

EVOLUTION FLIGHT DISPLAY

ASPEN Study Guide

1. When reading the PFD Pilot's Guide, you will encounter Notes. Draw a line to match the definition with its associated color.



Indicates an essential operating or maintenance procedure, which, if not strictly observed, could result in damage to, or destruction of, equipment.)Indicates the possible need for future corrective action.)

Highlights an important operating or maintenance procedure, condition, or statement. (Safe operation)

Emphasizes a crucial operating or maintenance procedure, which, if not strictly observed, could result in injury to, or death of, personnel or long term health hazards (Indicates a hazard that may require immediate corrective action)

2. What do the following stand for...?

EFIS

HSI

PFD

3. What are the 4 components of the EFD 1000 Pro Max PFD?

4. What information is displayed on the Data Bar between the upper Attitude Display and lower Navigation display?

5. Draw a line to match the purpose to its associated color...



Used to show primary flight data (e.g. IAS, ALT, and HDG), scales, and menu items that are selectable for editing.

Used to indicate flight envelope and system limits, and for warning annunciations that require immediate pilot recognition, and which may require immediate pilot correction or compensatory action. Is used to indicate Weather cell movement and precipitation areas, and terrain and obstruction data.

Used to indicate editable values that are not currently selected for editing, for bearing pointers, and for areas outside of the terrain database coverage area.

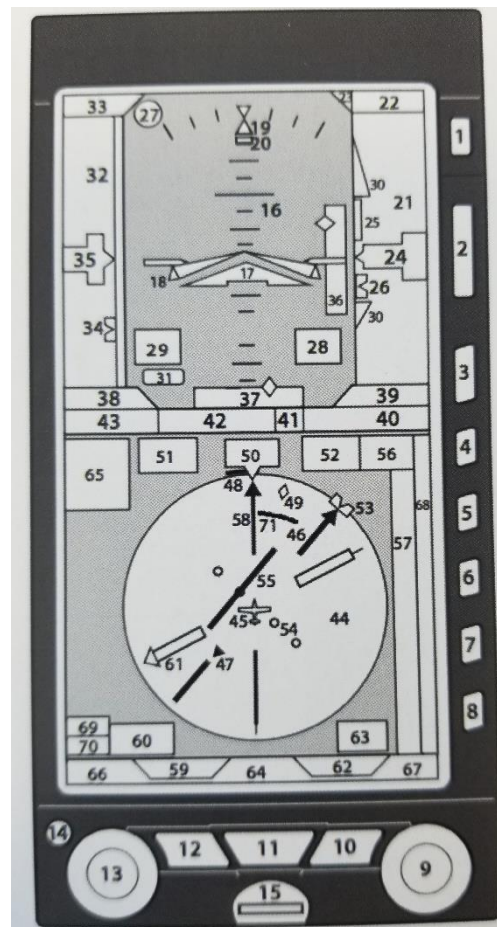
Used to indicate abnormal information sources, and for caution information that requires immediate pilot awareness and for which subsequent pilot action may be required. Is used to indicate Weather precipitation areas, WX-500 data and terrain and obstructions data.

6. Draw a line to match the purpose to its associated color...



Used to indicate the ground.
Used for navigation information or mode data related to or provided by the selected navigation source (i.e. navigation deviations, equipment operating state, waypoint information). Is also used to indicate Weather precipitation areas, terrain data, and the status of user controls (i.e., ON, enabled, or active).
Used to indicate the sky, Weather precipitation areas, and navigation map features.
Used for pilot-selectable references (bugs) enabled for editing, for depicting the active GPS Navigation leg or on a moving map display, and for depicting the fight director bar.
Used to show supplemental flight data and for hotkey and menu legends that are OFF, disabled, or inactive.

