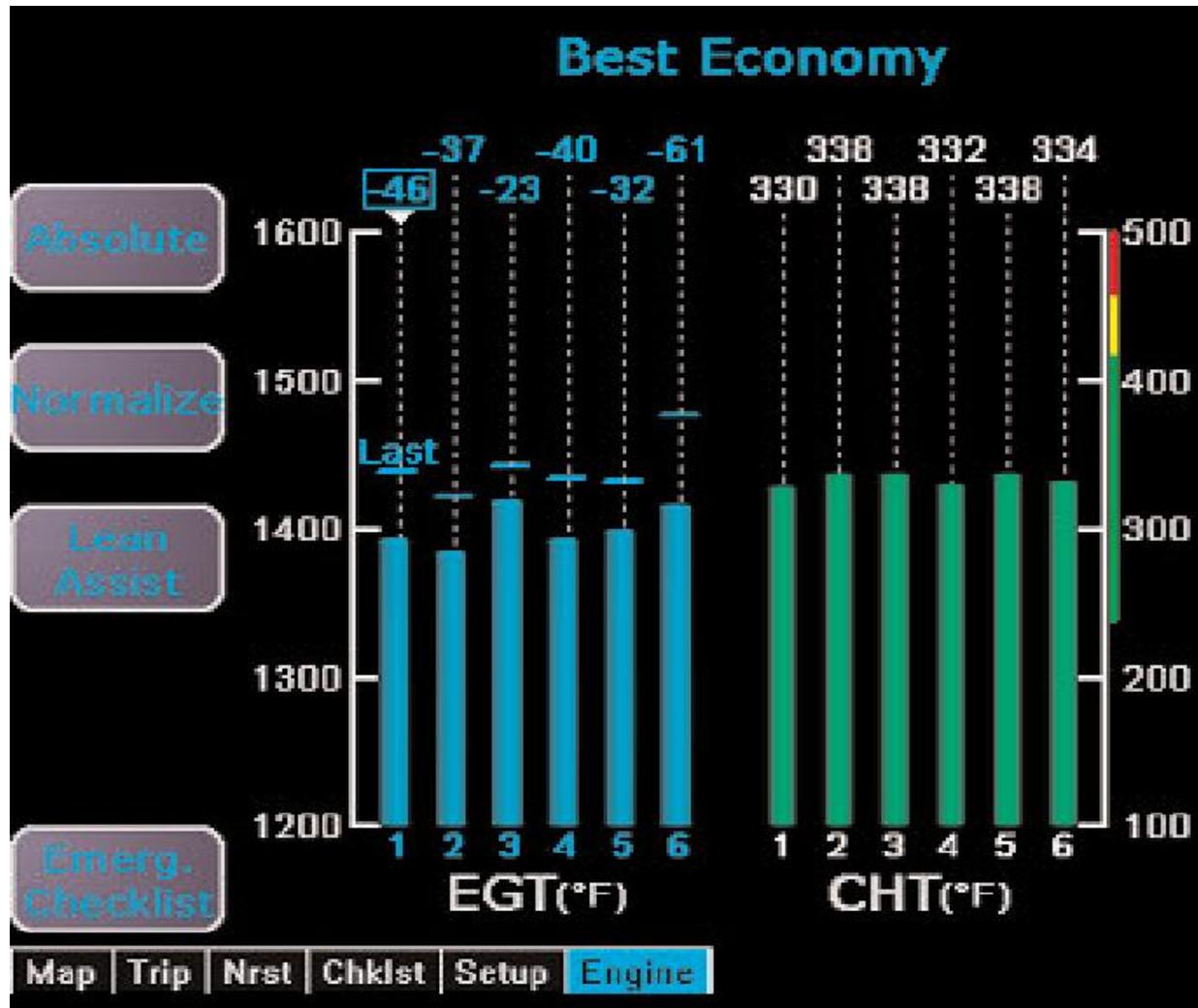


Leaning for Best Economy

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 annunciate "**Looking for First Peak**" at the top of the temperatures section of the display.
3. As the EGT 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 annunciate "**Last Peak Detected.**"
6. Continue leaning until the MFD annunciates "**Best Economy**" which will indicate that the best economy mixture has been achieved (-25°F to -50°F Lean of Peak).
7. After the desired engine lean setting is achieved, press the "**Normalize**" or "**Absolute**" button to exit the Lean Assist function.



Leaning for Best Economy



Engine Monitoring on Moving Map



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.

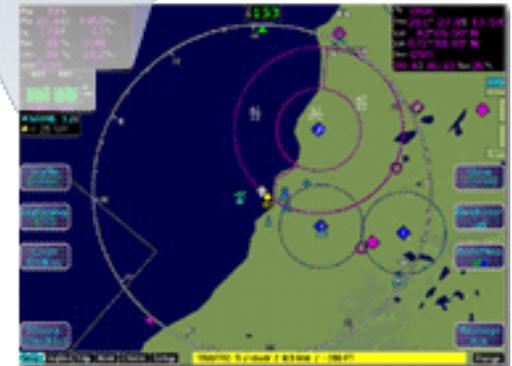
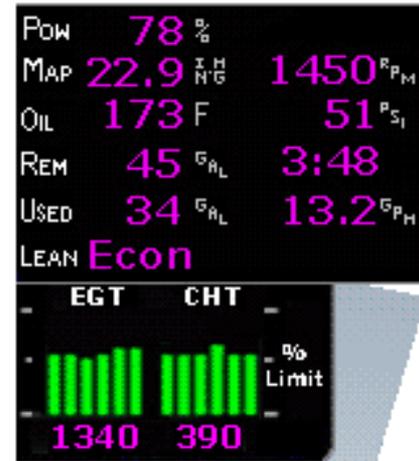
Other Lean data block states are:

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.



Limitations

1. The moving map display must not be used as the primary navigation instrument.
The moving map display provides visual advisory of the airplane's GPS position against a moving map. The information supplements CDI course deviation and information provided on the GPS navigator.
2. Use of Map page during IFR flight requires an IFR approved GPS receiver installation operated in accordance with applicable limitations.
3. Under no circumstances should the Map page terrain representations be used as a basis for terrain avoidance.
4. The Avidyne electronic checklists display supplements the Pilot Operating Handbook checklists and is advisory only. The electronic checklists must not be used as the primary set of onboard airplane checklists.
5. The MFD interfaces with separately approved sensor installations. Adherence to limitations in the appropriate sensor installation POH Supplements is mandatory.



Limitations

6. Traffic information shown on the Map page display is provided to the pilot as an aid to visually acquire traffic. Pilots should maneuver their aircraft based only on ATC guidance or positive visual acquisition of the conflicting traffic. Maneuver should be consistent with ATC instructions. No maneuvers should be made based solely on a traffic advisory.
7. Do not use the optionally installed XM Satellite Weather System for navigation of the aircraft. The XM Satellite Weather System is intended to serve as a situational awareness tool only.
8. Do not use the CMax Approach Charts function for navigation of the aircraft. The CMax Approach Charts function is intended to serve as a situational awareness tool only. The electronic approach charts must not be used as the primary set of on-board approach charts.
9. The Avidyne FlightMax EX5000C Pilot's Guide, P/N 600-00108-000, Revision 03 or later, must be available to the pilot during all flight operations.