7. Study the colored image. Next write in the number for the associated discription.



CONTROLS	
	Automatic Dimming Photocell
	BARO
	CDI Navigation Source Select Button (Middle Button)
	Hot Key Menu select
	Reversion and Power Button
	Feature/Mode Selection Keys
	Feature/Mode Selection Keys
	Feature/Mode Selection Keys
	Left Button, Single-Line Bearing Pointer Source Select
	Right Button, Double-Line Bearing Pointer source Select
	Range Buttons
	Left Knob
	Menu Button
	microSD Card Slot
	Right Knob

ATTITUDE DISPLAY	
	Airspeed Tape
	Altitude Tape
	Roll Pointer
	Airspeed Bug
	Lateral deviation Indicator (LDI)
	Vertical Deviation Indicator (VDI)
	Attitude display
	Numerical Altitude Indication, Altitude Drum/Pointer
	Radio Altitude (if installed)
	Minimums Marker
	Altitude Bug
	Single-Cue Flight Director
	Altitude Trend Vector
	Selected Airspeed Field (controls the Airspeed Bug)
	Aircraft Reference Symbol
	Selected altitude Field (controls the Altitude Bug)
	Altitude Alerter
	Slip/skid Indicator
	Numerical airspeed Indicator, Airspeed Drum/Pointer
	Decision Height Annunciation (if installed)
	Selected Minimums Field
	LDI Navigation source Annunciation

DATA BAR	
	Wind Direction Arrow
	Ground Speed
	Outside Air Temperature (OAT)
	Barometric Pressure Setting Field
	True airspeed (TAS) or Mach number
	Wind Direction and Speed

NAVIGATION DISPLAY	
	Ownship Symbol
	Course Pointer
	Navigation Display
	TO/FROM Indicator
	Rate of Turn Indicator
	Ground Track Marker
	Numerical Direction Indicator
	Selected Course (CRS) field
	Selected heading Field
	Heading Bug
	Course Deviation Indicator (CDI)
	Vertical speed Numerical Value
	Vertical Speed Tape
	Single-Line Bearing Pointer
	Single-Line Bearing Pointer Source
	Single-Line Bearing Pointer Source Info Block
	Double-Line Bearing Pointer
	Double-Line Bearing Pointer Source
	Double-Line Bearing Pointer Source Info Block
	Selected CDI Navigation Source
	Selected CDI Navigation source Information Block
	Left Knob State
	Right Knob State
	Hot Key Label
	Range
	Declutter Level
	Altitude Intercept Arc
	Course Deviation Scale

8. What does the first action of the Left or Right Knob do?
9. How do you cycle through the Menu options in a round-robin sequence using the Left or Right knob?
10. What 2 options may be made using the Left Knob?
11. What 4 options may be made using the Right Knob?
12. How do you set your approach Minimums?
13. When will the course automatically set itself?
14. How would you know if the Auto Course is enabled in the Menu?
15. How do you activate the SYNC function on the Left/Right knobs?
16. How many seconds of inaction does it take to revert to the Left/Right knob home state?
17. Once you have pressed the Menu button, how would you know which menu page you're on?
18. How do you navigate through the Menu pages?
19. How do you get the Menu into Edit Mode?
20. When trying to Edit an Option, what is the significance of the colors....White, Magenta, Green & Gray?
21. When finish editting in the Menu options, how do you lock in your selection?
22. When finish editting in the Menu options, how do you return to the Navigation Mode?
23. When finish editting in the Menu options, how do you exit from the Menu?
24. Referring to the five Hot Keys,... when are they not accessible?

25. Referring to the Hot Keys,... what is the color philosophy?
 26. Referring to the Hot Keys,... what is 1/3 key's function?
 27. Referring to the Hot Keys,... what is MIN key's function?
 28. Referring to the Hot Keys,... what is the 360/ARC key's function?
 29. Referring to the Hot Keys,... what is the GPSS key's function?
 30. Referring to the Hot Keys,... what is the BARO key's function?
 31. Which of the 3 CDI Navigation Source Select Buttons couple to the autopilot?
 32. What d you do if you have selected GPS as the CDI's Nav source and the source is shown as invalid?
 33. Normally the PFD brightness is set to AUTO and is adjusted based on the photocell sensing of ambient lighting conditions.. How do you override the AUTO brightness setting?
 34. What is the Max brightness level in the AUTO mode using Aircraft power? Using the PFD's Internal Battery?
 35. What happens when the PFD backlight temperature is greater than 70C?
 36. What does pressing and holding either the RNG (+) or (-) button do?
 37. What is the purpose of the REV Button?
 38. How do you know if the Database is valid?
 39. When using the Left or Right knob, what color are you looking to be able to change the value?
 40. How long should the PFD's internal Backup Battery last in the event the aircraft's power is no longer available?
 41. How do you know if the PFD is running off it internal Backup Battery?
 42. How does the PFD's internal Backup Battery get charged?
 43. Is it necessary to set both the PFD's and the Standby's Altimeter when given a new altimeter setting?
 44. Is it possible to override the automatic power configuration?
 45. Although the PFD is not a touch screen and should never have fingerprints on it, it may accumulate dust or pollen. What are the 6 guidelines for cleaning the screen?
46. Write the coresponding numbers beside the label...

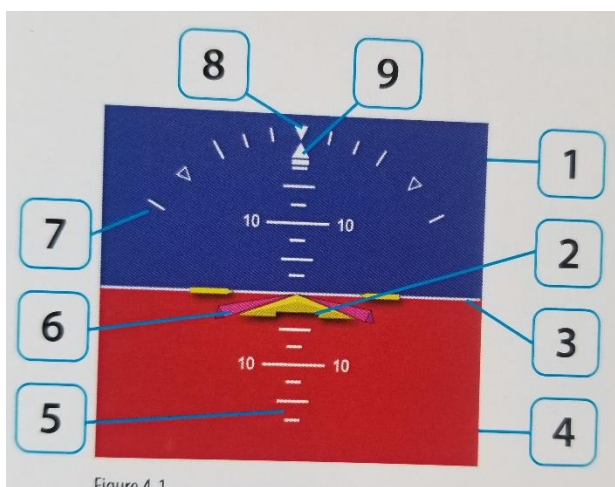
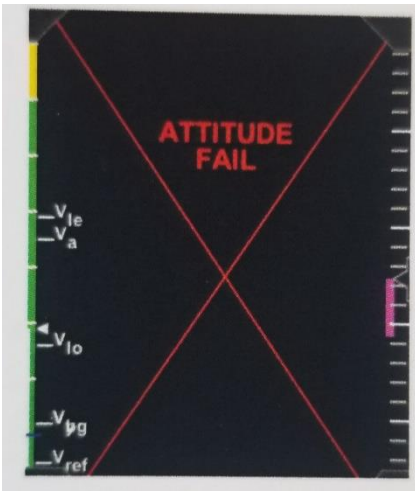


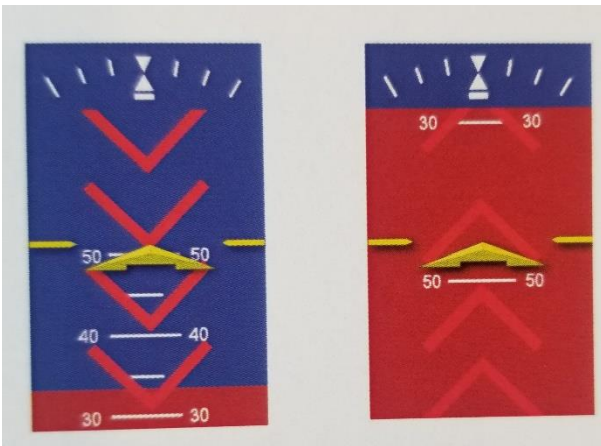
Figure 4-1

Attitude Indicator	
	Roll Scale
	Roll Pointer
	Ground
	Sky
	Horizon Line
	Pitch Scale
	Flight Director
	Slip/skid indicator
	Aircraft Reference Symbol

47. What does a Red X on the PFD indicate?



48. When would Red Chevrons come into view on the Attitude Indicator?

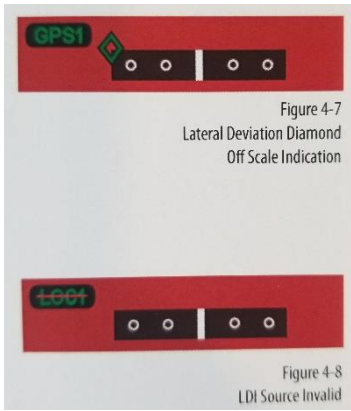


49. Write the corresponding numbers beside the label...



Lateral and Vertical Deviation Indicator	
	Lateral Deviation Indicator (LDI)
	Vertical Deviation indicator (VDI)
	LDI Navigation source Annunciation

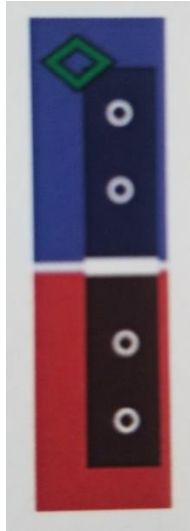
50. What does it mean if in the above figure, #3 is missing or has a red slash through it?



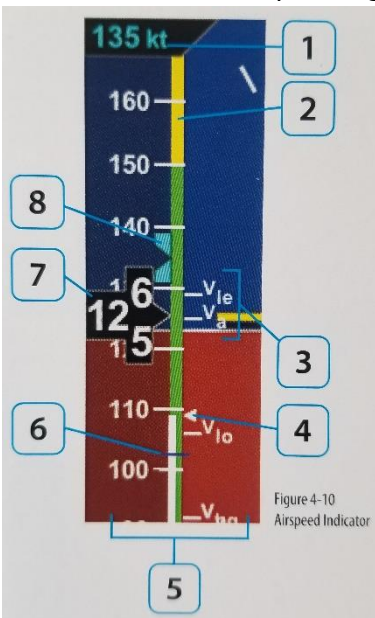
51. What happens when the lateral deviation exceeds the displayable range of 2.5 dots?

52. If the LOC(BC) mode is active, is there reverse sensing?

53. What happens when the vertical deviation exceeds the displayable range?

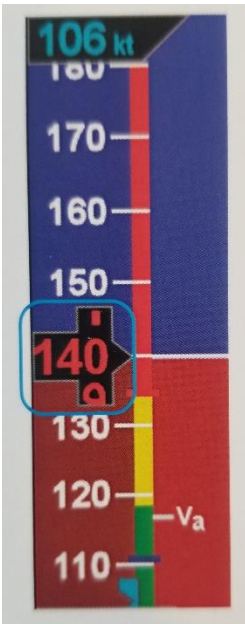


54. Write the corresponding number beside the label...



Airspeed Indicator	
1	Selected airspeed Bug
2	Speed Marker
3	Initial Flap Extension speed Marker
4	Color Speed Bands
5	Selected Airspeed Field
6	Textual Vspeeds
7	Airspeed Tape
8	Numerical Airspeed Value (drum)

55. What does a red Numerical Airspeed Value (drum) on the Airspeed Indicator indicate?



56. What is the difference between the Selected airspeed Field Value being Magenta or Cyan?



57. Write the corresponding number beside the label...

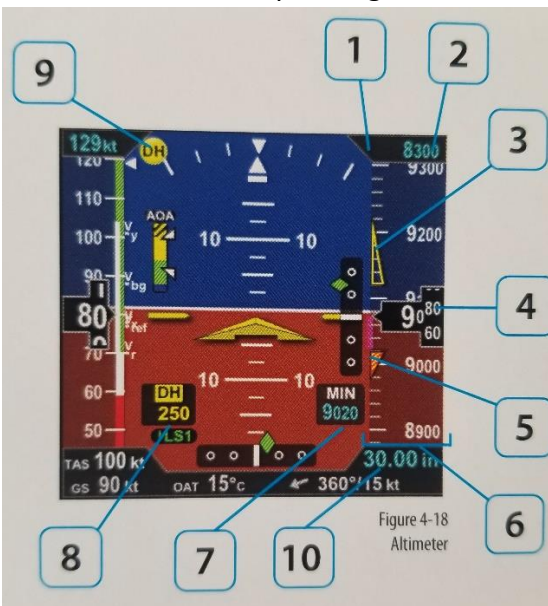
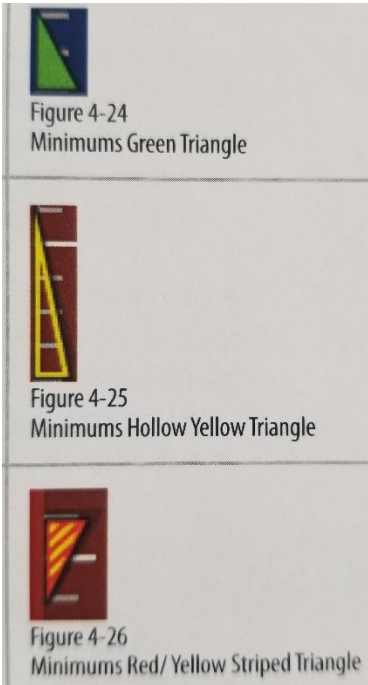


Figure 4-18
Altimeter

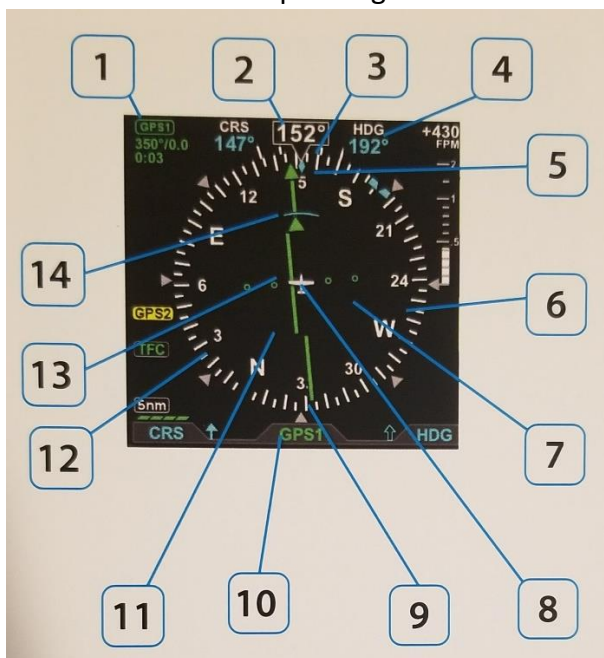
Altimeter	
	Altitude Alerter
	Minimums Marker
	Altitude Trend Vector
	MINIMUMS Annunciation/Selected Mins Field
	Decision Height Annunciation
	Selected altitude field
	Numerical Altitude Value
	Altitude Tape
	Radio altitude/Decision Height Window (if installed)
	Baro

- 58. When would the Altitude Alert render on-screen as a yellow alert flag next to the Selected altitude value?
- 59. Once you have leveled at your selected altitude, how many feet deviation would cause the Altitude Alert system to activate?
- 60. Regarding the MINIMUMS Annunciation markers on the Altitude Tape, draw a line connecting the description to the marker...



The Aircraft is 100 feet to 200 feet above the selected MINIMUM (The marker base is at 100 feet above MINIMUM, and the tip is at 200 feet above MINIMUM).
The aircraft is 500 feet above selected MINIMUM.
The aircraft is at the selected MINIMUM.

- 61. How do you display the MINIMUMS field?
- 62. What happens to the wind speed and direction values when the wind is below 10 kts?
- 63. What happens if the wind data is out of range or invalid?
- 64. Write the corresponding number beside the label...



NAVIGATION DISPLAY	
1	Altitude Intercept Arc
2	Course Deviation Indicator
3	Compass Scale
4	Course Deviation Scale
5	Selected CDI Navigation source
6	Heading Bug
7	Aircraft Ownship Symbol
8	CDI source Info Block
9	Magnetic heading
10	Rate of Turn Indicator
11	Selected Heading Field
12	Ground Track Marker
13	Course Pointer
14	TO/FROM Indicator

65. When looking at the Lateral Deviation Bar, how would you verify that you are set up to fly the Back Course and would you have reverse sensing?

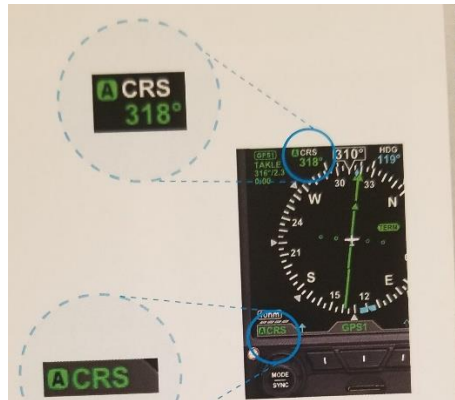


66. When flying a Back Course final approach, what CRS value should you set the head of the needle on?

67. Why might there be no Course Deviation Bar on the HSI?

68. In addition to there being no Course Deviation Bar on the HSI when the Nav source data is invalid or unavailable, what else would you expect to see?

69. What is the purpose of the inverse green A shown on the Nav Display?

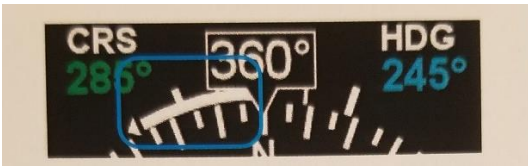


70. Write the corresponding number beside its label...



BEARING POINTER SOURCE SELECTION	
	Single-Line Bearing Pointer
	Single-Line Bearing Pointer Source Info. *Distance (NM) to active GPS waypoint *Waypoint ID, Station ID
	Single-Line Bearing Pointer Icon
	Double-Line Bearing Pointer
	Double-Line Bearing Pointer Source Info. *Distance (NM) to active GPS waypoint *Waypoint ID, Station ID
	Double-Line Bearing Pointer Source

71. What is the curved white line on the Heading Display?



72. What does the blue diamond indicate?



73. Does the image on the VSI show a climb or descent and at what rate?



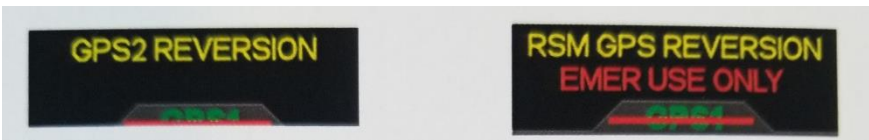
74. What is the purpose for the triangle cap on the VSI Tape?



75. When the Range is set to Auto Range, what will it always include?

76. What color is the Active Waypoint and Active Leg?

77. When might you see “GPS2 REVERSION” or “RSM GPS REVERSION EMER USE ONLY”?



78. How would you Declutter the Navigation Map?

79. When utilizing the GPSS Hot Key inconjunction with the Auto Pilot (AP), what Mode should the AP be in?

80. How would you know that the GPSS mode is active?



81. If the GPSS mode becomes inactive with the AP engaged, what will the AP follow?

82. If while using the GPSS mode, you select VLOC, what will the GPSS follow? (* the transition from GPS to VLOC may occur automatically if you have and ILS approach loaded and active and are established inbound on the final approach course.)

83. When flying an approach, why must you select the Approach mode on the AP eventhough the GPSS mode will fly the approach?

84. When flying an ILS on a WAAS GPS, what mode on the AP should be used to fly a full course reversal automatically?

85. When flying a full ILS on a WAAS GPS with the AP engaged, when should the Pilot switch the AP to approach mode?

86. When flying a precision approach, you notice the ATT button flashing on the AP. What should you do?

87. What is the purpose of the Flight Director?

88. Will the AP fly the selected heading if the GPSS mode is activated?

89. What Mode must the AP be in in order to receive GPSS signals from the PFD?

90. When intercepting and tracking VORs with the AP, what selections on the AP need to be made with or without AUTO CRS enabled?

91. When receiving vectors to final from ATC, how should the AP be managed?

92. In order for the AP to couple to vertical guidance on a GPS WAAS approach, where must you see “APPR” mode annunciated?













93. Unlike an ILS where the VDI will display as soon as the aircraft is established on final approach course with a valid signal, when will the WAAS GPS likley activate vertical guidance?

94. When initially navigating with the GPS with the intention of flying an ILS, what should the pilot do if the GPS doesn't automatically switch to VLOC before reaching either the glide slope intercept or the FAF?

95. When using the synthetic vision (SV) on 3/3 of the quick keys, what happens to the pitch scale when SV is shown only on the Attitude Display portion of the PFD?

96. If you are performing a missed approach and press the GA button on either the yoke or the AP, what pitch or IAS will the AP attempt to pursue?

97. The Tower Obstacle Symbols are shaped according to their height being below or above 1,000' AGL similar to the VFR Sectional chart. What do the blue, yellow and red color mean?

Obstacle Height < 1000' AGL		Obstacle Height > 1000' AGL	
			
			
			

98. What are the Red and Yellow coloring used for on the Terrain Warning System (TWS)?



99. Draw a Flight Path Marker and explain what it shows.

100. What section of the EFD1000 PRO MAX PFD Pilot Guide would you look up Unusual Conditions and Annunciations?